Bias in foreign equity portfolios: households versus professional investors[*]

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Abstract

Non professional investors display a much higher degree of home bias than financial investors suggesting that they might be more severely affected by information asymmetry issues. In particular, non professional investors, having more limited access to information on foreign firm-specific characteristics than institutional investors, should rely more heavily on country-specific factors. We test this conjecture restricting the analysis to foreign equity portfolios of four European investing countries -France, Italy, Spain and Sweden- in the period 2001-2004. We find, indeed, that households' portfolios are more strongly influenced by proximity variables, transparency of the destination stock market and, even more interestingly, by common-listing in the Euronext platform.

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1 Introduction

Standard asset pricing models assume that assets are held by a representative agent and, even when this assumption is relaxed, little investigation is devoted to the most obvious source of heterogeneity: investment can be made by individual investors or by professionally-managed funds. Very few works analyze the different investing behavior of individuals and institutional investors. Some notable exceptions are Lakonishov and Maberly (1990)[1], Cohen (2003)[2] and Jain (2007).[3] These works, however, analyze the different trading patterns without investigating the possible different impact of information asymmetry on these two broad categories of investors.[4] The objective of the present work is testing whether investors with a different degree of sophistication are differently affected by informational asymmetry. The only paper -to our knowledge- addressing, at least partially, this issue is by Grinblatt and Keloharju (2001): they consider Finnish institutional sectors investing in *domestic* firms finding that familiarity factors[5]- distance, language and culture- play a stronger role for less sophisticated investors, such as households and non profit institutions.[6]

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[1] They document differences in trading patterns of individuals and institutional investors for high frequency transactions to explain the so-called weekend effect.

[2] He finds that individuals reduce their exposure to equities more than institutions during the trough of the business cycle buying stocks from institutions after market increases and selling after market decreases.

[3] He shows that individual investors prefer to invest in dividend-paying firms whereas institutional investors- relatively lower-taxed- tend to prefer firms engaging in larger share repurchases.

[4] Actually, the informational superiority of institutional investors on individuals is a crucial point in Jain (2007) but it is postulated and never tested.

[5] Note that we will use the expression *familiarity factors* and *proximity variables* as synonymous throughout the paper.

[6] Grinblatt and Keloharju (2001) analyze domestic investment in Finnish firms considering their distance, language and culture with respect to the investor (6% of the Finnish population speaks Swedish, and there are also differences in terms of cultural background).

However, proximity variables represent a quite narrow subset of proxies capturing investment barriers. Other relevant factors might indeed differently impact portfolio positions according to the degree of sophistication of investors thus weakening or further reinforcing the proximity effect. We depart from Grinblatt and Keloharju (2001) work since, allowing for international portfolio diversification, we can test the different role of a larger set of country-specific variables in driving portfolio allocation decisions. In particular, households, typically non professional investors, may have more limited access to information on *firm-specific* characteristics than institutional investors and may be more influenced by *country-specific* factors. We focus on *foreign* investment at *market level* rather than on *domestic* investment at *individual firm level* (Grinblatt and Keloharju, 2001). Furthermore, relying on the international equity dataset, we consider, beyond the proximity variables, also other country-specific factors capturing informational barriers and which might potentially have a different impact for investors with various degrees of sophistication.

The higher degree of *home bias* in households' portfolios with respect to professional investors is a signal that they might be more severely affected by information asymmetry and, consequently, are likely to benefit more from its alleviation. We test this conjecture by considering the determinants of *foreign* equity portfolios of households[7] and professional investors for four European investing countries -France, Italy,

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[7]Note that, throughout the paper, we adopt the term *households* meaning *households and no profit organizations*. In fact, for data comparability across countries and for data matching between *CPIS* and *OECD National Accounts* (see Appendix C), we consider non profit organizations-representing an almost negligible fraction- and households as the same consolidated sector. The results of Grinblatt and Keloharju (2001) reveal a similar responsiveness of households and non profit organizations to geographical and cultural distances so providing support to our choice of consolidating the two sectors.

Spain and Sweden- in the period 2001-2004. In our work, we investigate the impact of informational asymmetry for households and financial investors by considering, in a panel dimension, the different role of country-specific factors in foreign equity portfolios. We consider, among the country-level determinants, proximity variables such as distance, common border and common language. They have been extensively used in the trade literature as determinants of trade flows between countries and, more recently, the same approach has been used for equity flows (Portes et al., 2001; Portes and Rey, 2005) and equity holdings (Chan et al., 2005 among the others). However, these variables have been included considering, as investor, either the overall economy (Lane and Milesi-Ferretti, 2005, 2007; Sorensen et al., 2007; Amadi, 2004; Faruqee et al., 2004) or mutual funds (Chan et al., 2005). We consider, instead, as in Grinblatt and Keloharju (2001), different institutional investing sectors in order to detect whether the strength of the impact of proximity variables on stockholding is related to the degree of sophistication of the investor. Furthermore, previous literature has mainly documented that unenforceable contracts, legal and regulation complexity unequivocally deter foreign *direct* investments. Recently, Gelos and Wei (2005) find that country transparency affects also *portfolio* investment in emerging markets. We check the role of "opacity" in determining foreign portfolio investments in developed markets and test whether this role - if any- is stronger for less sophisticated investors to which access to firm-specific information may be more limited than to financial investors. Finally, by listing in foreign markets, firms' stocks have shown to succeed in alleviating informational asymmetries and to be more present in foreign portfolios (Dahlquist and Robertsson, 2001; Pagano et al.,

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2002). Ahearne et al. (2004) show that, at aggregate level, the higher the portion of a country's market that has a public US listing the higher the country's weight in the US portfolio. However, the literature has never explicitly tested, to the best of our knowledge, the informational effect of stock market consolidation. The merger of national exchange markets into a common exchange market might, in fact, play a role in reducing information asymmetry and its effect on portfolio allocation might depend on the investor's degree of sophistication. We consider the role of the common exchange market Euronext, controlling for the liquidity effect in order to disentangle the informational component.

Our results point to a stronger impact of proximity variables and transparency of the destination stock market for households. Moreover, we find a crucial role of common-listing, controlling for liquidity, *only* for less sophisticated investors: firms publicly listing in a common exchange -such as Euronext- are subject to standardized regulations and homogenizations of accounting rules which alleviate information asymmetry for households directly investing in the stock market.

Before proceeding with the analysis, it is worth making two important considerations.

The first point concerns households' *a priori* choice to invest their financial wealth directly in the stock market or through financial intermediation. Households may decide to invest directly in the stock market since the higher expected gain (if any) determined by the intermediated investment is below the intermediation cost. Assuming that the expected reward to risk ratio of intermediated investment is common knowledge and that all households face the same cost for intermediation, the choice

on whether investing directly or not depends on the household-specific degree of information affecting the (perceived) riskiness of *direct investment.* In these terms, considering different degree of information level among households, we can imagine a marginal individual investor for which the cost of indirect investment equals the benefit in terms of reduced perceived return variability. All investors with an information level lower than the marginal investor will buy the financial intermediation service while households better informed than the marginal investor will choose to invest directly on the stock market. The focus of this work is on the different strategies of end-investors and, consequently, we restrict the analysis to the self-selected better informed investing households who decide to invest directly on the stock market. Hence, our results revealing the stronger impact of information asymmetry for households than for financial institutions, do hold for a self-selected better informed fraction of households and should hold, even more severely, for the (unobservable) fraction of households investing indirectly through financial institutions.

