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Does mutual fund family size matter? International evidence

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Does mutual fund family size matter? International evidence

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We use data from 33 countries to study how a fund's affiliation with large families shapes the flow–performance relationship internationally. Our results show that the effect of family size on the fund flows' response to performance depends on the sophistication of investors in a country. While less sophisticated investors are persuaded by the great visibility and strategies of funds that are affiliated with large and established families, more sophisticated investors are not. Affiliation with a large family increases the convexity of the flow–performance relationship in countries where investors are less sophisticated, but decreases this convexity in countries with more sophisticated investors. These results are important for investors, mutual fund companies and regulators because the flow–performance sensitivity determines the assets under management, the level of fees, risk–taking, and the performance of the fund.

JEL classification: G15, G23

Keywords: Mutual funds; Flow–performance relationship; Fund family size; Investor sophistication

1. Introduction

A fund family is a group of funds managed and marketed by the same company. Virtually all funds are part of a fund family (Brown and Wu, 2014).[1] Family ties bind funds in many different ways, affecting how mutual funds are managed and also how mutual fund investors allocate their money (e.g., Massa, 1998; Massa, 2003; Gaspar, Massa, Matos, 2006; and Huang, Wei, and Yang, 2007). Family size increases fund visibility and brand awareness (e.g., Sirri and Tufano 1998). The literature also shows that fund families exploit the patterns in investor behavior and fund flows to increase their assets under management and that these family–level strategies are more common in large fund complexes (e.g., Sirri and Tufano 1998; Chen, Hong, Huang, and Kubik, 2004; Gaspar, Massa, and Matos 2006; and Bhattcharya, Lee, and Pool, 2013).

We use a global sample of mutual funds from 33 countries to study cross–country variation in the influence of family size on investor decision–making. More specifically, we focus on the effect of family size on the convexity of the flow–performance sensitivity across countries. Prior research on this relationship concentrates on the US market, and there is a lack of evidence on how family size affects the flow–performance convexity internationally.[2]

The mutual fund literature shows that the US–based evidence does not apply to other environments, notably countries where financial markets are less developed and investors less

[1] Massa (2003, p. 249) classifies the increasing number of funds differentiated into market categories and belonging to only a few families as "*the most glaring stylized fact about mutual fund industry*".

[2] The literature on the impact of family size on flows outside the US is quite scarce. Benson, Tang, and Tutticci (2008) study the role of fund families in the determination of money flows to Australian funds and Jank and Wedow (2013) look at the effect of fund families in purchases and redemptions of German equity funds, but there are no cross–country studies examining how family size affects flows.

sophisticated; it is therefore particulary important to understand cross–country variation in the relation between family size and flow–performance convexity.[3, 4] Using a sample of countries with investors at different stages of sophistication sheds light on the likely evolution of the impact of family size on the flow–performance convexity in a given country, which would be difficult to study in a single country setting. Studying mutual funds internationally is also important given the significant growth of the mutual fund industry outside the US in recent years. The world share of assets under management outside the US grew from 38% in 1997 to about 52% in 2015 (EFAMA, 2015, and ICI, 2015).

Different studies address the role of fund families in the mutual fund industry. Evidence indicates that the interests of fund families and investors are not always aligned. Chevalier and Ellison (1997) argue that this misalignment is a classic example of an agency problem. As most fees are proportional to funds' managed assets, the main goal of fund families is to maximize their assets under management rather than maximize risk–adjusted performance. Massa (1998) argues that fund families use market segmentation and fund proliferation as marketing strategies to exploit investors' heterogeneity. Khorana and Servaes (1999 and 2012) show that large families are more likely to open new funds and that the family–level decision to start a new fund is strategically related to fee and flow maximization considerations. Massa (2003) finds that enhancing performance is not necessarily the optimal strategy for fund families, and that large complexes can

[3] Many studies show that there are statistically and economically significant differences in the conduct of mutual funds around the world and that the features of the US fund industry are not necessarily the same as those of other countries. The seminal studies by Khorana, Servaes, and Tufano (2005 and 2009) find differences in fund size and fees across countries, respectively. Ferreira, Keswani, Miguel, and Ramos (2012, 2013, and 2019) study alterations in the flow–performance relationship, mutual fund performance, and mutual fund persistence, respectively. Miguel (2020) finds differences in how fund flows eliminate future abnormal performance and persistence across countries. Keswani, Mamdough, Miguel, and Ramos (2020) use a sample of 25 countries to show that cultural differences explain differences in the flow–performance sensitivity, fund performance, and fund risk–taking.

[4] Ferreira, Keswani, Miguel, and Ramos (2012) study differences in the flow–performance sensitivity around the world, but their work does not examine the impact of mutual fund family size on the flow–performance relationship.

still attract investors to poorly performing funds by reducing fees or increasing the number of funds within the family.

There is also evidence that fund complexes increase market share by actively exploiting performance spillover effects across funds within a family. Sirri and Tufano (1998) and Evans (2010) find that fund families choose to advertise only the best performing funds within the family to take advantage of the convexity of the flow–performance relationship.[5,6] Nanda, Wang, and Zheng (2004) show that a star performer not only attracts flows to itself but also to the other funds in the family, which encourages families to create stars even at the expense of poorly performing funds. Gaspar, Massa, and Matos (2006) find that fund families strategically transfer performance from low–fee to high–fee funds in order to increase overall family profits. Bhattcharya, Lee and Pool (2013) observe that affiliated funds–of–funds serve to provide liquidity support to other funds, as fund families use these funds to absorb liquidity shocks in the family.

While the family–base structure of the mutual fund industry allows large complexes to implement a number of family–level strategies designed to influence investors' allocation decisions, the literature also shows that family size leads to brand recognition, allowing for investors' convenience. Investors can recognize large and established families such as Fidelity or Vanguard more easily (e.g. Capon, Fitzsimons, and Prince,1996, and Goetzmann, and Peles, 1997), which reduces participation costs (transaction costs and information costs) and also helps explain the asymmetric response of fund flows to past performance (Sirri and Tufano, 1998, and Huang, Wei, and Yang, 2007). On the other hand, the literature also shows that investors tend to

[5] The convexity of the flow–performance relationship encourages fund families to produce top performers even if it harms the performance of other funds. The non–linear relation between mutual fund performance and flows is well documented in the literature, both in the US (e.g. Ippolito, 1992, Chevalier and Ellison, 1997; Goetzman and Peles, 1997; Sirri and Tufano, 1998; Del Guercio and Tkac, 2002, Huang, Wei, and Yang, 2007) and around the world (Ferreira, Keswani, Miguel, and Ramos, 2012).

[6] The influence of advertisement on fund flows is amplified for larger fund complexes, as indicated by the results of Gallaher, Kaniel, and Starks (2015) that, at the family level, flows have a convex relation with advertising expenditure with a significant positive impact for high relative advertisers only.

concentrate on their investments within the same families of funds (Capon, Fitzsimons, and Prince, 1996), and seem to pick a fund family first and then the individual fund in which to invest (Massa, 2003). These results are consistent with the findings that fund flows are "*dumb money*" that is driven by behavioral biases instead of rational learning about managerial skill (Frazzini and Lamont, 2008, and Bailey, Kumar, and Ng, 2011).[7]

There is also evidence that more sophisticated investors are less likely to be influenced by behavioral tendencies, namely familiarity bias (Dumitrescu and Gil–Bazo, 2016). In the US, Gruber (1996) states that while sophisticated investors make decisions based on performance, "*disadvantaged"* investors are subjected to sales pressure or other constraints. Bailey, Kumar, and Ng (2011) observe that sophisticated investors engage less in trend–chasing. Huang, Wei, and Yan (2007) argue that unsophisticated investors prefer to passively accumulate knowledge rather than actively seek out the relevant information about the fund. They also find that participation costs decrease with the level of investor sophistication and that more sophisticated investors have a less convex flow–performance relationship. Outside the US, Ferreira, Keswani, Miguel, and Ramos (2012) use a worldwide sample to confirm that more sophisticated investors are less behaviorally biased. They observe significant differences in the flow–performance sensitivities across countries and show that investor sophistication explains these differences, as countries with more sophisticated investors present lower convexity in their flow–performance relationship.

The literature shows that fund family size influences investor behavior and that this behavior depends on investor sophistication. Prior studies also find that investor sophistication varies internationally and has implications for the way fund flows respond to past performance. Thus, we expect that family size is of varying importance to the flow–performance relationship across countries. Specifically, we posit that family size: (1) increases the convexity of the flow–

[7] Bailey, Kumar, and Ng (2011) also conclude that the familiarity behavioral bias leads to sub–optimal investment decisions.

performance sensitivity in countries where investors are less sophisticated; and (2) decreases the flow sensitivity to performance in countries with more sophisticated investors. Our evidence confirms these predictions. We show that family size affects the convexity of the flow–performance sensitivity differently in countries with more and less sophisticated investors. Affiliation with large families increases (decreases) the convexity of the flow–performance relationship in countries where mutual fund investors are less (more) sophisticated.

Huang, Wei, and Yang (2007) state that sophisticated investors demand superior performance before investing in a fund, even when the fund is affiliated with a large family. They argue that sophisticated investors are less *naïve* and actively seek relevant information or they at least use the available information more rationally than other investors. However, it will be more difficult for unsophisticated investors to process the information and make objective judgments when allocating their money, as they will be more persuaded by the strategies of funds affiliated with large and established fund families. Hence, in countries with less sophisticated investors, we expect fund flows to flock disproportionally more to top performers affiliated with larger families, increasing the convexity of the flow–performance relationship at the top of the performance scale (*High–Mid*). On the other hand, in countries with more sophisticated investors, funds with larger families are expected to present a less convex flow–performance relationship at the upper end of the performance scale, i.e., these funds will increase the slope of the flow–performance relationship in the middle section and decrease it in the top section. Our tests confirm this prediction. We examine the impact of family size on the sensitivity of flows for countries with more sophisticated investors and those with less sophisticated investors separately and find that the flows in the latter are less sensitive to mid–range performers affiliated with larger families, while they flock to top performers that are part of larger families. In the case of countries with more sophisticated investors, family size increases the sensitivity to middle–range performance

and decreases the sensitivity to top performers. When we test for differences in the flow–performance convexity between the two groups of countries, we find that family size significantly decreases (increases) the convexity of (*High–Mid*) performance range in countries with more (less) sophisticated investors. These differences are economically important as the increase in the convexity of (*High–Mid*) performance range that results from being affiliated with a large family in the group of countries with less sophisticated investors is approximately 20%; in contrast, affiliation with larger families decreases the convexity of (*High–Mid*) by more than 32% in countries with more sophisticated investors, regardless of the proxy used for measuring investor sophistication.

Ferreira, Keswani, Miguel, and Ramos (2012) show that less sophisticated investors react less to poor performance. Thus, we expect less sophisticated investors to be even less sensitive to poorly–performing funds affiliated with a large family. We anticipate that poor performers belonging to a large family experience fewer outflows in countries with less sophisticated investors. Less sophisticated investors also react more to top performers, which increases the convexity of the flow–performance relationship between low– and high–performance ranges (*High–Low*). Our third hypothesis tests this prediction. We find that flows in countries with less sophisticated investors are less sensitivite to bottom performers when funds are affiliated with larger families. We also find that family size increases the convexity of the (*High–Low*) performance range. Additionally, our results show that family size decreases (*High–Low*) convexity in countries where investors are more sophisticated. This change in convexity is explained by the lower sensitivity of flows to the top–performing funds affiliated with larger families.[8] Our results are economically

[8] Given that investors in more developed financial markets presumably have better channels for information processing and face fewer investment barriers, we would expect our country–level proxies for investor sophistication to also capture differences in information costs or investment barriers that vary across countries. Khorana, Servaes and Tufano (2005) show that countries where investors have access to better information and where fund companies face lower barriers to entry have larger mutual fund industries. This is more relevant for equity funds, because information asymmetries are more pronounced for equities than for other investments.

important. For example, affiliation with larger families increases (decreases) the convexity of (*High–Low*) performance range by 40% (42%) when we use the percentage of population owning shares as a proxy for investor sophistication in the group of countries with less (more) sophisticated investors.

We document the robustness of our results in various ways. We start by examining the combined effect of family size with other fund characteristics that have been shown to be correlated with family size, including total fees, star affiliation, and the number of fund categories offered by the affiliated family. We find that our results are mantained. We next control for the level of switching costs in a country, as larger families offer investors the flexibility to transfer money between different funds at reduced or even zero costs. This also leaves our results unchanged. Many mutual funds are run by asset management divisions of groups whose primary activity is commercial banking, particularly in less developed countries. This allows banks to follow cross–selling strategies and therefore many bank–affiliated fund investors are also clients of other financial products the bank offers. It is possible that captive investors react differently to the performance of funds managed by large complexes that are part of financial conglomerates. To assess this possibility, we run our tests separately for bank–affiliated and non–affiliated funds and observe that our main results are preserved. We repeat our tests individually for domestic and international funds and we find robust results in both sub–samples. To examine whether our results are driven by the US dominance of our sample, we exclude the US and observe that our results remain robust. We address concerns of cross–sectional dependence by running our main tests using the Fama–Macbeth estimation procedure and find that our main conclusions are maintained. Finally, we also run regressions using additional proxies for the level of investor sophistication in a country, and our results do not change.

Our paper contributes to the mutual fund literature in several ways. To the best of our knowledge, we are the first to study the effect of fund family size on the flow–performance relationship in an international context. Second, we show that there are marked differences in how a fund's affiliation with large families shapes the flow–performance relationship across countries and that the US–based evidence does not apply universally. The US evidence holds for countries with more sophisticated investors but not for countries where investors are less sophisticated. Moreover, our tests show that the observed differences in the impact of family size on the convexity of the flow–performance across countries are not only statistically significant but also economically relevant. Third, we contribute to the growing literature studying the investment decisions of mutual fund investors to determine whether they are sophisticated and whether they act rationally. Finally, we also add to literature investigating the family–based structure of the mutual fund industry and its implications for the investment decisions of individual investors.

The results of our study are important for mutual fund companies and investors because flow–performance sensitivity determines the assets under management, the level of fees and risk–taking, and, ultimately, the performance of the fund. As the mutual fund industry continues to grow worldwide, fund management companies use international comparisons to understand the relative efficiency of the different parts of their business. The development of the mutual fund industry imposes new challenges to both fund managers and investors. Investment decisions are increasingly demanding for the average retail investor, not only because of the rising number of alternative investments but also because of the increasing complexity of information investors need to understand.

