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Is home bias biased?
New evidence from the investment fund sector

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Abstract

Investment funds hold a disproportionately larger fraction of domestic relative to foreign stocks. Stock market development and familiarity (language and distance) are considered key determinants for home bias. The literature neglects however that investors often invest in foreign funds domiciled in financial centers. We use a "look-through approach" to account for this misclassification. First, we find substantially smaller home bias estimates compared to those in the literature. Second, the explanatory power of plausible home bias determinants is lower than previously documented. Third, familiarity only plays a meaningful role when investors are households, highlighting the role of investor sophistication.

Non-technical summary

Investment funds hold a disproportionately larger fraction of domestic relative to foreign stocks. The literature attributes this to stock market development and familiarity variables, such as common languages and geographical distance. Existing empirical work assumes that investment funds are representative investors of the country where the funds are legally domiciled. However, investors often put their assets in foreign funds, rather than investing in funds incorporated in their home country.

This paper develops a novel methodology to account for this misclasification and provides three contributions to the literature. First, we show that assuming the fund's country of incorporation as investment origin substantially overestimates home bias. Second, we examine whether taking the fund country of incorporation as investment origin when measuring home bias has implications for plausible determinants of home bias in a multivariate regression framework. Finally, we assess the relative importance of plausible home bias determinants depending on whether fund investors are households or institutional investors.

Our methodology is based on a "look-through approach" combining granular supervisory security-level investment fund holdings of euro area investors from the Securities Holdings Statistics (SHS) with security-by-security portfolio holdings of investment funds domiciled around the world. We classify the investor home country as investment origin when calculating home bias, rather than assuming the fund's legal country of incorporation as investment origin. This provides a uniquely detailed and representative view of investors' indirect equity investment allocation through investment funds.

Our analysis based on the look-through approach yields significantly lower home bias estimates compared to those in the literature. We find that equity home bias is lower in each country and, on average, more than halves when accounting for the investor country of origin. Second, the explanatory power of plausible home bias determinants is lower than previously documented in the literature. When we account for the investor's country of origin, we find that the magnitude of most coefficients and their statistical significance is lower and the same set of predefined

determinants is jointly less relevant for home bias. Third, we find that familiarity variables only play a meaningful role when fund investors are households, but not when they are institutional, highlighting the role of investor sophistication.

1 Introduction

Investment funds play an increasingly important role as financial intermediaries managing assets on behalf of their clients. Between 2014 and 2021, indirect equity holdings of euro area households and institutional investors, through investment funds, have increased more strongly and are now larger than their direct equity holdings (see Figure 1). Compared to direct investments in individual stocks, investment funds offer the advantage of diversification at relatively low costs. Yet, empirical evidence suggests that investment funds have undiversified stock portfolios tilted towards the country where the funds are located in (see Chan et al., 2005; Ferreira and Matos, 2008; Hau and Rey, 2008; Lau et al., 2010). This home-bias phenomenon has been explained by low stock market development and investors who are less familiar with foreign markets and thus invest disproportionately more domestically.

Regardless of the particular explanation, existing empirical work assumes that investment funds are representative investors of the country where the funds are legally domiciled.[1] However, investors often put their assets in foreign funds, rather than investing in funds incorporated in their home country. Euro area investors, for instance, invest on average only around one quarter of their fund assets in domestic funds, while the majority of their assets is invested in non-domestic funds domiciled in financial centers. We highlight in this paper that, when assuming the fund's country of incorporation as investment origin, these non-domestic investments are misclassified as investments originating in the non-domestic financial center country. This is critical as non-domestic funds invest substantially less in securities issued in the investor's home country relative to domestic funds, creating an upward bias in the measurement of home bias.

We develop a methodology to account for this misclassification. We introduce a "look-through approach" combining granular supervisory security-level investment fund holdings of euro area investors from the Securities Holdings Statistics (SHS) with security-by-security portfolio hold-

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[1]Chan et al. (2005), for instance, suggest that mutual fund managers' portfolio holdings "ought to reveal the fund manager's preferences for domestic versus foreign equities as well as preferences of individual investors, whose money they manage. It is therefore reasonable to assume that mutual funds are representative institutional investors of a country". Similarly, Lau et al. (2010) argue that "the extent of home bias as revealed by the stock holdings of domestic mutual funds is assumed to provide a reasonable approximation of the degree of home bias exhibited by domestic investors in a country".

Figure 1: Equity Holdings of Euro Area Investors

This figure shows the market value of equity holdings of euro area investors between 2014 and 2021 (in trillion EUR), broken down by whether equities are held directly or indirectly through investment funds. The blue bars show the market value of equities held indirectly through investment funds, while the gray bars show the market value of direct equity holdings. Panel (a) shows the equity holdings of households, while Panel (b) shows the equity holdings of institutional investors (including banks, non-financial corporations, insurers and pension funds). Note that in some cases, equity and mixed funds do not report their granular portfolio holdings in Lipper Refinitiv (see Section 3). For those funds, we take the average share of equity holdings per asset type and year as proxy for the individual equity holdings. For instance, in 2021, equity funds invested on average 93 percent of their portfolio in equities, while mixed funds invested around 35 percent of their portfolio in equity.
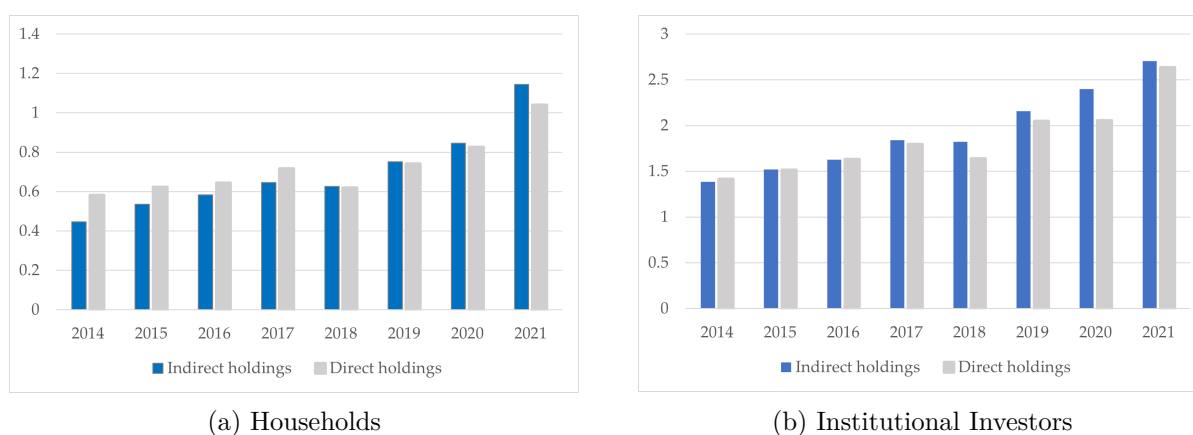
(a) Households

(b) Institutional Investors

ings of investment funds domiciled around the world. We classify the investor home country as investment origin when calculating home bias, rather than assuming the fund's legal country of incorporation as investment origin. This provides a uniquely detailed and representative view of investors' indirect equity investment allocation through investment funds. To the best of our knowledge, we are the first to look-through the investment funds' respective legal country of incorporation and thus account for the actual investment origin of funds' stock holdings.[2]

Our analysis based on the look-through approach yields significantly lower estimates for home bias compared to those in the literature. We find that out of 100 euros invested in equities, euro area investors put, on average, only around 2 euros in domestic stocks, compared to 16 euros when assuming the fund's country of incorporation as investment origin. This is reflected in substantially lower home bias estimates. For instance, when measuring home bias as the log ratio of domestic holdings to the country's world market capitalization weight, we find that equity home bias is lower in each country and, on average, more than halves when accounting

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[2]See also Molestina Vivar et al. (2020) for a preliminary policy discussion where we outline our look-through approach for the first time.

for the investor country of origin. These findings suggest that home bias is less severe than often documented in the literature, pointing to a higher degree of geographical portfolio diversification through investment funds.

We also investigate whether measuring home bias based on the look-through approach has implications for plausible home bias determinants that are typically discussed in the literature. To do so, we use the home bias measure based on the look-through approach as dependent variable in a home-bias determinant regression framework following Chan et al. (2005), and compare the regression results with using as dependent variable the traditional home bias measure that takes the fund country of incorporation as investment origin. Our findings suggest that the explanatory power of plausible home bias drivers is significantly lower than previously documented in the literature. When we account for the investor's country of origin, we find that the magnitude of most coefficients and their statistical significance is lower and the same set of pre-defined determinants is jointly less relevant for home bias. In particular, we find that familiarity variables (meaning common spoken languages and geographical distance), which have previously been documented in the literature as key determinants of home bias, become statistically insignificant.

Next, we investigate the role of familiarity further and re-run the regression analysis separately for households and institutional fund investors. The literature suggests that distance and language biases are less prevalent among more investment-savvy institutions than they are among households, suggesting that investors' sophistication is negatively related to home bias (Grinblatt and Keloharju, 2001). Consistent with the literature, we find that familiarity variables are statistically and economically insignificant for institutional fund investors, while for households familiarity variables have the largest explanatory power among the different economic categories. In other words, when fund investors are households, sharing more common spoken languages between countries is associated with lower home bias, while home bias is higher in countries that are farther away from the rest of the world. However, we do not detect a similar relationship for institutional fund investors, highlighting the role of investor sophistication.

The remainder of the paper is organized as follows. Section 2 discusses the related literature.

Section 3 describes our data set and methodology, contrasting the home bias measure typically used in the literature with the look-through approach. Section 4 presents the home bias results. It provides additional intuition on why assuming the fund's country of incorporation overestimates home bias. Section 5 re-assesses plausible determinants of home bias in a regression context. Section 6 concludes.

2 Related Literature

Our paper is related and contributes to several strands of the literature. First, we contribute to the literature on equity home bias. Modern portfolio theory suggests that investors should hold a diversified portfolio of assets to invest efficiently (Obstfeld, 1992; Adler and Dumas, 1983; Kho et al., 2009; Sharpe, 1964). Empirically, however, investors do not exploit potential gains from portfolio diversification, as they allocate a relatively large fraction of their wealth to domestic securities (French and Poterba, 1991; Karolyi and Stulz, 2003; Cooper et al., 2013; Coeurdacier and Rey, 2013; Wallmeier and Iseli, 2022).[3] One strand of this literature assesses investment fund holdings to measure the investment allocation of a country. To determine the investment origin, existing studies group investment funds into domestic and foreign funds based on the funds' country of incorporation. Chan et al. (2005), who provide evidence for home bias in all 26 countries in their sample, suggest that funds are representative institutional investors of a country since their portfolio holdings reveal the fund manager's preferences for domestic versus foreign equities as well as preferences of individual investors whose money they manage. Following the same methodology, Lau et al. (2010) find that the home-bias phenomenon exists in each of the 38 countries in their sample and suggest that the extent of home bias in funds' stock holdings provides a reasonable approximation of home bias by domestic investors in a country. Similarly, Ferreira and Matos (2008) and Hau and Rey (2008) take the fund country of incorporation as investment origin, providing evidence for home bias across countries.[4] Our

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[3]This home-bias phenomenon is one of the major puzzles in the international economics literature (see Lewis, 1999; Obstfeld and Rogoff, 2000).

[4]Demirci et al. (2022) also take the fund country of incorporation as investment origin, but consider that firms source sales from foreign operations suggesting large indirect exposure of funds to international stock markets through their holdings. Schumacher (2018) defines the home country of a fund as the country of residence of

findings highlight that assuming the fund's country of incorporation as investment origin neglects that investors often invest in foreign funds which introduces an upward bias in the measurement of home bias.