The second aspect worth stressing is the *direct* linkage of our research with the literature on lack of diversification of households in the stock market (Campbell, 2006)[8]. Lack of diversification and preference for local assets has been found both in aggregate data (Lewis, 1999) and in household-level data. For instance, Huber-

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[8]It is interesting to note that also the literature on the so-called stockholding puzzle is, indirectly, related to our research. Guiso and Jappelli (2005) address the (un)awareness of the menu of assets available -and so information costs and barriers- as explanation for the stockholding puzzle (or lack of participation puzzle). Merton (1987), in fact, points out that investors purchase only securities they know about. In some way, the lack of diversification can be seen as non participation to foreign stock market. Unawareness (Guiso and Jappelli, 2005) or fixed entry costs (Haliassos and Bertaut, 1995; Vissing-Jorgensen, 2003) are found to be plausible explanations for households lack of participation to stock market. The same motives, more broadly defined as information asymmetry between home and foreign investors, can be seen as responsible of households' lack of participation in foreign stock market, that is households' lack of diversification.

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man (2001) finds that individual investors prefer to own the stocks of their local telecommunication company. Feng and Seasholes (2004) find that Chinese individual investors overweight not only local companies but also companies traded on a local exchange suggesting a connection between cross-listing reasons and familiarity.

The fact that households are more heavily affected by informational issues is strongly supported by the higher fraction of domestic assets held by households than by financial investors. When restricting the analysis to foreign stocks, we find that households and non profit organization are more prone to invest in stocks closer in cultural and geographical terms, more reluctant to invest in more opaque stock markets and attracted by stocks listed in their own stock exchange. Since investing households are more heavily affected by information issues than financial institutions, the removal of these barriers should benefit households relatively more and increase their international diversification.

The paper is structured as follows. In Section 2 we illustrate the econometric setting and in Section 3 we implement the empirical analysis and derive results. Section 4 concludes.

2   Estimable equation

Our theoretical framework is very standard and simply captures the equilibrium portfolio allocations when investors are supposed to face different costs investing in different stock markets. We adopt the Gehrig (1993) approach in modelling information asymmetries and, more in general, investment barriers: foreign investments appear on average more risky to domestic investors -leading to an information-based

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justification to home bias- and portfolios differ among investors depending on the perceived variance-covariance matrix[9]. We consider this approach focussing on foreign investment only, considering a different investor-specific perceived variability of return for each foreign stock index in the investment opportunity set. Details on the derivation of the model are provided in Appendix A.

When considering different investors k in the same country l the optimal portfolio weight in asset j (w_{lj}^k) is[10]

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

where MS_j is the market share of asset j in the world stock market and $\frac{1}{D_{lj}^k}$ represents the *relative* (with respect to world average) "advantage" of sector k in country l investing in asset j. In other words, this variable captures the inverse of investor's relative (to world average) investment barriers (direct -such as transaction costs- or

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[9]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 "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 and 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. Our formulation is a special case of ambiguity aversion: foreign investors believe that the true variance is in the interval $[\sigma_l, \sigma_h]$ and so they behave as if the variance were σ_h. The same reasoning applies when considering the allocation in several foreign stock markets rather than the choice between home and foreign assets.

[10]Note that here we are considering *equilibrium* portfolios. In the model the "unbiased" portfolio holding of an asset depends, as in standard portfolio choice theory, on asset characteristics (risk and return). When considering *equilibrium* asset holdings (without investment barriers), all investors ought to hold the same portfolio in which each asset is weighted according to its stock market capitalization (see Appendix A).

indirect -such as informational barriers) in holding asset j: the investor belonging to sector k in country l will demand a share of asset j greater than its market share in proportion to $\dfrac{1}{D_{lj}^k}$ (inverse of relative investment cost).[11]

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

The ratio $\frac{w_{lj}^k}{MS_j}$ can be interpreted as the *bias* in asset j by investor k in country l : if the actual position w_{lj}^k is larger than j's market share then there is a positive bias while a ratio lower than one reveals a negative bias. The above relation implies that the bias in asset j by investor k residing in country l depends upon the reciprocal of the bilateral specific investment barrier relative to the world average investment barrier. In other words, the larger the bilateral specific investment barrier relative to the world average the lower the actual position in a given asset[12].

Since we are considering the institutional sector as investors we estimate a separate *pooled-OLS* regression for each institutional sector k for *all* investing countries. We adopt a "Least Square Dummy Variable Estimation" with fixed effects for investing countries, time dummy and White correction of variance-covariance matrix. Since D_{lj}^k is not directly observable we have to estimate the equation making use of proxies. In order to capture the unobservable $\dfrac{1}{D_{lj}^k}$ variable we consider i different proxies, denoted by $rel\_proxy_{lj}^{ik}$ to emphasize that what matters in determining the

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[11]Note that if $D_{lj}^k = 1$, i.e. if the investment barrier for sector k in country l is equal to the average one then the market share of asset j will be optimally held in equilibrium.

[12]Our theoretical framework is equivalent to Chan et al. (2005) and Cooper and Kaplanis (1994) return-reducing approach. Also in their equilibrium condition, in fact, what matters is the investment barrier relative to the average one. Adopting this approach in which investment barriers enter in a multiplicative way, our equation, conveniently, turns out to be directly implementable and interpretable in log terms.

wedge between the actual position and the market share is the *relative* investment barrier with respect to the world average barrier.

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

However, since proxies at investor level -households or financial investors- are not available we have to rely on common country-specific variables for investors residing in the same country but we allow for a different sector-specific role of the same variables in the portfolio choice problem. In other words, in the model we assume a different perceived variance at investor level while in the empirical implementation, constrained by data availability, we just consider different elasticities of financial investors and households to the same country-specific proxy. In the actual regression analysis we also include some dummies which might, a priori, capture investment barriers. Consequently, our final estimable regression, including i regressors and n dummies, will be the following

$$\log\left(\frac{w_{lj}^k}{MS_j}\right) = \alpha + \sum_i \beta^{i,k}\log(rel\_proxy_{lj}^i) + \sum_n \lambda^{n,k}dummy_{lj}^n + \varepsilon_{lj}^k \tag{4}$$

If we consider, for instance, the distance between country l and j as indicator of investment costs, we expect a negative sign of the associated β coefficient: a higher "relative proxy" (e.g., greater distance between investing country l and target country j with respect to the average distance) is associated with investor k biasing her portfolio away from country j stocks.

