What drives international equity and bond holdings? An empirical study

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In this article, we explore tentatively and formally the differences between bond and equity home and foreign bias based on a large data set including developed and emerging markets for the period 2001 to 2010. We show that, unlike for equities, the international demand for bonds is mainly supply-side driven: bond *home bias* increases with a growth in public debt, while the underinvestment bias towards a *foreign country's bonds* decreases if this country issues more (sovereign) debt. This explains the absence for a negative time trend in bond home bias while equity home bias has decreased over time, and similarly a decrease in foreign bond bias, which is not observed for equities. Besides variables being significantly more, less or incompatibly important for bond versus equity investment bias, we also determine variables to be exclusively relevant for bonds, like sovereign credit ratings and bank credit supply.

Keywords: home bias; foreign bias; international diversification; bond holdings

JEL Classification: G11; G12; H60

I. Introduction

The preference of investors for domestic assets over international ones is commonly known as home bias. Due to the limited availability of quality data on international bond holdings, most research has been carried out on equity holdings (see Lewis, 1999; Karolyi and Stulz, 2003; Sercu and Vanpée, 2012). Recently, international bond holdings data have become more readily available at higher quality levels through, for example, the Coordinated Portfolio Investment Survey (CPIS) conducted annually by the IMF since 2001.

Besides the recent improvements in data availability, studying bond home bias can be motivated by several other factors. To our knowledge, there is no study that compares home bias in equities with bonds on one large-scale data set. There is a lack of *exploratory studies* on the magnitude of home bias in equities versus bonds (see Section II). An exploratory study is interesting not only for the empirical results but also for the methodological approach. There is an issue of comparability of home bias measures of equities and bonds. Can the usual measures be compared when applied to equities and bonds, or do we need to rescale? And how?

We find a large dispersion of home bias between equities and bonds across countries. For some countries, the difference between equity and bond home bias is small, for others it is largely positive or negative. Given this large dispersion and the lack of any obvious pattern, an *explanatory study* is also justified. We tried to explain bond home bias using explanatory variables commonly used to explain equity home bias and found much lower R^2.[1] This motivates further research on *explanatory variables specifically important for bond home bias*. The search for these variables is interesting not only for

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[1] Using the commonly known variables that explain the equity home bias in a bond home bias regression, we find an adjusted R^2 of 61%. Adding debt-specific variables to the model, the explanatory power increases to 72%.

economic interpretation or theory but also methodologically. As we show, one needs to estimate the equity and bond regressions simultaneously in order to make correct statements about the asset-specific drivers.

The equity home bias puzzle is still something not completely understood. Studying the home bias in bonds may generate new ideas from which the understanding of equity home bias may benefit. For example, by studying equity and bond home bias simultaneously on one large data set both in terms of countries and time period, it is possible to distinguish asset-invariant home bias drivers from asset-specific drivers, country-invariant drivers from country-specific drivers and time-invariant from time-specific drivers. This distinction may generate new insights into the general home bias debate.

Identifying the differences in the countries' bond and equity home bias is important because the countries' representative agents can miss diversification opportunities in equities or bonds only, or in both, or even compensate equity under-diversification through its international bond holdings. This is the question of whether equities and bonds are complements or substitutes for international diversification (e.g., Hahm and Shin, 2009).

Lastly, countries that cannot attract foreigners to invest in their local currency bonds, run the risk of currency mismatches that can result in painful crises. Burger and Warnock (2007), for example, find that US investors fail to diversify their bond portfolios fully and avoid, especially, the most volatile bond markets representing mostly emerging economies. Understanding this underinvestment in emerging market bonds can help policy-making decisions with respect to emerging markets.

The aim of this article is not to answer all these research questions. Instead this article aims to stimulate further research on an asset class that is too interesting to ignore in terms of diversification opportunities (Levy and Lerman, 1988) and in terms of market value. This is

established by exploring the difference between the bond and equity home and foreign bias based on one large-scale data set including developed (OECD) and emerging markets (EMs).[2] Before we turn to the more formal discussion, Fig. 1 illustrates that home bias is more severe in EMs than in OECD countries. Interestingly, the OECD countries are more biased towards domestic bonds than towards domestic equity, especially since 2006, when bond home bias increased considerably after a 5-year steady decline. For the EMs, the bias in bonds is, on average, smaller than in equities, but the difference is minimal. Both equity and bond home bias hardly changed over the 10-year sample period.

We see two explanations for the *diversion of bond home bias from equity home bias* in OECD countries. In the years before and during the global financial crisis, many OECD countries were running increasing current account deficits and were engaged in high levels of public spending. To cover these deficits, public debt was issued, usually under the form of government bonds. A large portion of newly issued government bonds is typically held by domestic investors. Banks hold government debt to cover reserve requirements and most pension funds are required to hold a certain percentage of long-term domestic bonds for duration matching. So a first explanation for the increased bond home bias could be mainly *supply-side driven* by increasing levels of public debt. An alternative explanation for the increased bond home bias is *demand driven*. If (domestic) bond returns outperform foreign bonds and/or stocks, investors will divert to investments in home country bonds. During the financial crisis, a flight-to-quality from equity to domestic bonds can also lead to a similar investment pattern. However, this presumption fails to explain the continuing decline in equity home bias, which has become even steeper during the crisis years, indicating that investors did not observe foreign equity to be less attractive than domestic stocks. Still,
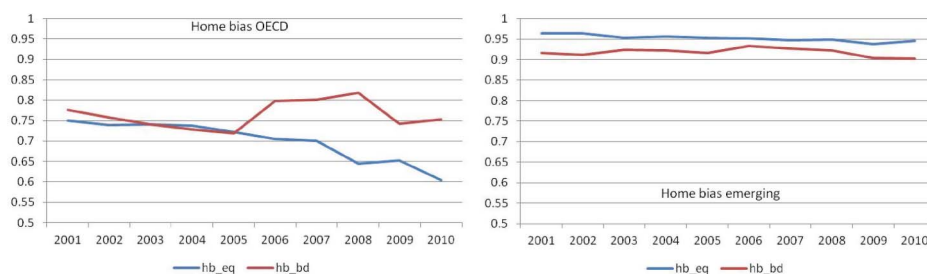

Fig. 1.   Equity and bond home bias: OECD versus EMs
Note: This figure shows the average equity and bond home bias for the period 2001 to 2010 for OECD countries and EMs. The home bias measures used are those from Equations 1 and 2. The countries included are listed in Table A1.

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[2] A list of the OECD and the EM countries in our sample is included in the Appendix (Table A1).

since the current global crisis has focused on credit and later public debt levels, a sudden aversion for foreign bonds is not unlikely.

The remainder of this article is structured as follows. In Section II, we review the restricted literature on bond home bias. Section III explains the home- and foreign bias measures and the regression equations. Section IV describes the data, taking special care of the explanatory variables. Section V discusses the regression results, and Section VI concludes.

II. Literature Review

Levy and Lerman (1988) document the potential benefits of international bond diversification. They show that US investors specializing in bonds could have improved their portfolio performance over the 1960 to 1980 period by 3–5% a year by diversifying internationally rather than restricting their investments to domestic bonds. They conclude that it is the low correlations between the bond markets in various countries, compared with the correlations across the international stock markets, that account for the potential gains from international diversification in bonds. Despite this, investors construct bond portfolios with a strong overinvestment bias towards domestic bonds and an underinvestment bias towards foreign bonds.