2. Data and variables construction

2.1 Sample description

We use data from 33 countries spanning the period 2000 to 2015. Our data on mutual funds comes from the Lipper Hindsight database, includes both domestic and international actively managed equity funds, and is free of survivorship–bias.[9] Although multiple share classes are listed separately in the Lipper dataset, they have the same returns before expenses and loads, the same manager, and the same holdings. To avoid counting the same fund twice, we follow Ferreira, Keswani, Miguel, and Ramos (2013) and Demirci, Ferreira, Matos, and Sialm (2020), and use the primary share class identified by Lipper. Table 1 presents the number of unique funds and TNA of our sample by country at the end of 2015.[10] The US is the country with the most funds and the largest total TNA. The US funds represent 23% of the total number of funds and 74% of TNA in our sample. France (9%) and Canada (7%) have the second and third highest number of funds, while UK (7%) and Canada (4%) have the second and third largest TNA. China and Argentina have the lowest number of funds and the lowest TNA, respectively.

The last column of Table 1 also presents the market share of the top five management companies across fund industries, which allows us to understand the importance of the largest mutual fund families internationally. From Table 1, we observe that, in most countries, the majority of assets under management is concentrated in the top five management companies. In 28 out of 33 countries, the market share of these companies represents more than half of the assets under management in the equity mutual fund industry. Only in five countries, namely the UK, Australia, the US, Canada, and France, do the top five companies manage less than 50% of the total assets managed by the country's equity mutual fund industry. Table 1 also shows a substantial variation in the fraction of assets managed by the largest fund management companies around the

[9] This dataset is used in Demirci, Ferreira, Matos, and Sialm (2020).
[10] Table IA1 presents the number of unique funds in our sample and TNA for domestic and international mutual funds.

world. In the UK equity mutual fund industry, these companies concentrate only 28% of the assets under management, while in Portugal this number goes up to nearly 90%.

2.2 Fund–level variables construction

2.2.1 Fund flow

We follow the literature (e.g., Sirri and Tufano, 1998) and calculate fund flow as the new money growth rate that is due to new external money. Fund flow for fund *i* in country *c* at quarter *t* is calculated as:

$$Flow_{i,c,t} = \frac{TNA_{i,c,t} - TNA_{i,c,t-1}(1 + R_{i,c,t})}{TNA_{i,c,t-1}}, \quad (1)$$

where $TNA_{i,c,t}$ is the total net asset value in the local currency of fund *i* in country *c* at the end of quarter *t*, and $R_{i,c,t}$ is fund *i*'s raw return from country *c* in quarter *t*. Panel A of Table 2 presents descriptive statistics of the fund–level variables aggregated across countries and shows that the average quarterly flow in our sample is negative (–0.48%), as in Ferreira, Keswani, Miguel, and Ramos (2012), and Ferreira, Massa, and Matos (2018).[11]

2.2.2 Fund performance

We measure fund performance using both raw returns and risk–adjusted returns (i.e., Carhart,1997, four–factor alpha). We follow Bekaert, Hodrick, and Zhang (2009), and Demirci, Ferreira, Matos, and Sialm (2020), and estimate four–factor alpha for domestic, foreign country, and regional funds by using regional factors based on a fund's investment region (Asia–Pacific, Europe, North America, and Emerging Markets). In the case of global funds, we use world factors.[12]

[11] For completeness, Table IA2, Panel A in the Internet Appendix shows summary statistics by country.
[12] The classification is based on the fund´s investment region using data on the fund's domicile country and geographic investment style provided by the Lipper database.

We run the following regression:

$$R_{i,t} = \alpha_i + \beta_1 MKT_{i,t} + \beta_2 SMB_{i,t} + \beta_3 HML_{i,t} + \beta_4 MOM_{i,t} + \varepsilon_{i,t}\,, \qquad (2)$$

where, $R_{i,t}$ is the return net of fees in US dollars of fund *i* in month *t* in excess of the one–month US Treasury bill rate; $MKT_{i,t}$ (*market)* is the excess return in the fund's investment region in month *t*; $SMB_{i,t}$ (*small minus big*) is the average return on the small–capitalization stock portfolio minus the average return on the large–capitalization stock portfolio in the fund's investment region; $HML_{i,t}$ (*high minus low*) is the average return on high book–to–market stock portfolio minus the average return on low book–to–market stock portfolio in the fund's investment region; and $MOM_{i,t}$ (*momentum*) is the average return on past 12–month winners portfolio minus the average return on past 12–month losers portfolio in the fund's investment region. The previous 36 months of net fund returns are used to estimate the time series regression of monthly excess returns based on the fund's factor portfolios. Next, we compare the difference between the fund's expected return and realized return and use this to estimate the fund's abnormal return (or alpha) in each month. We compound monthly alphas to calculate quarterly alphas. Panel A of Table 2 shows that the average raw return in our sample is positive (1.73%), and the average four–factor alpha is negative (–0.43%), which is comparable with the findings in Demirci, Ferreira, Matos, and Sialm (2020).

2.2.3 Additional control variables

The literature shows that mutual fund characteristics other than past performance affect mutual fund flows. These characteristics include fund size, age and its interaction with performance, and fees (Chevalier and Ellison, 1997, Sirri and Tufano, 1998, Huang, Wei, and Yang, 2007, and Ferreira, Keswani, Miguel, and Ramos, 2012). Sirri and Tufano (1998) and Huang, Wei, and Yang (2007) include volatility in their tests, measured by the standard deviation of fund returns. Ferreira, Keswani, Miguel, and Ramos (2012) use the number of countries where a fund is registered to sell

and also use loadings on SMB and HML factors to control for fund style. Because of the serial correlation of fund flows, Ferreira, Keswani, Miguel, and Ramos (2012) and Keswani, Mamdough, Miguel, and Ramos (2020) also control for past flows. We add the aggregate flow into each fund category to our tests to control for other unobserved factors that can potentially influence fund flows, such as sentiment shifts (Sirri and Tufano, 1998). Nanda, Wang, and Zheng (2004) show that a star performer not only attracts flows to itself but also to other funds in the family. We therefore control for funds affiliated with star families (but that are not stars themselves) in our regressions, following Huang, Wei, and Yang (2007), and Ferreira, Massa, and Matos (2018).

Panel A of Table 2 presents summary statistics for fund–level characteristics, while Appendix 1 contains definitions.[13] Table 2, Panel C, exhibits pairwise correlations among fund characteristics. Consistent with Ferreira, Keswani, Miguel, and Ramos, (2012), fund flows are positively correlated with both raw returns and four–factor alpha, family size, HML and the number of countries where the fund is sold, but negatively correlated with age, fees, and SMB. The pairwise correlation matrix among fund control variables also shows that using these variables together in our tests does not raise concerns of multicolinearity.

2.3 Country–level characteristics

We follow Ferreira, Keswani, Miguel, and Ramos (2012) and proxy for investor sophistication by using measures of financial market development. These authors argue that the more developed the financial markets in a country, the more sophisticated their investors are. Our first measure is the percentage of the population owning shares, from Grout, Megginson, and Zalewska (2009), as investors own more stocks in more developed financial markets. Our second measure is stock

[13] Table IA2, Panel A in the Internet Appendix presents summary statistics by country.

market trading costs. Countries with less developed financial markets are countries with higher trading costs (Khorana, Servaes, and Tufano, 2005, and Ferreira, Keswani, Miguel, and Ramos, 2012). Stock market trading costs are given by the annual average stock market transaction cost in basis points (including commissions, fees, and price impact) from the Global Universe Data–ElkinsMcSherry database. Finally, we also use a dummy variable that takes the value of one if the country is considered an emerging market country (following the MSCI criteria) in our baseline tests. Our proxies for investor sophistication have been widely used in cross–country studies (e.g., Khorana, Servaes, and Tufano, 2005 and 2009; Ferreira, Keswani, Miguel, and Ramos, 2012 and 2013; Cremers, Ferreira, Matos, and Starks, 2016; Keswani, Mamdough, Miguel, and Ramos, 2020); and Demirci, Ferreira, Matos, and Sialm, 2020).

In Table 2, Panels B and D present descriptive statistics and a pairwise correlation matrix for country–level characteristics, respectively. Table IA2, Panel B, in the Internet Appendix reports detailed numbers by country.[14] Canada has the highest percentage of population owning shares, while Indonesia has the smallest proportion of population investing in shares. Indonesia also has the highest trading costs, while Japan and the US have the lowest. Following the MSCI criteria, one–third of the countries in our sample are classified as emerging markets.

Ferreira, Keswani, Miguel, and Ramos (2012) argue that mutual fund investors are more familiar with financial products in countries with more developed financial markets. Investors in these countries also have a better understanding of mutual funds as the mutual fund industry is older, larger and more pervasive, and they are also expected to adopt innovative methods of investing more quickly.

In the robustness tests, we employ additional proxies for investor sophistication. We use financial literacy, measured as the percentage of adults who are financially literate, from Klapper,

[14] Panel B of Table IA10 in the Internet Appendix presents means of additional country–level characteristics by country.

Lusardi, and Oudheuseden (2015); we measure financial openness using the index of Chinn and Ito (2006), which measures a country's degree of capital account openness; and we use GDP per capita as a measure of a country's wealth, with data obtained from the World Development Indicators (WDI) database.

Education and GDP per capita capture investor sophistication, as high–income countries and countries with more educated populations have more sophisticated investors (Ferreira, Keswani, Miguel, and Ramos, 2012). These arguments are consistent with the findings in Khorana, Servaes, and Tufano (2005) that show that the mutual fund industry is larger in countries with wealthier and more educated populations and that this effect is more pronounced for equity funds as they require a higher level of investor sophistication. This is also in line with the findings in the US literature. Bailey, Kumar, and Ng (2011) show that investors with a higher income and higher educational levels are more likely to use mutual funds and benefit from their choices. Campbell (2006) and Calvet, Campbell, and Sodini (2009) find that wealthier households exhibit more financial sophistication and make fewer investment mistakes. Chinn and Ito (2006) show that financial openness leads to financial development, particularly in equity markets, which indicates a direct link between financial openness and investor sophistication.

3. The effect of family size on the flow–performance sensitivity

This section provides details of our empirical tests and their results. Our aim is to explain differences in the way family size shapes the flow–performance relationship across countries in our sample. We posit that the sophistication of the investors in the country affects the impact of family size on the flow–performance sensitivity.

To measure flow performance sensitivity, we use a piecewise–linear specification allowing for different flow–performance sensitivities at different levels of performance (e.g., Sirri and Tufano,

1998). A fund's performance rank ranging from zero (poorest performance) to one (best performance) is assigned in each country *c*, investment region *r*, and quarter *t*, on the basis of its performance in the prior year as measured by raw returns or four–factor alpha.[15]

We allow slopes to differ for the lowest quintile [$Low_{i,c,r,t-1}=min(0.2, Rank)$], middle three quintiles [$Mid_{i,c,r,t-1}=min(0.6, Rank-Low_{i,c,r,t-1})$], and the top quintile [$High_{i,c,r,t-1}=Rank-(Low_{i,c,r,t-1}+Mid_{i,c,r,t-1})$] of the fractional fund performance rank. The coefficients on these piecewise decompositions of fractional ranks represent the marginal fund–flow response to the performance. To examine the impact of family size on the sensitivity of flows to past performance, we estimate the following regression:

$$\begin{aligned}\text{Flows}_{i,r,t} = \; & a + \beta_1 Low_{i,r,t-1} + \beta_2 Low_{i,r,t-1} \times Large\ fund\ family_{i,r,t-1} \\ & + \beta_3 Mid_{i,r,t-1} + \beta_4 Mid_{i,r,t-1} \times Large\ fund\ family_{i,r,t-1} \\ & + \beta_5 High_{i,r,t-1} + \beta_6 High_{i,r,t-1} \times Large\ fund\ family_{i,r,t-1} \\ & + \delta\, Large\ fund\ family_{i,r,t-1} + \theta X_{t-1} + \varepsilon_t;\end{aligned} \tag{3}$$

where quarterly fund flows are regressed on piecewise past performance, a dummy variable that takes the value of one if the fund family size is above the median fund family size in the country, prior quarter (*t–1*), and investment region (*r*) concerned ($Large\ fund\ family_{i,r,t-1}$), and past performance interacted with $Large\ fund\ family_{i,r,t-1}$. X_{t-1} represents a set of lagged controls known to influence the flow–performance relationship. These variables are presented in Section 2 and include *Flows category, Star affiliation, Age* and its interaction with performance (*Age x Performance*), *Volatility*, fund size, *Flows*, *Expense ratio*, *Loads*, *SMB*, *HML*, and the number of countries where the fund is sold (*Countries sold)*. Regressions also include country, investment region, benchmark, and fund type (domestic, foreign, regional, and global) fixed effects as part of the controls. We calculate robust *t*–statistics that are twoway–clustered by fund and

[15] In untabulated results, we obtain consistent results if we use ranks based on the previous three years' performance.

quarter (Petersen, 2009).[16] We use weighted least squares to avoid giving excessive weight to countries in our sample with a greater fraction of the number of funds, weighting each fund by the inverse of the number of funds in that country–quarter. Additionally, we report the change in convexity due to a fund's affiliation with large families (*High–Mid* and *High–Low*) and *p*–values from a *Wald–test*, testing whether this change is statistically significant.

We start by estimating the regression in Equation (3) with funds pooled across the 33 countries in our sample. Column (1) of Panels A and B of Table 3 report the results with performance measured using raw returns and four–factor alpha, respectively.[17]

In Column (1) of Table 3, we find no evidence that family size has a significant impact on the convexity of the flow–performance relationship when we pool funds from all countries together.

Our first hypothesis states that family size affects the response of fund flows to performance across countries differently. We also anticipate that family size: (1) increases the convexity of the flow–performance sensitivity in countries where investors are less sophisticated; and (2) decreases the flow sensitivity to performance in countries with more sophisticated investors.

To test this conjecture, we repeat the regression in Equation (3), except that we partition countries into two groups based on proxies for investor sophistication presented in Section 2.3. These proxies include the percentage of the population owning shares, stock market trading costs, and an emerging market dummy that equals one if the country is an emerging market (following the MSCI Emerging Markets Index criteria).[18] Below and above refer to the group of countries with below– and above–median values for the country variable concerned.

[16] Fund investment regions are based on the fund's domicile country and geographic investment style provided by the Lipper database, and includes Asia–Pacific, Europe, North America, Emerging Markets, and Global, in the case of world funds.
[17] We refer to the numbers in Panel A of Table 3, but we find identical results for four–factor–alpha.
[18] In the robustness tests, we use additional proxies for investor sophistication, including financial literacy, financial openness, and GDP per capita.

The results for raw returns and four–factor alpha are presented in Columns (2–7) of Panels A and B of Table 3, respectively. We find fundamental differences in the way family size affects the levels of convexity for countries with more and less sophisticated investors. Consistent with our predictions, family size increases the convexity of the flow–performance sensitivity in the group of countries where investors are less sophisticated (in Columns 2, 4, and 6). Contrarily, in countries with more sophisticated investors (in Columns 3, 5, and 7), family size decreases convexity.

