

**Radboud Universiteit Nijmegen**



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## Bilateral Investment Patterns

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*A comprehensive comparison of the financial exposure  
towards the Euro Area and the United States*

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**Master's Thesis**

Economics and Business Economics

Specialization Financial Economics

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November 2016

## Abstract

This paper gives a comprehensive analysis of the difference in financial exposure towards the Euro Area and financial exposure towards the US of global investors. It finds that, although the US is by far the number 1 destination of foreign investment in the World, according to a simple benchmark from standard portfolio theory (the ICAPM) global investors are largely underexposed towards US securities, even after Home Bias taken into account. Euro Area investors – in particular from the Euro Area low rating countries – are overexposed towards Euro Area securities. Investors from outside the EU are underexposed, but after taking Home Bias into account, they are close to the ICAPM benchmark. Apparently, investors around the world are more exposed towards Euro Area securities than towards US securities in their portfolios of foreign securities. This (over)exposure was resilient to the Global crisis and the Euro Area crisis: the paper finds evidence that global investors invested a greater share of their total portfolio in equity issued by Euro Area countries during these periods of crisis. Further, the paper finds that countries with a more open capital account, that trade with and are close to the Euro Area and the US are more exposed towards securities issued by these destinations of foreign investment. In the more general it can be concluded that determinants of investing in foreign are a more open capital account, a higher degree of governance and a higher level of GDP per capita, but a lower degree of financial development relative to the foreign destination. Moreover, the bigger the relative institutional distance between an investor country and the country which is the destination of foreign investment, the stronger the impact on foreign bias.

**Keywords:** Home Bias, cross-border portfolio holdings, informational asymmetries, international finance gravity model, institutions.

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## 1. Introduction

For years, the United States is by far the number 1 destination of portfolio investment. 2012 End Decembers Portfolio investment in the US amounted to 9,037,631 million US Dollars, accounting for 20,7% of the total value of portfolio investment in the world. But also the Euro Area countries are major recipients of portfolio investment: as many as 6 countries rank among the top 10 issuers of portfolio investment assets in the world. These countries together account for a share of 29.2% of the total value of portfolio investment in the world. Can these portfolio investment patterns be explained by standard portfolio allocation models? Or are global investors over or underexposed towards the US and Euro Area? And how does home bias – the preference of investors to hold a disproportionate share of domestic assets in their total portfolio – affect the exposure towards financial assets issued by these two destinations of foreign investment? What are the determinants of investment into the US? Are these the same as for the Euro Area?

This paper aims to answer these questions by comprehensively comparing financial exposure towards the Euro Area and the financial exposure towards the US of global investors. The analysis starts by describing what the home bias looks like in the US and the Euro Area and the financial exposure of global investors towards these economies over the 2001-2012 period. Subsequently, the characteristics of countries investing in the Euro Area and US are identified for both destinations. Use is made of gravity variables proxying for informational asymmetries who are considered as important determinants of bilateral investment patterns in international finance literature. The role of the quality of institutions of the investor home country is also emphasized in some studies. There is however no consensus in literature whether it is the relative level of the institutional quality across countries (*the comparative advantage hypothesis*) that matters for bilateral international investment positions or it is their similarity (*the familiarity hypothesis*) (Floreani & Habib, 2015). The paper tests both hypotheses. Because the sample runs from 2001-2012, the paper also investigates the influence of the global crisis (2008-2009) and Euro crisis (2010-2012) on the observed bilateral investment patterns.

In addition, there is a more in-depth analysis of the Euro Area by looking whether the same determinants play a role in financial exposure towards the Euro Area for EMU countries and non-EMU countries and whether the results are driven by the exposure towards a particular group of countries within the Euro Area.

The paper tries to contribute to the rapidly increasing literature on explaining bilateral international investment patterns in the following ways. First, it provides a comprehensive comparison of the financial exposure of global investors towards the Euro Area and the US. Because the sample period includes the two crises periods, the impact of these periods on

portfolio investment holdings in the Euro Area and the US can be compared. As far as known, there is no such an analysis comparing directly the exposure of global investors towards these major recipients of foreign investment. Second, by taking the method of Floreani & Habib (2015) as a guide and applying the same model of exposure towards the Euro Area and the US, the characteristics of countries investing in the Euro Area and of countries investing in the US can be identified and compared. This model makes use of gravity variables and institutional variables, thereby combining different strands of literature on the explanation of bilateral investment patterns.

The remainder of this paper is organized as follows. The next section provides an overview of the related literature. Section 3 describes how the various measures of Home Bias and financial exposure towards Euro Area countries and the US are constructed. Section 4 discusses the data used to construct these measures and the possible determinants of financial exposure. Section 5 documents the Home Bias of and the financial exposure towards the Euro Area countries and the US. Then the empirical model is developed in section 6. Section 7 presents the empirical results on the determinants of foreign investment in the Euro Area countries and the US for both equity and debt. Moreover, section 7 contains a more in-depth analysis of the Euro Area exposure. Section 9 concludes. Finally, section 8 discusses some limitations on the used data and used models to estimate the determinants of foreign investment.

## 2. Related Literature

Home bias is the general tendency of investors to hold a disproportionate large fraction of wealth in domestic assets compared to a simple benchmark suggested by standard portfolio theory, namely the International Capital Asset Pricing Model (ICAPM) as formulated by Solnik (1974). The ICAPM predicts that global investors with the same risk-return preferences should hold the same world market portfolio. The rationale behind this is that if investors with the same risk-return preferences have identical expectations of the mean and variance of future returns of all securities and apply the same portfolio optimization procedure, all investors will allocate their portfolio in the same way (Fidora et al. 2006). This world market portfolio suggested by the ICAPM is a globally diversified portfolio where the fraction of investment in each country is equal to the market capitalization of that country relative to the world market capitalization. For example, as the 2012 US equity market capitalization share in World equity market capitalization accounts for about 42%, global investors should invest 42% of their equity wealth in the US stock market according to the ICAPM. Similarly, US investors should invest 58% of their total portfolio in equity holdings in foreign equity. Benefits of global diversification over domestic diversification is that it should generate a better risk-return profile as the world capital market entails lower systematic risk than any domestic capital market. By eliminating idiosyncratic risk (asset specific risk) through diversification, investors would obtain a better return while decreasing risk (Schoenmaker & Bosch, 2008).

The existence of Home Bias in equities was first documented by French and Poterba in 1991 for the countries Japan, the US and the UK. In the meanwhile, there is robust evidence for the existence of Home Bias in both equity and debt portfolios across a large range of countries (Tesar & Werner, 1998; Chan, Covrig & Ng, 2005). A steadily growing literature on the reasons as to why investors have the tendency to hold a disproportionate share of wealth in domestic assets in their portfolio fall into partly competing and partly complementary explanations. One important strand of literature argues that countries deviate from the ICAPM benchmark because the International CAPM is derived under assumptions which do not hold in global security markets. The ICAPM is subject to the assumption that international capital markets are perfect, that is without any barriers. In reality, there are several barriers to international investment (Karaolyi & Stulz, 2003). Some explanations stress the effect of direct barriers to international capital flows such as capital controls and tax barriers (Stulz, 1981; Black, 1974) other attempts have addressed the issue in terms of other forms of market imperfections such as transaction costs (Rowland, 1999). However, with the abolishment of capital controls starting from the mid-1980 and the relatively high turnover rates in international transactions indicating higher cross-border trading most of these explanations are rejected and do not seem to be sufficient for a

complete explanation of the observed behavior (French and Poterba, 1991; Gehrig, 1993; Tesar and Werner, 1995, Warnock, 2012).

Another assumption to which the International CAPM is subject and which does not hold in reality is the assumption of symmetrically informed investors. The role of information asymmetries between domestic and foreign investors is identified as one of the main explanations of Home Bias in the international finance literature. The reasoning is that domestic investors are on average better informed regarding domestic fundamentals and expected returns compared to foreign investors (Low, 1992; Gehrig, 1993; Kang & Stulz, 1997; Brennan & Cao, 1997) hence foreign investment appear on average riskier and investors rationally specialize in domestic assets (Gordon & Bovenburg, 1996; Van Nieuwerburgh & Veldkamp, 2009). Various recent empirical studies find that investors frequently earn significantly higher returns on investments in geographically close firms due to information asymmetries, challenging in particular the assumption that international diversification yields higher returns (Coval & Moskowitz, 2001; Choe, Khoe & Stulz 2004; Bae, Stulz & Tan, 2005). Informational asymmetries between domestic and foreign investors are also able to explain the retrenchment of gross capital flows in crisis periods (Broner et al. 2011). A retrenchment during crisis, with both domestic investor shedding foreign assets and foreign investors selling domestic assets, can take place if foreign investors are less informed than domestic investors about domestic fundamentals and expected returns, and crises increase this information asymmetry (Brennan & Cao, 1997; Tille & Van Wincoop, 2008).

The rapidly increasing literature tries to explain bilateral international investment patterns by gravity variables proxying for these informational asymmetries. In particular, bilateral trade appears to be strongly correlated with bilateral equity holdings (Lane, 2006; Aviat & Coeurdacier, 2007; Lane & Milesi-Ferretti, 2008). Portes & Rey (2005) find a significant negative impact of physical distance on international transactions.

Although the inclusion of these gravity variables proxying for information frictions work well in explaining bilateral international investment patterns, they are not able to explain the higher degree of financial integration among Euro Area countries. Several papers find evidence that there is still a Euro bias - Euro Area resident are overexposed towards Euro Area securities in their portfolio - among Euro Area countries, despite the lower distance and higher degree of trade among Euro Area countries (Lane & Milesi-Ferretti, 2005; Lane, 2006; Coeurdacier & Martin, 2007; De Santis & Gerard, 2009; Floreani & Habib, 2015). The presence of this Euro bias among Euro countries can be partially explained by the elimination of exchange rate risk with the arrival of the Euro. De Santis and Gerard (2006) & Schoenmaker and Bosch (2008) show the Euro-effect by contrasting changes in the home bias in the EMU countries and non-EMU countries. On a more

global scale, Fidora et al (2006) find that a decrease in the volatility of monthly exchange rate reduces Home Bias. They find a stronger effect on bond Home Bias than on equity Home Bias.

Furthermore, De Santis & Gerard (2006) and Schoenmaker & Bosch (2008) showed that the elimination of exchange rate volatility induced EMU based investors to switch from domestic securities to Euro Area securities by finding an increase in regional bias towards Euro Area securities. This regional bias measures the preference of investors to hold Euro Area securities in foreign portfolio in comparison to, for example US securities. Floreani & Habib (2015) find that not only EMU countries are over exposed towards Euro Area securities in their portfolio of foreign securities, but also other EU countries are overweighting Euro Area securities in their foreign portfolio. Investors outside the EU are close to the ICAPM benchmark. This suggests that factors as institutional quality and institutional distance could also play a role in explaining bilateral international investment patterns. Countries with a higher quality of institutions may attract more foreign investors. Institutions as regulations, accounting standards and rule of law and the absence of corruption contribute to a greater transparency of financial information and reduce informational asymmetries across countries. Ahearne et al. (2004), for example, show that the US public listing of a foreign firm – a proxy for the reduction of information asymmetries - is a major determinant of a country's weight in US investor's portfolios. Information costs are reduced when firms have a public listing in the US, because the firm is compelled to produce higher quality financial information as investor protection regulations elicit standardized, credible financial information.

There is however no consensus in this strand of literature whether it is the relative level of the institutional quality across countries that matters for bilateral international investment positions (*the comparative advantage hypothesis*) or it is their similarity (*the familiarity hypothesis*) (Floreani & Habib, 2015).

On the one hand, there is evidence for the first hypothesis as Salins & Bénassy-Quéré (2006) and Ahrend & Schwelnuess (2012) both show that the institutional quality in the host country is a significant determinant in explaining bilateral international investment. Several other recent studies provided evidence that countries with less developed financial markets and limited domestic investment opportunities to invest abroad in order to gain benefits from a more liquid and efficient financial sector. For example, Forbes (2010) finds that financially less developed countries have a greater exposure towards US securities in their portfolio. Floreani & Habib (2015) found a similar result in the case of financial exposure towards the Euro Area. Also Berkel (2007) shows that the level of equity market development in the host economies is a positive determinant of foreign portfolio equity.

On the other hand, there are also papers arguing that institutional similarity matters for bilateral investments positions. Huberman (2001) finds compelling evidence that people invest in the familiar while often ignoring the principles of portfolio theory. Other papers that address this 'familiarity bias' are Chan et al. (2005) and Grinblatt & Keloharju (2011). Vlachos (2004) shows that bilateral differences in securities regulation lead to decreased portfolio holdings. Forbes (2010) finds evidence that countries with better governance are more exposed towards US securities. Abdioglu et al. (2013) confirm the result by showing that there is a positive bias among investor countries with governance setups similar to the US. Also Kim et al. (2008) argue that a country's level of corporate governance has a positive impact on its exposure towards countries with strong corporate governance. They show that countries with stronger corporate governance dislike shares of Korean firms with weaker corporate governance, while this is not the case for investor countries with weaker corporate governance.

The next section describes how the various measures of Home Bias and financial exposure towards Euro Area countries and the US are constructed.

### 3. Measurement of Home Bias and financial exposure towards Euro Area countries and US

To measure the level of Home Bias in Euro Area countries and the US, the International Capital Asset Pricing Model (ICAPM) is used. This model assumes that capital markets are fully integrated in the international setting, and thus investors can buy and sell securities in foreign markets without any restrictions or extra transaction costs. Equilibrium in the international setting is achieved when all investors hold the market portfolio in which each country is weighted by its market capitalization (Schoenmaker & Bosch, 2009). This is the optimal portfolio with no bias. Home Bias is the preference of investors to hold a share of domestic assets which is larger than implied by the ICAPM benchmark and is measured as the opposite of Foreign Bias in finance literature:

$$HB_{ijt} = 1 - \left( \frac{F_{ijt}/T_{ijt}}{MC_{ijt}^F/MC_{jt}^W} \right) \quad (1)$$

Where the share of Foreign Assets ( $F_{ijt}$ ) in the Total (domestic and foreign) Portfolio ( $T_{ijt}$ ) of investor country  $i$  in the asset class  $j$ , is divided by the share of the market capitalization of the rest of the world for the investor country  $i$  ( $MC_{ijt}^F$ ) in the World Market Portfolio  $MC_{jt}^W$ .

If for example investor country  $i$  allocates 15 percent of their portfolio to foreign assets (equity or debt), while the World Market Portfolio according to the ICAPM benchmark comprises 75 percent of foreign assets and 25% percent of domestic assets, the Home Bias measure is equal to  $1 - \frac{15}{75} = 0.8$ : only one fifth (15/75) of international diversification is exploited by investors. So when the home bias measure for country  $i$   $HB_{ijt}$  is equal to one, there is full home bias; when it is equal to zero, the portfolio is optimally diversified according to the basic International CAPM (Coeurdacier & Rey, 2012).

To measure the exposure towards the Euro Area and US, this paper follows the method of Floreani & Habib (2015). The Total Bias towards the Euro Area (US) is denoted to the deviation of the actual share of investment in the Euro Area (US) in 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 (US)<sup>1</sup> is denoted as  $TB_{ijt}^{EA}$ , is equal to

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<sup>1</sup> In case of measuring the exposure towards the US, the superscript EA should be read as US.

$$TB_{ijt}^{EA} = \left( \frac{I_{ijt}^{EA}/T_{ijt}}{MC_{jt}^{EA}/MC_{jt}^W} \right) \quad (2),$$

where  $I_{ijt}^{EA}$  is the investment by country  $i$  in the security  $j$  issued by a Euro Area resident;  $T_{ijt}$  is the total (domestic and foreign) portfolio in the asset class  $j$  of the investor country  $i$ ;  $MC_{jt}^i$  is the market capitalization of country  $i$  for the asset class  $j$  and, finally,  $MC_{jt}^W$  is the world market capitalisation for asset class  $j$ .