Lane (2006) uses an empirical method borrowed from the traditional gravity models of the international goods trade and examines the bilateral composition of international bond portfolios for EMU member countries. He finds that EMU member countries disproportionately invest in one another relative to other country pairs. Similarly, Coeurdacier and Martin (2009) document that the introduction of the euro has significantly reduced transaction costs inside the euro zone, making it cheaper for all countries to buy euro zone assets. They also find a diversion effect which leads euro zone countries to purchase fewer non euro assets. Schoenmaker and Bosch (2008) show that, although still severe, both the equity and the bond home bias amongst euro zone countries have decreased significantly since the introduction of the euro. The decline in the bond home bias is more pronounced, indicating the importance of exchange rate risk.

Fidora *et al.* (2007) compare the home bias in equities and bonds, but on a smaller data set than ours. They find that bond home bias is, on average, more pronounced than equity home bias and, according to their benchmark model, real exchange rate volatility can explain around 20% of the cross-country variation in equity and bond home biases. This is because the contribution of real exchange rate volatility to the real volatility of an asset is higher for foreign assets with lower returns. Compared to Fidora *et al.*, we include more explanatory variables in our study, and we take into account the issue of comparability and rescaling. Also, we apply a formal statistical test to check for the difference in drivers for equity and bond home bias, an approach which is necessary in order to reach correct conclusions.

Burger and Warnock (2007) analyse the ability of countries to attract US investors to their local bond markets. They find that US investors participate very little in local currency bond markets overall, and especially in emerging markets. Based on a three-moment CAPM, they find that US investors avoid local currency bonds that have returns with historically high variance and negative skewness. Decomposing these risks, they find that US investors are avoiding diversifiable idiosyncratic risk, an indication of the home bias in portfolios.

Hahm and Shin (2009) employ a variant of gravity models and find strong evidence for the presence of complementarities amongst debts and equity holdings. They partially explain this by common factors such as economy size, state of economic development and information cost proxies (such as distance).

De Santis and Gérard (2009) look at the determinants of bilateral changes in portfolio country weights in both equity securities and fixed income for a panel of thirty countries. They find that the strongest drivers are the marginal diversification benefits arising from the pure asset component (i.e., nonlinear fully hedged diversification benefits) and the initial degree of underweight. This evidence suggests that global portfolio reallocations over the asset boom and bust period were determined by optimal diversification considerations.

De Santis (2010) investigates whether portfolio flows and, therefore, the global reallocation of portfolio capital across 23 developed countries and seven emerging market economies are functions of the optimal weights at the beginning of the period, as suggested by the International CAPM (Solnik, 1974; Sercu, 1980). He finds that portfolio asset flows are influenced positively by the relative size of the recipient countries' financial markets, and that the predictions of the International CAPM are only partially met, in view of the fact that the estimated coefficient on the benchmarks is less than unity: 0.4 for the equity portfolio and 0.2 for the bond portfolio, i.e., global equity markets might be more integrated than global bond markets. Moreover, over the turbulent 1998 to 2001 period characterized by an equity bubble and the subsequent burst, they find evidence that investors preferred portfolio assets of countries where the central bank gave relative priority to money. As for EMU, once controlling for diversification benefits and the elimination of the exchange rate risk, they show that cross-border portfolio flows amongst euro-area countries have increased due to the catalyst effect of EMU. Countries' shares in the world market portfolio, home bias, initial degree of misallocation across countries, past returns, diversification benefits and EMU can explain 35–40% of the total variation in equity and bond asset flows.

III. Methodology

Home bias

Traditionally, a country's equity home bias is defined as the difference between the proportion of the total equity portfolio invested in home equity and the relative weight of the domestic stock market in the global equity market capitalization (Cooper and Kaplanis, 1994; Brealey *et al.*, 1999; Sercu and Vanpée, 2012):

$$HB_i^{eq} = \frac{EQ_{i,i}}{TEQ_i} - \frac{MEQ_i}{WEQ}, \tag{1}$$

where $EQ_{i,i}$ represents the domestic equity holdings of investors from country i, TEQ_i is the total equity portfolio held by investors from country i, MEQ_i is the equity market capitalization of country i and WEQ is the total market capitalization of equities worldwide. Similarly, bond home bias can be defined as:

$$HB_i^{bd} = \frac{BD_{i,i}}{TBD_i} - \frac{MBD_i}{WBD}, \tag{2}$$

where $BD_{i,i}$ represents the domestic bond holdings of country i, TBD_i denotes the total bond portfolio held by investors of country i, MBD_i is country i's bond market capitalization and WBD is the world bond market capitalization. The home bias measures range from 1 (fully home biased) to $-M/W$ (all assets held abroad). Bekaert and Wang (2009) indicate that there is a size effect in the traditional home bias measure: for large markets, home bias will be relatively small by definition. For example, if the United States, with a total market capitalization of 40% of the global market cap, invests 90% domestically, the country's home bias equals 50%. If Belgium with a total market cap of 0.5% invests 90% at home, Belgium's home bias is 85%. The question is, thus, whether it is reasonable to claim that the Belgian situation is 1.7 times worse than the under-diversification in the United States. To solve the size bias, Bekaert and Wang (2009) propose to scale the traditional home bias measure by the maximum home bias:

$$\overline{HB}_i = \frac{HB_i}{\left(1 - \frac{M_i}{W}\right)}, \tag{3}$$

Table 1 shows the traditional equity and bond home bias and the scaled version for a sample of 42 countries at the end of 2010. Scaling significantly alters the home bias for large countries only. The correlation between the unscaled and the scaled home bias measure is 98% for equities and 96% for bonds. Both the unscaled and scaled measures show the lowest equity home bias in the Netherlands (33.5% and 34% respectively) and the highest equity home bias in Egypt (99.7% and 99.9%). Bond home bias is lowest in Hong Kong (31.2% and 31.3%) and the

Table 1. Equity and bond home bias 2010

Country	Equity home bias		Bond home bias	
	Unscaled (%)	Scaled (%)	Unscaled (%)	Scaled (%)
Argentina	84.4	84.5	91.2	91.3
Australia	78.9	81.3	87.1	88.7
Austria	47.9	48.1	58.6	59.1
Belgium	42.4	42.6	55.3	55.8
Brazil	95.8	98.9	97.7	99.4
Canada	71.3	74.5	90.1	92.3
Chile	79.0	79.5	78.2	78.3
Colombia	96.5	96.9	92.6	92.7
Czech Republic	71.8	71.9	86.6	86.7
Denmark	54.5	54.8	76.9	77.7
Egypt	99.7	99.9	99.7	99.8
Finland	47.3	47.5	39.3	39.4
France	62.0	64.5	58.9	62.6
Germany	48.5	49.9	54.2	57.3
Greece	71.8	71.9	86.7	87.3
Hong Kong	81.7	86.4	31.2	31.3
Hungary	60.5	60.5	97.7	97.8
India	96.6	99.9	99.1	100.0
Indonesia	99.0	99.7	97.0	97.1
Israel	83.6	83.9	90.1	90.3
Italy	53.5	54.2	81.0	85.0
Japan	75.5	82.3	69.0	82.3
Korea	89.8	91.8	96.1	97.5
Malaysia	93.1	93.8	96.0	96.3
Mexico	98.6	99.5	98.6	99.2
Netherlands	33.5	34.0	62.1	64.2
New Zealand	47.3	47.3	82.3	82.4
Norway	34.5	34.7	45.0	45.2
Philippines	99.6	99.9	95.7	95.8
Poland	96.0	96.3	99.0	99.3
Portugal	55.5	55.8	64.7	65.1
Russia	97.6	99.6	76.6	76.8
Singapore	61.2	61.7	56.3	56.5
South Africa	86.5	88.3	96.4	96.6
Spain	86.9	89.0	82.1	85.0
Sweden	54.5	55.1	74.4	75.0
Switzerland	58.3	59.8	35.9	36.1
Thailand	97.5	98.0	94.5	94.7
Turkey	99.2	99.9	98.9	99.2
United Kingdom	55.0	58.7	60.7	64.6
United States	43.7	66.9	57.7	91.6
Venezuela	98.7	98.7	94.6	94.7

Note: This table shows the equity and bond home bias for the year 2010 of 42 countries. The unscaled home bias measures are those from Equations 1 and 2. The scaled home bias measures are those from Equation 3.

highest in Egypt (99.7% according to the unscaled measure) or India (100% according to the scaled version). In general, EMs show more home bias than industrialized countries.