Our second hypothesis postulates that family size affects the sensitivity of flows in the middle and top performance ranges. We expect family size to increase (decrease) the convexity at the upper end of the performance scale (*High–Mid*) in countries where investors are less (more) sophisticated. Less sophisticated investors have less sensitivity to mid–range performing funds that are affiliated with larger families. On the other hand, these investors are more swayed by top performers affiliated with larger families. In the case of countries with more sophisticated investors, the affiliation with a large family should be sufficient for funds with a moderately good performance to obtain more flows. This is because sophisticated investors increase their performance threshold in order to invest in top–performing funds, which leads to a greater sensitivity to middle performers and reduces the sensitivity of flows to superior performance for these investors.

Our tests strongly confirm our second hypothesis regardless of the proxies for investor sophistication used. In countries with less sophisticated investors, affiliation with large families increases the convexity of the flow–performance relationship at the top of the performance scale (*High–Mid*). In these countries, investors buy more top performers affiliated with larger families. Contrarily, the sensitivity to middle–range performers decreases. We observe the opposite results in countries with more sophisticated investors. In these countries, investors become more sensitive to the medium performance range and less sensitive to high performance when funds are part of

large families. This decreases the convexity of the flow–performance relationship at the top of the performance scale (*High–Mid*), which is in line with the findings for the US (Huang, Wei, and Yang, 2007).

Our third hypothesis posits that family size affects the convexity of the flow–performance relationship between the low– and high–performance ranges (*High–Low*), particularly in countries with less sophisticated investors. We expect funds affiliated with large families to experience fewer outflows if they perform poorly and to obtain a significantly greater flow if they do well in countries with less sophisticated investors. Our results confirm this prediction and show a more convex flow–performance relationship between (*High–Low*) performance ranges for countries where investors are less sophisticated. We also observe that family size decreases (*High–Low*) convexity in countries with more sophisticated investors. This change in convexity is mostly explained by the lower sensitivity of flows to top–performing funds observed in these countries.[19]

The coefficients of the control variables are consistent with the main findings in the literature. Past flows and the number of countries where the fund is sold increase flows, consistent with Ferreira, Keswani, Miguel, and Ramos (2012) and Ferreira, Massa, and Matos (2018). Flows are negatively related to the volatility of fund returns (e.g., Sirri and Tufano, 1998, and Huang, Wei, and Yang, 2007). Larger and older funds get less flow, as in Ferreira, Keswani, Miguel, and Ramos (2012), and Cremers, Ferreira, Matos, and Starks (2016), and funds that charge more fees or load more on small–caps also obtain more flows (e.g, Ferreira, Keswani, Miguel, and Ramos, 2012).

[19] Our results in Panel A of Table 3 show a higher flow–performance sensitivity to poor–performing funds that are members of a large family in countries with more sophisticated investors. Given that family size is expected to affect the behavior of the less sophisticated investors, this result indicates a sophisticated behavior from unsophisticated investors. In Panel B of Table 3, the coefficient on the interaction between poor–performance and family size is not statistically significant when we use four–factor alpha rather than raw returns as our performance measure. In the robustness tests, we also find that the coefficient on the interaction between poor–performance and family size is no longer statistically significant when we control for other fund–level and country–level characteristics in our model (see Tables IA4, IA5, and IA6). These findings are in line with the results of Huang, Wei, and Yang (2007) for the US fund industry.

Our results are economically important. For example, when we use the percentage of the population owning shares as a proxy for investor sophistication (in Columns 2–3 of Panel A of Table 3), we find that affiliation with larger families increases the convexity of (*High–Mid*) and (*High–Low*) performance ranges by 23% and 40%, respectively for the group of countries with less sophisticated investors.[20] For countries with more sophisticated investors, the convexity of (*High–Mid*) declines by 34%, and (*High–Low*) convexity decreases by 42%.[21]

We next test for the impact of family size on the flow–performance relationship in individual countries. We therefore run identical regressions to those in Equation (3) for each country in our sample, except that we use fund–fixed effects rather than country–fixed effects. The results are presented in Table IA3.[22]

We first observe that family size influences the flow–performance sensitivity in many countries in our sample. Consistent with the predictions in our first hypothesis, we also find that there are substantial differences in the way family size affects convexity across countries. In countries where investors are less sophisticated, like Argentina and Indonesia, family size increases the convexity of the flow–performance sensitivity. In contrast, family size decreases convexity in the US, the UK, and Canada, where investors are more sophisticated.

Next, we examine the impact of family size on the convexity of the flow–performance sensitivity of (*High–Mid*) and (*High–Low*) performance ranges. Our results show that in seven

[20] To compute the economic impact of (*High–Mid*) performance range we divide the change in convexity that is due to a fund's affiliation with large families (*Change in convexity (High–Mid)*) – computed as the difference between the coefficients on the *High x Family size* and *Mid x Family size* interactions variables – by the level of convexity for the funds that are not affiliated with large families (*High–Mid*) – calculated as the difference between the coefficients of *High* and *Mid*. As an example (from Column (2) of Panel A of Table 3): 23% = 0.0429/0.1901; where 0.049=(0.0351– (–.0078)); and 0.1901=(0.2307–0.0406). To compute the economic impact of (*High–Low*) we proceed likewise, except that we use the coefficients of *Low* and the coefficients on the *Low x Family size* interaction variable, rather than the coefficients of *Mid* and *Mid x Family size.*

[21] The magnitude of the economic impact is also relevant when investor sophistication is proxied by trading costs or emerging markets. In countries with higher (lower) trading costs, family size increases (decreases) the convexity of (*High–Mid*) and (*High–Low*) by 22% and 42% (39% and 47%), respectively. In the case of emerging markets, affiliation with larger families increases the convexity of (*High–Mid*) and (*High–Low*) performance ranges by 20% and 41%, respectively, while a fund's affiliation with a large family decreases the convexity of (*High–Mid*) and (*High–Low*) performance ranges by 32% and 50%, respectively.

[22] In Table IA3, we measure performance using raw returns. In the untabulated analysis we run the country–by–country regressions with performance measured using four–factor alpha and find similar results.

countries, namely Australia, Canada, Denmark, France, Sweden, the UK, and the US, family size significantly decreases the convexity of both performance ranges. All these countries belong to the group of countries in our sample with an above–median percentage of the population owning shares– countries with less sophisticated investors. In addition, we also find that most countries where the affiliation with large families contributes to increasing the convexity of the flow–performance sensitivity of (*High–Mid*) and (*High–Low*) performance ranges have a below–median percentage of the population owning shares – countries with more sophisticated investors. These countries are Argentina, Greece, Indonesia, Italy, Netherlands, Poland, Portugal, and Thailand. These findings support our second and third hypotheses.

Our country–by–country results are also very important economically. In the US, affiliation with larger families decreases the convexity of (*High–Mid)* and *(High–Low)* performance ranges by 64% and 52%, respectively. In the case of Portugal, however, (*High–Mid*) convexity increases by 50%, while (*High–Low*) convexity decreases by 76%.

Overall, our results highlight the importance of investor sophistication when studying the role of family size on the response of flows to past performance in different countries around the world.

4. Robustness

We perform a number of robustness checks on the main findings. The results are presented in the Internet Appendix.

Huang, Wei, and Yang (2007) report that larger fund complexes charge lower fees, produce more star funds, and allow investors to have access to a wide range of products.[23] To understand whether our results are affected by these variables, we start by running the regressions in Panel A

[23] Khorana, Servaes and Tufano (2009) also find that large families charge lower fees when using an international sample of 18 countries.

of Table 3 including *Fees*, *Star affiliation*, and *Diversity*, and the interaction of past performance (*Low, Mid*, and *High* performance ranges) with theses variables. *Fees* are measured as the expense ratio plus one–seventh of front–end loads; *Star affiliation* is a dummy variable that takes the value of one for funds that are affiliated with star families (i.e., those including a star fund) but are not stars themselves, and zero otherwise; *Diversity* is a dummy variable that is one if the number of different fund categories offered by the affiliated family is larger than the medium number for all families, and zero otherwise. The results are presented in Table IA4 and show the inclusion of these variables does not affect our main conclusions.

Providing investors with more fund choices within the complex, larger fund families may also reduce the transaction costs associated with switching from one fund to another. Additionally, because switching a fund entails a certain level of uncertainty and investors are more likely to know about a larger family and its funds, we might expect this to affect the impact of family size on the flow–performance sensitivity. We test this by adding the costs of switching funds and the number of available investment alternatives to our regressions in Panel A of Table 3 and interact each one of these variables with past performance.

We follow Keswani, Mamdough, Miguel, and Ramos (2020) and proxy for switching costs by using back–end fees and front–end fees. As investors pay front– and back–end fees when buying and selling funds, respectively, we measure the cost of switching funds in a given country–quarter as the average of: (i) the weighted average front–end fee; and (ii) the weighted average back–end fee, where the weights are determined by a fund's assets under management relative to the country's total assets under management in that quarter. We compute the *Number of available investment alternatives* by using the number of funds with similar styles based on their *SMB*– and *HML* loadings. In each quarter, we sort funds into three groups based on *SMB* loadings (low, medium, and high) and also into three groups based on *HML* loadings to obtain nine equal–sized

groups. The fund's *Number of investment alternatives* in a given quarter is the total number of funds in the same *SMB/HML* group.[24] The results are presented in Table IA5 and show that the documented effects of family size on the flow–performance sensitivity remain unchanged.

The literature shows conflicts of interests in mutual funds that are owned by banking groups. In the US, this includes Massa and Rehman (2008) , and internationally, Gil–Bazo, Hoffmann, and Mayordomo (2020), and Ferreira, Matos, and Pires (2018). Ferreira, Matos, and Pires (2018) show that outside the US (but not in the US), affiliated funds exhibit less flow–performance sensitivity – particularly to poor performing funds – than non–affiliated funds, which the authors find consistent with non–US affiliated fund investors being unsophisticated.[25]

Banks follow cross–selling strategies as this allows them to offer mutual funds jointly with other financial products. We would therefore expect many affiliated fund investors to be clients of other financial products the bank is offering, particularly in less developed countries where most mutual funds are run by asset management divisions of groups whose primary activity is commercial banking. Therefore, captive investors may react differently to the performance of funds managed by large complexes that are part of financial conglomerates. We investigate this possibility by performing the flow–performance tests in Panel A of Table 3 separating bank–affiliated and non–affiliated funds. [26]

The results are presented in Table IA6 and confirm that family size has a larger impact on the convexity of the bank–affiliated funds – both *(High–Low)* and *(High–Mid)* – in countries with less sophisticated investors. In these countries, investors react less to poor– and mid– performing bank–

[24] Hoberg, Kumar, and Prabhala (2018) also sort funds using a similar procedure.
[25] Ferreira, Matos, and Pires (2018) use a worldwide sample to show that commercial bank–affiliated funds underperform unaffiliated funds. This is because affiliated funds do not always invest in a way that maximizes investor returns; instead, they choose to invest in a way that benefits the banking group they are owned by. We thank Pedro Pires for providing us with the data.
[26] For simplicity, we only present the results of reestimating Columns 2 and 3 of Panel A of Table 3, where we proxy for investor sophistication using the percentage of population owning shares. We find robust results for all our proxies for investor sophistication.

affiliated funds that belong to larger families and react more to the performance of those affiliated funds that are part of larger complexes. This larger impact is also confirmed economically, as family size increases the convexity of (*High–Mid)* and *(High–Low)* performance ranges by 26% and 50% in the case of the bank–affiliated funds, and by 20% and 37% for non–affiliated funds, respectively. Table IA6 also shows that our main conclusions are robust as the effect of family size on convexity remains significant for bank–affiliated and non–affiliated funds.

Our sample includes both domestic funds (those investing primarily in stocks of the country of domicile), and international funds (those that invest primarily in stocks of countries other than the country of domicile, including funds investing in a particular country, regional funds, and global funds). In all our regressions, we include fund type (domestic, foreign, regional, and global) fixed effects to control for differences in these types of funds. To test whether our results hold separately for domestic and international funds, we repeat our regressions in Panel A of Table 3 individually for domestic and international funds.

Table IA7 shows that the results are robust in both sub–samples. Table IA7 also shows that family size has a particularly strong impact on the convexity of international funds for the (*High–Mid)* performance range in less sophisticated countries. Family size increases the convexity of (*High–Mid)* performance ranges by 36% in the case of international funds, and by 27% for domestic funds. This is consistent with less sophisticated investors facing higher participation costs when investing in international funds.

We use weighted least squares in our main tests, weighting each fund by the inverse of the number of funds in that country–quarter. This is to avoid giving excessive weight to countries in our sample with a greater fraction of the number of funds.[27] As the US represents nearly 30% of

[27] As the average fund size is very different across countries in our sample, we also use weighted least squared weighting in unreported results by the inverse of the average TNA in each country–quarter; the results remain similar.

the observations in our sample, one can argue that the US dominance of our sample is driving our results. We therefore run separate regressions where we exclude the US from our sample. Table IA8 presents the results of these tests and shows that excluding the US does not change our main findings.

To address concerns of cross–sectional dependence in our results, we rerun the results in Panel A of Table 3 using the Fama–Macbeth estimation procedure. Table IA9 presents the results and demonstrates that our main conclusions are confirmed.

We use additional proxies for the level of investor sophistication in a country. Panel A of Table IA10 presents the means of these proxies that include the percentage of adults who are financially literate in the country, the KAOPEN index, measuring a country's degree of capital account openness and GDP per capita. Panel B of Table IA10 shows that our main results are confirmed when we use these proxies.

In the untabulated analysis, we run the regressions in Table 3 with performance measured using benchmark–adjusted returns. Our results remain similar. The untabulated analysis also addresses concerns that residuals are correlated within country–time and the regressions are estimated in Table 3 with *t*–statistics twoway–clustered by country–time. We find that our results remain unchanged.

5. Conclusion

In this study, we use data from 33 countries to show substantial differences in the way a fund's affiliation with large families affects the flow–performance sensitivity across countries. We find that family size reduces the convexity of the flow–performance relationship in countries where investors are more sophisticated. On the other hand, family size increases the flow–performance convexity in countries with less sophisticated investors.

Our results are consistent with the literature that shows that the US–based evidence is not a universal truth. We show that the US evidence only holds for countries where investors are more sophisticated. The economic impact of our results is also significant.

Our results are important for investors, mutual fund companies, and regulators. As family size affects investors' allocation decisions, it determines mutual fund industry outcomes such as fees, risk–taking, and performance.

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Table 1
Mutual fund industry sample by country
This table presents the number of unique funds in our sample, the total net assets (TNA) under management (sum of all share classes in millions of US dollars at the end of 2015), and the market share (percentage of TNA sum) of the top five management companies (equity funds) in each country. The sample is restricted to open–end and actively managed equity funds drawn from the Lipper database. The sample period is 2000–2015.

