Home Bias at the Fund Level

Harald Hau
INSEAD and CEPR

Hélène Rey
LBS, CEPR and NBER

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Abstract

This paper presents new stylized facts on the distribution of the home bias at the fund level. We find (i) a large heterogeneity in the degree of home bias across mutual funds; (ii) a positive correlation between the size of funds and home bias; and (iii) a positive correlation between the size of funds, the number of foreign countries and the number of sectors in which they invest. These facts constitute a challenge for existing theories.

Hélène Rey: London Business School, Department of Economics, Regent's Park, London NW1 4SA, UK. Tel: +44 (0) 207 000 8412. Fax: +44 (0) 207 000 8401. E-mail: hrey@london.edu. Web page: www.princeton.edu/~hrey

Harald Hau: INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, France. Tel: +33 1 6072 4484. Fax: +33 1 6072 4045. E-mail: harald.hau@insead.edu. Web page: faculty.insead.edu/hau

In their classic 1991 paper, Kenneth French and James Poterba pointed out that the degree of diversification in international equity markets was very low. Their estimates of the domestic ownership shares of the US, Japan, the UK, Germany and France were 92.2%, 95.7%, 79% and 89.4% respectively for end 1989 holdings. Since then, so many papers have attempted to explain the phenomenon of home bias in developed equity markets that it is impossible here to give justice to all of them[1]. Models based on proportional transaction costs or capital controls have been dismissed early on, since they are hard to square with the high turnover in international equities (Linda Tesar and Ingrid Werner 1996); as have explanations based on institutional constraints, since whenever these exist, they do not appear to be binding (French and Poterba 1991). Deviations from purchasing power parity and inflation risk do not seem to be quantitatively important enough (Ian Cooper and Evi Kaplanis 1994). Transport costs may explain home bias in some settings (Maurice Obstfeld and Kenneth Rogoff 2000, Philip Lane and Gian-Maria Milesi-Ferretti 2007), or may have to be complemented with transaction costs on asset markets (Nicolas Coeurdacier 2006). Since gross international equity flows and holdings follow a gravity model (Richard Portes and Hélène Rey 2005), a strand of literature has emphasized familiarity effects or information costs to explain home bias. Models of rational inattention generate home bias when domestic investors have a small informational advantage on domestic assets (Laura Veldkamp and Stijn Van Nieuwerburgh 2006). The interaction of rational inattention and liberalization of capital markets can reproduce the time series of slightly declining home bias (Jordi Mondria and

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[1]See Karen Lewis 1999 for a survey. We use the term home bias to denote the low degree of foreign holdings in portfolios. We do not take a stand regarding whether this low degree of diversification is due to frictions or is consistent with a frictionless environment and perfect risk sharing.

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Thomas Wu 2006).

If returns on labour and on domestic equity were negatively correlated, home bias in equity could be consistent with perfect risk sharing. But introducing human capital in a one-good two-country model does not help, since its returns tend to be positively correlated with physical capital in the presence of productivity shocks (Marianne Baxter and Urban Jermann 1997)[2]. Harold Cole and Maurice Obstfeld 1991 show that in a two-good endowment economy terms of trade effects can insure against changes in relative endowments. In the case of log preferences, they enable perfect risk sharing, even under financial autarky. Jonathan Heathcote and Fabrizio Perri 2007 extend the argument to a two-good open economy with production and find that terms of trade effects operating on the price of capital generate a negative correlation between relative returns on labour and on domestic equity. Goods market price stickiness can also generate a negative correlation between labour income and profits (Charles Engel and Akito Matsumoto 2006). All these theories aim at explaining the extent of home bias at the country level; in that sense, they are all theories of *aggregate home bias*. In this paper, we believe we are the first to present stylized facts on home bias at the *fund level*. In doing so, we have three goals. First we document the investment behavior of mutual equity funds; since they are important actors in international markets, this is interesting in its own right. Second, our data have the advantage that, unlike most of the literature, they are not US centric. Thus, we have more robust stylized facts, since the US may be a very special market. Third, we document patterns of heterogeneity in the degree

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[2]Laura Bottazzi, Paolo Pesenti and Eric Van Wincoop 1996 find that additional sources of risk can overturn this result.

of home bias at the microeconomic level. These patterns could help discriminate between the various theories of aggregate home bias described above.