After having implemented a regression for households and financial investors we test whether the coefficients are statistically different by running the following complementary regression

$$\log(w_{lj}^H) - \log(w_{lj}^F) = \delta + \sum_i \beta^{i*} \log(rel\_proxy_{lj}^i) + \sum_n \lambda^{n*} dummy_{lj}^n + \varepsilon_{lj}^k \qquad (5)$$

where the subscripts H and F denote, respectively, households and financial investors. The coefficient β^{i*} is equal to $(\beta^{i,H} - \beta^{i,F})$ and λ^{n*} is equal to $(\lambda^{n,H} - \lambda^{n,F})$. By testing the null hypothesis that $\beta^{i*} = 0$ (and analogously for λ^{n*}) we test the hypothesis that country-level factors are equally important in determining portfolio allocation for more sophisticated investors -professional investors- and less sophisticated investors -households[13]. Results against the null hypothesis, that is coefficients significantly different from zero in the expected direction[14], support, in statistical terms, our thesis[15].

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[13]In this paper we focus on the informational motive ignoring any other factor such as hedging motives which is, admittedly a quite restrictive perspective. However, in order to significantly affect our results, one should claim that the excluded factors are expected to have a different impact for different investors. In fact, the effect of all possible determinants -not only hedging motives- left out of the analysis do cancel out if they enter symmetrically for all investors so leaving unaffected our results. This might be a relevant issue considering, for instance, labor income hedging. On the one hand, the representative household's labor income may be indeed more highly correlated with home country GDP, and so domestic equities, than an international investment banker's labor income is. On the other hand, hedging motives- inflation hedging and labor income hedging- are expected to have a limited impact on international equity diversification as shown by previous literature (Cooper and Kaplanis, 1994; Baxter and Jermann, 1997).

[14]The sign of the coefficient depends on whether the proxy is aimed at capturing investment barriers rather than reduction in investment barriers.

[15]Please note that the above regression (5) allows us to test the difference in coefficients without performing the Wald test which would require a computationally heavier procedure -for instance a Seemingly Unrelated Regression- in order to compare coefficients of separate regressions.

3 Empirical analysis

We consider, for the period 2001-2004, four European investing countries -France, Italy, Spain and Sweden- for which the breakdown by sector holder in the *CPIS* (*Coordinated Portfolio Investment Survey*, by IMF) is available and for which we could find data on the fraction of equity assets held by various institutional sectors within a country (*OECD, National Accounts, Financial Balance Sheets*)[16]. Many recent papers have relied on the *CPIS* data source (Lane and Milesi-Ferretti, 2005, 2007; Faruqee et al., 2004; Sorensen et al., 2007) but none -to the best of our knowledge-exploits the breakdown by investing sector.

We consider two investing categories: the *households*' sector comprising households and non profit organizations and the *financial investors*' sector comprising banks, pension funds and insurance companies, mutual funds, and other financial auxiliaries.

The destination stock markets are 20 countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Italy, Japan, Korea, Mexico, Netherlands, Portugal, Singapore, Spain, Sweden, United Kingdom, United States[17].

The way different variables affect foreign holdings depends on how domestic and foreign investors evaluate these factors for investment purposes. The total market capitalization in any country must be held in aggregate by some investors so a country

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[16]See Appendix C for further details on the data.

[17]Since we focus on *foreign* portfolio allocation, the destination stock markets are 19 as the domestic country is excluded from the analysis. The Pooled-OLS regression is run, therefore, on 304 observations (19 observations for each year, for each investing country).

cannot be underweighted in portfolio by all investors. French and Poterba (1991) suggest that investors may simply be relatively more optimistic about their domestic markets. This assertion is confirmed by Strong and Xu (2003) and Li (2004) showing, using different datasets, as fund managers or investors in general are more optimistic about their home stock market. Notwithstanding the notable attempts proposed in the literature (Lewis, 1999), the equity home bias puzzle is far from been solved. The strong familiarity bias driving domestic investments is such that the same observable stock characteristic might generate a very different impact on investment decisions for domestic and foreign investors. If a country-specific factor had a symmetric impact on home and foreign investors then there should be no impact on foreign position. Conversely, if this factor had the effect of reducing the deadweight cost for foreign more than for domestic investors then more foreign investors would be induced to invest in the country and fewer domestic would hold local equities. For instance, let us consider the case of a process of homogenization of accounting standards across countries: this does not entail any additional advantage for investors in holding domestic assets while it might induce stronger incentives for investors to hold foreign assets perceived as less opaque and thus less volatile.

When looking at the portfolio composition in domestic and foreign equities in Table 1 we find some interesting regularities. As expected, all four countries considered display *home bias* with a domestic position ranging from 0.55 to 0.78. More interestingly, the *home bias* for households is much larger than for financial investors: the domestic share for households ranges from 0.76 for Italy to 0.94 for Spain while for professional investors the range goes from 0.29 for Italy to 0.60 for France. This

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preliminary evidence suggests that, at least for the countries considered, investment patterns for households and financial investors might be quite different and it is worth investigating whether a similar degree of diversity is present also within the foreign portfolio. Since now on, in our work we will ignore any explicit explanation relative to the *home bias* phenomenon and focus on the determinants of foreign positions[18].

3.1 Portfolio determinants of households and financial investors

We conjecture that since households have more limited access to foreign firm-level information they ought to rely more heavily on country-level factors.

In this section we consider the results from regression (4): results for financial investors and households are reported in Table 2 and Table 3, respectively. Results are also shown for the representative national investor (Table 4) to allow comparison with financial investors and households. The discussion on the statistical significance of the differences between households and financial investors is deferred to the next section (Table 5).

3.1.1 Indirect barriers

Proximity variables The first variables included in the regression analysis are the proximity variables. Market proximity captures the influence of asymmetric information on investor's portfolio choice (Gehrig, 1993; Brennan and Cao, 1997; Kang and Stulz, 1997). Many empirical contributions find that cultural and geographic

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[18]Even though domestic positions are not explicitly investigated here, they enter indirectly in our analysis since the weight of each foreign stock index in the overall portfolio depends also on the domestic share.

proximity of the market has an important influence on investor stock holdings and trading (Grinblatt and Keloharju, 2001; Faruqee et al., 2004; Chan et al., 2005; Portes and Rey, 2005; Lane and Milesi-Ferretti, 2005).

The regressors we include as proximity variables are distance, common border dummy and common language dummy[19]. The first two variables simply capture physical distance between the country of the investor and the destination country[20]. Since transactions in financial assets are "weightless" a role for distance may be found only if it has an informational content (Portes and Rey, 2005). The role for the common language dummy is more easily interpretable as foreign languages make more difficult collecting information and this is likely to be a serious issue mainly for non professional investors.

We expect to find a stronger role of proximity variables for households than for financial investors, as already found by Grinblatt and Keloharju (2001) for Finland. The first noticeable result, looking at columns (1) in Table 2 and 3, is the strong explanatory power of these regressors. The Adj-R^2 is indeed 39% for professional investors and 52% for households denoting a relatively stronger role for the latter. The second point to stress is the strong significant impact of the proximity variables in statistical and economic terms for both financial investors and households. Finally, the coefficients are much larger for households than for financial investors. The point estimate of the elasticity of the portfolio bias (w_{lj}^k/MS_j) with respect to the distance

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[19]See Appendix B for further details.

