International Diversification: Households versus Institutional Investors

International Diversification: Households versus Institutional Investors*

Maela Giofré†
University of Torino, CeRP-Collegio Carlo Alberto

Abstract

Directly investing households exhibit more domestically concentrated portfolios than institutional investors. We aim to identify the factors that asymmetrically affect the foreign equity portfolios held by households and institutional investors in four European investing countries – France, Italy, Spain, and Sweden. We find that transparency and being listed on a common exchange platform such as Euronext have larger effects on households' portfolio decisions than on those of institutional investors. Policies encouraging transparency and common, standardized trading rules can therefore be particularly effective in helping households to better internationally diversify their portfolios.

JEL: F30, G11, G15
Keywords: portfolio choice, international diversification, household finance, investor's sophistication

*An earlier version of this paper was circulated under the title "Information Asymmetries and Foreign Equity Portfolios: Households versus Financial Investors".

†University of Torino, Department of Economics and Statistics "Cognetti de Martiis" - Lungo Dora Siena 100/A - 10153 Torino - Italy. E-mail address: maela.giofre@unito.it

1 Introduction

Households face increasingly complex choices in financial markets. The privatization of pension systems and the expansion of the set of available products driven by financial innovation have made households more involved in financial decisions than ever before. Household finance has attracted substantial academic attention over the past decade (Guiso and Sodini, 2012)

The first contributions to household portfolios primarily focused on the ability of investor characteristics to predict stock market participation (Haliassos and Bertaut, 1995; Vissing-Jorgensen, 2003; Guiso and Jappelli, 2005; van Rooij et al., 2011; Hsu, 2012). More recently, the lack of portfolio diversification has become a timely issue in the academic debate (Ivkovic and Weisbenner, 2005; Campbell, 2006; Karlsson and Nordén, 2007; Kimball and Shumway, 2007; Norden, 2010). Information on portfolio diversification relies on survey-based data that typically do not provide details on portfolio holdings (Guiso and Jappelli, 2009; Kimball and Shumway, 2007; von Gaudecker, 2011; Abreu and Mendes, 2010); hence, the analysis of portfolio diversification has been restricted to either broad asset classes (von Gaudecker, 2011) or diversification indexes based on the fraction invested in mutual funds and the number of individual stocks in a portfolio (Guiso and Jappelli, 2009).

Calvet et al. (2007) and Goetzmann and Kumar (2008) are two notable exceptions. Calvet et al. (2007) exploit a dataset with information on the overall wealth of all Swedish resident households to evaluate the risk properties of household portfolios. The data include not only all asset classes (real estate, bonds, stocks, funds and bank accounts) but also portfolio holdings at individual asset level. Among the findings of the papers, less sophisticated households are shown to hold less diversified portfolios. In particular, they note that households possessing the standard predictors of financial sophistication hold more equities and balanced mutual funds, most of which are internationally diversified. Interestingly, they find that directly held individual stocks are almost exclusively Swedish stocks.

Similarly, Goetzmann and Kumar (2008), in an investigation of the level of diversification achieved by clients of a US brokerage house, observe that directly held stock portfolios are severely

under-diversified.

Although international under-diversification is not their focus, these contributions suggest that less financially sophisticated investors are more likely to directly hold stock portfolios that are under-diversified and particularly concentrated in domestic assets.

We contribute to the literature on portfolio diversification by identifying the drivers of international investment patterns for investors that typically exhibit different levels of financial sophistication, such as households versus institutional investors.

Irrespective of the benefits from the international diversification of equity portfolios that has been documented for many years (Markowitz, 1952; Sharpe, 1964; Grubel, 1968; Levy and Sarnat, 1970; Solnik, 1974), investors still display a strong preference for domestic assets, the so-called "home bias" (French and Poterba, 1991; Tesar and Werner, 1995; Coval and Moskowitz, 1999). Several attempts have been made to rationalize this evidence. As reviewed in Lewis (1999) and Karolyi and Stulz (2003), proposed explanations refer to barriers to international investment (Stulz, 1981; Tesar and Werner, 1995), behavioral bias consisting of the over-optimism of domestic investors toward domestic assets (French and Poterba, 1991; Strong and Xu, 2003; Li, 2004), the hedging of background risk such as inflation risk (Cooper and Kaplanis, 1994; Sercu and Vanpée, 2008; Giofre', 2009) or human capital risk (Baxter and Jermann, 1997; Palacios-Huerta, 2001; Pesenti and van Wincoop, 2002; Fugazza et al., 2011) and information asymmetries between domestic and foreign investors (Coval and Moskowitz,1999; Grinblatt and Keloharju, 2001;.Chan et al., 2005; Portes and Rey, 2005)

Standard asset pricing models such as the CAPM assume that assets are held by a representative agent. Even when this assumption is relaxed, little investigation has been devoted to one of the most obvious sources of heterogeneity: investments can be made by either individuals or professionally -managed funds. Existing studies that analyze the investment behaviors of individuals and institutional investors primarily focus on their different trading patterns and neglect the impact of information asymmetry on these two broad categories of investors (Lakonishov and Maberly, 1990; Cohen, 2003; Griffin et al., 2003; Jain, 2007)[1].

[1]The informational superiority of institutional investors over individuals is a crucial point in Jain (2007), but is

Barber and Odean (2008) find that individual investors buy attention-grabbing stocks, such as those of firms that appear prominently in the news while institutional investors are free of this bias. Grinblatt and Keloharju (2001), analyzing Finnish institutional actors investing in domestic firms, find that familiarity factors[2]– distance, language, and culture – play a stronger role for less sophisticated investors, such as households and nonprofit institutions [3].

These findings suggest the need to conduct a detailed investigation of the drivers of households' portfolio diversification decisions as a prerequisite for the design of appropriate remediation policies. Indeed, the proximity variables considered in the existing literature are by definition invariant to policy implementation, while it would be crucial to identify which policy-sensitive factors can encourage households' to improve the diversification of their portfolios.

From a methodological perspective, we depart from Grinblatt and Keloharju (2001) in that we focus on foreign investments at the market level, while Grinblatt and Keloharju (2001) investigate domestic investments at the individual firm level. Our coarser, market-level analytical approach has certain drawbacks with respect to their more targeted and finer-grained individual analysis. However, by relying on international equity portfolios, we can test the role of regulatory factors that might asymmetrically affect different classes of investors. Our analysis can therefore be regarded as complementary to theirs, as we expand the set of potential drivers of household behavior to derive policy recommendations regarding how to enhance portfolio diversification among these less sophisticated investors, who less effectively diversify their portfolios.

We show that the aggregate disproportionate investment in domestic assets reflects a larger bias on the part of households and a lower bias on the part of institutional investors. This evidence is consistent with the hypothesis that less sophisticated investors are more affected by the informational barriers connected with foreign investments. We perform our analysis of portfolio holdings using panel data, to infer which factors are more likely to affect households than institutional investors in four European investing countries – France, Italy, Spain, and Sweden – over the period

only postulated and never tested.

[2] Note that we use the expressions *familiarity factors*, *proximity variables,* and *gravity variables* synonymously throughout the paper.

[3] The authors analyze domestic investments in Finnish firms, considering their geographical and cultural distance with respect to the investor (6% of the Finnish population speaks Swedish, and differences in cultural background also exist).

2001–2004.

Our findings highlight that households and nonprofit organizations are more prone to invest in stocks that are more proximate in cultural and geographical terms, more reluctant to invest in opaque stock markets, and attracted by stocks listed on a common exchange platform such as Euronext. Phrased differently, directly investing households are likely to be more heavily affected by information issues than financial institutions, and hence the removal of these barriers would benefit the former to a relatively greater extent. In particular, to the best of our knowledge, this is the first contribution to identify a significant impact of stock exchange consolidation on international portfolio diversification: controlling for liquidity, stock market visibility and the common currency factor, we show that only less sophisticated investors invest more in the stocks of firms publicly listed on a common exchange such as Euronext. Belonging to the same exchange platform implies adhering to standardized regulations, which might have the effect of alleviating information asymmetries for directly investing households. These findings provide clear-cut policy implications to achieve the goal of fostering diversification opportunities for households directly investing in the stock market.

This paper is structured as follows. Section 2 presents the equation to be estimated and describes the econometric specification. Section 3 describes the data and provides descriptive statistics. Section 4 reports the main results of our analysis and some robustness checks. Section 5 concludes.

2 Estimation equation

Our theoretical framework relies on equilibrium portfolio allocations in which investors are assumed to face different information costs when investing in various financial markets. According to Gehrig (1993), foreign investment on average appears more risky to domestic investors –leading to an information-based justification for home bias– and portfolios differ among investors depending on their perceived covariance matrix. We adopt this approach that allows for a different investor-specific variability of return for each foreign index included in the investment opportunity set.

Absent any investor-specific factor, the "unbiased" portfolio holding of an asset depends, as in

standard portfolio choice theory, on the assets' returns and covariance matrix[4]. When considering equilibrium asset holdings absent investment barriers, all investors ought to hold the same portfolio, i.e., the value-weighted portfolio, in which each asset is weighted according to its share of global stock market capitalization. The same portfolio is still universally optimal in equilibrium even in the presence of investment barriers, provided that these barriers affect all investors identically. Conversely, heterogeneity in bilateral-specific investment barriers generates a departure from the CAPM and therefore a wedge between the investor-specific portfolio and the value-weighted portfolio. This wedge depends, in particular, on the distance between the investment barrier of country l investing in country j and the average barrier calculated across all countries investing in the same asset j.

The optimal portfolio weight on asset j (w_{lj}) for country l is

$$w_{lj} = \frac{1}{D_{lj}} MS_j \tag{1}$$

or in log terms

$$\log\left(\frac{w_{lj}}{MS_j}\right) = \log\left(\frac{1}{D_{lj}}\right) \tag{2}$$

where MS_j is the market share of asset j in world market capitalization and D_{lj} captures the relative (to the world average) investment barrier of country l investing in asset j[5]. Investors residing in country l will demand a share of asset j greater than its market share in proportion to $\frac{1}{D_{lj}}$[6].

The ratio $\frac{w_{lj}}{MS_j}$ can be interpreted as the foreign bias in asset j of a representative investor in country l. A portfolio share w_{lj} larger than j's market share signals that asset j is over-weighted in country l's portfolio, while a ratio lower than 1 signals that country j is under-weighted[7].

[4] Details on the derivation of our stylized model are available in Appendix A.

[5] Note that if $D_{lj} = 1$, i.e., if the investment barrier of country l in country j is equal to the average, then MS_j is optimally held in equilibrium.

[6] Our theoretical framework is equivalent to the return-reducing approach of Cooper and Kaplanis (1994) and Chan et al. (2005). In fact, in equilibrium, what matters is the relative (to the average) investment barrier.

[7] Our stylized theoretical setting ignores relevant factors such as inflation and exchange rate uncertainty, as in many other models that focus on barriers to international investment (Dahlquist et al., 2003). See Lewis (1999) and Kang and Stulz (2003) for a review of the effects of inflation and exchange rate uncertainty on portfolio choice.

2.1 Econometric specification

To test the impact of investment barriers on different investing sectors – households and institutional investors – we estimate a separate regression for each sector k, across all investing countries.

A feasible GLS regression is implemented to correct for the presence of cross-sectional heteroskedasticity. Indeed, Sweden's investment in Mexico is likely much more noisy than U.S. investment in the UK, and estimation techniques need to properly account for this issue through a weighted regression[8]. Finally, we cluster standard errors by country-pair to draw correct inferences in the presence of non independent repeated observations over time.

The relative investment barrier faced by sector k operating in country l when investing in country j (D_{lj}^k) is not directly observable. We make use of I proxies, denoted $rel\_proxy_{lj}^{ik}$, to explain the wedge between the actual position and the market share[9].

$$\log\left(\frac{w_{lj}^k}{MS_j}\right) = \alpha + \sum_{i=1}^{I} \beta^{i,k} \log(rel\_proxy_{lj}^{ik}) + \varepsilon_{lj}^k \tag{3}$$

The unavailability of proxies at the sector level – households or institutional investors – does not allow us to directly test the predictions of the model as currently specified. In the empirical implementation, we rely instead on country-specific variables but allow the coefficients to be sector-specific, that is, to vary according to the investor's sophistication. In other words, the model would assume different investment barriers at the investing sector level, while the empirical implementation, constrained by data availability, considers the different elasticities ($\beta^{i,k}$) of various sectors with respect to the same country-specific proxy.

Our general estimation equation is quite standard in the literature (Vlachos, 2004; Fidora et al., 2007; Lane and Milesi-Ferretti, 2008; Ferreira and Miguel, 2011) and includes I country-pair specific (lj) relative proxies, M country-pair specific (lj) "dummy variables" and N destination country-specific relative proxies that are expected to potentially influence foreign portfolio choice.

[8] In column (3) of Table 8b, we present our findings under a OLS specification: the main findings appear only modestly sensitive to the regression specification.

[9] Note that the dependent variable (both components w_{lj}^k and MS_j) is recorded on December 31st of each year. This allows us to consider regressors as pre-determined with respect to the dependent variable, thus ruling out any source of endogeneity induced by reverse causality.

$$\log\left(\frac{w_{lj}^k}{MS_j}\right) = \alpha + \sum_{i=1}^{I} \beta^{i,k} \log(rel\_proxy_{lj}^i) + \sum_{m=1}^{M} \lambda^{m,k} dummy_{lj}^m + \sum_{n=1}^{N} \delta^{n,k} \log(rel\_proxy_j^n) + \varepsilon_{lj}^k \tag{4}$$

We expect these macro-level variables to play a stronger role for households than for institutional investors, who may access more specific sources of information.

To test this conjecture, after having implemented a separate regression for households and institutional investors, we run the following regression to test the difference in coefficients between the two sectors of investors:

$$\log(w_{lj}^H) - \log(w_{lj}^F) = \delta + \sum_{i=1}^{I} \beta^{i*} \log(rel\_proxy_{lj}^i) + \sum_{m=1}^{M} \lambda^{m*} dummy_{lj}^m + \sum_{n=1}^{N} \delta^{n*} \log(rel\_proxy_j^n) + \xi_{lj}^k \tag{5}$$

where the subscripts H and F denote, respectively, households and institutional investors, $\beta^{i*} = \beta^{i,H} - \beta^{i,F}$, $\lambda^{n*} = \lambda^{m,H} - \lambda^{m,F}$ and $\delta^{n*} = \delta^{n,H} - \delta^{n,F}$.

By testing the null hypothesis that $\beta^{i*} = 0$ (analogously for λ^{m*} and δ^{n*}), we test the hypothesis that country-level factors are equally important in determining portfolio allocation for more sophisticated investors and less sophisticated ones. Coefficients significantly different from zero in the expected direction would reject the null hypothesis and provide statistical support for our thesis[10].

3 Data and descriptive statistics

3.1 Data

We consider the determinants of foreign equity portfolio investment decisions for households and institutional investors operating in four European investing countries – France, Italy, Spain, and

[10] Note that the above regression (5) allows us to test the difference in coefficients without performing the Wald test, which would require a computationally more burdensome procedure – for instance, a Seemingly Unrelated Regression (SUR)– to properly compare the coefficients across separate regressions.

