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Do Global Equity Mutual Funds Exhibit Home Bias?

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Abstract

We study a sample of U.S. global equity mutual funds that invest in markets around the world. While the existing literature shows significant home bias among investors, we find that U.S. global funds on average do not exhibit home bias but with cross-fund variation. Fund manager teams with more foreign educational background, younger fund managers, and those with MBA degrees tend to invest more in international markets. When sorting funds into deciles by the level of home bias, we find a convex relationship between home bias and performance. Both home- and foreign-biased funds outperform medium decile funds and hold concentrated portfolios, supporting the information hypothesis for home and foreign bias. Further, the well-performing foreign-biased funds are much larger than other funds, indicating that there are no decreasing returns to scale among global equity mutual funds.

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Abstract

We study a sample of U.S. global equity mutual funds that invest in markets around the world. While the existing literature shows significant home bias among investors, we find that U.S. global funds on average do not exhibit home bias but with cross-fund variation. Fund manager teams with more foreign educational background, younger fund managers, and those with MBA degrees tend to invest more in international markets. When sorting funds into deciles by the level of home bias, we find a convex relationship between home bias and performance. Both home- and foreign-biased funds outperform medium decile funds and hold concentrated portfolios, supporting the information hypothesis for home and foreign bias. Further, the well-performing foreign-biased funds are much larger than other funds, indicating that there are no decreasing returns to scale among global equity mutual funds.

JEL Classification: G11; G15; G23

Key Words: Home bias; Global equity mutual funds

1. Introduction

Home bias is a puzzling phenomenon in which investors over-invest in domestic financial assets relative to their weights in the global market portfolio, thus forgoing the benefits of international diversification. Since the early work of French and Poterba (1991), Cooper and Kaplanis (1994), and Tesar and Werner (1995), many papers have demonstrated strong home bias in international investment for investors from different countries. Over the past two decades, global equity markets have become more integrated, but home bias persists (Karolyi and Stulz, 2003). Researchers have proposed various explanations for home bias, such as barriers to international investment, hedging of foreign exchange risk, differing labor market risk, withholding tax, information asymmetry, and behavioral bias. However, no one factor alone appears sufficient to justify the magnitude of globally observed home bias. Cooper, Sercu and Vanpee (2012) suggest that a combination of the above factors would help explain the puzzle, with information asymmetry and economic openness the most important.

Most of the empirical evidence for home bias focuses on country-level investment data. One problem with such studies on home bias at aggregate level is that the dispersion of home bias among investors remains largely undiscovered. We show new insight on the home bias phenomena by utilizing fund-level holdings data of U.S.-based global equity mutual funds investing in global markets, including their home-country market and international markets.[1] We explore the relation between fund allocation in domestic and international markets and manager characteristics, as well as performance. Compared to country-level studies, one clear advantage of our study is that, to a large extent, we eliminate the potential effects of macro-level and

[1] Global equity mutual funds are expected to provide international exposure to fund investors and they normally state that they will invest certain proportion of portfolio in foreign (or domestic) stocks. However fund managers have the discretionary power to decide the allocation in domestic and foreign stocks. For example, Vanguard Global Equity Fund writes in the product summary that "This fund invests in companies of varies sizes from all over the globe, with the United States representing about 40% of its assets", however the Fund invests 52% of its asset in U.S. stocks in May 2017.

institutional factors in global investment, such as capital restrictions, withholding tax, and country-level uncertainties. All global equity funds domiciled in the U.S. should face institutional constraints on an equal basis when managers select stocks globally. This allows us to more rigorously investigate the issue related to home bias explanations: the information vs. behavioral hypothesis.

Several theoretical papers suggest an information-based explanation for home bias. Gehrig (1993) shows that in a noisy rational expectations model with two countries and two risky assets, the higher precision of domestic signals than foreign signals results in investor bias toward domestic shares in equilibrium. Van Nieuwerburgh and Veldkamp (2009) develop a two-country general equilibrium model in which investors have more (less) information endowment on domestic (foreign) assets than the average investor of the two countries. In contrast to previous studies, their model allows investors to choose which information to learn from to maximize their mean-variance utility. The equilibrium outcome is that home investors choose to learn home risk factors, which results in a home bias in their portfolios, because home assets bring more profit and appear less risky.

Many empirical studies provide supporting evidence on the information-based explanation of home bias. Kang and Stulz (1997) find that foreign investors investing in Japan tend to hold stocks of large and export-oriented companies that are more well-known to foreigners. Ahearne, Griever and Warnock (2004) find that the more companies of a foreign country listed on the U.S. stock market, the more U.S. investors invest in that country. Andrade and Chhaochharia (2010) find that U.S. foreign direct investment in a destination country in the 1990s is positively related to U.S. portfolio investment in that country, consistent with the learning hypothesis proposed by Van Nieuwerburgh and Veldkamp (2009).

Home bias may also be caused by behavioral factors. For example, Huberman (2001), Hiraki et al. (2003) and Pool et al. (2012) show that investors may perceive familiar assets to have

higher expected return and less return dispersion. Graham, Harvey and Huang (2009) show that the more competent investors consider themselves, the more international stocks they invest in. Morse and Shive (2011) show that country-level patriotism is positively correlated with holdings of domestic assets by investors.

Home bias at the fund-level is of great importance and interest. First, studying international investment at the granular level helps us better understand the home bias puzzle documented at the country-level. Secondly, global fund managers are sophisticated investors who have better research resources and learning capacity than the average investors modeled in previous work. Global funds can simply hire managers with an information advantage on foreign countries (e.g., managers with foreign backgrounds). Alternatively, domestic fund managers may apply what they learn in domestic markets about specific industries to global markets (Schumacher, 2015). In the latter case, smart global investment is simply an extension of smart domestic investment. We address these issues by examining the relations between fund home bias and manager and fund characteristics.

Thirdly, it would be interesting to test the implications of information asymmetries and/or behavioral biases from the viewpoint of professional money managers managing assets entrusted to them by investors. In fact, some papers (e.g., Van Nieuwerburgh and Veldkamp, 2009, Hau and Rey, 2008) call for theoretical work to study home bias in a framework of agency problems as faced by mutual fund managers. Mutual fund managers may have different objectives than individual client investors due to principal–agent conflicts (He and Xiong, 2013). Our study on global fund managers provides several useful empirical findings on fund-level home bias and thus helps this immediacy called by theoreticians in the literature.

Finally, we address the relationship between competitions and return performance. The mutual fund industry is very competitive in that fund investors chase funds' risk-adjusted returns.

Global funds in particular fiercely compete with each other to provide domestic investors with global market exposure. Whether home bias at the fund-level, if any, is an equilibrium outcome of high competition in the industry remains an interesting question. We address these issues by examining the relation between fund-level home bias and performance.

Our paper sets forth several interesting findings. First, we find that U.S. global equity mutual funds do not exhibit home bias on average. From 1999 to 2014, a median fund over-invests in domestic assets by insignificant four percentage points to the U.S. market weight in the global market portfolio. Moreover, the portfolio weight of U.S. stocks has stayed relatively stable over time. This finding is in sharp contrast with previous studies that document a high level of home bias. While we find no home bias on average, we observe some cross-sectional variation in fund-level domestic holdings.[2]

Next, we explain these variations using fund manager characteristics and fund variables. We find that fund manager teams with more foreign educational backgrounds, younger managers, and managers with MBA degrees tend to invest more in international stocks, while older managers and female managers tend to invest more in domestic markets. The finding on managers with foreign educational backgrounds is consistent with both the information and behavioral hypotheses. In the sample period 1999-2014, the mean proportion of all managers that have foreign education background is 35%, while the mean proportion of all fund manager teams that include at least one such manager is 57%.[3]

To examine fund characteristics at different levels of home bias in detail, we sort funds into deciles by portfolio weight of U.S. stocks. We find that fund size increases with fund's investment in foreign stocks. Fund size can be a proxy for fund research resources. This result

[2] When we study cross-fund variations on home bias, we simply focus on fund's portfolio weight on U.S. stocks because all funds face the same benchmark – U.S. equity market weigh in the global market – at any point of time. In other words, we use the terms "home bias" and "portfolio weight in U.S. stocks" interchangeably when we examine fund level variations in home bias. We find this direct measure easier to interpret.

[3] We define a manager with foreign education background if she has received either undergraduate or graduate degree from a university outside U.S.

suggests that funds increase international investment significantly along with research capability. Alternatively, this result may be caused by the fact that funds with more international investments attract more fund flows, probably due to good performance or provision of international exposure. Another interesting finding is that both home- and foreign-biased funds hold more concentrated portfolios.