[20]A separate role for the dummy border can be found when considering this variable as "correcting" the distance variable which is measured as the great circle distance between the capital cities of the destination and investing country. Please note that the variable entering our regression is the *relative* distance between investing and destination country (see Appendix B for further details).

is about -1.3 for households and -0.9 for financial investors while point estimates for the proximity dummies (border and language) are more than twice as large for households. In particular, contiguity enhances the portfolio bias by more than 50% for financial investors ($e^{0.448} = 1.565$) while sharing a common border induces for households a portfolio bias 2.5 times larger. Sharing a common language has almost the same quantitative effect than contiguity for financial investors while it has a much stronger impact for households, increasing portfolio bias by 6 times.

Transparency   We include, as potential explanatory variable, an index capturing the degree of opacity of the destination country (Kurtzman et al., 2004).[21] The empirical literature on financial investments has assessed the relevance of small scale risks: fraudulent transactions, bribery, unenforceable contracts, legal and regulation complexity unequivocally deter investment. Previous literature has mainly documented that these institutional factors affect foreign *direct* investments. Recently, Gelos and Wei (2005), adopting opacity indexes similar to the one considered here, find that country transparency affects also *portfolio* investment in emerging markets. We check whether a role of opacity in foreign *portfolio* investments exists also when the analysis is focused on developed stock markets and whether this role - if any- is stronger for less sophisticated investors to which access to firm-specific information may be more limited than to financial investors.

Interestingly, the relative opacity index shows the expected negative sign for both investors but is statistically significant *only* for households (column 2). The elasticity is higher than 1 so quite large in economic terms: an increase of the relative opacity

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[21]We consider as regressor the relative opacity index, i.e. the country opacity relative to the average world opacity (see Appendix B for further details).

index by 50% halves the portfolio bias. After the inclusion of the opacity index, the proximity variables coefficients appear substantially unchanged for professional investors, where this proxy has no significant impact, but also the coefficients of proximity variables for households are only modestly affected. Therefore, our results seem to suggest that transparency of a country enhances foreign *portfolio* investments alleviating information asymmetry *only* for non professional investors.

Common exchange market: Euronext   Finally, we consider the Euronext "natural experiment" to test whether *common-listing*, that is listing on a common exchange platform, has any effect on stock portfolio decisions and whether the impact, if any, depends on the sophistication of the investor. Previous literature (Ahearne et al., 2004; Pagano et al., 2002; Dahlquist and Robertsson, 2001; Sarkissian and Shill, 2004) show how foreign firms publicly listing in a common exchange, subject to standardized regulations and homogenizations of accounting rules, are preferred by investors suggesting that cross-listing might reduce information asymmetry[22]. Following this perspective, we consider the effects of the Euronext creation. In September 2000 the Euronext is formed by the stock exchanges of Paris, Brussels and Amsterdam. In February 2002 Euronext continues to grow and merges with the Portuguese exchange[23]. We add the Euronext-dummy - taking value 1 if both the investing and the destination country are listed in the Euronext exchange and 0

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[22]Following a similar perspective, Vlachos (2004) highlights the relevance of regulatory harmonization as determinant of cross-country portfolio holdings based on the *CPIS* dataset.

[23]In 2002 Euronext merges also with the LIFFE (*London International Financial Futures and Options Exchange*). This merger is, however, not considered here since it is a future exchange and not strictly a stock exchange. In April 2007, Euronext merged with *NYSE* (New York Stock Exchange) creating the larger stock exchange in the world. For obvious reasons, this merger cannot be object of investigation in the present work.

otherwise - to our regression in order to check whether the creation of a common stock exchange with standardized financial regulations may be perceived by investors as a reduction of information barriers. Moreover, if the common listing had an informational content then we should expect it to be stronger for households than for financial investors who may rely on more specific (and costly) sources of information. Results reported in column 3 of Table 2 and 3, indeed, support our conjecture. The coefficient has the expected positive sign for both kinds of investors but is large and statistically significant *only* for households: trading in a common stock exchange platform increases the portfolio bias by about three times.

Control for liquidity Padilla and Pagano (2006) have recently found that the integration of the Amsterdam, Brussels, Lisbon and Paris exchanges in a single platform resulted in a significant increase in liquidity[24]. Therefore, in order to exactly pick up the informational Euronext effect, it is crucial accounting also for liquidity. We consider a variable capturing the relative illiquidity of the market adopted by Bortolotti et al. (2007). This is a measure of price impact which is the aggregate version of Amihud (2002) illiquidity measure. The market illiquidity of a stock market is defined as the ratio of absolute return on the stock index to turnover, capturing the response of the stock index return to turnover. Since our portfolio holdings are recorded at annual frequency we need 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

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[24]Sarkissian and Shill (2004) point out some evidence on the role of liquidity in the choice of listing abroad.

day d and D is the number of trading days in year t.[25] $TURN_{dt}$ 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 higher the reaction of stock index return to a given turnover rate, the higher the illiquidity of the stock market. In particular we consider the logarithm of the relative illiquidity measure capturing the relative illiquidity of the stock market j relative to the world illiquidity[26]. Results in column 4a show that the illiquidity measure has the expected negative sign and is significant for both types of investors, although the coefficient point estimate is more than two times larger for households than for financial investors. The same result applies when considering the annual turnover rate (column 4b) as alternative, and more commonly adopted, measure of liquidity (Levine, 1997; Dhalquist and Robertsson, 2001; Lane and Milesi-Ferretti, 2007)[27].

$$turn_t = \frac{1}{D} \sum_d TURN_{dt}$$

These results confirm that the Euronext dummy has an informational content

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[25]The index return 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).

[26]The same procedure is followed when we consider the turnover rate as alternative to the illiquidity measure.

[27]The two alternative measures of liquidity/illiquidity we consider have an average correlation coefficient equal to -0.53. It stresses, on the one hand, the existence of a strong linkage among them and, on the other hand, the fact that they must capture different aspects as their correlation coefficient is far below unity. As pointed out by Bortolotti et al. (2007), the Amihud (2002) index is a better proxy for market (il)liquidity than the turnover ratio since the latter may not account for all aspects of market liquidity (Hasbrouk, 2003).

per se further stressing the high relevance of aggregate informational barriers for less sophisticated investors[28].

Control for EMU   Finally, members of the Euronext exchange are also EMU members so that the Euronext effect could simply capture the reciprocal attractiveness among EMU countries due to the elimination of exchange rate risk as documented in the recent literature (Lane and Milesi-Ferretti, 2007; Berkel, 2004). We therefore include the EMU dummy in our analysis in order to disentangle the *informational* impact of Euronext[29]. Results in columns 4a and 4b show that the Euro dummy is, for both investors, economically and statistically relevant: sharing a common currency determines a strong impact on portfolio bias (5 times larger for financial investors and more than 8 times larger for households). It is worth noticing that controlling for liquidity and for the EMU dummy does actually reduce the impact of the Euronext dummy for households -the dependent variable increases by 2.4 times rather than by 3 times- but the coefficient remains very large.