Country	Number of Funds	TNA ($ million)	Fund industry top five share (%)
Argentina	65	476	68.83
Australia	1,343	130,519	38.39
Austria	232	10,638	60.03
Belgium	814	19,624	83.52
Brazil	935	21,231	57.64
Canada	1,385	267,596	44.11
China	27	6,117	59.65
Denmark	261	33,217	51.75
Finland	210	26,568	77.16
France	1,509	159,864	46.47
Germany	476	120,833	81.94
Greece	46	915	84.20
Hong Kong	107	32,944	61.78
India	320	44,084	61.04
Indonesia	66	4,686	84.26
Italy	349	21,872	66.51
Japan	1,268	111,690	67.37
Malaysia	268	15,130	86.28
Netherlands	158	25,013	74.10
New Zealand	48	1,872	76.79
Norway	192	36,296	79.75
Poland	111	7,481	68.99
Portugal	72	1,690	87.93
Singapore	166	8,674	69.44
South Africa	178	21,614	64.92
South Korea	845	24,412	63.06
Spain	360	19,639	61.39
Sweden	319	116,759	63.90
Switzerland	349	50,779	79.55
Taiwan	370	12,577	52.16
Thailand	210	11,498	66.74
UK	1,290	523,944	27.97
US	4,378	5,265,178	43.76
All countries	18,727	7,155,433	65.34

Table 2
Mutual fund and country characteristics
This table presents mean, median, standard deviation, minimum, maximum, and number of observations of the fund–level characteristics in Panel A, and country–level characteristics in Panel B. Panels C presents pairwise correlations among fund characteristics, while Panel D presents pairwise correlations among country characteristics. The sample is restricted to open–end and actively managed equity funds drawn from the Lipper database. The sample period is 2000–2015. See Appendix 1 for variable definitions.

Variable	Mean	Median	Standard deviation	Percentile 10th	Percentile 90th	Number of Observations
Panel A – Fund characteristics						
Raw return (% quarter)	1.73	2.33	10.96	–12.59	14.39	570,432
Benchmark–adjusted return (% quarter)	–0.08	–0.17	3.97	–4.23	4.18	564,933
Four–factor alpha (% quarter)	–0.43	–0.52	5.36	–6.35	5.52	570,432
Flows (% quarter)	–0.48	–1.80	15.67	–10.82	9.14	570,432
Size ($ million)	563	73	3,076	5.26	975	570,432
Family size ($ million)	23,429	3,633	87,601	143.40	38,256	570,432
Age (years)	12.20	9.58	9.25	4.42	22.08	570,432
Expense ratio (%)	1.63	1.56	0.72	0.84	2.54	570,432
Loads (%)	2.47	2.00	2.54	0.00	5.25	570,432
SMB	0.13	0.05	0.47	–0.37	0.78	570,432
HML	–0.06	–0.04	0.54	–0.70	0.53	570,432
Countries sold	1.31	1.00	1.30	1.00	2.00	570,432
Volatility	0.41	0.38	0.16	0.23	0.63	570,432
Panel B – Country characteristics						
Population owning shares (%)	13.70	11.97	9.15	2.39	30.75	570,432
Trading costs (basis points)	31.28	29.30	11.05	20.14	49.78	570,432
Emerging market dummy	0.14	0.00	0.35	0.00	1.00	570,432

Panel C– Pairwise correlations among fund characteristics

		1	2	3	4	5	6	7	8	9	10	11	12
Raw return (% quarter)	1	1											
Four–factor alpha (% quarter)	2	0.39	1										
Flows (% quarter)	3	0.06	0.05	1									
Size ($ million)	4	0.01	0.01	0.01	1								
Family size ($ million)	5	0.01	0.02	0.02	0.35	1							
Age (years)	6	–0.01	0.01	–0.03	0.23	0.14	1						
Expense ratio (%)	7	–0.01	–0.02	–0.01	–0.13	–0.15	–0.10	1					
Loads (%)	8	–0.03	0.00	–0.01	–0.03	–0.06	0.05	0.28	1				
SMB	9	0.02	0.01	–0.01	–0.03	0.00	–0.04	0.08	–0.02	1			
HML	10	–0.03	–0.02	0.01	0.01	0.01	0.02	–0.07	0.003	–0.19	1		
Countries sold	11	0.01	0.01	0.01	0.02	–0.02	0.08	–0.01	0.09	–0.01	–0.02	1	
Volatility	12	0.03	0.00	–0.01	–0.07	–0.07	–0.10	0.18	–0.10	0.25	–0.21	0.003	1

Panel D– Pairwise correlations among country characteristics

		1	2	3
Population owning shares	1	1		
Trading costs	2	–0.48	1	
Emerging markets	3	–0.33	0.73	1

Table 3

Flow–performance sensitivity and fund's affiliation with large families across countries – Investor sophistication

This table presents the results of panel regressions examining the aggregate flow–performance relationship for all countries in our sample (in Column 1) and for funds pooled across countries with below and above median values of the country variable concerned (in Columns 2–7). Panels A and B present the results when fund performance is measured using *raw return*s and *four–factor alpha*, respectively. Country–level variables proxy for investor sophistication and include, *Population owning shares, Tradings costs,* and *Emerging markets*. Weighted least squares are used where each fund is weighted by the inverse of the number of funds in each country–quarter. The dependent variable is *fund flows* and the independent variables are past performance, *Large fund family*, and a dummy variable that takes the value of one if the fund family size is above the median fund family size in the country–quarter and investment region concerned, past performance interacted with *Large fund family,* and control variables lagged by one quarter. A piecewise linear regression is used to define three linear segments in the flow–performance relationship. In each quarter, by country, and investment region, fractional performance ranks ranging from zero to one are assigned to funds according to their average performance in the past year. This procedure designates three performance variables: $Low_{i,c,r,t-1}=min(0.2,Rank_{i,c,r,t-1})$, $Mid_{i,c,r,t-1}=min(0.6,Rank–Low_{i,c,r,t-1})$, and $High_{i,c,r,t-1}=Rank–(Low_{i,c,r,t-1}+Mid_{i,c,r,t-1})$. Control variables include: *Flows category*; *Star affiliation*; *Age*; *Age x Performance; Volatility*; *Size*; *Flows*; *Expense ratio*; *Loads*; *SMB*, *HML*; and *Countries sold*. Regressions also include country, time, investment region, benchmark, and fund type fixed effects. Robust t–statistics twoway–clustered by fund and time are reported in parentheses. At the bottom of the table, we report the increase in convexity due to a fund's affiliation with large families (*High–Mid* and *High–Low*) and p–values from a *Wald–test* testing whether this change is statistically significant. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

Panel A– Raw returns

		Population owning shares		Trading Costs		Emerging markets	
	All Countries	Below	Above	Above	Below	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Low	0.0458***	0.0302**	0.0354***	0.0335**	0.0390***	0.0646***	0.0490***
	(4.87)	(2.09)	(3.38)	(2.44)	(3.72)	(2.70)	(4.65)
Low x Family size	0.0064	–0.0456**	0.0185*	–0.0474**	0.0181*	–0.0432**	0.0245**
	(0.77)	(–2.16)	(1.73)	(–2.34)	(1.67)	(–2.47)	(2.46)
Mid	0.0394***	0.0406***	0.0394***	0.0349***	0.0414***	0.0401***	0.0393***
	(8.42)	(9.12)	(16.44)	(8.85)	(14.54)	(8.38)	(14.50)
Mid x Family size	0.0021	–0.0078*	0.0062**	–0.0056*	0.0071**	–0.0084	0.0037
	(0.59)	(–1.73)	(2.35)	(–1.68)	(1.75)	(–1.17)	(1.44)
High	0.2042***	0.2307***	0.1833***	0.2395***	0.1717***	0.2545***	0.1827***
	(10.46)	(10.06)	(15.45)	(11.30)	(14.76)	(9.12)	(16.41)
High x Family size	–0.0041	0.0351**	–0.0438***	0.0387**	–0.0449***	0.0341*	–0.0423**
	(–0.38)	(2.09)	(–2.74)	(2.27)	(–2.61)	(1.72)	(–2.52)
Large fund family	0.0068***	0.0073***	0.0066***	0.0069***	0.0066***	0.0056***	0.0071***
	(8.97)	(5.16)	(8.47)	(5.41)	(9.54)	(3.80)	(10.37)
Flows category	0.2301**	0.3482***	0.0778	0.1579*	0.0383	0.3679*	0.0309
	(2.33)	(3.36)	(1.55)	(1.88)	(0.68)	(1.79)	(0.54)
Star affiliation	–0.0019	–0.0031***	–0.0025***	–0.0051***	–0.0017***	–0.0084***	–0.0016***
	(–1.62)	(–2.68)	(–4.46)	(–4.14)	(–3.23)	(–4.41)	(–3.42)
Age (log)	–0.0127***	–0.0067***	–0.0140***	–0.0058***	–0.0144***	–0.0058***	–0.0134***
	(–5.66)	(–6.41)	(–23.03)	(–6.65)	(–18.76)	(–5.36)	(–21.14)
Age x Performance	0.0399***	0.0392***	0.0395***	0.0433***	0.0404***	0.0469***	0.0416***
	(5.71)	(4.31)	(8.42)	(6.16)	(9.08)	(4.40)	(9.25)
Volatility	–0.0118	0.0040	–0.0227***	0.0153	–0.0240***	0.0255	–0.0215**
	(–0.89)	(0.37)	(–2.61)	(1.03)	(–2.73)	(1.47)	(–2.44)
Size (log)	–0.0057***	–0.0070***	–0.0055***	–0.0059***	–0.0057***	–0.0048***	–0.0058***
	(–10.88)	(–10.21)	(–15.66)	(–9.82)	(–20.21)	(–7.86)	(–19.44)
Flows	0.1934***	0.1574***	0.2034***	0.1690***	0.2023***	0.1932***	0.1908***
	(7.67)	(15.01)	(30.39)	(18.97)	(27.94)	(19.90)	(28.87)
TER	–0.2581**	–0.0847	–0.3926***	–0.3311***	–0.2307***	–0.2138**	–0.2487***
	(–1.99)	(–0.92)	(–7.35)	(–3.16)	(–3.59)	(–2.02)	(–4.31)
Loads	–0.0241	–0.0659**	–0.0119	–0.0265	–0.0207	0.1023*	–0.0318*
	(–0.55)	(–2.36)	(–0.61)	(–0.76)	(–1.13)	(1.87)	(–1.78)
SMB	–0.0058**	–0.0106***	–0.0037**	–0.0131***	–0.0041**	–0.0155***	0.0001
	(–2.08)	(–4.07)	(–2.19)	(–5.07)	(–2.33)	(–5.40)	(0.09)
HML	–0.0003	–0.0052**	0.0024**	–0.0060***	0.0029**	–0.0068**	0.0027**
	(–0.18)	(–2.32)	(2.18)	(–3.47)	(2.29)	(–2.52)	(2.23)
Countries sold	0.0023***	0.0050***	0.0015***	0.0007**	0.0040***	–0.0007	0.0023***
	(2.79)	(8.02)	(5.62)	(2.28)	(9.76)	(–0.19)	(8.61)
Benchmark fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund type fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in convexity *(High–Mid)*	–0.0061	0.0429*	–0.0492**	0.0443**	–0.0511**	0.0421*	–0.0457**
Wald test (p–value)	(0.81)	(0.06)	(0.02)	(0.04)	(0.04)	(0.08)	(0.02)
Change in convexity *(High–Low)*	–0.0104	0.0807***	–0.0615***	0.0857***	–0.0621***	0.0771***	–0.0665***
Wald test (p–value)	(0.47)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Adjusted R–squared	0.085	0.067	0.093	0.082	0.089	0.118	0.081
Number of observations	570,432	108,078	462,354	143,579	426,853	79,997	490,435

Panel B – Four–factor alpha

		Population owning shares		Trading Costs		Emerging markets	
	All Countries	Above	Below	Above	Below	Above	Below
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Low	0.0405***	0.0296**	0.0397***	0.0302**	0.0426***	0.0632**	0.0354***
	(4.73)	(2.14)	(4.08)	(2.11)	(4.08)	(2.58)	(2.70)
Low x Family size	–0.0200*	–0.0336**	0.0179	–0.0425**	0.0127	–0.0452**	0.0167
	(–1.69)	(–2.28)	(1.49)	(–2.05)	(1.14)	(–2.32)	(1.55)
Mid	0.0366***	0.0257***	0.0404***	0.0353***	0.0368***	0.0397***	0.0360***
	(18.83)	(5.72)	(17.93)	(7.44)	(13.97)	(6.12)	(15.09)
Mid x Family size	–0.0011	–0.0098**	0.0061**	–0.0106**	0.0042*	–0.0123	0.0014
	(–0.41)	(–1.99)	(2.09)	(–2.10)	(1.78)	(–1.56)	(0.45)
High	0.1602***	0.2121***	0.1693***	0.2175***	0.1443***	0.2307***	0.1526***
	(12.93)	(8.96)	(11.89)	(9.06)	(10.50)	(8.27)	(11.64)
High x Family size	–0.0132	0.0408**	–0.0502***	0.0391**	–0.0363**	0.0118	–0.0418***
	(–1.09)	(2.55)	(–3.00)	(2.38)	(–2.20)	(0.67)	(–2.59)
Large fund family	0.0117***	0.0186***	0.0100***	0.0173***	0.0097***	0.0188***	0.0109***
	(5.85)	(4.55)	(4.64)	(4.63)	(4.44)	(4.05)	(5.22)
Flows category	0.2550***	0.4073***	0.2417***	0.2297**	0.2253***	0.4243*	0.2258***
	(5.04)	(3.79)	(4.90)	(2.55)	(4.38)	(1.95)	(4.15)
Star affiliation	–0.0028***	–0.0028**	–0.0028***	–0.0056***	–0.0019***	–0.0081***	–0.0019***
	(–5.01)	(–2.41)	(–4.80)	(–4.47)	(–3.34)	(–4.30)	(–3.78)
Age (log)	–0.0126***	–0.0064***	–0.0139***	–0.0061***	–0.0143***	–0.0060***	–0.0133***
	(–21.60)	(–6.17)	(–22.50)	(–6.57)	(–18.35)	(–5.17)	(–20.61)
Age x Performance	0.0268***	0.0326***	0.0238***	0.0358***	0.0235***	0.0448***	0.0240***
	(5.51)	(3.22)	(4.84)	(4.76)	(4.62)	(4.05)	(4.73)
Volatility	–0.0053	0.0056	–0.0126*	0.0204	–0.0152**	0.0316*	–0.0124*
	(–0.88)	(0.55)	(–1.86)	(1.42)	(–2.42)	(1.77)	(–1.96)
Size (log)	–0.0054***	–0.0066***	–0.0052***	–0.0055***	–0.0054***	–0.0046***	–0.0055***
	(–17.37)	(–9.69)	(–15.52)	(–9.70)	(–19.94)	(–7.41)	(–19.55)
Flows	0.1967***	0.1607***	0.2069***	0.1723***	0.2059***	0.1971***	0.1941***
	(29.99)	(15.20)	(29.76)	(18.90)	(27.44)	(20.06)	(28.28)
TER	–0.2726***	–0.1059	–0.4024***	–0.3413***	–0.2466***	–0.2391**	–0.2600***
	(–5.27)	(–1.15)	(–7.45)	(–3.33)	(–3.76)	(–2.32)	(–4.42)
Loads	–0.0259	–0.0727**	–0.0113	–0.0207	–0.0222	0.1021*	–0.0331*
	(–1.49)	(–2.58)	(–0.58)	(–0.60)	(–1.20)	(1.88)	(–1.85)
SMB	–0.0047***	–0.0098***	–0.0027	–0.0123***	0.0010	–0.0154***	0.0013
	(–2.73)	(–3.43)	(–1.48)	(–4.38)	(0.61)	(–5.00)	(0.80)
HML	0.0023	–0.0015	0.0035**	–0.0050***	0.0069***	–0.0069**	0.0068***
	(1.48)	(–0.85)	(2.12)	(–2.64)	(3.69)	(–2.41)	(3.64)
Countries sold	0.0024***	0.0050***	0.0016***	0.0008***	0.0040***	–0.0005	0.0024***
	(8.70)	(8.31)	(6.06)	(2.78)	(9.83)	(–0.14)	(9.12)
Benchmark fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund type fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment region fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Change in convexity *(High–Mid)*	–0.0120	0.0506***	–0.0561***	0.0497***	–0.0402**	0.0238	–0.0424**
Wald test (*p*–value)	(0.36)	(0.00)	(0.00)	(0.01)	(0.04)	(0.17)	(0.02)
Change in convexity *(High–Low)*	0.0070	0.0738***	–0.0679***	0.0811***	–0.0487**	0.0568**	–0.0577***
Wald test (*p*–value)	(0.68)	(0.00)	(0.00)	(0.00)	(0.02)	(0.03)	(0.00)
Adjusted R–squared	0.082	0.065	0.090	0.080	0.087	0.116	0.078
Number of observations	570,432	108,078	462,354	143,579	426,853	79,997	490,435