Second, our paper contributes to the literature on international financial centers. Several studies have documented their growing role and how they can distort the interpretation of cross-border financial statistics (Monti and Felettigh, 2008; Zucman, 2013; Milesi-Ferretti et al., 2010; Hines Jr and Rice, 1994; Lane and Milesi-Ferretti, 2001, 2011; Beck et al., 2023). Financial centers also play an important role as hosts of investment funds receiving large subscriptions from foreign investors. In this context, Chan et al. (2005) consider the possibility that their results may be due to their approach of classifying funds into domestic and foreign funds strictly based on the country of incorporation of the funds. Referring to funds domiciled in Ireland and Luxembourg, Lau et al. (2010) suggest that the asset allocations of funds domiciled in financial centers might not necessarily measure the home bias of domestic investors in those countries. The novelty of our paper, in this context, is to demonstrate that the presence of financial centers results in an upward bias across all countries, while the bias is larger in countries that are not financial centers themselves. The reason is that investors in those countries invest a large part of their assets in foreign funds domiciled in financial centers which underweight domestic stocks, relative to domestic funds.[5] By linking the fund investor countries directly with the issuer countries of the securities held through the individual investment funds, our look-through approach allows us to account for the presence of financial centers when measuring home bias.

Third, our paper contributes to studies on plausible determinants of equity home bias. These include barriers to foreign investment, country-specific risks, information asymmetry, and familiarity and behavioral factors (see Cooper et al. (2013) and Lee et al. (2023) for a review).[6] Focusing on mutual fund holdings, Chan et al. (2005) find that stock market development and

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its management company. However, the landscape of fund management companies is also concentrated in a few countries, suggesting that investors often invest in funds that are part of a management company that is registered outside of their own jurisdiction.

[5]While domestic investors in Luxembourg and Ireland also invest in foreign funds, our findings suggest that investments in stocks issued in the investor home country are similar between domestic and foreign funds which are held by Luxembourgish and Irish investors, respectively. See also Section 4.2.

[6]See Section 5.1 for a more detailed discussion.

familiarity variables are key determinants for explaining equity home bias across countries. Our findings suggest that the large home bias estimates previously documented in the literature are not primarily due to economic reasons, but are to a large extent an artefact of a measurement error in the calculation of home bias that arises when assuming the fund's country of incorporation as investment origin. We also contribute to the literature by showing that familiarity variables only play a meaningful role when fund investors are households, but not when they are institutional investors. This finding is consistent with the literature suggesting that investor sophistication is negatively associated with home bias (see Grinblatt and Keloharju, 2001; Kimball and Shumway, 2010; Pool et al., 2012; Goetzmann and Kumar, 2008; Karlsson and Nordén, 2007).

3   Data and Methodology

We construct a data set of portfolio holdings at the investor-fund-security-time level between 2014 and 2021, using year-end data. To do so, we merge information on euro area investor holdings of investment funds from SHS with granular information on the security-level holdings of investment funds from Refinitiv Lipper. The SHS are collected on a security-by-security basis and provide information on securities held by different types of euro area sectors, broken down by instrument type, issuer country and investor country. Fund investor sectors include banks, households, insurance corporations, non-financial corporations and pension funds domiciled in euro area countries. We exclude the investment fund sector as an originating fund investor sector, since these investments are already captured when the funds are held by other euro area sectors. Refinitiv Lipper provides data on various types of investment funds, including open-end funds, closed-end funds, exchange-traded funds and hedge funds. In particular, it provides data on the asset type of the funds as well as their granular security-by-security portfolio breakdown. Combining these two data bases yields a matched data set of investor holdings in funds and the security-level holdings of those funds, offering a uniquely detailed view of euro area investors' indirect equity portfolios through investment funds.

When merging the investment funds held by euro area investors (based on SHS) with the investment funds available in Refinitiv Lipper, we match around 89% of the funds. Since we are interested in equity home bias, we only keep those funds that invest in equities based on their portfolio breakdown from Refinitiv Lipper, leaving us with around 63% of the merged funds. The majority of the remaining 37% of funds are funds of other asset classes (primarily bond funds), while around 22% of those funds that do not report their granular portfolio breakdown are classified as equity funds which are excluded from our analysis given that we need the funds' security-by-security portfolio breakdown to apply our look-through approach. In terms of the total assets that euro area investors put in funds investing in equities, for which the granular portfolio breakdown from Refinitiv Lipper is available, our sample covers around 2.1 trillion EUR in 2021. This corresponds to 81% of the total assets held by euro area investors in equity and mixed assets funds together, suggesting a representative sample of indirect equity holdings of euro area investors (see Section 3.3 for a discussion). For the purpose of our study, and in line with the literature, we only consider the equity portion of funds. This yields our final sample including around 13.4 million observations between end-2014 and end-2021, comprising 14,576 distinct primary funds (including 49,390 distinct fund share classes) incorporated in 45 countries holding 38,178 distinct equity securities issued in 123 countries (see Section 3.4 for summary statistics).

3.1 The Traditional Home Bias Measure Based on the Fund Country of Incorporation as Investment Origin

Home bias is defined as the extent to which the investment fund holdings in the domestic market of country j deviate from the holdings of country j in the world market portfolio. To determine the domestic market of country j, existing empirical work groups investment funds into domestic and foreign funds based on the country of incorporation of the funds. The methodology then proceeds in three steps (see, for instance, Chan et al., 2005). First, we calculate the percentage allocation of fund holdings in the investment countries for each of the countries of incorporation (the host countries). For each of the euro area host countries in our sample, we calculate the

percentage allocation of equity fund holdings in 123 issuance countries in our data set as follows:

$$\text{w}_{i,j} = \frac{\text{MV}_{i,j}}{\sum\limits_{j=0}^{123} MV_{i,j}} \tag{1}$$

where $\text{w}_{i,j}$ is the share of country j in the fund holdings for the fund domicile in country i and $\text{MV}_{i,j}$ is the market value of fund holdings of country j for host country i. Second, we compute the weight of country j in the world market portfolio as follows:

$$\text{w}_j^* = \frac{\text{MV}_j^*}{\sum\limits_{i=0}^{123} MV_i} \tag{2}$$

where w_j^* is the share of country j in the world market portfolio and MV_j^* is the market capitalisation of country j. In the literature, home bias is then often calculated as the log ratio of the share of country j's fund holdings in the domestic market (w_{jj}) to the world market capitalisation weight of country j (w_j^*):

$$\text{HomeBias}_j = \log\left(\frac{\text{w}_{jj}}{\text{w}_j^*}\right) \tag{3}$$

If country j has a domestic bias, $HomeBias_j$ is positive. If the assumption holds that the fund's investor country of origin is representative of the fund's country of incorporation, then $HomeBias_j$ would reflect the extent to which the investment fund holdings in the domestic market of country j deviate from the holdings of country j in the world market portfolio. However, investors often buy funds in countries that are domiciled outside their own jurisdiction, in particular in financial centers. Therefore, the fund's country of incorporation may not be representative of the fund investors' country of origin. In the following we present an adjusted methodology which does not rely on this assumption.

3.2 The Look-through Approach using Supervisory Holdings Statistics

We adjust the methodology above by taking into account the fund investors' countries of origin. In particular, we re-estimate (1) but instead of assuming the fund's country of incorporation as investment origin (host country i), we take the fund investor's country (fund investor country i_{new}) as investment origin. To do so, our look-through approach links the fund investor home country directly with the issuance country of the securities held by the funds. We re-estimate (1) as follows:

$$\mathrm{w}_{i_{new},j} = \frac{\mathrm{MV}_{i_{new},j}}{\sum\limits_{j=0}^{123} MV_{i_{new},j}} \qquad \text{(new 1)}$$

Likewise, we re-estimate equation (2) as follows:

$$\mathrm{w}_j^* = \frac{\mathrm{MV}_j^*}{\sum\limits_{i=0}^{123} MV_{i_{new}}} \qquad \text{(new 2)}$$

This gives the home bias measure based on the look-through approach which takes the fund investor country j_{new} as investment origin:

$$\mathrm{HomeBias}_{j_{new}} = \log\left(\frac{\mathrm{w}_{j_{new},j}}{\mathrm{w}_j^*}\right) \qquad \text{(new 3)}$$

To estimate (new 1), we merge the fund investors' country of origin with the issuance country of the individual securities of their funds, looking through the individual funds' country of incorporation. This allows us to estimate the share of country j in the fund holdings for the fund investors in country i ($\mathrm{w}_{i_{new},j}$). The remainder of the home bias estimation follows the methodology presented in Section 3.1, but using $\mathrm{w}_{i_{new},j}$ and not relying anymore on the fund's country of incorporation.

3.3 Discussion

Our look-through approach considers the entire universe of fund investments originating in the investor country and thereby allows for a comprehensive view of investors' indirect equity investment allocation through investment funds. By applying the look-through approach, we also consider investments through non-domestic funds, including funds domiciled outside the euro area in the case where domestic investors invest directly in those funds. Non-domestic investments would be excluded from the fund investor country's calculation of home bias when assuming the country of incorporation as investment origin. Instead, they would be classified as investments originating in the non-domestic country where the fund is legally domiciled. As the entire universe of investments through equity funds by euro area investors for a given country is taken into account, this approach allows for a representative assessment of home bias through investment funds.[7]

By comparing traditional home bias measures based on prior studies with our new measure based on the look-through approach using the same data source, we ensure that differences in home bias estimates can be attributed to adjusting the classification of the investment origin and not to differences or inconsistencies in the underlying data. In this regard, it is reassuring that our investment allocation statistics and home bias measures (see Section 4) as well as our regression results (Section 5) that take the fund country of incorporation as investment origin are consistent and similar in terms of magnitude compared with prior studies that take the fund domicile as investment origin.

Importantly, while our data is restricted to euro area fund investors due to the euro area scope in SHS, the bias that we demonstrate is likely to be found also in countries outside the euro area given the high concentration of investment funds in financial centers around the world. At the end of 2021, for instance, around 76% of global investment funds' total assets were held by

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[7]Carvalho (2022), for instance, approximates home bias through investment funds without security-by-security fund portfolio data. This requires the author to assume that (i) euro area residents across all euro area countries have the same preferences regarding their investment in non-euro area funds and (ii) investments of the aggregate domestic fund sector are representative for all individual funds in a given country. Combining supervisory holdings statistics of euro area fund investor allocations with granular investment fund security-by-security holdings data for funds across the globe, our approach allows us to look-through the fund country of incorporation, providing a representative measure of home bias through investment funds that does not rely on those assumptions.

funds incorporated in financial centers.[8] This suggests that our analysis is not only valid for our sample, but also has high external validity. Since investors around the world often put their fund assets in global financial centers, the calculation of home bias through investment funds is likely biased in other countries as well when this is not accounted for.

3.4 Summary Statistics

Table 1 presents the summary statistics, based on year-end 2021 data. Column 2 shows the amount euro area investors put in funds that invest in equities, broken down by the fund's country of incorporation. Euro area investors invest nearly half of their fund assets in funds domiciled in Luxembourg, followed by investments in funds domiciled in Germany, Ireland and France.[9] Euro area investors also invest in funds domiciled outside of the euro area, while most of those funds are domiciled in the United States and the United Kingdom.[10] Columns 3, 4 and 5 show the breakdown by funds' primary asset class. Most funds in our sample are equity funds, which invest almost exclusively in equities. Euro area investors also invest in mixed assets funds which invest, on average, more than a third of their portfolio in equities. The other funds investing in equities are alternative, bond, and real estate funds, which are held less by euro area investors or invest only a small portion of their portfolio in equities (for instance bond funds). Across all asset types, most assets are held by funds domiciled in Luxembourg, while Ireland, France and Germany also play an important role as fund country of incorporation.