3.1.2   Additional results and robustness check

Return-chasing or contrarian trading?   In Gompers and Metricks (2001) love for liquidity as well as contrarian trading behavior are identified as characteristics of large investors. Since households are typically small investors, there might be some variables included in our analysis correlated with past reward to risk ratio and so

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[28]As pointed out by Padilla and Pagano (2005), the merger of stock exchanges also determines a reduction in direct costs. However, since financial investors are those who more frequently turnover their portfolios they should be more affected than households by these costs. Under this consideration, the fact that the Euronext-dummy plays a role for households supports even more strongly our informational hypothesis.

[29]Note that, among investors, Italy and Spain are EMU but not Euronext members and, among destination countries, Austria, Finland, Germany, Italy, Spain are EMU but not Euronext members

influencing our results. We therefore include the relative lagged Sharpe ratio[30] in our regression analysis showing the relative results in column 5 of each table[31]. We find no significant role for lagged Sharpe ratio neither for households nor for financial investors while other coefficients are almost unaffected.

Restrictions to capital mobility   Finally, we add, as further control, a variable capturing direct investment barriers that is restrictions to international capital mobility. The strand of literature trying to explain the lack of portfolio diversification through the existence of barriers to international investment dates back to contributions by Black (1974), Stulz (1981) and Errunza and Losq (1981). Since the relaxation of capital controls occurred over the last decades has not significantly induced a parallel drop in the *home bias,* the direct transaction costs' explanation has been considered as inadequate (Ahearne et al., 2004; Berkel, 2004). In fact, we find the same results when considering the representative country investor in Table 4: column 6 shows how capital control variables have no impact on foreign portfolio holdings[32]. However, it is worth stressing that the institutional explanation has revealed to be unsatisfactory when considering aggregate investment by the *representative* country investor or by particular institutional investors, typically mutual funds (Chan et al., 2005). In fact, direct costs might have, *a priori*, a different impact

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[30]See Appendix B for details.

[31]Lane and Milesi-Ferretti (2005) consider the same regressor finding mixed results on its significance for the representative country investor.

[32]When considering only OECD destination countries, the "source component" of capital control is statistically significant. Note that table 4, considering all institutional sectors, includes, beyond households and financial institutions, also government and non financial corporations (excluded from the analysis).

on households and financial investors since they operate on a diverse scale[33]. Consequently, we include here the direct costs' explanation of cross-border investment as it could interact with our results on informational barriers.

Since it is not so easy to identify a bilateral specific relative cost, D_{lj}, it is decomposed into two components: the relative "source component" (D_l), i.e. the costs that investor faces to transfer funds out of her own country l, and the relative "host component" (D_j), i.e. the cost faced to enter country j.

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

We adopt an index measuring the restrictions countries impose on capital flows derived from the *Economic Freedom Network* (Chan et al., 2005, among the others, adopt the same index)[34]. It is an index (0-10) assigning a lower rating to countries with more restrictions on foreign capital transactions[35]. We consider the relative host (source) capital mobility index, that is the index of capital mobility of the destination market j (investing country l) divided by the average capital mobility index.

Our results, displayed in column 6, show how the "source component" of capital mobility variables has, indeed, a relevant explanatory power for both types of investors with a stronger impact for households.

Summing up, our results on the different impact of country-level informational

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[33]Financial investors, typically larger and more sophisticated, may be rationally less affected by costly procedures to foreign investment.

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

[35]See Appendix B for further details.

for households and professional investors still hold after controlling for past reward to risk ratio and capital control.

No Hong Kong and Singapore Finally, we run the above regression excluding Hong Kong and Singapore from the pool of destination stock markets for two kind of reasons. The first one is that they play also a relevant role as offshore financial centers and it might have the effect of distorting investors' decisions for reasons lying beyond the scope of this work. The second motive is related to possible (explicit or implicit) constraints, especially for pension funds and life-insurance companies (Davis, 2001), restricting non-OECD foreign asset holdings. The results are displayed in the last column of each table: the significance and the magnitude of regression coefficients remain unchanged and our results are not affected by the exclusion of Hong Kong and Singapore.

A final consideration comes from the comparison of Table 2, 3 and 4. As it can be noticed, the results in Table 4 referred to the whole investing economy, are fairly similar to Table 2 which refers to institutional investors. It goes in the direction of confirming Chan et al (2005)'s conjecture that mutual funds investment patterns - and, more in general, institutional investors' patterns- reflect the portfolio allocation of the representative investor in a given country. At the same time, the neat difference in results between households and the overall economy reveals that the *representative country investor* is far from "representing" the *representative household*.

3.2 Testing differences households-financial investors

To test the significance of the different impact of informational barriers on households portfolio choice with respect to financial investors, we run regression (5) where the dependent variable is the $\log(w_{lj}^H/w_{lj}^F)$ and the coefficients exactly capture the *wedge* in sensitivity to country-level factors for households with respect to financial investors. Results are reported in Table 5. Had the effect of one regressor been equal for households and professional investors we should have observed its coefficient equal to zero, or not significantly different from zero. For instance, the hypothesis of null coefficient for distance is not rejected so revealing that the effect of this variable on the two types of investors is not statistically different. For the other proximity variables (border and language), for opacity and the Euronext dummy the coefficient is statistically different from zero[36] underlying a significant different impact of these variables on households and financial investors in the expected direction. Summing up, with the exception of distance, all variables capturing information asymmetry at country-level play a stronger role in driving portfolio allocations for households than for financial investors.

Sensitivity analysis: one country out As a final robustness check, we consider whether our results, based on a pooled regression including four countries, are driven by one particular investing country. We display our regression results in columns 2a, 3a, 4a and 5a of Table 5 when, respectively, France, Italy, Spain or

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[36]Also the "host component" of capital controls, the EMU-dummy and illiquidity show a significant different impact for households and financial investors.

Sweden are excluded from the sample[37]. The coefficients show some variability when one country is excluded from the sample[38] but the evidence shows that our results are comfortingly not driven by one single country. In columns (#b) the same results are reported when only OECD countries are included in the pool of destination stock indexes. Under all sample specifications, the variables proxying information asymmetry -with the exception of distance- display a significantly larger impact for households than for professional investors confirming our initial conjecture[39].

4   Conclusions

We analyze the determinants of foreign portfolio allocations of more sophisticated investors -financial investors- and less sophisticated investors -households- in four European countries, France, Italy, Spain and Sweden in the period 2001-2004. We conjecture that a different degree of sophistication implies different access to firms' specific information so resulting in different demand patterns. We provide evidence that households' foreign portfolio investments are more heavily influenced by country-level informational barriers. In particular, we reveal for households a stronger impact of proximity variables, transparency of the destination stock market and a relevant

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[37]When France is excluded from the sample, the Euronext dummy is necessarily excluded from the regression.

[38]The variability of coefficients is not surprising since the exclusion of one country represents a reduction by one-forth of the overall sample size. The Adj-R^2 also displays some variability: it is basically unaffected by the exclusion of Italy, remarkably decreased by the exclusion of France and Sweden while remarkably increased when Spain is dropped out.