Appendix 1. Variable definitions

Variable	Definition
Panel A: Fund characteristics	
Raw return	Fund's net return in local currency (percentage per quarter) (Lipper).
Four–factor alpha	Four–factor alpha (percentage per quarter) is estimated with three years of past monthly fund excess returns in US dollars, and regional factors (Asia–Pacific, Europe, North America, or Emerging or markets) or world factors in the case of global funds. The classification is based on the fund´s investment region using data on the fund's domicile country and geographic investment style provided by the Lipper database.
Flow	Percentage growth in TNA (in local currency) in a quarter, net of internal growth (assuming reinvestment of dividends and distributions). See equation (1).
Flow category	Average percentage growth in TNA (in local currency) in a quarter, net of internal growth (assuming reinvestment of dividends and distributions) into funds with the same investment style, i.e., geographical focus.
Size	Total net assets in millions of US dollars (Lipper).
Family size	Family total net assets in millions of US dollars of other equity funds in the same management company excluding the own fund TNA (Lipper).
Large fund family	Dummy variable that takes the value of one if the fund family size is above the median fund family size in the country, quarter, and investment region concerned, and zero otherwise.
Star affiliation	Dummy variable that takes the value of one for funds that are affiliated with star families (i.e., those including a star fund) but are not stars themselves, and zero otherwise.
Age	Number of years since the fund launch date (Lipper).
Expense ratio	Total expense ratio (Lipper).
Loads	Sum of front–end plus back–end loads (Lipper).
SMB	Loadings on the small–minus–big size factor (SMB) from four–factor alpha regressions.
HML	Loadings on the high–minus–low factor (HML) from four–factor alpha regressions.
Countries sold	Number of countries where a fund is registered to sell (Lipper).
Volatility	Standard deviation of monthly fund returns in the prior 36 months.

Panel B: Country characteristics

Population owning shares	Percentage of the population owning shares in a country (Grout, Megginson, and Zalewska, 2009).
Trading costs	The annual average stock market transaction costs in basis points (including commissions, fees, and price impact) (Global Universe Data–ElkinsMcSherry).
Emerging markets	Emerging market dummy that equals one if the country is an emerging market (MSCI Emerging Markets Index, https://www.msci.com/market–classification).
Market share of top five management companies	Market share (percentage of TNA sum) of the top five management companies (equity funds) in each country (computed using Lipper data).
Financial literacy	Percentage of adults who are financially literate (Klapper, Lusardi, and Oudheusden, 2015).
Financial openness	KAOPEN index (Chinn and Ito, 2006) is an index measuring a country's degree of capital account openness. The index is based on the binary dummy variables that codify the tabulation of restrictions on cross–border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).
GDP per country	Gross Domestic Product per capita in US dollars in the fund's country (World Development Indicators).

Web Appendix to:
"Does mutual fund family size matter? International Evidence"

This appendix contains tables that supplement the analysis in the paper "Does mutual fund family size matter? International Evidence".

Table IA1
Mutual fund industry sample by country – Domestic and international mutual funds
This table presents the number of unique funds in our sample and total net assets (TNA) under management (sum of all share classes in millions of US dollars at the end of 2015), splitting the sample in Table 1 into domestic and international mutual funds.

	Domestic Funds		International Funds	
Country	Number of Funds	TNA ($ million)	Number of Funds	TNA ($ million)
Argentina	30	19.81	35	1.21
Australia	662	132.66	681	196.58
Austria	15	101.02	217	56.82
Belgium	30	92.32	784	86.45
Brazil	927	34.07	8	2.36
Canada	529	399.39	856	239.74
China	18	241.02	9	172.74
Denmark	29	184.69	232	169.50
Finland	33	165.57	177	178.75
France	298	212.94	1,211	170.18
Germany	68	819.71	408	336.91
Greece	25	32.15	21	14.15
Hong Kong	14	741.78	93	312.72
India	302	167.04	18	8.86
Indonesia	66	84.78		
Italy	57	221.94	292	225.72
Japan	672	125.43	596	190.15
Malaysia	152	99.02	116	23.60
Netherlands	21	305.76	137	305.50
New Zealand	12	53.11	36	60.64
Norway	57	231.97	135	407.34
Poland	62	95.45	49	49.46
Portugal	19	20.99	53	35.68
Singapore	11	119.54	155	88.96
South Africa	149	161.78	29	139.01
South Korea	597	58.54	248	24.56
Spain	86	127.60	274	101.11
Sweden	126	662.07	193	521.06
Switzerland	113	439.74	236	366.49
Taiwan	194	47.04	176	46.49
Thailand	161	73.71	49	17.10
UK	501	855.02	789	564.38
US	3,401	2,644.33	977	2,362.21
All countries	9,437	6,201.3	9,290	4,530.35

Table IA2
Summary statistics by country
This table presents the means and the total number of observations of fund–level characteristics by country. Panel B presents means of country–level characteristics by country. The sample is restricted to open–end and actively managed equity funds drawn from the Lipper database. The sample period is 2000–2015. See Appendix 1 for variable definitions.

Panel A– Fund–level characteristics by country

Country	N	Raw return (% quarter)	Four–factor alpha (% quarter)	Flows (% quarter)	Size ($ million)	Family size ($ million)	Age (years)	Expense ratio (%)	Loads (%)	SMB	HML	Countries sold	Volatility
Argentina	1,717	1.57	–1.35	–0.76	10	45	12	2.93	0.17	0.32	0.07	1.00	0.57
Australia	34,224	1.75	–0.38	–1.04	159	4,868	10	1.53	0.99	–0.09	–0.05	1.14	0.44
Austria	7,472	1.44	–0.73	–0.27	82	1,540	12	1.82	4.50	0.16	–0.10	2.44	0.41
Belgium	16,967	1.36	–0.51	–3.55	64	11,225	8	1.33	4.80	–0.11	–0.10	2.62	0.32
Brazil	18,628	–1.83	–3.10	–1.79	86	4,233	8	1.77	0.21	0.22	–0.23	1.00	0.62
Canada	42,259	1.54	–0.65	0.60	287	13,071	13	2.24	5.71	0.05	–0.01	1.00	0.38
China	544	3.40	1.40	–3.16	579	3,062	7	1.82	2.24	0.29	–0.19	1.00	0.46
Denmark	8,634	2.20	0.03	0.45	144	2,385	12	1.55	1.87	0.09	–0.15	1.80	0.42
Finland	6,894	1.92	–0.20	1.80	142	3,124	9	1.73	1.90	0.21	–0.13	1.58	0.45
France	43,242	1.57	–0.63	–0.33	188	6,864	13	1.73	3.21	0.07	–0.06	1.54	0.40
Germany	15,266	1.95	–0.66	–1.76	378	14,360	15	1.53	4.18	0.02	–0.12	2.00	0.40
Greece	1,405	–0.05	–1.83	0.73	61	246	12	2.77	5.94	0.15	0.38	1.02	0.55
Hong Kong	3,071	1.93	0.35	0.56	280	3,480	13	1.45	4.74	0.04	–0.12	2.49	0.42
India	8,539	3.15	1.65	–0.41	123	1,858	8	2.31	0.91	0.08	–0.66	1.25	0.60
Indonesia	1,601	1.82	0.02	3.60	93	401	8	2.89	3.17	0.34	–0.03	1.01	0.57
Italy	8,766	1.68	–0.81	–1.67	246	3,816	12	2.09	2.93	–0.08	–0.05	1.01	0.32
Japan	37,861	1.55	–0.55	–2.28	112	15,383	9	1.59	2.54	0.18	–0.01	1.00	0.38
Malaysia	7,545	1.55	0.16	–1.76	58	1,913	10	1.70	5.61	0.22	0.12	1.08	0.35
Netherlands	4,730	2.02	–0.29	–0.92	357	4,474	14	1.25	0.81	0.07	–0.10	1.24	0.40
New Zealand	953	2.52	0.12	–0.32	48	444	12	1.32	2.01	0.16	–0.11	1.21	0.44
Norway	7,632	3.07	–0.12	0.69	202	3,111	12	1.48	1.27	0.17	0.00	1.71	0.47
Poland	2,677	0.79	–1.60	4.06	129	510	8	3.32	4.63	–0.05	0.38	1.00	0.55
Portugal	2,843	1.07	–0.74	–1.07	43	326	11	1.87	2.00	0.10	–0.09	1.09	0.42
Singapore	5,638	2.12	0.06	–1.37	68	950	11	1.99	4.84	0.09	–0.18	1.23	0.40
South Africa	4,837	1.17	–0.60	0.71	160	1,619	11	1.59	1.92	0.00	–0.28	1.00	0.48
South Korea	16,491	2.58	–0.88	–7.47	67	3,423	7	1.84	0.34	0.33	–0.01	1.00	0.53
Spain	11,654	1.61	–0.83	0.68	71	1,456	11	2.06	0.81	–0.21	0.10	1.02	0.41
Sweden	13,070	2.49	0.50	1.15	378	13,779	14	1.41	0.32	0.02	–0.17	1.56	0.45
Switzerland	10,187	2.08	–0.39	–1.33	188	13,858	13	1.27	3.07	0.12	–0.11	1.34	0.38
Taiwan	11,593	2.02	0.34	–1.57	57	1,124	10	2.96	3.15	0.49	–0.41	1.00	0.47
Thailand	6,495	2.65	–0.32	–1.03	37	714	10	1.67	0.82	0.34	–0.16	1.00	0.49
UK	39,939	2.12	–0.02	–0.07	510	11,475	16	1.46	3.71	0.22	–0.10	2.28	0.37
US	169,816	1.83	–0.27	0.61	1,420	60,539	14	1.33	1.64	0.19	–0.01	1.05	0.37
All countries	573,190	1.73	–0.43	–0.48	563	23,429	12	1.63	2.47	0.13	–0.06	1.31	0.41

Panel B– Country–level characteristics by country

Country	Population owning shares (%)	Trading costs (basis points)	Emerging market dummy
Argentina	0.52	63.72	1
Australia	35.11	32.27	0
Austria	7.11	30.23	0
Belgium	17.30	29.61	0
Brazil	1.62	50.22	1
Canada	37.52	32.51	0
China	5.90	43.63	1
Denmark	23.50	33.91	0
Finland	14.50	41.37	0
France	14.70	25.96	0
Germany	12.50	24.17	0
Greece	8.36	54.09	0
Hong Kong	22.98	41.60	0
India	2.00	67.49	1
Indonesia	0.15	72.11	1
Italy	7.98	30.61	0
Japan	30.75	21.07	0
Malaysia	6.27	53.76	1
Netherlands	17.05	26.99	0
New Zealand	28.10	38.34	0
Norway	7.30	32.13	0
Poland	2.70	33.16	1
Portugal	3.07	32.32	0
Singapore	11.97	40.37	0
South Africa	2.63	51.30	1
South Korea	9.30	54.56	1
Spain	5.00	28.24	0
Sweden	19.70	30.51	0
Switzerland	20.22	29.66	0
Taiwan	34.78	49.24	1
Thailand	5.30	58.55	1
UK	15.09	50.10	0
US	21.20	23.94	0
All countries	13.70	31.28	

Table IA3

Flow–performance sensitivity and fund's affiliation with large families – country level regressions

In this table we run the identical analysis to Table 3– Panel A, except that the results are estimated country by country. We, therefore, run identical regressions to those of Equation (3) for each country in our sample, except that fund–fixed effects are used rather than country–fixed effects. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