When this ratio is greater (smaller) than 1, the total portfolio of country  $i$  is over (under-) weighing the securities  $j$  issued by country  $i$  according to the ICAPM benchmark. In general, the total portfolio of country  $i$  will be underweighting the securities  $j$  issued by Euro Area residents according to the ICAPM benchmark, due to the presence of home bias in the asset allocation of domestic investors.

Equation (2) can be further decomposed into:

- (1) a *Foreign Bias* ( $FB_{ijt}$ ): the propensity to hold a greater or smaller share of foreign securities (total cross-border portfolio investment of country  $i$ ) in the total (domestic plus foreign) portfolio of country  $i$  compared to the notional share implied by the International CAPM.
- (2) A Euro Area (US) *Country Bias* in the foreign portfolio ( $CB_{ijt}^{EA}$ ): the propensity to hold a greater or smaller share of Euro Area (US) securities in the foreign portfolio of country  $i$  compared to the notional share implied by the International CAPM.

$$Total\ Bias\ (TB_{ijt}^{EA}) = ForeignBias(FB_{ijt}) * CountryBias(CB_{ijt}^{EA})$$

$$\left( \frac{I_{ijt}^{EA}/T_{ijt}}{MC_{jt}^{EA}/MC_{jt}^W} \right) = \left( \frac{F_{ijt}/T_{ijt}}{MC_{jt}^F/MC_{jt}^W} \right) * \left( \frac{I_{ijt}^{EA}/F_{ijt}}{MC_{jt}^{EA}/MC_{jt}^F} \right) \quad (3)$$

Where  $F_i$  is the foreign investment of country  $i$  and  $MC_{jt}^F$  is the market capitalization of the rest of the world for the investor country  $i$ . Due to the preference of investors to hold a share of domestic assets which is larger than implied by the ICAPM benchmark, the *Foreign Bias* is usually smaller than 1. Therefore, even if country  $i$  has no regional bias towards the Euro Area in its portfolio of foreign securities (i.e.  $CB_{ijt}^{EA} = 1$ ), the presence of the Home Bias implies that the country  $i$  underweights Euro Area assets in its total portfolio.

#### 4. Data to construct the various measures of exposure

Cross-border positions: Cross Border Positions of countries in the Euro Area ( $I_{ijt}^{EA}$ ) and in the US ( $I_{ijt}^{US}$ ) are derived from the IMF Coordinated Portfolio Investments Survey (CPIS)<sup>2</sup>. The CPIS reports the end December bilateral holdings of up to 70 investing countries into 245 territories from 2001 until 2012. The foreign portfolio investment (foreign assets) is broken down by instruments (equity and debt) and residence of issuer, the latter providing the information the destination of portfolio investment.

Total portfolio, foreign portfolio and ICAPM benchmark: The *total portfolio* ( $T_{ijt}$ ) is the sum of foreign and domestic securities held by residents in the investor country  $i$ . The holding of domestic securities<sup>3</sup> by domestic residents, is not directly available and is derived as the difference between the market capitalization of country  $i$  and its foreign liabilities. Total portfolio of investor country  $i$  is thus calculated as *foreign assets + (market capitalization of country  $i$  – foreign liabilities)*. Foreign assets and liabilities of investor country  $i$  with the World as counterparty are derived from the CPIS database. Data on Equity Market Capitalization is at market value and is retrieved from The World Bank database on WDI and is complemented with data from an archive database World Development Indicators of the World Bank (data published in 2015). Data on Debt Market Capitalization is at nominal value and is retrieved from the BIS Security Statistics from Table 18: Total Debt. For countries not reported Table 18, the sum of Table 11A Total International Debt and 16A Total Domestic Debt was taken (only if both were available). Because the coverage of countries is limited, data on Debt Market Capitalization is complemented with a countries' share of GDP in the Worlds value of GDP multiplied by Debt World Market Capitalization ( $((GDP_t^i / GDP_t^W) * MC_t^W)$ ). This occurs only for small countries: when the proxy of Debt Market Capitalization is below 1.000 Billion USD, and when there was no data at all available during the 12 years. Yearly data on Debt Market Capitalization of the World is retrieved from the yearly Global Financial Stability Report, which includes an Appendix with Data on Market Capitalization.

*Foreign portfolio* ( $F_{ijt}$ ) is simply the foreign assets of investor country  $i$  with the World as counterparty.

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<sup>2</sup> For some countries (especially the countries in the Emerging Countries category) investment positions are not available or confidential (for each year) in some Euro Area countries.

<sup>3</sup> This estimate is problematic for countries with greater Financial Liabilities than Market Capitalization (i.e. Luxembourg and Ireland, which are two major financial centers). These observations are excluded. Figures 15 and 16 in the appendix show the results of when these countries are included.

The *ICAPM benchmark* for investment in the US in *total portfolio* is calculated by dividing the US Market Capitalization by World Market capitalization ( $MC_{jt}^{US}/MC_{jt}^W$ ). The ICAPM benchmark for investment in the Euro Area is calculated by dividing the aggregated Market Capitalization of the Euro Area countries (or EA High Rating or EA Low rating aggregates) by World Market capitalization ( $MC_{jt}^{EA}/MC_{jt}^W$ ). When calculating this ICAPM benchmark for investment in the Euro Area for Euro Area Countries themselves, the benchmark is adjusted by subtracting its own market capitalization from the aggregated market capitalization of the Euro Area. For example, The ICAPM benchmark for investment in the Euro Area for Dutch investors is calculated by  $((MC_{jt}^{EA} - MC_{jt}^{NL})/MC_{jt}^W)$ . The ICAPM benchmark for investment in foreign is calculated by dividing market capitalization of foreign by World market capitalization ( $MC_{ijt}^F/MC_{jt}^W$ ). Market capitalization of foreign is specific for each investor country and is derived by subtracting the market capitalization of country  $i$  from the World market capitalization ( $MC_{jt}^W - MC_{jt}^i$ ). The ICAPM benchmark for investment in the Euro Area (US) in foreign portfolio is calculated by dividing the Market capitalization of the Euro Area (US) by the Market Capitalization of foreign ( $MC_{jt}^{EA}/MC_{ijt}^F$ ).

*The various measures of biases are measured towards the US and Euro Area.*

Euro Area countries are divided in three Euro Area groups<sup>4</sup>:

1. 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.

Two major financial centers, Luxembourg and Ireland, are excluded as they attract large amounts of foreign investment due to favorable tax policies (Schoenmaker & Bosch, 2008). The remaining countries are divided into two subgroups:

2. High rating economies (Austria, Belgium, Finland, France, Germany, and the Netherlands)
3. Low-rating economies (Greece, Italy, Portugal, and Spain).

To calculate the various measures of bias, portfolio holdings are aggregated into and market capitalizations of the various Euro Area countries.

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<sup>4</sup> Appendix C contains an overview of the country groups

### **Determinants of Financial exposure towards the Euro Area and US**

Also here, this paper follows Floreani & Habib (2015) by taking the same measures of possible determinants of financial exposure towards the Euro Area and US.

- *Exchange rate volatility*: nominal exchange rates of the investor country  $i$  against the Euro and dollar- the WM/Reuters spot rates- are downloaded from Datastream. The volatility of the exchange rate is calculated as the standard deviation of weekly returns in each calendar year;
- *Bilateral trade*: measured as the logarithm of the bilateral imports and exports between investor country  $i$  and the Euro Area countries or US as counterparty, 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 Germany or the capital of the US, which was obtained from the CEPII distance database;
- *Capital account openness*, measured by the Chinn-Ito financial openness index, where a higher value on the index indicates a more open capital account. The index is based on the IMF Annual Reports on Exchange Arrangements and Exchange Restrictions;
- The logarithm of *GDP per capita* in US dollars, retrieved from the IMF World Economic Outlook;
- *Governance*, the average of four indices (government effectiveness, regulatory quality, rule of law and control of corruption) retrieved from the World Bank Worldwide Governance Indicators database, where a higher score on the index indicates a higher level of governance;
- *Financial development*, the average of three measures of depth and efficiency for equity and credit markets (the total value of stocks traded as a percentage of GDP, the total value of stocks traded over the average market capitalization (turnover ratio), and the domestic credit provided to the private sector by financial corporations as a share of GDP), obtained from the World Bank Global Financial Development Database. Also here, a higher value on the measure of financial development indicates a higher level of financial development.

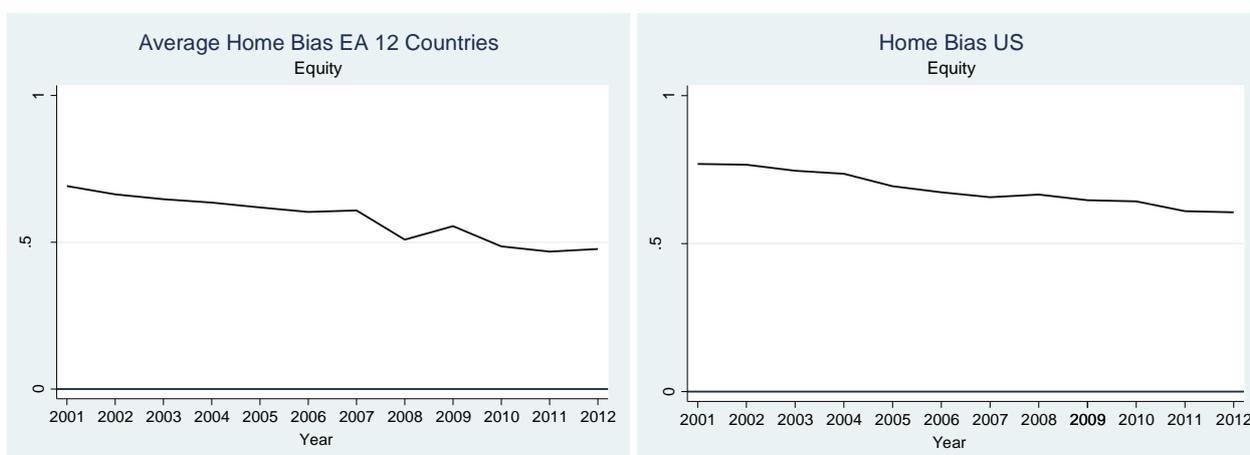
Tables 11 to 14 in the appendix summarize the statistics of the exposure towards the EA12 countries, the US, Euro Area high rating countries and Euro Area low rating countries, respectively. The independent variables are measured relatively to each of these four destinations of foreign investment.

## 5. Exposure towards Euro Area Countries and the US

### 5.1 Equity

Figures 1 and 2 display the average Home Bias of the EA12 countries and Home Bias in the US. As the Figures show, for both economies there is on average a Home Bias above 0.5 visible. This implies that less than half of international diversification is exploited by investors from the EA12 countries and the US. The preference of US investors to hold a share of domestic assets which is larger than implied by the ICAPM benchmark, is larger than the average preference of investors from EA12 Countries. Although both Figures show (on average) a decrease in Home Bias during the 2001-2012 period, the decrease in Home Bias of the EA12 countries is much quicker. This decrease in Home Bias in the EA12 countries is accompanied by a sharp increase in exposure of these EA12 countries towards the 12 Euro Area countries as a whole, as will be visible in Figures 7 and 8, confirming the results found by De Santis & Gerard (2006) and Schoenmaker & Bosch (2008).

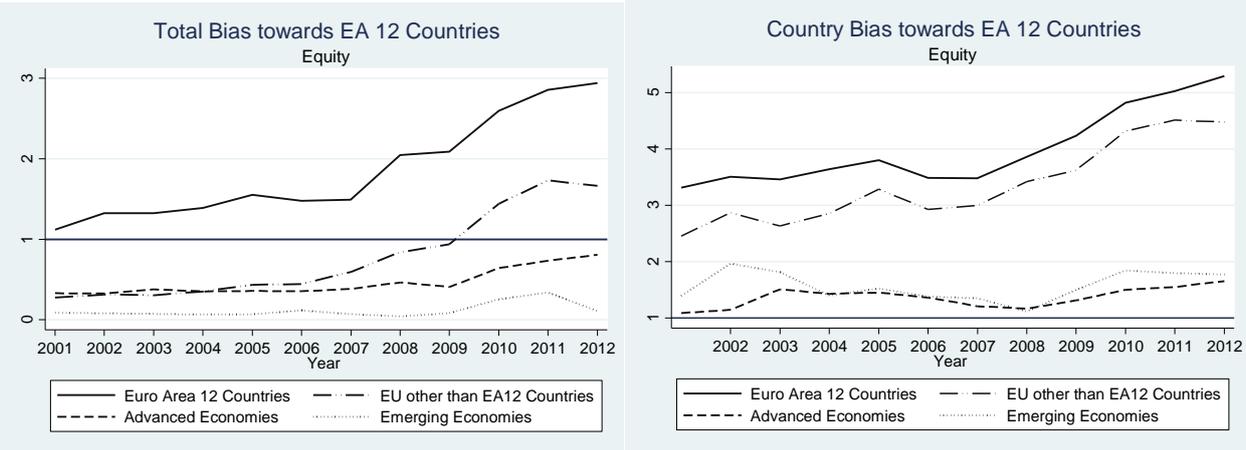
**Figures 1 and 2** Average Equity Home Bias EA12 countries and Equity Home Bias in the US



Figures 13 and 14 in the appendix show the equity Home Bias of Euro Area high rating countries and Euro Area low rating countries respectively. As Figure 1 indicated, on average, there is a decline visible in Home Bias during the 2001-2012 period. For some countries, there is a small increase in Home Bias visible in 2008, the beginning of the global crisis (i.e. Austria, Belgium, Greece and Portugal). But for some countries, the Home Bias decreased during this year, so no clear pattern of the influence of the global financial crisis on equity Home Bias is visible. The same applies for the Euro Area crisis.

Figures 3 and 4 compare the average degree of Total Bias and Country Bias towards the Euro Area - for equity, respectively - for four groups of countries since 2001: the 12-Euro Area countries having already adopted the Euro in 2001 (EA12), the other EU countries, a sample of advanced economies and of emerging markets outside the EU. In Figure 3, the horizontal line with value 1 on the y axis corresponds to the benchmark when the share of Euro Area equity in total portfolio is equal to the notional one implied by the ICAPM. As expected, the Euro Area 12 countries are strongly overexposed to the Euro Area equities: during the 2001-2012 period, the weight of Euro Area equities in their total portfolio lies above the ICAPM benchmark. This is especially so in the last three years since one observes a sharp increase in weight in that period: Euro equities are weighted almost three times larger than the share of Euro Area to world market capitalization. The Figure shows that, at least since 2009, other EU economies are also overexposed to Euro Area equities in their total portfolio. Both the samples of advanced economies and emerging economies are instead under-exposed towards Euro Area equities in their total portfolio. When taking Home Bias<sup>5</sup> - the opposite of Foreign Bias - into account, Figure 4 shows that all four groups of countries are – on average – over exposed towards Euro Area equities: the share of holdings of Euro Area equities in the foreign portfolio of equities is above the benchmark implied by the ICAPM. What’s striking about the Figures is that the exposure towards Euro Area equities of all country groups did not decrease during the global financial crisis or since the onset of the Euro Area crisis in 2010; indeed, the Figures show an increase in the exposure towards the Euro Area equities.