I. Fund Level Data

We employ a data set on global equity holdings created by Thomson Financial Securities (TFS) that contains detailed mutual fund equity holdings worldwide. The data document holdings of individual mutual funds at the stock level. Similar data have been previously used by Kalok Chan, Vicentiu Covrig and Lilian Ng 2005 for the years 1999 and 2000. Our own data set covers the six year period 1997 to 2002. Chan et *al.* perform a detailed study of the determinants of investment shares in domestic and foreign markets, aggregating mutual fund investments country by country. In contrast, we focus on the heterogeneity of the distribution of home bias across funds. In our data set, some funds report quarterly but most funds report only with a frequency of 6 months. Thus, we undertake our analysis at the semester frequency. We focus on funds incorporated in the most developed financial markets where we have a very substantial cross-section of mutual funds, namely the 16 following countries: the United States (US), Canada (CA), United Kingdom (UK), euro area countries (EU)[3] and Switzerland (SWZ). We keep all the 96 investment markets of the data set. These include several off-shore centers and emerging markets. Several filters were applied to eliminate data outliers. Funds with less than 10 million U.S. Dollars of total asset value in any semester are discarded. These might represent incubator funds and other

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[3]Ireland, Finland, France, Greece, Germany, Austria, Netherlands, Italy, Belgium, Luxembourg, Portugal, Spain.

non-representative entities. Stocks are eliminated from the fund portfolio if their total return index increases by more than 500% or decreases by more than −90%.

Our data are extremely disaggregated and cover many different countries. The drawback is that they only contain information on mutual funds and not on individual investors or on other types of institutional investors. In our sample we have 11,129 fund-semester observations in our 16 countries. In order to gauge the representativeness of our data at the macroeconomic level, we compare them to the best aggregate data available on international investment, that of the Coordinated Portfolio Investment Survey (CPIS) of the IMF[4]. CPIS data are available on an annual basis since 2001. The correlations of our holdings with the CPIS geographical distribution of cross border equity holdings are very high: 0.73 for the Euro area, 0.93 for the US, 0.99 for Canada, 0.52 for Switzerland, and 0.95 for the UK[5]. These high correlations suggests that, as far as the geographical dispersion of holdings is concerned, our sample is representative of foreign equity positions in the world economy.

Next, we document the summary statistics for our mutual funds holdings data. In Table 1, we report the number of funds-semester per country over the period 1998-2002, the number of equity positions and their market value in $bn. For example, for the Euro area, we have 3,804 funds and 310,726 positions valued at around $353 bn. The largest cross-section we have is for the US with 5,123 equity funds-semester. In Table 2, we present total investment over the period 1998-2002 by country of fund origin and by destination market. Advanced economies

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[4]One drawback of the CPIS data is that it does not preclude equity investments in mutual funds, hence indirect holdings of foreign equity.

[5]These correlations have been computed on foreign holdings only and do not include zeros. Adding investments into the domestic markets would push these correlations even higher. We report the smallest correlation for the two years 2001 and 2002.

invest mostly in other advanced economies. The integration of the US and Canadian market is very high, as expected. In each of our countries, there is a non-negligible number of pure international funds: 249 in the US (5%), 100 in Canada (16%), 281 in the UK (24%), 280 in the EU (7%); 108 in Switzerland (29%).

Table 1: Summary Statistics on Fund Holdings 1998-2002

Fund in:	US	CA	UK	EU	SWZ
Funds	5, 123	643	1, 186	3804	373
Positions	800, 339	57, 003	140, 523	310, 726	40, 302
Value	2, 851	111	252	353	80

Note: Authors' calculations based on TFS data. We report the number of funds, of stock positions, and the corresponding asset value (in $billion).

Table 2: Summary Statistics by Investment Destination (1998-2002)

Fund in:	US	CA	UK	EU	SWZ
US	2, 451	33	39	62	18
CA	37	62	2	1	1
UK	82	4	124	45	6
EU	110	5	53	200	18
SWZ	22	1	10	18	17
Other	149	6	47	27	20

Note: We report the investment value by investment market (in $billion).