Sweden – over the period 2001–2004.

The destination stock market comprises 20 countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Korea, Mexico, the Netherlands, Portugal, Singapore, Spain, Sweden, the United Kingdom, and the United States[11].

The main dataset employed in the analysis is the Coordinated Portfolio Investment Survey (*CPIS*), released by the IMF. The *CPIS* provides information on the bilateral portfolio positions of many countries, but a breakdown by sector holder is available only for a limited subgroup of nations. France, Italy, Spain, and Sweden are the only countries that consistently report the portfolio holdings of institutional investors and households throughout the time period considered[12].

As the *CPIS* dataset only provides information on foreign positions, auxiliary data sources are needed to retrieve domestic holdings and then compute portfolio shares, specifically we employ: the *International Financial Statistics* released by IMF, the *National Accounts Financial Balance Sheets* released by OECD and *Datastream* published by Thomson Corporation (see Appendix B1 for further details).

The *CPIS* survey collects security-level data from major custodians and large end-investors, providing information on the residence of the issuer and the destination of the portfolio investment[13]. Many recent papers rely on *CPIS* data (Faruqee et al., 2004; Sorensen et al., 2007; Lane and Milesi-Ferretti, 2008) but none – to the best of our knowledge – exploit the breakdown of foreign portfolio holdings by investing sector.

The limited sample of investing countries might challenge the validity of our results, as this may not be generally representative (all four countries are European Union members), and it constitutes only a small fraction (approximately 10%) of world stock market capitalization[14]. However, the

[11] As we focus on foreign portfolio allocations (the investor's country of residence is excluded from the analysis), we consider 19 destination stock markets for each investing country, and every year (304 observations).

[12] The *CPIS* also reports the breakdown by sector for the Netherlands, Portugal, and Denmark. However, for the Netherlands, the breakdown begins in 2003, but data for households and non-profit organizations are not available for 2003 and 2004. With respect to Portugal, no breakdown is available in 2003, and no 2004 data are disclosed ("confidential data"). For Denmark, there are severe inconsistencies regarding the share of financial wealth held by various institutional sectors (*OECD National Accounts-Financial Balance Sheets* Database).

[13] While the *CPIS* provides the most comprehensive survey of international portfolio investment holdings, it is still subject to a number of important caveats. Collection and definitional problems are discussed by Lane and Milesi-Ferretti (2008), section IV. These are not generally perceived to be severe. See http://www.imf.org/external/np/sta/pi/datarsl.htm for more details on the survey.

[14] As far as the destination countries are concerned the coverage is instead quite high. Although our investment

countries included are characterized by well-functioning financial markets, and a priori our results should not be biased in any obvious direction. While any generalization to emerging economies would be inappropriate, the descriptive statistics presented below seem to suggest that our limited sample is quite representative of developed economies. Moreover, we confirm, for other European countries at a macro level, the results on the role of familiarity variables obtained by Grinblatt and Keloharju (2001) at a micro level: households' portfolio holdings appear to be more severely affected by information asymmetries regardless of the Finnish nationality of the investors investigated by Grinblatt and Keloharju (2001).

We consider two investing categories[15]: the *households*' sector, comprising households and non profit organizations (NPOs) and the *institutional investors*' sector, comprising banks, pension funds and insurance companies, mutual funds, and other financial auxiliaries[16]. We consider professional investors as a single entity: the *CPIS* and the *OECD National Accounts* database would allow for a finer but diverse disaggregation of the financial sector thereby making any more specific matching process unreliable. While a notable heterogeneity exists among financial institutions, and considering them as a homogeneous entity may appear incautious, for the purposes of our paper, many of the distinctive features of various financial institutions are irrelevant. Institutional investors are highly specialized professionals operating on behalf of others, and we take for granted their informational superiority over individual investors.

3.2 Descriptive statistics

The relevance of the present paper crucially builds on the relative importance of the two competing classes of investors analyzed. A negligible proportion of financial wealth being directly managed by individual investors would cause our analysis to be of little relevance. Table 1 reports information

opportunity set is restricted to 20 out of more than 235 countries available in the *CPIS* dataset, excluded destination countries cover on average less than 3% of total stock market participation.

[15] The *General Government* and *Non-Financial Companies* sectors are excluded in the analysis and are those that hold complementary asset shares in the economy.

[16] Note that throughout the paper, we employ the term *households* to mean *households and non-profit organizations*. For comparability across countries and to match *CPIS* data with *OECD National Accounts* (see Appendix B.1), we consider non-profit organizations (representing an almost negligible fraction) and households as a consolidated sector. The results of Grinblatt and Keloharju (2001), revealing a similar responsiveness of households and non-profit organizations to geographical and cultural distances, provides some rationale for this forced consolidation.

on the relative share of overall financial assets held by households and institutional investors for major investing countries. The fraction attributed to households and NPOs consists of assets they "directly" manage by them: households' indirect investments in mutual funds or pension funds is therefore allocated to the institutional investors' share[17].

The average fraction of financial wealth directly managed by households and non-profit institutions is approximately 30% of total financial wealth and ranges from 25% in Sweden and the United Kingdom, to 45% in Italy[18]. We can draw two main considerations from this table. First, the sizeable fraction of direct holdings points to the policy relevance of the issue raised. Second, the quite similar figures across major developed countries may signal that our results, restricted to four European countries, could be valid for a larger set of developed economies.

Column (a) of Table 2 reports the average 2001-2004 domestic portfolio shares held by overall economies. For reference, we report, in column (d), the average market share, that is, the corresponding fraction of world stock market capitalization that would be the optimal portfolio share under the assumption of no market segmentation. As expected, all countries display home bias, as they place a disproportionately high fraction of their financial wealth in domestic assets. All countries invest over 50% of their portfolio internally, with Austria and Netherlands being the only exceptions. We place in bold the figures relative to the investing countries included in the analysis: their overall domestic share is close to the median (0.64), thus suggesting that they are not far from the representative developed economy.

A lack of diversification and a preference for local assets have been observed in both aggregate data (Lewis, 1999) and household-level data (Huberman, 2001). In columns (b) and (c), we report the domestic position held by institutional investors and by households and NPOs, respectively, in the four European economies analyzed in the paper. The domestic position of the overall economy ranges from 0.55 in Sweden to 0.78 in Spain. Regarding the domestic positions of different sectors, we find an interesting regularity: households display a much larger home bias than institutional investors. The domestic share held by households ranges from 0.76 for Italy to 0.94 for Spain, while

[17] Data on household investments refer to a self-selection of households choosing to invest their financial wealth directly in the stock market rather than operating through a financial intermediary. Lacking information on individual households, we have, of course, no ability to correct for this selection bias.

[18] The figure relative to the U.S. economy is consistent with descriptive statistics reported in Campbell (2006).

the range for institutional investors spans from 0.29 for Italy to 0.60 for France. This preliminary evidence suggests that investment patterns for households and institutional investors may be quite different, and it is worth investigating the determinants driving foreign portfolio allocation decisions for these two classes of investors[19].

In Table 3, we shift our focus from investing to destination countries. In column (a), we report the average foreign share – obtained by averaging across the four investing countries – invested in the country at the head of the row. In column (b), we report the market share attached to the destination countries in the opportunity set.

In column (c), we present the average bilateral foreign bias. The bilateral foreign bias is computed as the ratio of the actual share to the market share, following equation (2). The average foreign bias is obtained by averaging the bilateral foreign bias across investing countries. To provide an economic interpretation of this measure, consider that a bias measure equal to 1 implies that the foreign asset enters portfolios with a weight equal to its stock market share. The evidence that foreign bias is almost always below unity – i.e., that foreign assets are underweighted – is not surprising given the strong home bias reported in Table 2. The stock market foreign bias ranges from 0.11 for Canada to 1.08 for Sweden, which is the only country overweighted on average by foreign investors. Interestingly, the destination countries with foreign bias above the median (0.41), are primarily members of the European Monetary Union (EMU). These findings are consistent with previous studies (Lane and Milesi-Ferretti, 2007; Giofre', 2008; Balta and Delgado, 2009), which find a notable increase in foreign investments among EMU countries as a result of monetary integration. For our purposes, the most intriguing element is the overall heterogeneity across destination countries, which suggests the existence of some country-specific effect that makes some countries more attractive than others to foreign investors. Finally, in column (d), we report the standard deviation of the bilateral foreign bias: this provides information on the dispersion of the bilateral foreign bias of various investing countries with respect to the average. The degree of dispersion is quite large: on average, it is nearly 80 % of the average bias. The evidence of strong dispersion underlines that be-

[19] It would be interesting to explore eventual differences among the countries considered. However, the limited investment opportunity set and time span do not allow consistent country-specific estimates. In Table 8a, we control for our findings being driven by any of the investing countries included in the sample.

yond the differences arising from destination-country effects, there might also be investing-country and/or bilateral-specific components that induce differing evaluations of the same asset by different investors. This emphasizes the need to consider both bilateral-specific and country-specific factors in our empirical analysis as potential determinants of cross-border investment.

In tables 4a and 4b, we report the descriptive statistics and correlation matrix for all regressors. Statistics are computed for the variables in relative (to the world average) form, following our regression specification. This allows us to immediately draw some inferences regarding the sample of countries considered: mean values close to 1 in column (a) of Table 4a would indicate a sample in line with the world average, values higher or lower than 1 would signal instead a departure of the sample from the rest of the world's economies. We notice, for instance, that the countries included in the sample are relatively large and rich, transparent, have liquid and well developed stock markets and few restrictions on capital mobility. They are relatively close in geographical terms, while their cultural distance is quite in line with the world average.

In Table 4b, we report the correlation matrix for the regressors. Large correlation coefficients refer to covariates that never simultaneously enter the regression: for instance, the correlation between opacity and its sub-components is of course quite large (up to 0.907), but these regressors are considered as alternatives in columns (1)-(2d) of Table 8b. Similarly, the number of publicly listed companies is very highly correlated with the respective country's GDP (0.811), but these regressors represent two alternative proxies for stock market visibility. An analogous argument applies to the high correlation (0.868) between the Euronext dummy and the Euronext-LIFFE dummy that are alternatively included in the analysis[20].

4 Results

Standard asset pricing models using a representative agent predict that differences across assets should be capitalized in share prices, such that investing in any given nation's stocks should be a

[20] Note that we cannot compute the correlation coefficient between the common language dummy and the Euronext dummy (both versions) because when there is variability, across countries or over time, in one regressor (e.g., Euronext for France, language dummy for Spain) the other (language dummy for France, Euronext for Spain) does not vary.

fair investment, regardless of the countries' specificities (Dahlquist et al., 2003). As noted by Leuz et al. (2009), the key question is whether this price discount is sufficient for foreign investors, who plausibly face information problems beyond those of domestic investors. Indeed, the evidence of home bias can be read as evidence of the asymmetric perceptions of observable asset characteristics by foreign and domestic investors, thereby contradicting the representative agent hypothesis (French and Poterba, 1991; Gehrig, 1993; Kang and Stulz, 1997)[21].

In our setting, heterogeneity across investors is not limited to the "home versus foreign" dimension but is enriched by the "household versus professional" one. Consequently, the key point made by Leuz et al. (2009) becomes in our setting whether, among foreign investors, the price discount capitalized in share prices is *less* sufficient for *less* sophisticated foreign investors, such as households, than for institutional investors. The former sector is likely to suffer from information asymmetry that magnifies the perceived variability of foreign assets to a greater extent. To internationally diversify their portfolios, households would therefore need to be compensated by a higher asset return relative to financial investors or, alternatively, would require effective policies to alleviate informational barriers.

4.1 Proximity variables

The first variables included in the regression analysis are gravity (or familiarity) variables. They have been extensively used in the trade literature as determinants of trade flows between countries, and the same approach has been used, more recently, for equity flows (Portes et al., 2001; Portes and Rey, 2005) and equity holdings (Chan et al., 2005).

Many empirical contributions find that a market's cultural and geographic proximity has an important influence on investor stockholding and trading (Grinblatt and Keloharju, 2001; Faruqee et al., 2004; Chan et al., 2005; Portes and Rey, 2005; Lane and Milesi-Ferretti, 2008). Most of them investigate, relying on the *CPIS* dataset, the impact of these factors on investments made by a representative investor (Faruqee et al., 2004; Sorensen et al., 2007; Lane and Milesi-Ferretti, 2008;

[21] Domestic positions are not explicitly investigated here but enter our analysis indirectly: the weight of each foreign stock index in the overall portfolio also depends on the domestic share.

Ferreira and Miguel, 2011). Other contributions focus on the allocation of institutional investors such as mutual funds (Chan et al., 2005). We consider, instead, as in Grinblatt and Keloharju (2001), different investing sectors to detect whether the effect of familiarity on stockholding is related to the investor's degree of sophistication.

Market proximity captures the influence of asymmetric information on investors' portfolio choices (Gehrig, 1993; Brennan and Cao, 1997; Kang and Stulz, 1997). The regressors included as geographic proximity variables are geographical distance and a common border dummy. These covariates capture the physical distance between the investor's country and the destination country. The distance is measured as the Great Circle distance in miles between capital cities of the source (l) and destination (j) country. The average distance from a destination country (j) is obtained as the weighted (by market share) average of the distance of investing countries. The variable included in the regression is the logarithm of the relative distance, i.e., the ratio of the distance $l - j$ to the average distance from country j. If we consider the distance between countries l and j as an indicator of investment costs, we expect a negative sign on the associated β coefficient: a higher "relative proxy" (e.g., greater distance between the investing country l and the target country j with respect to the average distance) is associated with investor k biasing her portfolio away from country j's stocks. Because transactions in financial assets are "weightless", distance may only be found to play a role if it has informational content (Portes and Rey, 2005).

The border dummy can play a separate role in "correcting" for the distance between the capital cities of the destination and investing countries. The common border-dummy variable takes value 1 if the investing country and the destination country share a common border (0 otherwise).

The variables included to capture cultural proximity are the common language dummy and a more general index of cultural distance relying on Hofstede's (1980) seminal work.

The common language dummy takes value 1 if the investing country and the destination country share a common language (0 otherwise). The role of the common language dummy is easily interpretable: foreign languages make it more difficult to collect information, and this is likely to be a more serious issue for households than for professional investors.

The cultural distance measure has recently gained attention in the international finance liter-

ature (Beugelsdijk and Friins, 2010; Aggarwal et al., 2012). Although the field of cross-cultural studies is characterized by multiple approaches to culture (Adler, 1983), comparative empirical work in economics and international business has been dominated by Hofstede's (1980) seminal study[22].

Hofstede (2001) assigns each country a score on each cultural dimension to indicate how individuals from different cultures feel about the following societal issues: "Power Distance", "Uncertainty Avoidance", "Individualism", and "Masculinity". We adopt the extended version of Hofstede's index that adds "Long-Term Orientation" and "Indulgence versus Restraint" [23] and compute the Euclidean distance in culture between investing and destination countries, following Shenkar's (2001) variant of Kogut and Singh's (1988) measure (see Appendix B2 for more details on cultural dimensions and on construction of the distance measure)[24].