Foreign bias

Following Chan *et al.* (2005) and Bekaert and Wang (2009), we distinguish home bias (overinvestment in the home country) from foreign asset bias (underinvestment abroad). Unscaled, the underinvestment equity bias of country i in country j is the difference between the optimal equity holdings of country j and the actual holdings of country i in country j's stocks:

$$FB_{i,j} = \frac{MEQ_j}{WEQ} - \frac{EQ_{i,j}}{TEQ_i} \qquad (4)$$

The foreign bias for bond portfolios is calculated in a similar way. Bekaert and Wang (2009) propose a measure for foreign asset bias that reflects the relative attractiveness of the foreign country by looking at the market capitalizations that are freely available to global investors. Or, stated differently, the foreign bias measure controls for all existing home biased asset allocations. We use the Bekaert and Wang foreign bias measure to analyse underinvestment from country i in country j:

$$FB_{i,j}^{eq} = \frac{MEQ_j - EQ_{j,j}}{WEQ - MEQ_i - \sum_{k=j} EQ_{k,k}} - \frac{EQ_{i,j}}{TEQ_i - EQ_{i,i}} \qquad (5)$$

This foreign bias measure is normalized such that the values lie between –1 and 1:

$$FB_{i,j}^{eq} = \begin{cases} \dfrac{W_{i,j}^{eq} - a_{i,i}^{eq}}{W_{i,j}^{eq}} & \text{When } a_{i,j}^{eq} \le W_{i,j}^{eq} \text{ (underinvestment)} \\[2ex] -\left(\dfrac{a_{i,i}^{eq} - W_{i,j}^{eq}}{1 - W_{i,j}^{eq}}\right) & \text{When } a_{i,j}^{eq} \le W_{i,j}^{eq} \text{ (overinvestment)} \end{cases} . \qquad (6)$$

where $W_{i,j}^{eq}$ represents the benchmark weight and is equal to the first part of Equation 5 and $a_{i,j}^{eq}$ is the actual weight of

investor i's investment in stocks of country j. In the same way, the normalized foreign bias measure for the bond markets is defined as

$$FB_{i,j}^{bd} = \begin{cases} \dfrac{W_{i,j}^{bd} - a_{i,i}^{bd}}{W_{i,j}^{bd}} & \text{When } a_{i,j}^{bd} \le W_{i,j}^{bd} \text{ (underinvestment)} \\[2ex] -\left(\dfrac{a_{i,i}^{bd} - W_{i,j}^{bd}}{1 - W_{i,j}^{bd}}\right) & \text{When } a_{i,j}^{bd} \le W_{i,j}^{bd} \text{ (overinvestment)} \end{cases} \qquad (7)$$

Estimation

We estimate the drivers of equity and bond home and foreign bias simultaneously as a system of equations. By applying a Wald test, we can determine whether an explanatory variable X_i has a significantly different impact on international equity and bond holdings. For the home bias equations, we distinguish between three different types of explanatory variables: interaction variables between country i and the world ($X_{i,w,t}$), country-dependent variables ($X_{i,t}$) and equity market (bond market) specific variables of country i ($X_{i,t}^{eq}$ and $X_{i,t}^{bd}$). To control for a potential time trend, we add a variable *time* that takes on the value from 1 to 10, covering our ten sample years:

$$\begin{cases} HB_{i,t}^{eq} = \alpha_{i,t}^{eq} + (\beta^{eq} X_{i,w,t} + \delta^{eq} X_{i,t} + \gamma^{eq} X_{i,t}^{eq})(1 + \tau^{eq} * time) + \varepsilon_{i,t}^{eq} \\ HB_{i,t}^{bd} = \alpha_{i,t}^{bd} + (\beta^{bd} X_{i,w,t} + \delta^{bd} X_{i,t} + \gamma^{bd} X_{i,t}^{bd})(1 + \tau^{bd} * time) + \varepsilon_{i,t}^{bd} \end{cases} \qquad (8)$$

A Wald test then tests whether

$$\begin{aligned} \beta^{eq} &= \beta^{bd} \\ \delta^{eq} &= \delta^{bd} \\ \gamma^{eq} &= \gamma^{bd} \\ \tau^{eq} &= \tau^{bd} \end{aligned} \qquad (9)$$

For the foreign bias equations, the interaction variables between the home country and the world are replaced by interaction variables between home and host country ($X_{i,j,t}$):

$$\begin{cases} FB_{i,t}^{eq} = \alpha_{i,t}^{eq} + (\beta^{eq} X_{i,j,t} + \delta^{eq} X_{i,t} + \lambda^{eq} X_{j,t} + \gamma^{eq} X_{i,t}^{eq} + \mu^{eq} X_{j,t}^{eq} + \theta^{eq} X_{i,j,t}^{eq})(1 + \tau^{eq} * time) + \varepsilon_{i,t}^{eq} \\ FB_{i,t}^{bd} = \alpha_{i,t}^{bd} + (\beta^{bd} X_{i,j,t} + \delta^{bd} X_{i,t} + \lambda^{bd} X_{j,t} + \gamma^{bd} X_{i,t}^{bd} + \mu^{bd} X_{j,t}^{bd} + \theta^{bd} X_{i,j,t}^{bd})(1 + \tau^{eq} * time) + \varepsilon_{i,t}^{bd} \end{cases} \qquad (10)$$

Equations 8 and 10 are estimated by Seemingly Unrelated Regression (SUR).

IV. Data

Portfolio holdings

Data on international portfolio holdings are retrieved from the CPIS, conducted annually by the IMF since 2001. Our sample contains data on 42 countries, both developed and emerging over a period of 10 years (2001–2010). The CPIS data set has two shortcomings. First, a number of countries, for example China and the Arab countries, did not participate in the CPIS, resulting in an incomplete country coverage. Second, the CPIS does not take effects of third-party holdings or round tripping into account. This creates misleading results for countries such as Luxembourg, Ireland and some smaller off-shore financial centres. To partly overcome this last shortcoming, we reallocate investments in off-shore financial centres over the sample countries in proportion to the foreign investments of these centres.[3] Equity market capitalizations are from the World Federation of Exchanges and bond market capitalizations are from the Bank of International Settlements (BIS).

To construct the international bond portfolios, we look at long-term bonds only. Short-term bond holdings (maturities smaller than 1 year) are typically money market instruments and treasury bills that are held for hedging purposes. Including these instruments in our bond portfolios could lead to biased results.