[39]It is worth pointing out how our results are not driven by the different positions of households and financial investors in domestic assets. In fact, the logarithmic specification makes coefficients invariant to any scale factor which is totally absorbed in the intercept. In other words, were households' and financial investors' portfolios identical in terms of foreign portfolio *composition,* the coefficients of our regressors would also be identical regardless the sharp difference in the domestic position.

role for the common stock exchange market - Euronext - in enhancing information disclosure. This evidence highlights that differences in the investment patterns of households and institutional investors might be driven by the different degree of sophistication. Consequently, technological advances reducing the "distance" between markets and any effort to improve transparency of financial markets might plausibly induce a higher international portfolio diversification of households' portfolios. Furthermore, this is the first work, to our knowledge, detecting a significant informational role of the Euronext stock exchange merger: less informed investors seem to benefit from the information disclosure mechanisms connected with the common listing. In this turmoil period of stock market consolidations, this result suggests that a common exchange platform might represent an effective mechanism to alleviate information asymmetry and enhance international diversification for households.

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A   Theoretical framework

Our theoretical framework is very standard and simply captures the equilibrium portfolio allocations when investors are supposed to face different costs investing in N stock markets. As in French and Poterba (1991), we assume our investor maximizes the expected value of a constant relative risk aversion utility function

$$U(W) = - \exp\left(-\lambda \frac{W}{W_0}\right)$$

where λ is the coefficient of relative risk aversion, W_0 is initial wealth and W is financial wealth.

Assuming stock returns are normally distributed, the expected utility may be rewritten as

$$E\left[U(W)\right] = - \exp\left[-\lambda\left(\mathbf{w}'\left(\bar{\boldsymbol{\mu}} - r\mathbf{i}\right) - \frac{\lambda}{2}\mathbf{w}'\boldsymbol{\Sigma}\mathbf{w}\right)\right]$$

where $\mathbf{w}$ 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 $\boldsymbol{\Sigma}$ is the variance-covariance matrix of stock returns.

Maximizing the above expected utility under the constraint $\displaystyle\sum_{s=1}^{N} w_s = 1$ we get the standard mean-variance vector of optimal weights

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

We adopt Gehrig (1993) approach in modelling information asymmetries (and in general investment barriers). In Gehrig (1993) 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 variance-covariance matrix. We consider this approach focussing on foreign investment only, considering a different investor-specific perceived variability of stock returns for each foreign stock index in the investment opportunity set.

Denoting by $\mathbf{C}_l$ the matrix of investment barriers we rewrite the personalized vector of weights for each investor l in the following way

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

where $\mathbf{\Sigma}_l = \mathbf{\Omega C}_l$ (and therefore $\mathbf{\Sigma}_l^{-1} = \mathbf{C}_l^{-1}\mathbf{\Omega}^{-1})$[40]. We obtain

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

The diagonal NxN positive definite matrix $\mathbf{C}_l$ may be defined as

$$\mathbf{C}_l = \begin{bmatrix} C_{l1} & 0 & \cdots & \cdots & & 0 \\ 0 & \ddots & \ddots & & & \vdots \\ \vdots & & \ddots & C_{lj} & \ddots & \vdots \\ \vdots & & & \ddots & \ddots & 0 \\ 0 & \cdots & \cdots & & 0 & C_{lN} \end{bmatrix}$$

where C_{lj} is the bilateral cost of holding country j's stock by country l's investor. As C_{lj} stands for the investment barrier cost for country l investing in j , its reciprocal $\dfrac{1}{C_{lj}}$ stands for a variable capturing the investment "advantage" of country l investing in country j.

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

$$\mathbf{MS} = \mathbf{\Phi}\mathbf{\Omega}^{-1}\left[\frac{1}{\lambda}(\bar{\boldsymbol{\mu}} - r\mathbf{i})\right] \tag{7}$$

where $\mathbf{MS}$ 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

$$\mathbf{\Phi} = \begin{bmatrix} \phi_1 & 0 & \cdots & \cdots & & 0 \\ 0 & \ddots & \ddots & & & \vdots \\ \vdots & & \ddots & \phi_j & \ddots & \vdots \\ \vdots & & & \ddots & \ddots & 0 \\ 0 & \cdots & \cdots & & 0 & \phi_N \end{bmatrix}$$

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

where $\phi_j = \sum_{l=1}^{L} MS_l \frac{1}{C_{lj}}$ 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 (6) as

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

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 (7) we get the following result

$$\mathbf{w}_l = \mathbf{D}_l^{-1}\mathbf{MS} \tag{9}$$

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

$$w_{lj} = \frac{1}{D_{lj}}MS_j \tag{10}$$

MS_j is the market share of stock index j in the world stock market, $\frac{1}{D_{lj}}$ represents the *relative* (with respect to world average) "advantage" 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 $\frac{1}{D_{lj}}$ (inverse of relative investment cost). 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.

B Data appendix

market share

Market shares refer to the values at December, 28th of each year from 2001 to 2004.

Source: Datastream, Thomson Financial

proximity 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 logarithm of the

ratio of the distance $l - j$ to the average distance from country j.

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)

opacity index

Index capturing the degree of opacity (Kurtzman et al., 2004) of a country. It is a synthetic index capturing corruption, inefficacy of the legal system, deleterious economic policies, inadequate accounting and governance practices, detrimental regulatory structures. It is a synthetic measure (1-100) of indexes coming from 41 different sources (World Bank, IMF, International Securities Services Association, International Country Risk Guide and Individual Country's Regulations).

Euronext dummy (Common Stock Exchange dummy)

Dummy variable taking value of 1 if the investing country and the destination country share the Euronext stock exchange platform (0 otherwise). In our case, it coincides with a common stock exchange dummy since the investing countries considered did not merge in a common stock exchange with other countries.

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.

illiquidity measure

The illiquidity measure is defined in the text. The average 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 on the average illiquidity.

Source: Datastream, Thomson Financials

turnover rate

The turnover rate is defined in the text. The average turnover rate is obtained as weighted (by market share) average of country stock index turnover. The variable included in the analysis is the relative turnover measure of country j, i.e. the ratio of country j turnover on the average turnover.

Source: Datastream, Thomson Financials

relative Sharpe ratio

Similarly to Lane and Milesi-Ferretti (2007) we consider the average excess return of the country stock market relative to world return, divided by the standard deviation of the excess return's variability.

Source: authors' calculations based on Datastream data.

capital mobility index

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

- domestic investments by foreigners and foreign investments by local residents are unrestricted

- investments are restricted in a few industries within the countries

- investments are permitted but regulatory restrictions slow the mobility of capital

- either domestic investments by foreigners or foreign investments by local residents require approval from government authorities

- both domestic by foreigners and foreign investments by local require government approval

We consider capital mobility indexes for both the investor country's index and the destination country index as we do not have bilateral specific capital control indexes: the barrier of country l 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.