We differentiate the information and behavioral hypotheses on home (and foreign) bias by examining performance. Information advantage would lead to a positive relation between the level of home bias and performance (Van Nieuwerburgh and Veldkamp, 2009), however behavioral bias would imply a neutral relation at best. We sort funds into deciles based on level of home bias and measure the subsequent six-month returns of each decile portfolio. Interestingly, we find a convex relationship between level of home bias and fund raw returns: the deciles with the highest and the lowest home bias (i.e., highest foreign bias) perform better than the intermediate deciles; however, the performance of the two extreme decile portfolios are indistinguishable. We then risk-adjust fund portfolio returns using the U.S. four-factor (U.S. Fama–French three factors plus U.S. momentum factor), global four-factor (global Fama–French three factors plus global momentum factor), U.S. six-factor (U.S. Fama–French five factors plus U.S. momentum factor), and global six-factor (global Fama–French five factors plus global momentum factor) models. The convex relation remains in the risk-adjusted returns. Since funds with more international investment tend to have larger size, we follow Berk and Binsbergen (2015) to measure the value added by fund managers. We use both Vanguard index funds and global six factors as benchmarks. The convex relationship between home bias and fund value added remains.

In summary, we show that home-biased funds tend to be much smaller and hire less managers with foreign education background. The foreign-biased funds are much larger and hire more managers with foreign education background. Both home- and foreign-biased funds hold concentrated portfolios and outperform medium-biased funds. Also, fund size increases with level

of foreign bias. If fund size is a good proxy to research resource, the results suggest that both the smallest and largest global funds optimally allocate assets in domestic and international stock markets based on their research resources and capacities. In addition, it suggests that there is no diminishing returns to scale in global equity funds, similar to the findings in Ferreira et al. (2013).

The present paper relates to several strands of literature. In addition to extensive studies on country-level home bias, several papers investigate home bias at the individual portfolio level. Hau and Rey (2008) show that there is wide dispersion in fund-level home bias across funds and countries.[4] Coval and Moskowitz (1999) find that U.S. mutual fund managers have strong preference for local firms, or home bias at home. Other papers study whether households invest internationally and the associated investor characteristics, using Swedish data (Calvet, Campbell and Sodini, 2007; Karlsson and Norden, 2007; Norden, 2010), survey data from the U.S. investors (Graham, Harvey and Huang, 2009), and a proprietary data set from a U.S. investment advisor (Bekaert et al., 2016). Very few papers, however, show the performance consequences of home bias, especially in the international investment setting. Our paper relates differing degrees of home bias among U.S.-based global funds to their manager characteristics and performance.

The second strand of the literature that our paper relates to is the relation between mutual fund manager (team) characteristics and investment behavior and performance. Chevalier and Ellison (1999) find that managers attending high-SAT undergraduate institutions outperform. Cici et al. (2015) show that mutual fund managers' prior industry experience helps their stock picking from these industries. Patel and Sarkissian (2016) find a manager team with three members performs better than teams with less or more than three. Jagannathan, Jiao, and Karolyi (2019) show that fund managers receiving undergraduate degree in a foreign country have an information advantage on stocks of that country. Massa and Schumacher (2015) show that it is optimal for fund

[4] Chan, Covrig and Ng (2005) and Choi and Skiba (2014) also use fund level home bias data but their studies focus on the aggregated country level home bias of the mutual funds.

families to outsource when investing in foreign countries due to the information advantage of outsourced funds. We relate global fund manager attributes to fund-level home bias in the context of international investment.

Finally, this paper relates to the extensive literature on mutual fund performance. One strand of this literature follows Berk and Green (2004), examining this issue from the perspective of mutual fund industry dynamics. For example, Pastor, Stambaugh and Taylor (2015) show that decreasing returns to scale exist in both the active fund industry and at the fund-level. Berk and Binsbergen (2015) develop a new and intuitive measure of fund manager skills that combines fund excess return and size. To the extent that international markets require higher information cost than domestic markets and that fund size is related to fund research capability, it is worthwhile to investigate the relations among fund home (foreign) bias, fund size, and performance.

This paper proceeds as follows. In Section 2, we introduce the sample and data sources. Section 3 presents our findings on fund-level home bias and its relation to manager characteristics and fund variables. Section 4 investigates the relation between fund-level home bias and performance. Finally, Section 5 describes our conclusions.

2. Data

Our data come from several sources. Mutual fund holdings data are from Morningstar, and fund characteristics data are from the Center for Research in Security Prices (CRSP) Mutual Fund Database. Both databases are free of survivorship bias. The holdings data set from Morningstar includes individual holdings' country and industry information. About 5% of the stock holdings data of the global funds do not have country or industry information. These records correspond to

about 9,500 securities.[5] We manually match these names with stock names retrieved from Datastream to populate the country and industry data.

We merge the Morningstar and CRSP data sets by fund ticker, CUSIP, and fund name. We document the merge procedures in the Internet Data Appendix. The procedures mainly follow the Internet Data Appendixes of Berk and Binsbergen (2015) and Pastor, Stambaugh, and Taylor (2015). After the merge, we include only global equity funds in our sample. Specifically, we select global equity funds based on fund categories provided by Morningstar and fund investment objective codes from CRSP. We manually check the fund prospectus to ensure the investment objective is to invest in global equity markets in order to remove institutional constraints that may affect fund decisions on international diversification. Finally, we examine funds with large changes in portfolio weight of U.S. stocks within a short time period. For example, a fund may have a 0% investment in U.S. stocks at one point, increasing to 50% six months later and remaining at this level thereafter. In such case, it is likely that the fund has changed from an international fund, investing only in foreign stocks, to a global fund, investing both in foreign and U.S. stocks, by merging with other funds; we remove the fund portfolio records whenever the fund is identified as an international fund. Our final sample includes 320 global funds from December 1999 to December 2014. We select the last fund portfolio reporting date for each fund every six months, yielding 4,161 fund portfolios (82% of fund reporting dates fall in June or December).

We obtain fund manager tenure information from Morningstar Direct and supplement this data set with hand-collected data on manager characteristics from Internet resources, such as fund Internet sites, SEC filings, LinkedIn, Bloomberg, and ZoomInfo.[6] Fund manager data include: start and end date at the fund, gender, age, undergraduate institution, MBA school, other graduate

[5] The actual number of unique securities is smaller because funds may use different names for the same security. For example, some funds report in the file "Apple Inc." while others may report it as "Apple Incorporated."
[6] Patel and Sarkissian (2015) show that Morningstar Direct provides more accurate data on fund managers than other mutual fund databases.

study schools, and CFA designation. We set dummy variables for these characteristics, except for manager tenure and age measured in years, for each manager. Merging fund manager start and end dates with portfolio report dates yields the managers making decisions for each portfolio. When managers form a team, we take the average across all fund managers for each characteristic variable. For example, AQR Global Equity Fund has five managers in December 2014. All of them are male and three of them have an MBA degree. So the values for manager team variables *Pcnt_Male* and *Pcnt_MBA* in December 2014 are 1 (5/5) and 0.6 (3/5), respectively. We are able to collect manager data for 315 (out of the 320) funds and 4,074 (out of the 4,161) fund portfolios.

Finally, to obtain the benchmark for global diversification, we obtain the year-end market capitalization of stocks for 51 countries from Datastream and calculate each country's weight as the total market value of stocks in that country divided by the total market value of all 51 countries.[7] For the fund characteristic data from CRSP, such as total net asset (TNA), monthly fund returns, flows, and expense ratios, we use the fund share class TNA-weighted average values as the fund variables.

3. Fund-level home bias, manager characteristics, and fund variables

We explain the relation between fund-level home bias, manager characteristics, and fund variables in this section. We focus on the fund level portfolio weight on U.S. stocks. The key manager characteristic is manager's foreign educational backgrounds while we control for other manager and fund variables.

3.1 Summary statistics on funds and managers

Table 1 reports summary statistics for fund- and manager-related variables. Panel A shows the statistics for the fund variables. An average fund holds 156.7 stocks from 17.8 countries. The mean portfolio weight in U.S. stocks is 43.7%. There are some variations in the level of home bias,

[7] We list these 51 markets in Appendix.

with investment of 26.7% and 60% in the U.S. market for the 10^{th} and 90^{th} percentiles, respectively. These figures stand in sharp contrast to the previously reported aggregate home bias, where U.S. investors may hold more than 90% in domestic stocks in their portfolios (e.g., French and Poterba, 1991). Fund characteristics, such as TNA and returns, include the mean monthly fund variables for the six-month period leading up to the portfolio reporting date. Mean TNA for global equity funds is 1.99 billion in 2014 U.S. dollars, and the expense ratio is 1.42%. Average monthly return and flow are 0.60% and 1.16%, respectively.

Panel B displays fund manager variables. We are able to identify 1,310 managers for 315 funds that report manager names instead of mere "Management Team." Among the 1,310 managers, 1,159 (88%) are male and 486 (37%) have a foreign educational background. There are 655 managers with an MBA degree and 632 managers with a CFA charter; among these managers, 334 hold both an MBA and CFA. Panel C shows manager characteristics at the portfolio level. For the period from December 1999 to December 2014, there are 2.96 fund managers per fund portfolio on average. About 36% of team members have a foreign educational background. Male managers comprise 90.4% of the management teams. Half the manager teams have MBA degrees or CFA charters. Only 7.5% of manager team holds doctoral degrees. Out of the 1,310 managers, we find age information for 1,070 managers by year born or undergraduate graduation year. For the fund portfolios, the average age of the management team is 46.67 years.