Explanatory variables

To explain the differences between equity and bond home bias and foreign bias, we use a set of variables that have been proven to be correlated with international investment decisions (amongst others Burger and Warnock, 2003; Ahearne *et al.,* 2004; Chan *et al.,* 2005; Fidora *et al.,* 2007; Sercu and Vanpée, 2008; Bekaert and Wang, 2009). As most of these variables are specifically used for explaining international equity holdings, we add bond-specific variables (international bond issues, credit ratings, debt levels and debt growth ratios) to our analysis to gain further insight into the difference between bond and equity holdings. Table 2 summarizes the explanatory variables used in the analysis, together with their expected sign of correlation with the home and foreign bias. If we expect a different sign for the equity and bond home bias, the table shows the expected sign for the equity bias first, followed by the expected sign of correlation with the bond bias. For a detailed description of and motivation for each of the variables, we refer to the Appendix.

V. Results

Home bias regressions

Table 3 shows the estimation results for the home bias regressions as specified in Equation 8, for the total sample of 42 countries over the period 2001 to 2010. For India and Mexico, home bias data start in 2003 due to missing data in the CPIS data set. The table shows the coefficient estimates and their corresponding *p*-values for the drivers of equity home bias and bond home bias, and the last two columns show the Wald tests for equality of the corresponding equity and bond home bias coefficient. As the main focus of this article is to point out the difference between equity and bond home bias – not to explain home bias as such – the discussion of the results will be focused on the Wald tests.

First and foremost, the regression results in Table 3 confirm the indication from Fig. 1 that although the equity home bias has decreased over time this is not the case for bond home bias. It seems puzzling that international diversification has only improved for equities, not for bonds. Our aim is to explain this discrepancy by looking at the remaining variables.

We find that the *level of financial development* (Findev) is significantly more influential for bond home bias than for equity home bias: people prefer to invest at home if their home market is better developed relative to the world, but the impact is more pronounced for bonds. *Domestic credit provided by the banking sector relative to GDP* (Credit) turns out to have a lowering effect on home bias. As this variable measures the strength of the credit markets rather than the equity markets, the effect is logically more pronounced for bond home bias. As could be expected, the *proportion of international bonds in the total bond market capitalization* (Intl_debt) has a larger reducing effect on bond home bias than on equity home bias. Still, as the proportion of international debt also seems to reduce the equity home bias, we assume that this variable correlates positively with the international orientation of a country in general. *The level and the growth of a country's government debt* (Debt, Debt growth) are asset-specific drivers. The equity home bias is not influenced by these variables, whereas the bond home bias is significantly positively influenced by the level of public debt and the growth in public debt over the recent years. This result is in line with the hypothesis of a *supply-side effect* in bond home bias (see Introduction). Having a poor *credit rating* (Rating) will impact bond portfolios more than equity portfolios. As sovereign credit ratings mainly affect (sovereign) bond returns, and only to a lesser extent equity returns, this

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[3] Sercu and Vanpée (2008) show that alternative allocation methods for the investments from and into financial off-shore centres do not meaningfully affect estimation results.

Table 2. **Definition of the explanatory variables for equity and bond home and foreign bias**

Variable	Exp. Sign		Description
	HB	FB	
Time	−	−	Takes on a value from 1 for 2001 to 10 for 2010
Information−related variables			
Distance	+	+	Logarithm of the physical distance between the home and the host country
Language	−	−	HB: Number of common languages with the home country
			FB: Dummy if home and host country share the same official language
English	−	−	Dummy if the host country has English as official language
Trade	−	−	HB: Sum of imports and exports to the world divided by home GDP
			FB: Sum of bilateral imports and exports divided by home GDP
Liberalization			
FRI_home		−	Financial Reform Index of home country (Abiad *et al.*, 2008)
FRI_host	−	−	Financial Reform Index of host country (Abiad *et al.*, 2008)
Financial market development			
Findev_host	+	−	Host country equity (bond) market capitalization relative to GDP
Credit_host	+	−	Host country domestic credit provided by the banking sector relative to GDP
Intl_debt_host	no/−	no/−	Host country international bonds relative to total bond market capitalization
Economic health and stability			
OECD_home		−	Dummy if the home country is a OECD member country
OECD_host	−	−	Dummy if the host country is a OECD member country
Rating_host	+	+	Host country sovereign rating: 1 = AAA to 21 =C
GDP_home	?	?	GDP of the home country relative to world GDP
GDP_host	?	?	GDP of the host country relative to world GDP
GDP_growth_host	?	−	3-year annual average GDP growth of the host country
Debt_home		no/+	Government debt of the home country relative to GDP
Debt_host	no/+	+/−	Government debt of the host country relative to GDP
Ddebt_home		no/+	3-year annual average growth of government debt relative to GDP
Ddebt_host	no/+	+/−	3-year annual average growth of government debt relative to GDP
Misery_host	−	+	Annual inflation rate+unemployment rate of the host country
Governance			
Goveff_host	−	−	Indicator of government effectiveness (Kaufmann *et al.*, 2009)
Corp_board_host	−	−	Corporate board efficacy indicator (Global Competitiveness Report)
Diversification benefits			
Correl	+	+	HB: 5-year equity (bond) return correlation between home and world
			FB: 5-year equity (bond) return correlation between home and host
Sharpe	+	−	Host country equity (bond) Sharpe ratio of the sample year
Sharpe_lag	+	−	Host country equity (bond) Sharpe ratio of the previous year
Skew_host	+	−	Standardized skewness for the equity (bond) return of the host country
Foreign exchange rate risk			
Euro	−	−	Dummy if home and host country are Euroland members
RER_vol	+	+	HB: 10-year monthly real exchange rate volatility between home and USD
			FB: 10-year monthly real exchange rate volatility between home and host
RER	+	+	HB: past year real exchange rate of the home country's currency and USD
			FB: past year real exchange rate of the home and host country's currencies

result is not surprising. As far as the other variables for economic health and stability are concerned, we find that the *size of the economy* (GDP) has a negative effect on bond home bias, but no effect on equity home bias. The coefficients of the *growth rate of the economy* (GDP growth) suggest that faster growing countries exhibit a higher equity home bias, while the effect on bond home bias is smaller. The coefficient estimate for the *OECD dummy* is significantly negative for both types of home bias, i.e., home bias is lower in OECD countries than in EMs which is in line with Fig. 1.

With respect to the governance variables, we notice that both *country-level* (Goveff) and *corporate governance practices* (Corp_board) seem to influence equity home bias only. But the Wald test indicates that only corporate governance has a different impact on equity and bond home bias. A potential explanation is that corporate governance, measured here as the efficiency of corporate boards, is especially relevant for shareholders, and probably less important for bond holders.