**Figures 3 and 4.** Total Bias and Country Bias towards EA12 equity

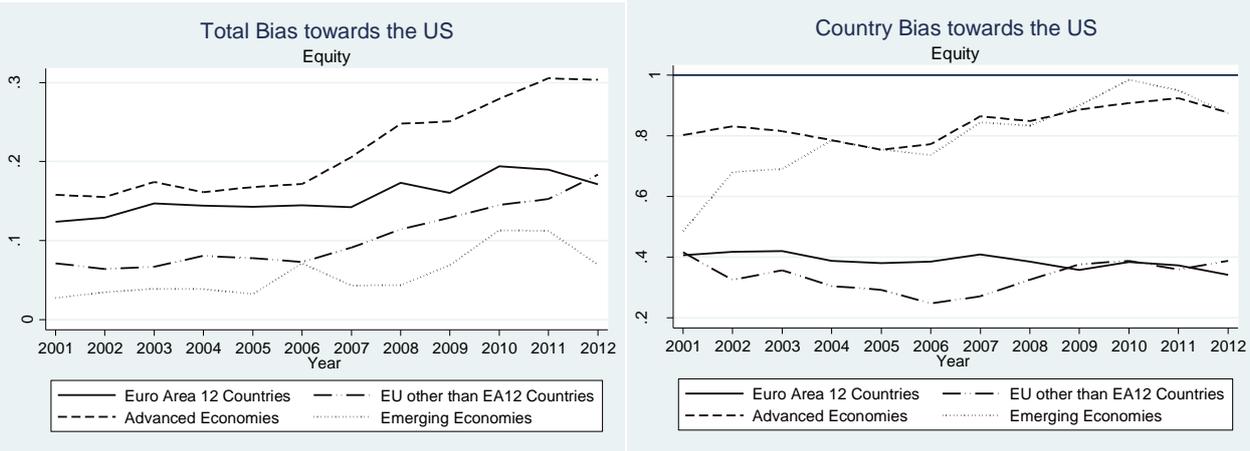


<sup>5</sup> Figures 17 and 18 in the appendix show that for both equity and debt, all the four groups of countries have a share of foreign assets in their portfolio which is smaller than implied by the ICAPM benchmark (which implies on average, all countries have a Home Bias). Therefore, even if the 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 implies that the country  $i$  is underweighting Euro area assets in its total portfolio. For both equity and debt, the Euro area is the group of countries with the highest Foreign Bias, and thus the lowest Home Bias. Emerging economies have the lowest level of Foreign Bias, about 0.1, and thus the highest Home Bias.

However, when excluding Ireland and Luxembourg and dividing the other Euro Area countries in Euro Area high rating countries and low rating countries, the impact of the major financial centers becomes visible on both the Total Bias and Country Bias towards Euro Area equities. While the Euro Area countries were overexposed towards Euro Area equities in their total portfolio (three times the optimal weight according to the ICAPM benchmark) Euro Area countries are under exposed towards both Euro Area high rating and low rating countries in their total portfolio. Also the exposure of the other country groups towards the Euro Area countries in their total portfolio, is notably lower (Figures 19-22 in appendix). The same applies to the holdings of Euro Area equity in their foreign portfolio.

Figures 5 and 6 compare the average degree of Total Bias and Country Bias towards the US for the four groups of countries. All four groups of countries are largely underexposed towards the US in their total portfolio. Even after taking the Home Bias into account, all four groups are underexposed towards US equities in their foreign portfolio of equities. This is a remarkably large difference with the exposure towards the EA12 equities in foreign portfolio equities, which is above the ICAPM benchmark for all four country groups. A similarity between exposure towards US equities in total portfolio of equity holdings with the exposure towards EA12 is its increase during the 2001-2012 period. The exposure towards US equities in foreign portfolio of equity holdings increased towards the ICAPM benchmark for both advanced and emerging economies, whereas exposure of EA12 countries and other EU countries in foreign portfolio of equity holdings is lower and more stable over time.

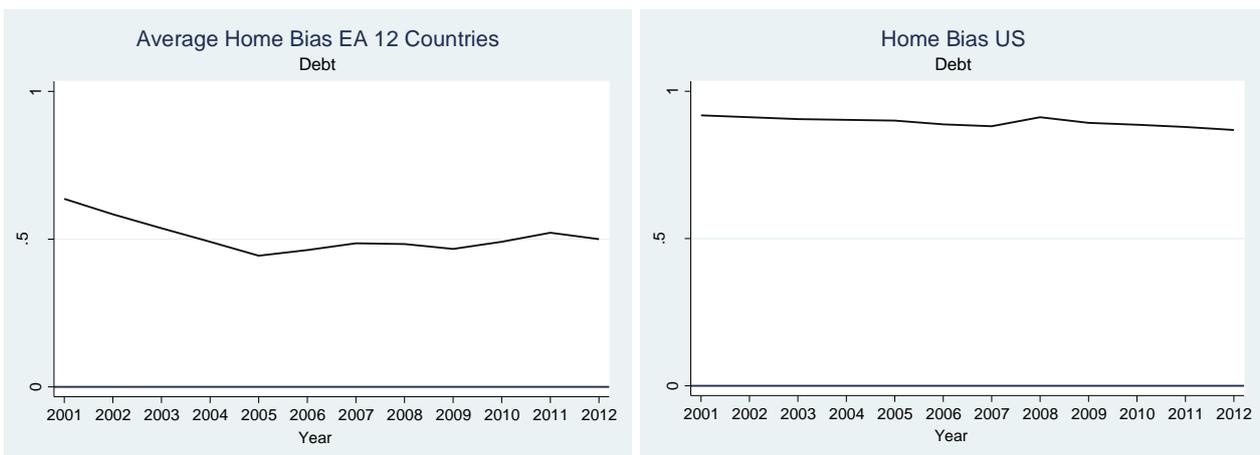
**Figures 5 and 6** Total Bias and Country Bias towards US equity



## 5.2 Debt

Turning to debt, Figures 7 and 8 display Home Bias in EA12 countries and the US respectively. Two things stand out. Firstly, there is a remarkably stronger debt Home Bias in the US than in the Euro Area. The measure is around 0.9 for the US, whereas the measure is on average between 0.50 and 0.55 for the EA12 countries. This implies that US investors are very domestically focused in their debt portfolios and only exploit around 10% of international diversification, while this is for EA12 countries around 45-45%. This results supports the theory that there is more scope for the US investors to diversify their credit risk away within the US without incurring exchange rate risk because of the dominant US debt market (Schoenmaker & Bosch, 2009). Secondly, the debt Home Bias in the US is more or less stable over time; only a small increase is visible in 2008. The debt Home Bias in the EA12 countries is more unstable during the 2001-2012 period: periods of (sharp) decrease (2001-2005, 2007-2008 and 2012) and periods in which the Home Bias becomes stronger (2005-2007 and 2009-2011) alternate.

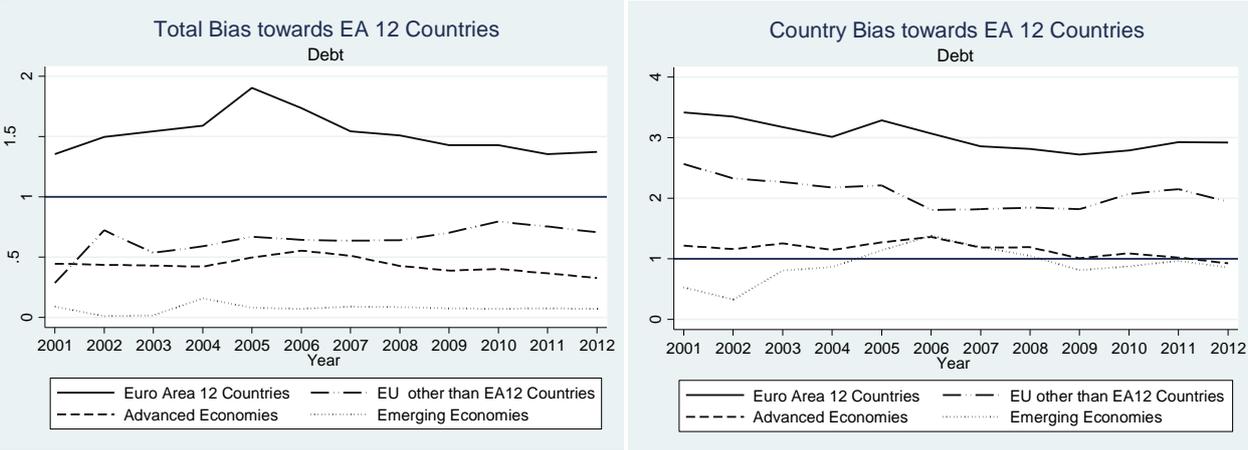
**Figures 7 and 8** Average Debt Home Bias EA12 Area and Debt Home Bias in the US



Taking a closer look at debt Home Bias in the Euro Area (Figures 15 & 16 in the appendix) a clearer pattern is visible than in the case of equity: the Euro Area low rating countries have on average a stronger Home Bias than the Euro Area high rating countries. Further, the Figures show for all countries a decline in Home Bias until around 2007, the beginning of the global financial crisis. During the global financial crisis period (2008-2009) a small increase in Home Bias is visible for Euro Area high rating countries is visible, while Home Bias increases more sharply in the Euro Area low rating countries. The increase in Home Bias becomes even more larger during the Euro crisis period, starting in 2010.

Figures 9 and 10 display the Total Bias and the Country Bias of debt towards Euro Area countries respectively. A similar ranking of the four groups<sup>6</sup> of countries is notable as in the case of equity. The Euro Area countries are overexposed towards debt securities in their total portfolio, the other country groups not. The Total Bias towards the Euro Area debt of advanced countries is lower than that of other EU countries, and emerging countries have the lowest Total Bias towards the Euro Area. Again, taking Debt Home Bias (see Figure 18 appendix) into account, the picture is different. In their foreign portfolio, Euro Area countries and other EU countries are overweighting Euro Area debt securities according to the ICAPM benchmark. Advanced economies and emerging economies are close to the benchmark. A slightly decrease in the exposure towards Euro Area debt is notable for both Advanced and Emerging countries in both the global financial crisis and Euro crisis period. For the Euro Area country group, the exposure towards Euro Area debt slightly decreased during the global financial crisis, but not during the Euro Area crisis, starting in 2010.

**Figures 9 and 10** Total Bias and Country Bias towards EA12 Debt

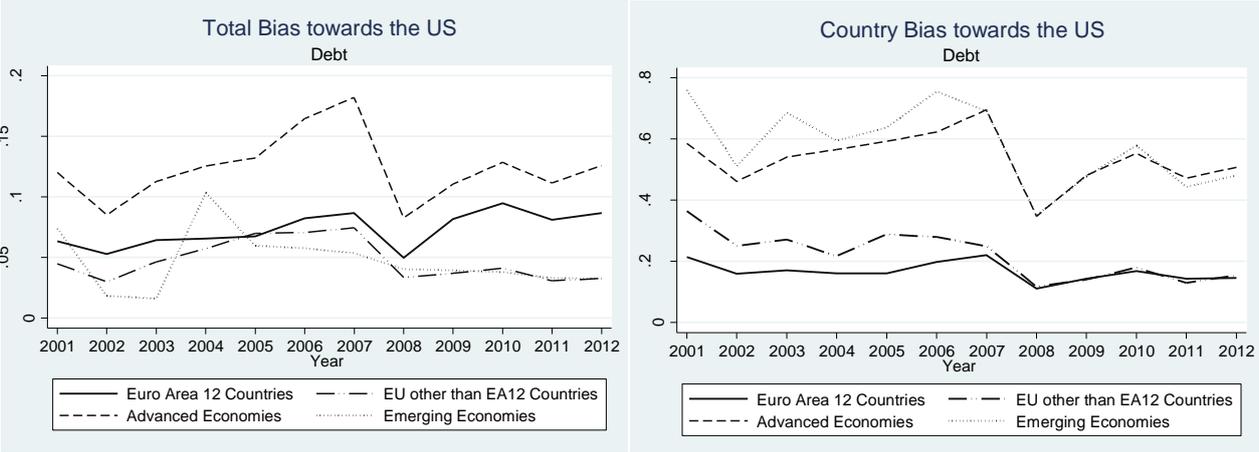


In the case of debt, the impact of the two major financial centers Ireland and Luxembourg is less huge (Figures 23-26). The degree of exposure towards the Euro Area high rating countries debt and low rating countries debt in total portfolio is largely in line with the degree of exposure to the Euro Area debt. Only the exposure towards Euro Area low rating debt in the foreign portfolio is notably lower for the other EU country group, advanced countries group and emerging countries group.

<sup>6</sup> The country coverage of the four country groups for debt is slightly different than for equity, because the more limited availability of data on debt market capitalization.

Turning to the exposure of countries towards the US in total portfolio of debt securities, Figures 11 shows that all four country groups are largely underexposed. EA12 countries, other EU countries and emerging countries have an exposure of only less than 0.1 towards the US, whereas advanced economies have on average an exposure just above 0.1. Taking Home Bias into account, the exposure towards US debt of all four country groups increases, but are still underexposed towards US debt in their foreign portfolio of debt holdings (Figure 12). As in the case of equity, a similar ranking of exposure towards US in total portfolio the four groups of countries is visible: Advanced economies have the largest exposure towards the US in their total portfolio, followed by EA12 countries, other EU countries and emerging economies. Also in the case of Country Bias towards the US, a similar division is visible as in the case of equity: advanced and emerging economies have a remarkably larger exposure towards the US than EA12 countries and other EU countries. Another notable thing about the Figures is the sharp decrease in Total Bias and Country Bias towards US in 2007, the beginning of the global crisis.

**Figures 11 and 12 Total Bias and Country Bias towards US Debt**



Summarizing the difference in biases of and towards the Euro Area 12 Countries and the US:

- Debt and equity Home Bias in the US are both stronger than the average debt and equity Home Bias in the Euro Area. This implies that US investors are very domestically focused in their security portfolios and supports the theory that there is more scope for the US investors to diversify their credit risk away within the US without incurring exchange rate risk.
- All four groups of countries are overexposed towards EA12 equity in foreign portfolio and, in the case of debt, above or close to the benchmark. All four groups of countries are underexposed towards the US in both cases of debt and equity. So investors around the world appear to be more Euro Area oriented for both equity and debt in their foreign portfolio holdings of these securities than US oriented. Especially EA12 and other EU countries themselves: EA12 and other EU

countries are overexposed by 3 times the weight of the benchmark towards EA12 countries in their foreign portfolio, while the Country Bias towards the US measures an underexposure around 0.2-0.4 for these country groups.

- Although the exposure towards both the Euro Area and US equity seems not or hardly to be affected by the global crisis, a slight decrease in the exposure towards Euro Area debt is notable and a large decrease in exposure towards US debt is visible in 2008. This suggests a greater impact of the global crisis on the holdings of US debt than on the holdings of Euro Area debt.

## 6. The Model

To investigate the potential determinants of the financial exposure towards the Euro Area and the US, the following linear model can be estimated, for both equity and debt:

$$tb_{ijt}^{EA} = \alpha + \beta x_{it}^{EA} + \gamma y_{it}^{EA} + \varepsilon_{it} \quad (4)$$

With the log of the measure of financial exposure towards EA12 countries - alternatively US, Euro Area high rating countries and Euro Area low rating countries - as dependent variables.  $x_{it}^{EA}$  are the traditional gravity variables bilateral distance and bilateral trade between the investor country  $i$  and the Euro Area or US and the exchange rate volatility of the currency of country  $i$  against the Euro or dollar,  $y_{it}^{EA}$  are institutional variables that are measured relative to the Euro Area or US, including: capital account openness, governance, GDP per capita and financial development. For each of these institutional variables, the difference between the investor country  $i$ 's observation and that of the Euro Area or US is calculated as  $y_{it}^{EA} = (z_{it} - z_{EA,t})$ . In the case of the Euro Area, the observation of the Euro Area is measured as the nominal GDP weighted average of each Euro Area country observation.