The first notable result, from column (1) in tables 5a and 6a, is the explanatory power of these regressors[25]. The R^2 is 43% for institutional investors and 53% for households, denoting a relatively stronger power for the latter. The second point to stress is the strong significant impact, in statistical and economic terms, of the proximity variables for both classes of investors. Specifically, the point estimate of the elasticity of portfolio bias (w_{lj}^k/MS_j) with respect to relative distance is approximately -1.5 for households and -1.0 for institutional investors, while point estimates for the proximity dummies (border and language) are more than twice as large for households. In terms of effects on the dependent variable, contiguity leads to a portfolio holding 2.2 times larger for households ($e^{0.774} = 2.17$) and a 30% increase for institutional investors ($e^{0.448} = 1.32$).

Cultural factors also affect home bias and foreign investment decisions. Sharing a common

[22] There has been some criticism of Hofstede's (1980, 2001) cultural framework, stating that the cultural dimensions, widely employed in empirical research, may not fully capture all aspects of culture. See Kirkman et al. (2006) for a comprehensive survey of the empirical studies relying on Hofstede's cultural values framework.

[23] Some argue that these new dimensions are not yet as widely collected or robustly analyzed as the other four. Our findings are qualitatively invariant to the choice of the four- versus the six-dimension measure (not reported but available upon request).

[24] Country scores on these dimensions – which have been proven quite stable over the decades – are meaningful to the extent that are in relative terms, i.e., insofar as societies are compared to other societies. These scores perfectly fit our setting, as all explanatory variables enter in relative terms.

[25] We report the unweighted R^2 statistics, to provide a more conservative coefficient of determination. Indeed, the R^2 of a weighted least squares regression is frequently much larger than the value obtained under the corresponding OLS regression. This does not capture an improvement in fit but rather the success of the weighting in solving the problem of heteroskedasticity. It is more appropriate and less misleading to report the proportional variance explained in the original metric rather than in the transformed one (Willet and Singer, 1988).

language has an impact similar to that observed for geographical contiguity for household investors, whereas it has a much stronger impact for financial investors, increasing the portfolio bias by a factor of 2.2. The cultural distance measure also significantly affects portfolio holdings with a similar magnitude across the two sectors: the elasticity of portfolio bias to a 10% increase in relative cultural distance leads to about an approximately 5% lower investment.

This latter finding is in line with results obtained by Aggarwal et al. (2012) and Beugelsdijk and Friins (2010), who find, for aggregate economies, that cultural differences between countries lead to a lower preference for foreign stocks.

As noticed by Buch et al. (2010), the importance of proximity and common culture – factors that are per se invariant to policy intervention – suggests the existence of a limit to the degree of international diversification achievable through the removal of formal economic barriers. Consequently, it becomes extremely relevant to identify policy-sensitive factors that are able to compensate for forces acting against international diversification, especially for those investors – households and non-profit institutions – that diversify less effectively. The remainder of the paper will pursue this objective.

4.2 Transparency

The empirical literature on financial investments has assessed the relevance of small-scale risks: fraudulent transactions, bribery, unenforceable contracts, and legal and regulation complexity unequivocally deter direct investments[26]. Recently, Gelos and Wei (2005), adopting opacity indexes similar to that considered here (Kurtzman et al., 2004), found that country transparency also affects portfolio investments in emerging markets.

We first examine whether a role for opacity in foreign portfolio investments also exists when the analysis is focused on developed stock markets. Second, we test whether this role – if any – is stronger for less sophisticated investors, who are likely more severely affected by informational barriers. We include, as a potential explanatory variable, an index capturing the degree of opacity

[26] Noy and Vu (2007), for instance, find that liberalizing the capital account is not sufficient to generate increases in FDI inflows unless it is accompanied by a lower level of corruption or a decrease in political risk.

in the destination country (Kurtzman et al., 2004). It is a synthetic measure (1-100) of indexes coming from 41 different sources (the World Bank, IMF, International Securities Services Association, International Country Risk Guide and individual countries' regulations) and is the synthesis of five sub-indexes capturing corruption, inefficacy of the legal system, deleterious economic policies, inadequate accounting and governance practices, and detrimental regulatory structures. This destination country-specific variable enters our specification as a relative opacity index, that is, as the country's opacity relative to the average world opacity.

Interestingly, the relative opacity index shows the expected negative sign for both types of investors (column (2) of tables 5a and 6a) but is only statistically significant for households. The coefficient for households is not only statistically significant but also quite large in economic terms: the elasticity higher than 1 implies that a 50% higher value of the opacity index more than halves the portfolio bias. After the inclusion of the opacity index, the proximity variables' coefficients appear to be qualitatively unchanged for both institutional investors and households. Our results suggest that institutional transparency enhances foreign portfolio investments by alleviating information asymmetries for non-professional investors.

4.3 Common exchange market: Euronext

The competition and integration of stock exchanges in Europe has recently attracted substantial attention (Di Noia, 2001; Kazarian, 2006), with a particular emphasis being devoted to the consolidation of the Euronext platform (Schmiedel and Schönenberger, 2005; Ramos and von Thadden, 2008; Kasch-Haroutounian and Theissen, 2009). Previous studies (Dahlquist and Robertsson, 2001; Pagano et al., 2002; Ahearne et al., 2004; Sarkissian and Shill, 2004) show how foreign firms publicly listed on the stock exchange of a given country, subject to standardized regulations and homogenization of accounting rules, are preferred by investors residing in that country. This is commonly interpreted as cross-listing being a means by which firms can reduce information asymmetry. Vlachos (2004), in his analysis relying on *CPIS* data, more generally highlights the relevance of regulatory harmonization as a determinant of cross-country portfolio holdings.

Following this perspective, we consider the effects of Euronext's creation. We test whether

being listed on a common exchange platform such as Euronext (Amsterdam, Brussels, Lisbon, and Paris), had any effect on stock portfolio decisions and whether this impact depends on the investor's sophistication.

In September 2000, Euronext was formed by the stock exchanges of Paris, Brussels, and Amsterdam. In February 2002, Euronext continued to grow and merged with the Portuguese exchange. We include a dummy variable taking value 1 if the investing and destination countries share the same stock exchange platform (0 otherwise). We expect the creation of a common stock exchange to be perceived by investors as a reduction in informational barriers due to standardized financial regulations. Among the investing countries considered, only France is a Euronext member, while all Euronext countries belong to the set of destination stock indexes. The coefficient of the Euronext dummy captures, ceteris paribus, the relative increase in foreign bias in Portugal, the Netherlands and Belgium by French investors with respect to investments in non-Euronext countries. If investors perceive the creation of a common stock exchange as a reduction in informational barriers, we would expect this channel to be more effective for households than institutional investors. The results reported in column (3) of tables 5a and 6a corroborate this conjecture. The coefficient is positive and significant for both classes of investors, though larger for households.

Our findings could capture other dimensions such as liquidity, visibility and the common currency of the EMU members. In columns (4) and (5), we control for these factors to disentangle the effects of Euronext consolidation.

4.3.1 *Controlling for common currency, liquidity and visibility*

Members of the Euronext exchange are also members of the European Monetary Union (EMU): the Euronext effect could spuriously capture the higher comovement (Contessi and De Pace, 2009; Giofre', 2012) and reciprocal attractiveness among EMU countries (Berkel, 2004; Lane and Milesi-Ferretti, 2008; Slavov, 2009) due to the elimination of exchange rate risk, as documented in the recent literature. We therefore include the EMU dummy (which takes value 1 if both the investing and destination countries are EMU members, and 0 otherwise) as a control[27].

[27] Among investors, Italy and Spain are EMU but not Euronext members, and among destination countries, Austria, Finland, Germany, Italy, and Spain are EMU but not Euronext members.

Second, we also need to decompose the Euronext effect from the liquidity component. Padilla and Pagano (2006) find that integrating the Amsterdam, Brussels, Lisbon, and Paris exchanges into a single platform resulted in a significant increase in liquidity. We consider a variable capturing the relative measure of stock market illiquidity adopted by Bortolotti et al. (2007). This is a price impact measure that is the aggregate version of Amihud's (2002) illiquidity measure and captures the response of the stock index return to stock market turnover. It is defined as the ratio of the absolute return on the stock index to turnover: the higher the stock index return's reaction to a given turnover rate, the higher the illiquidity of the stock market[28].

Finally, visibility issues have been shown to be important for stock investment (Arbel and Strebel, 1982; Arbel et al., 1983; Merton, 1987; Grullon et al., 2004; Yuan, 2012): a larger stock market is more likely to attract the attention of investors and reduce informational asymmetries.

To properly account for this issue, we proxy visibility by the number of publicly listed companies, which is expected to significantly influence international portfolio holdings (Faruquee et al., 2004; Chan et al., 2005; Sercu and Vanpée, 2008)[29].

Our findings in column (4) indicate that the common currency dummy is, for both classes of investors, economically and statistically relevant: sharing a common currency has a strong impact on portfolio bias, with a larger coefficient for households and NPOs.

The illiquidity measure has the expected negative sign and is significant for both types of investors, although the elasticity is more than two times larger for households than for institutional investors[30].

In column (5), we control for the effect of the number of publicly listed companies on foreign portfolio investment. The effect of visibility has the expected positive sign but is not statistically significant for either sector and does not affect previous findings[31].

[28] See Appendix B.2 for further details on the illiquidity index.

[29] We cannot use the logarithm of total market capitalization as a proxy of stock market visibility: it would induce an automatic source of endogeneity in the regression, as the same variable appears as the denominator in the dependent variable.

[30] The same results apply when considering the annual turnover rate (see Tables 5b, 6b) as an alternative and more commonly adopted, measure of liquidity (Levine, 1997; Dahlquist and Robertsson, 2001; Lane and Milesi-Ferretti, 2008). As noted by Bortolotti et al. (2007), the Amihud (2002) index is a better proxy for market (il)liquidity than the turnover ratio, as the latter may not account for all aspects of market liquidity (Hasbrouk, 2003).

[31] The significance in the coefficient of stock market visibility when proxied by other variables is restored in some cases (see columns (2a) and (2b) in tables 5b and 6b), but this never affects our main findings.

Interestingly, after controlling for liquidity, the EMU dummy and stock market visibility, the impact of the Euronext dummy for households is only slightly reduced and remains large and significant, while the impact for institutional investors disappears.

4.4 Additional controls

Finally, we include other factors that are potentially correlated with the above-described regressors and might therefore bias our findings.

Gompers and Metricks (2001) identify contrarian trading behavior as a characteristic of large investors. Because households are typically small investors, there might be some variables included in our analysis that are highly correlated with the past reward-to-risk ratio, thereby biasing our results.

Analogously, direct costs might have, a priori, a different impact on households and institutional investors, as they operate on a diverse scale. We therefore also include direct costs as potential confounding factors that influence cross-border investment.

4.4.1 Return-chasing or contrarian trading?

We first include the "relative" lagged Sharpe ratio, that is, the 3-year lagged excess return of the country's stock market relative to world returns, divided by the standard deviation of the excess return[32].

Contrarian trading behavior is identified as a characteristic of large investors (Gompers and Metricks, 2001). As households are typically small investors, omitting the past reward-to-risk ratio might bias the coefficients of the included variables. We present results in column (6) of tables 5a and 6a. We find a significant negative role for the lagged Sharpe ratio for both sectors and a stronger negative impact for institutional investors, as predicted by the literature.

[32] We choose the 3-year lagged Sharpe ratio in the main specification because the 1-year could be quite volatile and the 5-year quite smooth (as also evidenced in Table 4a). For robustness checks, in columns 3a and 3b of tables 5b, 6b and 7b, we also report results under the two alternative specifications: the choice of the lag does not affect our main findings.

4.4.2 Restrictions to capital mobility

Finally, we add, as a further control, a variable capturing direct investment barriers, that is, restrictions to international capital mobility.

Lacking a measure of bilateral-specific direct costs, we decompose D_{lj} into two components: the relative "source component" (D_l), that is, the costs that investors face to transfer funds out of their own country l, and the relative "host component" (D_j), that is, the cost faced to enter country j[33]. The barrier faced by country l's investment in country j depends both on the restrictions imposed by country l on outward investment and on the restrictions imposed by country j on inward investment.

We adopt an index measuring the restrictions imposed by different countries on capital flows derived from the *Economic Freedom Network* (Chan et al., 2005; Ferreira and Miguel, 2011)[34]. This index (0-10) measures the restrictions countries impose on capital flows, assigning a lower rating to countries with more restrictions on foreign capital transactions.

The strand of the literature attempting to explain the lack of portfolio diversification through the existence of barriers to international investment dates back to contributions by Black (1974), Errunza and Losq (1981), and Stulz (1981). As the relaxation of capital controls in recent decades has not significantly induced a parallel decline in home bias, the direct transaction costs' explanation has been considered inadequate (Ahearne et al., 2004; Berkel, 2004). When considering the aggregate economy in Table 7a, we find mixed evidence: column (7) shows how capital control restrictions in the destination country do not have any significant impact on foreign portfolio holdings while investing countries' restrictions do. Interestingly, heterogeneity can be observed when comparing the two sectors. Our results, displayed in column (7) of tables 5a and 6a, show how the source and host components of capital mobility variables have no impact on institutional investors, while they have a significant and relevant explanatory power for households and NPOs.

Overall, the different impact of our main variables of interest, opacity and the Euronext dummy,

[33] See Appendix B.2 for further details on the two components.

[34] Edison and Warnock (2003) propose an alternative measure of capital controls based on the International Finance Corporation's (IFC) emerging market indices. However, this cannot be adopted here because our analysis is restricted to developed countries.

across sectors persists after controlling for past reward-to-risk ratio and capital controls.

A final consideration can be drawn by comparing tables 5a and 6a with Table 7a. The results for the aggregate economy reported in Table 7 are quite in line with results relative to institutional investors as reported in Table 6a. This finding is fully consistent with Chan et al. (2005), who emphasize how mutual funds' investment patterns – and, more generally, institutional investors' patterns – reflect the portfolio allocation of the representative investor in a given country. In contrast, the clear difference between portfolios held by households and the overall economy reveals the fallacy of extending policy implications obtained for aggregate economies to individual investors, as the representative country investor is far from "representing" the representative directly -investing household.

4.5 Robustness checks

Tables 5b, 6b and 7b check the robustness of our findings to alternative specifications.

We first consider a more commonly used alternative to measure liquidity (Levine, 1997; Dahlquist and Robertsson, 2001; Lane and Milesi-Ferretti, 2008), the turnover rate. In column (1), we find that this measure of liquidity has the expected positive sign with a coefficient for households that is twice as large[35].

We then consider in column (2a) the relative GDP as an alternative to the number of listed companies to proxy for visibility, as proposed in the literature (Faruquee et al., 2004; Chan et al., 2005; Sercu and Vanpée, 2008). A third proxy, the market share of listed companies scaled by the country's GDP, is considered in column (2b). While relative GDP has a positive and significant impact on portfolio holdings for both investing sectors, the scaled market capitalization is positive and significant for institutional investors while it has a counterintuitive negative coefficient for households. Our main findings are however qualitatively invariant to the choice of visibility proxy.