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[8]The classification of financial centers follows Chan et al. (2005) and includes the United States, the United Kingdom, Luxembourg, Switzerland, Ireland, Japan, Hong Kong and Singapore. Note that the figure is consistent with European Fund and Asset Management Association (2022) suggesting that around 72% of worldwide regulated open-ended funds are domiciled in financial centers (excluding Singapore and Hong Kong).

[9]Note that there are no funds domiciled in Cyprus, Slovakia and Slovenia. Therefore, it is not possible to calculate equity home bias when taking the fund country of incorporation as investment origin. We thus exclude those countries from our analyses.

[10]For simplicity, we report non-euro area funds as a single category (rest of the world or "RoW") in the descriptive statistics. When applying our look-through approach, however, we consider all funds held by euro area investors and their granular portfolio holdings, irrespective of their legal country of incorporation.

Table 1: Summary Statistics

This table shows the summary statistics for the funds investing in equity and held by euro area investors, based on year-end 2021 data. Column 1 shows the country. AT stands for Austria, BE for Belgium, DE for Germany, EE for Estonia, ES for Spain, FI for Finland, FR for France, GR for Greece, IE for Ireland, IT for Italy, MT for Malta, LT for Lithuania, LU for Luxembourg, LV for Latvia, NL for the Netherlands, PT for Portugal and RoW stands for countries outside the euro area. Column 2 shows the amount (in billion EUR) euro area investors put in funds that invest in equities, broken down by the fund's country of incorporation. Columns 3, 4 and 5 show the breakdown by funds' asset class.

|	All funds	Equity funds	Mixed funds	Other funds
AT	32.2	14.0	14.3	3.9
BE	47.9	18.9	27.9	1.1
DE	303.6	213.6	71.3	18.7
EE	0.0	0.0	0.0	0.0
ES	18.5	5.2	7.7	5.5
FI	24.9	10.9	11.0	3.0
FR	178.4	101.1	39.3	37.9
GR	0.1	0.0	0.0	0.0
IE	303.1	217.9	15.7	69.5
IT	78.6	14.6	51.8	12.2
LT	0.0	0.0	0.0	0.0
LU	1042.3	596.0	229.4	216.9
LV	0.0	0.0	0.0	0.0
MT	0.2	0.0	0.1	0.0
NL	44.7	28.6	5.5	10.6
PT	8.0	2.8	5.2	0.0
RoW	51.4	39.8	5.6	6.0

Figure 2 shows the investment allocation of euro area fund investors and the funds they invest in. The left side of the figure shows the relative amount that euro area investors put in funds investing in equities, broken down by the euro area investor country of origin (left part) and the fund's country of incorporation (middle part). It shows that euro area investors put a substantial share of their fund investment in non-domestic funds, in particular in those domiciled in Luxembourg and Ireland. This is consistent with the fact that these countries are major financial centers for investment funds and are bought by investors outside their jurisdiction. The right side of the figure shows the relative amount that those funds invest in equities, broken down by the issuance country of the securities they hold. In line with the literature, it shows that funds invest a large share in equities issued in the country in which the fund is incorporated. For instance, funds domiciled in Greece (GR, light blue color) invest around 76% of their portfolio in Greek stocks. Given Greece's weight in the world market capitalisation of around 0.1%, this would suggest that Greek investors invest around 760 times more in domestic securities than the country's weight in the world market capitalisation would suggest. Importantly, however, as shown by the left side of the figure, Greek investors put only around 1% of their fund assets

in domestic funds and invest the majority of their assets in funds domiciled in Luxembourg and Ireland. Those non-domestic funds invest substantially less in Greek stocks compared with funds domiciled in Greece. In this sense, the investment allocation of domestically domiciled funds differs materially from the investment allocation of non-domestically domiciled funds, suggesting that funds are not representative for domestic investors in a given country. This logic can be extended to most other countries and highlights the importance of considering the entire universe of fund investments for a given investor country in order not to overestimate home bias. The look-through approach addresses this issue.

Figure 2: Investment Allocation of Euro Area Fund Investors

This figure shows the investment allocation of euro area fund investors and the funds they invest in (in percent), based on year-end 2021 data. The left side of the figure shows the relative amount that euro area investors put in funds investing in equities, broken down by the investor country of origin (left part) and the fund's country of incorporation (middle part). The right side of the figure shows the relative amount that those funds invest in equities, broken down by the issuance country of the securities they hold. To facilitate readability, and since the figure shows the relative amounts, the size of the outgoing bars is normalised and thus the same across investor countries and across fund countries of incorporation, regardless of their actual size.
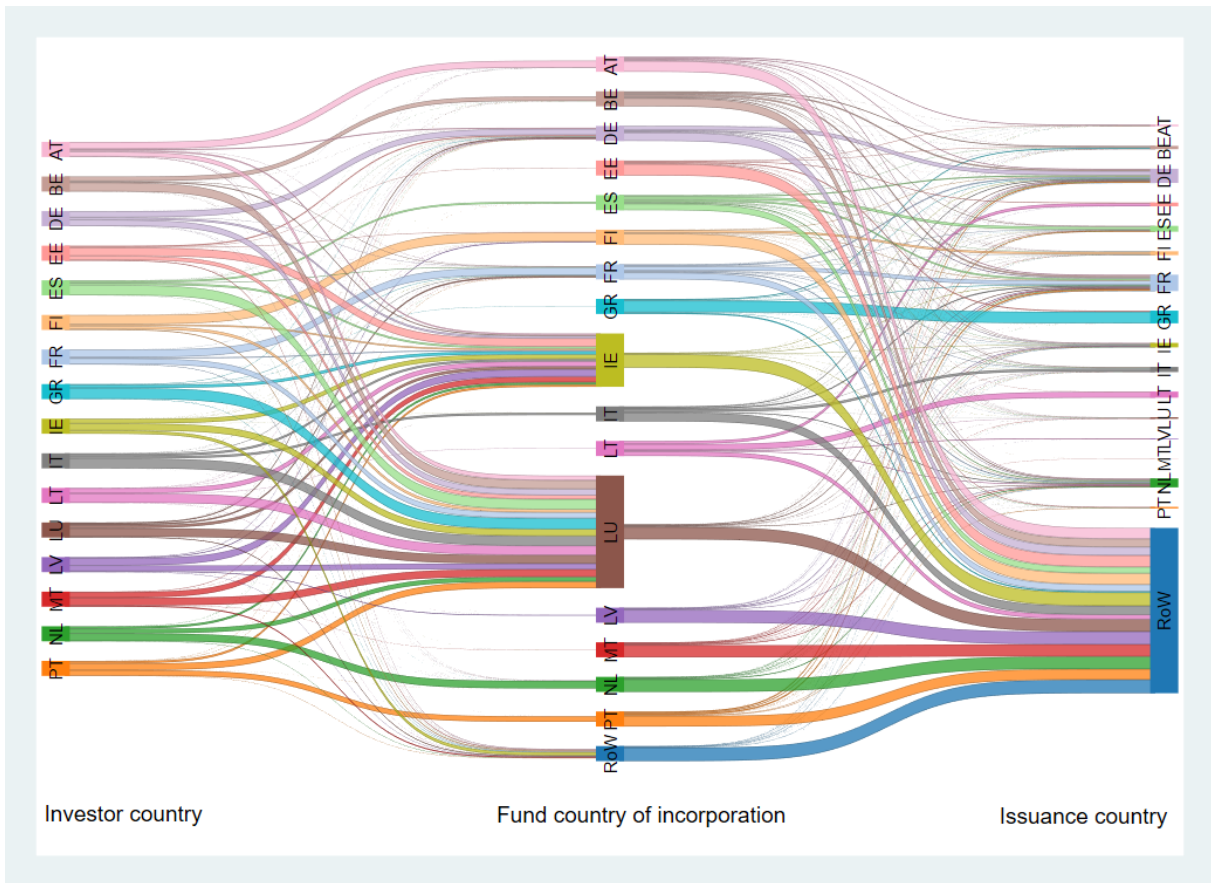
4 Equity Home Bias and the Look-through Approach

4.1 Results

Table 2 presents the home bias results, based on year-end 2021 data. Column 2 shows the country's percent share of the world market capitalisation weight, while Column 3 shows the average investment in stocks issued in the funds' country of incorporation (in percent), taking the fund country of incorporation as investment origin. In line with the literature, in each country, the share of fund holdings in the domestic market is substantially larger than the market capitalisation. While the average weight in the world market capitalisation of the countries in our sample is 0.7 %, the funds' average domestic holdings are around 15.5% of their portfolio. In other words, the average weight of domestic stocks in funds' portfolios is around 22 times higher than the average country's weight in the world market portfolio, suggesting substantial equity home bias across countries when taking the fund country of incorporation as investment origin. This is also reflected in Column 4, which shows substantial home bias in each country, with an average euro area home bias of 4.5 when taking the log ratio of domestic holdings to the country's world market capitalization weight, following (3).

Table 2: Equity Home Bias of Domestic Fund Investors

This table shows the equity home bias measures in 2021, broken down by euro area country in 2021. Column 2 shows the percent share of the country's weight in the world market capitalisation. Column 3 shows the relative investment in stocks issued in the funds' country of incorporation, assuming the fund country of incorporation as investment origin (in percent). Column 4 shows the country's home bias taking the fund country of incorporation as investment origin. Column 5 shows the relative investment in domestic stocks taking the fund investor country as investment origin (in percent). Column 6 shows the country's home bias taking the fund investor country as investment origin. Columns 5 and 6 are calculated based on the look-through approach (see Section 3.2). Column 7 shows the difference between the two home bias measures (as shown in Columns 4 and 6). The ***, ** and * stand for significant coefficients at the 1%, 5%, and 10% levels, based on a one-sided t-test at the investor type-country-year level over the entire sample period between 2014 and 2021.

	MktCap(%)	Traditional Measure		Look-through Approach		
		DomHold	HomeBias	DomHold	HomeBias	Difference
AT	0.1	5.5	3.7	1.7	2.5	-1.2***
BE	0.5	5.9	2.5	1.0	0.8	-1.7***
DE	2.4	27.2	2.4	8.7	1.3	-1.1***
EE	0.0	4.1	9.4	0.1	5.8	-3.6***
ES	0.8	18.4	3.1	1.1	0.3	-2.8***
FI	0.6	15.4	3.2	5.7	2.2	-1.0***
FR	3.4	27.3	2.1	7.9	0.8	-1.2***
GR	0.1	76.3	7.2	0.1	0.3	-6.9***
IE	0.2	1.9	2.5	1.9	2.5	-0.0**
IT	0.9	17.9	3.0	1.5	0.6	-2.5***
LT	0.0	39.3	11.7	0.0	4.2	-7.5***
LU	0.1	0.4	2.0	0.4	2.0	-0.0
LV	0.0	0.1	9.6	0.0	4.3	-5.3***
MT	0.0	0.8	5.0	0.1	2.7	-2.3***
NL	1.4	5.0	1.3	3.0	0.8	-0.5***
PT	0.1	2.2	3.2	0.3	1.2	-2.1***
EA	0.7	15.5	4.5	2.1	2.0	-2.5***

These findings are consistent and similar in magnitude compared with those in the literature. For instance, in line with Chan et al. (2005) and Lau et al. (2010), our data suggests that funds domiciled in Greece have the highest investment in domestic stocks among the euro area countries in their sample, while funds domiciled in Ireland and Luxembourg have the lowest investment in domestic stocks.[11] In addition, like in Lau et al. (2010), our findings suggest that, for the countries that are available in both data sets, the largest home bias (measured as the log ratio of domestic holdings to the country's world market capitalization weight) is in Greece with a measure of 5.6, while Greece has the second largest home bias in Chan et al. (2005) (5.4).[12] Overall, our estimates closely resemble prior studies in terms of the countries' relative degree of domestic investment and home bias, suggesting that our methodology and results are consistent with those in literature when taking the country of incorporation as investment origin.