Following Floreani & Habib (2015), the linear model in equation 4 is extended by introducing a measure of institutional distance of each investor country from the Euro Area or the US. The absolute value of the difference between the investor country  $i$ 's observation and that of the Euro Area (or US) is taken  $|y_{it}^{EA}| = |z_{it} - z_{EA,t}|$ . A distinction is then made between countries with institutional scores above the Euro Area (or US) and those with scores below the Euro Area (or US):

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

And

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

As a result, the institutional variables have a non-linear impact on the dependent variable. The extended non-linear model can be written as follows:

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

There are four possible combinations of the signs of the two coefficients  $\gamma_1$  and  $\gamma_2$ , of which each of these combinations reflects a hypothesis regarding the relationship between the institutional variables and the exposure towards the Euro Area or US:

- The *comparative advantage* hypothesis:  $\gamma_1 < 0$  and  $\gamma_2 > 0$ . Investors from countries with a lower score on an institutional variable than the Euro Area (US) are expected to invest more in the Euro area (US) in order to benefit from the higher quality of institutions. A negative relationship is expected between  $(z_{it} - z_{EA,t})$  and exposure towards the Euro Area (US) in a linear way (the higher the institutional score in the investor country, the lower the exposure towards the US or Euro Area).
- The *familiarity* hypothesis:  $\gamma_1 < 0$  and  $\gamma_2 < 0$ . The more similar the institutions of the investor country  $i$  and that of the Euro Area (US) are, the larger the exposure towards the Euro Area. So, the greater the institutional distance from the Euro Area (US), the lower the investment in the Euro Area (US).
- The *institutional divergence* hypothesis:  $\gamma_1 > 0$  and  $\gamma_2 > 0$ . This hypothesis is the opposite of the familiarity hypothesis: institutional divergence instead of similarity matters for foreigners when they decide whether to invest in the Euro Area (US) or not. The greater the institutional distance from the Euro Area (US), the greater the investment in the Euro Area (US).
- The *high-standard investors' attraction* hypothesis:  $\gamma_1 > 0$  and  $\gamma_2 < 0$ . The Euro Area (US) attracts investors with higher institutional scores than the Euro Area (US) itself (a positive relationship is expected between  $(z_{EA} - z_{EA,t})$  and investment in the Euro Area (US) in a linear way).

Following Floreani & Habib (2015), after testing the impact of institutional distance on financial exposure towards the Euro Area (US) in equation 4, two linear restrictions on the coefficients  $\gamma_1$  and  $\gamma_2$  are tested by means of F-tests:

- $\gamma_1 = -\gamma_2$  (corresponds to the linear model in equation 4; the institutional variable is measured relative to the Euro Area (US)).
- $\gamma_1 = \gamma_2$  (a linear model is estimated with the absolute value of the difference between the investor country  $i$ 's observation and that of the Euro Area (or US)  $|y_{it}^{EA}| = |z_{it} - z_{EA,t}|$  as a regressor).

Because the data is panel data, the model is estimated through fixed-effects estimation. An advantage of this model is that the estimated coefficients cannot be biased because of omitted time-invariant characteristics because the fixed-effects model controls for all time-invariant differences between the individuals. Interpretation of the beta coefficients of a fixed effects model is "...for a given country, as  $X$  varies across time by one unit,  $Y$  increases or decreases by  $\beta$  units" (Bartels, 2008, p. 6). One drawback of the features of the fixed effects model is that only variables which do vary over time can be included, because all time-invariant characteristics are captured by the country dummies in a fixed effects model. As a result, the effects of the time-invariant

variable Bilateral Distance and dummy variable identifying the global crisis period (and in case of exposure towards the Euro Area, a dummy identifying countries which have adopted the Euro and a dummy identifying the Euro crisis period) on financial exposure cannot be estimated. Therefore the model is re-estimated through OLS pooled cross-section with Huber-White robust standard errors<sup>7</sup> clustered by countries, including these time-invariant variables. The re-estimation through OLS pooled cross-section also serves as robustness check, although the model is less efficient than the fixed effects model – the model is not an exact fit for the data as the model does not recognize the panel structure of the data.

The models (fixed effects and OLS pooled cross-section) will be run several times with different dependent variables: the log of the Total Bias and Country Bias towards EA12 countries; towards the US; towards only the Euro Area high rating countries and towards only Euro Area low rating countries for both asset classes. Furthermore, the log of Foreign Bias is taken as dependent variable. As it is a component of Total Bias, the Foreign Bias and Total Bias may be driven by the same institutional determinants. Finally, separate regressions will be run for countries which have adopted the Euro and non-Euro countries, to compare whether determinants of financial exposure towards the Euro Area are different for these two country groups.

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<sup>7</sup> Corrects for correlation across residuals.

## 7. Results

For each destination of foreign investment (i.e. EA 12 countries, Euro Area high rating countries, Euro Area low rating countries and the US), the results are displayed corresponding the following structure: columns 1 and 2 display the results for the estimation of equation 4, the linear model with the independent variables measured *relative* to the Euro Area or US, with total bias and country bias as dependent variables, respectively. The results of the estimation of the non-linear model (equation 5) with independent variables measured *absolute* to the Euro Area or US are displayed in columns 3 and 4. For one institutional variable, capital account openness, there is no distinction made between scores above the Euro Area and scores below the Euro Area, because the Euro Area ranks among the top in capital openness and thus only a few observations are above the Euro Area<sup>8</sup>. In the case of variables relative to the US, this applies in addition to capital account openness also to the institutional variables GDP per capita and financial development. For these variables, only the relative values are used. The bottom of columns 3 and 4 show the results of testing the restrictions  $\gamma_1 = -\gamma_2$  and  $\gamma_1 = \gamma_2$ . If the F-test is significant at the 1, 5 or 10% level (indicated by asterix \*\*\*, \*\*, and \*, respectively), the null-hypothesis is rejected. If both null-hypotheses are rejected, the impact of scores above and under the Euro Area (US) are not uniform. If both hypotheses cannot be rejected, the one with the highest probability is selected for the nested model. This nested model is displayed in columns 5 and 6 for both Total Bias and Country Bias as dependent variables. In the case of financial exposure towards the EA12 countries and the US, there is a seventh column with only the institutional variables regressed on the dependent variable Foreign bias. As Foreign Bias is a component of Total Bias, these two biases may be driven by the same institutional determinants. In the case of analyzing the financial exposure towards the EA12 countries, the nested models in in columns 4 and 5 are used to run separate regressions for countries which adopted the Euro (columns 1 & 3 of Tables 5 and 8) and for countries which did not (columns 2 & 4 of Tables 5 and 8).

The re-estimations of the nested models in columns 4 and 5 through OLS pooled regressions for robustness are included in the appendix (Tables 16 to 21). These models include the time-invariant variable Bilateral Distance and the dummy variables identifying the global crisis period (and, in the case of financial exposure towards the Euro Area, additional dummies identifying Euro countries, Euro high rating countries, Euro low rating countries and the Euro crisis are added in the model). The OLS pooled regressions are included in the appendix, because the models are less efficient and have in general less significant outcomes.

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<sup>8</sup> Table 5 in the appendix.

## 7.1 Financial exposure towards EA12 equity vs US equity

### 7.1.1 Financial exposure towards EA12 equity

Table 1 displays the results of testing the influence of the traditional gravity variables and the institutional variables at home on financial exposure towards EA12 equity. Looking at the traditional gravity variables, the coefficient of the gravity variable bilateral trade does come with the expected sign and is in general statistically significant. Countries that trade more with the Euro Area appear to invest a greater share of their total and foreign portfolio equity in equity securities issued by the Euro Area. Taking a look at the institutional variables, relative capital account openness appears to have a significant positive impact on Foreign Bias (column 7); countries with a more open capital account have a stronger foreign bias. This country characteristic appears to be also a driver behind Total Bias towards Euro Area equity of about the same impact. The rest of the institutional variables don't have a significant influence on Foreign Bias and appear to have a different influence on Foreign Bias than on Total Bias towards the EA12 countries: the sign, size and significance for the regresses relative governance, relative GDP per capita and relative financial development are different for the two dependent variables. The non-linear impact of the institutional variables on Total Bias and Country bias are displayed in columns 3 and 4, and the outcomes show that for the variable GDP per capita the institutional distance may matter. The results of the F-test in the lower part of Table 5 reject both test restrictions on  $\gamma_1$  and  $\gamma_2$  in the case of Total Bias, suggesting that the impact of scores of GDP per capita above and below the Euro Area on Total Bias towards EA12 countries are not uniform. The F-test suggests to impose  $\gamma_1 = -\gamma_2$  on GDP per capita in the case of Country Bias, recovering the linear model for this variable. The significant negative coefficient of relative GDP provides support for the *comparative advantage* hypothesis: the higher the level of GDP of the investor country relative to the Euro Area, the lower the financial exposure towards the Euro Area in foreign portfolio of equity holdings. The variables volatility, governance and financial development don't have any statistically significant impact on the dependent variables in the different models. They were included in the baseline model and restrictions were tested on the coefficients of the two institutional variables governance and financial development, but are left out of the Table because of reasons of space.

**Table 1. Equity. Exposure towards the Euro Area 12 countries and Foreign Bias.**

Dependent Variable:	Linear Model		Non-Linear Model		Nested Model		Foreign Bias
	Total Bias	Country Bias	Total Bias	Country Bias	Total Bias	Country Bias	
Trade	.925*** (.100)	.192*** (.057)	.732*** (.125)	.144 (.070)	.676*** (.118)	.209*** (.056)	
Capital Account	.427***	.025	.424***	.027	.414***	.023	.522***
Openness	(.071)	(.040)	(.070)	(.039)	(.070)	(.039)	(.059)
GDP per capita	-.237*** (.059)	-.178*** (.034)				-.181*** (.034)	-.019 (.051)
GDP per capita  <sup>+</sup>			-1.093*** (.271)	-.464** (.151)	-1.153*** (.267)		
GDP per capita  <sup>-</sup>			-.524** (.244)	-.067 (.135)	-.581 (.240)		
Observations	573	601	573	601	573	601	584
Countries	50	52	50	52	50	52	50
Test restrictions							
GDP  <sup>+</sup> = GDP  <sup>-</sup>			0.0000***	0.0000***			
GDP  <sup>+</sup> ≠ GDP  <sup>-</sup>			0.0013***	0.0570			
R <sup>2</sup>							
Within	0.2695	0.0689	0.2965	0.0853	0.2938	0.0752	0.1645
Between	0.2094	0.2315	0.4343	0.1368	0.5133	0.2469	0.6420
Overall	0.2199	0.1819	0.4026	0.1122	0.4697	0.1953	0.5664

Turning to the results of the OLS pooled regression with Huber-White robust standard errors clustered by countries (Table 16 in the appendix), less significant outcomes are detectable. This is expected as the model is not an exact fit for the panel structure of the respective data. However, the coefficient of the added variable Bilateral Distance appears to be significant with the expected sign in all 4 models: countries that are further away from the Euro Area are less exposed towards Euro Area equities in their total and foreign portfolio. The sign and size of the variables used in the previous fixed effects models do not always correspond to the previous models – the results appear not to be very robust. But, the coefficients that are significant, do have the same sign as in the previous model. The relative level of governance has a significant positive effect on Foreign Bias: countries with better governance have a stronger Foreign Bias. The significant negative coefficient of relative GDP on EA12 Country Bias confirms the support for the comparative advantage hypothesis found in the previous model. The added dummies identifying countries that adopted the Euro – i.e. EA12 countries, Euro Area high rating countries, Euro Area low rating countries – have a positive coefficient but turn out to have no significant impact on financial exposure towards the Euro Area, except for Euro Area low rating countries on EA12 Country Bias. According to this model, only the Euro Area low rating countries do have a Euro Area bias in foreign portfolio. This results confirms the finding of Floreani & Habib (2015) that the Euro Area equity bias is stronger for the investors from Euro Area low-rating economies compared to Euro Area high-rating economies. The dummies identifying the global crisis period (2008-2009) and the Euro crisis (2010-2014) have, surprisingly, a positive significant on Total Bias towards EA12 countries. It turns out that countries invested a greater share of their total

equity portfolio in equity issued by EA 12 countries during these periods of crises. This outcome confirms the findings of Floreani & Habib (2015) that exposure towards Euro Area equity did not decrease during the two crises. Possible explanation is that countries shed equity assets in emerging economies during periods of crisis and buy assets in more advanced economies, also known as the safe haven attraction of those economies. In section 7.3.1 we will see whether this attraction is driven by a particular group of countries within the Euro Area. To test whether there was a significant stronger Euro Bias among Euro high rating and low rating countries during the Global and Euro crises periods, dummies identifying low and high rating countries interacted with the dummies for the two crises periods are added to the nested model. In these models, none of the interaction terms between the investor specific dummies and the two crises periods dummies are significant<sup>9</sup>.

### 7.1.2 Financial exposure towards US equity

Table 2 displays the results of testing the impact of the traditional gravity variables and the institutional variables at home on financial exposure towards US equity. Looking at the traditional gravity variables, the coefficient of Bilateral Trade is positive and significant, but only in the case of exposure in total portfolio of equity holdings. The variable Volatility is left out of the Table because no significant impact was found, as in the case of financial exposure towards the EA12 countries. Turning to the institutional variables measured relative to the US, a more significant impact on Foreign Bias is found than for the institutional variables measured relative to the Euro Area (Column 7 of Tables 1 & 2 compared). Countries with a more open capital account and a higher governance level have a stronger Foreign Bias. A higher level of financial development has the opposite effect on Foreign Bias. These results confirm the findings of Forbes (2010), providing support for the *comparative advantage* hypothesis in case of financial development (countries with less developed financial markets invest abroad in order to gain the benefits of a more liquid and efficient financial market) and the *high-standard investors' attraction* hypothesis in case of capital account openness and governance level. The country characteristic relative capital account openness appears to be also a driver behind Total Bias towards US equity of about the same impact (as in the case of Total Bias towards EA12 countries). The other variables don't have a significant impact on Total Bias, but their coefficient do have the expected sign. Where relative Capital Account Openness has a significant positive impact on Total Bias towards US equity (supporting the *high-standard investors' attraction* hypothesis), it has a negative significant impact on Country Bias towards the US (supporting the *comparative advantage* hypothesis). As previously mentioned, in the case of the US, only for the institutional variable Governance there

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<sup>9</sup> Results of these extended models omit for reasons of space, but are available upon request.

is a distinction made between scores above and below the US. On the basis of the F-test, it is possible to constrain  $\gamma_1 = \gamma_2$  for Governance on both dependent variables, suggesting that the institutional distance of Governance from the US matters, not the relative level. The absolute value of Governance appears to have a significant negative impact on financial exposure towards US equity in total portfolio, suggesting that the *familiarity* hypothesis holds. The relative value of GDP appears to have a significant positive effect on US Country Bias, supporting the *high-standard investors' attraction* hypothesis that the US attracts investors with a higher level of GDP per capita than the US.

**Table 2. Equity. Exposure towards the US countries and Foreign Bias.**

Dependent Variable:	Linear Model		Non-Linear Model		Nested Model		Foreign Bias
	Total Bias	Country Bias	Total Bias	Country Bias	US Total Bias	Country Bias	
Trade	.672*** (.162)	.105 (.106)	.714*** (.162)	.144 (.106)	.709*** (.154)	.133 (.101)	
Capital Account Openness	.223** (.081)	-.226*** (.052)	.211* (.081)	-.023*** (.052)	.209* (.080)	-0.225*** (.052)	.434*** (.057)
Governance	.726 (.320)	.337 (.207)					.700*** (.206)
Governance  <sup>+</sup>			-1.117 (.771)	-.086 (.500)			
Governance  <sup>-</sup>			-1.039** (.340)	-.411 (.222)			
Governance					-1.052*** (.302)	-.352 (.198)	
GDP per capita	.125 (.078)	.132 (.052)	.133 (0.078)	.134* (.052)	.133 (0.078)	.136* (.052)	.015 (.049)
Financial Development	-.273 (.121)	-.084 (.079)	-.237 (.121)	-.0758 (0.340)	-.238 (.120)	-.073 (.079)	-.449*** (.072)
Observations	560	588	560	588	560	588	593
Countries	49	51	49	51	49	51	52
Test restrictions							
Gov.  <sup>+</sup> = Gov.  <sup>-</sup>			0.9279	0.5612			
Gov.  <sup>+</sup> =- Gov.  <sup>-</sup>			0.0089*	0.3533			
R <sup>2</sup>							
Within	0.1736	0.0551	0.1847	0.0567	0.1847	0.0561	0.2427
Between	0.2734	0.2177	0.2666	0.2015	0.2722	0.2078	0.6421
Overall	0.2620	0.1651	0.2544	0.1530	0.2590	0.1580	0.5739

The results of the OLS pooled cross section model in Table 17 in the appendix confirm the robustness of the results of the fixed effects model: all the signs of the coefficients are the same. The relative institutional variables Governance and Financial Development have also a significant impact on Foreign Bias in this model. This further suggests that the *familiarity* hypothesis holds in case of Governance. Of the traditional gravity variables, the Bilateral Trade variable is confirmed to be a positive determinant. The added variable Bilateral Distance is a significant negative determinant of financial exposure towards US equity.