C Derived portfolios of institutional investors

Our dependent variable is the logarithm of *foreign* portfolio shares, that is the share of each foreign stock index in the equity portfolio of a given investor. Foreign equity holdings (in US\$) are derived from *Coordinated Portfolio Investment Survey (CPIS)* for the years 2001 to 2004. However, the CPIS does not provide domestic holdings. 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; Lane and Milesi-Ferretti, 2007; Amadi, 2006). In particular, we derive the stock market capitalization of each investing country l ($MCAP_l$) from Datastream 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

$$\frac{for\_eq\_assets_l}{MCAP_l + for\_eq\_assets_l - for\_eq\_liab_l} = \frac{for\_eq\_assets_l}{tot\_eq\_assets_l} \qquad (11)$$

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

As far as the portfolio at institutional sector level is concerned, very few countries in CPIS provide details on the breakdown by sector holder and many countries report incomplete surveys. From CPIS data on foreign holdings by institutional sector we derive the ratio of foreign holdings by sector k on the total amount of equities held by country l

$$\frac{for\_eq\_assets_l^k}{tot\_eq\_assets_l} \qquad (12)$$

In order to obtain the domestic holding position for each investing sector we rely on an additional data source, 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

$$\frac{tot\_eq\_assets_l^k}{tot\_eq\_assets_l} \qquad (13)$$

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.

$$\frac{for\_eq\_assets_l^k}{tot\_eq\_assets_l^k} \qquad (14)$$

The investing countries considered -France, Italy, Spain and Sweden- are the only large investing countries providing the sectoral breakdown of equity holdings in the *CPIS* and in the *OECD* database.

The households' sector in the text is the aggregation of the *Household* with *Non Profit Organizations serving Households*. The financial sector is obtained by merging *Monetary authorities*, *Banks* and *Other Financial Institutions*. The sectors *General Government* and *Non Financial Companies* are not considered in the analysis.

Tables

Table 1.   Domestic share in equity portfolio (by investor type)

The table shows the average portfolio shares in domestic equities for the period 2001-2004. The first row refers to the overall economy, the second and third row refer, respectively, to financial investors and to households and non profit organizations. Portfolio shares are reported for the four investing countries considered in the analysis. Data are derived relying upon *CPIS* and *OECD, National Accounts, Financial Balance Sheets* (See Appendix B for further details).

	FRANCE	ITALY	SPAIN	SWEDEN
SHARE IN DOMESTIC STOCK MARKET				
- overall economy	*0.69*	*0.64*	*0.78*	*0.55*
- financial institutions	*0.60*	*0.29*	*0.33*	*0.34*
- households and NPOs	*0.90*	*0.76*	*0.94*	*0.83*

Table 2. Role of country factors in portfolio allocation: financial institutions

The table reports results of the pooled OLS regression as in (4) in the text. A "Least Square Dummy Variable Estimation" with fixed effects for investing countries is implemented. 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 couple investment country l -destination country j while the superscript F represents the "financial institutions" sector in country l. Details on the variables included as regressors are provided in Appendix B. Data on w_{lj}^F are at December, 31th of each year (2001-2004) while regressors (when time variant) are average value within the relevant year to avoid endogeneity issues. In column (7) Hong Kong and Singapore are excluded from the pool of destination countries. Constants and time dummies are included but not reported. White (1980) cross-section standard errors (d.f. corrected) are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	financial institutions							
	(1)	**(2)**	**(3)**	**(4a)**	**(4b)**	**(5)**	**(6)**	**(7)**
								(OECD only)
log(dist/av_dist)	-0.956***	-0.949***	-0.932***	-0.530***	-0.529***	-0.528***	-0.453***	-0.376***
	(0.106)	(0.111)	(0.115)	(0.094)	(0.096)	(0.094)	(0.098)	(0.103)
dummy_border	0.448**	0.468**	0.483**	0.252*	0.259*	0.252*	0.276*	0.383***
	(0.188)	(0.198)	(0.197)	(0.147)	(0.151)	(0.147)	(0.145)	(0.137)
dummy_lang	0.448**	0.437*	0.442*	0.948***	0.911***	0.945***	1.020***	0.852***
	(0.228)	(0.252)	(0.250)	(0.278)	(0.269)	(0.277)	(0.322)	(0.313)
log(opacity/av_opacity)		-0.080	-0.094	-0.397	-0.404	-0.391	-0.072	-0.148
		(0.328)	(0.327)	(0.281)	(0.285)	(0.286)	(0.249)	(0.248)
Euronext dummy			0.251	-0.052	-0.039	-0.052	-0.042	0.068
			(0.222)	(0.230)	(0.237)	(0.230)	(0.221)	(0.221)
log(illiq_out/av_illiq)				-0.231*		-0.231*	-0.222*	-0.159
				(0.136)		(0.136)	(0.124)	(0.121)
log(turn_out/av_turn)					0.213			
					(0.148)			
EMU dummy				1.604***	1.598***	1.604***	1.535***	1.373***
				(0.212)	(0.205)	(0.213)	(0.210)	(0.206)
rel_Sharpe ratio						0.005	0.008	-0.012
						(0.022)	(0.022)	(0.021)
log(cap_mob_out/av_cap_mob)							1.038*	1.501***
							(0.543)	(0.536)
log(cap_mob_in/av_cap_mob)							-0.506	-0.533
							(1.392)	(1.498)
Observations	304	304	304	304	304	304	304	272
Adj-R^2	0.39	0.39	0.39	0.48	0.48	0.48	0.49	0.47

Table 3. Role of country factors in portfolio allocation: households and non profit organizations

The dependent variable is the logarithm of the ratio of portfolio share to market share, $\log(w^H/MS_j)$, where the subscript lj represents the couple investment country l -destination country j while the superscript H represents the "households and non profit institutions" sector in country l. Otherwise the table is the same as Table 2. Constants and time dummies are included but not reported. White (1980) cross-section standard errors (d.f. corrected) are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	households and no profit organizations							
	(1)	(2)	(3)	(4a)	(4b)	(5)	(6)	(7)
								(OECD only)
log(dist/av_dist)	-1.279***	-1.170***	-1.091***	-0.559***	-0.558***	-0.552***	-0.433***	-0.300***
	(0.177)	(0.182)	(0.176)	(0.118)	(0.127)	(0.118)	(0.116)	(0.095)
dummy_border	0.881***	1.174***	1.240***	0.949***	0.967***	0.947***	0.985***	1.134***
	(0.251)	(0.295)	(0.269)	(0.203)	(0.212)	(0.203)	(0.203)	(0.194)
dummy_lang	1.821***	1.656***	1.679***	2.498***	2.395***	2.486***	2.606***	2.285***
	(0.233)	(0.233)	(0.231)	(0.230)	(0.211)	(0.225)	(0.289)	(0.331)
log(opacity/av_opacity)		-1.166***	-1.227***	-1.571***	-1.591***	-1.548***	-1.039***	-1.167***
		(0.387)	(0.386)	(0.297)	(0.308)	(0.298)	(0.297)	(0.286)
Euronext dummy			1.162***	0.874***	0.900***	0.872***	0.880***	0.889***
			(0.358)	(0.306)	(0.299)	(0.307)	(0.300)	(0.306)
log(illiq_out/av_illiq)				-0.590***		-0.589***	-0.575***	-0.433***
				(0.146)		(0.145)	(0.124)	(0.111)
log(turn_out/av_turn)					0.529***			
					(0.165)			
EMU dummy				2.120***	2.101***	2.118***	2.009***	1.711***
				(0.226)	(0.218)	(0.225)	(0.232)	(0.218)
rel_Sharpe ratio						0.018	0.023	-0.021
						(0.028)	(0.030)	(0.022)
log(cap_mob_out/av_cap_mob)							1.651***	2.461***
							(0.557)	(0.447)
log(cap_mob_in/av_cap_mob)							0.782	0.490
							(1.151)	(1.103)
Observations	304	304	304	304	304	304	304	272
Adj-R²	0.52	0.55	0.55	0.69	0.69	0.69	0.70	0.72