We next examine alternative lagged Sharpe ratios. While in the main specification we adopt the 3-year lagged Sharpe ratio, in columns (3a) and (3b) we test the sensitivity of our results to 5

[35] The turnover measure is negatively correlated (-0.502) with the illiquidity measure (Table 3b). This emphasizes that turnover plays an important role in determining the illiquidity measure but also that the return's impact on the numerator makes the two measures substantially different.

year- and 1 year-lagged Sharpe ratios, respectively. Coefficients differ across sectors and the choice of lags but do not affect other regressors' coefficients.

Finally, we test for an alternative definition of the Euronext platform. In 2002, Euronext also merged with the futures exchange LIFFE (London International Financial Futures and Options Exchange). In column (4), we test the effect of this event: consistently, it is only significant for households' investments. As LIFFE is not strictly a stock exchange, the lower coefficient size was expected and can be interpreted as supportive of our thesis on the impact of stock exchange mergers.

4.6 Testing the difference between households and institutional investors

To test the significance of the difference in the effects of our variables between households and institutional investors, we run regression (5), where the dependent variable is the logarithm of the ratio of the household portfolio share in country j to the corresponding share held by institutional investors, $\log(w_{lj}^H / w_{lj}^F)$. The coefficients capture the wedge in sensitivity to country-level factors between households and institutional investors[36]. The results are reported in Table 8a, column (1). Had the effect of one regressor been equal for households and institutional investors, we would have observed that its coefficient was not significantly different from zero. In column (1) we observe, for instance, that the null hypothesis is not rejected for the coefficient of the cultural distance variable, thus revealing that the effect of this variable on the two classes of investors is not significantly different. For other familiarity variables (border and language), opacity, and the Euronext dummy, the coefficients are instead significantly different from zero, revealing a stronger impact of these variables on households[37].

4.6.1 Sensitivity analysis

We now investigate the sensitivity of our results to the sample of investing and destination countries.

[36] Also in this regression we include investing country fixed effects to allow for a different effect of the source country for the two sectors. Peculiarities in the financial structure of the investing economy could have indeed a diverse effect on the financial decisions of individuals and insititutional investors.

[37] Our results are not statistically driven by the large households' home bias: the logarithmic specification makes coefficients invariant to any scale factor, that is, completely absorbed by the intercept. In other words, if households' and institutional investors' shares of the foreign portfolio were identical, then the coefficients of our regressors would also be identical, regardless of the sharp difference in their domestic positions.

In columns (2) and (3), we modify the sample of destination countries, while in columns (4a)-(4d) we test the sensitivity to investing countries. In column (2), we enlarge the sample to include Switzerland and Ireland. These countries are excluded in the main regression analysis because the IMF includes them in the pool of offshore financial centers: investors' decisions can be distorted for reasons beyond the scope of this work. We test the eventually asymmetric response by households and institutional investors to this issue and its impact on our main findings.

In column (3), we run our GLS regression while excluding Hong Kong and Singapore from the pool of destination stock markets. The motivation concerns possible (explicit or implicit) constraints, especially for pension funds and life insurance companies (Davis, 2001), restricting non-OECD foreign asset holdings[38].

In both cases, the coefficients of our variables of interest, opacity and the Euronext dummy, are only modestly affected by sample variation and maintain their economic and statistical significance.

Finally we test whether our findings are driven by a particular investing country. In columns (4a)-(4d), we display the results when France, Italy, Spain, or Sweden is, respectively, excluded from the sample[39]. The coefficients display some variability when one country is excluded from the sample but, comfortingly, a single country does not drive our results[40].

4.6.2 Robustness

In Table 8b, results from Table 8a undergo further investigations and robustness checks. To ease comparability, we report in column (1) the corresponding column of Table 8a.

In columns (2a)-(2e), we investigate which factors of the opacity index are particularly relevant for households. The opacity index is replaced, alternatively, by inadequate accounting and governance practices (column 2a), corruption (column 2b), deleterious enforcement of economic policies (column 2c), inefficacy of the legal system (column 2d), and detrimental regulatory structures (col-

[38] Notice that also Singapore is considered, under some dimensions, as an active offshore financial center: by checking the robustness of our results to its exclusion, we account for this legitimate objection.

[39] When France is excluded from the sample, the Euronext dummy is necessarily excluded from the regression. The same holds for the common language dummy when Spain is dropped.

[40] The variability of the coefficients is not surprising: the exclusion of one country represents a reduction in the sample size by one-fourth. The R^2 also displays some variability: it is equal to the benchmark R^2 in column (1) when Italy is excluded, modestly decreased by the exclusion of France and Sweden, and notably increased when Spain is dropped.

umn 2e)[41]. We find that, with the exception of the proxy in column (2c), the other four sub-indices have a stronger impact on households' portfolio holdings.

Finally, in columns (3) and (4), we check the robustness of our findings to alternative econometric specifications. In column (3), our GLS regression is replaced by a standard pooled OLS regression (with fixed investing country effects and time dummies), and our findings are not affected. In column (4), we run a cross-sectional regression. As the Euronext dummy is a time-varying covariate (Portugal joined Euronext only in 2002), we lose a potentially important piece of information by neglecting the time dimension. We find that the Euronext coefficient still displays a positive sign but a weaker statistical significance[42]. We interpret this result as supporting the relevance of our Euronext variable: the evidence that its effect crucially depends on the timing of Portugal's entry into the platform helps dispel the legitimate doubts that the Euronext dummy spuriously captures other omitted country-pair specific factors.

5 Conclusions

We analyze the determinants of foreign portfolio allocations of more sophisticated investors – institutional investors – and less sophisticated investors – households – in four European countries, France, Italy, Spain, and Sweden, over the period 2001–2004.

We provide evidence that households' foreign portfolio investments are more heavily influenced by proximity variables, the transparency of the destination stock market, and the presence of a common stock exchange market – Euronext.

Our results contribute to the relatively scarce extant literature comparing the investment behaviors of individuals and institutional investors. In particular, these findings provide support for the design of policies aimed at promoting portfolio diversification for less sophisticated investors, who diversify less effectively. Any effort to improve transparency and disclosure in financial mar-

[41] As noted above, some components of the opacity index are very highly correlated (Table 3b), and this hampers their contemporaneous inclusion in the regression.

[42] Note that the coefficient of Euronext in columns (2a) and (4) of Table 8b is not significantly different from zero. However, the corresponding *p-values* are, respectively 0.102 and 0.109, then very close to significance at the standard level of confidence.

kets is expected to induce greater international portfolio diversification, especially in households' portfolios.

More specifically, this is the first work to detect a significant and sizeable role for the consolidation of the Euronext stock exchange on international portfolios: less-informed investors seem to benefit from the information disclosure mechanisms connected with common listing. This result appears particularly insightful in light of recent stock exchange mergers: eliciting more uniform and standardized trading rules can be an effective mechanism to alleviate information costs and enhance international diversification for less sophisticated investors. Further research is therefore encouraged in this direction by exploiting more recent stock exchange consolidation events to derive sounder and more general conclusions on their effect on international portfolio diversification.

Acknowledgements

I am particularly indebted to two anonymous referees and the editor Hamid Beladi for their constructive comments that greatly improved the paper. I am grateful to David Amdur, Fabio Bagliano, Hisham Foad, Elsa Fornero, Thomas Gehrig, Massimo Guidolin, Iftekhar Hasan, and Giovanna Nicodano. I have also benefited from helpful comments of participants to the CCA seminar (Turin, Italy), the XVII International Tor Vergata Conference on Banking and Finance (Rome, Italy), the XIII Annual ICMAIF Conference (Rethymno, Greece), the 7th INFINITI Conference (Dublin, Ireland), and the 26th Symposium on Money, Banking and Finance (Orléans, France). Financial support from MIUR is gratefully acknowledged. The usual disclaimer applies.

References

Abreu, M. and V. Mendes (2010). Financial literacy and portfolio diversification. Quantitative Finance, 10, 515-528.

Adler, N. (1983). A typology of management studies involving culture. Journal of International Business Studies, 14, 29-47.

Aggarwal, R., C. Kearney and B. Lucey (2012). Gravity and culture in foreign portfolio investment. Journal of Banking and Finance, 36(2), 525-538.

Ahearne, A.G., W.L. Griever and F.E. Warnock (2004). Information Costs and Home Bias: An Analysis of U.S. Holdings of Foreign Equities. Journal of International Economics, 62, 313-336.

Amihud, Y. (2002). Illiquidity and Stock Returns: Cross-Section and Time-Series Effects. Journal of Financial Markets, 5, 31-56.

Arbel, A., S. Carvell and P. Strebel (1983). Giraffes, institutions and neglected firms. Financial Analysts Journal, 39 (3), 57-63.

Arbel, A. and P. Strebel (1982). The neglected and small firm effects. Financial Review, 17 (4), 201-218.

Balta, N. and J. Delgado (2009). Home bias and market integration in the EU. CESifo Economic Studies, 55, 110–144.

Barber, B. M. and T. Odean (2008). All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors. Review of Financial Studies, 21(2), 785-818.

Baxter, M. and U. Jermann (1997). The international diversification puzzle is worse than you think. American Economic Review, 87, 170–180.

Berkel, B. (2004). Institutional determinants of International Equity Portfolios- A Country-Level Analysis. EFA 2004 Maastricht Meetings, Paper No. 2899.

Beugelsdijk, S. and B. Frijns (2010). A cultural explanation of the foreign bias in international asset allocation. Journal of Banking and Finance, 34(9), 34, 2121-2131.

Black, F.S. (1974). International Capital Market Equilibrium with Investment Barriers. Journal of Financial Economics, 1, 337-352.

Bortolotti, B., F. de Jong, G. Nicodano and I. Schindele (2007). Privatization and stock market liquidity. Journal of Banking and Finance, 31(2), 297-316.

Brennan, M.J. and H.H. Cao (1997). International portfolio investment flows. Journal of Finance, 52, 1851–1880.

Buch, C.M., J. C. Driscoll and C. Ostergaard (2010). Cross-Border Diversification in Bank Asset Portfolios. International Finance, 13(1), 79-108.

Calvet, L., J. Campbell and P. Sodini (2007). Down or out: assessing the welfare costs of household investment mistakes. Journal of Political Economy, 115, 707-747.

Campbell, J. Y. (2006). Household Finance. Journal of Finance, 61, 1553-1604.

Chan, K., V. Covrig and L. Ng (2005). What determines the Domestic and Foreign Bias? Evidence from Mutual Fund Equity Allocations Worldwide. Journal of Finance, 60(3), 1495-1534.

Cohen, R. (2003). Asset allocation decisions of individuals and institutions. Working paper, Harvard Business School.

Contessi, S. and P. De Pace (2009). Do European capital flows comove?. The North American Journal of Economics and Finance, 20(2), 145-161.

Cooper, I.A. and E. Kaplanis (1994). Home Bias in Equity Portfolios, Inflation Hedging and International Capital Market Equilibrium. Review of Financial Studies, 7(1), 45-60.

Coval, J. and T. Moskowitz (1999). Home Bias at Home: Local Equity Preference in Domestic Portfolios. Journal of Finance, 54, 2045-2073.

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

Dahlquist, M. and G. Robertsson (2001). Direct Foreign Ownership, Institutional Investors and Firm Characteristics. Journal of Financial Economics, 59, 413-440.

Davis, E.P. (2001). Portfolio Regulations of Life Insurance Companies and Pension Funds. Discussion Paper PI-0101, The Pensions Institute, Birckbeck College, London.

Di Noia (2001). Competition and Integration among Stock Exchanges in Europe: Network Effects, Implicit Mergers and Remote Access. European Financial Management, 7, 39-72.

Edison, H. and F. Warnock (2003). A Simple Measure of the Intensity of Capital Controls. Journal of Empirical Finance, 10, 83-103.

Epstein, L. and J. Miao (2003). A two-person dynamic equilibrium under ambiguity. Journal of Economic Dynamics and Control, 27, 1253–1288.

Errunza, V. and E. Losq (1981). International Asset Pricing Under Mild Segmentation: Theory and Test. Journal of Finance, 40, 105-124.

Faruqee, H, S. Li and I.K. Yan (2004). The Determinants of International Portfolio Holdings and Home Bias. IMF Working Paper WP/04/34.

Ferreira, M. A. and A. F. Miguel (2011). The determinants of domestic and foreign bond bias. Journal of Multinational Financial Management, 21(5), 279-300.

Fidora, M, M. Fratzscher and C. Thimann (2007). Home Bias in Global Bond and Equity Markets: The Role of Real Exchange Rate Volatility. Journal of International Money and Finance, 26, 631-655.

French, K. and J.M. Poterba (1991). International Diversification and International Equity Markets. American Economic Review, 81(2), 222-226.

Fugazza, C., M. Giofre' and G. Nicodano (2011). International Diversification and Industry-Related Labor Income Risk. International Review of Economics and Finance, 20, 764-783.

Gelos, R.G. and S.J. Wei (2005). Transparency and International Portfolio Holdings. Journal of Finance, 60, 2987-3020.

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

Giofre', M. (2008). EMU Effects on Stock Markets: from Home Bias to Euro Bias. International Research Journal of Finance and Economics, 15, 136-158.

Giofre', M. (2009). The Role of Informational Asymmetries and Inflation Hedging in International Equity Portfolios. Journal of Multinational Financial Management, 19, 237-255.

Giofre', M. (2012). Convergence of EMU Equity Portfolios. Open Economies Review, 23(2), 381-419.

Goetzmann, W. and A. Koumar (2008). Equity Portfolio Diversification. Review of Finance 12, 433-463.

Gompers, P.A. and A. Metrick (2001). Institutional Investors and Equity Prices. Quarterly Journal of Economics, 116, 229-259.

Griffin, J.M., J.H. Harris and S. Topaloglu (2003). The Dynamics of Institutional and Individual Trading. Journal of Finance, 58(6), 2285-2320.

Grinblatt, M. and M. Keloharju (2001). How Distance, Language, and Culture Influence Stockholdings and Trades. Journal of Finance, 56, 1053-1073.

Grossman, S. and J. Stiglitz (1980). On the impossibility of informationally efficient markets. American Economic Review, 70, 393–408.

Grubel, H. (1968). International diversified portfolios: Welfare gains and capital flows. American Economic Review, 58, 1299–1314.

Grullon, G., Kanatas, G., Weston, J. (2004). Advertising, breadth of ownership, and liquidity. Review of Financial Studies, 17(2), 439-461.

Guiso, L. and T. Jappelli (2005). Awareness and Stock Market Participation. Review of Finance, 9(4), 537-567.

Guiso, L. and T. Jappelli (2009). Financial literacy and portfolio diversification. CSEF Working Papers 212.

Guiso. L. and P. Sodini (2012). Household Finance: An Emerging Field. CEPR Discussion Paper #8934.