## 7.2 Financial exposure towards EA12 debt vs US debt

### 7.2.1 Financial exposure towards EA12 Debt

Turning to Debt, Table 3 on the next page reports the results for the exposure towards debt securities issued by Euro Area 12 countries in debt portfolio. The results are in general less stable: the signs and the size of the coefficients of exchange rate volatility are different for the three models, but are not significant. The variable Volatility has no significant impact and is omitted from the Table. Trade has only a significant positive impact on Total Bias towards EA12 debt in the nested model. Of the institutional variables, only relative Capital account openness has a positive significant effect on Foreign Bias, as in the case of Foreign Bias towards equity. Relative capital account openness appears to be also a driver behind Total Bias towards Euro Area debt of about the same impact. Absolute Governance appears to be a significant determinant on exposure towards EA12 debt as well. It has the similar effect as on exposure towards EA12 equity, only now significant (the effect supports the familiarity hypothesis: the greater the institutional distance from the Euro Area, the lower the investment in the Euro Area). Absolute GDP per capita has a significant positive effect on Country Bias towards EA12 debt, supporting the institutional divergence hypothesis. The F-test in the lower part of Table 3 rejects both test restrictions on the coefficients of Financial Development, suggesting that scores of financial development above and under the level of the Euro Areas' financial development have a different effect on EA12 debt Country Bias.

Table 19 in the appendix shows the results of the OLS pooled cross section. In the OLS pooled cross section model the following results come out: the added variable Bilateral Distance significant negative determinant for EA12 bias towards debt. Capital account openness has a positive significant effect on Foreign Bias, confirming the result of the fixed effects model. Further no significant outcomes are detectable in the OLS pooled cross section models, also not for the dummies identifying countries which adopted the Euro, the global crisis and the Euro crisis period.

### 7.2.2 Financial exposure towards US Debt

Table 4 on page 33 displays the results of testing the influence of the traditional gravity variables and the institutional variables at home on financial exposure towards US debt. The results of the impact of the institutional variables on Foreign Bias show the same pattern as in the case with equity: the sign and size of the coefficients is the same – except that now all variables have a

**Table 3. Debt. Exposure towards the Euro Area 12 countries and Foreign Bias.**

Dependent Variable:	Linear Model		Non-Linear Model		Nested Model		Foreign Bias
	Total Bias	Country Bias	Total Bias	Country Bias	Total Bias	Country Bias	
Trade	.209 (.106)	-.134 (.067)	.242 (.110)	-.121 (.070)	.323** (.101)	-.072 (.064)	
Capital Account Openness	.241*** (.065)	.077 (.042)	.232 (.065)	.068 (.041)	.270*** (.061)	.089 (.039)	.255*** (.052)
Governance	.601 (.257)	.532*** (.163)					.277 (.207)
Governance +			-.542 (.565)	-.133 (.335)			
Governance -			-.854** (.302)	-.660*** (.191)			
Governance					-.745** (.266)	-.514** (.168)	
GDP per capita	.055 (.208)	-.157 (.131)					.076 (.048)
GDP per capita +			1.006 (.478)	.562 (.290)			
GDP per capita -			.139 (.233)	.298 (.147)			
GDP per capita					.346 (.207)	.385** (.130)	
Financial Development	.018 (.106)	-.132 (.068)					.001 (.001)
Financial Development +			.162 (.124)	-.002 (.078)		.010 (.075)	
Financial Development -			.362 (.292)	.582** (.185)		.588** (.184)	
Financial Development					.173 (.114)		
Observations	465	468	465	468	465	468	465
Countries	41	41	41	41	41	41	41
Test restrictions							
Gov. += Gov. -			0.6170	0.1633			
Gov. +=- Gov. -			0.0342	0.0449			
GDP += GDP -			0.1024	0.4163			
GDP +=- GDP -			0.0327	0.0088*			
Fin.Dev. += Fin.Dev. -			0.5114	0.0025**			
Fin.Dev. +=- Fin.Dev. -			0.1123	0.0056*			
R <sup>2</sup>							
Within	0.1171	0.0512	0.1353	0.0855	0.1271	0.0787	0.0940
Between	0.3307	0.0075	0.2926	0.0177	0.1905	0.0383	0.5640
Overall	0.3174	0.0025	0.2802	0.0043	0.1851	0.0135	0.5116

significant impact. Countries with a more open capital account, better governance and a higher level of GDP per capita have a stronger Foreign Bias. A higher level of Financial Development has on the other hand the opposite effect on Foreign Bias. The impact of these institutional variables measured relative to the US are not the same on Total Bias towards the US: the sign and signs of the coefficients differ, but are not statistically significant. Furthermore, turning to the traditional gravity variables, Exchange rate volatility against the dollar comes with the expected negative sign and has a significant impact on US Total Bias and US Country Bias. But Trade has – surprisingly -

a negative impact on financial exposure towards US (significant in the case of exposure in the foreign portfolio). Furthermore, no significant effects of the institutional variables are found in the models reported in Table 4. As the R statistics indicates, the models have very low explanatory power. Results from the pooled cross section models displayed in Table 18 in the appendix, are roughly the same as those from the fixed effects models in Table 3, but are not statistical significant. Except for the variable Bilateral Trade on US Country Bias, which has a significant positive impact – what one would expect, but contradicts the outcome of the fixed effects model.

**Table 4. Debt. Exposure towards the US countries and Foreign Bias.**

Dependent Variable:	Linear Model		Non-Linear Model		Nested Model		Foreign Bias
	Total Bias	Country Bias	Total Bias	Country Bias	Total Bias	Country Bias	
Volatility	-.226*** (.066)	-.122* (.045)	-.235*** (.066)	-.128** (.043)	-.226 (.066)	-.128** (.043)	
Trade	-.234 (.180)	-.414 *** (.096)	-.254 (.181)	-.353*** (.096)	-.234 (.180)	-.353*** (.091)	
Capital Account Openness	-.169 (.078)	-.239*** (.048)	-.158 (.079)	-.023*** (.046)	-.169 (.078)	-0.226*** (.045)	.404*** (.057)
Governance	.186 (.293)	.006 (.190)			.186 (.293)		.619** (.213)
Governance +			.736 (.584)	.218 (.434)			
Governance -			-.042 (.321)	.214 (.192)			
Governance						.214 (.172)	
GDP per capita	.411 (.238)	.107 (.045)	.394 (.239)	.082 (.058)	.411 (.239)	.082 (.058)	.262*** (.066)
Financial Development	.199 (.099)	.170 (.073)	.181 (.110)	.135 (0.069)	.199 (.098)	.135 (.069)	-.370*** (.074)
Observations	452	600	452	600	452	600	543
Countries	40	52	40	52	40	52	47
Test restrictions							
Gov. += Gov. -			0.2623	0.9933			
Gov. *=- Gov. -			0.2764	0.3531			
R <sup>2</sup>							
Within	0.0716	0.1552	0.0743	0.1559	0.0716	0.1559	0.2692
Between	0.1355	0.1274	0.0921	0.0455	0.1355	0.0453	0.6674
Overall	0.1179	0.0359	0.0798	0.0102	0.1179	0.0101	0.6121

Summarizing the results in this section, the gravity variables trade and distance work in general well in explaining the financial exposure towards EU and US securities. The institutional variables measured relative to the US do have a significant impact on foreign bias (for both equity and debt), while of the institutional variables measured relative to the Euro Area, only capital account openness relative has a significant effect. Reason for this is the top ranking of the US in scores on the institutional variables, institutional distance relative to the US and investor countries is therefore bigger than that of investor countries relative to the Euro Area. This implies

the bigger the relative institutional distance between an investor country and the country which is the destination of foreign investment, the stronger the impact on foreign bias. The variables relative capital account openness and relative governance have a positive impact on foreign bias, whereas financial development appears to be a negative determinant. Capital account openness appears to be also a driver behind Total Bias towards Euro Area and US securities. The impact of rest of the institutional variables is different on exposure towards the Euro Area and US and equity and debt, or not significant. For the influence of the global and financial crises periods, only a positive significant influence is found for exposure towards Euro Area debt in total portfolio. It turns out that countries invested a greater share of their total equity portfolio in equity issued by EA 12 countries during these periods of crisis.

## 7.3 Closer look at Euro Area exposure

### 7.3.1 Equity

#### **Euro countries vs non-Euro countries**

Table 5 reports the separate regressions for countries which have adopted the Euro and non-Euro countries for both dependent variables Total Bias and Country Bias. The variable exchange rate volatility omits in the regressions in the case of Euro countries, because there is no exchange rate volatility among Euro countries. Comparing the determinants of financial exposure towards equity securities by EA12 countries in total portfolio of equity holdings between Euro countries and non-Euro countries, Bilateral trade shows to be a significant determinant for both country groups. For both country groups, the *high-standard investors' attraction* hypothesis seems to apply to capital account openness: countries with a more open capital account have greater financial exposure towards EA12 equity in total portfolio. But this is only significant for non-Euro countries. In both the exposure towards EA12 countries equity in total and foreign portfolio, results for Euro countries support the institutional divergence *institutional divergence* hypothesis, while for non-Euro countries the familiarity hypothesis is supported (although not significant). Also for the variable GDP per capita the influence on Total Bias towards EA12 equity is different for Euro countries and non-Euro countries. For non-Euro countries, the relative level of GDP has a negative significant impact on EA12 Country Bias (supporting the *comparative advantage* hypothesis). The coefficient on absolute Financial development is in all 4 models negative, supporting the familiarity hypothesis, but is only significant as determinant of financial exposure towards EA12 equity in foreign portfolio for countries which adopted the Euro.

**Table 5. Equity. Comparison of exposure towards EA12 countries between EA12 countries and non-Euro countries (Nested model).**

	EMU Countries	Non-EMU Countries	EMU Countries	Non-EMU Countries
Dependent Variable:	Total Bias	Total Bias	Country Bias	Country Bias
Volatility	Omitted	.164 (0.076)	Omitted	-.006 (0.044)
Trade	.679*** (.157)	.597*** (0.146)	.252*** (.060)	.175 (.068)
Capital Account Openness	.795 (0.360)	.409*** (0.077)	-.234 (.147)	.024 (.044)
Governance	1.968*** (.550)	-.440 (.355)	.843*** (.205)	-.201 (.197)
GDP per capita			-.636 (.365)	-.177*** (.038)
GDP per capita  <sup>+</sup>	2.116 (2.472)	-1.212*** (0.303)		
GDP per capita  <sup>-</sup>	1.818 (1.222)	-.647 (0.273)		
Financial Development	-.147 (.246)	-.124 (.184)	-.365*** (.101)	-.122 (.108)
Observations	119	454	132	469
Countries	10	40	11	41
R <sup>2</sup>				
Within	0.4636	0.2957	0.4339	0.0706
Between	0.0698	0.4214	0.2591	0.1474
Overall	0.1465	0.3793	0.2856	0.1068

### Euro Area high rating versus low rating countries

Taking a closer look at the exposure towards the Euro Area - to see whether the results are driven by the exposure towards a particular group of countries within the Euro Area - countries are divided into two subgroups: Euro Area high rating countries, which score a higher mean value on the institutional variables GDP per capita and Governance (Table 15 in appendix) and Euro Area low rating countries with lower mean scores on these variables<sup>10</sup>. Two major financial centers, Luxembourg and Ireland, are excluded as they attract large amounts of foreign investment. Comparing the results of exposure towards both destinations of foreign investment in Table 6<sup>11</sup>, a couple of things stand out: Exchange rate volatility and Bilateral Trade appear to be positive significant determinants of Total Bias towards EA high rating equity, while Bilateral Trade a significant negative impact has on Country Bias towards Euro Area low rating countries. Determinants of Total Bias towards EA high rating and low rating countries that appear to be similar are relative Capital Account Openness and the absolute level of GDP per capita (the results support the *high-standard investors' attraction* hypothesis for Capital Account Openness and the *familiarity* hypothesis for GDP). It further shows the variable Financial Development opposite

<sup>10</sup> This distinction is also valid when the median is taken as the threshold.

<sup>11</sup> For reasons of space, only the nested models are shown in Table 6. But as in the case of the Euro area 12 countries, a general model with unrestricted coefficients is estimated as a first step whereupon the linear restrictions on the coefficients are tested.

signs for exposure towards Euro Area high rating countries and low rating countries, but in both cases not significant. The outcomes of the test restrictions in the lower part of Tables 6 suggest that the relative level of governance matters for Total Bias towards EA high rating countries, while the institutional distance matters for Total Bias towards low rating countries and for Country Bias towards both Euro Area groups. The results in column 1 & 2 of Table 6 provide support for the *comparative advantage* hypothesis in case of Total Bias towards high rating countries, and the *familiarity* hypothesis in the case of Country Bias. Column 3 & 4 of Table 7 suggests that the *institutional divergence* hypothesis holds for the influence of Governance on exposure towards low rating countries. However, the results are not significant.

**Table 6. Equity. Exposure towards the Euro Area high rating countries versus low rating countries (nested model).**

Dependent Variable:	EA high rating		EA low rating	
	Total Bias	Country Bias	Total Bias	Country Bias
Volatility	.321*** (.083)	.142 (.067)	.024 (.087)	-.074 (.067)
Trade	.357* (.137)	-.188 (.108)	-.093 (.154)	-.449* (.108)
Capital Account Openness	.522*** (.082)	.073 (.064)	.559*** (0.086)	.194 (.093)
Governance	-.279 (.346)			
Governance		-.107 (.283)	.749 (.311)	.216 (.327)
GDP per capita	-.822** (.282)	-.192 (.221)	-.898** (.305)	-.335 (.317)
Financial Development		.105 (.139)		-.178 (.180)
Financial Development	.051 (.182)		-.309 (.166)	
Observations	562	590	502	530
Countries	50	52	44	44
R <sup>2</sup>				
Within	0.1953	0.0148	0.1293	0.0218
Between	0.5897	0.0706	0.4276	0.0787
Overall	0.5202	0.0554	0.4008	0.0368

The results of the OLS pooled cross section in Table 20 in the appendix show that Bilateral Distance has a significant negative influence on exposure towards Euro Area high rating countries, and that trade has a significant positive impact on exposure towards Euro Area low rating countries. Further the same effect of absolute level of GDP per capita is found as in the fixed effects model for exposure towards Euro Area high rating countries and low rating countries in total portfolio of equity holdings. The absolute level of governance turns out to be a significant determinant in exposure towards Euro Area low rating countries in total and foreign portfolio and supports the *institutional divergence* hypothesis.