We find no convincing evidence for the *demand-driven* explanation of bond home bias, i.e., the return chasing

Table 3. Home bias regressions

	Expected	Equity		Bonds		Wald test	
	Sign	Coefficient	*p*-Value	Coefficient	*p*-Value	χ^2	*p*-Value
Intercept	?	0.279	0.100	−0.089	0.634	3.120	0.077
Time	−	−0.010	0.050	0.004	0.124	**6.970**	**0 .008**
Information-related variables							
Distance	+	0.237	<0.0001	0.249	<0.0001	0.080	0.772
Language	−	−0.006	0.002	−0.010	<0.0001	3.080	0.079
English	−	0.008	0.746	0.110	<0.0001	**15.290**	<**0.0001**
Trade	−	−0.066	<0.0001	−0.091	<0.0001	3.390	0.066
Liberalization							
FRI	−	0.220	0.004	0.301	0.000	0.830	0.362
Financial market development							
Findev	+	0.027	<0.0001	0.150	<0.0001	**65.280**	<**0.0001**
Credit	+	−0.017	0.213	−0.091	<0.0001	**20.550**	<**0.0001**
Intl_debt	no/−	−0.201	<0.0001	−0.316	<0.0001	**9.490**	**0.002**
Economic health and stability							
OECD	−	−0.082	0.000	−0.046	0.021	2.160	0.142
Rating	+	0.005	0.074	0.012	<0.0001	**4.190**	**0.041**
GDP	?	−0.078	0.525	−0.254	0.032	1.590	0.207
GDP_growth	?	2.141	<0.0001	1.043	0.002	**7.840**	**0.005**
Debt	no/+	0.021	0.304	0.071	0.000	**4.890**	**0.027**
Debt_growth	no/+	−0.048	0.429	0.116	0.075	**5.210**	**0.023**
Misery	+	0.134	0.198	0.289	0.005	1.740	0.188
Governance							
Goveff	−	−0.040	0.005	−0.017	0.168	2.130	0.144
Corp_board	−	−0.076	<0.0001	−0.013	0.368	**12.200**	**0.001**
Diversification benefits							
Correl	+	0.036	0.328	−0.068	0.022	**4.980**	**0.026**
Sharpe	+	0.002	0.461	−0.003	0.502	1.050	0.305
Sharpe_lag	+	−0.002	0.612	−0.005	0.153	0.560	0.453
Skew	+	0.041	<0.0001	0.004	0.403	**11.740**	**0.001**
Foreign exchange rate risk							
Euro	−	−0.044	0.012	−0.092	<0.0001	**5.670**	**0.017**
RER_vol	+	−0.298	0.024	−0.424	0.001	0.720	0.396
RER	+	−0.047	0.270	−0.062	0.152	0.080	0.778
Adjusted R^2		0.770		0.718			

Note: This table contains the SUR estimation results for the home bias regressions as specified in Equation 8 for the full sample of 42 countries over the period 2001 to 2010. The last two columns show the Wald test statistics for the coefficient equality test on the corresponding explanatory variables.

behaviour and flight-to-capital. The *1-year lagged Sharpe ratio* (Sharpe_lag) and the *Sharpe ratio* (Sharpe) are statistically insignificant in both the equity and bond home bias regressions. The coefficient estimate of *return correlation* (Correl) is insignificant for equity home bias and comes with a wrong sign for bond home bias. For *skewness* (Skew), we find that it only affects equity home bias, indicating that countries with positive skewness in their equity returns are more home biased.

In contrast to Fidora *et al.* (2007), our results do not indicate that real exchange rate risk is more important for bonds than for equities. The effect of a *common euro currency* (Euro) does impact equity portfolios in a different way from bond portfolios: home bias is lower in Eurozone countries, both for equities and for bonds, but the impact on bond home bias is more pronounced.

Foreign bias regressions

We now turn to the discussion of the estimation results of the foreign bias regressions as specified in Equation 10, which are presented in Table 4. The table contains the coefficient estimates, their corresponding *p*-values and the Wald tests for the full sample of 42 countries over the period 2001 to 2010.

In contrast to the equity home bias, the foreign equity bias has increased over time, on average. For foreign bond bias, we do find a negative time trend. Our hypothesis is that the negative time trend in foreign bond bias is linked to the increased supply of debt-related instruments, especially government debt.

The information-related variables show some differences between equity and bond foreign bias. A strong

Table 4. Foreign bias regressions

	Expected Sign	Equity Coefficient	Equity *p*-Value	Bonds Coefficient	Bonds *p*-Value	Wald test χ^2	Wald test *p*-Value
Intercept	?	−0.685	<0.0001	−0.095	0.239	**39.250**	<**0.0001**
Time	−	0.003	0.003	−0.010	<0.0001	**24.740**	<**0.0001**
Information-related variables							
Distance	+	0.300	<0.0001	0.283	<0.0001	2.240	0.135
Language	−	−0.061	<0.0001	−0.086	<0.0001	3.660	0.056
English	−	−0.060	<0.0001	0.070	<0.0001	**88.160**	<**0.0001**
Trade	−	−1.189	<0.0001	−1.606	<0.0001	**6.400**	**0.011**
Liberalization							
FRI_host	−	0.155	<0.0001	0.133	0.003	0.200	0.657
FRI_home	−	0.113	<0.0001	0.026	0.494	**4.260**	**0.039**
Financial market development							
Findev_host	−	−0.021	<0.0001	0.068	<0.0001	**88.550**	<**0.0001**
Credit_host		0.008	0.205	−0.032	0.001	**14.190**	**0.000**
Intl_debt_host	no/−	−0.081	<0.0001	−0.159	<0.0001	**10.410**	**0.001**
Economic health and stability							
OECD_host	−	0.014	0.106	0.073	<0.0001	**20.310**	<**0.0001**
OECD_home	−	−0.097	<0.0001	−0.091	<0.0001	0.250	0.614
GDP_host	?	−2.061	<0.0001	−1.476	<0.0001	**35.770**	<**0.0001**
GDP_home	?	−1.491	<0.0001	−1.502	<0.0001	0.020	0.892
GDP_growth	?	0.182	0.250	−0.352	0.099	**4.750**	**0.029**
Rating_host	+	−0.012	<0.0001	0.007	<0.0001	**99.410**	<**0.0001**
Debt_host	+/−	0.078	<0.0001	−0.030	0.021	**56.740**	<**0.0001**
Debt_home	no/+	0.056	<0.0001	0.031	0.006	**4.030**	**0.045**
Debt_host_growth	+/−	−0.068	0.015	−0.152	0.000	3.610	0.057
Debt_home_growth	no/+	0.018	0.433	0.228	<0.0001	**30.730**	<**0.0001**
Misery	+	0.296	<0.0001	0.038	0.557	**13.140**	**0.000**
Governance							
Goveff	−	0.003	0.635	−0.057	<0.0001	**48.700**	<**0.0001**
Corp_board	−	0.005	0.451	−0.067	<0.0001	**37.600**	<**0.0001**
Diversification benefits							
Correl	+	−0.154	<0.0001	−0.049	0.001	**26.970**	<**0.0001**
Sharpe	−	−0.004	0.005	−0.007	0.008	0.760	0.383
Sharpe_lag	−	−0.001	0.386	0.014	<0.0001	**30.320**	<**0.0001**
Skew	−	0.004	0.420	0.006	0.114	0.170	0.676
Foreign exchange rate risk							
Euro	−	−0.165	<0.0001	−0.205	<0.0001	**4.360**	**0.037**
RER_vol	+	0.316	<0.0001	−0.185	0.000	**83.380**	<**0.0001**
RER	+	−0.050	0.000	−0.133	<0.0001	**13.600**	**0.000**
Adjusted R^2		0.392		0.221			

Note: This table contains the SUR estimation results for the foreign bias regressions as specified in Equation 10 for the full sample of 42 countries over the period 2001 to 2010. The last two columns show the Wald test statistics for the coefficient equality test on the corresponding explanatory variables.

trade relationship (Trade) impacts international bond portfolios more than equities. Interestingly – but puzzlingly – countries that have *English* (English) as their official language attract more foreign equity investment, but less foreign bond investments.