Table 2 reports correlations of the variables at the manager and fund portfolio levels. Panel A shows correlations of the manager characteristics. It seems that managers with a foreign educational background are less likely to have an MBA degree or a CFA charter, but are more likely to have a PhD degree; MBA and CFA are positively correlated. Panel B reports correlations between home bias and manager team and fund characteristics. Funds managed by manager teams with higher levels of foreign educational background tend to invest less in home assets. This is

consistent with both the information and behavioral hypotheses. Teams with more managers and younger managers tend to invest less in domestic market. Larger funds or funds from larger fund families tend to invest more in international markets. Fund size and fund family size can be seen as proxies for fund research resources. More home-biased funds have higher turnover, consistent with the notion that these funds trade more in the highly liquid U.S. market.

3.2 Home bias at the fund level

This section provides two snapshots of fund-level home bias. Panel A of Figure 1 compares fund-level investment in the U.S. market with the percentage weight of the U.S. market in the world portfolio from 1999 to 2014. We use annual data for this comparison, where both fund and world portfolio weights are calculated at year-end. Fund-level U.S. holdings are moderate and stable at less than 50% throughout the sample period. We calculate the TNA-weighted average of fund-level U.S. holdings for all funds. In contrast to the existing evidence on home bias, U.S. global funds actually underinvest in the U.S. market compared to the benchmark. That is, during the sample period, global funds invest 3.68% less than the benchmark weighting. Median fund home bias is positive by only 4.07%. Combining the results of aggregate and median fund-level home bias, it seems that larger funds tend to invest more in international markets.

Since new funds may enter and existing funds may exit the sample during the sample period, we also examine a sample of 25 global funds in existence throughout the 1999–2014 period. The pattern is similar. These funds actually underinvest in the U.S. market in the earlier period, but they turn to overinvest somewhat beginning in 2007. In Panel B, we show the frequency histogram of semiannual portfolio weightings of U.S. holdings. There is some dispersion in fund-level home bias, with the highest frequency of portfolio weight ranging from 40% to 50%, and with a somewhat rightward skewness. Both charts in Figure 1 highlight the notable finding that home bias does not exist at the fund-level on average, although there is fund-level dispersion in home

bias. In addition, we find some evidence for a "flight home" phenomenon among the global funds following the 2007–2008 financial crisis. We address these issues below.

In Table 3, we illustrate several important characteristics of funds with different levels of home bias. We first sort funds into deciles by portfolio weight on U.S. holdings in each semiannual, then we measure average portfolio weight on U.S. stocks, fund size (TNA), number of countries and stocks for each decile. Finally, we take the mean and median of these average values over the sample period. The least home-biased decile (lowest portfolio weight on U.S. stocks) holds 20% U.S. stocks, while the most home-biased decile holds 75%. Interestingly, funds with the lowest U.S. home bias (most foreign bias) are much larger than those with the most home bias; the average TNA for each of these two groups is $3.94 billion and $494 million, respectively. Moreover, fund TNA increases with a fund's investment in foreign stocks. Investment in international markets carries high information cost due to the inherent information barrier (Massa and Schumacher, 2015); our results indicate that large funds have greater ability to afford this cost.

The most home-biased fund decile invests in 12 countries on average, while the numbers of invested countries for all other deciles are between 16 and 21. Finally, we show the mean number of stocks held by funds, a measure of portfolio concentration. Both the most home-biased and foreign-biased fund deciles hold more concentrated portfolios than the other deciles. These funds hold 112 and 125 stocks, respectively. This result is particularly interesting for the foreign-biased funds, which have much larger size. This indicates that these funds hold concentrated portfolios despite their large size and high portfolio weighting in international stocks. Many papers (e.g., Kacperczyk et al., 2005; Sapp and Yan, 2008; Hiraki et al., 2015; Choi et al., 2017) study the relation between portfolio concentration and performance. We investigate fund performance in Section 4.

3.3 Home bias and manager team and fund characteristics

We conduct a panel regression analysis on what determines fund-level home bias and report the result in Table 4. The dependent variable is fund-level portfolio weighting of U.S. stocks, which we use as a measure of home bias. The key independent variable is the percentage of manager team with foreign educational backgrounds, *Pcnt_Foredu*. We control for other manager and fund characteristics. We first run the regressions on *Pcnt_Foredu* without (Model 1) and with (Model 2) fund fixed effect as a diagnostic test on endogeneity issue. The estimated coefficient are -0.057 and -0.024 respectively. Both coefficients are statistically significant. The change of the coefficient after including fixed effect is economically significant. Therefore, the inclusion of fixed effect helps us at least partially solve the omitted variable problem. In Model 3, 4, and 5, we add fund manager team and fund characteristics as control variables. The coefficient remains largely the same. Funds with more managers with foreign education background tend to be associated with less home bias, or more foreign bias. This finding is consistent with both the information and behavioral hypothesis. We also find that male managers and managers with an MBA degree tend to invest less (more) in the U.S. (international) market. Older managers invest more in the U.S. market. Among the fund variables, recent returns and flows are negatively correlated with investment in the U.S. market. This could be so because funds gravitate to quality when funds have low returns and/or foreign-biased funds perform well and attract more flows (Jagannathan, Jiao and Karolyi, 2019).

To further address the endogeneity issue, we examine fund home bias surrounding manager turnover. Out of the 315 funds, 204 funds have hired managers with foreign education background, while the rest 111 funds have never hired such managers in the sample period. We look at the home bias before and after the 204 funds first time hire foreign-educated managers and we use the 111 funds as control group. We find that after hiring the foreign-educated managers the first time,

the funds significantly reduce the investment in U.S. stocks, while the investment of the control group stays at same level. The difference-in-difference is statistically significant.[8]

The flight home effect in international financial markets may transmit shocks from one financial market to another. In the financial crisis of 2007–2008, the flight home effect is documented in studies on international banking loans (e.g., Giannetti and Laeven, 2012) and equity investment (Hau and Lai, 2016). We examine whether there is flight home effect among global equity funds, focusing on fund holdings in the early stage of the 2007–2008 financial crisis. For year-end 2006 and 2007, we calculate the difference between fund portfolio weight in U.S. stocks and that in the world portfolio. A positive difference indicates an overweight in U.S. stocks, or home bias. We then compare the values for home bias at the end of 2006 and 2007. We show the results in Table 5. There are 95 funds for both 2006 and 2007. From the end of 2006 to the end of 2007, the level of home bias increases from 7.5% to 10.8%, and the 3.3% flight home rate is statistically significant, indicating a flight home effect of global equity funds by the end of 2007. The result is similar when we repeat the tests using the average of two years of home bias measures: 2005–2006 and 2007– 2008.

Do funds with high or low levels of home bias before the 2007 crisis exhibit more flight home? To answer this question, we classify funds by whether they have home bias before the crisis and examine the flight home for both groups. The results show that flight home is pervasive among funds, regardless of the level of home bias the funds have before the crisis. Before the crisis, there are 64 and 31 funds showing positive and negative home bias, respectively; they fly home at rates of 3.0% and 3.9%, respectively. Next we investigate the question: Do fund managers with foreign educational backgrounds alleviate the flight home effect? We sort funds by the variable *Pcnt_Foredu* before the crisis and compare the flight home effect of the top-half and bottom-half

[8] To save the space, we do not report the result in the paper. It is available upon request.

groups. We find that both groups show a flight home effect and the difference is statistically insignificant. Overall, we observe a widespread flight home effect among U.S. global equity funds during the 2007-2008 financial crisis.

4. Fund-level home bias and performance

Previous papers focus on investor's characteristics when studying home bias at the individual portfolio level (e.g., Karlsson and Norden, 2007; Bekaert et al., 2016) but do not analyze the performance consequence of the home bias. In this section, we study the consequence of home bias at the fund level. Specifically, we examine the fund performance implications of different levels of home bias. We compute the raw returns as well as the risk-adjusted returns (alphas) and value-added measure proposed by Berk and Binsbergen (2015, BB hereafter).

4.1 Raw and risk-adjusted returns

Table 6 displays average monthly returns of fund deciles sorted by level of home bias in each semiannual period. Fund net returns are obtained from CRSP, and we compute gross returns by adding the expense ratio to net returns. For risk-adjustment, we use U.S./global four-factor (Fama–French U.S./global three factors plus U.S./global momentum factor) and six-factor (Fama–French U.S./global five factors plus U.S./global momentum factor) models. All factors are obtained from Professor Ken French's website. We observe a convex relationship between home bias and fund returns. Particularly, the most home-biased decile show significantly higher returns. For example, the gross return for this decile is 68.1 bps and the risk-adjusted returns are significantly higher than the medium decile (Decile 6). For example, when adjusted by U.S. the four-factor model, the return difference between Decile 10 and Decile 6 generates an alpha of 15.6 bps per month, which translates into 1.87 percent per year. Home-biased fund decile also has higher risk-adjusted returns than the most foreign-biased decile (Decile 1) when adjusted by global factor models but not U.S. factor models. The result highlights the importance of benchmark choice when evaluating mutual

fund return performance. Chan, Dimmock and Lakonishok (2009) show that holding-based benchmarks and attributes/factor-based benchmarks may produce different inferences, even on domestic equity fund performance. This issue can potentially become more severe for investments in the global equity market.[9] We show that different factor models indeed produce very different results for performance valuation.