Column 5 shows the country's investment in domestic stocks when taking the fund investor country as investment origin. When applying our look-through approach based on (new 2), we find that investment in domestic holdings is lower for each country compared with taking the country of incorporation as investment origin (Column 3). On average, euro area investors put only around 2.1 percent in domestic stocks. This is around 7 times less than when taking the funds' country of incorporation as investment origin (15.5 percent, Column 3). For many countries equity home bias through funds seems to have low economic relevance. For instance, only 4 out of 16 countries invest 2 percent or more of their assets in domestic stocks. For comparison, when taking the fund country of incorporation as investment origin, 12 countries invest at least 2 percent in domestic stocks. This substantial reduction in domestic holdings is also reflected in the home bias measure based on (new 3), as shown in Column 6. We find that across all countries home bias is lower when considering the fund investor country of origin, rather than taking the fund's country of incorporation as investment origin. On average,

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[11]Similarly, Ferreira and Matos (2008) find that domestic investment is lowest in funds domiciled in Irish and Luxembourgish funds, while funds domiciled in Greece have the third highest share of domestic investment. Note that Hau and Rey (2008) do not report home bias results for individual euro area countries.

[12]Note that the difference in absolute terms between our analysis and prior studies is to a large extent due to Greece's lower market capitalisation, resulting in a smaller denominator in 3. While in 2021 the market capitalisation of Greece was 0.06%, it was 0.33% using an aggregated sample over the period 1998 to 2007 (Lau et al. (2010)). If we would take 0.33% as market capitalisation for Greece, our home bias measure would be around 5.5.

equity home bias is less than half of the home bias measure that assumes the fund's country of incorporation as investment origin (Column 4).[13] Overall, these findings suggest that home bias is not as severe as typically documented in the literature, pointing to a higher degree of geographical portfolio diversification through investment funds.

As robustness check, we re-estimate our home bias measure based on the look-through approach, separately for each year and broken down by households and institutional fund investors. Overall, home bias estimates remain robust and largely similar in magnitude across time and investor types.[14] We find that, out of 251 available investor type-country-year home bias observations, home bias estimates are lower in 237 cases (corresponding to around 94 percent) when taking the investor country as investment origin relative to taking the fund country of incorporation as investment origin.[15] To investigate whether the reduction in home bias is statistically significant, we apply a simple paired t-test comparing both measures, based on the available time and investor breakdowns, separately for each country. As shown in Column 7 of Table 2, for most countries the reduction in home bias is significant at the one percent level.[16] However, there are some noteworthy differences in the reduction of home bias across countries. For instance, in Greece, Italy and Spain home bias is close to zero when applying the look-through approach.[17] Also in Belgium, France, Italy, Lithuania, and Portugal home bias reduces by more than half, while in Ireland and Luxembourg the difference is smaller and not statistically significant at the 1% level. We discuss the heterogeneity of these findings in the next section.

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[13]Note that if we also consider CY, LV and LT for the look-through approach, the average home bias across euro area countries falls even further to 0.9, since all three countries have negative home bias. However, given the lack of funds domiciled in these countries, we cannot estimate home bias based on the country of incorporation. To ensure comparability across the two home bias measures, we thus exclude those countries from our analyses.

[14]For instance, in 2014 the euro area home bias average is 4.4 when taking the fund country of incorporation as investment origin and 2.1 when taking the fund investor country as investment origin, which is similar to the estimates in 2021. In addition, home bias estimates based on the look-through approach are similar in magnitude between households and and institutional fund investors for most countries. While the simple euro area average is higher for institutional investors than for households as fund investors (2.33 versus 1.30), this is driven by Malta and Greece who have negative home bias when restricting the sample to households as fund investors. Excluding those two countries, the euro area home bias average based on the look-through approach is very similar for households and institutional fund investors (2.06 versus 2.03).

[15]Only in Luxembourg and Ireland, home bias does not reduce consistently in all investor type-year observations. We discuss this in detail in Section 4.2.

[16]This finding is robust to excluding the investor type breakdown.

[17]As mentioned above, home bias in Cyprus, Slovenia and Slovakia is even negative when applying the look-through approach. However, given that there are no funds domiciled in these countries, it is not possible to calculate home bias for those countries when taking the country of incorporation as investment origin, which is why we did not include them in our analyses.

4.2   The Role of Non-Domestic Funds and Financial Centers

This section discusses in more detail the lower levels of home bias when applying the look-through approach and gives additional intuition on why the reduction in home bias differs across countries. We provide evidence that mainly two factors drive the lower home bias when taking the fund investor country as investment origin, rather than relying on the fund domicile: (i) the extent to which domestic fund investors invest in non-domestic funds and (ii) the extent to which those non-domestic funds underweight securities issued in the investors' country of origin, relative to domestic funds.

Table 3 shows the share of fund investment in domestic funds, funds domiciled in financial centers, and other funds, for each investor country. Fund investors in the euro area only invest around 28% in domestic funds (see Column 2, last row). Around 72% of their fund assets are in non-domestic funds that are to a large extent incorporated in financial centers (around 67%, Column 3, last row). This result is striking as it suggests that taking the fund's country of incorporation is only representative for around a quarter of the actual investors' fund investments. For instance, in Spain, which has a substantially lower home bias when applying the look-through approach relative to the home bias measure based on the fund country of incorporation, only around 13% of domestic fund investment is in funds domiciled in Spain, while around 82% of Spanish investments are in funds domiciled in financial centers. In this case, the fund's country of incorporation would only be representative for around 13% of Spanish fund investors' investment allocations, with the remaining Spanish investments being allocated to other countries, in particular Luxembourg and Ireland. This logic also applies to most other countries as investors put a large share of their fund investment in non-domestic funds. This can create an upward bias of the home bias measure for the investor country, in the case where non-domestic funds underweight securities issued in the investor country of origin, relative to domestic funds.

Table 3: Fund Investment Allocation of Domestic Investors

This table shows domestic investors' investment allocation in (i) funds investing in equity that are domiciled in the fund investor country (domestic funds), (ii) funds investing in equity that are domiciled in non-domestic funds incorporated in financial centers, and (iii) other non-domestic funds investing in equity (in percent of the investor country's total investment in funds that invest in equity), based on 2021 data (see Columns 2 to 4). Column 1 shows the country. AT stands for Austria, BE for Belgium, DE for Germany, EE for Estonia, ES for Spain, FI for Finland, FR for France, GR for Greece, IE for Ireland, IT for Italy, LT for Lithuania, MT for Malta, LU for Luxembourg, LV for Latvia, NL for the Netherlands, PT for Portugal and EA for euro area. In line with Chan et al. (2005), the financial centers are: the United States, the United Kingdom, Luxembourg, Switzerland, Ireland, Japan, Hong Kong, and Singapore. The last row shows the euro area average.

	Domestic funds	Financial centres	Other funds
AT	46.8	41.1	12.1
BE	29.9	66.7	3.4
DE	40.9	56.2	2.9
EE	1.9	86.3	11.8
ES	12.9	81.6	5.5
FI	61.4	33.7	4.9
FR	50.7	47.9	1.3
GR	1.1	94.7	4.2
IE	30.4	67.1	2.5
IT	15.9	80.4	3.6
LT	1.3	95.9	2.8
LU	57.0	23.8	19.2
LV	4.6	87.5	7.9
MT	1.0	95.5	3.5
NL	50.9	47.8	1.2
PT	37.0	60.6	2.3
EA	27.7	66.7	5.6

To determine the extent to which taking the fund's country of incorporation overestimates home bias, we compare the funds' investment in equity securities issued in the investor country between domestic funds and non-domestic funds (broken down by funds domiciled in financial centers and other non-domestic funds). Table 4 shows the results. In most euro area countries, domestic funds invest substantially more in securities issued in the investor country, relative to non-domestic funds that are held by the domestic fund investor. While domestic funds invest on average around 17% of their assets in equity securities that are issued in the investors' home country (Column 3), funds incorporated in non-domestic financial centers (that are held by domestic fund investors) only invest around 1% of their assets in equities issued in the investors' home country (Column 4). In other words, domestic funds invest, on average, around 17 times more in securities issued in the investor home country, relative to funds domiciled in non-domestic financial centers that are held by domestic fund investors.

Given that almost three quarters of fund investments are in non-domestic funds, in particular those domiciled in financial centers (as shown in Table 3), and given that those funds invest substantially less in securities issued in the investor's home country (as shown in Table 4), home bias is considerably overestimated when taking the fund domicile as investment origin. The rationale is that fund investors' non-domestic investments are not counted towards the investor's home country (but are instead allocated to the countries where the funds are legally incorporated). These non-domestic investments are thus also excluded from the calculation of home bias for the respective investor home country. This creates an upward bias given that domestic funds overweight the investor's domestic securities substantially more than non-domestic funds.

Table 4: Funds' Investment in Equities Issued in the Domestic Investor Country

This table shows the investment in equities issued in the domestic fund investor country in 2021 (in percent of the funds' total equity investment), broken down by (i) funds that are domiciled in the fund investor country of origin and held by domestic investors, (ii) funds domiciled in financial centers but held by domestic investors and (iii) other non-domestic funds held by domestic investors (Columns 2 to 4). Column 1 shows the country. AT stands for Austria, BE for Belgium, DE for Germany, EE for Estonia, ES for Spain, FI for Finland, FR for France, GR for Greece, IE for Ireland, IT for Italy, MT for Malta, LT for Lithuania, LU for Luxembourg, LV for Latvia, NL for the Netherlands, PT for Portugal and EA for the euro area. The financial centers are: the United States, the United Kingdom, Luxembourg, Switzerland, Ireland, Japan, Hong Kong, and Singapore. The last row shows the euro area average.

	Domestic funds	Financial centres	Other funds
AT	6.6	0.2	0.3
BE	6.2	0.6	0.7
DE	27.9	4.7	4.8
EE	4.3	0.0	0.0
ES	18.6	0.9	2.3
FI	17.0	0.6	2.8
FR	32.3	4.8	6.2
GR	76.2	0.0	0.3
IE	1.9	1.9	0.8
IT	18.0	1.2	2.5
LT	38.8	0.0	0.0
LU	0.4	0.4	0.4
LV	0.1	0.0	0.0
MT	17.4	0.0	.
NL	5.2	2.6	2.1
PT	2.2	0.3	0.1
EA	17.1	1.0	1.3

Overall, one can conclude that the upward bias in the home bias measure when taking the fund's country of incorporation as investment origin is larger (smaller), (i) the higher (smaller) the investment in non-domestic funds and (ii) the more (less) these non-domestic funds invest in securities that are issued outside of the investors' country of origin, relative to domestic funds. This logic also explains the differences in home bias reductions across countries when taking the actual fund investor country as investment origin rather than taking the fund domicile. For instance, taking again Spain as an example, domestic fund investors invest around 82% in non-domestic funds domiciled in financial centers (Table 3). These non-domestic funds invest around 20 times less in Spanish securities than domestic funds.[18] When these non-domestic investments are not considered for that country's calculation of home bias, this leads to a significant upward bias for home bias in a given country. In Spain, for instance, equity home bias falls from 3.1 to 0.3 when applying the look-through approach.

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[18]Funds domiciled in financial centers and held by Spanish investors invest only around 0.9% in Spanish securities while funds domiciled in Spain and held by Spanish fund investors invest around 18.6% of their assets in Spanish stocks (Table 4).