	Argentina	Australia	Austria	Belgium	Brazil	Canada	China	Denmark	Finland	France	Germany	Greece	Hong Kong	India	Indonesia	Italy	Japan
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Low	0.1421**	0.0749**	0.1060*	0.0326	0.0932**	0.0501***	0.0341	0.1061**	0.1433*	0.1228***	0.0833**	0.1449*	0.0960	0.0232	0.1079	0.0603**	0.0353**
	(2.19)	(2.38)	(1.94)	(1.11)	(2.51)	(2.72)	(0.46)	(1.99)	(1.66)	(4.14)	(2.25)	(1.65)	(1.23)	(0.54)	(0.56)	(2.35)	(2.22)
Low x Large fund family	–0.0807*	0.0433*	–0.0802*	0.0531*	–0.0303	0.0454**	0.0121	0.0575*	0.0845	–0.0395*	0.0342	–0.0736	0.1099	0.0041	–0.1210	–0.0396**	–0.0079
	(–1.72)	(1.87)	(–1.78)	(1.95)	(–1.07)	(2.17)	(0.42)	(1.83)	(1.23)	(–1.75)	(1.28)	(–1.01)	(1.11)	(0.15)	(–0.71)	(–2.16)	(–0.89)
Mid	0.0231	0.0215***	0.0400**	0.0099	0.0423***	0.0574***	0.1017	0.0153	0.0631***	0.0309***	0.0189*	0.0472*	0.0335	0.0626***	0.2012***	0.0207	0.0142***
	(0.74)	(3.58)	(2.27)	(1.50)	(3.54)	(9.37)	(1.21)	(1.10)	(3.35)	(4.37)	(1.87)	(1.66)	(0.58)	(4.14)	(2.79)	(1.63)	(2.76)
Mid x Large fund family	–0.0560*	0.0137**	–0.0331	0.0310*	0.0037	0.0225**	–0.0017	0.0341	–0.0380*	0.0192**	0.0004	–0.0655*	0.0133	0.0325	0.0384	0.0146	–0.0014
	(–1.65)	(2.29)	(–1.26)	(1.67)	(0.27)	(2.29)	(–0.09)	(1.58)	(–1.71)	(2.14)	(0.04)	(–1.89)	(0.22)	(1.20)	(0.42)	(1.16)	(–0.18)
High	0.2404**	0.1540***	0.1580**	0.1217***	0.2084***	0.1551***	0.2689	0.2118***	0.2060**	0.1964***	0.1760***	0.2980*	0.2998**	0.4822***	0.5473*	0.0982**	0.0640***
	(2.17)	(5.46)	(2.47)	(3.05)	(3.38)	(3.81)	(1.02)	(3.08)	(2.24)	(5.06)	(3.18)	(1.95)	(1.98)	(5.85)	(1.87)	(2.21)	(2.61)
High x Large fund family	0.0836	–0.0602**	–0.1072**	–0.0657	0.0851	–0.0634*	0.0618	–0.1281*	–0.1319	–0.1002**	–0.0900*	0.1251	–0.0922	–0.1156	0.4518*	0.0637**	0.0422**
	(1.08)	(–2.01)	(–2.04)	(–1.61)	(–1.11)	(–1.92)	(0.14)	(1.95)	(–1.59)	(–2.36)	(–1.74)	(1.29)	(–1.03)	(–1.33)	(1.67)	(1.97)	(2.17)
Large fund family	0.0043	0.0038	0.0074	–0.0000	0.0010	0.0082***	0.0318**	0.0004	0.0316***	0.0069***	0.0049	0.0300***	–0.0133	0.0062	0.0061	0.0243***	0.0016
	(0.31)	(1.62)	(1.12)	(–0.01)	(0.38)	(2.95)	(2.11)	(0.06)	(4.18)	(3.03)	(1.16)	(2.84)	(–1.45)	(0.98)	(0.23)	(4.67)	(0.80)
Flows category	–0.4588	–0.0850	–0.1959	0.5855***	0.5177	0.0912	1.6145	0.0409	0.1424	–0.0841	0.0808	–0.8026	0.1760	1.6901*	–0.8438	0.1998	0.0795
	(–1.59)	(–0.57)	(–0.83)	(3.52)	(0.72)	(1.12)	(0.81)	(0.18)	(0.60)	(–0.66)	(0.51)	(–1.60)	(0.57)	(1.76)	(–1.43)	(1.06)	(0.98)
Star affiliation	–0.0484***	–0.0088***	0.0064	0.0053*	0.0016	0.0022	–0.0872**	–0.0030	–0.0030	0.0015	–0.0006	–0.0397**	0.0239***	–0.0042	–0.0992***	–0.0074	0.0011
	(–2.87)	(–6.99)	(1.24)	(1.67)	(0.65)	(0.80)	(–2.01)	(–0.50)	(–0.37)	(0.66)	(–0.24)	(–2.22)	(2.73)	(–0.88)	(–3.97)	(–1.61)	(0.59)
Age (log)	–0.0093	–0.0343***	0.0030	0.0294***	–0.0050	–0.0157***	0.0018	–0.0071*	0.0049	–0.0101***	–0.0085***	–0.0207**	–0.0163**	0.0031	–0.0194	0.0051	–0.0061**
	(–1.12)	(–12.91)	(0.41)	(5.53)	(–1.56)	(–5.60)	(0.06)	(–1.66)	(0.63)	(–5.29)	(–2.90)	(–2.52)	(–2.21)	(0.47)	(–0.96)	(1.03)	(–2.47)
Age x Performance	–0.0203	0.0257***	0.0371*	0.0344*	0.0371***	0.0381***	–0.0852	0.0820***	0.0377	0.0625***	0.0301***	0.0074	0.0566**	0.1659***	0.2788***	0.0722***	0.0458***
	(–0.77)	(3.85)	(1.88)	(1.83)	(3.90)	(4.48)	(–0.59)	(4.54)	(1.12)	(4.79)	(2.67)	(0.29)	(2.08)	(4.65)	(3.44)	(2.77)	(6.57)
Volatility	0.0068	–0.0097	–0.0194	–0.0367*	0.0375*	–0.0891***	0.1111	0.0133	0.0344	–0.0158	–0.0197	0.0533	0.0127	–0.0364	0.3174**	–0.0012	0.0215
	(0.10)	(–0.50)	(–0.54)	(–1.94)	(1.86)	(–5.85)	(0.41)	(0.38)	(0.96)	(–0.86)	(–0.96)	(1.12)	(0.21)	(–1.16)	(2.49)	(–0.03)	(1.56)
Size (log)	–0.0126**	–0.0037***	–0.0190***	–0.0095***	–0.0073***	–0.0077***	–0.0174**	–0.0163***	–0.0265***	–0.0063***	–0.0025**	–0.0175***	–0.0005	–0.0076***	–0.0221**	–0.0124***	–0.0042***
	(–2.39)	(–4.64)	(–4.99)	(–5.56)	(–8.06)	(–8.39)	(–2.24)	(–7.06)	(–5.97)	(–9.45)	(–2.13)	(–4.71)	(–0.15)	(–4.24)	(–2.59)	(–5.57)	(–5.83)
Flows	0.1654***	0.1901***	–0.0080	0.1414***	0.1779***	0.0905***	0.1356**	0.0724***	0.0461***	0.1647***	0.1744***	–0.0169	0.1406***	0.2463***	0.0303	0.1523***	0.2862***
	(4.51)	(11.04)	(–0.29)	(5.04)	(10.04)	(6.38)	(2.08)	(3.73)	(3.09)	(17.62)	(8.39)	(–0.29)	(4.41)	(8.13)	(0.68)	(5.97)	(17.37)
Expense ratio	0.8186	–0.4512**	–1.4459*	0.4294	–0.3878***	0.2576	1.7211	–1.2435*	–0.2881	–0.1625	–0.5317	1.0031	–1.9796***	–0.1672	–1.8688	–0.2363	0.5839**
	(1.21)	(–2.56)	(–1.79)	(1.00)	(–3.56)	(1.51)	(0.32)	(–1.88)	(–0.52)	(–1.14)	(–1.25)	(1.65)	(–2.62)	(–0.28)	(–1.07)	(–0.47)	(2.23)
Loads	–0.0778	–0.2098**	–0.3885	–0.0474	0.1196	–0.0004	–0.1353	–0.8079***	–0.8796**	–0.1136**	0.0519	–0.5391**	0.0092	–0.3248	0.3614	–0.0311	–1.0032***
	(–0.16)	(–2.43)	(–1.00)	(–0.50)	(1.09)	(–0.01)	(–0.16)	(–3.17)	(–2.11)	(–2.11)	(0.65)	(–2.25)	(0.08)	(–0.85)	(0.35)	(–0.45)	(–8.27)
SMB	0.0082	–0.0057*	0.0085	0.0184***	0.0032	–0.0048	0.0136	–0.0084	–0.0088	–0.0012	–0.0045	–0.0184	–0.0054	–0.0010	–0.0585*	0.0181	0.0002
	(0.90)	(–1.88)	(1.18)	(3.98)	(0.64)	(–1.34)	(0.55)	(–1.35)	(–1.13)	(–0.34)	(–0.91)	(–1.40)	(–0.93)	(–0.15)	(–1.81)	(1.61)	(0.09)
HML	–0.0113	–0.0005	0.0005	0.0074*	–0.0016	0.0041*	0.0353	–0.0057	0.0081	0.0006	0.0050	–0.0159*	0.0039	0.0052	0.0390*	0.0034	0.0029*
	(–1.46)	(–0.21)	(0.10)	(1.84)	(–0.32)	(1.96)	(1.26)	(–0.96)	(1.23)	(0.19)	(1.58)	(–1.74)	(0.50)	(0.72)	(1.79)	(0.59)	(1.72)
Countries sold	0.0001	0.0137***	0.0054***	0.0041***	0.0011	–0.0051	0.0002	–0.0021	0.0035	0.0024***	0.0057***	0.0014	0.0024	–0.0042	–0.0329	–0.0081**	0.0207***
	(0.02)	(3.56)	(3.61)	(4.74)	(0.74)	(–0.61)	(0.04)	(–1.48)	(0.93)	(5.12)	(3.94)	(0.52)	(0.73)	(–0.94)	(–0.62)	(–2.08)	(5.45)
Change in convexity *(High–Mid)*	0.1396*	–0.0739***	–0.0741	–0.0967	0.0814	–0.0855***	0.0628	–0.1622***	–0.0939	–0.1192***	–0.0904	0.1906*	–0.1055	–0.1475	0.4134**	0.0491**	0.0436***
Wald test (*p*–value)	(0.08)	(0.00)	(0.74)	(0.12)	(0.47)	(0.00)	(0.61)	(0.01)	(0.12)	(0.00)	(0.39)	(0.09)	(0.32)	(0.11)	(0.03)	(0.02)	(0.00)
Change in convexity *(High–Low)*	0.1643**	–0.1035***	–0.0270	–0.1188	0.1154	–0.1084***	0.0497	–0.1856***	–0.2164**	–0.061***	–0.1242	0.1987**	–0.2021	–0.1191	0.5728**	0.1027***	0.0492***
Wald test (*p*–value)	(0.03)	(0.00)	(0.53)	(0.11)	(0.49)	(0.00)	(0.86)	(0.01)	(0.04)	(0.00)	(0.13)	(0.05)	(0.14)	(0.34)	(0.02)	(0.00)	(0.00)
Adjusted R–squared	0.147	0.088	0.038	0.088	0.087	0.063	0.196	0.069	0.052	0.072	0.075	0.210	0.083	0.236	0.252	0.089	0.136
Number of observations	1,717	34,200	7,472	16,794	18,271	42,228	544	8,634	6,863	42,472	15,202	1,375	3,071	8,531	1,576	8,686	37,737

Table IA3 –Flow–performance sensitivity and fund's affiliation with large families – country level regressions (Continued)