### 7.3.2 Debt

**Table 8. Debt. Comparison of exposure towards EA12 countries between EA12 countries and other countries (Nested model).**

	EMU Countries	Non-EMU Countries	EMU Countries	Non-EMU Countries
<b>Dependent Variable:</b>	Total Bias	Total Bias	Country Bias	Country Bias
Volatility	Omitted	-.058 (.069)	Omitted	-.007 (0.045)
Trade	-.006 (.110)	.477 *** (0.135)	-.257 *** (.063)	-.013 (0.087)
Capital Account Openness	.462 (.295)	.256 *** (.069)	-.045 (.170)	.082 (.045)
Governance	-1.448 *** (.428)	-.594 (.355)	-.211 (.228)	-.523 (.207)
GDP per capita	.502 (.822)	.445 (.240)	1.610 *** (.376)	.412* (.155)
Financial Development +			-.211 (.125)	.019 (.091)
Financial Development -			.044 (.295)	.613* (.221)
Financial Development	-.287 (.206)	.160 (.134)		
Observations	120	345	132	336
Countries	10	31	11	30
R <sup>2</sup>				
Within	0.1276	0.1461	0.3070	0.0773
Between	0.2477	0.0110	0.4656	0.0024
Overall	0.2085	0.0176	0.2627	0.0124

Table 8 reports the separate regressions for EMU countries and non-EMU countries for both dependent variables Total Bias and Country Bias in the case of debt. Comparing the determinants of financial exposure towards equity securities by EA12 countries in total portfolio of equity holdings between Euro countries and non-Euro countries, Bilateral trade shows to be a positive significant determinant for non-Euro countries in the case of Total Bias and a negative significant determinant for EMU countries in the case of Country Bias. For both country groups, the *high-standard investors' attraction* hypothesis seems to apply to capital account openness in the case of Total Bias - but is only significant for non-EMU countries. The coefficient on absolute Governance is in all 4 models negative, supporting the familiarity hypothesis. But note that it is only significant as determinant of financial exposure towards EA12 equity in total portfolio for countries which adopted the Euro. Absolute GDP per capita appears to be a positive determinant of financial exposure towards EA12 debt, and is significant for both EMU and non-EMU countries in the case of EA12 Country Bias. Furthermore, when Financial Development in the investor countries is below the level of the Euro Area, the relationship is positive significant for non-Euro countries in the case of EA12 Country Bias. The rest of the differences in results between Euro and non-Euro countries are small and not significant.

### **EA high rating versus low rating countries**

The comparison between the exposure towards Euro Area high-rating economies and that towards Euro Area low rating economies (Table 9) show that exchange rate volatility has a negative impact, but only significant in the case of exposure towards EA low rating countries. This result is strange as both country groups have the same currency, why would it be only a significant negative determinant towards Euro Area low rating countries? Perhaps exchange rate volatility captures something more. E.g. Duarte et al (2007) found that there is a co-movement between volatility among exchange rates with macroeconomic aggregates and with business cycles. But this is only a highly speculative explanation for the found result. Turning to the rest of the variables, Trade is a positive significant determinant of exposure towards EA high rating countries in Total bias, but Trade would have –surprisingly - a negative impact on Country Bias towards EA low rating countries. Furthermore, a comparison the Tables show that relative Capital Account Openness a positive significant determinant is of exposure towards EA low rating countries, while its impact on exposure towards EA high rating countries is small and not significant. Relative Governance has a positive significant impact on EA high rating Country Bias (supporting the *high-standard investors' attraction* hypothesis), while the negative coefficients of absolute Governance on Total Bias and Country Bias towards EA high rating debt supports the *familiarity* hypothesis – although not significant. Also for Absolute GDP per capita there is a difference in its impact on financial exposure towards Euro Area high and low rating countries. GDP per capita is a positive determinant in exposure towards EA high rating countries (significant in the case of Total Bias, supporting the *institutional divergence* hypothesis), and a negative determinant in exposure towards EA low rating countries (supporting the *familiarity* hypothesis). Furthermore, it appears that the absolute level of Financial Development has a positive significant impact on exposure towards EA low rating countries debt in Total and Foreign Portfolio (supporting the *institutional divergence* hypothesis), while for EA high rating countries this determinant is not significant in the case of Total Bias and for Country Bias towards EA high rating countries the impact of scores of Financial Development above and below Euro Area high rating countries are not uniform (column 6).

**Table 9. Debt. Exposure towards the Euro Area high rating countries vs Euro Area low rating countries.**

Dependent Variable	EA high rating		EA low rating	
	Total Bias	Country Bias	Total Bias	Country Bias
Volatility	-0.130 (.066)	-0.063 (.051)	-0.353** (.114)	-0.275* (.106)
Trade	.331** (.104)	-0.012 (.079)	-0.229 (.199)	-0.481* (.181)
Capital Account	.069 (.067)	.050 (.053)	.285 (0.124)	.307* (.115)
Openness		.571* (.205)		
Governance				
Governance	-0.586 (.272)		-0.476 (.383)	-0.644 (.345)
GDP per capita	.596* (.222)	.298 (.164)	-0.258 (.344)	-0.381 (.315)
Financial Development +		-0.079 (.092)		
Financial Development ·		1.000*** (.292)		
Financial Development	.131 (.117)		.638** (.217)	.539* (.198)
Observations	461	464	557	462
Countries	41	41	42	42
R <sup>2</sup>				
Within	0.0538	0.0670	0.0693	0.0828
Between	0.0724	0.2215	0.1775	0.0198
Overall	0.0805	0.1865	0.1473	0.0193

Table 21 with the results of the OLS pooled cross section models in the appendix does not confirm the robustness of the results of the fixed effects model. But as mentioned, the OLS pooled cross section model is less efficient and statistical significance is harder to detect. The variables that are significant, are consistent with the results from the fixed effects models. The added gravity variable Bilateral Distance has a negative significant effect on EA high rating Country Bias.

In this section, it is more difficult to detect a clear pattern in the determinants of the exposure towards securities of Euro Area high rating countries and low rating countries: the results show often different drivers behind the exposure towards both destinations of foreign investment and sometimes the results are somewhat strange. The same applies to the comparison of exposure towards securities issued by EA12 countries between EMU and non-EMU countries. But as the R<sup>2</sup>s in the lower part of Tables 5 to 8 indicate, the explanatory power of the models are very low.

## 8. Conclusion

Although the US is by far the number 1 destination of foreign investment in the World, according to a simple benchmark from standard portfolio theory (the ICAPM) global investors are largely underexposed towards US securities, even after Home Bias taken into account. The picture is different for exposure towards Euro Area securities: Euro Area investors are overexposed towards Euro Area securities and other EU investors are close to (above) the benchmark in their total (foreign) portfolio of security holdings. Further analysis of this overexposure shows however that only investors from Euro Area low rating countries have a Euro Area bias in their portfolio of foreign equity holdings. Investors outside the EU are underexposed towards the Euro Area securities, but after taking Home Bias into account, they are close to the ICAPM benchmark. It can be concluded that investors around the world are more towards Euro Area securities than towards US securities in their portfolios of foreign securities. This pattern of foreign investment is in line with the documented Home Bias in the US and the Euro Area. Domestic US investors themselves are largely overexposed towards US securities in their total portfolio of domestic and foreign securities. The average Home Bias in the Euro Area is much lower and is decreasing over the 2001-2012 period, while the overexposure of these countries towards Euro Area securities is large and increasing.

However, the impact of the two major financial centers Ireland and Luxembourg in attracting foreign investment in the Euro Area becomes visible as they are excluded and the rest of the countries are divided in high and low rating countries as destination of foreign investment. Global investors are notably lower exposed towards these two country groups in their total and foreign portfolios.

In determining the characteristics of countries investing in the Euro Area and the US, the gravity variables trade and distance work well: countries that trade more and that are closer to the Euro Area and the US are more exposed towards these destinations of foreign investment. It is also possible to establish a relationship between the institutions at home and the financial exposure towards the Euro Area and the US. Countries that have a more open capital account are more exposed towards Euro Area and US securities. This institutional characteristic of investors at home is also a driver behind Foreign Bias, the opposite of Home Bias. Moreover, the institutional variables relative governance, relative GDP per capita and relative financial development do have a significant impact on Foreign Bias. Countries that have a more open capital account, a higher degree of governance and a higher level of GDP per capita, but a lower degree of financial development, have a stronger Foreign Bias and the bigger the relative institutional distance

between an investor country and the country which is the destination of foreign investment, the stronger the effect (positive or negative) on Foreign Bias. These results suggest that the *high-standard investors' attraction* hypothesis holds for capital account openness, governance and GDP per capita, whereas the *comparative advantage* hypothesis holds for financial development as motives for investing in foreign securities.

The results show no any remarkable decline in financial exposure towards Euro Area and US equity during the global financial crisis. In the contrary, there is evidence that global investors invested a greater share of their total portfolio in equity issued by Euro Area countries during the Global crisis and the Euro crisis. There is no evidence found that this increased exposure was towards a particular group of countries within the Euro Area or that the Euro Bias of low rating countries towards Euro Area equity increased during these periods of crisis. Turning to debt, there is a slight decline in financial exposure towards the Euro Area visible during the Global crisis, mainly caused by a decrease in exposure towards debt securities issued by low-rating countries. The decrease in exposure towards US debt is much sharper. There is however no empirical evidence for a significant influence of the Global crisis on financial exposure towards Euro Area debt or the US debt.

## 9. Discussion

As in the majority of other international finance gravity studies, this paper uses the IMF CPIS to construct the various measures of exposure. While the CPIS provides the most comprehensive survey of bilateral holdings, there are a number of important drawbacks to the use of it: Firstly, the CPIS does not address the issue of third country holdings and round-tripping. As a result, the CPIS reports amounts of equity investment in countries like Luxembourg and Ireland much larger than their the stock market capitalization<sup>12</sup>. Secondly, the cross-border holdings of emerging economies reported in the CPIS is very low. Because there is no other financial data available, it is hard to Figure out whether the reporting reflect reality or is due to reporting omissions. If it is the latter case, the measured financial exposure towards the Euro Area and US of this country group is not accurate. Finally, the CPIS does not report domestic security holdings<sup>13</sup>. In the case of debt, data from BIS Debt Security Statistics is used to estimate these domestic security holdings and the debt market capitalization of countries and the world. This database is also subject to a number of important caveats: Firstly, data is collected by different governments using different reporting standards and therefore is not as consistently calculated across countries. A second disadvantage of the BIS Debt Security Database is that data are at nominal values. A third disadvantage of the database is its very limited country coverage. This paper chooses to complement the data on debt market capitalization with a proxy for a country's debt market capitalization (see section 4). All these caveats of the data used to construct the measures of financial exposure have as a result the measures are not completely accurate. At present, however, these are the most accurate estimates possible as there is simply no more accurate data available.

In addition to the drawbacks of the data used, there are also problems with the models used to estimate the impact of the regressors on financial exposure. As mentioned before, the pooled OLS regression does not fit the data as it does not recognize the panel structure of the data. But also the fixed effects model is not an exact fit for the data: the variance across time is much smaller than the variability across countries for all dependent and independent variables (comparing the between and within standard deviation in Tables 11 to 14). Due to the relatively short time period (t=12) and the low variance of series across time, an estimator that explores the variability between countries perhaps would have been more appropriate.

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<sup>12</sup> That's the reason why some countries are excluded from the analysis, in particular financial centres such as Ireland and Luxembourg, for which data seem distorted.

<sup>13</sup> Domestic security holdings are part of Total Portfolio of security holdings, needed to calculate the measures Total Bias and Foreign Bias (equation 3).

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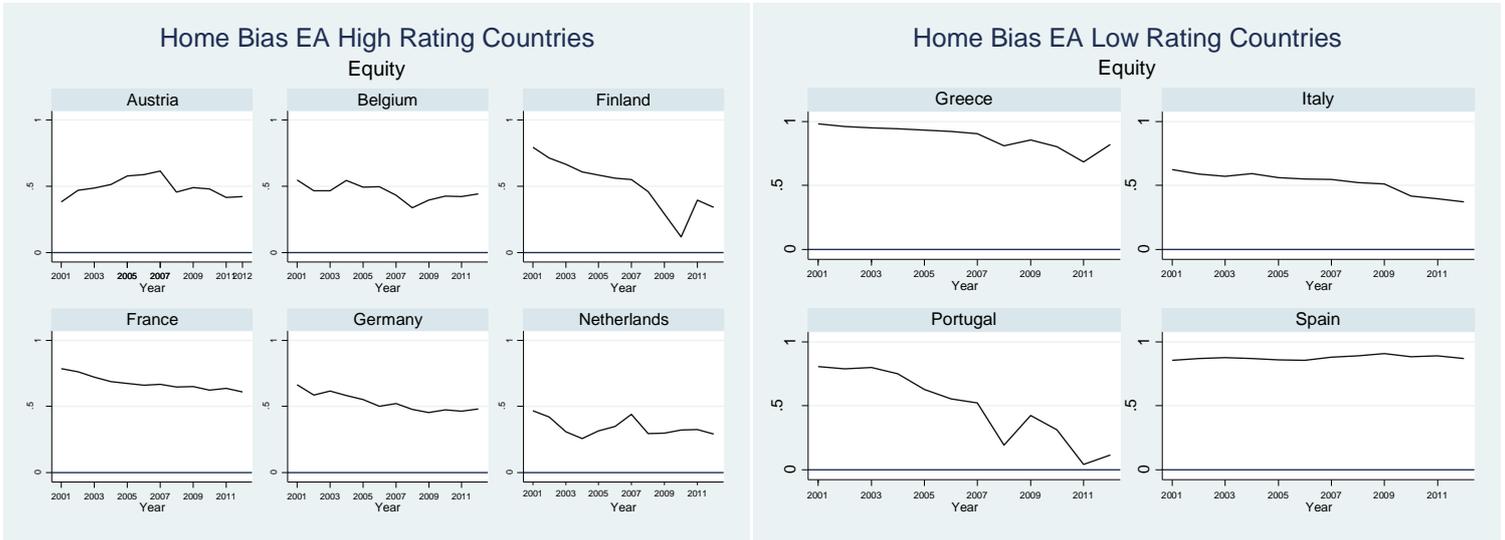
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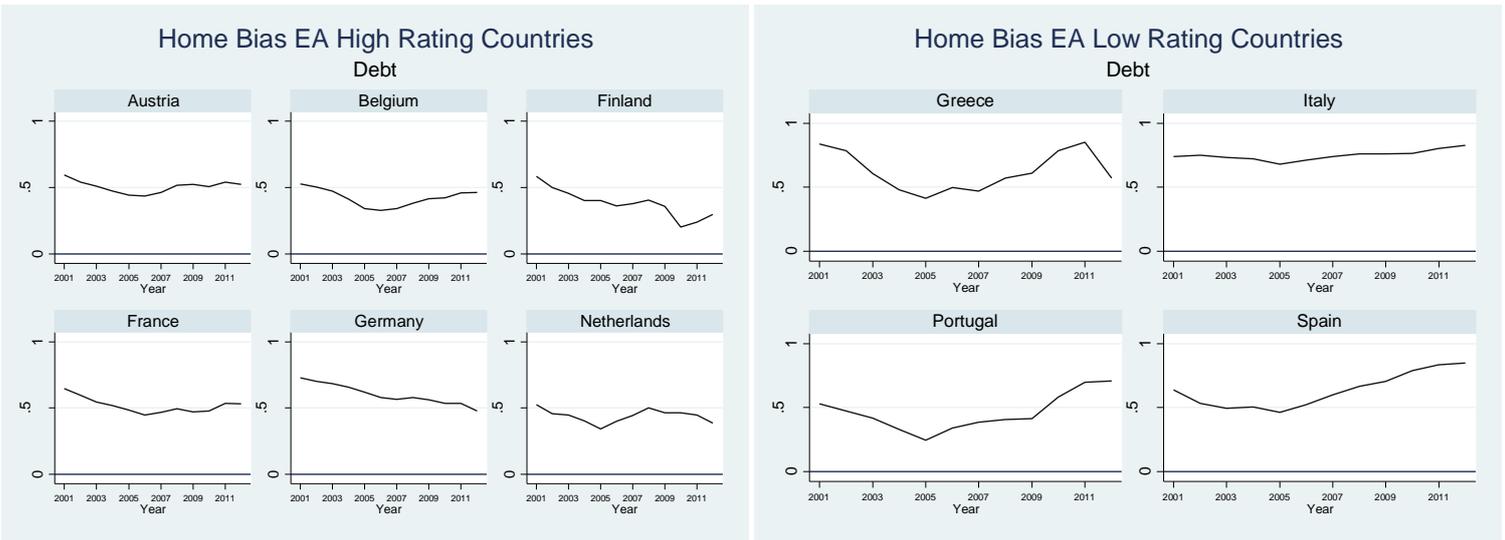
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# 11. Appendix A: Figures