In contrast, in Luxembourg and Ireland, the home bias reduction is relatively low and not statistically significant at the 1% level. This can be explained following the same logic. In Luxembourg, for instance, investors put the majority of their fund assets in domestic funds (57%). At the same time, the investment allocation of domestic funds is similar to that of foreign funds held by Luxembourgish investors.[19] This is consistent with Luxembourg's role as financial center, where funds tend to hold more diversified portfolios relative to other fund countries of incorporation. While Irish investors invest more in non-domestic funds than investors in Luxembourg, Irish funds do not invest substantially more in Irish securities than non-domestic funds held by Irish investors. In this sense, the upward bias for Luxembourg and Ireland when taking the fund domicile as investment origin is lower relative to that other countries, where domestic funds substantially overweight domestic stocks relative to foreign funds.

5 Implications for the Sources of Home Bias

In this section, we assess whether measuring home bias on the basis of the fund's country of incorporation has implications for plausible determinants of equity home bias identified in the literature. To do so, we first regress the home bias measure that assumes the country of incorporation as investment origin against a set of explanatory variables, following Chan et al. (2005). We then re-run the regression models, but take our new home bias measure based on the look-through approach as dependent variable.

5.1 Plausible Sources of Home Bias

In line with Chan et al. (2005), we categorise our explanatory variables into the following groups: (i) *economic development*: log GDP per capita, real GDP growth, trade volume, foreign direct investment, country credit rating; (ii) *capital control*: investment freedom; (iii) *stock market development*: stock market capitalisation, stock market turnover ratio, emerging market dummy;

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[19]Funds domiciled in Luxembourg and held by Luxembourgish investors invest 0.4% of their portfolio in Luxembourgish securities, while funds domiciled in other financial center countries that are held by Luxembourgish investors also invest 0.4% in Luxembourgish securities.

(iv) *familiarity*: sum of common spoken languages, average distance of the official capitals; (v) *investor protection*: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy. We also control for the country's past 1-year return (as part of the residual category *other variables*). We calculate the descriptive statistics of the explanatory variables as the average between 2014 and 2021, broken down by country. Table 5 shows the results which we discuss below.[20]

Although our variable selection follows Chan et al. (2005), there are some differences. For example, some variables, including anti director rights measure, transaction costs and accounting standards, are not available for all countries or time periods in our sample. In addition, the definitions and measurements of some variables are different relative to the original paper. For instance, in our data set, the "rule of law" is an index capturing, among other factors, the risk of expropriation and judicial effectiveness. In Chan et al. (2005), the "rule of law" addresses the law and order tradition in the country, while the risk of expropriation index and the efficiency of the judicial system are defined separately. Importantly, we cover all the economic categories proposed by Chan et al. (2005), suggesting that our analysis captures the relevant economic dimensions of equity home bias.[21] In addition, unlike Chan et al. (2005) who run a cross-section estimation for 1999, we exploit the time series dimension of our data by implementing a panel data model, thereby also controlling for time-invariant factors.[22]

Economic Development

To what extent a country's level of economic development affects equity home bias depends on how domestic and foreign investors assess this factor for investment purposes (Chan et al., 2005). If a country's economic development reduces the investment costs more for foreign investors relative to domestic investors, the country would attract more foreign investors and thus, in relative terms, fewer domestic investors would hold domestic securities. However, if there is no

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[20]Since none of the variables in the residual category *other variables* are significant with overall low explanatory power in Chan et al. (2005), we do not discuss this category explicitly.

[21]Within those categories, we cover 16 out of the 22 variables. The remaining six variables are not statistically significant in Chan et al. (2005).

[22]While Chan et al. (2005) have data for 1999 and 2001 available, in their paper they report results for 1999. Our regressions include all available periods between 2014 and 2021.

difference in the reduction of investment costs for domestic and foreign investors, then economic development measures should not have a noticeable impact on home bias. Similarly, the empirical evidence of economic development variables on home bias is mixed. While emerging countries generally have larger home bias relative to developed countries (Coeurdacier and Rey, 2013; Fidora et al., 2007; Hu, 2020), several studies do not find a statistically significant impact of those variables on home bias (Chan et al., 2005; Baele et al., 2007; Dahlquist et al., 2003).

Columns 2-6 of Table 5 show that there is substantial cross-sectional variation in the five measures of economic development across the countries. On average, Luxembourg and Ireland have the largest GDP per capita while Latvia, Lithuania and Greece have the lowest. Together with Malta, Ireland and Luxembourg also have the highest trade volume and foreign direct investment (in percent of GDP). In addition, Austria, Belgium, Germany, Finland, France, Luxembourg, and Netherlands have high credit quality with an average credit rating of AA or better, while Greece has the worst average credit rating followed by Portugal, Italy, Spain and Malta.

Capital Control

Capital controls are important barriers to international investment (Alfaro et al., 2017; Chang et al., 2015; French and Poterba, 1991; Zeev, 2017). Several studies have assessed capital flow restrictions on home bias. Ahearne et al. (2004) find that capital controls have a small but positive effect on American investors' home bias. Similarly, Daly and Vo (2013) find that capital controls impose positive and economically large effects on equity home bias of Australian investors. Chan et al. (2005) suggest that capital control measures make it more difficult for investors to invest abroad, meaning that investors put a disproportionate amount of their investment in the domestic market.

Column 7 shows the degree of investment restrictions among euro area countries. While the free flow of capital is a key element of the European single market, there is significant cross-sectional heterogeneity in the degree of investment restrictions among euro area countries. For instance, LU has the highest investment freedom with a score of 95 out of 100 (followed by AT, EE, IE, and NL with scores of 90), while Greece has most constraints on the flow of investment capital

with an average score of 58 which may contribute to higher equity home bias, other things being equal.

Table 5: Summary Statistics for the Explanatory Variables

This table shows the average of the different categories and explanatory variables between 2014 and 2021, broken down by country. Columns 2 to 6 show the variables related to *economic development*: log (GDP per capita), real GDP growth, trade, foreign direct investment, country credit rating. Column 7 shows the *capital control* variable: investment freedom. Columns 8 to 10 show the *stock market development* variables: stock market capitalisation, stock market turnover ratio, emerging market dummy. Columns 11 to 12 show the *familiarity* variables: sum of common spoken languages and the average distance of the official capitals. Columns 13 to 14 show the *investor protection* variables: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy. Column 15 shows the country's past 1-year return. AT stands for Austria, BE for Belgium, DE for Germany, EE for Estonia, ES for Spain, FI for Finland, FR for France, GR for Greece, IE for Ireland, IT for Italy, LT for Lithuania, LU for Luxembourg, LV for Latvia, MT for Malta, NL for the Netherlands, and PT for Portugal.

	Economic Development					Capital Control	Stock Market Development			Familiarity		Investor Protection		Other
	Log GDP Per Capita	Real GDP Growth (%)	Trade Volume (% GDP)	Foreign Direct Investment (% GDP)	Credit Rating	Investment Freedom	Stock Market Cap. (% GDP)	Stock Market Turnover	Emerging Market Dummy	Common Languages	Average Distance	Rule of Law	Legal System Dummy	Lag 1-year Return
AT	10.8	-0.4	104.9	-1.9	21.0	90.0	28.7	3.4	0	41	6508	82	0	6.1
BE	10.7	-0.0	162.1	-1.8	20.0	85.0	70.4	3.3	0	52	6637	78	0	3.3
DE	10.7	0.4	86.0	2.5	23.0	83.8	52.8	4.3	0	42	6600	83	0	9.3
EE	10.0	2.5	149.3	7.4	19.0	90.0	10.7	2.2	0	36	6815	79	0	10.7
ES	10.2	-0.9	65.2	2.8	15.8	84.4	61.2	4.4	0	39	6713	71	0	1.0
FI	10.8	0.5	75.0	4.0	21.0	86.3	104.0	4.6	0	39	6842	87	0	8.8
FR	10.6	-0.8	61.6	1.6	20.0	72.5	86.4	4.1	0	41	6636	73	0	6.8
GR	9.8	-1.7	73.8	1.7	8.5	57.5	23.5	3.6	1	31	6495	61	0	0.8
IE	11.2	8.8	226.5	25.1	18.3	90.0	37.1	3.1	0	60	6838	81	1	9.9
IT	10.4	-1.6	58.0	0.9	13.6	85.0	27.2	5.9	0	22	6484	65	0	6.1
LT	9.8	2.6	144.0	3.7	16.6	78.8	8.6	1.5	0	28	6675	75	0	11.2
LU	11.6	1.6	360.0	25.1	23.0	95.0	80.6	-2.0	0	52	6596	83	0	4.5
LV	9.7	1.7	123.0	3.5	16.8	83.8	3.4	1.1	0	32	6732	71	0	14.6
MT	10.3	3.4	308.8	25.1	15.8	83.8	35.2	0.6	0	54	6513	68	0	2.2
NL	10.8	0.6	153.6	4.9	22.8	90.0	118.2	4.1	0	59	6660	84	0	9.7
PT	10.0	-0.4	82.5	3.3	13.0	70.0	27.4	4.4	0	29	6833	70	0	5.9

Stock Market Development

In general, more developed stock markets should encourage investment in a given country due to higher liquidity and lower transaction costs in these markets. But, similar to the discussion on economic development variables, the extent to which this influences home bias depends on how domestic and foreign investors assess this factor for investment purposes. Chan et al. (2005) find that stock market development variables have the largest explanatory power for explaining variation in home bias, relative to the other categories. They find that stock market capitalisation and turnover both negatively impact equity home bias, while the dummy variable for emerging markets is positively related to home bias. They suggest that domestic investors in an emerging market or a country with small market capitalisation have lower costs when investing in domestic equities, relative to foreign investors. On the other hand, larger stock markets are more visible and more developed globally, thus attracting more foreign investments and thereby contributing to a smaller home bias in these countries.

Columns 7-9 show the average of our stock market development measures. In terms of the relative size of the stock market (in percent of GDP), the value ranges from 3.4% in Latvia to 118% in the Netherlands. The values for the stock market turnover range between -2.0% in Luxembourg and 5.9% in Italy. Finally, we also include a dummy variable that is 1 for emerging market countries and 0 otherwise.[23]

Familiarity

Another common explanation for home bias is that investors are less familiar with foreign markets and thus invest disproportionately more domestically. Coval and Moskowitz (1999), for example, find that fund managers invest more in firms that are headquartered close to their home city. Similarly, Sialm et al. (2020) find that funds of hedge funds overweight their investments in hedge funds located in the same geographical areas. Controlling for fund location, Pool et al. (2012) find that funds overweight stocks from their managers' home states. The home-state bias is stronger if the manager is inexperienced, resource-constrained, or spent more

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[23]Greece is the only emerging market economy in our sample, given that our sample focuses on euro area countries.

time in his home state. Grinblatt and Keloharju (2001) show that Finnish-speaking investors prefer stocks of firms that publish their annual reports in Finnish as they can more easily communicate with such firms using their native language. They also prefer to invest in nearby firms and firms having CEOs of a similar cultural background. Furthermore, Wright and Yanotti (2019) studied familiarity-driven home bias in the Australian real estate market and find that residential real estate investors strongly prefer to invest in the same location as their residence. Konara (2020) suggests that if a country's language is widely spoken in the world, then the people in the country have an advantage in communicating with the rest of the world and thus are more likely to engage in cross-border investments, suggesting lower home bias. For example, English-speaking countries have a greater potential to integrate with the rest of the world, while countries dominated by languages not widely spoken outside should experience larger home bias. In a similar vein, Chan et al. (2005) find that countries that share more common languages have lower home bias, while those that are farther away from the rest of the world are inclined to have a larger home bias, suggesting that investors weight domestic rather than foreign equities more heavily when they are less familiar with foreign markets.