	Malaysia	Netherlands	New Zealand	Norway	Poland	Portugal	Singapore	South Africa	South Korea	Spain	Sweden	Switzerland	Taiwan	Thailand	UK	US
	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)
Low	0.0702**	0.0512	0.0218	0.1641**	0.1101***	0.0473**	0.0138	0.0390	0.1358***	0.0659	0.0165	0.0124	0.0533	0.0570*	0.0819***	0.0391***
	(1.97)	(1.18)	(0.14)	(2.05)	(2.83)	(2.19)	(0.28)	(0.41)	(3.45)	(0.85)	(0.43)	(0.21)	(1.52)	(1.73)	(3.97)	(4.30)
Low x Large fund family	–0.0731*	–0.0225	–0.0092	–0.0406	0.0088	–0.0261**	–0.0209	0.0174	–0.0412	–0.0032	0.0185	0.0402	–0.0065	–0.0329	0.0371**	0.0157*
	(–1.85)	(–0.52)	(–0.09)	(–1.25)	(0.48)	(–2.01)	(–0.66)	(0.26)	(0.90)	(–0.03)	(0.53)	(0.93)	(–0.40)	(–1.39)	(2.12)	(1.73)
Mid	0.0255***	0.0298**	0.0415	0.0454*	0.0828***	0.0486***	0.0106	0.0256**	0.0282**	0.0591***	0.0237**	0.0063	0.0327***	0.0284**	0.0385***	0.0650***
	(2.94)	(2.28)	(0.73)	(1.78)	(2.92)	(2.60)	(0.74)	(2.23)	(2.33)	(4.02)	(2.23)	(0.87)	(2.89)	(2.21)	(4.59)	(13.64)
Mid x Large fund family	–0.0158	–0.0087	0.0254	0.0222	–0.0454**	–0.0013	0.0224	0.0181	0.0199	–0.0235	–0.0178	0.0027	–0.0254	–0.0397**	0.0213**	0.0160*
	(–0.86)	(–0.46)	(0.74)	(0.75)	(–2.34)	(–0.15)	(0.87)	(1.08)	(1.18)	(–0.95)	(–1.18)	(0.17)	(–1.46)	(–2.31)	(2.22)	(1.88)
High	0.1487***	0.0991*	0.4006*	0.0362	0.1292***	0.1405***	0.1401	0.1876**	0.2686***	0.1617**	0.1725**	0.0484	0.3302***	0.1965**	0.2370***	0.1762***
	(3.19)	(1.79)	(1.92)	(0.61)	(2.89)	(5.38)	(1.52)	(2.04)	(3.47)	(2.06)	(2.28)	(0.81)	(4.04)	(2.36)	(4.56)	(7.23)
High x Large fund family	0.0841**	0.0269	–0.2835	0.0284	0.0402**	0.0451**	–0.0448	0.0490	–0.1020*	–0.0478	–0.1667**	0.0501	–0.0566	0.1541*	–0.1084**	–0.0547**
	(2.11)	(0.66)	(–0.79)	(0.57)	(2.01)	(2.31)	(–0.41)	(0.61)	(–1.65)	(–1.37)	(–2.21)	(0.89)	(–0.56)	(1.94)	(–2.29)	(–2.00)
Large fund family	0.0023	–0.0026	–0.0145	0.0109*	0.0190**	0.0187	0.0066	0.0157**	–0.0022	0.0164***	–0.0013	0.0042***	0.0091**	0.0138***	0.0109***	0.0071***
	(0.51)	(–0.39)	(–1.14)	(1.81)	(2.06)	(1.59)	(1.35)	(2.23)	(–0.66)	(2.92)	(–0.40)	(2.89)	(2.40)	(2.69)	(5.26)	(6.69)
Flows category	–0.5242	0.0556	1.0810*	–0.2135	0.5004	0.2420	0.0050	0.5622	0.3020	0.6730***	0.1438	0.0884	0.8594**	–0.1889	0.2084*	0.1952***
	(–1.35)	(0.33)	(1.68)	(–0.68)	(0.79)	(0.70)	(0.03)	(1.29)	(1.46)	(2.74)	(0.87)	(0.56)	(2.40)	(–0.43)	(1.92)	(3.59)
Star affiliation	–0.0045	–0.0007	–0.0018	–0.0017	–0.0329***	0.0022	–0.0029	–0.0054	–0.0077**	–0.0046	–0.0012	0.0072**	–0.0010	–0.0048	0.0006	0.0022*
	(–0.98)	(–0.13)	(–0.09)	(–0.40)	(–3.16)	(0.28)	(–0.46)	(0.96)	(–2.33)	(–0.66)	(–0.28)	(2.25)	(–0.20)	(–1.09)	(0.29)	(1.93)
Age (log)	–0.0129**	–0.0069	0.0200*	–0.0321***	–0.0148	–0.0215*	–0.0070	–0.0117*	0.0026	–0.0242***	–0.0078	–0.0137***	0.0119**	–0.0306***	–0.0069***	–0.0163***
	(–2.56)	(–1.23)	(1.94)	(–3.68)	(–0.71)	(–1.79)	(–1.07)	(–1.96)	(0.46)	(–2.84)	(–1.62)	(–4.11)	(2.45)	(–3.65)	(–4.02)	(–17.59)
Age x Performance	0.0279	0.0108	0.0339	0.0581***	0.2818***	0.0490**	0.0919***	0.0632***	0.0046	0.0886***	0.0366**	0.0409***	0.0998***	0.1037***	0.0470***	–0.0519***
	(1.52)	(0.63)	(0.61)	(3.22)	(3.97)	(2.07)	(5.02)	(2.68)	(0.23)	(3.17)	(2.56)	(2.88)	(4.11)	(3.42)	(4.98)	(–14.15)
Volatility	–0.0204	–0.0328	–0.2025***	0.0279	0.1795*	–0.0672	0.0073	0.0023	0.0644**	0.0694*	0.0086	0.0521**	0.0550	–0.0004	–0.0190	–0.0430***
	(–0.62)	(–1.10)	(–2.66)	(0.73)	(1.75)	(–1.39)	(0.26)	(0.08)	(2.18)	(1.69)	(0.35)	(2.11)	(1.08)	(–0.01)	(–0.98)	(–5.30)
Size (log)	–0.0034*	–0.0093***	–0.0091	–0.0063***	–0.0164***	–0.0110**	–0.0041	–0.0126***	–0.0012	–0.0204***	–0.0075***	–0.0073***	–0.0162***	–0.0012	–0.0079***	–0.0055***
	(–1.70)	(–3.77)	(–1.31)	(–3.02)	(–3.63)	(–2.14)	(–1.55)	(–4.43)	(–1.21)	(–6.99)	(–4.77)	(–3.82)	(–5.88)	(–1.25)	(–7.52)	(–14.95)
Flows	0.2138***	0.1307***	0.2979***	0.0867***	0.1783***	0.1756***	0.2750***	0.0869**	0.2146***	0.0764***	0.0297	0.1098***	0.1074***	0.2319***	0.1414***	0.2644***
	(7.78)	(3.04)	(2.79)	(4.93)	(3.97)	(4.30)	(6.87)	(2.54)	(8.83)	(2.63)	(1.59)	(5.22)	(3.42)	(8.68)	(9.38)	(21.98)
Expense ratio	0.6607	–0.3713	0.6436	0.0500	–0.0646	–0.6948	–0.7119	–0.2841	–0.8887***	–0.4834	–1.6497***	–0.3658	–0.5790*	0.5793	0.1832	–0.5350***
	(1.18)	(–0.70)	(0.85)	(0.07)	(–0.12)	(–0.92)	(–1.04)	(–0.49)	(–3.35)	(–0.97)	(–4.45)	(–1.10)	(–1.67)	(1.21)	(0.75)	(–4.31)
Loads	0.0906	–0.8915**	–0.7095***	–0.3785**	0.6341**	–0.4947*	0.9917*	0.0835	0.1867	0.0222	0.0115	–0.1485**	0.2181	0.2865*	–0.1448***	–0.1141***
	(0.73)	(–2.44)	(–2.96)	(–2.07)	(2.32)	(–1.95)	(1.76)	(0.59)	(0.34)	(0.10)	(0.09)	(–1.97)	(1.10)	(1.71)	(–3.07)	(–5.43)
SMB	–0.0258***	0.0092	–0.0064	–0.0008	–0.0054	–0.0214*	0.0021	–0.0053	–0.0112**	0.0156*	0.0000	–0.0064	–0.0203**	–0.0197**	0.0024	0.0014
	(–4.53)	(1.42)	(–0.58)	(–0.08)	(–0.35)	(–1.76)	(0.48)	(–0.69)	(–2.38)	(1.95)	(0.00)	(–1.47)	(–2.26)	(–2.13)	(0.65)	(0.69)
HML	–0.0095	0.0001	0.0013	0.0068	0.0160	0.0249***	0.0092*	0.0072	–0.0061	0.0101	0.0080**	0.0001	0.0005	–0.0033	–0.0027	–0.0015
	(–1.31)	(0.02)	(0.09)	(1.04)	(0.95)	(3.32)	(1.93)	(1.08)	(–1.45)	(1.44)	(1.99)	(0.04)	(0.10)	(–0.37)	(–1.01)	(–0.96)
Countries sold	0.0034	0.0002	–0.0317	0.0023*	0.0011	0.0197*	0.0116**	0.0186	0.0085	0.0301**	0.0049***	0.0012	–0.0411***	0.0007	0.0011***	0.0099***
	(0.37)	(0.11)	(–1.58)	(1.84)	(0.44)	(1.76)	(2.10)	(0.35)	(0.89)	(2.31)	(2.78)	(0.45)	(–3.23)	(0.12)	(3.61)	(6.40)
Change in convexity (*High–Mid*)	0.0991*	0.0356**	–0.3084	0.0062	0.0856*	0.0461**	–0.0664	0.0309	–0.1219	–0.0240	–0.1489**	0.0474	–0.0306	0.1931**	–0.1293***	–0.0707***
Wald–test (*p*–value)	(0.07)	(0.03)	(0.19)	(0.23)	(0.07)	(0.04)	(0.85)	(0.81)	(0.19)	(0.23)	(0.03)	(0.43)	(0.64)	(0.02)	(0.00)	(0.00)
Change in convexity (*High–Low*)	0.1572***	0.0494***	–0.2738	0.0690	0.0314**	0.0712**	–0.0231	0.0316	–0.0608	–0.0438	–0.1852**	0.0099	–0.0495	0.1861***	–0.1451***	–0.0704***
Wald–test (*p*–value)	(0.01)	(0.01)	(0.34)	(0.17)	(0.05)	(0.02)	(0.62)	(0.31)	(0.11)	(0.15)	(0.04)	(0.86)	(0.73)	(0.01)	(0.00)	(0.00)
Adjusted R–squared	0.155	0.078	0.141	0.045	0.232	0.154	0.141	0.061	0.254	0.112	0.050	0.038	0.142	0.176	0.058	0.138
Number of observations	7,531	4,730	953	7,632	2,644	2,843	5,638	4,616	16,491	11,654	12,907	10,116	11,593	6,495	39,849	169,367

Table IA4

Flow–performance sensitivity and fund's affiliation with large families across countries – Investor sophistication – The joint effect of Fees, Star affiliation, and Diversity

In this table, we run the identical analysis to Table 3 – Panel A, Columns (2–7), except that *Fee*s, *Star affiliation*, and *Diversity*, and the interaction of past performance (*Low*, *Mid*, and *High* performance ranges) with theses variables are add to the regression. Fees are measured as the expense ratio plus one–seventh front–end loads; Star affiliation is a dummy variable that takes the value of one for funds that are affiliated with star families (i.e., those including a star fund) but are not stars themselves, and zero otherwise; Diversity is a dummy variable that is one if the number of different fund categories offered by the affiliated family is larger than the median number for all families, and zero otherwise. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

	Population owning shares		Trading Costs		Emerging markets	
	Below	Above	Above	Below	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)
Low	0.0573***	0.0512***	0.0598***	0.0504***	0.0620***	0.0462***
	(3.48)	(4.21)	(3.54)	(4.14)	(3.69)	(3.80)
Low x Large fund family	–0.0333**	0.0146	–0.0342**	0.0159	–0.0214*	0.0139
	(2.08)	(1.32)	(–2.01)	(1.48)	(–1.88)	(1.43)
Low x Fees	–0.6234	–0.8645	–0.7094	–0.6363	–0.7612	–0.5849
	(0.37)	(–1.14)	(–0.43)	(–0.84)	(–0.45)	(–0.73)
Low x Star affiliation	–0.0503*	–0.0116	–0.0937***	–0.0145	–0.0706*	–0.0155
	(–1.71)	(–0.95)	(–3.21)	(–1.25)	(–1.83)	(–1.38)
Low x Diversity	–0.0112	0.0059	–0.0107	0.0036	–0.0033	0.0013
	(–0.98)	(1.62)	(–0.90)	(0.92)	(–0.41)	(0.34)
Mid	0.0479***	0.0173***	0.0473***	0.0164***	0.0259**	0.0154***
	(3.37)	(3.77)	(3.64)	(3.73)	(2.31)	(3.65)
Mid x Large fund family	–0.0151*	0.0046	–0.0160*	0.0065*	–0.0119	0.0053
	(–1.66)	(1.35)	(–1.78)	(1.85)	(–0.96)	(1.27)
Mid x Fees	–0.6589	0.6423***	–0.2909	0.7192***	–0.0204	0.7155***
	(–1.54)	(3.50)	(–0.83)	(3.71)	(–0.05)	(4.11)
Mid x Star affiliation	–0.0009	0.0137***	–0.0119	0.0092**	–0.0070	0.0118***
	(–0.11)	(3.62)	(–1.60)	(2.20)	(–0.76)	(3.33)
Mid x Diversity	–0.0098***	0.0018	–0.0090**	0.0028***	–0.0112**	0.0023**
	(–2.80)	(1.48)	(–2.50)	(2.73)	(–2.22)	(2.36)
High	0.2028***	0.1618***	0.1985***	0.1638***	0.1963***	0.1572***
	(10.26)	(12.10)	(9.89)	(12.37)	(9.03)	(12.70)
High x Large fund family	0.0495**	–0.0477***	0.0440**	–0.0458***	0.0364*	–0.0415**
	(2.27)	(–3.29)	(2.14)	(–3.01)	(1.91)	(–2.57)
High x Fees	3.4719	–1.5576*	0.6548	–0.6281	1.8080	–1.2514
	(1.54)	(–1.69)	(0.50)	(–0.65)	(0.86)	(–1.36)
High x Star affiliation	–0.0161	–0.0282	–0.0134	–0.0306*	0.0079	–0.0400**
	(–0.52)	(–1.34)	(–0.44)	(–1.70)	(0.20)	(–2.23)
High x Diversity	0.0071	–0.0098	0.0264	–0.0229***	0.0342	–0.0206***
	(0.52)	(–1.46)	(1.29)	(–3.86)	(1.27)	(–3.54)
Large fund family	0.0090***	0.0067***	0.0086***	0.0067***	0.0071***	0.0072***
	(6.27)	(8.51)	(6.55)	(9.49)	(4.47)	(10.45)
Fees	–0.6422*	–0.1512	–0.3632	–0.1379	–0.3581	–0.1919
	(–1.84)	(–1.18)	(–1.37)	(–1.08)	(–1.28)	(–1.51)
Star affiliation	0.0072	0.0029	0.0091**	0.0040*	0.0032	0.0030
	(1.44)	(1.38)	(2.22)	(1.92)	(0.57)	(1.58)
Diversity	0.0037**	0.0029***	0.0034**	0.0030***	0.0065***	0.0026***
	(2.15)	(4.63)	(2.27)	(4.39)	(2.83)	(4.01)
Age (log)	–0.0067***	–0.0140***	–0.0058***	–0.0144***	–0.0055***	–0.0133***
	(–6.32)	(–22.98)	(–6.55)	(–18.74)	(–4.96)	(–21.21)
Age x Performance	0.0389***	0.0395***	0.0430***	0.0403***	0.0470***	0.0414***
	(4.27)	(8.38)	(6.15)	(9.04)	(4.41)	(9.16)
Volatility	0.0002	–0.0235***	0.0121	–0.0249***	0.0211	–0.0224**
	(0.02)	(–2.67)	(0.82)	(–2.83)	(1.22)	(–2.54)
Size (log)	–0.0071***	–0.0055***	–0.0060***	–0.0057***	–0.0049***	–0.0058***
	(–10.32)	(–15.92)	(–9.93)	(–20.25)	(–7.96)	(–19.61)
Flows	0.1559***	0.2031***	0.1677***	0.2019***	0.1915***	0.1903***
	(14.87)	(30.40)	(18.85)	(27.87)	(19.80)	(28.80)

Table IA4 (Continued)

Flows category	0.3370***	0.0792	0.1583*	0.0378	0.3664*	0.0313
	(3.31)	(1.58)	(1.88)	(0.68)	(1.79)	(0.55)
SMB	–0.0110***	–0.0037**	–0.0132***	–0.0001	–0.0156***	0.0002
	(–4.24)	(–2.21)	(–5.08)	(–0.04)	(–5.44)	(0.10)
HML	–0.0016	–0.0005	–0.0061***	0.0029**	–0.0069**	0.0027**
	(–0.73)	(–0.43)	(–3.51)	(2.31)	(–2.55)	(2.24)
Countries sold	0.0049***	0.0015***	0.0009***	0.0040***	–0.0001	0.0023***
	(7.76)	(5.75)	(3.03)	(9.69)	(–0.04)	(8.74)
Change in convexity *(High–Mid)*	0.0646***	–0.0516**	0.0600**	–0.0515**	0.0474*	–0.0463**
Wald test (p–value)	(0.01)	(0.02)	(0.03)	(0.02)	(0.06)	(0.03)
Change in convexity *(High–Low)*	0.0825***	–0.0616***	0.0782***	–0.0609***	0.574**	–0.0549***
Wald test (p–value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.01)
Adjusted R–squared	0.068	0.093	0.083	0.089	0.119	0.081
Number of observations	108,078	462,354	143,579	426,853	79,997	490,435

Table IA5

Flow–performance sensitivity and fund's affiliation with large families across countries – Switching costs and the Number of investment opportunities

In this table, we run the identical analysis to Table 3 – Panel A, Columns (2–7), except that we add to the regression *Switching costs*, the *Number of available investment alternatives*, and the interaction of past performance (*Low*, *Mid*, and *High* performance ranges) with these variables. We measure the cost of switching funds (*Switching costs*) in a given country–quarter as the average of (i) the weighted average front–end fee and (ii) the weighted average back–end fee, where the weights are determined by a fund's assets under management relative to the country's total assets under management in that quarter. To compute the *Number of available investment alternatives*, we use the number of funds with similar styles based on their *SMB*– and *HML* loadings. In each quarter, we sort funds into three groups based on *SMB* loadings (low, medium, and high) and also into three groups based on *HML* loadings, to obtain nine equal–sized groups. The fund's *number of investment alternatives* in a given quarter is the total number of funds in the same *SMB/HML* group. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