II. Aggregate Measures of Home Bias

We estimate the aggregate degree of home bias for each country of incorporation of the funds. To do so, we compute the total market capitalization of the domestic assets in which funds invest and divide it by their total investment portfolio. We call this measure the "aggregate mutual fund home bias". We compare this measure to the home bias given by aggregate data. We use the CPIS data (available from 2001) on cross-border holdings and market capitalization data of the Fédération Internationale des Bourses de Valeurs to estimate total investment in the domestic market by domestic agents. We then simply divide it by the total domestic market capitalization[6]. Results are shown in Table 3 where we report the average home bias in 2001-2002. It is clear that equity mutual funds tend to be less home biased than other investors. The relative pattern of home bias across countries, however, is similar to the one of the aggregate data. Just like for international trade in goods, large countries tend to be more closed than smaller ones. Several theories outlined in the introduction can account for this fact (for example Heathcote and Perri 2007 or Obstfeld and Rogoff 2000). The US exhibits the highest degree of home bias. Our UK and Swiss sample of mutual funds exhibit considerably less home bias than other investors. There is a slight decrease in the degree of home bias for all countries between 2001 and 2002.

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[6]We choose not to normalize our numbers by the relative size of the domestic capitalization in the world capitalization. We find these unnormalized numbers easier to interpret.
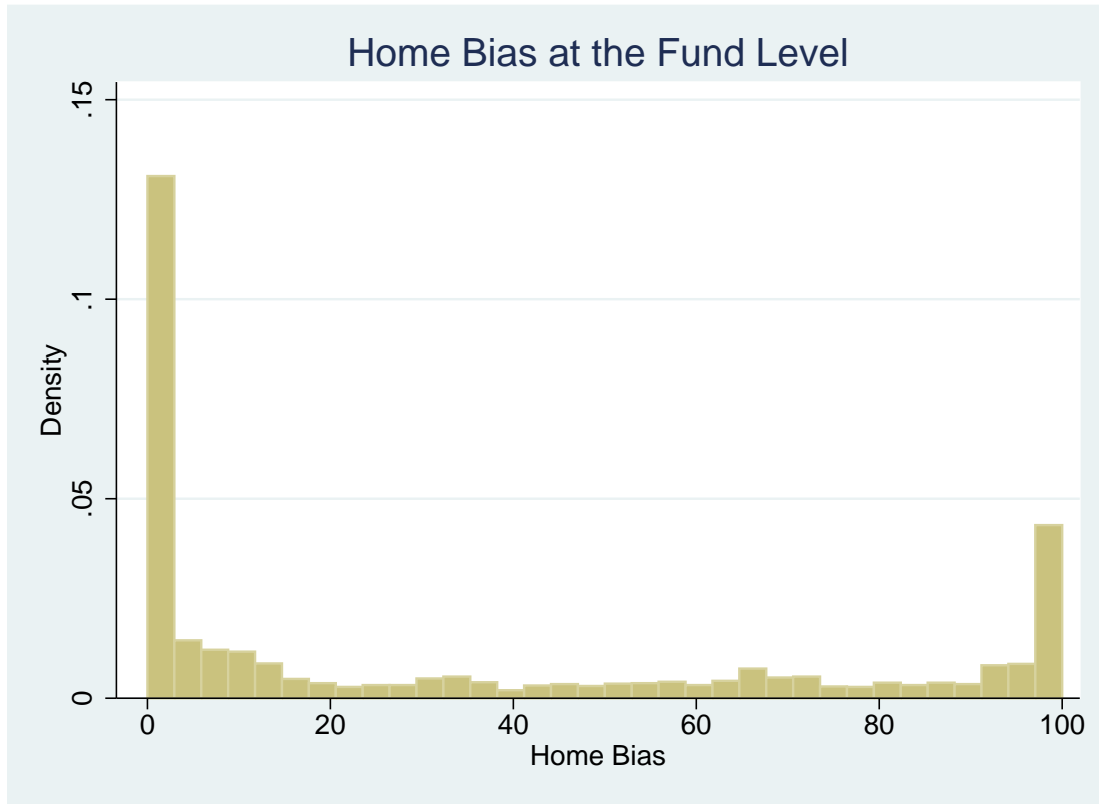
Figure 1: Authors' calculations based on TFS Data.