Columns 10 and 11 show the familiarity variables. The first is common languages, which is calculated as the sum of common spoken languages, following Melitz and Toubal (2014).[24] The values range from 22 in Italy to 60 in Ireland. While Ireland shares English as a common spoken language with many countries in the world, Italy has its own language resulting in a lower score. The second variable is geographical proximity. Since our sample focuses on the euro area, countries are closer to another compared with studies that include countries across the world. Still there is quite some heterogeneity in our sample. For instance, Italy has the closest average proximity to other countries in the world with an average distance of 6,484 kilometers followed by Greece (6,495) and Austria (6,508). Finland and Ireland are the most remote countries with 6,842 and 6,838 kilometers.

Investor protection

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[24] We take common spoken languages rather than focusing on official languages only, as considering only official languages would largely ignore second language capabilities. This could introduce bias given the important role of English as a second language in many countries (see Konara, 2020).

The literature suggests that the degree of investor protection contributes to more diversified portfolios and decreases home bias (Porta et al., 1998; La Porta et al., 1999). Similarly, Chan et al. (2005) find that a higher score on the rule of law variable and lower expropriation risk is associated with lower home bias, while other investor protection variables are not significant. Column 12 shows the rule of law variable which measures the extent to which countries adhere to the rule of law in practice, also capturing the risk of expropriation and judiciary effectiveness. While AT, DE, FI, LU and LU have average scores above 80, Greece and Italy have the lowest score with 61 and 65, respectively. This is in line with Chan et al. (2005) who also find low scores for Greece and Italy relative to most other euro area countries, suggesting that the variables are comparable. Column 13 shows the legal system dummy which equals 1 for common-law countries and 0 otherwise, suggesting that the common law system provides higher legal protection to shareholders than the civil law system. In our sample, Ireland is the only country based on the common law.

5.2 Empirical Analysis

We first regress the home bias measure that takes the country of incorporation as investment origin against the variables described above. We then re-run the regression, but take our new home bias measure based on the look-through approach as dependent variable. We estimate the following specification:

$$\text{HomeBias}_{i,t} = \alpha_0 + \sum_{j=0}^{J} \beta_j \text{X}_{j,i,t} + \tau_t + \epsilon_{i,t} \tag{4}$$

where $\text{HomeBias}_{i,t}$ is first measured as in (3), meaning the home bias measure that takes the fund country of incorporation as investment origin, and then measured as in (new 3), meaning the home bias measure based on our look-through approach. X is a vector of explanatory variables for country i in period t, including the variables described in Section 5.1. τ_t represents yearly

time fixed effects.[25]

Following Chan et al. (2005), we first regress the home bias measure (taking the fund country of incorporation as investment origin) on each of the six groups of variables separately. This allows us to assess the relative contribution of each category on home bias and to evaluate how our model compares with the original model. Table 6 shows the results. Consistent with Chan et al. (2005), we find considerable variation in the extent to which different categories of predetermined variables impact home bias. Judging from the adjusted R-squared values, economic and stock market development variables have the highest explanatory power, while capital control measures only explain around 8% of the variation in home bias.

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[25]We do not control for country fixed effects as time invariant variables, such as common languages or distance, would be omitted in this case.

Table 6: Regression Analysis on Plausible Determinants of Home Bias, by Category

This table shows the regression results of the determinants of home bias between 2014 and 2021, where home bias is regressed on each of the categories separately. The dependent variable is equity home bias taking the fund country of incorporation as investment origin (see Section 3.1). The explanatory variables are grouped in the following categories: *economic development*: log (GDP per capita), real GDP growth, trade, foreign direct investment, country credit rating. Column 7 shows the *capital control* variable: investment freedom; *stock market development* variables: stock market capitalisation, stock market turnover ratio, emerging market dummy; *familiarity* variables: sum of common spoken languages and the average distance of the official capitals; *investor protection* variables: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy; *other variables:*: return. The ***, ** and * stand for significant coefficients at the 1%, 5%, and 10% levels, respectively. All variables are explained in more detail in the appendix.

	(1) HomeBias	(2) HomeBias	(3) HomeBias	(4) HomeBias	(5) HomeBias	(6) HomeBias
Economic Development						
Log GDP Per Capita	-5.41***					
	(0.35)					
Real GDP Growth	0.05*					
	(0.03)					
Trade	0.01***					
	(0.00)					
Foreign Direct Investment	-0.00					
	(0.01)					
Credit Rating	0.09**					
	(0.04)					
Capital Control						
Investment Freedom		-0.08***				
		(0.02)				
Stock Market Development						
Stock Market Capitalisation			-0.05***			
			(0.01)			
Stock Market Turnover Ratio			-0.35***			
			(0.10)			
Emerging Market Dummy			1.62***			
			(0.23)			
Familiarity						
Common Languages				-0.12***		
				(0.02)		
Distance				0.00		
				(0.00)		
Investor Protection						
Rule of Law					-0.13***	
					(0.02)	
Legal System Dummy					-1.39***	
					(0.25)	
Other Variables						
Return						0.01
						(0.02)
Look-through Approach	No	No	No	No	No	No
Adj. R-squared	0.76	0.08	0.62	0.25	0.16	0.01
Observations	128	128	128	128	128	128

In line with Chan et al. (2005), all stock market development variables are statistically significant while also the direction and size of coefficients are largely similar (Column 3).[26] In addition, familiarity variables play an important role in explaining the variation of home bias when taking the fund country of incorporation as investment origin. In line with Chan et al. (2005), we find that the common language variable is negatively related, while distance is positively related to home bias (albeit not statistically significant at the 10% level, see Column 4). This would suggest that countries that share more common spoken languages have smaller home bias, while those that are farther away from the rest of the world tend to have larger home bias.

In addition, and also consistent with Chan et al. (2005), restrictions on capital flows contribute to higher home bias, as indicated by the negative and statistically significant coefficient on "investment freedom" (Column 2). Similarly, investor protection variables are negatively related to home bias. This is consistent also with Chan et al. (2005) who find a negative coefficient on judicial efficiency and expropriation risk (which are captured in our "rule of law" variable) as well as on the legal system dummy.[27] While they hypothesize a negative impact of the rule of law index, they report a positive coefficient in their model.[28]

Finally, while the economic development category has large explanatory power, only two of the five variables are significant at the 1% level (Column 1). In addition, the direction of the impact of a country's economic development on home bias is not clear given that the signs of the coefficients are different across the variables. For instance, log(GDP per capita) and foreign direct investment are negatively related to home bias, while trade, credit rating and real GDP growth have positive coefficients. Similarly, and consistent with Chan et al. (2005), a country's returns is statistically and economically insignificant (Column 6). Overall, these results suggest that, when using the traditional home bias measure that takes the fund country of incorporation

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[26] For instance, the coefficient on the stock market turnover ratio is -0.35 while it is - 0.41 in Chan et al. (2005). The coefficient on the emerging market dummy is 1.62 in our model and 1.33 in the original model. Only the coefficient of the stock market capitalisation is substantially smaller in our model (-0.05 relative to -0.52), while the direction of the coefficient is the same.

[27] Note that only the coefficient on expropriation risk is significant.

[28] Note that, as mentioned above, the rule of law variables are defined differently across the two data sets which could explain the difference in the coefficient. While in our data set, the "rule of law" is an index capturing also the risk of expropriation and judicial effectiveness, the "rule of law" in Chan et al. (2005) addresses the law and order tradition in the country and the risk of expropriation index and the efficiency of the judicial system are defined separately.

as investment origin, the model estimates are largely consistent with the literature, providing supporting evidence that our variable selection and model are comparable with the original model in Chan et al. (2005).

In Table 7, we expand Chan et al. (2005) by including all explanatory variables in a single multivariate regression model. Column 1 shows the result without yearly fixed effects, while Column 2 shows the results with yearly fixed effects. In both Columns, our dependent variable is the home bias measure that assumes the fund country of incorporation as investment origin. As suggested by the high adjusted R-squared, controlling for the full set of covariates increases the model's overall explanatory power. However, some of the variables become statistically less significant (e.g. trade, stock market capitalisation, investment freedom), while others change the sign of the coefficient. For instance, investor protection variables turn positive in the full regression model, while they had negative coefficients in Table 6. The positive coefficient and significant coefficient on the "Rule of Law" variable is consistent with Chan et al. (2005). Finally, the coefficient on distance becomes negative while statistically significant at the 1% level.

Table 7: Regression Analysis on Plausible Determinants of Home Bias

This table shows the regression results of the determinants of home bias between 2014 and 2021. In Columns 1 and 2, the dependent variable is equity home bias taking the fund country of incorporation as investment origin (see Section 3.1). In Columns 3 and 4, the dependent variable is equity home bias taking the fund investor country as investment origin, following the look-through approach (see Section 3.2). The explanatory variables are grouped in the following categories: *economic development*: log (GDP per capita), real GDP growth, trade, foreign direct investment, country credit rating. Column 7 shows the *capital control* variable: investment freedom; *stock market development* variables: stock market capitalisation, stock market turnover ratio, emerging market dummy; *familiarity* variables: sum of common spoken languages and the average distance of the official capitals; *investor protection* variables: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy; *other variables*:: return. In Columns 2 and 4, we include year fixed effects. The ***, ** and * stand for significant coefficients at the 1%, 5%, and 10% levels, respectively. All variables are explained in more detail in the appendix.

	Traditional Measure		Look-through Approach	
	(1) HomeBias	(2) HomeBias	(3) HomeBias	(4) HomeBias
Economic Development				
Log GDP Per Capita)	-4.82*** (0.38)	-5.02*** (0.39)	-1.31*** (0.32)	-1.26*** (0.36)
Real GDP Growth	0.03* (0.02)	0.15*** (0.05)	0.04** (0.02)	0.07** (0.03)
Trade	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Foreign Direct Investment	-0.00 (0.00)	-0.01* (0.00)	-0.00 (0.00)	-0.00 (0.00)
Credit Rating	0.00 (0.08)	-0.03 (0.07)	0.06 (0.07)	0.04 (0.07)
Capital Control				
Investment Freedom	0.02 (0.02)	0.03** (0.01)	0.02 (0.01)	0.02 (0.01)
Stock Market Development				
Stock Market Capitalisation	-0.01* (0.00)	-0.00 (0.00)	-0.02*** (0.00)	-0.01*** (0.00)
Stock Market Turnover Ratio	-0.57*** (0.13)	-0.60*** (0.11)	-0.24*** (0.09)	-0.24*** (0.09)
Emerging Market Dummy	1.62** (0.63)	1.61*** (0.50)	1.19* (0.62)	1.21** (0.60)
Familiarity				
Common Languages	-0.06*** (0.02)	-0.07*** (0.02)	-0.01 (0.01)	-0.01 (0.02)
Distance	-0.00*** (0.00)	-0.00*** (0.00)	0.00 (0.00)	0.00 (0.00)
Investor Protection				
Rule of Law	0.14*** (0.03)	0.15*** (0.03)	0.06* (0.03)	0.06* (0.03)
Legal System Dummy	2.19*** (0.73)	1.77** (0.82)	0.26 (0.54)	-0.02 (0.62)
Other Variables				
Return	0.00 (0.01)	-0.01 (0.01)	0.00 (0.00)	0.01 (0.01)
Year Fixed Effects	No	Yes	No	Yes
Look-through Approach	No	No	Yes	Yes
Adj. R-squared	0.91	0.94	0.77	0.78
Observations	128	128	128	128

In Columns 3 and 4, we re-estimate our model taking the home bias measure following the look-through approach as a dependent variable. We find that almost all coefficients, except for stock market capitalisation and credit rating (although the latter is not statistically significant), become smaller in terms of absolute magnitude when assuming the fund investor country as investment origin for measuring home bias. Similarly, many variables become statistically less significant. In Column 4, for instance, only 5 out 14 variables are significant at the 5% level and only 3 variables are significant at the 1% level. For comparison, when taking the fund country of incorporation as investment origin when measuring home bias, 9 variables are significant at the 5% level and 7 variables are significant at the 1% level (Column 2). In addition, the explanatory power of variables reduces, as shown by the reduction in the adjusted R-squared from 0.94 to 0.78. These findings suggest that assuming the fund's country of incorporation as investment origin when measuring home bias tends to overstate the explanatory power of plausible determinants for home bias.