In Table 7, we report the factor loadings of fund decile returns on U.S. and global six factors in Panels A and B, respectively. The adjusted R^2 is higher across deciles in Panel B than in Panel A. Some of the factor loading patterns across the deciles are very different in Panel A compared to Panel B. For example, the most foreign-biased funds (Decile 1) do not have statistically significant loading on U.S. size factor. However, Panel B shows that funds in this decile have a statistically significant positive loading on the international size factor, suggesting these funds may tilt portfolios to small international stocks. Different fund deciles may have different loadings on the two factors newly developed in Fama and French (2015): profitability and investment. For example, the most foreign-biased funds have a positive loading on the international RMW (robust minus weak), while the most home-biased funds have a negative loading on the same factor. It seems that there is a wide dispersion on the types of stocks held by global mutual funds.

4.2 Berk and Binsbergen (2015) performance measure

Berk and Binsbergen (2015) develop a new measure of fund manager skills. They argue that because fund investors chase fund returns and there is a decreasing return to fund scale, the risk-adjusted return does not reflect the value that skillful managers add to fund investors. Therefore, they develop a new performance measure by combining fund returns in excess of benchmark and fund size. We find in the previous analysis that the foreign-biased funds are much

[9] The Fama-French five factors and global momentum factor are derived from stocks in developed markets.

larger than other funds. Thus it is natural for us to examine the BB measure in our sample of global equity funds.

We analyze the BB measure for funds with different levels of home bias. We calculate the equal- and value-weighted fund portfolio excess gross returns for each decile sorted by fund home bias. Fund size for each decile is the average size of the funds. Therefore, we assume ten hypothetical funds, each having the same size as the mean of the fund decile and with returns equal to equal- or value-weighted fund decile returns. Following BB, we calculate the benchmark returns using 12 Vanguard index funds and the Fama–French global six factors.[10]

We report the results in Table 8. The convex relationship between fund home bias and performance still remains. For example, the foreign- and home-biased deciles add 6.17 and 2.21 million dollars more than the medium decile (Decile 5), respectively. Moreover, the most foreign-biased fund decile delivers the highest value added to fund investors. For example, the equal-weighted foreign-biased fund decile (Decile 1) add 3.9 million dollar value to fund investors. It is higher than the medium decile (Decile 5). The result when using global six factors shows a similar pattern.[11] In fact, the foreign-biased funds add more value to investors than home-biased funds when using global six factors as benchmark. Overall, it seems that the manager teams of the foreign-biased funds add value to fund investors: they invest more in international markets (which have high information cost), hold concentrated portfolios, and generate more BB value-added measure. The large size of these foreign-biased funds suggest that the diminishing return to scale does not exist in global equity funds.

5. Conclusion

[10] Berk and Binsbergen (2015) use eleven Vanguard index funds as the benchmark funds. We add Vanguard Developed Market Index Fund to this group. In addition, we differ from BB in that we use global six factors (Fama-French global five factors plus global momentum factor) as the factor benchmark rather than U.S. four factors. The twelve Vanguard index funds used in this paper are listed in Appendix.

[11] The magnitudes of the value added calculated from the two benchmarks are different. This may be because that the Fama-French global five factors and global momentum factor do not include emerging market but the Vanguard index funds include funds with investment objectives in all regions.

We conduct a comprehensive study on fund-level home bias using a sample of global equity funds for the period 1999 to 2014. These funds are all domiciled in the U.S. and are bounded to invest in the global market. Therefore, we eliminate the influence of institutional factors that may affect home bias. We find that these funds do not exhibit home bias on average. We sort funds into deciles based on level of home bias and investigate the cross-fund variation in home bias. We find that management teams with a high percentage of team members with foreign educational backgrounds, MBA degrees, and younger fund managers tend to invest more in the international market. Both home- and foreign-biased funds tend to hold concentrated portfolios. We also find that the foreign-biased funds are much larger.

With respect to the consequences of fund-level home and foreign bias, we find that fund raw returns show a convex relationship between home bias and performance – funds with the most home bias and most foreign bias outperform other funds; however there are indistinguishable returns between these two groups. When fund returns are risk-adjusted by global factors, including Fama–French global five factors and global momentum factor, funds with the most home-bias outperform medium-biased funds; however, we do not find the same pattern for the most foreign-biased funds.

The large size of foreign-biased funds motives us to compute the Berk and Binsbergen (2015) performance measure. The convex relation between home bias and performance remains. More interestingly, the foreign-biased funds generate greater value to fund investors than other funds. Combined with the finding that the most foreign-biased funds are much larger and hold concentrated portfolios, the results are consistent with the notion that there is high information asymmetry in international markets, but skillful managers are able to take the opportunities available in the international market, and fund investors reward these managers.

Previous literature focuses on home bias at the country-level. Theoretical papers explain this puzzle by modeling average investors in the market. However, mutual fund managers are not average investors. Hence, we provide new insight and evidence about home bias on professional investors. In addition, compared to the literature on domestic equity mutual funds, few papers study global equity funds. However, these funds have become increasingly important since they provide investors the opportunity to invest in global markets. Our findings suggest that the smallest global equity funds overinvest home assets and deliver positive alphas to investors, while the largest global funds hire managers with foreign educational backgrounds to overcome the information barrier and generate greater value for fund investors.

Appendix

Table A1.

This table displays the market weights of the 51 markets at the end of 2014.

Country	Weight	Country	Weight
UNITED STATES	39.08%	CHILE	0.42%
CHINA	10.46%	NORWAY	0.42%
JAPAN	6.52%	PHILIPPINES	0.39%
UK	5.55%	FINLAND	0.33%
FRANCE	3.59%	POLAND	0.28%
GERMANY	3.49%	COLOMBIA	0.28%
HONG KONG	3.10%	TURKEY	0.27%
INDIA	2.81%	ISRAEL	0.26%
CANADA	2.35%	BELGIUM	0.19%
SOUTH KOREA	2.25%	ABU DHABI	0.19%
SWITZERLAND	2.24%	IRELAND	0.16%
AUSTRALIA	1.81%	AUSTRIA	0.13%
BRAZIL	1.55%	PERU	0.13%
TAIWAN	1.47%	EGYPT	0.12%
SPAIN	1.29%	PAKISTAN	0.11%
NETHERLANDS	1.25%	NEW ZEALAND	0.11%
SWEDEN	0.93%	ARGENTINA	0.10%
RUSSIA	0.87%	MOROCCO	0.09%
ITALY	0.80%	GREECE	0.06%
MALAYSIA	0.73%	PORTUGAL	0.06%
SOUTH AFRICA	0.72%	BANGLADESH	0.06%
DENMARK	0.62%	CZECH REPUBLIC	0.04%
THAILAND	0.60%	HUNGARY	0.04%
MEXICO	0.59%	CROATIA	0.03%
SINGAPORE	0.54%	ROMANIA	0.03%
INDONESIA	0.50%		

Table A2.

The table below shows the Vanguard index funds we use to calculate fund performance using the method from Berk and Binsbergen (2015). All funds start before 1999, the beginning year of our sample.

Fund ticker	Fund name
VFINX	S&P 500 Index Fund
VTMGX	Vanguard Developed Markets Index Fund
VEIEX	Vanguard Emerging Markets Stock Index Fund
VBINX	Vanguard Balanced Index Fund
VEURX	Vanguard European Stock Index Fund
VEXMX	Vanguard Extended Market Index Fund
VIMSX	Vanguard Mid Cap Index Fund
VPACX	Vanguard Pacific Stock Index Fund
VISGX	Vanguard Small Cap Growth Index Fund
NAESX	Vanguard Small Cap Index Fund
VISVX	Vanguard Small Cap Value Index Fund
VVIAX	Vanguard Value Index Fund

References

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

Andrade, S. C., and V. Chhaochharia (2010), "Information immobility and foreign portfolio investment." *Review of Financial Studies* 23(6), 2429–2463.

Bekaert, G., K. Hoyem, W. Y. Hu, and E. Ravina (2016), "Who is internationally diversified? Evidence from 296 401(k) Plans." *Journal of Financial Economics* Forthcoming.

Berk, J., and J. Binsbergen (2015), "Measuring skill in the mutual fund industry." *Journal of Financial Economics* 118, 1–20.

Calvet, L., J. Campbell, and P. Sodini (2007), "Down or out: Assessing the welfare cost of household investment mistakes." *Journal of Political Economy* 115(5), 707-74.

Chan, K., V. Covrig, and L. Ng (2005), "What determines the domestic bias and foreign bias? Evidence from mutual fund equity allocations worldwide." *Journal of Finance* 60(3), 1495-1543.

Chan, L., S. Dimmock, and J. Lakonishok (2009), Benchmarking money manager performance: Issues and evidence." *Review of Financial Studies* 22(11), 4553-4559.