Haliassos, M. and C. Bertaut (1995). Why do so few hold stocks?. Economic Journal, 105, 1110-1129.

Hasbrouck, J. (2003). Trading Costs and Returns for US Equities: the Evidence from Daily Data. Working Paper NYU, Stern School of Business.

Hofstede, G. (1980). Culture's Consequences: International Differences in Work-Related Values. Beverly Hills CA: Sage Publications.

Hofstede, G. (2001). Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations. 2nd Edition, Thousand Oaks CA: Sage Publications.

Hsu, J. (2012). What drives equity market non-participation?. The North American Journal of Economics and Finance, 23, 86-114.

Huberman, G. (2001). Familiarity Breeds Investment. Review of Financial Studies, 14, 659-680.

Ivkovic, Z. and S. Weisbenner (2005). Local Does as Local Is: Information Content of the Geography of Individual Investors' Common Stock Investments. Journal of Finance, 60, 267-306.

Jain, R. (2007). Institutional and individual investor preferences for dividends and share repurchases. Journal of Economics and Business, 59,06-429.

Kang, J.K. and R. Stulz (1997). Why is There a Home Bias? An Analysis of Foreign Portfolio Equity Ownership in Japan. Journal of Financial Economics, 46, 3-28.

Karlsson, A. and L. Nordén (2007). Home Sweet Home: Home Bias and International Diversification among Individual Investors. Journal of Banking and Finance, 31, 317-333.

Kasch-Haroutounian, M. and E. Theissen (2009). Competition between Exchanges: Euronext versus Xetra. European Financial Management, 15, 181–207.

Kazarian, E. (2006). Integration of the Securities Market Infrastructure in the European Union: Policy and Regulatory Issues. IMF Working Paper # 241.

Kimball, M.S. and T. Shumway (2007). Investor Sophistication and the Home Bias, Diversification, and Employer Stock Puzzles. University of Michigan, mimeo.

Kirkman, B., K. Lowe, K. and C. Gibson (2006). A quarter century of Culture's Consequences: A review of empirical research incorporating Hofstede's cultural values framework. Journal of International Business Studies 37, 285-320.

Kogut, B. and H. Singh (1988).The effect of national culture on the choice of entry mode. Journal of International Business Studies, 19, 411–432.

Kurtzman, J., G. Yago and T. Phumiwasana (2004), The Global Costs of Opacity: Measuring Business and Investment Risk Worldwide. MIT Sloan Management Review

Lakonishok, J. and E. Maberly (1990). The Week-end effect: Trading Patterns of Individual and Institutional Investors. Journal of Finance, 45, 231-243.

Lane, P. and G. Milesi-Ferretti (2007). The international equity holdings of euro area investors. In The Importance of the External Dimension for the Euro Area: Trade, Capital Flows, and International Macroeconomic Linkages (Robert Anderton and Filippo di Mauro, eds), Cambridge University Press.

Lane, P. and G.M. Milesi-Ferretti (2008). International Investment Patterns. Review of Economics and Statistics, 90, 538-549.

Levine, R. (1997). Financial Development and Economic Growth. Views and Agenda. Journal of Economic Literature, 35, 688-726.

Levy, H. and M. Sarnat (1970). International diversification in investment portfolios. American Economic Review, 60, 668–675.

Lewis, K. (1999). Trying to Explain Home Bias in Equities and Consumption. Journal of Economic Literature, 37(2), 571-608.

Leuz, C., K. Lins, and F. Warnock (2009). Do foreigners invest less in poorly governed firms?. Review of Financial Studies, 22, 3245–3285.

Li, K. (2004). Confidence in the familiar: An international perspective. Journal of Financial and Quantitative Analysis, 39, 47–68.

Markowitz, H. (1952). Portfolio selection. Journal of Finance, 7, 77–91.

Merton, R. (1969). Lifetime portfolio selection under uncertainty: the continuous time case. Review of Economics and Statistics, 51, 247–257.

Merton, R. (1987). A simple model of capital market equilibrium with incomplete information. Journal of Finance 42 (3), 483-510.

Nordén, L. (2010). Individual Home Bias, Portfolio Churning and Performance. European Journal of Finance, 16, 329-351.

Noy, I. and T. Vu (2007). Capital account liberalization and foreign direct investment. The North American Journal of Economics and Finance, 18(2), 175-194.

Obstfeld, M. and K. Rogoff (2001). The six major puzzles in international macroeconomics: is there a common cause?. NBER Macroeconomics Annual 15, 339–390.

Padilla, A., J. and M. Pagano (2005). Efficiency Gains from Integration of Exchanges. Lessons from the Euronext 'natural experiment'. A Report for Euronext, Law and Economics Consulting Group (LECG), Brussel-Madrid.

Pagano, M., A. Roell and J. Zechner (2002). The Geography of Equity Listing: Why Do Companies List Abroad?. Journal of Finance, 57(6), 2651-2694.

Palacios-Huerta, I. (2001). The human capital of stockholders and the international diversification puzzle. Journal of International Economics, 54(2), 309-331.

Pesenti, P. and E. van Wincoop (2002). Can nontradables generate substantial home bias?. Journal of Money, Credit and Banking, 34, 25–50.

Portes, R., H. Rey and Y. Oh (2001). Information and capital Flows: The determinants of transactions in financial assets. European Economic Review, 45, 783-796.

Portes, R. and H. Rey (2005). The Determinants of Cross-Border Equity Flows. Journal of International Economics, 65(2), 269-296.

Ramos, S. B. and E.- L. von Thadden (2008). Stock exchange competition in a simple model of capital market equilibrium. Journal of Financial Markets, 11, 284–307

Sarkissian, S. and M.J. Shill (2004). The Overseas Listing Decisions: New Evidence of Proximity Preference. Review of Financial Studies, 17, 769-809.

Sharpe, W. (1964). Capital asset prices: A theory of market equilibrium under the condition of risk. Journal of Finance, 19, 425–442.

Shenkar, O. (2001). Cultural distance revisited: Towards a more rigorous conceptualization and measurement of cultural differences. Journal of International Business Studies, 32, 519–535.

Schmiedel., H. and A. Schönenberger (2005). Integration of Securities Market Infrastructure in the Euro Area. ECB Occasional Paper Series #33.

Sercu, P. and R. Vanpee (2008). Estimating the Costs of International Equity Investments. Review of Finance (2008), 12 (4), 587-634.

Slavov, S. (2009). Do common currencies facilitate the net flow of capital among countries?. The North American Journal of Economics and Finance, 20 (2), 124-144.

Solnik, B. (1974). The international pricing of risk: An empirical investigation of the world capital market structure. Journal of Finance 47, 365–378.

Sorensen, B. E., Y. Wu, O. Yosha and Y. Zhu (2007). Home Bias and International Risk Sharing: Twin Puzzles Separated at Birth. Journal of International Money and Finance, 26, 587-605.

Strong, N. and X. Xu (2003). Understanding the equity home bias: Evidence from survey data. Review of Economics and Statistics, 85, 307–312.

Stulz, R. M. (1981). On the Effects of Barriers to International Investment. Journal of Finance, 36(4), 923-934.

Tesar, L. and I. Werner (1995). Home bias and high turnover. Journal of International Money and Finance, 14, 467–492.

Uppal, R. and T. Wang (2003). Model misspecification and underdiversification. Journal of Finance 58, 2465–2486.

Vissing-Jorgensen, A. (2003). Perspectives on Behavioral Finance: Does "Irrationality" Disappear with Wealth? Evidence from Expectations and Actions. In M. Gertler and K. Rogoff, eds NBER Macroeconomics Annual 2003, MIT Press, Cambridge, MA

van Rooij, M., A. Lusardi, and R. Alessie (2011). Financial literacy and stock market participation. Journal of Financial Economics, 101, 449–472.

Vlachos, J.(2004). Does Regulatory Harmonization Increase Bilateral Asset Holdings?. CEPR 4417 Discussion Paper.

von Gaudecker, H. (2011). How does household portfolio diversification vary with financial sophistication and advice?. Netspar Discussion Papers No. 03/2011-026.

Willet, J.B and J.D. Singer (1988). Another Cautionary Note about R^2: Its Use in Weighted Least-Squares Regression Analysis. The American Statistician, 42(3), 236-238.

Yuan, Y. (2012). Market-wide attention, trading, and stock returns. http://ssrn.com/abstract=1105532 or http://dx.doi.org/10.2139/ssrn.1105532.

A Theoretical framework

Following Merton (1969) with constant relative risk aversion utility function and constant investment opportunities the vector of optimal portfolio shares takes the well-known following form:

$$\mathbf{w}^* = \frac{1}{\lambda}\mathbf{\Sigma}^{-1}(\bar{\boldsymbol{\mu}} - r\mathbf{i}) \tag{6}$$

where λ is the coefficient of relative risk aversion, $\mathbf{w}$ is the vector of weights, $\bar{\boldsymbol{\mu}}$ is the vector of stock returns, r is the risk-free interest rate, $\mathbf{i}$ is a vector of ones and $\mathbf{\Sigma}$ is the covariance matrix of stock returns.

We incorporate in this standard setting investment cross-border barriers following Gehrig (1993) approach. In his contribution foreign investments appear on average more risky to domestic investors -leading to an information-based justification to home bias- and the portfolio of each investor is different depending on the perceived covariance matrix[43]. We follow this approach when dealing with the departure from the CAPM model on foreign investment, considering a different investor-specific perceived variability of stock returns for each foreign stock index in the investment opportunity set.

Let us denote by $\mathbf{C}_l$ the NxN positive definite diagonal matrix of investment barriers, where the $j-th$ diagonal element C_{lj} is the cost of holding country j's stock by country l's investor. Capturing C_{lj} the investment barrier cost for country l investing in j , its reciprocal $\frac{1}{C_{lj}}$ stands for a variable capturing the investment "advantage" of country l investing in country j. Consequently, the optimal portfolio is no longer universal ($\mathbf{w}^*$) but is investor-specific ($\mathbf{w}_l$)

$$\mathbf{w}_l = \frac{1}{\lambda}\mathbf{\Sigma}_l^{-1}(\bar{\boldsymbol{\mu}} - r\mathbf{i}) = \mathbf{C}_l^{-1}\mathbf{\Omega}^{-1}\frac{1}{\lambda}(\bar{\boldsymbol{\mu}} - r\mathbf{i}) \tag{7}$$

where $\mathbf{\Sigma}_l = \mathbf{\Omega}\mathbf{C}_l$ (and therefore $\mathbf{\Sigma}_l^{-1} = \mathbf{C}_l^{-1}\mathbf{\Omega}^{-1}$)[44]

Therefore the equilibrium condition, equating stock demand and stock supply, will be

[43] In a standard setting with asymmetric information (Grossman and Stiglitz, 1980) an informed investor has a lower perceived variance due to its private signal but, at the same time, her perceived expected return is generally also different from the uninformed investor's. It implies that we should sometimes observe a "foreign-bias" when the domestic investors observe bad signals. What we, instead, label "information asymmetries" throughout the paper is closer to the concept of "model uncertainty" or "Knightian uncertainty" (Epstein and Miao, 2003; Uppal and Wang, 2003): roughly speaking, the foreign investor's perceived uncertainty is higher than the domestic investor's one, though they observe the same return. This approach may help to understand home bias because small differences in the ambiguity about the return distributions can lead to largely under-diversified portfolio holding. The same reasoning applies when considering allocation in several foreign stock markets rather than the choice between home and foreign assets.

[44] The matrix $\mathbf{\Omega}$ is the universal variance-covariance matrix that would prevail in absence of investment barriers.

$$\mathbf{MS} = \mathbf{\Phi\Omega}^{-1}\left[\frac{1}{\lambda}(\bar{\boldsymbol{\mu}} - r\mathbf{i})\right] \tag{8}$$

where **MS** represents the vector of market shares of stock market indexes (supply side) and the right hand side is the (weighted) sum of stock indexes' demands (demand side). $\mathbf{\Phi}$ is a diagonal NxN positive definite matrix where the $j-th$ diagonal element, $\phi_j = \sum_{l=1}^{L} MS_l \frac{1}{C_{lj}}$ is the average investment "advantage" in holding asset j across investors, weighted by the market share of each investor's domestic stock market.

Let us define $\mathbf{D}_l = \mathbf{\Phi C}_l$, where $\mathbf{D}_l$ is again a diagonal NxN positive definite matrix. We can rewrite the above expression (7) as

$$\mathbf{w}_l = \mathbf{D}_l^{-1}\mathbf{\Phi\Omega}^{-1}\left[\tfrac{1}{\lambda}(\bar{\boldsymbol{\mu}} - r\mathbf{i})\right] \tag{9}$$

where $D_{lj} = \phi_j C_{lj}$ and $\dfrac{1}{D_{lj}} = \dfrac{\frac{1}{C_{lj}}}{\sum_{l=1}^{L} MS_l \frac{1}{C_{lj}}}$

and using the equilibrium condition (8) we get the following result

$$\mathbf{w}_l = \mathbf{D}_l^{-1}\mathbf{MS} \tag{10}$$

or, in terms of individual asset, the following optimal portfolio weights

$$w_{lj} = \frac{1}{D_{lj}} MS_j \tag{11}$$

that is condition (1) in the main text. MS_j is the market share of stock index j in the world stock market, $\frac{1}{D_{lj}}$ represents the inverse of relative (with respect to world average) cost of country l investing in asset j. In other words, the investor l will demand a share of assets greater than the market share in proportion to $\frac{1}{D_{lj}}$[45]. Note that if $C_{lj} = \phi_j$, i.e. if the investment barrier for country l is equal to the average then the investor l will hold the value market share of asset j.

[45] As in Obstfeld and Rogoff (2001), the share of country j's equity held by country l is a decreasing (increasing) function of the bilateral trading cost (efficiency) between l and j relative to the average trading cost (efficiency) between country j and all other countries.

B Data appendix

B.1 Dependent variable

Our dependent variable is the logarithm of bilateral foreign bias, that is, the ratio between foreign portfolio share and market share.

Denominator: market share

Market shares refer to the values at end-December of each year from 2001 to 2004.(Source: Datastream, Thomson Financials)

Numerator: Foreign portfolio share

To derive the numerator, we rely on data derived from four different datasets: the Coordinated Portfolio Investment Survey (CPIS, released by IMF), the International Financial Statistics (IFS, released by IMF), the National Accounts Financial Balance Sheets (released by OECD) and Datastream (Thomson Corporation).

Foreign equity holdings by country-pair (in millions of US$) are derived from Coordinated Portfolio Investment Survey (CPIS) for the years 2001 to 2004. The *CPIS* does not provide domestic holdings and this problem is circumvented by making use of complementary data sources to derive the share of foreign assets in each portfolio (Sorensen et al., 2007; Fidora et al., 2007). In particular, we derive from Datastream the stock market capitalization of each investing country l ($MCAP_l$) and from International Financial Statistics (IFS) the foreign equity liabilities held by each investing country ($foreign\ eq\_\ liab_l$) and the foreign equities assets held by each country ($for\_eq\_assets_l$).