As with home bias, the impact of the level of *financial market development* (Findev_host; Credit_host) is different for equities and bonds: a large market size in the host country attracts equity investments, but not bonds. Foreign bond bias is lower if credit facilities provided by banks are better developed and debt securities are mainly internationally oriented. A possible explanation for this finding is that the majority of the countries in our sample

(OECD and EMs) have well-developed equity markets in comparison to bond markets. Eichengreen and Luengnaruemitchai (2006), Eichengreen *et al.* (2006), for example, document the relative underdevelopment of Asian and Latin American debt markets compared to their equity markets and to other countries. This leads to more cross-country variation in the financial development of bond markets than of equity markets.

Consistent with our hypothesis of a supply-driven debt market, Table 4 shows that a higher level of *public debt* in the *home country* (Debt_home) increases the foreign bias, implying that if the bond supply at home is already large, there is less demand for foreign bonds. Similarly, a higher

public debt to GDP ratio for the *host country* decreases the foreign bias towards this country, as part of the issued debt is held by foreigners. In the meantime, the foreign equity bias towards this country increases, as higher debt ratios scare of equity investors since they indicate worsening economic conditions. A similar conclusion can be drawn from the results for the *growth in government debt* (Debt_host_growth; Debt_home_growth). The aversion to credit risk is also reflected in the coefficient estimate of the *credit rating* (Rating_host) variable: countries with a lower credit rating attract fewer foreign bond investors. Interestingly, this result does not hold for equities: we find that, on average, low sovereign credit ratings come with lower foreign equity bias.

We find that *OECD countries exhibit a lower foreign bias than EMs* (OECD_home) both for equities and bonds. But *OECD countries attract fewer foreign bond investments than EMs* (OECD_host). The *host country development* (GDP_host) seems to matter more for equities than for bonds.

Our conclusions with respect to the impact of *corporate governance* (Corp_board) and *political risk* (Goveff) on foreign bias are opposed to those for home bias: good governance practices, both on the country and the corporate level, matter for bond investments only.

Diversification benefits are not exploited in both equities and bonds. On the contrary, the foreign bias is lower between countries that have higher correlated equity and bond market returns (Correl). This effect is more pronounced for equities than for bonds and indicates a familiarity bias: If investors hold foreign assets, they prefer stocks and bonds that are closely related to their domestic assets. Investors do not seem to chase positive skewness in returns (Skew), nor do they chase past equity or bond risk-adjusted returns (Sharpe_lag).

In contrast to what we found for home bias, *real exchange rate risk does matter* considerably in determining bond and equity foreign bias. However, in contrast to our expectations, a higher real exchange rate volatility seems to lower foreign bond bias. On the contrary, having a *common euro currency* (Euro) does have a decreasing effect on foreign underinvestment in bonds and equities, with a bigger impact on foreign bond bias.

Robustness check

We test the robustness of our results when matched against the modified Bekaert and Wang (2009) home and foreign bias measures by running similar regressions with the traditional home and foreign bias measures as dependent variables. Thus, we calculate the equity and bond home bias as specified in Equations 1 and 2 and the foreign bias measures are calculated as specified in Equation 4. Tables A2 and A3 show the results.

The results for the home bias regressions with the traditional home bias measure as the left-hand-side variable are very similar to our results, as presented in Table 3 (Table A2). This is not surprising as the correlation between the scaled and unscaled home bias measures is very high (Table 1). The general fit of the model is slightly higher when explaining the traditional equity home bias; the adjusted R^2 increase from 77% to 79% and for bond home bias from 72% to 73%. This slightly better fit is due to the size effect in the traditional home bias measure. Size is picked up by the GDP variable that is now significant in explaining both equity and bond home bias.

Table A3 shows the estimation results for the foreign bias regressions, with the traditional foreign bias measure as the dependent variable. If we compare the results from Table A3 with the ones from Table 4, we note that the overall fit of the model improves significantly when the traditional home bias measure is used as the left-hand-side variable. For equities, the adjusted R^2 increases from 39% to 92%, while for bonds the increase is even more spectacular: from 22% to 95%. Although the fit seems better, our results regarding the difference in equity and bond foreign bias remain valid for most variables. An exception is the time trend: By applying the traditional foreign bias measure, we do find a negative evolution in foreign equity bias, even stronger than for foreign bond bias. Other estimation results are confirmed, though. Countries with a high level of government debt and an accelerating debt level attract more foreign investment in their bond assets, while foreign equity investment is not affected negatively. Also, the level of financial development, and especially the size of the international debt market and a country's rating, matters more for bond markets than for equity markets.

The difference between the traditional measure and the Bekeart and Wang foreign bias measure is revealed in the coefficient estimates for the GDP of the home country and the host country. Using the scaled foreign bias measure, estimation results indicated that the foreign bias in both bond and equities is lower if the GDP of the host and the home country is high (Table 4). The traditional foreign bias measure leads to the opposite conclusion: foreign bias will be higher for host and home countries with a high GDP (Table A3). This means that the Bekeart and Wang measure succeeds in its aim of correcting for size and indicates that ignoring the size effect in home and foreign bias can lead to contradictory conclusions. However, scaling comes with a cost: the overall explanatory power of the scaled model is much lower than the explanatory power of the traditional model.

VI. Conclusion

The existing literature on bond home bias is quite restricted because of the historically limited availability of quality data on international bond holdings. This is,

however, not an issue any more as the CPIS has been conducted annually by the IMF since 2001. Nevertheless, the level of research interest in bond home bias is low, something that is undeserved as we argue. Besides the recent availability of data, we see many other reasons for further investigating the observed preference towards domestic bonds, such as the lack of exploratory studies on the magnitude of home bias in bonds versus equities, the issue of comparability of bond and equity home bias measures, the large dispersion of home bias between equities and bonds across countries, the low R^2 when explaining bond home bias using explanatory variables commonly used to explain equity home bias, the issue of simultaneous estimation of bond and equity home bias, the potential spill-over effects of bond home bias research insights in terms of new insights into equity home bias, the issue of bonds as complements to or substitutes for international diversification and the economic link between the ability to attract foreign investors to local currency bonds and the risk of currency mismatch, possibly resulting in economic crises.

We point out four main differences in equity and bond home and foreign bias. First, we set the stage by tentatively – and later on, more formally – linking the diversion of bond and equity home bias (since 2006) to the increasing government budget deficits and engagement in high levels of public spending covered by increasing public debt issues under the form of government bonds, i.e., the supply-driven argument. Second, apart from debt ratios, credit ratings and the relative importance of international debt in a country's total debt help to distinguish international bond investments from international equity investments. Third, unlike Fidora *et al.* (2007), we do not find that exchange rate volatility matters more for bonds than for equities in explaining home and foreign bias. Fourth, we show that improving the level of financial development is more important for attracting international bond investments than international equity investments. This is probably due to the fact that equity markets are, in general, already well developed in our sample countries, while there is more room for improvement in the bond markets. In general, the motivation, the results and the tentative explanations in this article should stimulate further research on an asset class that is too interesting and too distinct to ignore with respect to home and foreign bias.