Table 3: Aggregate Measures of Home Bias (average 2001-2002)

Fund in:	US	CA	UK	EU	SWZ
Measures (percent)					
Aggregate data	92.1	83.7	65.4	55.4	65.3
Agg. Mutual Fund	85.1	71.2	22.8	44.0	20.4

Note: Authors' calculations based on TFS, CPIS and FIBV data.

III. Home Bias at the Fund Level

In Table 4, we present data on the average degree of home bias at the fund level for the period 1998-2002. There is considerable heterogeneity both across countries and across funds within a country regarding the degree of home bias. A typical equity fund exhibits a degree of home bias which is not as pronounced as in aggregate data. For the US, the mean degree of home bias at the fund level is 68.1%, which is much smaller than the aggregate degree of home bias. For the UK and the Euro area the mean home biases are low: 32.4% and 29.1%, respectively. The distribution of the degree of home bias at the fund level is very bimodal. There is a peak of the distribution for pure international equity funds (0 degree of home bias) and another peak with funds which are totally home biased (see Figure 1). The distribution in between these two peaks is more regular. We can disaggregate these data by size of funds. In Figure 2, we show the distribution of (log) fund sizes in our sample. Recall that we filtered out those funds whose market capitalization is smaller than $10 million. In all countries (except the UK and Switzerland), bigger funds tend to be more home biased. In our sample, the mean of a fund market capitalization is 4.33 $bn (median $0.63bn) if its degree of home bias is bigger than 80%, whereas its mean is only 0.67$bn (median $0.07bn) if its degree of home bias is smaller than 20%. Furthermore, for intermediate degrees of home bias (higher than 20% and smaller than 80%), the degree of home bias tends to be positively correlated with the size of funds. This is why the mean degree of home bias at the fund level is smaller than the aggregate mutual fund home bias (except for the UK and Switzerland for which our sample seems biased towards the more international funds).

Table 4: Summary Statistics on Fund Level Home Bias (1998-2002)

Fund in:	US		UK		EU		CA		SWZ	
	HB	C	HB	C	HB	C	HB	C	HB	C
mean	68.1%	8.6	32.4%	11.6	29.1%	9.3	55.2%	7.4	34.6%	10.3
min	0	0	0	0	0	0	0	0	0	0
max	100	57	100	55	100	54	100	54	100	52

Note: We report statistics on fund level home bias (HB) and the number of foreign countries (C) in which funds invest.

We can also investigate in how many different foreign countries and different sectors of activity these funds invest. US funds invest on average in 8.6 different countries (the most internationalized fund investing in 57 countries) and in 5.3 different sectors (the most diversified fund investing in 26 sectors). UK funds invest on average in 11.6 countries (maximum 55 countries) and in 6.48 sectors, EU funds in 9.3 countries (maximum 54 countries) and 6.2 sectors[7]. There is a strong positive correlation between the number of sectors and the number of countries funds invest in. In our sample, the correlation between the number of sectors and the number of foreign countries in which funds invest is 0.87. And interestingly, in all our countries larger funds tend to invest in more foreign economies and in more sectors. Regressing the (log) fund size on the (log) number of countries (respectively the (log) number of sectors) gives a strongly significant coefficient of 0.11 (respectively 0.07) for the US. The coefficients were similar and significant for all countries except Switzerland[8]. This strong

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[7]The number of sectors is not reported in Table 4 due to the lack of space.

[8]We included time dummies in all the regressions. These results are not reported due to lack of space.

heterogeneity in investment strategies, which correlates with the size of funds, is a challenge for existing theories. One could argue that fund managers are only intermediaries and that, ultimately, only the portfolio of households matter. It could be that households invest in different funds, some domestic, some international, some partly diversified and that, *in fine*, household portfolios can be well represented by one or several of the aggregate representative agent theories outlined in the introduction. Although we have no systematic data to bear on this question, anecdotal or related evidence on limited participation in stock markets would rather suggest pronounced heterogeneity across households as well. *Prima facie*, it is still puzzling to observe that fund managers, whose common goal is presumably to maximize returns while minimizing risk, could have so widely heterogeneous portfolios, and ones that vary systematically with the size of their funds. Finally, it could be argued that managers face heterogeneous institutional constraints which determine the degree of home bias of their portfolios. It would be surprising, but not impossible, that such constraints lead to a continuum of different degrees of home bias as found in Figure 1. But if such constraints exist and are binding, they are certainly not exogenous and are likely to come from an agency problem between investors and fund managers. This agency problem has yet to be modeled.