Chevalier, J., and G. Ellison (1999), "Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance." *Journal of Finance* 54(3), 875-899.

Choi, N., M. Fedenia, H. Skiba, and T. Sokolyk (2017), "Portfolio concentration and performance of institutional investors worldwide." *Journal of Financial Economics* 123(1), 189-208.

Choi, N., and H. Skiba (2014), "Mutual fund home bias and market uncertainty." Working Paper. University of Wyoming.

Cici, G., M. Gehde-Trapp, M. A. Goricke, and A. Kempf (2015), "What they did in their previous lives? The investment value of mutual fund managers' experience outside the financial sector." Working Paper. William and Mary University.

Cooper, I., and E. Kaplanis (1994), "Home bias in equity portfolios, inflation hedging, and international capital market equilibrium." *Review of Financial Studies* 7(1), 45–60.

Cooper, I., P. Sercu and R. Vanpee (2012), "The equity home bias puzzle: A survey." *Foundations and Trends in Finance* 7(4).

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

Fama, E. F., and K. R. French (2015), "A five-factor asset pricing model," *Journal of Financial Economics* 116, 1-22.

Ferreira, M. A., A. Keswani, A. F. Miguel, and S. B. Ramos (2013), "The determinants of mutual fund performance: A cross-country study," *Review of Finance* 17, 483-525.

French, K. R., and J. M. Poterba (1991), "Investor diversification and international equity markets." *American Economic Review* 81(2), 222–226.

Gehrig, T. (1993), "An information based explanation of the domestic bias in international equity investment." *Scandinavian Journal of Economics* 95(1), 97–109.

Giannetti, M., and L. Laeven. 2012. "The flight home effect: Evidence from the syndicated loan market during financial crises." *Journal of Financial Economics* 104(1), 23–43.

Graham, J. R., C. R. Harvey, and H. Huang (2009), "Investor competence, trading frequency, and home bias." *Management Science* 55(7), 1094–1106.

Hau, H., and S. Lai (2016), "The role of equity funds in the financial crisis propagation." *Review of Finance,* Forthcoming.

Hau, H., and H. Rey (2008), "Home bias at the fund level." *American Economic Review* 98, 333-338.

He, Z., and W. Xiong (2013), "Delegated asset management, investment mandates, and capital immobility," *Journal of Financial Economics*, 107, 239–258.

Hiraki, T., A. Ito, and F. Kuroki (2003), "Investor familiarity and home bias." *Asia-Pacific Financial Markets* 10, 281–300.

Hiraki, T., M. Liu, and X. Wang (2015), "Country and industry concentration and the performance of international mutual funds." *Journal of Banking and Finance* 59, 297–310.

Huberman, G. (2001), "Familiarity breeds investment." *Review of Financial Studies* 14(3), 659–680.

Jagannathan, M., W. Jiao, and A. Karolyi (2019), "Is there a home field advantage in global markets?" Working Paper. Binghamton University.

Kacperczyk, M., C. Sialm, and L. Zheng (2005), "On the industry concentration of actively managed equity mutual funds." *Journal of Finance* 60(4), 1983-2011.

Kang, J.-K., and R. M. Stulz (1997), "Why is there a home bias? An analysis of foreign portfolio equity ownership in Japan." *Journal of Financial Economics* 46(1), 3–28.

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

Karolyi, G. A., and R. M. Stulz (2003), "Are financial assets priced locally or globally?" In: G. M. Constantinides, M. Harris, and R. M. Stulz (eds.): *Handbook of the Economics of Finance*. Elsevier, pp. 975–1020.

Massa, M., and D. Schumacher (2015), "Information barriers in global markets: Evidence from international subcontracting relationships." Working Paper. Insead University.

Morse, A., and S. Shive (2011), "Patriotism in your portfolio." *Journal of Financial Markets* 14(2), 411–440.

Norden, L. (2010), "Individual home bias, portfolio churning and performance." *European Journal of Finance* 16(4), 329-351.

Pastor, L., R. Stambaugh, and L. Taylor (2015), "Scale and skill in active management." *Journal of Financial Economics* 116, 23–45.

Patel, S., and S. Sarkissian (2015), "To group or mot to group? Evidence from mutual fund databases." *Journal of Financial and Quantitative Analysis*, forthcoming.

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

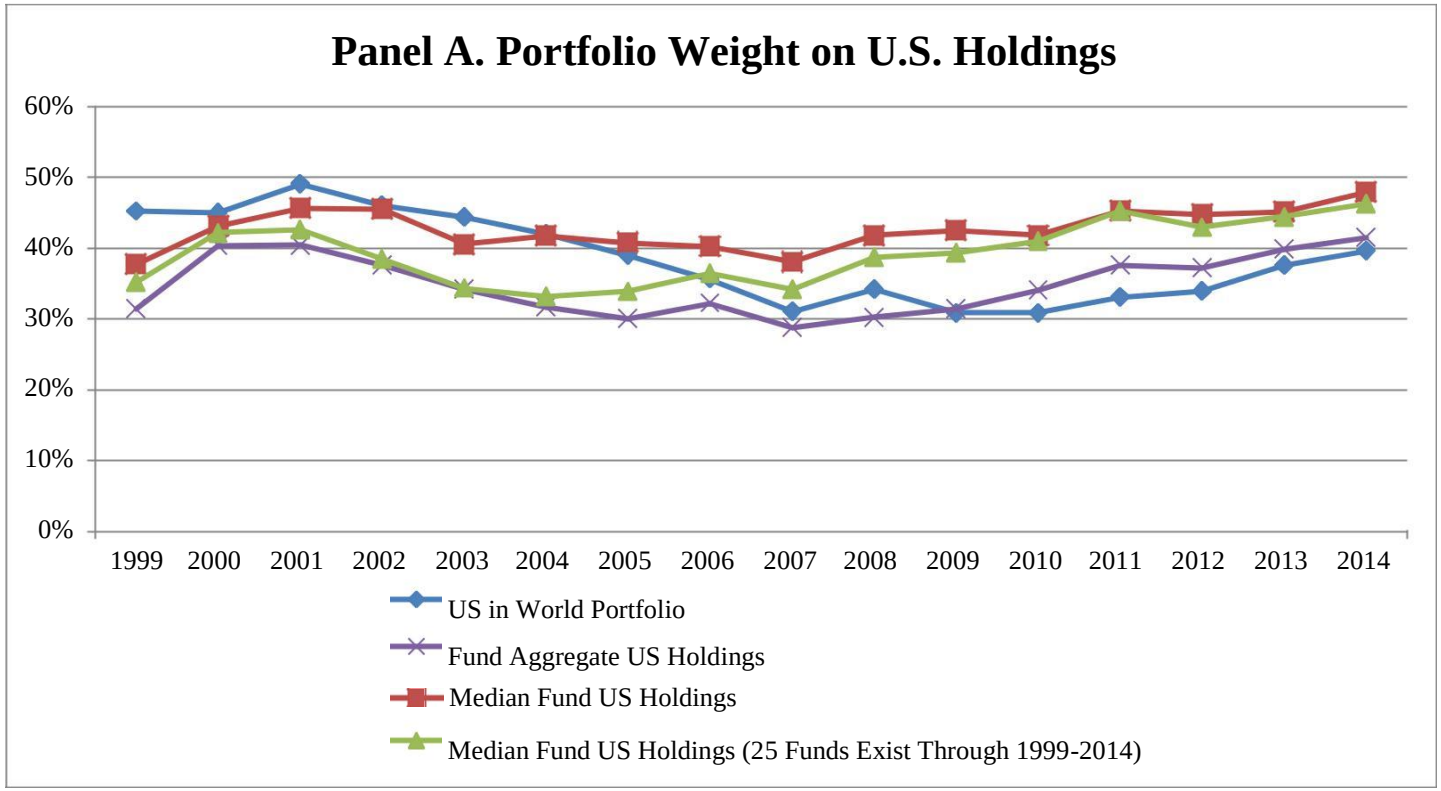
Sapp, T., and S. Yan (2008), "Security concentration and active fund management: Do focused funds offer superior performance?" *The Financial Review* 43(1), 27–49.

Schumacher, D. (2015), "Home bias abroad: Domestic industries and foreign portfolio choice." Working Paper. McGill University.

Tesar, L. L., and I. M. Werner (1995), "Home bias and high turnover." *Journal of International Money and Finance* 14(4), 467–492.

Van Nieuwerburgh, S., and L. Veldkamp (2009), "Information immobility and the home bias puzzle." *Journal of Finance* 64(3), 1187–1216.