In terms of the relative weight of the predetermined categories, only the stock market development category remains statistically significant across the specifications and the variables of the categories. Similar to Columns 1 and 2, the impact of the economic development category differs across variables and does not provide a clear conclusion regarding the impact on home bias. In addition, none of the variables related to capital control restrictions, familiarity and investor protection are statistically significant at the 5% level with smaller coefficients relative to Columns 1 and 2.[29] Table 8 shows the results when regressing home bias on each of the six groups of variables, separately. While stock market development variables have the maximum explanatory power with an adjusted R-squared of 57%, capital controls, familiarity and investor protection variables' explanatory power ranges between 0% and 7%, suggesting that those categories play a minor role in explaining variation in equity home bias.

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[29]Note that the sign of distance turns positive when assuming the fund investor country as investment origin, which is economically intuitive and in line with the literature suggesting that greater distance to the rest of the countries is associated with higher home bias. However, this variable is not statistically significant at the 10% level.

Table 8: Regression Analysis on Plausible Determinants of Home Bias, by Category based on the Look-through Approach

This table shows the regression results of the determinants of home bias between 2014 and 2021, where home bias is regressed on each of the categories of variables separately. The dependent variable is equity home bias taking the fund investor country as investment origin, following the look-through approach (see Section 3.2). The explanatory variables are grouped in the following categories: *economic development*: log (GDP per capita), real GDP growth, trade, foreign direct investment, country credit rating. Column 7 shows the *capital control* variable: investment freedom; *stock market development* variables: stock market capitalisation, stock market turnover ratio, emerging market dummy; *familiarity* variables: sum of common spoken languages and the average distance of the official capitals; *investor protection* variables: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy; *other variables:*: return. The ***, ** and * stand for significant coefficients at the 1%, 5%, and 10% levels, respectively. All variables are explained in more detail in the appendix.

	(1) HomeBias	(2) HomeBias	(3) HomeBias	(4) HomeBias	(5) HomeBias	(6) HomeBias
Economic Development						
Log GDP Per Capita	-2.12*** (0.21)					
Real GDP Growth	0.06*** (0.02)					
Trade	0.01*** (0.00)					
Foreign Direct Investment	-0.00 (0.00)					
Credit Rating	0.11*** (0.03)					
Capital Control						
Investment Freedom		0.01 (0.01)				
Stock Market Development						
Stock Market Capitalisation			-0.02*** (0.00)			
Stock Market Turnover Ratio			-0.28*** (0.04)			
Emerging Market Dummy			-0.29 (0.33)			
Familiarity						
Common Languages				-0.02** (0.01)		
Distance				0.00** (0.00)		
Investor Protection						
Rule of Law					-0.00 (0.01)	
Legal System Dummy					0.19 (0.14)	
Other Variables						
Return						0.01 (0.01)
Look-through Approach	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.53	0.00	0.57	0.07	0.00	0.02
Observations	128	128	128	128	128	128

These results suggest that assuming the fund country of incorporation has important implications on the plausible determinants of home bias. Our analysis suggests that the economic and statistical relevance across most covariates decrease. While findings in Chan et al. (2005) indicate that stock market development and familiarity variables have significant but asymmetric effects on home bias, our results based on the look-through approach suggest that familiarity variables have low explanatory power for home bias and become statistically insignificant in the full multivariate regression model.

To investigate the role of familiarity further, we distinguish between the type of fund investor when measuring home bias. The rationale is that behavioral biases should be larger among less sophisticated investors and thus familiarity variables should be more important in these cases (see Pool et al., 2012; Kimball and Shumway, 2010; Goetzmann and Kumar, 2008; Karlsson and Nordén, 2007; Grinblatt and Keloharju, 2001). In this context, we hypothesize that familiarity variables should be more important when fund investors are households, but should be less important when investors are institutional. To do so, we re-estimate our home bias measure based on the look-through approach separately for households and institutional investors as fund investor, and then re-run our regression separately for both investor types.

Table 9 shows the results. In Columns 1 and 2, we only consider households' fund investment when measuring home bias. In Columns 3 and 4, we only consider institutional investors' fund investment when measuring home bias. When considering only households as fund investors, we find that familiarity variables are significant at the 1% level. The signs of the coefficients suggest that countries that share more common spoken languages have substantially smaller home bias, while those that are farther away from the rest of the world have larger home bias. The magnitude of familiarity for households is economically meaningful. For instance, the coefficient on common languages is around twice as large than when taking the fund country of incorporation as investment origin (Columns 1 and 2 of Table 9) and more than ten times larger than when considering all fund investors when measuring home bias (Columns 3 and 4 of Table 9). In contrast, for institutional investors, familiarity variables are not significant at the 10% level. This result is robust to regressing home bias on each of the six groups of variables, separately for

households and institutional investors as fund investors. For households, familiarity variables have the maximum explanatory power among the different economic categories (see Table 10), while for institutional investors the explanatory power is zero (Table 11). This suggests that familiarity variables play virtually no role in the asset allocation of funds to the domestic market when investors are institutional, while this category is the main determinant when investors are households.

Table 9: Regression Analysis on Plausible Determinants of Home Bias, by Investor Type

This table shows the regression results of the determinants of home bias between 2014 and 2021. The dependent variable is equity home bias taking the fund investor country as investment origin, following the look-through approach (see Section 3.2). In Columns 1 and 2, we only consider households' fund investment when measuring home bias. In Columns 3 and 4, we only consider institutional investors' fund investment when measuring home bias. The explanatory variables are grouped in the following categories: *economic development*: log (GDP per capita), real GDP growth, trade, foreign direct investment, country credit rating. Column 7 shows the *capital control* variable: investment freedom; *stock market development* variables: stock market capitalisation, stock market turnover ratio, emerging market dummy; *familiarity* variables: sum of common spoken languages and the average distance of the official capitals; *investor protection* variables: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy; *other variables*: return. In Columns 2 and 4, we include year fixed effects. The ***, ** and * stand for significant coefficients at the 1%, 5%, and 10% levels, respectively. All variables are explained in more detail in the appendix.

	Households		Institutional Investors	
	(1) HomeBias	(2) HomeBias	(3) HomeBias	(4) HomeBias
Economic Development				
Log GDP Per Capita	0.77 (0.54)	0.93* (0.53)	-1.18*** (0.42)	-1.13** (0.45)
Real GDP growth	0.03 (0.03)	0.04 (0.06)	0.02 (0.02)	0.05 (0.04)
Trade	-0.02*** (0.00)	-0.02*** (0.00)	0.00 (0.00)	0.00 (0.00)
Foreign Direct Investment	-0.01* (0.01)	-0.01* (0.01)	0.00 (0.00)	0.00 (0.00)
Credit Rating	0.29*** (0.10)	0.29** (0.11)	0.15** (0.07)	0.13* (0.07)
Capital Control				
Investment Freedom	0.09*** (0.02)	0.09*** (0.02)	0.03** (0.01)	0.03** (0.01)
Stock Market Development				
Stock Market Capitalisation	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)
Stock Market Turnover Ratio	-0.65*** (0.15)	-0.60*** (0.16)	-0.05 (0.11)	-0.08 (0.10)
Emerging Market Dummy	5.91*** (1.02)	5.99*** (1.05)	2.99*** (0.59)	2.96*** (0.57)
Familiarity				
Common Languages	-0.13*** (0.03)	-0.13*** (0.03)	0.01 (0.02)	0.02 (0.02)
Distance	0.01*** (0.00)	0.01*** (0.00)	0.00 (0.00)	0.00 (0.00)
Investor Protection				
Rule of Law	0.05 (0.04)	0.05 (0.04)	-0.02 (0.04)	-0.02 (0.04)
Legal System Dummy	1.72* (0.89)	1.41 (0.94)	-0.38 (0.69)	-0.66 (0.75)
Other Variables				
Return	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Year Fixed Effects	No	Yes	No	Yes
Look-through Approach	Yes	Yes	Yes	Yes
Adj. R-squared	0.76	0.77	0.65	0.67
Observations	126	126	128	128

Table 10: Regression Analysis on Plausible Determinants of Home Bias, by Category for Households

This table shows the regression results of the determinants of home bias between 2014 and 2021, where home bias is regressed on each of the categories of variables separately. The dependent variable is equity home bias taking the fund investor country as investment origin, following the look-through approach (see Section 3.2). We only consider households' fund investment when measuring home bias. The explanatory variables are grouped in the following categories: *economic development*: log (GDP per capita), real GDP growth, trade, foreign direct investment, country credit rating. Column 7 shows the *capital control* variable: investment freedom; *stock market development* variables: stock market capitalisation, stock market turnover ratio, emerging market dummy; *familiarity* variables: sum of common spoken languages and the average distance of the official capitals; *investor protection* variables: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy; *other variables:*: return. The ***, ** and * stand for significant coefficients at the 1%, 5%, and 10% levels, respectively. All variables are explained in more detail in the appendix.

	(1) HomeBias	(2) HomeBias	(3) HomeBias	(4) HomeBias	(5) HomeBias	(6) HomeBias
Economic Development						
Log(GDP per capita)	-1.39** (0.63)					
Real GDP growth	0.11** (0.06)					
Trade (% GDP)	-0.01 (0.00)					
FDI	-0.01 (0.01)					
Credit rating	0.22*** (0.05)					
Capital Control						
Investment freedom		0.02 (0.01)				
Stock Market Development						
Stock market capitalisation			-0.02*** (0.00)			
Stock market turnover ratio			-0.01 (0.13)			
Emerging market dummy			-0.44 (0.40)			
Familiarity						
Common languages				-0.08*** (0.02)		
Distance (in km)				0.01*** (0.00)		
Investor Protection						
Rule of Law					0.09*** (0.03)	
Legal system dummy					0.27 (0.21)	
Other Variables						
Return						0.02** (0.01)
Look-through Approach	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.17	0.01	0.08	0.32	0.07	0.02
Observations	126	126	126	126	126	126

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Regression Analysis on Plausible Determinants of Home Bias, by Category for Institutional Investors

This table shows the regression results of the determinants of home bias between 2014 and 2021, where home bias is regressed on each of the categories of variables separately. The dependent variable is equity home bias taking the fund investor country as investment origin, following the look-through approach (see Section 3.2). We only consider institutional investors' fund investment when measuring home bias. The explanatory variables are grouped in the following categories: *economic development*: log (GDP per capita), real GDP growth, trade, foreign direct investment, country credit rating. Column 7 shows the *capital control* variable: investment freedom; *stock market development* variables: stock market capitalisation, stock market turnover ratio, emerging market dummy; *familiarity* variables: sum of common spoken languages and the average distance of the official capitals; *investor protection* variables: rule of law (also covering expropriation risk and judicial effectiveness index), legal system dummy; *other variables:*: return. The ***, ** and * stand for significant coefficients at the 1%, 5%, and 10% levels, respectively. All variables are explained in more detail in the appendix.