Therefore, country l foreign share is given by the ratio

$$\frac{for\_eq\_assets_l}{MCAP_l + for\_eq\_assets_l - for\_eq\_liab_l} = \frac{for\_eq\_assets_l}{tot\_eq\_assets_l}$$

where the denominator represents the total amount (domestic and foreign) of equities held by country l

As far as portfolios at institutional sector level are concerned, the CPIS survey provides data on foreign holdings by institutional sector and we can derive the ratio of foreign holdings by sector k on the total amount of equities held by country l

$$\frac{for\_eq\_assets_l^k}{tot\_eq\_assets_l} \tag{12}$$

To obtain information on the domestic position by investing sector, absent in the CPIS dataset, we rely on the OECD National Accounts, Financial Balance Sheets providing information on the fraction of wealth, split by instrument (equities, short term securities, long term securities, etc.), held by a particular institutional sector.

Therefore, we derive for each institutional sector k in each country l the ratio

$$\frac{tot\_eq\_assets_l^k}{tot\_eq\_assets_l} \tag{13}$$

which represents the fraction of equities in country l held by sector k.

Finally, by taking the ratio of (12) to (13), we can recover the ratio we are interested in, that is the foreign share in each institutional sector's equity portfolio allowing to derive the share of each foreign country in each sector's portfolio.

$$\frac{for\_eq\_assets_l^k}{tot\_eq\_assets_l^k}$$

B.2 Regressors

To assure consistency with the theoretical framework, each variable X (dummy variables excluded) enters our regression specifications as the ratio of X to its world average.

Familiarity variables

Distance

The distance is measured as the Great Circle distance in miles between capital cities of source (l) and destination (j) country. The average distance from a destination country (j) is obtained as weighted (by market share) average of the distance of investing countries. The variable included in the regression is the ratio of the distance $l - j$ to the average distance.

Border dummy

Dummy variable taking value of 1 if the investing country and the destination country share a common border (0 otherwise).

Language dummy

Dummy variable taking value of 1 if the investing country and the destination country share a common language (0 otherwise)

Cultural distance

Hofstede (2001) distinguishes between four dimensions that are assumed to capture cross-cultural differences: *power distance* refers to the extent to which people believe that power and status are distributed unequally and the extent to which they accept an unequal distribution of power as the proper way of organizing social systems; *uncertainty avoidance* refers to the extent to which people are uncomfortable with uncertain, unknown or unstructured situations; *masculinity-femininity* refers to the extent to which a society emphasizes traditional masculine values such as competitiveness, assertiveness, achievement, ambition and the acquisition of money and other material

possessions, versus feminine values such as nurturing, helping others, not showing off and caring for the quality of life; *individualism-collectivism* reflects the degree to which a society emphasizes the role of the individual as opposed to that of the group.

These four dimensions are assumed to reflect key aspects of a society's culture. Throughout the years, these scores have become available for an increasing number of countries and two more dimensions have been added: *long-term orientation* refers to orientation towards future rewards, in particular saving, persistence, and adaptability to changing circumstances and *indulgence versus restraint* refers to the extent to which a society allows relatively free gratification of basic and natural human drives related to enjoying life and having fun.

Specifically we define cultural distance between home market l and host market j as:

$$cultdist_{lj} = \sqrt{\sum_{h=1}^{6} \frac{(I_{h,j} - I_{h,l})^2}{Var_h}}$$

where $I_{h,j}$ is country j's score on the $h-th$ cultural dimension, $I_{h,l}$ is the score of country l on this dimension, and Var_h is the variance of the score of the dimension. We calculate this distance for every possible combination of home and host market in our sample. For consistency with our theoretical framework, we compute the average world cultural distance with respect to country j and scale each country-pair index accordingly.

EMU dummy (Common Currency dummy)

Dummy variable taking value of 1 if the investing country and the destination country are members of the European Monetary Union (0 otherwise). In our case, it coincides with a common currency dummy since do not belong to any other currency union.

Euronext dummy

Dummy variable taking value 1 if the investing and destination country share the same stock exchange platform (0 otherwise). France is the only investing country in the Euronext system while among the destination economies, Belgium, the Netherlands are in the platform since the beginning of our period of analysis while Portugal joins in 2002.

Euronext-LIFFE dummy

In 2002, Euronext merged also with the future exchange LIFFE (London International Financial Futures and Options Exchange). The Euronext dummy variable is therefore accommodated to test the impact of the platform including the UK.

Liquidity proxies

Illiquidity measure

It is defined as the ratio of the absolute return on the stock index to turnover: the higher the stock index return's reaction to a given turnover rate, the higher the illiquidity of the stock market. Since

portfolio holdings are recorded at annual frequency, we construct an average annual illiquidity measure. We compute the illiquidity of a stock market in year t as the annual average of daily illiquidity, where d represents the day, $|R_{dt}|$ is the absolute return on day d and D is the number of trading days in year t.[46] Here, $TURN_{dt}$ represents the total value of shares traded scaled by total daily market capitalization.

$$illiq_t = \frac{1}{D} \sum_d \frac{|R_{dt}|}{TURN_{dt}}$$

The average annual illiquidity is obtained as weighted (by market share) average of country stock index illiquidity. The variable included in the analysis is the relative illiquidity measure of country j, i.e. the ratio of country j illiquidity to the average illiquidity.

Turnover rate

$TURN_{dt}$ represents the annual average of total value of shares traded scaled by total daily market capitalization as described in the *Illiquidity measure.*

Stock market visibility proxies

(Financial Sector Indicators released by the World Bank)

Number of publicly listed companies (Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data). Number of listed domestic companies, i.e., those that are the domestically incorporated companies listed on the country's stock exchanges at the end of the year.

Gross Domestic Product (World Bank national accounts data, and OECD National Accounts data files). Gross Domestic Product (GDP) at purchaser's prices computed as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.

Stock Market Capitalization as a fraction of GDP (Standard & Poor's, Global Stock Markets Factbook and supplemental S&P data). Market capitalization of listed companies (% of GDP).

Sharpe ratios

We compute the (relative to world) lagged Sharpe ratio, that is the lagged excess return of the country stock market relative to world return, divided by the standard deviation of the excess return.

For robustness check we compute 1-year, 3-year and 5-year lagged Sharpe ratios.

[46] The index returns and turnover rates are computed as the weighted average of all stocks included in the index (each stock is weighted by its relative stock market capitalization).

Capital mobility index

(Economic Freedom Network)

The Economic Freedom Network constructs an index (0-10) measuring the restrictions countries impose on capital flows assigning a lower rating to countries with more restrictions on foreign capital transactions.

In decreasing rating order are ranked countries where: a) domestic investments by foreigners and foreign investments by local residents are unrestricted; b) investments are restricted in a few industries within the countries; c) investments are permitted but regulatory restrictions slow the mobility of capital; d) either domestic investments by foreigners or foreign investments by local residents require approval from government authorities; e) both domestic by foreigners and foreign investments by local require government approval.

To maintain a linkage with the theoretical specification, we design the bilateral-specific direct cost decomposed into a source-specific D_l – the costs that investors face to transfer funds out of their own country l – and a host-specific factor D_j – the cost faced to enter country j – as follows:

$$\log(1/D_{lj}) = a \log \underbrace{(1/D_l)}_{source} + b \log \underbrace{(1/D_j)}_{host}$$

where the coefficients a and b capture, respectively, the relative importance of the source component and the host component.

Table 1. Share of country's financial assets (by investing sector)

This table presents the average relative share of a country's financial assets held by "households and non-profit institutions" and "institutional investors" in 2001-2004 (General Government and Non-Financial Companies complement the information on the overall economy). The figures for the four investing countries considered in the analysis are emphasized in bold.

Source: OECD National Accounts, Financial Balance Sheets; UK Statistics.

	share of country's financial assets	
	institutional investors (a)	households and NPOs (b)
Austria	0.497	0.266
Belgium	0.453	0.330
Canada	0.474	0.311
France	**0.451**	**0.240**
Germany	0.553	0.278
Italy	**0.376**	**0.450**
Spain	**0.436**	**0.320**
Sweden	**0.394**	**0.247**
United Kingdom	0.615	0.255
United States	0.468	0.372

Table 2. Domestic share in equity portfolio

This table presents the average portfolio shares in domestic equities in 2001-2004. Column (a) reports the share of the portfolio invested in domestic equities by the investing country at the head of the row. Column (d) shows the corresponding market share. Figures in bold refer to the four investing countries considered in the analysis. Columns (b) and (c) refer, respectively, to "institutional investors" and "households and nonprofit organizations".

Source: CPIS (Coordinated Portfolio Investment Survey); Datastream (Thomson Financial); OECD National Accounts, Financial Balance Sheets; UK Statistics.

	home bias			
	domestic share			market share
	overall economy	institutional investors	households and NPOs	
	(a)	(b)	(c)	(d)
Austria	0.362	-	-	0.002
Belgium	0.509	-	-	0.007
Canada	0.825	-	-	0.029
France	**0.681**	**0.603**	**0.901**	**0.046**
Germany	0.502	-	-	0.035
Italy	**0.629**	**0.287**	**0.757**	**0.023**
Spain	**0.772**	**0.331**	**0.943**	**0.018**
Sweden	**0.550**	**0.338**	**0.831**	**0.010**
United Kingdom	0.652	-	-	0.087
United States	0.814	-	-	0.436

Table 3. Dependent variable: descriptive statistics

This table presents descriptive statistics on the destination countries. In column (a), we report the average foreign share invested in the country at the head of the row. Column (b) indicates the corresponding market share. In column (c), we report the average foreign bias, that is, the averaged -- across investing countries -- foreign bias defined following equation (2) and report its standard deviation in column (d).

Source: CPIS (Coordinated Portfolio Investment Survey); Datastream (Thomson Financial); OECD National Accounts, Financial Balance Sheets; UK Statistics.

	descriptive statistics dependent variable			
	average foreign share (a)	market share (b)	average foreign bias (c)	st. dev. foreign bias (d)
Australia	0.003	0.018	0.139	0.114
Austria	0.001	0.002	0.404	0.430
Belgium	0.003	0.006	0.469	0.481
Canada	0.003	0.026	0.105	0.119
Denmark	0.001	0.004	0.357	0.382
Finland	0.007	0.007	0.992	0.693
France	0.030	0.045	0.681	0.466
Germany	0.026	0.034	0.744	0.963
Hong Kong	0.003	0.021	0.155	0.158
Italy	0.010	0.023	0.422	0.254
Japan	0.017	0.104	0.160	0.080
Mexico	0.001	0.005	0.198	0.195
Netherlands	0.019	0.021	0.923	0.561
Portugal	0.001	0.002	0.424	0.460
Singapore	0.001	0.005	0.239	0.185
South Korea	0.002	0.010	0.229	0.173
Spain	0.009	0.017	0.521	0.321
Sweden	0.010	0.010	1.084	2.022
United Kingdom	0.042	0.088	0.483	0.201
United States	0.097	0.461	0.211	0.132

Table 4a. Regressors: descriptive statistics

This table presents descriptive statistics on the destination countries. All statistics refer to "relative" regressors as they enter our regression specification. Subscript *l* refers to the investing country while subscript *j* refers to the destination country.

Source: Datastream (Thomson Financial); Kurtzman et al. (2004); Economic Freedom Network (2008); Hofstede (2001); World Bank Financial sector Indicators.

	descriptive statistics regressors			
	mean (a)	max (b)	min (c)	st.dev. (d)
$dist_{lj}$/av_dist	0.653	1.787	0.069	0.459
$dummy\_border_{lj}$	0.131	1	0	0.323
$dummy\_lang_{lj}$	0.012	1	0	0.054
$cultdist_{lj}$/av_cultdist	0.969	1.582	0.347	0.233
$opacity_j$/av_opacity	0.736	1.242	0.367	0.225
acc_j/av_acc	0.964	1.903	0.514	0.352
$corr_j$/av_corr	0.592	1.361	0.063	0.333
enf_j/av_enf	0.803	1.306	0.406	0.191
leg_j/av_leg	0.653	1.750	0.087	0.357
reg_j/av_reg	0.715	1.364	0.332	0.304
dummy $Euronext_{lj}$	0.033	1	0	0.085
dummy $Euronext\text{-}LIFFE_{lj}$	0.042	1	0	0.094
dummy EMU_{lj}	0.321	1	0	0.373
$illiq_j$/av_illiq	1.917	10.184	0.325	1.513
$turn_j$/av_turn	0.748	5.038	0.104	0.723
$nlisted_j$/av_nlisted	2.547	14.983	0.121	3.272
$mcapgdp_j$/av_mcapgdp	1.146	4.292	0.145	0.867
gdp_j/av_gdp	7.140	64.008	0.494	13.200
rel_Sharpe $ratio_j$ (1y_lag)	0.794	5.894	-3.205	1.645
rel_Sharpe $ratio_j$ (3y_lag)	0.323	2.871	-0.936	0.732
rel_Sharpe $ratio_j$ (5y_lag)	0.136	1.030	-0.616	0.332
cap_mob_j/av_cap_mob	1.513	1.951	0.790	0.278

Table 4b. Regressors: correlation matrix

This table presents the correlation matrix of "relative" regressors. Subscript *I* refers to the investing country, while subscript *j* refers to the destination country.