Figure 1. Fund-level home bias 1999–2014



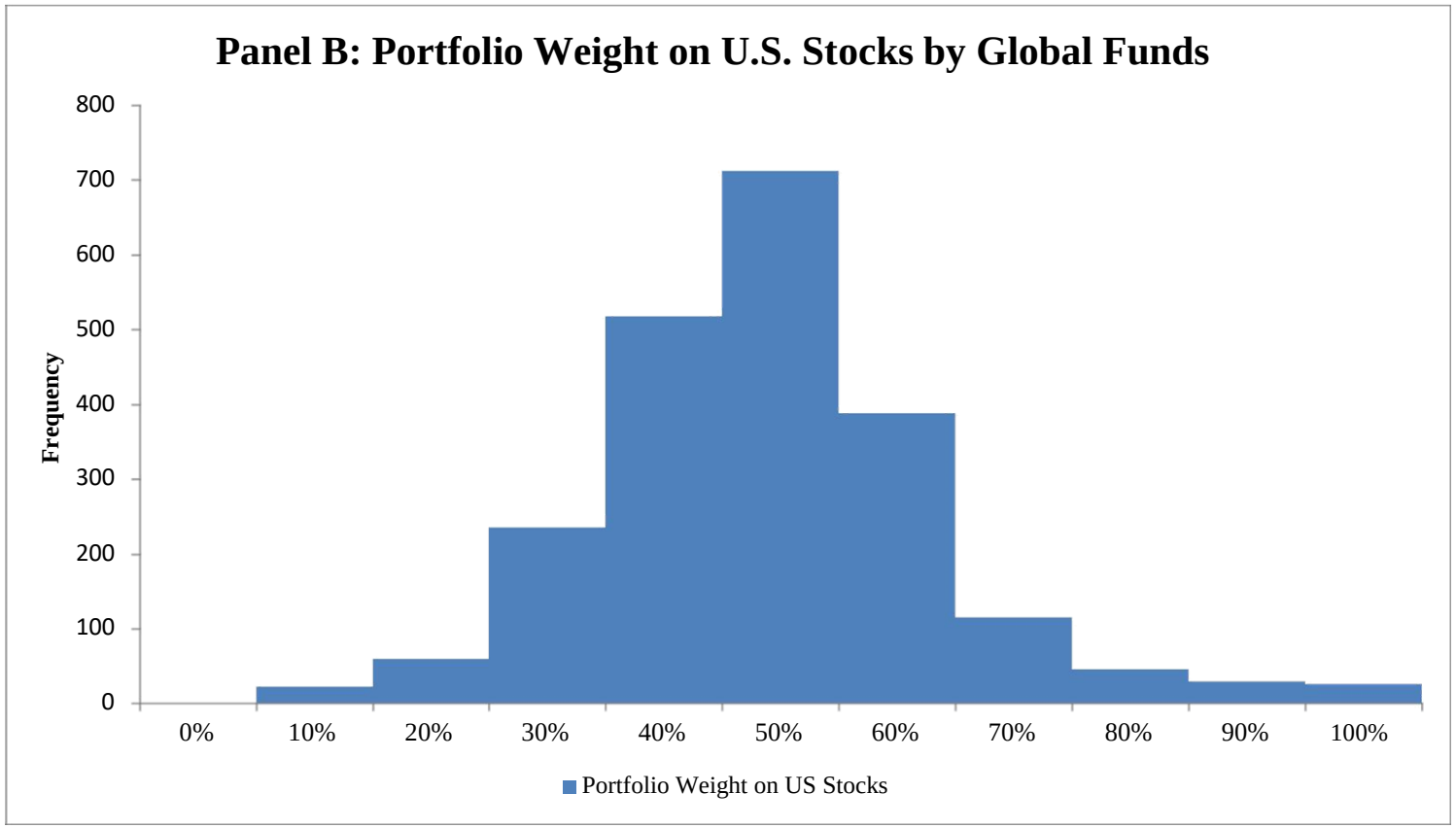

Panel B: Portfolio Weight on U.S. Stocks by Global Funds
Frequency
800
700
600
500
400
300
200
100
0
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Portfolio Weight on US Stocks

Table 1. Summary statistics

This table shows fund and manager summary statistics. Panel A displays all fund variables. *Tot_Numfund* shows the total number of global funds in our sample. *Num_stock* shows the number of stocks held by each fund portfolio report date. *Portwt_US* is the portfolio weight of U.S. stocks. *Num_cnty* is the number of countries held by the funds. *TNA* is total net assets of the funds at 2014 value. *MRet* is the monthly net of fee return. *MExp* is expense ratio and *Mflow* is monthly fund flows (in %). Panel B displays fund manager information. *Tot_NumMgr* is total number of fund managers. *Foredu* is number of managers with foreign educational background. *Male* is the number of male managers. *MBA*, *CFA*, and *PhD* are number of managers with MBA degree, CFA charter, and PhD degree, respectively. Panel C shows fund manager characteristics at the portfolio level. We first define our dummy variables, such as CFA and MBA degree, at the manager level and find managers working in the fund for each half year by matching the fund manager start/end date with portfolio dates. Then, we calculate the average characteristics of all fund managers if the fund is managed by a team. *Num_Fund* and *Num_Portfolio* are the number of funds and fund portfolios for which we find manager information, respectively. *Num_Mgr* is the average number of managers for each fund portfolio date. *Pcnt_Foredu* is the percentage of managers (or, the average of the dummy variables for each manager in the team) that have foreign educational experience. *Pcnt_Male*, *Pcnt_CFA*, *Pcnt_MBA*, and *Pcnt_PhD* are the percentage of managers who are male, with a CFA charter, an MBA degree, or a PhD degree, respectively. *Avg_Age* is the average age of the managers.

	Mean	**Median**	**Pctl_10**	**Pctl_90**
Panel A: Fund variables				
Tot_Numfund	320			
Num_Portfolio	4161			
Num_Stock	156.700	89	36	275
Num_Cnty	17.855	17	9	27
Portwt_US	0.437	0.434	0.267	0.600
Mret (%)	0.595	1.062	-5.189	6.014
TNA (Mil, in 2014 $)	1991.698	216.752	8.351	2726.436
Mexp (%)	1.413	1.373	0.895	1.970
Mflow (%)	1.160	-0.165	-2.544	5.773
Turnover (%)	74.074	54	15	158
FamTNA (Mil, in 2014 $)	82475.156	26640.097	377.965	209592.875

Panel B: Fund manager characteristics				
Tot_NumMgr	1310			
Foredu	486			
Male	1159			
MBA	655			
CFA	632			
MBA&CFA	334			
PhD	99			
Panel C: Fund manager (team) variables at portfolio level				
Num_Fund	315			
Num_Portfolio	4074			
Num_Mgr	2.960	2	1	6
Pcnt_Foredu	0.358	0.333	0	1
Pcnt_Male	0.904	1	0.600	1
Pcnt_MBA	0.509	0.500	0	1
Pcnt_CFA	0.489	0.500	0	1
Pcnt_PhD	0.075	0	0	0.333
Avg_Age	46.677	46	38	56

Table 2. Variable correlations

This table shows the correlations between manager and fund level variables. Panel A reports the fund manager characteristics. There are 1310 managers. Panel B shows the correlation between fund home bias (portfolio weight in U.S. market) and fund and manager team characteristics. The fund manager team characteristics is the mean of manager characteristics of the team at the decision time of the portfolio (we require the manager start working at the fund at least two months before the portfolio report date). The fund variables are the average monthly values in the six-month period leading up to the portfolio report date. We report the Pearson correlations. ***, **, * represents the 1%, 5%, and 10% significance level, respectively.

Panel A: Correlations at fund manager level

	Foredu	*Male*	*MBA*	*CFA*
Foredu				
Male	0.01			
MBA	-0.20***	0		
CFA	-0.12***	-0.02	0.05**	
PhD	0.12***	0.02	-0.11***	-0.09***

Panel B: Correlations at fund portfolio level

	Portwt_US	*Num_Stock*	*Num_Cnty*	*Num_Mgr*	*Pcnt_Foredu*	*Pcnt_Male*	*Pcnt_MBA*	*Pcnt_CFA*	*Pcnt_PhD*	*Avg_Age*	*TNA*	*Mret*	*Mexp*	*Mflow*	*Turnover*
Portwt_US															
Num_Stock	*0.01*														
Num_Cnty	*-0.27****	*0.50****													
Num_Mgr	*-0.05****	*0.25****	*0.29****												
Pcnt_Foredu	*-0.15****	*-0.04***	*0.04****	*0*											
Pcnt_Male	*0.01*	*-0.10****	*-0.06****	*-0.07****	*0.05****										
Pcnt_MBA	*0.05****	*0.08****	*0.10****	*0.08****	*-0.18****	*-0.12****									
Pcnt_CFA	*0.02*	*-0.05****	*0*	*0*	*-0.19****	*-0.04****	*0.03**								
Pcnt_PhD	*-0.01*	*0.06****	*0.09****	*0.02*	*0.12****	*0.05****	*-0.18****	*0.01*							
Avg_Age	*0.09****	*0*	*-0.11****	*-0.03**	*-0.17****	*0.09****	*0.11****	*-0.02*	*0.04****						
TNA	*-0.15****	*0.06****	*0.21****	*0.25****	*0.02*	*-0.08****	*0.05****	*0*	*0.04****	*0.04****					
Mret	*-0.06****	*0.01*	*0.05****	*0.01*	*0.02*	*0*	*0.02*	*0.02*	*-0.01*	*0.02*	*0*				
Mexp	*-0.01*	*-0.09****	*-0.08****	*-0.13****	*-0.02*	*0.04***	*-0.03**	*-0.12****	*-0.08****	*-0.10****	*-0.20****	*0.01*			
Mflow	*0.04***	*-0.01*	*-0.03*	*-0.01*	*0.02*	*0.01*	*-0.02*	*0.02*	*0.07****	*-0.02*	*0*	*-0.02*	*-0.01*		
Turnover	*0.11****	*-0.03*	*0.09****	*-0.05****	*0.04****	*0.04***	*0.06****	*-0.06****	*-0.02*	*-0.14****	*-0.14****	*0*	*0.17****	*0.06****	
FamTNA	*-0.14****	*0.08****	*0.34****	*0.24****	*-0.02*	*-0.08****	*0.13****	*-0.06****	*0.01*	*-0.03*	*0.51****	*0*	*-0.24****	*-0.02*	*-0.05****

Table 3. Fund portfolio weights in U.S. stocks

This table shows the average of the mean and median values of home bias, fund TNA, number of countries and stocks held by funds. In each semiannual period from December 1999 to December 2014, we sort funds by portfolio weight in U.S. stocks (our measure of home bias) into deciles, then calculate the mean and median values for the four variables in each decile. We then calculate the average values of these mean and median values for the full sample period.