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Appendix

A popular explanation for home bias is that investors have less information about foreign assets than about domestic ones and therefore prefer to invest in what they are familiar with. To proxy for information asymmetries and familiarity, we include four variables: *Distance*, *Language*, *English* and *Trade*. Distance is calculated as the log of the physical distance between the home and host country. The physical distance between countries is calculated following the great circle formula using latitudes and longitudes of the most important city or a country's capital.[4] The common language variable is a dummy that takes on the value of one if two countries share the same language and zero otherwise. In the home bias regressions, the variable equals the number of common languages with other sample countries. English is a dummy variable that takes the value of one if the host country has English as its official language. The trade variable is constructed to measure the intensity of bilateral trade between the host and home country and is calculated as the sum of bilateral imports and exports divided by the GDP of the home country. In the home bias regressions, trade is calculated as the sum of a country's total imports and exports relative by its GDP. Distance is expected to come up with a positive sign in the home and foreign bias regressions, while language, English and trade should be negatively related to home and foreign asset bias.

Market liberalization

It has been well documented that barriers to international capital flows can still hamper international asset allocation, especially in emerging markets (Edison and

Warnock, 2003). We apply the Financial Reform Index (*FRI*) developed by Abiad *et al.* (2008) to measure financial liberalization. This index is a nonbinary measure which captures various stages of liberalization on a 1–21 score. Scores are given on seven dimensions of financial sector policy: credit controls and reserve requirements, interest rate controls, entry barriers, state ownership in the banking sector, capital account restrictions, prudential regulations and supervision of the banking sector and securities market policy. As a higher FRI score indicates a higher stage of financial market liberalization, we expect this measure to correlate negatively with both home and foreign asset bias.

Financial market development

Investors will be more inclined to invest abroad if the foreign market is well developed. We apply two variables to proxy for financial market development, notably market capitalization relative to GDP (*MC/GDP*) and domestic credit provided by the banking sector as a percentage of GDP (*CREDIT/GDP*). Equity market capitalizations, GDP and credit data are retrieved from the World Bank. Bond market capitalizations are retrieved from the Bank of International Settlements. Market size is a commonly used indicator for market development (amongst others Levine and Zervos, 1998; Burger and Warnock, 2003; Bekaert and Wang, 2009) and bond market capitalization is also a reasonable, although imperfect, proxy for bond market liquidity (McCauley and Remolona, 2000). We expect both measures for financial development to correlate positively with home bias and negatively with foreign asset bias. Burger and Warnock (2007) indicate that countries that issue international bonds are better able to attract

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[4] Bilateral distances are obtained from http:// www.cepii.fr/.

foreign investors than countries that issue local bonds. Therefore, we include the variable *Intl_debt* that measures the proportion of international bonds to total bond market capitalization. As countries with more international debt are assumed to show a lower home and foreign bias, we expect the coefficient estimate for this variable to be negative.

Economic health and stability

We include three variables to proxy for the economic health and stability in a country, notably *GDP*, *GDP growth* and the misery index (*Misery*). GDP serves as an indicator for market size and is measured as the country's GDP relative to total world GDP. GDP growth is measured as the average growth rate over the three preceding years. The misery index of a country is the sum of its inflation rate and its unemployment rate, and measures the degree of a country's macroeconomic distress. Both unemployment rates and inflation rates are retrieved from the World Bank. Home bias can be both positively and negatively related to GDP and GDP growth. A country with a large GDP typically has a lot of diversification opportunities at home, such that international diversification becomes less important. In this case, the coefficient estimate for GDP will be positive. On the other hand, large countries can be perceived to be more attractive and accessible, which will attract foreign investors and lead to lower home bias and foreign bias figures. As far as GDP growth is concerned, on the one hand, strong growing countries are usually attractive for investors, but on the other hand, fast growing economies are typically emerging markets, which can have other features like high uncertainty that scare off international investors. A high score on the misery index adds to uncertainty and macroeconomic distress, so the misery index is expected to correlate positively with home and foreign asset bias.

To test whether home and foreign bias differ for OECD countries and emerging markets, we include a dummy variable that takes the value of one if the country is an OECD member, and zero otherwise. Based on Fig. 1, we expect the coefficient estimate to be negative, indicating a lower bias for OECD countries. A potential explanation for the exceeding bond home bias is a higher level of public debt. To test this hypothesis, we include three variables: government debt relative to GDP (*Debt*), public debt growth measured as the mean growth rate over the three preceding years (*Debt_growth*) and the S&P country credit rating (*Rating*). We transform Standard and Poor's country ratings into a numeric score ranging from one (AAA) to 21 (C). We do not expect that these debt-related variables will impact equity home bias directly, but an indirect effect might come up as low ratings and high debt levels are correlated with weak policies. In the bond home and foreign bias regressions, we expect the coefficient estimates for rating to be positively related to home

and foreign bias. For debt and debt_growth, the story is more subtle. If bond portfolios are mainly demand-side driven, a higher level of government debt and an increase in public debt levels in the *home* country will result in a higher home bias if the debt is mainly held by local investors, thus a positive coefficient is expected. Similarly, increasing debt issues abroad increases the international supply of government bonds, so a higher level of public debt in the *host* country may result in a lower foreign bond bias, implying a negative coefficient estimate between host country debt and foreign bond bias.

Governance

Kho *et al.* (2009), Doidge *et al.* (2007), and Gelos and Wei (2005) show that foreign portfolio investors exhibit an underinvestment bias towards countries with poor governance, partly because of the limited supply of freely available shares due to the presence of controlling shareholders and partly because of the poor level of protection of minority shareholders. Following Gelos and Wei (2005), and Sercu and Vanpée (2008), we distinguish between country-level governance and corporate governance by allowing for two governance-related variables. The government effectiveness indicator (*Goveff*) is a measure of country-level governance and captures the effects of the quality of government institutions in general. The government effectiveness indicator is developed by Kaufmann *et al.* (2009) and can be retrieved from the World Bank. As an indicator of corporate governance we use the corporate board efficacy indicator (*Corp_board*), obtained from the Global Competitiveness Report.

Diversification opportunities and performance

If investors aim to exploit diversification benefits, one would expect them to prefer assets that are only weakly correlated with their domestic portfolio. Therefore, we include the 5-year equity (bond) return correlation between the home and host country in the equity (bond) home and foreign bias regressions. Some authors show that investors display return chasing behaviour by investing more in foreign markets that performed well (Bohn and Tesar, 1996; Ahearne *et al.,* 2004; Chan *et al.,* 2005). We also correct for risk by introducing the Sharpe ratio of the sample year and 1-year lagged Sharpe ratio of the host country as explanatory variable (*Shape* and *Sharpe_lag*). Finally, we expect that investors prefer positive skewness in returns, thus we add the standardized skewness (*Skew*) for the return of the host country. The skewness variable is expected to have a positive effect on home bias and a negative effect on foreign bias. Equity returns are MSCI country indices and bond returns are Barclays Multiverse indices.[5] For the bond markets that do not have a Multiverse Index, we use JP

Morgan country indices. All return data are retrieved from Thomson Reuters Datastream.

Foreign exchange rate risk

Hedging foreign exchange rate risk is another popular explanation for international underinvestment (Fidora *et al.,* 2007). Baele *et al.* (2007) find that home bias has been decreasing faster for countries that are part of the European Monetary Union than for other countries. To account for foreign exchange rate risk, we include three variables: a dummy variable that takes the value of one if the home and host country are a member of the Euro Area and zero otherwise (*Euro*), the real exchange rate volatility between the home and host country measured by monthly data over a period of 10 years (*RER_vol*) and the change in the real exchange rate of the home and host country's currencies over the past year (*RER*). To be consistent with the literature, the euro variable should be negatively correlated with the home and foreign bias and the real exchange rate variables are expected to come up with a positive sign. Fidora *et al.* (2007) show that real exchange rate volatility is more important for bond home bias than for equity home bias, and therefore we expect the Wald test for equality of the coefficient estimates in the equity and bond equations to be rejected.