Source: Datastream (Thomson Financial); Kurtzman et al. (2004); Economic Freedom Network (2008); Hofstede (2001); World Bank Financial sector Indicators.

		regressors' correlation matrix																					
		1	**2**	**3**	**4**	**5**	**5a**	**5b**	**5c**	**5d**	**5e**	**6a**	**6b**	**7**	**8a**	**8b**	**9a**	**9b**	**9c**	**10a**	**10b**	**10c**	**11**
$dist_{ij}$/av_dist	**1**	1																					
$dummy\_border_{ij}$	**2**	-0.390	1																				
$dummy\_lang_{ij}$	**3**	0.330	-0.073	1																			
$cultdist_{ij}$/av_cultdist	**4**	0.238	-0.509	-0.074	1																		
$opacity_j$/av_opacity	**5**	0.115	0.095	0.474	-0.228	1																	
acc_j/av_acc	**5a**	-0.208	0.005	0.004	-0.036	0.500	1																
$corr_j$/av_corr	**5b**	0.314	-0.002	0.508	-0.176	0.907	0.248	1															
enf_j/av_enf	**5c**	0.089	0.118	0.225	-0.148	0.578	0.202	0.495	1														
leg_j/av_leg	**5d**	0.225	0.122	0.665	-0.193	0.828	0.173	0.744	0.353	1													
reg_j/av_reg	**5e**	-0.163	0.164	0.143	-0.301	0.682	0.147	0.587	0.227	0.537	1												
dummy $Euronext_{ij}$	**6a**	-0.333	0.114	-	-0.462	0.036	0.040	-0.047	-0.017	0.074	0.155	1											
dummy $Euronext\text{-}LIFFE_{ij}$	**6b**	-0.397	0.050	-	-0.321	-0.051	0.041	-0.091	-0.053	-0.091	0.066	0.868	1										
dummy EMU_{ij}	**7**	-0.636	0.330	-0.194	-0.438	0.125	0.157	-0.015	0.363	-0.035	0.167	0.448	0.323	1									
$illiq_j$/av_illiq	**8a**	0.064	-0.001	0.640	0.001	0.255	0.037	0.250	0.221	0.384	-0.091	0.131	0.046	0.126	1								
$turn_j$/av_turn	**8b**	0.081	-0.064	-0.185	-0.041	0.121	-0.160	0.248	-0.164	0.038	0.427	-0.125	-0.079	-0.124	-0.502	1							
$nlisted_j$/av_nlisted	**9a**	0.618	-0.154	-0.141	0.088	-0.134	-0.308	0.072	0.064	-0.153	-0.177	-0.258	-0.151	-0.399	-0.373	0.216	1						
$mcapgdp_j$/av_mcapgdp	**9b**	0.122	-0.035	-0.237	0.120	-0.441	-0.046	-0.353	-0.635	-0.329	-0.387	-0.153	-0.097	-0.408	-0.254	-0.085	0.126	1					
gdp_j/av_gdp	**9c**	0.475	-0.080	-0.058	0.073	-0.058	-0.303	0.102	0.121	-0.036	-0.119	-0.153	-0.117	-0.214	-0.260	0.184	0.811	-0.002	1				
rel_Sharpe $ratio_j$ (1y_lag)	**10a**	-0.040	-0.017	-0.017	0.045	0.023	0.158	0.001	0.097	-0.039	-0.117	0.004	-0.001	0.005	0.101	-0.053	-0.073	-0.104	-0.283	1			
rel_Sharpe $ratio_j$ (3y_lag)	**10b**	0.140	-0.036	0.105	0.076	0.012	0.046	0.025	0.065	0.033	-0.152	-0.125	-0.121	-0.128	0.251	-0.137	-0.040	-0.030	-0.246	-0.218	1		
rel_Sharpe $ratio_j$ (5y_lag)	**10c**	0.252	0.038	0.119	0.015	0.049	-0.077	0.064	0.045	0.170	-0.064	-0.288	-0.348	-0.157	0.115	0.033	0.087	0.076	-0.050	-0.023	0.197	1	
cap_mob_j/av_cap_mob	**11**	-0.414	0.076	-0.447	0.019	-0.496	-0.112	-0.531	-0.123	-0.537	-0.319	0.157	0.222	0.277	-0.223	-0.305	-0.014	0.322	0.054	0.077	-0.185	-0.301	1

Table 5a. Households and nonprofit organizations (NPOs): main regression

This table reports results of the Feasible GLS regression described in equation (4) in the text. The dependent variable is the logarithm of the ratio of portfolio share to market share, $\log(w_{lj}^{H} / MS_j)$, where the subscript *lj* represents the investment country *l*-destination country *j* pair, while the superscript *H* represents the "households and non-profit institutions" sector in country *l*. See Appendix B.1 for details on the construction of the dependent variable. Constants, investing country fixed effects and time dummies are included but not reported. Standard errors are clustered by country-pair. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	households and NPOs						
	main regression						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
log(dist$_{lj}$/av_dist)	-1.464 ***	-1.293 ***	-1.227 ***	-0.702 ***	-0.716 ***	-0.686 ***	-0.555 ***
	(0.073)	(0.074)	(0.073)	(0.047)	(0.050)	(0.051)	(0.051)
dummy_border$_{lj}$	0.774 ***	0.881 ***	0.976 ***	1.053 ***	1.037 ***	1.089 ***	1.217 ***
	(0.123)	(0.113)	(0.116)	(0.127)	(0.130)	(0.134)	(0.138)
dummy_lang$_{lj}$	0.818 **	1.478 ***	1.450 ***	2.771 ***	2.787 ***	2.747 ***	3.095 ***
	(0.316)	(0.316)	(0.314)	(0.271)	(0.275)	(0.278)	(0.323)
log(cultdist$_{lj}$/av_cultdist)	-0.456 ***	-0.782 ***	-0.704 ***	-0.480 ***	-0.464 ***	-0.392 ***	-0.394 **
	(0.117)	(0.144)	(0.134)	(0.118)	(0.119)	(0.136)	(0.160)
log(opacity$_j$/av_opacity)		-1.322 ***	-1.381 ***	-1.994 ***	-1.990 ***	-1.972 ***	-1.626 ***
		(0.170)	(0.167)	(0.137)	(0.138)	(0.145)	(0.151)
dummy Euronext$_{lj}$			0.580 ***	0.427 **	0.461 **	0.499 **	0.477 **
			(0.137)	(0.198)	(0.200)	(0.227)	(0.223)
dummy EMU$_{lj}$				1.644 ***	1.672 ***	1.685 ***	1.547 ***
				(0.104)	(0.111)	(0.115)	(0.111)
log(illiq$_j$/av_illiq)				-0.692 ***	-0.656 ***	-0.564 ***	-0.590 ***
				(0.055)	(0.065)	(0.079)	(0.082)
log(nlisted$_j$/av_nlisted)					0.031	0.044	-0.012
					(0.031)	(0.034)	(0.033)
rel_Sharpe ratio$_j$						-0.252 ***	-0.263 ***
						(0.065)	(0.057)
log(cap_mob$_j$/av_cap_mob)							1.527 ***
							(0.328)
log(cap_mob$_l$/av_cap_mob)							1.578 ***
							(0.529)
#obs	304	304	304	304	304	304	304
Coeff R^2	0.53	0.57	0.57	0.66	0.66	0.68	0.69

Table 5b. Households and NPOs: robustness checks

This table reports robustness checks of the main findings reported in Table 5a. The dependent variable and regression techniques are the same as in Table 5a.

	households and NPOs robustness					
	(1)	(2a)	(2b)	(3a)	(3b)	(4)
log($dist_{lj}$/av_dist)	-0.506 ***	-0.705 ***	-0.515 ***	-0.645 ***	-0.623 ***	-0.490 ***
	(0.053)	(0.060)	(0.052)	(0.058)	(0.065)	(0.054)
dummy_border$_{lj}$	1.274 ***	0.982 ***	1.171 ***	1.061 ***	1.201 ***	1.237 ***
	(0.140)	(0.148)	(0.135)	(0.143)	(0.139)	(0.135)
dummy_lang$_{lj}$	3.237 ***	2.840 ***	3.030 ***	3.096 ***	3.019 ***	3.013 ***
	(0.325)	(0.344)	(0.327)	(0.323)	(0.342)	(0.320)
log($cultdist_{lj}$/av_cultdist)	-0.345 *	-0.373 ***	-0.524 ***	-0.437 ***	-0.361 **	-0.455 ***
	(0.178)	(0.135)	(0.159)	(0.134)	(0.155)	(0.159)
log($opacity_j$/av_opacity)	-1.405 ***	-1.931 ***	-1.798 ***	-1.538 ***	-1.480 ***	-1.603 ***
	(0.134)	(0.138)	(0.158)	(0.149)	(0.149)	(0.148)
dummy Euronext$_{lj}$	0.543 ***	0.459 ***	0.472 **	0.518 **	0.481 **	
	(0.189)	(0.177)	(0.214)	(0.212)	(0.189)	
dummy Euronext-LIFFE$_{lj}$						0.290 ***
						(0.107)
dummy EMU$_{lj}$	1.527 ***	1.766 ***	1.496 ***	1.613 ***	1.591 ***	1.580 ***
	(0.104)	(0.104)	(0.109)	(0.103)	(0.106)	(0.110)
log($illiq_j$/av_illiq)		-0.272 ***	-0.652 ***	-0.688 ***	-0.659 ***	-0.580 ***
		(0.089)	(0.070)	(0.067)	(0.073)	(0.081)
log($turn_j$/av_turn)	0.679 ***					
	(0.073)					
log($nlisted_j$/av_nlisted)	-0.035			-0.009	-0.019	-0.039
	(0.032)			(0.032)	(0.034)	(0.032)
log(gdp_j/av_gdp)		0.281 ***				
		(0.041)				
log($mcapgdp_j$/av_mcapgdp)			-0.216 **			
			(0.085)			
rel_Sharpe ratio$_j$ (3y_lag)	-0.264 ***	-0.184 ***	-0.268 ***			-0.277 ***
	(0.052)	(0.051)	(0.055)			(0.055)
rel_Sharpe ratio$_j$ (5y_lag)				0.332 ***		
				(0.102)		
rel_Sharpe ratio$_j$ (1y_lag)					-0.164 ***	
					(0.022)	
log(cap_mob_j/av_cap_mob)	2.124 ***	0.942 ***	1.669 ***	1.451 ***	1.405 ***	1.532 ***
	(0.301)	(0.325)	(0.324)	(0.332)	(0.309)	(0.322)
log(cap_mob_l/av_cap_mob)	1.431 ***	1.203 **	1.741 ***	1.208 ***	1.035 *	1.443 ***
	(0.495)	(0.495)	(0.515)	(0.437)	(0.540)	(0.518)
#obs	304	304	304	304	304	304
Coeff R^2	0.70	0.71	0.69	0.68	0.70	0.69

Table 6a. Institutional investors: main regression

This table reports results of the Feasible GLS regression described in equation (4) in the text. The dependent variable is the logarithm of the ratio of portfolio share to market share, $\log(w_{lj}^{F} / MS_j)$, where the subscript *lj* represents the investment country *l* -destination country *j* pair, while the superscript *F* represents the "institutional investors" sector in country *l.* Otherwise, the table is the same as Table 5a. Constants, investing country fixed effects and time dummies are included but not reported. Standard errors are clustered by country-pair. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	institutional investors main regression						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
log(dist$_{lj}$/av_dist)	-1.033 ***	-1.011 ***	-0.990 ***	-0.630 ***	-0.655 ***	-0.625 ***	-0.602 ***
	(0.037)	(0.039)	(0.040)	(0.036)	(0.043)	(0.044)	(0.046)
dummy_border$_{lj}$	0.278 ***	0.221 ***	0.243 ***	-0.053	-0.118	0.004	-0.034
	(0.065)	(0.063)	(0.064)	(0.121)	(0.138)	(0.137)	(0.135)
dummy_lang$_{lj}$	0.797 **	0.761 **	0.747 **	1.714 ***	1.687 ***	1.757 ***	1.547 ***
	(0.341)	(0.343)	(0.344)	(0.311)	(0.315)	(0.343)	(0.352)
log(cultdist$_{lj}$/av_cultdist)	-0.407 ***	-0.431 ***	-0.425 ***	-0.378 ***	-0.388 ***	-0.314 ***	-0.436 ***
	(0.084)	(0.084)	(0.082)	(0.071)	(0.070)	(0.093)	(0.085)
log(opacity$_j$/av_opacity)		-0.006	-0.010	-0.325 ***	-0.264 **	-0.395 ***	-0.330 ***
		(0.069)	(0.070)	(0.085)	(0.102)	(0.098)	(0.114)
dummy Euronext$_{lj}$			0.333 *	-0.227	-0.209	-0.276 **	-0.207
			(0.181)	(0.143)	(0.142)	(0.136)	(0.148)
dummy EMU$_{lj}$				1.497 ***	1.523 ***	1.479 ***	1.387 ***
				(0.091)	(0.096)	(0.092)	(0.104)
log(illiq$_j$/av_illiq)				-0.282 ***	-0.248 ***	-0.140 ***	-0.196 ***
				(0.046)	(0.052)	(0.053)	(0.056)
log(nlisted$_j$/av_nlisted)					0.039	0.026	0.027
					(0.029)	(0.028)	(0.029)
rel_Sharpe ratio$_j$						-0.347 ***	-0.307 ***
						(0.046)	(0.049)
log(cap_mob$_j$/av_cap_mob)							-0.183
							(0.203)
log(cap_mob$_l$/av_cap_mob)							0.223
							(0.520)
#obs	304	304	304	304	304	304	304
Coeff R^2	0.43	0.43	0.42	0.52	0.51	0.54	0.53

Table 6b. Institutional investors: robustness checks

This table reports robustness checks of the main findings reported in Table 6a. The dependent variable and regression techniques are the same as in Table 6a.

	institutional investors					
	robustness					
	(1)	(2a)	(2b)	(3a)	(3b)	(4)
$\log(dist_{lj}/av\_dist)$	-0.560 ***	-0.793 ***	-0.609 ***	-0.576 ***	-0.652 ***	-0.654 ***
	(0.044)	(0.042)	(0.043)	(0.047)	(0.044)	(0.061)
$dummy\_border_{lj}$	0.043	-0.238 *	-0.015	-0.117	-0.016	-0.062
	(0.127)	(0.132)	(0.130)	(0.146)	(0.128)	(0.140)
$dummy\_lang_{lj}$	1.665 ***	1.358 ***	1.592 ***	1.695 ***	1.590 ***	1.548 ***
	(0.357)	(0.360)	(0.352)	(0.334)	(0.357)	(0.356)
$\log(cultdist_{lj}/av\_cultdist)$	-0.436 ***	-0.418 ***	-0.412 ***	-0.447 ***	-0.382 ***	-0.406 ***
	(0.097)	(0.068)	(0.093)	(0.077)	(0.078)	(0.083)
$\log(opacity_j/av\_opacity)$	-0.281 ***	-0.565 ***	-0.257 **	-0.059	-0.232 **	-0.316 ***
	(0.101)	(0.098)	(0.121)	(0.107)	(0.111)	(0.117)
$dummy\ Euronext_{lj}$	-0.212	-0.263 *	-0.224	-0.185	-0.159	
	(0.140)	(0.135)	(0.148)	(0.137)	(0.123)	
$dummy\ Euronext\text{-}LIFFE_{lj}$						-0.186
						(0.136)
$dummy\ EMU_{lj}$	1.362 ***	1.416 ***	1.391 ***	1.442 ***	1.424 ***	1.347 ***
	(0.094)	(0.093)	(0.099)	(0.103)	(0.102)	(0.103)
$\log(illiq_j/av\_illiq)$		0.019	-0.207 ***	-0.264 ***	-0.303 ***	-0.182 ***
		(0.050)	(0.051)	(0.058)	(0.049)	(0.057)
$\log(turn_j/av\_turn)$	0.297 ***					
	(0.052)					
$\log(nlisted_j/av\_nlisted)$	-0.005			0.037	0.033	0.047
	(0.027)			(0.029)	(0.026)	(0.033)
$\log(gdp_j/av\_gdp)$		0.269 ***				
		(0.027)				
$\log(mcapgdp_j/av\_mcapgdp)$			0.102 *			
			(0.061)			
$rel\_Sharpe\ ratio_j\ (3y\_lag)$	-0.288 ***	-0.213 ***	-0.301 ***			-0.310 ***
	(0.047)	(0.041)	(0.050)			(0.050)
$rel\_Sharpe\ ratio_j\ (5y\_lag)$				-0.112		
				(0.091)		
$rel\_Sharpe\ ratio_j\ (1y\_lag)$					-0.110 ***	
					(0.017)	
$\log(cap\_mob_j/av\_cap\_mob)$	0.074	-0.269	-0.249	0.551 ***	-0.150	-0.228
	(0.198)	(0.188)	(0.212)	(0.210)	(0.197)	(0.205)
$\log(cap\_mob_l/av\_cap\_mob)$	0.353	0.191	0.216	0.589	0.295	0.232
	(0.502)	(0.428)	(0.512)	(0.520)	(0.532)	(0.522)
#obs	304	304	304	304	304	304
Coeff R^2	0.53	0.55	0.53	0.52	0.52	0.53