IV. Theoretical Implications

Theories of home bias need to be compatible with i) considerable heterogeneity in the degree of home bias across countries and *within* countries across funds; ii) a limited number of countries of investment; iii) a limited number of sectors of investments; iv) a positive
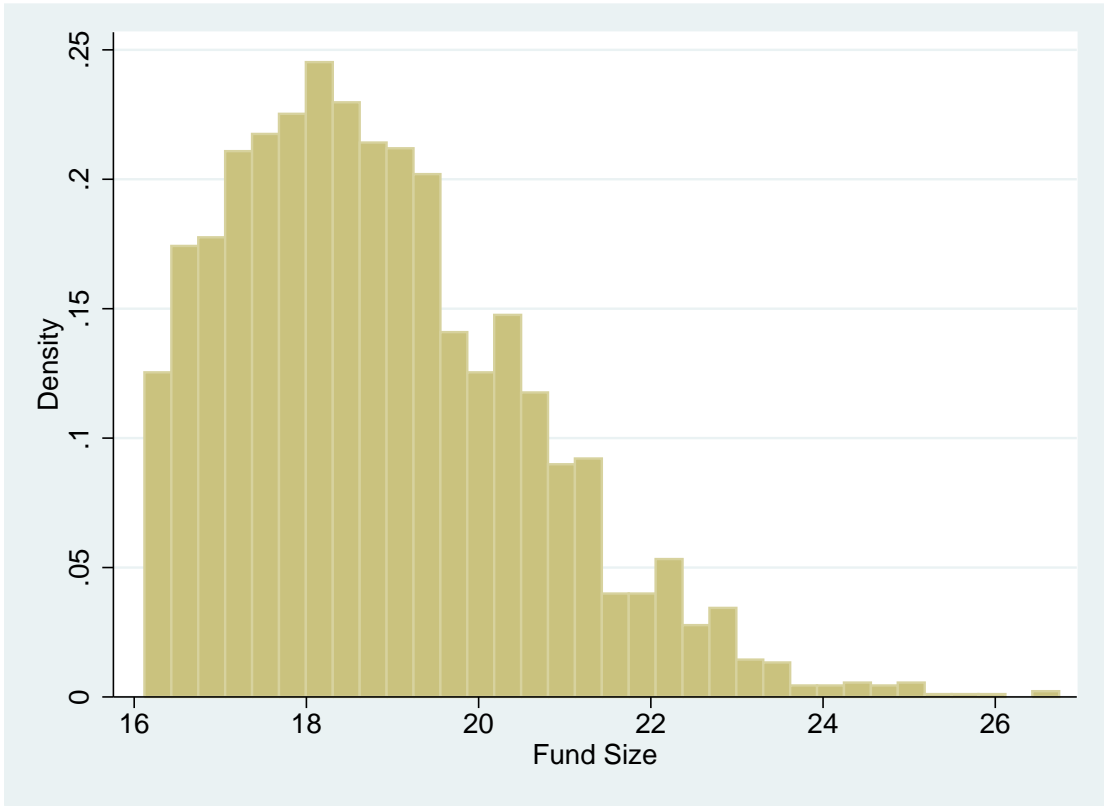
Figure 2: Authors' calculations based on TFS Data.

correlation between the size of funds and the number of countries in which funds invest as well as with the number of sectors of activity in which funds invest; and v) a positive correlation between the degree of home bias and the size of funds (except in our UK and Swiss sample which seem overweighted in very international funds). Ideally, theories of home bias should also be compatible with the empirical evidence linking equity prices, exchange rates and equity flows (Harald Hau and Hélène Rey 2006). They should also be consistent with the dynamic trading strategies of international equity funds we uncover in another paper using the same data set (Harald Hau and Hélène Rey 2007). We find strong evidence in favour of portfolio rebalancing strategies out of foreign equities when the foreign equity weight unexpectedly increases in funds portfolios. Fund managers sell foreign equity and buy domestic equity when the return on the foreign part of their portfolio outperforms the return on the domestic part of their portfolio, and *vice versa*. We believe that these stylized facts still constitute a challenge for existing theories.

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