	Portwt_US		TNA ($ mil)		Num_Cnty		Num_Stock	
Home bias decile	**mean**	**median**	**mean**	**median**	**mean**	**median**	**mean**	**median**
Low	0.22	0.22	3937.91	2923.93	20.11	20.29	125.26	86.74
2	0.30	0.30	4347.34	3862.98	20.71	20.84	129.87	106.19
3	0.35	0.35	3214.72	3342.99	21.08	20.76	153.59	109.77
4	0.38	0.38	2228.52	1666.35	21.13	20.32	159.33	107.42
5	0.42	0.42	1370.35	1116.71	20.90	19.94	192.89	107.86
6	0.44	0.44	841.11	472.39	21.20	20.26	221.25	117.86
7	0.47	0.47	599.88	506.33	19.74	18.57	213.91	104.50
8	0.51	0.51	601.18	469.42	19.04	18.77	183.77	111.98
9	0.57	0.57	521.97	406.94	15.70	14.39	164.53	86.10
High	0.75	0.73	493.59	445.95	11.57	9.55	111.81	74.21

Table 4. Home bias and manager and fund characteristics

This table reports the panel regression result of the determinants of fund-level home bias. The dependent variable is fund portfolio weight of U.S. stocks. We take the fund portfolio for each semiannual. The independent variables include fund manager characteristics and fund-level variables, which are taken in the six-month window before the portfolio report date. *Lg_Avg_Age* and *Lg_TNA* are the natural logs of average age of the manager team and fund TNA, respectively. All other variables are defined in Table 1. Fund-level variables are the monthly average values of fund characteristics in the six-month window. ***, **, * represent 1%, 5%, and 10% significance levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Pcnt_Foredu	-0.057***	-0.024***	-0.023***	-0.025***	-0.022***
	(-9.64)	(-3.51)	(-3.01)	(-3.56)	(-2.83)
Num_Mgr			-0.001		0.000
			(-0.82)		(0.04)
Pcnt_Male			-0.037***		-0.038***
			(-3.35)		(-3.40)
Pcnt_CFA			0.019***		0.023***
			(2.65)		(3.21)
Pcnt_MBA			-0.031***		-0.027***
			(-4.41)		(-3.76)
Pcnt_PhD			-0.046***		-0.050***
			(-3.72)		(-3.91)
Lg_Avg_Age			0.074***		0.095***
			(4.67)		(5.66)
Lg_TNA				0.000	-0.002
				(-0.21)	(-1.00)
Mret				-0.305***	-0.313***
				(-4.96)	(-5.01)
Mexp				0.309	1.502*
				(0.38)	(1.78)
Mflow				-0.038***	-0.040***
				(-3.27)	(-3.40)
Turnover				0.004	0.007**
				(1.18)	(2.01)

Fund fixed effect	No	Yes	Yes	Yes	Yes
Num. of Obs.	4074	4074	3871	3768	3587
R^2	0.022	0.706	0.710	0.706	0.710

Table 5. Flight home in financial crisis

This table shows the flight home of U.S. global funds during the 2007–2008 financial crisis. We compare fund-level home bias before the financial crisis (2005–2006) and during the financial crisis (2007–2008). Fund-level home bias is defined as the difference between a fund's portfolio weight on U.S. stocks and U.S. market weight in the world market at the end of the year. The change of this fund-level home bias from before the financial crisis to during the financial crisis is a measure of flight home. U.S. market weight in the world market is calculated from Datastream for 51 global markets. For each fund, average value of this home bias measure is calculated for 2005 and 2006, and 2007 and 2008. There are 95 funds that exist in both of these periods. ***, **, * represent the 1%, 5%, and 10% significance levels, respectively.

Flight home from 2006 to 2007	**# of funds**	**Mean**
HB_2006	95	0.075
HB_2007		0.108
Difference		0.033***
p-value		*< 0.0001*
Flight home from 2005-2006 to 2007-2008		
HB_2005-2006	95	0.063
HB_2007-2008		0.108
Difference		0.045***
p-value		*< 0.0001*
Flight home by funds with positive / negative home bias before crisis (2006)		
HB_Positive	64	0.030
HB_Negative	31	0.039
Difference		0.009
p-value		*0.45*
Flight home by fund management teams' foreign educational level before crisis (2006)		
Foredu_low	47	0.037
Foredu_high	48	0.053
Difference		0.017
p-value		*0.23*

Table 6. Home bias and performance

This table displays fund portfolio performance when funds are sorted into groups based on portfolio weight of U.S. stocks. In each half year, we sort funds into deciles based on portfolio weight of U.S. stocks. Decile 1 (10) represents the decile with low (high) investment in U.S. stocks. We then measure fund performance for the following 6 months. Fund net returns are obtained from CRSP. Average net and gross returns of the fund decile portfolios are reported, where gross returns are expense ratio added back to net returns. We also report risk-adjusted returns of the fund portfolios using Fama–French U.S. and global three- and five-factor models plus U.S. and global momentum factor, resulting in an adjustment with U.S./global four- and six-factor models. We report *t*-value in parentheses, and ***, ** and * represent 1%, 5%, and 10% significance levels, respectively.

Home bias	**Net return**	**Gross return**	**US 4-factor**	**Global 4-factor**	**US 6-factor**	**Global 6-factor**
1—low	0.503	0.642	-0.023	-0.037	0.000	-0.067
	(1.27)	*(1.66)*	*(-0.17)*	*(-0.52)*	*(0.00)*	*(-0.90)*
2	0.500	0.619	0.026	0.042	-0.013	-0.032
	(1.34)	*(1.66)*	*(0.21)*	*(0.62)*	*(-0.10)*	*(-0.48)*
3	0.470	0.585	-0.080	-0.053	-0.068	-0.065
	(1.17)	*(1.46)*	*(-0.70)*	*(-0.95)*	*(-0.56)*	*(-1.10)*
4	0.464	0.587	-0.090	-0.046	-0.025	-0.003
	(1.11)	*(1.41)*	*(-0.76)*	*(-0.78)*	*(-0.20)*	*(-0.06)*
5	0.428	0.551	-0.138	-0.062	-0.070	0.008
	(0.99)	*(1.27)*	*(-1.19)*	*(-0.88)*	*(-0.58)*	*(0.11)*
6	0.425	0.547	-0.112	-0.052	-0.086	-0.027
	(1.03)	*(1.32)*	*(-1.04)*	*(-0.88)*	*(-0.76)*	*(-0.44)*
7	0.446	0.572	-0.088	0.016	0.036	0.135*
	(1.07)	*(1.37)*	*(-0.79)*	*(0.20)*	*(0.31)*	*(1.83)*
8	0.396	0.520	-0.139	-0.063	-0.060	0.031
	(0.93)	*(1.23)*	*(-1.40)*	*(-1.03)*	*(-0.58)*	*(0.55)*
9	0.404	0.520	-0.083	-0.016	-0.130	0.000
	(1.02)	*(1.34)*	*(-0.87)*	*(-0.20)*	*(-1.31)*	*(-0.00)*
10—high	0.570	0.681*	0.044	0.202**	0.064	0.330***
	(1.45)	*(1.73)*	*(0.56)*	*(2.07)*	*(0.79)*	*(3.61)*
Difference (10-1)	0.066	0.039	0.068	0.239*	0.064	0.398***
	(0.48)	*(0.29)*	*(0.57)*	*(1.92)*	*(0.52)*	*(3.35)*
Difference (10-6)	0.145	0.134	0.156*	0.253***	0.150*	0.358***
	(1.52)	*(1.42)*	*(1.92)*	*(3.00)*	*(1.78)*	*(4.42)*

Difference (1-6)	0.079	0.095	0.088	0.014	0.086	-0.040
	(0.86)	*(1.03)*	*(1.12)*	*(0.17)*	*(1.03)*	*(-0.48)*

Table 7. Factor loadings on U.S. and global six-factor models

This table reports the factor loadings of fund portfolio returns on US and Global Fama-French five-factor and momentum factor. The dependent variable is the time-series returns of fund portfolios where the portfolios are grouped by the holdings of US stocks. The independent variables are the U.S. and global Fama-French five factors plus momentum factor downloaded from Professor Ken French's website. We report *t*-value in parenthesis and ***, ** and * represents 1%, 5% and 10% significance level, respectively.