Table 4. Role of country factors in portfolio allocation: all investors

The dependent variable is the logarithm of the ratio of portfolio share to market share, $\log(w_{lj}^{TOT}/MS_j)$, where the subscript lj represents the couple investment country l -destination country j while the superscript TOT indicates the "representative investor" in country l. Otherwise the table is the same as Table 2 and Table 3. Constants and time dummies are included but not reported. White (1980) cross-section standard errors (d.f. corrected) are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	all institutional sectors							
	(1)	(2)	(3)	(4a)	(4b)	(5)	(6)	(7) *(OECD only)*
log(dist/av_dist)	-0.867***	-0.885***	-0.860***	-0.510***	-0.507***	-0.509***	-0.472***	-0.391***
	(0.115)	(0.114)	(0.119)	(0.106)	(0.104)	(0.106)	(0.113)	(0.107)
dummy_border	0.683***	0.634**	0.655**	0.447**	0.450**	0.446**	0.459**	0.578**
	(0.221)	(0.228)	(0.227)	(0.216)	(0.215)	(0.216)	(0.216)	(0.211)
dummy_lang	0.305	0.333	0.340*	0.696***	0.709***	0.694***	0.731***	0.534***
	(0.205)	(0.208)	(0.256)	(0.251)	(0.237)	(0.250)	(0.274)	(0.282)
log(opacity/av_opacity)		0.192	0.173	-0.124	-0.120	-0.119	-0.036	-0.049
		(0.394)	(0.391)	(0.340)	(0.348)	(0.343)	(0.169)	(0.312)
Euronext dummy			0.365	0.038	0.057	0.037	0.047	0.163
			(0.224)	(0.259)	(0.263)	(0.261)	(0.255)	(0.256)
log(illiq_out/av_illiq)				-0.041		-0.040	-0.036	0.040
				(0.172)		(0.173)	(0.169)	(0.172)
log(turn_out/av_turn)					0.079			
					(0.161)			
EMU dummy				1.397***	1.406***	1.396***	1.362***	1.168***
				(0.271)	(0.264)	(0.271)	(0.267)	(0.276)
rel_Sharpe ratio						0.004	0.005	-0.019
						(0.026)	(0.027)	(0.030)
log(cap_mob_out/av_cap_mob)							0.507	1.014*
							(0.614)	(0.586)
log(cap_mob_in/av_cap_mob)							-0.943	-0.902
							(1.525)	(1.627)
Observations	304	304	304	304	304	304	304	272
Adj-R ^{2}	0.38	0.38	0.38	0.44	0.44	0.44	0.44	0.40

Table 5. Test of different impact of country factors for households and financial investors

The dependent variable is the logarithm of the ratio of portfolio share of households to portfolio share of financial investors, $\log(w_{lj}^H) - \log(w_{lj}^F)$, where the subscript lj represents the couple investment country l -destination country j while the superscript H and F represent, respectively, "households and non profit institutions" and "financial institutions" in country l. Columns (#a) report values when Hong Kong and Singapore are included in the regression while in columns (#b) values are referred to the case in which only OECD destination countries are considered. . Constants and time dummies are included but not reported. White (1980) cross-section standard errors (d.f. corrected) are reported in parentheses. ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

	Test difference households-financial investors									
	all countries		no France		no Italy		no Spain		no Sweden	
	(1a)	**(1b)**	**(2a)**	**(2b)**	**(3a)**	**(3b)**	**(4a)**	**(4b)**	**(5a)**	**(5b)**
log(dist/av_dist)	0.020	0.076	0.062	0.066	-0.042	0.034	0.056	0.150**	0.038	0.106**
	(0.060)	(0.056)	(0.098)	(0.100)	(0.066)	(0.064)	(0.077)	(0.060)	(0.075)	(0.066)
dummy_border	0.709***	0.751***	0.851***	0.835***	0.752***	0.834***	0.556***	0.668***	0.659***	0.669***
	(0.149)	(0.152)	(0.223)	(0.217)	(0.126)	(0.122)	(0.167)	(0.172)	(0.207)	(0.210)
dummy_lang	1.585***	1.432***	1.452***	1.418***	1.462***	1.269***	1.927***	1.617***	1.432***	1.204***
	(0.151)	(0.146)	(0.262)	(0.260)	(0.169)	(0.153)	(0.163)	(0.199)	(0.160)	(0.129)
log(opacity/av_opacity)	-0.968***	-1.019***	-0.942***	-0.982***	-1.005***	-1.061***	-0.893***	-1.034***	-0.962***	-0.943***
	(0.151)	(0.149)	(0.202)	(0.202)	(0.177)	(0.175)	(0.169)	(0.152)	(0.177)	(0.183)
Euronext dummy	0.921***	0.821***	-	-	1.156***	1.0786***	0.635***	0.567**	0.967***	0.863***
	(0.236)	(0.238)			(0.240)	(0.243)	(0.239)	(0.244)	(0.235)	(0.239)
log(illiq_out/av_illiq)	-0.353***	-0.274***	-0.348***	-0.312***	-0.384***	-0.286***	-0.198**	-0.106	-0.474***	-0.386***
	(0.063)	(0.067)	(0.091)	(0.095)	(0.085)	(0.085)	(0.088)	(0.086)	(0.067)	(0.070)
EMU dummy	0.474***	0.338**	0.520***	0.476**	0.053	-0.143	0.825***	0.620***	0.542***	0.433**
	(0.125)	(0.138)	(0.185)	(0.201)	(0.169)	(0.169)	(0.140)	(0.148)	(0.098)	(0.100)
rel_Sharpe ratio	0.015	-0.010	0.005	-0.011	0.011	-0.018	0.022	-0.008	0.026	0.002
	(0.014)	(0.014)	(0.016)	(0.017)	(0.018)	(0.016)	(0.019)	(0.015)	(0.015)	(0.016)
log(cap_mob_out/av_cap_mob)	0.613*	0.960***	0.390	0.426	0.292	0.719	1.377***	1.919***	0.399	0.822*
	(0.314)	(0.332)	(0.448)	(0.496)	(0.416)	(0.441)	(0.326)	(0.267)	(0.379)	(0.429)
log(cap_mob_in/av_cap_mob)	1.288	1.023	1.599*	1.192	1.068	0.605	0.588	1.025	1.432	1.116
	(0.890)	(0.887)	(0.948)	(0.951)	(1.663)	(1.707)	(1.129)	(1.179)	(0.886)	(0.881)
Observations	304	272	228	204	228	204	228	204	228	204
Adj-R²	0.40	0.44	0.30	0.31	0.41	0.47	0.56	0.62	0.31	0.33