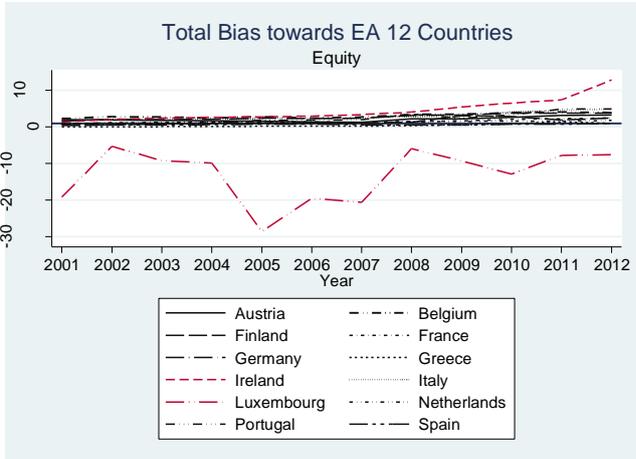
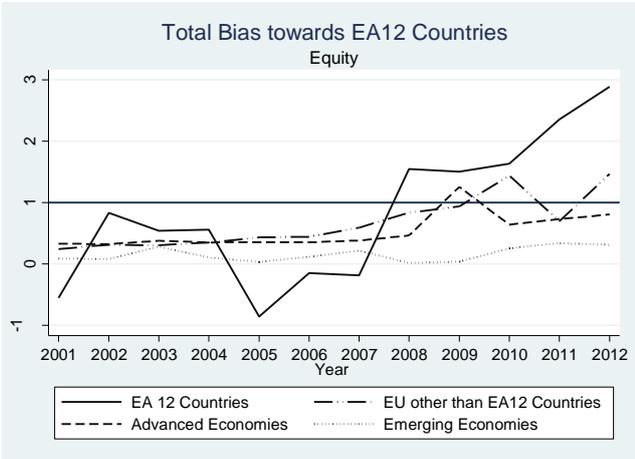
**Figures 13 and 14** *Equity Home Bias EA high rating countries and low rating countries*



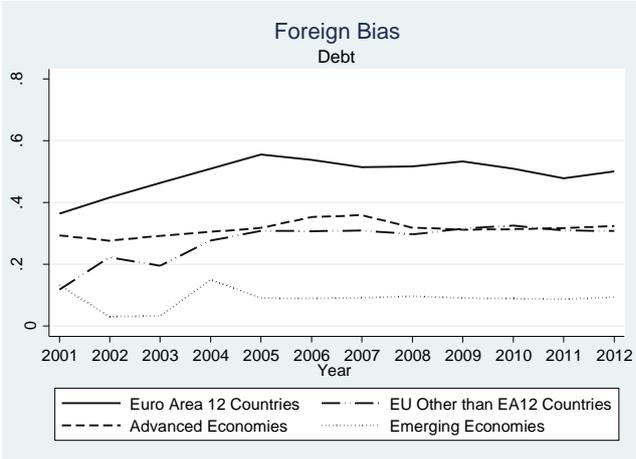
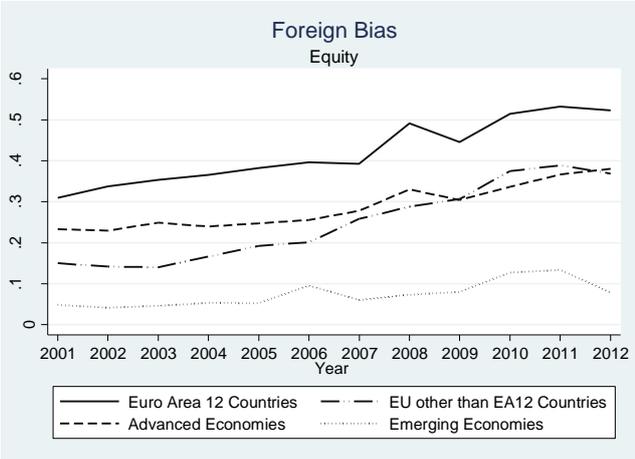
**Figures 15 and 16** *Debt Home Bias EA high rating countries and low rating countries*



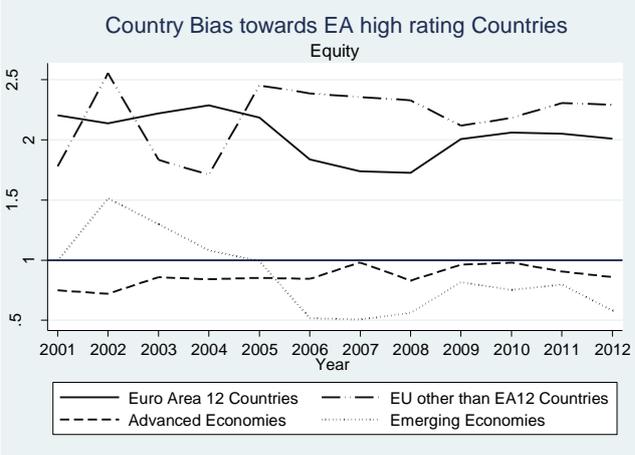
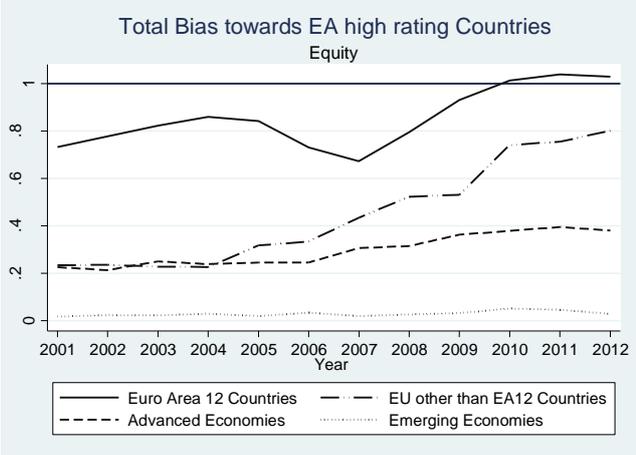
**Figures 17 and 18** Total Bias towards EA12 Equity, including the two financial centers Ireland and Luxembourg.



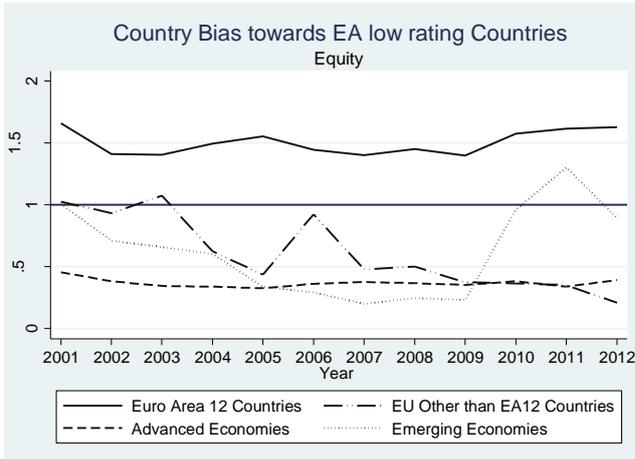
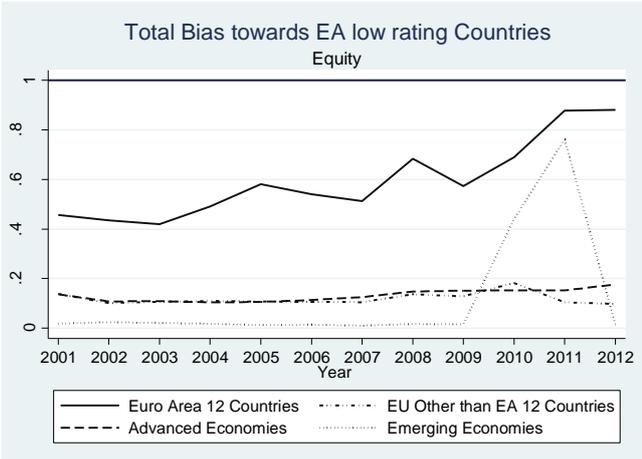
**Figures 19 and 20** Equity Foreign Bias and Debt Foreign Bias



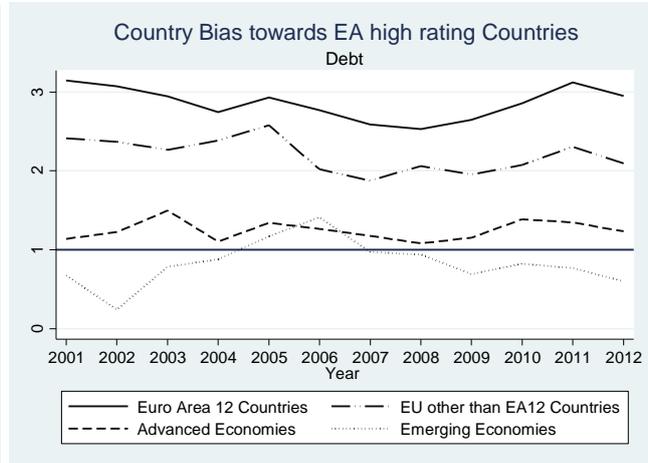
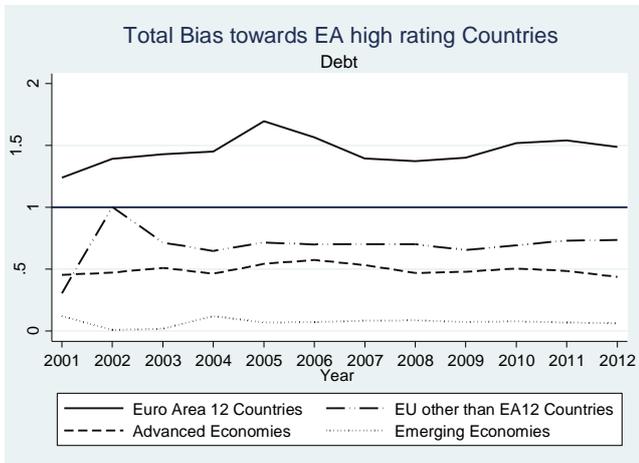
**Figures 21 and 22** Total Bias and Country Bias towards equity issued by Euro Area high rating countries



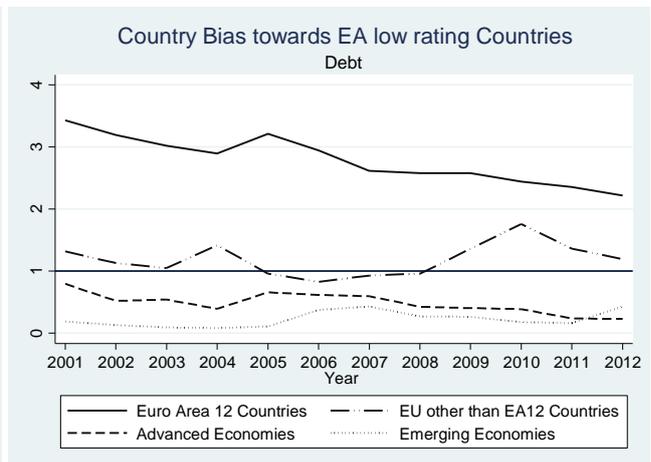
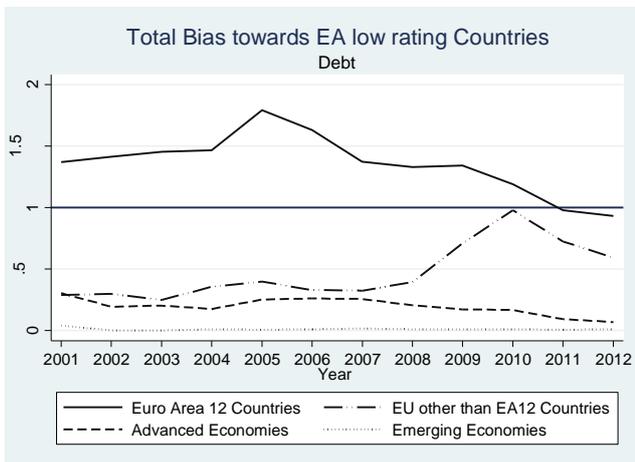
**Figures 23 and 24** Total Bias and Country Bias towards equity issued by Euro Area low rating countries



**Figures 25 and 26** Total Bias and Country Bias towards debt issued by Euro Area high rating countries



**Figures 27 and 28** Total Bias and Country Bias towards debt issued by Euro Area low rating countries



## 12. Appendix B: Tables

**Table 11. Summary Statistics EA12**

Variable	Mean	Standard Deviation			Min	Max	Observations
		Overall	Between	Within			
<b>Dependent variables</b>							
EA 12 Total Bias – Equity (log)	-1.86	2.37	2.26	0.93	-12.23	1.61	586
EA 12 Bias – Equity (log)	0.53	1.07	0.98	0.47	-5.03	2.05	623
EA 12 Total Bias – Debt (log)	-1.75	2.51	2.62	0.67	-13.69	1.26	499
EA 12 Bias – Debt (log)	0.35	.95	1.02	0.45	-6.07	1.57	508
<b>Independent variables relative to EA 12</b>							
Volatility	0.98	.89	0.75	0.48	0.00	8.01	645
Distance (log)	7.84	1.11	1.12	0.00	5.87	9.69	648
Trade (log)	24.33	1.60	1.56	0.39	20.26	27.74	648
Capital Account Openness	-0.97	1.29	1.19	0.51	-4.24	0.04	636
Governance	-0.44	0.79	0.79	0.13	-2.25	0.88	648
GDP per capita (log)	-0.75	1.14	0.97	0.60	-3.76	3.78	648
Financial Development	-0.09	0.52	0.48	0.23	-1.09	2.90	647
Capital Account Openness (abs)	0.97	1.29	1.19	0.51	0.00	4.24	636
Governance (abs)	0.75	0.51	.50	0.12	0.00	2.25	648
GDP per capita (abs)	1.00	0.92	.91	0.20	0.00	3.78	648
Financial Development (abs)	0.41	0.34	.26	0.21	0.00	2.90	647

**Table 12. Summary Statistics US**

Variable	Mean	Standard Deviation			Min	Max	Observations
		Overall	Between	Within			
<b>Dependent variables</b>							
US Total Bias – Equity (log)	-3.37	2.28	2.14	1.01	-14.43	-0.22	573
US Bias – Equity (log)	-0.95	1.13	0.98	0.61	-8.56	1.00	610
US Total Bias – Debt (log)	-3.68	2.32	2.24	0.75	-13.76	-0.55	490
US Bias – Debt (log)	-1.37	1.02	0.84	0.60	-6.17	0.52	616
<b>Independent variables relative to US</b>							
Volatility	1.35	0.79	0.54	0.59	0.00	7.94	633
Distance (log)	8.93	0.49	0.49	0.03	6.60	9.70	636
Trade (log)	23.00	1.86	1.86	1.86	18.55	18.54	636
Capital Account Openness	-0.97	1.29	1.19	0.51	-4.28	0.00	636
Governance	-0.66	0.79	0.79	0.15	-2.54	0.71	648
GDP per capita (log)	-1.00	1.14	0.97	0.61	-3.83	3.26	648
Financial Development	-1.30	0.62	0.48	0.40	-3.05	1.50	647
Capital Account Openness (abs)	0.97	1.29	1.19	0.52	0.00	4.28	636
Governance (abs)	0.83	0.62	0.61	0.14	0.00	2.54	648
GDP per capita (abs)	1.13	1.00	0.97	0.26	0.00	3.82	648
Financial Development (abs)	1.32	0.57	0.43	0.38	0.00	3.04	647