Panel A: US factors	**Mkt_RF**	**SMB**	**HML**	**RMW**	**CMA**	**WML**	***Adj-R^2***
1 - low	0.874***	0.074	0.147**	-0.028	-0.059	0.011	0.837
	(23.01)	*(1.43)*	*(2.30)*	*(-0.39)*	*(-0.69)*	*(0.40)*	
2	0.875***	0.037	0.100*	0.092	-0.049	-0.048*	0.855
	(25.04)	*(0.79)*	*(1.70)*	*(1.37)*	*(-0.63)*	*(-1.97)*	
3	0.937***	0.091**	0.111**	-0.018	-0.029	0.025	0.890
	(29.07)	*(2.07)*	*(2.04)*	*(-0.29)*	*(-0.40)*	*(1.10)*	
4	0.953***	0.093**	0.103*	-0.110*	-0.061	0.036	0.894
	(28.74)	*(2.06)*	*(1.85)*	*(-1.73)*	*(-0.83)*	*(1.55)*	
5	0.977***	0.138***	0.033	-0.142**	0.006	0.017	0.909
	(30.37)	*(3.14)*	*(0.60)*	*(-2.32)*	*(0.08)*	*(0.73)*	
6	0.983***	0.059	0.070	-0.043	-0.028	0.021	0. 912
	(32.67)	*(1.45)*	*(1.39)*	*(-0.75)*	*(-0.43)*	*(1.00)*	
7	0.963***	0.122***	0.000	-0.198***	-0.105	0.062***	0. 919
	(31.64)	*(2.94)*	*(0.00)*	*(-3.42)*	*(-1.55)*	*(2.90)*	
8	0.985***	0.078**	0.042	-0.126**	-0.082	0.059***	0.929
	(35.71)	*(2.07)*	*(0.90)*	*(-2.39)*	*(-1.34)*	*(3.03)*	
9	0.999***	0.001	0.065	0.100**	-0.035	-0.046**	0.929
	(37.67)	*(0.03)*	*(1.46)*	*(1.98)*	*(-0.60)*	*(-2.50)*	
10 - high	0.973***	0.102***	-0.033	-0.089**	0.090*	-0.029*	0.955
	(44.72)	*(3.43)*	*(-0.91)*	*(-2.14)*	*(1.85)*	*(-1.91)*	
Difference (10-1)	0.099***	0.028	-0.180***	-0.061	0.148**	-0.040*	0.232
	(3.04)	*(0.62)*	*(-3.28)*	*(-0.97)*	*(2.04)*	*(-1.73)*	
Difference (10-6)	-0.010	0.042	-0.104***	-0.045	0.118**	-0.050***	0.138
	(-0.46)	*(1.39)*	*(-2.75)*	*(-1.06)*	*(2.37)*	*(-3.21)*	
Difference (1-6)	-0.109***	0.015	0.077**	0.015	-0.030	-0.011	0.205
	(-4.93)	*(0.49)*	*(2.06)*	*(0.36)*	*(-0.61)*	*(-0.69)*	

Panel B: Global factors

1 - low	0.947***	0.206***	0.075	0.084*	0.014	0.007	*0.956*
	(47.48)	(5.44)	*(1.58)*	*(1.67)*	*(0.23)*	*(0.36)*	
2	0.932***	0.061*	0.018	0.213***	0.026	-0.066***	*0.964*
	(52.46)	(1.79)	*(0.43)*	*(4.75)*	*(0.48)*	*(-4.00)*	
3	0.986***	0.126***	0.022	0.018	0.030	0.030**	*0.975*
	(62.83)	(4.23)	*(0.59)*	*(0.45)*	*(0.62)*	*(2.06)*	
4	0.999***	0.136***	0.025	-0.100**	-0.057	0.049***	*0.976*
	(62.06)	(4.46)	*(0.64)*	*(-2.45)*	*(-1.14)*	*(3.32)*	
5	1.022***	0.164***	-0.043	-0.205***	-0.019	0.045**	*0.969*
	(53.88)	(4.55)	*(-0.96)*	*(-4.28)*	*(-0.32)*	*(2.55)*	
6	1.002***	0.058*	-0.031	-0.082**	0.011	0.021	*0.975*
	(61.47)	(1.88)	*(-0.79)*	*(-1.99)*	*(0.22)*	*(1.38)*	
7	0.982***	0.164***	-0.115**	-0.315***	-0.097	0.091***	*0.967*
	(49.74)	(4.37)	*(-2.46)*	*(-6.31)*	*(-1.59)*	*(5.02)*	
8	0.987***	0.072**	-0.049	-0.243***	-0.085*	0.089***	*0.979*
	(64.27)	(2.47)	*(-1.36)*	*(-6.27)*	*(-1.78)*	*(6.31)*	
9	0.961***	-0.125***	-0.007	-0.059	0.022	-0.059***	*0.955*
	(44.88)	(-3.07)	*(-0.13)*	*(-1.08)*	*(0.33)*	*(-3.00)*	
10 - high	0.920***	-0.049	-0.108*	-0.401***	0.009	-0.015	*0.945*
	(37.75)	(-1.06)	*(-1.87)*	*(-6.50)*	*(0.12)*	*(-0.67)*	
Difference (10-1)	-0.026	-0.255***	-0.183**	-0.485***	-0.005	-0.022	0.299
	(-0.84)	(-4.24)	*(-2.44)*	*(-6.07)*	*(-0.06)*	*(-0.75)*	
Difference (10-6)	-0.081***	-0.107***	-0.078	-0.319***	-0.002	-0.036*	0.221
	(-3.76)	(-2.61)	*(-1.52)*	*(-5.85)*	*(-0.03)*	*(-1.80)*	
Difference (1-6)	-0.055**	0.148***	0.106**	0.166***	0.003	-0.014	0.209
	(-2.44)	*(3.47)*	*(1.98)*	*(2.93)*	*(0.05)*	*(-0.68)*	

Table 8. Home bias and performance: value added

This table displays the Berk and Binsbergen (2015) fund skill measures (value added, in $mil). Funds are first sorted into deciles, following the same procedure as previous tables. The monthly skill measure is calculated as TNA-weighted excess gross returns. Excess gross returns are calculated as mean fund decile returns minus benchmark return. We calculate both equal-weighted and value-weighted mean fund decile returns. The benchmark returns use two sets of factor returns: 12 Vanguard index funds and Fama–French global five factors (Mkt_FR, SMB, HML, RMR, and CMA) plus global momentum factor (WML). We report *p*-value for the value added.

	Vanguard Index Funds				**FF Global 6-factor**			
	EW		**VW**		**EW**		**VW**	
Home bias	**Value added**	***p*-value**	**Value added**	***p*-value**	**Value added**	***p*-value**	**Value added**	***p*-value**
1—low	3.906	*0.237*	0.058	*0.984*	10.546***	*0.003*	8.251**	*0.037*
2	-1.130	*0.686*	0.465	*0.895*	4.71	*0.161*	6.485	*0.150*
3	1.355	*0.385*	-1.365	*0.602*	4.475*	*0.054*	5.59*	*0.091*
4	-4.876**	*0.011*	-2.097	*0.284*	2.288	*0.262*	6.127	*0.112*
5	-2.262**	*0.033*	-2.242	*0.147*	1.332	*0.150*	0.833	*0.540*
6	-0.966	*0.125*	-1.396	*0.210*	0.579	*0.418*	1.078	*0.354*
7	-0.938***	*0.005*	-1.096*	*0.052*	0.952**	*0.016*	1.057*	*0.093*
8	-1.144	*0.010*	-1.035	*0.108*	0.608	*0.179*	1.066	*0.102*
9	-0.676	*0.105*	-0.514	*0.331*	0.984*	*0.062*	1.221	*0.150*
10—high	-0.048	*0.887*	-0.118	*0.794*	2.531***	*<.0001*	2.121***	*0.006*
Difference (10-1)	-3.955	*0.237*	-0.176	*0.951*	*-8.015***	*0.023*	-6.13	*0.104*
Difference (10-6)	0.917	*0.148*	1.278	*0.286*	1.952**	*0.012*	1.043	*0.429*
Difference (1-6)	4.872	*0.132*	1.454	*0.611*	9.968***	*0.004*	7.172*	*0.071*
Difference (10-5)	2.214**	*0.033*	2.124	*0.183*	1.199	*0.192*	1.288	*0.353*
Difference (1-5)	6.169*	*0.084*	2.300	*0.390*	9.214**	*0.010*	7.418*	*0.056*