Table 7a. Aggregate economy: main regression

This table reports the results of the pooled Feasible GLS regression described in equation (4) in the text. The dependent variable is the logarithm of the ratio of portfolio share to market share, $\log(w_{lj}^{T} / MS_j)$, where the subscript *lj* represents the investment country *l* -destination country *j* pair, while the superscript *T* represents the "representative investor" sector in country *l*. Otherwise, the table is the same as Table 5a. Constants, investing country fixed effects and time dummies are included but not reported. Standard errors are clustered by country-pair. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	aggregate economy **main regression**						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\log(dist_{lj}/av\_dist)$	-0.978 ***	-0.966 ***	-0.935 ***	-0.646 ***	-0.701 ***	-0.627 ***	-0.608 ***
	(0.039)	(0.038)	(0.038)	(0.027)	(0.034)	(0.039)	(0.035)
$dummy\_border_{lj}$	0.408 ***	0.378 ***	0.420 ***	0.144	-0.012	0.083	0.089
	(0.089)	(0.084)	(0.085)	(0.115)	(0.138)	(0.143)	(0.134)
$dummy\_lang_{lj}$	0.410	0.396	0.381	1.456 ***	1.414 ***	1.492 ***	1.301 ***
	(0.312)	(0.314)	(0.314)	(0.293)	(0.297)	(0.309)	(0.351)
$\log(cultdist_{lj}/av\_cultdist)$	-0.581 ***	-0.618 ***	-0.605 ***	-0.237 ***	-0.256 ***	-0.291 ***	-0.348 ***
	(0.092)	(0.092)	(0.090)	(0.063)	(0.062)	(0.066)	(0.065)
$\log(opacity_j/av\_opacity)$		-0.010	-0.020	-0.396 ***	-0.282 ***	-0.401 ***	-0.393 ***
		(0.068)	(0.069)	(0.071)	(0.090)	(0.096)	(0.109)
$dummy\ Euronext_{lj}$			0.438 ***	-0.212	-0.204	-0.205	-0.155
			(0.166)	(0.137)	(0.133)	(0.135)	(0.137)
$dummy\ EMU_{lj}$				1.602 ***	1.648 ***	1.558 ***	1.488 ***
				(0.076)	(0.084)	(0.087)	(0.093)
$\log(illiq_j/av\_illiq)$				-0.255 ***	-0.188 ***	-0.140 ***	-0.169 ***
				(0.040)	(0.046)	(0.042)	(0.049)
$\log(nlisted_j/av\_nlisted)$					0.062 **	0.059 **	0.048 *
					(0.025)	(0.025)	(0.025)
$rel\_Sharpe\ ratio_j$						-0.302 ***	-0.292 ***
						(0.039)	(0.043)
$\log(cap\_mob_j/av\_cap\_mob)$							-0.169
							(0.150)
$\log(cap\_mob_l/av\_cap\_mob)$							1.141 **
							(0.469)
#obs	304	304	304	304	304	304	304
Coeff R^2	0.52	0.52	0.51	0.61	0.61	0.63	0.62

Table 7b. Aggregate economy: robustness checks

This table reports robustness checks of the main findings reported in Table 7a. The dependent variable and regression techniques are the same as in Table 7a.

	aggregate economy					
	robustness					
	(1)	(2a)	(2b)	(3a)	(3b)	(4)
log(dist$_{lj}$/av_dist)	-0.569 ***	-0.745 ***	-0.613 ***	-0.579 ***	-0.636 ***	-0.659 ***
	(0.033)	(0.038)	(0.034)	(0.039)	(0.035)	(0.050)
dummy_border$_{lj}$	0.170	-0.113	0.142	0.030	0.085	0.047
	(0.123)	(0.126)	(0.124)	(0.138)	(0.129)	(0.137)
dummy_lang$_{lj}$	1.424 ***	1.164 ***	1.394 ***	1.324 ***	1.357 ***	1.314 ***
	(0.351)	(0.344)	(0.346)	(0.327)	(0.355)	(0.353)
log(cultdist$_{lj}$/av_cultdist)	-0.355 ***	-0.352 ***	-0.318 ***	-0.354 ***	-0.283 ***	-0.321 ***
	(0.068)	(0.059)	(0.072)	(0.066)	(0.070)	(0.064)
log(opacity$_j$/av_opacity)	-0.354 ***	-0.601 ***	-0.298 ***	-0.207 **	-0.319 ***	-0.376 ***
	(0.093)	(0.089)	(0.111)	(0.103)	(0.104)	(0.110)
dummy Euronext$_{lj}$	-0.145	-0.224 *	-0.176	-0.142	-0.086	
	(0.126)	(0.123)	(0.135)	(0.125)	(0.108)	
dummy Euronext-LIFFE$_{lj}$						-0.167
						(0.117)
dummy EMU$_{lj}$	1.448 ***	1.548 ***	1.473 ***	1.548 ***	1.539 ***	1.468 ***
	(0.084)	(0.079)	(0.085)	(0.090)	(0.089)	(0.091)
log(illiq$_j$/av_illiq)		-0.041	-0.204 ***	-0.249 ***	-0.280 ***	-0.157 ***
		(0.046)	(0.043)	(0.052)	(0.047)	(0.049)
log(turn$_j$/av_turn)	0.254 ***					
	(0.046)					
log(nlisted$_j$/av_nlisted)	0.019			0.046 *	0.047 *	0.067 **
	(0.023)			(0.026)	(0.025)	(0.029)
log(gdp$_j$/av_gdp)		0.246 ***				
		(0.025)				
log(mcapgdp$_j$/av_mcapgdp)			0.140 ***			
			(0.050)			
rel_Sharpe ratio$_j$ (3y_lag)	-0.275 ***	-0.187 ***	-0.267 ***			-0.294 ***
	(0.042)	(0.038)	(0.045)			(0.043)
rel_Sharpe ratio$_j$ (5y_lag)				-0.156 *		
				(0.080)		
rel_Sharpe ratio$_j$ (1y_lag)					-0.093 ***	
					(0.015)	
log(cap_mob$_j$/av_cap_mob)	0.103	-0.342 **	-0.227	0.203	-0.111	-0.197
	(0.158)	(0.158)	(0.151)	(0.153)	(0.152)	(0.151)
log(cap_mob$_l$/av_cap_mob)	1.238 ***	0.961 **	1.132 **	1.329 ***	1.186 **	1.149 **
	(0.439)	(0.421)	(0.457)	(0.453)	(0.458)	(0.469)
#obs	304	304	304	304	304	304
Coeff R^2	0.62	0.64	0.62	0.61	0.62	0.62

Table 8a. Differences between households and institutional investors: sensitivity to country sample.

This table reports the results of the Feasible GLS regression described in equation (5) in the text. The dependent variable is the logarithm of the ratio of households' portfolio share to institutional investors' portfolio share, $\log(w_{lj}^{H} / w_{lj}^{F})$, where the subscript *lj* represents the investment country *l* -destination country *j* pair, while the superscripts *H* and *F* represent, respectively, "households and nonprofit institutions" and "institutional investors" in country l. Column (2) adds Switzerland and Ireland to the pool of destination countries. Column (3) considers only OECD destination countries. Columns (4a)-(4d) exclude from the set of investing countries France, Italy, Spain and Sweden, respectively. Constants, investing country fixed effects and time dummies are included but not reported. Standard errors are clustered by country-pair. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	difference households-institutional investors sensitivity to country sample						
	(1)	(2)	(3)	(4a)	(4b)	(4c)	(4d)
log(dist$_{lj}$/av_dist)	-0.098 **	-0.042	0.053	-0.038	-0.064	-0.049	-0.008
	(0.043)	(0.049)	(0.049)	(0.083)	(0.054)	(0.051)	(0.055)
dummy_border$_{lj}$	0.597 ***	0.801 ***	0.653 ***	0.789 ***	0.740 ***	0.622 ***	0.569 ***
	(0.097)	(0.110)	(0.121)	(0.173)	(0.134)	(0.119)	(0.123)
dummy_lang$_{lj}$	1.205 ***	1.050 ***	1.302 ***	1.200 ***	0.941 ***	-	1.163 ***
	(0.151)	(0.172)	(0.184)	(0.222)	(0.181)	-	(0.154)
log(cultdist$_{lj}$/av_cultdist)	-0.153	-0.091	-0.136	-0.268 **	-0.216 *	-0.074	0.114
	(0.095)	(0.102)	(0.102)	(0.116)	(0.112)	(0.098)	(0.218)
log(opacity$_j$/av_opacity)	-1.208 ***	-1.123 ***	-1.093 ***	-1.228 ***	-1.022 ***	-1.208 ***	-1.040 ***
	(0.089)	(0.090)	(0.099)	(0.132)	(0.141)	(0.115)	(0.110)
dummy Euronext$_{lj}$	0.569 ***	0.490 ***	0.408 *	-	0.705 ***	0.458 **	0.932 ***
	(0.163)	(0.172)	(0.168)	-	(0.166)	(0.179)	(0.162)
dummy EMU$_{lj}$	0.221 ***	0.122	0.138	0.248 **	0.705 ***	0.442 ***	0.932 ***
	(0.074)	(0.074)	(0.090)	(0.099)	(0.166)	(0.081)	(0.162)
log(illiq$_j$/av_illiq)	-0.210 ***	-0.242 ***	-0.141 *	-0.307 ***	-0.183 *	-0.142 *	0.441 ***
	(0.061)	(0.062)	(0.073)	(0.075)	(0.096)	(0.076)	(0.103)
log(nlisted$_j$/av_nlisted)	0.013	-0.073 **	-0.041	-0.040	-0.246 ***	0.018	-0.248 ***
	(0.027)	(0.032)	(0.034)	(0.043)	(0.069)	(0.031)	(0.077)
rel_Sharpe ratio$_j$	-0.105 ***	-0.082 ***	-0.082 *	-0.047	-0.019	-0.073 *	0.037
	(0.037)	(0.038)	(0.044)	(0.044)	(0.036)	(0.043)	(0.038)
log(cap_mob$_j$/av_cap_mob)	0.623 ***	0.789 ***	1.546 ***	0.476 *	-0.111 **	1.443 ***	-0.165 ***
	(0.202)	(0.196)	(0.308)	(0.272)	(0.050)	(0.275)	(0.040)
log(cap_mob$_l$/av_cap_mob)	0.842 ***	0.181	0.513	1.078 ***	0.760 ***	0.873	0.491 **
	(0.317)	(0.325)	(0.393)	(0.354)	(0.251)	(0.541)	(0.212)
#obs	304	336	256	228	228	228	228
Coeff R^2	0.36	0.34	0.52	0.29	0.36	0.50	0.28

Table 8b. Differences between households and institutional investors: robustness

This table reports robustness checks of the main findings in Table 8a. The dependent variable and regression techniques are the same as in Table 8a except for columns (3) and (4) that report results under an OLS regression and a cross-sectional regression, respectively.

	difference households-professional investors							
	robustness							
	(1)	(2a)	(2b)	(2c)	(2d)	(2e)	(3)	(4)
log($dist_{ij}$/av_dist)	-0.098 **	-0.130 **	-0.045	-0.070	0.109 **	-0.150 ***	-0.024	-0.024
	(0.043)	(0.055)	(0.047)	(0.050)	(0.052)	(0.048)	(0.109)	(0.244)
dummy_$border_{ij}$	0.597 ***	0.489 ***	0.651 ***	0.418 ***	0.607 ***	0.498 ***	0.899 ***	1.061 **
	(0.097)	(0.122)	(0.103)	(0.124)	(0.108)	(0.109)	(0.203)	(0.432)
dummy_$lang_{ij}$	1.205 ***	0.661 ***	1.071 ***	0.740 ***	0.831 ***	0.848 ***	1.022 ***	1.053
	(0.151)	(0.177)	(0.144)	(0.172)	(0.147)	(0.155)	(0.317)	(0.651)
log($cultdist_{ij}$/av_cultdist)	-0.153	-0.121	0.012 ***	-0.093	-0.242 **	-0.077	-0.144	-0.034
	(0.095)	(0.108)	(0.091)	(0.124)	(0.111)	(0.116)	(0.177)	(0.350)
log($opacity_j$/av_opacity)	-1.208 ***						-1.133 ***	-1.383 ***
	(0.089)						(0.190)	(0.334)
log(acc_j/av_acc)		-0.786 ***						
		(0.091)						
log($corr_j$/av_corr)			-0.455 ***					
			(0.039)					
log(enf_j/av_enf)				-0.106				
				(0.167)				
log(leg_j/av_leg)					-0.380 ***			
					(0.061)			
log(reg_j/av_reg)						-0.472 ***		
						(0.080)		
dummy $Euronext_{ij}$	0.569 ***	0.342	0.979 ***	0.878 ***	1.008 ***	0.638 ***	0.786 ***	0.748
	(0.163)	(0.208)	(0.146)	(0.159)	(0.163)	(0.171)	(0.240)	(0.461)
dummy EMU_{ij}	0.221 ***	0.034	0.115	-0.032	0.113	0.043	0.197	0.067
	(0.074)	(0.092)	(0.077)	(0.100)	(0.088)	(0.084)	(0.157)	(0.308)
log($illiq_j$/av_illiq)	-0.210 ***	-0.229 ***	-0.169 ***	-0.261 ***	-0.262 ***	-0.319 ***	-0.359 ***	-0.366 *
	(0.061)	(0.067)	(0.062)	(0.068)	(0.062)	(0.065)	(0.129)	(0.213)
log($nlisted_j$/av_nlisted)	0.013	-0.037	0.090	-0.009	-0.069 **	-0.070 **	-0.046	-0.047
	(0.027)	(0.034)	(0.033)	(0.033)	(0.030)	(0.031)	(0.058)	(0.121)
rel_Sharpe $ratio_j$	-0.105 ***	-0.039	-0.128 ***	-0.094 **	-0.091 **	-0.097 **	-0.038	-0.138
	(0.037)	(0.045)	(0.037)	(0.045)	(0.039)	(0.040)	(0.097)	(0.153)
log(cap_mob_j/av_cap_mob)	0.623 ***	1.358 ***	0.952 ***	1.459 ***	1.045 ***	1.183 ***	0.525	0.034
	(0.202)	(0.245)	(0.205)	(0.248)	(0.216)	(0.200)	(0.537)	(1.144)
log(cap_mob_I/av_cap_mob)	0.842 ***	0.963 **	1.073 ***	1.184 ***	1.202 ***	1.113 ***	1.190	-
	(0.317)	(0.405)	(0.340)	(0.424)	(0.357)	(0.361)	(0.944)	-
#obs	304	304	304	304	304	304	304	76
Coeff R^2	0.36	0.37	0.34	0.30	0.31	0.32	0.33	0.32