**Table 14. Summary Statistics EA High Rating Countries**

Variable	Mean	Standard Deviation			Min	Max	Observations
		Overall	Between	Within			
<b>Dependent variables</b>							
EA High Rating – Equity (log)	-2.66	2.658	2.559	1.007	-14.308	0.77	575
EA High Rating – Equity (log)	-0.27	1.509	1.379	0.73	-10.756	2.136	612
EA High Rating – Debt (log)	-1.72	2.48	2.62	0.68	-13.519	1.52	494
EA High Rating – Debt (log)	0.31	1.006	1.05	0.51	-5.546	1.967	503
<b>Independent variables relative to EA High Rating</b>							
Volatility	0.98	0.89	0.75	0.48	0.00	8.01	645
Distance (log)	7.84	1.11	1.12	0.00	5.87	9.69	648
Trade (log)	24.01	1.65	1.61	0.40	19.64	27.41	648
Capital Account Openness	-0.97	1.29	1.19	0.51	-4.26	0.03	636
Governance	-0.70	0.79	0.79	0.11	-2.44	0.59	648
GDP per capita (log)	-0.82	1.14	0.97	0.60	-3.83	3.70	648
Financial Development	0.03	0.52	0.48	0.22	-0.09	3.06	647
Capital Account Openness (abs)	0.97	1.29	1.19	0.51	0.00	4.26	636
Governance (abs)	0.84	0.63	0.63	0.11	0.00	2.44	648
GDP per capita (abs)	1.00	0.92	0.91	0.20	0.00	3.83	648
Financial Development (abs)	0.39	0.35	0.28	0.21	0.00	3.06	647

**Table 14. Summary Statistics EA Low Rating Countries**

Variable	Mean	Standard Deviation			Min	Max	Observations
		Overall	Between	Within			
<b>Dependent variables</b>							
EA Low Rating – Equity (log)	-3.55	2.79	2.96	1.00	-14.63	2.47	532
EA Low Rating – Equity (log)	-1.38	1.83	1.73	.99	-8.83	2.48	569
EA Low Rating – Debt (log)	-2.81	3.23	3.09	0.98	-14.38	1.86	482
EA Low Rating – Debt (log)	-0.74	1.89	1.77	.91	-8.78	1.86	491
<b>Independent variables relative to EA Low Rating</b>							
Volatility	0.98	.89	0.75	0.48	0.00	8.01	645
Distance (log)	7.84	1.11	1.12	0.00	5.87	9.69	648
Trade (log)	22.81	1.56	1.53	0.38	19.26	26.38	648
Capital Account Openness	-0.96	1.29	1.19	0.51	-4.21	0.07	636
Governance	0.09	0.80	0.79	0.17	-1.83	1.48	648
GDP per capita (log)	-0.56	1.14	0.97	0.61	-3.57	4.00	648
Financial Development	-0.34	0.53	0.48	0.25	-1.43	2.55	647
Capital Account Openness (abs)	0.97	1.29	1.19	0.51	0.00	4.26	636
Governance (abs)	0.70	0.40	0.37	0.16	0.00	1.83	648
GDP per capita (abs)	0.95	0.84	0.81	0.21	0.01	4.00	648
Financial Development (abs)	0.53	0.35	0.27	0.22	0.00	2.55	647

**Table 15. Mean Institutional scores.**

	Capital account openness	Governance	Financial Development	GPD per capita
<b>United States</b>	2.4	1.6	199.3	10.7
<b>EA High Rating Countries</b>	2.4	1.7	69.1	10.6
<b>EA 12 Countries</b>	2.4	1.4	73.4	10.5
<b>Advanced Economies</b>	1.8	1.6	123.7	10.5
<b>EA Low rating Countries</b>	2.4	0.9	97.6	10.2
<b>EU other than EA12 Countries</b>	1.7	1.0	58.0	9.6
<b>Emerging Economies</b>	0.4	0.1	40.3	8.8

**Table 16. Equity. Exposure towards the Euro Area 12 countries and Foreign Bias. Nested Model: OLS pooled cross section.**

<b>Dependent Variable:</b>	<b>Total Bias</b>	<b>Country Bias</b>	<b>Total Bias</b>	<b>Country Bias</b>	<b>Foreign Bias</b>
Volatility	-.073 (.177)	-.062 (.118)	-.069 (.179)	-.043 (.112)	
Distance	-.476** (.154)	-.371*** (.103)	-.483** (.163)	-.400*** (.106)	
Trade	-.005 (.133)	.151 (.094)	-.003 (.134)	.149 (.095)	
Capital Account Openness	.274 (.183)	-.071 (.097)	.272 (.184)	-.081 (.096)	.410 (.189)
Governance					1.271*** (.348)
Governance	-1.205 (.632)	-.475 (.231)	-1.175 (.642)	-.495 (.228)	
GDP per capita		-.337* (.122)		-.327* (.121)	.219 (.238)
GDP per capita  <sup>+</sup>	-.635 (.332)		-1.103 (.605)		
GDP per capita  <sup>-</sup>	-.067 (.422)		-.667 (.330)		
Financial Development					-.003 (.001)
Financial Development	-.180 (.159)	-.060 (.266)	-.073 (.421)	-.055 (.263)	
Euro Dummy	.666 (.392)	.393 (.233)			
EA High Rating Countries			.567 (.386)	.182 (.248)	
EA Low Rating Countries			.694 (.542)	.765*** (.213)	
Global Crisis	.397* (.144)	-.015 (.119)	.399* (.145)	-.022 (.117)	
Euro Crisis	.814*** (.162)	.211 (.084)	.722*** (.157)	.211 (.084)	
Observations	573	601	573	601	584
Countries	50	52	50	52	50
R <sup>2</sup>	0.6614	0.3912	0.6616	0.4077	0.6182

**Table 17. Equity. Exposure towards the US countries and Foreign Bias. Nested Model: OLS pooled cross section.**

<b>Dependent Variable:</b>	<b>Total Bias</b>	<b>Country Bias</b>	<b>Foreign Bias</b>
Volatility	-.170 (.253)	-.133 (.127)	
Distance	-.476** (.154)	-.380 (.183)	
Trade	.030 (.092)	.171** (.057)	
Capital Account Openness	.005 (.256)	-.318 (.135)	.385 (.191)
Governance			1.300*** (.349)
Governance	-1.628* (.595)	-.194 (.326)	
GDP per capita	.666 (.393)	.235 (.131)	.238 (.238)
Financial Development	-.319 (.224)	-.200 (.172)	-.331** (.101)
Global Crisis	.204 (.235)	.078 (.155)	
Euro Crisis			
Observations	560	588	584
Countries	49	51	50
R <sup>2</sup>	0.5131	0.2017	0.6295

**Table 18. Debt. Exposure towards the US countries and Foreign Bias. Nested model: OLS pooled cross section.**

<b>Dependent Variable:</b>	<b>Total Bias</b>	<b>Country Bias</b>	<b>Foreign Bias</b>
Volatility	-1.077 (.253)	-.229 (.087)	
Distance	.251 (.270)	-.278 (.152)	
Trade	.014 (.104)	.185*** (.047)	
Capital Account Openness	-.286 (.402)	-.209 (.098)	.410 (.175)
Governance	.283 (.375)		.413 (.401)
Governance		.218 (.257)	
GDP per capita	1.452 (.750)	-.034 (.128)	.587 (.355)
Financial Development	.001 (.185)	.126 (.123)	-.134 (.177)
Global Crisis	.391 (.344)	-.062 (.105)	
Observations	452	587	456
Countries	40	50	40
R <sup>2</sup>	0.4080	0.2776	0.5068

**Table 19. Debt. Exposure towards the Euro Area 12 countries and Foreign Bias. Nested Model: OLS pooled cross section.**

Dependent Variable:	Total Bias	Country Bias	Total Bias	Country Bias	Foreign Bias
Volatility	-1.024 (.484)	-.098 (.087)	-1.042 (.503)	-.079 (.086)	
Distance	-.151 (.409)	-.442*** (.071)	-.127 (.436)	-.452*** (.071)	
Trade	-.133 (.119)	.058 (.058)	-.134 (.118)	.056 (.057)	
Capital Account Openness	-.090 (.317)	-.033 (.064)	-.082 (.309)	-.043 (.063)	.575** (.192)
Governance					.811 (.406)
Governance	.025 (1.060)	-.205 (.214)	.042 (1.073)	-.229 (.214)	
GDP per capita					.184 (.241)
GDP per capita	-1.524 (.836)	.101 (.179)	-1.514 (.822)	.081 (.175)	
Financial Development					-.002 (.002)
Financial Development +		.040 (.150)		.035 (.143)	
Financial Development -		.158 (.271)		.248 (.270)	
Financial Development	.303 (.522)		.308 (.528)		
Euro Dummy	.644 (.548)	.303 (.161)			
EA High Rating Countries			.778 (.659)	.279 (.144)	
EA Low Rating Countries			.472 (.529)	.477 (.215)	
Global Crisis	.384 (.264)	-.092 (.088)	.392 (.271)	-.104 (.088)	
Euro Crisis	-.100 (.137)	-.146 (.077)	-.098 (.138)	-.146 (.077)	
Observations	465	468	465	468	465
Countries	41	41	41	41	41
R <sup>2</sup>	0.4957	0.6393	0.4966	0.6488	0.5304

**Table 20. Equity. Exposure towards the Euro Area high rating countries versus Euro Area low rating countries. Nested model: OLS pooled cross section.**

Dependent Variable:	EA high rating		EA high rating		EA low rating		EA low rating	
	Total Bias	Country Bias	Total Bias	Country Bias	Total Bias	Country Bias	Total Bias	Country Bias
Volatility	.007 (.185)	.045 (.154)	.012 (.188)	.080 (.144)	-.532 (.269)	-.315 (.166)	-.517 (.279)	-.356 (.174)
Distance	-.635** (.193)	-.555*** (.164)	-.640** (.196)	-.578*** (.101)	-.077 (.219)	-.006 (.150)	-.111 (.219)	-.051 (.148)
Trade	.060 (.132)	.257 (.101)	.062 (.132)	.263 (.165)	.210 (.157)	.281* (.101)	.221 (.159)	.322** (.107)
Capital Account Openness	.527 (.202)	.182 (.126)	.523 (.202)	.167 (.127)	.468 (.254)	.170 (.161)	.456 (.253)	.161 (.159)
Governance	.338 (.458)	.044 (.367)	.358 (.499)					
Governance			-1.175 (.642)	-.048 (.395)	2.063*** (.522)	1.109** (.354)	2.279*** (.538)	1.434*** (.368)
GDP per capita	-1.028* (.384)	-.030 (.298)	-1.019 (.396)	-.011 (.301)	-.954** (.282)	.210 (.247)	-1.008*** (.275)	.098 (.248)
Financial Development		-.453 (.283)		-.512 (.273)	-.059 (.465)	-.059 (.322)	-.163 (.482)	-.254 (.321)
Financial Development	-.316 (.530)		-.325 (.537)					
Euro Dummy	.062 (.446)	-.160 (.291)			.791 (.580)	.787 (.397)		
EA High Rating Countries			.005 (.394)	-.355 (.309)			.398 (.473)	-.062 (.380)
EA Low Rating Countries			.138 (.655)	.168 (.346)			1.262 (.963)	1.200 (.665)
Global Crisis	.289 (.159)	-.204 (.144)	.289 (.159)	-.217 (.142)	.125 (.224)	-.236 (.202)	.094 (.220)	-.264 (.195)
Euro Crisis	.346 (.173)	-.234 (.118)	.348 (.174)	-.230 (.119)	-.145 (.198)	-.376 (.234)	-.168 (.198)	-.425 (.236)
Observations	562	590	562	590	502	530	502	530
Countries	50	52	50	52	44	46	44	46
R <sup>2</sup>	0.6724	0.3730	0.6725	0.3774	0.5669	0.3359	0.5722	0.3473

**Table 21. Debt. Exposure towards the Euro Area high rating countries versus Euro Area low rating countries. Nested model: OLS pooled cross section.**

Dependent Variable:	EA high rating		EA high rating		EA low rating		EA low rating	
	Total Bias	Country Bias	Total Bias	Country Bias	Total Bias	Country Bias	Total Bias	Country Bias
Volatility	-1.039 (.421)	-.163 (.076)	-1.040 (.440)	-.124 (.075)	-1.564* (.535)	-.616 (.230)	-1.570 (.523)	-.674* (.232)
Distance	-.101 (.417)	-.351*** (.072)	-.101 (.433)	-.349*** (.069)	.118 (.505)	-.230 (.171)	.124 (.491)	-.204 (.175)
Trade	-.115 (.121)	.073 (.042)	-.115 (.122)	.076 (.040)	-.146 (.173)	.124 (.094)	-.145** (.173)	.134 (.095)
Capital Account Openness	-.091 (.368)	.032 (.084)	-.090 (.351)	-.000 (.083)	.354 (.415)	.502 (.174)	.354 (.418)	.512** (.173)
Governance		.346 (.168)		.492** (.164)				
Governance	-.682 (.669)		-.681 (.770)		1.800 (.387)	-.236 (.354)	1.774 (1.364)	-.360 (.439)
GDP per capita	-1.134 (.880)	.195 (.181)	-1.134 (.880)	.234 (.168)	-1.632* (.586)	-.127 (.278)	-1.633* (.584)	-.137 (.278)
Financial Development +	.453 (.457)	.120 (.142)	.454 (.491)	.090 (.131)				
Financial Development -	1.670 (1.467)	.983 (.353)	1.667 (1.374)	1.262 (.349)				
Financial Development					.106 (.567)	-.101 (.367)	.095 (.586)	-.160 (.373)
Euro Dummy	.684 (.514)	.279 (.164)			1.356 (.826)	.502 (.384)		
EA High Rating Countries			.686 (.641)	.282 (.145)			1.391 (.787)	.567 (.360)
EA Low Rating Countries			.680 (.473)	.647** (.204)			1.289 (1.072)	.082 (.563)
Global Crisis	.317 (.232)	-.092 (.079)	.317 (.238)	-.107 (.204)	.340 (.307)	-.015 (.172)	.344 (.296)	.015 (.172)
Euro Crisis	-.048 (.137)	-.074 (.088)	-.048 (.137)	-.059 (.077)	-.543 (.205)	-.497 (.188)	-.542 (.204)	-.497 (.188)
Observations	461	464	461	464	457	462	457	462
Countries	41	41	41	41	42	42	42	42
R <sup>2</sup>	0.5270	0.5977	0.5270	0.6150	0.5977	0.5459	0.5977	0.5466

### 13. Appendix C: Country Coverage

<b>EA 12 Countries</b>	<b>EA high rating</b>	<b>EA low rating</b>	<b>Other EU not EA12</b>	<b>Advanced Economies</b>	<b>Emerging Economies</b>
Austria	Austria	Greece	Bulgaria	Australia	Bahrain, Kingdom of
Belgium	Belgium	Italy	Cyprus	Canada	Brazil
Finland	Finland	Portugal	Czech Republic	Honk Kong	Chile
France	France	Spain	Denmark	Iceland	Colombia
Germany	Germany		Estonia	Israel	Costa Rica
Greece	Netherlands		Hungary	Japan	Egypt
Ireland	Austria		Latvia	Korea, Rep.	India
Italy	Belgium		Malta	Norway	Indonesia
Luxembourg	Finland		Poland	Singapore	Kazakhstan
Netherlands	France		Romania	Switzerland	Kuwait
Portugal	Germany		Slovak Republic	United States	Malaysia
			Sweden		Mexico
			United Kingdom		Philippines
					Russian Federation
					South Africa
					Thailand
					Turkey
					Uruguay