	(1) HomeBias	(2) HomeBias	(3) HomeBias	(4) HomeBias	(5) HomeBias	(6) HomeBias
Economic Development						
Log GDP Per Capita	-1.74*** (0.27)					
Real GDP Growth	0.03 (0.02)					
Trade	0.01*** (0.00)					
Foreign Direct Investment	0.00 (0.00)					
Credit Rating	0.03 (0.03)					
Capital Control						
Investment Freedom		-0.01 (0.01)				
Stock Market Development						
Stock Market Capitalisation			-0.02*** (0.00)			
Stock Market Turnover Ratio			-0.30*** (0.05)			
Emerging Market Dummy			1.01*** (0.33)			
Familiarity						
Common Languages				-0.01 (0.01)		
Distance				0.00 (0.00)		
Investor Protection						
Rule of Law					-0.03** (0.01)	
Legal System Dummy					0.36*** (0.12)	
Other Variables						
Return						0.01 (0.01)
Look-through Approach	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-squared	0.44	0.00	0.51	0.00	0.03	0.01
Observations	128	128	128	128	128	128

6 Conclusion

The equity home bias through investment fund holdings has been attributed to low stock market development and familiarity variables related to language and geographical distance. The existing empirical analysis assumes that investment funds are representative investors of the country in which the funds are legally domiciled. The literature neglects, however, that investors often invest in foreign funds domiciled in financial centers. To account for this misclassification, we use a look-through approach combining supervisory holdings statistics on euro area fund investor allocations with global investment fund security-level holdings. This yields a uniquely granular and representative view of investors' indirect equity investment allocation, allowing us to look-through the fund's legal country of incorporation when classifying the investment origin.

Our findings have a number of important implications for the literature. We are the first to show that assuming the fund's country of incorporation as investment origin overestimates home bias. Second, the explanatory power of plausible home bias determinants is lower than previously documented in the literature. Third, our findings point to important differences across investor types, depending on whether they are households or institutional investors. In this regard, we find that familiarity variables only play a meaningful role when investors are households, but not when they are institutional, highlighting the role of investor sophistication.

Importantly, while our data is restricted to euro area fund investors, our findings ought to extrapolate to other countries given the high concentration of investment funds in financial centers around the world. In addition, home bias through investment funds may be even lower across countries when considering funds' indirect exposure through their holdings of home-based firms with foreign operations (Demirci et al., 2022). Future research may extend our look-through approach by also taking into account funds' indirect international exposure.

References

Adler, M. and Dumas, B. (1983). International portfolio choice and corporation finance: A synthesis. *The Journal of Finance*, 38(3):925–984.

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

Alfaro, L., Chari, A., and Kanczuk, F. (2017). The real effects of capital controls: Firm-level evidence from a policy experiment. *Journal of International Economics*, 108:191–210.

Baele, L., Pungulescu, C., and Ter Horst, J. (2007). Model uncertainty, financial market integration and the home bias puzzle. *Journal of International Money and Finance*, 26(4):606–630.

Beck, R., Coppola, A., Lewis, A., Maggiori, M., Schmitz, M., and Schreger, J. (2023). The geography of capital allocation in the euro area. *SSRN Working Paper*.

Carvalho, D. (2022). The portfolio holdings of euro area investors: Looking through investment funds. *Journal of International Money and Finance*, 120:102519.

Chan, K., Covrig, V., and Ng, L. (2005). What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide. *The Journal of Finance*, 60(3):1495–1534.

Chang, C., Liu, Z., and Spiegel, M. M. (2015). Capital controls and optimal Chinese monetary policy. *Journal of Monetary Economics*, 74:1–15.

Coeurdacier, N. and Rey, H. (2013). Home bias in open economy financial macroeconomics. *Journal of Economic Literature*, 51(1):63–115.

Cooper, I., Sercu, P., Vanpée, R., et al. (2013). The equity home bias puzzle: A survey. *Foundations and Trends in Finance*, 7(4):289–416.

Coval, J. D. and Moskowitz, T. J. (1999). Home bias at home: Local equity preference in domestic portfolios. *The Journal of Finance*, 54(6):2045–2073.

Dahlquist, M., Pinkowitz, L., Stulz, R. M., and Williamson, R. (2003). Corporate governance and the home bias. *Journal of Financial and Quantitative analysis*, 38(1):87–110.

Daly, K. and Vo, X. V. (2013). The determinants of home bias puzzle in equity portfolio investment in Australia. *International Review of Financial Analysis*, 27:34–42.

Demirci, I., Ferreira, M. A., Matos, P., and Sialm, C. (2022). How global is your mutual fund? International diversification from multinationals. *The Review of Financial Studies*, 35(7):3337–3372.

European Fund and Asset Management Association (2022). Worldwide Regulated Open-end Fund Assets and Flows. Trends in the Fourth Quarter of 2021. *International Quarterly Statistics March 2022*.

Ferreira, M. A. and Matos, P. (2008). The colors of investors' money: The role of institutional investors around the world. *Journal of Financial Economics*, 88(3):499–533.

Fidora, M., Fratzscher, M., and Thimann, C. (2007). Home bias in global bond and equity markets: the role of real exchange rate volatility. *Journal of International Money and Finance*, 26(4):631–655.

French, K. R. and Poterba, J. (1991). Investor diversification and international equity markets. *American Economic Review*, 81:222–26.

Goetzmann, W. N. and Kumar, A. (2008). Equity portfolio diversification. *Review of Finance*, 12(3):433–463.

Grinblatt, M. and Keloharju, M. (2001). How distance, language, and culture influence stock-holdings and trades. *The Journal of Finance*, 56(3):1053–1073.

Hau, H. and Rey, H. (2008). Home bias at the fund level. *American Economic Review*, 98(2):333–38.

Hines Jr, J. R. and Rice, E. M. (1994). Fiscal paradise: Foreign tax havens and american business. *The Quarterly Journal of Economics*, 109(1):149–182.

Hu, C. (2020). Industrial specialization matters: A new angle on equity home bias. *Journal of International Economics*, 126:103354.

Karlsson, A. and Nordén, L. (2007). Home sweet home: Home bias and international diversification among individual investors. *Journal of Banking and Finance*, 31(2):317–333.

Karolyi, G. A. and Stulz, R. M. (2003). Are financial assets priced locally or globally? *Handbook of the Economics of Finance*, 1:975–1020.

Kho, B.-C., Stulz, R. M., and Warnock, F. E. (2009). Financial globalization, governance, and the evolution of the home bias. *Journal of Accounting Research*, 47(2):597–635.

Kimball, M. S. and Shumway, T. (2010). Investor sophistication and the home bias, diversification, and employer stock puzzles. *University of Michigan Working Paper.*

Konara, P. (2020). The role of language connectedness in reducing home bias in trade, investment, information, and people flows. *Research in International Business and Finance*, 52:101180.

La Porta, R., Lopez-de Silanes, F., and Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance*, 54(2):471–517.

Lane, P. R. and Milesi-Ferretti, G. M. (2001). The external wealth of nations: measures of foreign assets and liabilities for industrial and developing countries. *Journal of International Economics*, 55(2):263–294.

Lane, P. R. and Milesi-Ferretti, G. M. (2011). The cross-country incidence of the global crisis. *IMF Economic Review*, 59(1):77–110.

Lau, S. T., Ng, L., and Zhang, B. (2010). The world price of home bias. *Journal of Financial Economics*, 97(2):191–217.

Lee, J., Lee, K., and Oh, F. D. (2023). International portfolio diversification and the home bias puzzle. *Research in International Business and Finance*, 64:101807.

Lewis, K. K. (1999). Trying to explain home bias in equities and consumption. *Journal of Economic Literature*, 37(2):571–608.

Melitz, J. and Toubal, F. (2014). Native language, spoken language, translation and trade. *Journal of International Economics*, 93(2):351–363.

Milesi-Ferretti, G. M., Strobbe, F., and Tamirisa, N. T. (2010). Bilateral financial linkages and global imbalances: a view on the eve of the financial crisis.

Molestina Vivar, L., Lambert, C., Wedow, M., and Giuzio, M. (2020). Is the home bias biased? New evidence from the investment fund sector. *ECB Financial Integration and Structure.*

Monti, P. and Felettigh, A. (2008). How to interpret the CPIS data on the distribution of foreign portfolio assets in the presence of sizeable cross-Border positions in mutual funds-evidence for Italy and the main euro-area countries. *Bank of Italy Occasional Paper*, 16.

Obstfeld, M. (1992). Risk-taking, global diversification, and growth.

Obstfeld, M. and Rogoff, K. (2000). The six major puzzles in international macroeconomics: is there a common cause? *NBER Macroeconomics Annual*, 15:339–390.

Pool, V. K., Stoffman, N., and Yonker, S. E. (2012). No place like home: Familiarity in mutual fund manager portfolio choice. *The Review of Financial Studies*, 25(8):2563–2599.

Porta, R. L., Lopez-de Silanes, F., Shleifer, A., and Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106(6):1113–1155.

Schumacher, D. (2018). Home bias abroad: Domestic industries and foreign portfolio choice. *The Review of Financial Studies*, 31(5):1654–1706.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3):425–442.

Sialm, C., Sun, Z., and Zheng, L. (2020). Home bias and local contagion: Evidence from funds of hedge funds. *The Review of Financial Studies*, 33(10):4771–4810.

Wallmeier, M. and Iseli, C. (2022). Home bias and expected returns: A structural approach. *Journal of International Money and Finance*, 124:102634.

Wright, D. and Yanotti, M. B. (2019). Home advantage: The preference for local residential real estate investment. *Pacific-Basin Finance Journal*, 57:101167.

Zeev, N. B. (2017). Capital controls as shock absorbers. *Journal of International Economics*, 109:43–67.

Zucman, G. (2013). The missing wealth of nations: are Europe and the US net debtors or net creditors? *The Quarterly journal of economics*, 128(3):1321–1364.

Appendix

Table 12: Variable Description

This table describes the explanatory variables used in our regression analyses.

Variable name	Data source	Description
Log GDP Per Capita	European Central Bank	The log of GDP per capita.
Real GDP growth	European Central Bank	Annual GDP growth, measured in percent.
Trade Volume	World Bank	The sum of exports and imports of goods and services, in percent of GDP.
Foreign Direct Investment (FDI)	World Bank	The sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments, calculated as net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, in percent of GDP.
Credit Rating	Standard & Poor	A country's credit rating on a scale from 1 (D) to 24 (AAA+).
Investment Freedom	The Heritage Foundation	The degree of a free and open investment environment, on a scale from 0 to 100.
Stock Market Capitalisation	World Bank and CEIC	The market capitalisation of listed domestic companies, in percent of GDP.
Stock Market Turnover Ratio	World Bank and FRED	The value of domestic shares traded divided by their market capitalization. The value is annualized by multiplying the monthly average by 12.
Emerging Market	Standard & Poor	Dummy variable which equals 1 for emerging market countries and 0 otherwise, based on the Dow Jones Emerging Markets Index.
Common Languages	CEPII	The sum of common spoken languages per country. Common spoken languages measure the probability that a pair of people at random from two countries understands one another in some language.
Distance	CEPII	The average of bilateral geographical distances between capital cities of countries.
Rule of Law	The World Justice Project	The extent to which countries adhere to the rule of law in practice, capturing eight primary factors: constraints on government powers, absence of corruption, open government, fundamental rights, order and security, regulatory enforcement (including expropriation risk), civil justice, and criminal justice. On a scale from 0 to 100.
Legal System	CEPII	Dummy variable that equals 1 for common-law countries and 0 otherwise.
Return	The Global Economy	A country's stock market return. Measured in percent.

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