Table A1. Country classification

OECD	Emerging
Australia	Argentina
Austria	Brazil
Belgium	Chile[a]
Canada	Colombia
Czech Republic	Egypt
Denmark	Hong Kong
Finland	India
France	Indonesia
Germany	Israel [a]
Greece	Malaysia
Hungary	Philippines
Italy	Russia
Japan	Singapore
Korea, South	South Africa
Mexico	Thailand
Netherlands	Venezuela
New Zealand	
Norway	
Poland	
Portugal	
Spain	
Sweden	
Switzerland	
Turkey	
United Kingdom	
United States	

Note: [a]Chile and Israel became OECD member countries in 2010.

Table A2. Home bias regressions, traditional home bias measure as dependent variable

	Expected	Equity		Bonds		Wald test	
	Sign	Coefficient	*p*-Value	Coefficient	*p*-Value	Test stat	Pr > χ^2
Intercept	?	0.291	0.075	0.009	0.962	1.96	0.162
Time	−	−0.011	0.045	0.005	0.107	7.66	0.006
Information-related variables							
Distance	+	0.236	<0.0001	0.229	<0.0001	0.03	0.867
Language	−	−0.006	0.002	−0.009	<0.0001	2.04	0.153
English	−	0.002	0.942	0.108	<0.0001	**17.56**	<**0.0001**
Trade	−	−0.068	<0.0001	−0.094	<0.0001	**4.04**	**0.044**
Liberalization							
FRI	−	0.220	0.003	0.283	0.000	0.53	0.465
Financial market development							
Findev	+	0.023	0.000	0.145	<0.0001	**65.44**	<**0.0001**
Credit	+	−0.017	0.224	−0.091	<0.0001	**21.54**	<**0.0001**
Intl_debt	−	−0.199	<0.0001	−0.308	<0.0001	**8.91**	**0.003**
Economic health and stability							
OECD	−	−0.083	0.000	−0.046	0.022	2.53	0.112
Rating	+	0.004	0.192	0.010	0.000	**4.50**	**0.034**
GDP	?	−1.047	<0.0001	−1.388	<0.0001	**5.94**	**0.015**
GDP_growth	?	2.143	<0.0001	1.053	0.002	**8.12**	**0.004**
Debt	no/+	0.011	0.596	0.070	0.000	**7.14**	**0.008**
Debt_growth	no/+	−0.044	0.473	0.116	0.074	**5.24**	**0.022**

(*continued*)

Table A2. Continued

	Expected	Equity		Bonds		Wald test	
	Sign	Coefficient	*p*-Value	Coefficient	*p*-Value	Test stat	Pr > χ^2
Misery	+	0.123	0.239	0.273	0.008	1.73	0.188
Governance							
Goveff	–	−0.044	0.002	−0.021	0.088	2.25	0.134
Corp_board	–	−0.077	<0.0001	−0.013	0.371	**13.41**	**0.000**
Diversification benefits							
Correl	+	0.043	0.230	−0.068	0.020	**5.89**	**0.015**
Sharpe	+	0.003	0.425	−0.003	0.460	1.26	0.261
Sharpe_lag	+	−0.001	0.634	−0.005	0.140	0.67	0.413
Skew	+	0.041	<0.0001	0.004	0.451	**12.61**	**0.000**
Foreign exchange rate risk							
Euro	–	−0.040	0.021	−0.088	<0.0001	**5.94**	**0.015**
RER_vol	+	−0.239	0.071	−0.370	0.004	0.83	0.364
RER	+	−0.051	0.232	−0.062	0.147	0.05	0.822
Adjusted R^2		0.789		0.732			

Note: [a]Chile and Israel became OECD member countries in 2010.

Table A3. Foreign bias regressions, traditional foreign bias as dependent variable

	Expected	Equity		Bonds		Wald test	
	Sign	Coefficient	*p*-Value	Coefficient	*p*-Value	Statistic	*p*-Value
Intercept	?	0.000	0.855	−0.051	<0.0001	**364.45**	**<0.0001**
Time	–	−0.029	<0.0001	−0.002	0.001	**2151.90**	**<0.0001**
Information-related variables							
Distance	+	0.002	<0.0001	0.003	<0.0001	**16.400**	**<0.0001**
Language	–	−0.003	<0.0001	−0.003	<0.0001	0.030	0.857
English	–	0.011	<0.0001	−0.005	<0.0001	**1033.700**	**<0.0001**
Trade	–	−0.160	<0.0001	−0.129	<0.0001	**26.080**	**<0.0001**
Liberalization							
FRI_host	–	0.008	<0.0001	0.018	<0.0001	**33.340**	**<0.0001**
FRI_home	–	−0.011	<0.0001	−0.003	0.006	**27.890**	**<0.0001**
Financial market development							
Findev_host	–	0.006	<0.0001	0.001	<0.0001	**272.910**	**<0.0001**
Credit_host	–	0.005	<0.0001	−0.004	<0.0001	**481.410**	**<0.0001**
Intl_debt_host	no/−	−0.003	0.000	−0.007	<0.0001	**15.170**	**<0.0001**
Economic health and stability							
OECD_host	–	−−0.001	0.082	−0.001	0.003	0.070	0.786
OECD_home	–	−0.005	<0.0001	−0.001	0.077	**141.230**	**<0.0001**
GDP_host	?	1.269	<0.0001	1.152	<0.0001	**490.270**	**<0.0001**
GDP_home	?	0.008	0.008	0.005	0.037	1.550	0.214
GDP_growth	?	0.052	<0.0001	0.057	<0.0001	0.330	0.564
Rating_host	+	0.000	<0.0001	0.001	<0.0001	**69.500**	**<0.0001**
Debt_host	+/−	0.009	<0.0001	−0.011	<0.0001	**1342.200**	**<0.0001**
Debt_home	no/+	−0.001	0.101	0.000	0.746	**4.090**	**0.043**
Debt_host_growth	+/−	0.013	<0.0001	−0.004	0.001	**21.710**	**<0.0001**
Debt_home_growth	no/+	0.001	0.380	0.005	<0.0001	**12.580**	**0.000**
Misery	+	−0.001	0.719	0.002	0.214	1.800	0.180
Governance							
Goveff	–	0.003	<0.0001	0.001	<0.0001	**35.250**	**<0.0001**
Corp_board	–	−0.001	0.007	0.002	<0.0001	**53.740**	**<0.0001**
Diversification benefits							
Correl	+	−0.008	<0.0001	−0.004	<0.0001	**18.530**	**<0.0001**
Sharpe	–	0.000	0.015	0.000	0.036	0.300	0.587
Sharpe_lag	–	0.000	0.011	0.000	0.024	0.410	0.523

Table A3. Continued

	Expected	Equity		Bonds		Wald test	
	Sign	Coefficient	*p*-Value	Coefficient	*p*-Value	Statistic	*p*-Value
Skew	−	−0.002	<0.0001	0.000	0.058	**32.980**	<**0.0001**
Foreign exchange rate risk							
Euro	−	−0.009	<0.0001	−0.015	<0.0001	**73.420**	<**0.0001**
RER_vol	+	−0.020	<0.0001	0.003	0.052	**131.510**	<**0.0001**
RER	+	0.000	0.850	0.000	0.509	0.520	0.469
Adjusted R^2		0.919		0.950			