	Population owning shares		Trading Costs		Emerging market	
	Below	Above	Above	Below	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)
Low	0.0869***	0.0887***	0.0884***	0.0948***	0.0899***	0.0944***
	(3.18)	(5.82)	(3.31)	(6.40)	(3.18)	(6.26)
Low x Large fund family	–0.0345***	0.0133	–0.0362***	0.0149	–0.0342***	0.0153
	(–2.94)	(1.16)	(–3.24)	(1.34)	(2.78)	(1.46)
Low x Switching costs	–0.5552	–0.1408	–0.6625	–0.1356	–0.4376	–0.2179
	(–1.27)	(–0.64)	(–1.32)	(–0.62)	(–1.06)	(–0.96)
Low x Number of investment opportunities	–0.0024	–0.0051	–0.0058	–0.0043	–0.0093	–0.0030
	(–0.42)	(–1.47)	(–0.97)	(–1.34)	(–1.12)	(–1.21)
Mid	0.0419***	0.0199***	0.0295***	0.0268***	0.0346***	0.0267***
	(4.76)	(6.74)	(3.05)	(9.39)	(3.04)	(9.23)
Mid x Large fund family	–0.0196***	0.0088***	–0.0045	0.0038	–0.0144*	0.0048*
	(–3.26)	(3.38)	(–0.83)	(1.30)	(–1.78)	(1.83)
Mid x Switching costs	–0.4796***	0.2240***	–0.1654	0.0237	–0.1210	0.0393
	(–3.76)	(4.23)	(–1.60)	(0.55)	(–0.62)	(0.92)
Mid x Number of investment opportunities	0.0023**	0.0026***	0.0007	0.0026***	0.0011	0.0022***
	(1.98)	(5.00)	(0.41)	(4.91)	(0.56)	(5.12)
High	0.2010***	0.1607***	0.2362***	0.1624***	0.2280***	0.1635***
	(8.93)	(14.26)	(10.65)	(14.01)	(9.43)	(14.71)
High x Large fund family	0.0572***	–0.0443***	0.0612***	–0.0459***	0.0568***	–0.0448***
	(3.01)	(–4.06)	(3.34)	(–4.14)	(2.63)	(–4.41)
High x Switching costs	0.8919*	0.3313	0.8487	0.3563	1.5350*	0.5184*
	(1.71)	(1.00)	(1.29)	(1.13)	(1.91)	(1.69)
High x Number of investment opportunities	–0.0061	0.0004	0.0037	–0.0038	–0.0165	0.0006
	(–1.18)	(0.10)	(0.49)	(–1.04)	(–1.55)	(0.17)
Large fund family	0.0086***	0.0067***	0.0084***	0.0067***	0.0067***	0.0072***
	(6.01)	(8.62)	(6.34)	(9.67)	(4.24)	(10.67)
Switching costs	0.0097	–0.0578	0.0054	–0.0969**	0.0185	–0.0973*
	(0.14)	(–1.30)	(0.08)	(–2.13)	(0.14)	(–1.94)
Number of investment opportunities	0.0036***	0.0007	0.0019*	0.0008	0.0027*	0.0005
	(3.06)	(1.18)	(1.82)	(1.40)	(1.91)	(0.92)
Expense ratio	–0.0954	–0.3928***	–0.3423***	–0.2294***	–0.2225**	–0.2490***
	(–1.04)	(–7.35)	(–3.25)	(–3.58)	(–2.12)	(–4.28)
Star affiliation	–0.0019*	–0.0012**	–0.0042***	–0.0004	–0.0073***	–0.0002
	(–1.66)	(–2.11)	(–3.39)	(–0.80)	(–3.95)	(–0.37)
Diversity	–0.0027***	–0.0012***	–0.0030***	–0.0011***	–0.0028***	–0.0013***
	(–4.03)	(–3.85)	(–3.75)	(–3.40)	(–2.66)	(–4.20)
Age (log)	–0.0060***	–0.0140***	–0.0056***	–0.0144***	–0.0054***	–0.0134***
	(–5.82)	(–23.16)	(–6.34)	(–18.88)	(–4.89)	(–21.61)
Age x Performance	0.0399***	0.0395***	0.0435***	0.0405***	0.0474***	0.0415***
	(4.39)	(8.34)	(6.05)	(9.04)	(4.40)	(9.18)
Volatility	0.0038	–0.0232***	0.0147	–0.0243***	0.0259	–0.0219**
	(0.34)	(–2.64)	(0.98)	(–2.76)	(1.47)	(–2.48)
Size (log)	–0.0070***	–0.0056***	–0.0059***	–0.0057***	–0.0048***	–0.0059***
	(–10.26)	(–15.55)	(–9.90)	(–19.97)	(–7.83)	(–19.29)
Flows	0.1565***	0.2033***	0.1685***	0.2023***	0.1928***	0.1907***
	(14.90)	(30.45)	(18.91)	(27.96)	(19.84)	(28.91)
Flows category	0.3450***	0.0772	0.1457*	0.0370	0.3457*	0.0304
	(3.39)	(1.54)	(1.75)	(0.67)	(1.68)	(0.53)
SMB	–0.0157***	–0.0051*	–0.0162***	–0.0011	–0.0176***	–0.0004
	(–5.01)	(–1.87)	(–5.31)	(–0.64)	(–5.70)	(–0.26)
HML	–0.0030	–0.0010	–0.0070***	0.0026**	–0.0076***	0.0026**
	(–1.39)	(–0.74)	(–3.82)	(2.13)	(–2.72)	(2.13)
Countries sold	0.0049***	0.0015***	0.0009***	0.0039***	–0.0003	0.0023***
	(7.66)	(5.73)	(2.81)	(9.58)	(–0.07)	(8.70)
Change in convexity *(High–Mid)*	0.0762***	–0.0531**	0.0657**	–0.0497***	0.0712**	–0.0496*
Wald test (p–value)	(0.00)	(0.02)	(0.02)	(0.01)	(0.04)	(0.05)
Change in convexity *(High–Low)*	0.0912***	–0.0576***	0.0972***	–0.0608***	0.0908**	–0.0601**
Wald test (p–value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.04)
Adjusted R–squared	0.068	0.093	0.083	0.089	0.119	0.081
Number of observations	108,078	462,354	143,579	426,853	79,997	490,435

Table IA6
Flow–performance sensitivity and fund's affiliation with large families across countries –Bank–affiliated versus unaffiliated funds
In this table, we run the identical analysis to Table 3 – Panel A, Columns (2–3), except that we run our tests separately for bank–affiliated and unaffiliated funds sub–samples. Bank–affiliated funds are mutual funds for which the ultimate owner of the fund's management company is a commercial banking group. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

	Affiliated funds		Unaffiliated funds	
	Below	Above	Below	Above
	(1)	(2)	(3)	(4)
Low	0.0305*	0.0498***	0.0404**	0.0314**
	(1.91)	(3.41)	(2.20)	(2.41)
Low x Large fund family	–0.0549**	0.0152	–0.0411*	0.0390**
	(–2.12)	(1.45)	(–1.89)	(2.43)
Mid	0.0268***	0.0384***	0.0420***	0.0431***
	(4.17)	(9.22)	(8.13)	(13.57)
Mid x Large fund family	–0.0041	0.0043	–0.0076	0.0078**
	(–0.46)	(0.95)	(–1.05)	(2.38)
High	0.2421***	0.1690***	0.2398***	0.1810***
	(9.17)	(10.86)	(9.60)	(11.14)
High x Large fund family	0.0515**	–0.0463**	0.0331*	–0.0418**
	(1.98)	(–2.29)	(1.87)	(–2.15)
Large fund family	0.0120***	0.0073***	0.0040	0.0061***
	(6.11)	(6.60)	(0.46)	(6.12)
Flows category	0.2219**	0.0924	0.0937	–0.0144
	(2.45)	(1.11)	(0.94)	(–0.32)
Star affiliation	–0.0026	–0.0021**	–0.0052***	–0.0013
	(–1.31)	(–2.48)	(–3.41)	(–1.61)
Diversity	–0.0042	0.0006	0.0141***	–0.0134***
	(–0.69)	(0.20)	(2.67)	(–4.19)
Age (log)	–0.0009	–0.0122***	–0.0084***	–0.0162***
	(–0.54)	(–10.31)	(–6.66)	(–18.56)
Age x Performance	0.0420***	0.0360***	0.0428***	0.0432***
	(5.21)	(6.24)	(5.45)	(9.12)
Volatility	0.0241*	–0.0060	0.0051	–0.0362***
	(1.81)	(–0.64)	(0.28)	(–3.75)
Size (log)	–0.0071***	–0.0062***	–0.0055***	–0.0055***
	(–7.32)	(–11.90)	(–8.24)	(–19.17)
Flows	0.1605***	0.1876***	0.1744***	0.2098***
	(14.70)	(21.83)	(16.51)	(23.50)
TER	–0.5740***	–0.2140**	–0.0487	–0.2935***
	(–4.22)	(–2.05)	(–0.38)	(–3.97)
Loads	–0.1460***	–0.0756***	0.0102	0.0053
	(–2.62)	(–3.07)	(0.24)	(0.22)
SMB	–0.0159***	–0.0024	–0.0112***	0.0014
	(–5.47)	(–1.51)	(–3.94)	(0.74)
HML	–0.0080***	0.0019	–0.0044**	0.0032**
	(–4.09)	(1.22)	(–2.17)	(2.30)
Countries sold	0.0009	0.0054***	0.0012***	0.0032***
	(1.10)	(8.55)	(3.53)	(7.23)
Change in convexity *(High–Mid)*	0.0556**	–0.0506**	0.0401*	–0.0496***
Wald test (*p*–value)	(0.04)	(0.02)	(0.06)	(0.01)
Change in convexity *(High–Low)*	0.1064***	–0.0615**	0.0741**	–0.0808***
Wald test (*p*–value)	(0.00)	(0.02)	(0.04)	(0.00)
Adjusted R–squared	0.085	0.080	0.087	0.097
Number of observations	47,790	197,666	60,288	264,688

Table IA7

Flow–performance sensitivity and fund's affiliation with large families across countries – Domestic versus international funds

In this table, we run the identical analysis to Table 3 – Panel A, Columns (2–3), except that we run our tests separately for domestic and international funds sub–samples. Domestic funds are those investing primarily in stocks of the country of domicile, while international funds invest primarily in stocks of countries other than the country of domicile, including funds investing in a particular country, regional funds, and global funds. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

	Domestic		International	
	Below	Above	Below	Above
	(1)	(2)	(3)	(4)
Low	0.0422**	0.0410***	0.0503**	0.0350***
	(2.03)	(3.75)	(2.36)	(3.17)
Low x Large fund family	–0.0372*	0.0168	–0.0443**	0.0175
	(–1.82)	(1.35)	(–2.01)	(1.53)
Mid	0.0549***	0.0470***	0.0147**	0.0369***
	(8.98)	(14.79)	(2.35)	(8.95)
Mid x Large fund family	–0.0063	0.0016	–0.0058	0.0027
	(–1.06)	(0.31)	(–1.12)	(0.58)
High	0.2130***	0.2117***	0.2399***	0.1730***
	(8.98)	(10.43)	(9.96)	(8.08)
High x Large fund family	0.0489**	–0.0543**	0.0546**	–0.0416**
	(2.01)	(–2.31)	(2.23)	(–2.09)
Large fund family (log)	0.0249***	0.0078***	0.0107**	0.0135***
	(3.31)	(2.97)	(1.97)	(4.54)
Flows category	0.4806***	0.2794*	0.2610*	0.0873
	(4.48)	(1.82)	(1.77)	(1.45)
Star affiliation	–0.0047***	–0.0026***	0.0007	–0.0004
	(–2.99)	(–2.87)	(0.39)	(–0.53)
Age (log)	–0.0076***	–0.0139***	–0.0026	–0.0140***
	(–5.98)	(–20.23)	(–1.18)	(–14.98)
Age x Performance	0.0421***	0.0388***	0.0452***	0.0431***
	(3.92)	(10.40)	(5.38)	(5.47)
Volatility	0.0211	–0.0139*	–0.0172	–0.0304**
	(1.46)	(–1.69)	(–1.33)	(–2.38)
Size (log)	–0.0059***	–0.0048***	–0.0090***	–0.0065***
	(–7.21)	(–12.40)	(–11.18)	(–14.35)
Flows	0.1780***	0.2148***	0.1310***	0.1869***
	(14.61)	(24.06)	(9.83)	(23.58)
TER	–0.0083	–0.4486***	–0.3164*	–0.2646***
	(–0.08)	(–4.79)	(–1.72)	(–3.04)
Loads	0.0058	0.0369	–0.1103**	–0.0544**
	(0.10)	(1.44)	(–2.37)	(–2.14)
SMB	–0.0170***	–0.0061**	0.0041	–0.0018
	(–5.20)	(–2.10)	(1.49)	(–0.94)
HML	–0.0028	0.0003	0.0057**	0.0004
	(–1.00)	(0.21)	(2.45)	(0.23)
Countries sold	0.0037***	0.0008*	0.0050***	0.0017***
	(2.72)	(1.82)	(7.27)	(5.97)
Change in convexity *(High–Mid)*	0.0552**	–0.0559***	0.0604*	–0.0443**
Wald test (*p*–value)	(0.04)	(0.01)	(0.06)	(0.02)
Change in convexity *(High–Low)*	0.0861**	–0.0711***	0.0989**	–0.0591***
Wald test (*p*–value)	(0.03)	(0.00)	(0.04)	(0.00)
Adjusted R–squared	0.078	0.109	0.069	0.081
Number of observations	63,620	225,224	44,458	237,130

Table IA8

Flow–performance sensitivity and fund's affiliation with large families across countries– Excluding the US

In this table, we run the identical analysis to Table 3 – Panel A, Columns (2–7), except that we exclude the US from our regressions. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

	Population owning shares		Trading Costs		Emerging markets	
	Below	Above	Above	Below	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)
Low	0.0302**	0.0479***	0.0335**	0.0564***	0.0646***	0.0455***
	(2.09)	(4.54)	(2.44)	(5.13)	(2.70)	(3.11)
Low x Family size	–0.0456**	0.0178*	–0.0474**	0.0169	–0.0432**	0.0252**
	(–2.16)	(1.68)	(–2.34)	(1.56)	(–2.47)	(2.35)
Mid	0.0406***	0.0302***	0.0349***	0.0325***	0.0401***	0.0311***
	(9.12)	(11.17)	(8.85)	(10.04)	(8.38)	(10.76)
Mid x Family size	–0.0078*	0.0049*	–0.0056*	0.0057*	–0.0084	0.0023
	(–1.73)	(1.90)	(–1.68)	(1.88)	(–1.17)	(0.78)
High	0.2307***	0.1773***	0.2395***	0.1760***	0.2545***	0.1712***
	(10.06)	(8.25)	(11.30)	(7.85)	(9.12)	(8.34)
High x Family size	0.0351**	–0.0373**	0.0387**	–0.0467***	0.0341*	–0.0363**
	(2.09)	(–2.38)	(2.27)	(–2.63)	(1.72)	(–2.34)
Large fund family	0.0073***	0.0058***	0.0069***	0.0057***	0.0056***	0.0064***
	(5.16)	(6.10)	(5.41)	(6.53)	(3.80)	(8.21)
Flows category	0.3482***	0.1887**	0.1579*	0.1586**	0.3679*	0.1197
	(3.36)	(2.32)	(1.88)	(2.07)	(1.79)	(1.61)
Star affiliation	–0.0031***	–0.0024***	–0.0051***	–0.0011	–0.0084***	–0.0010
	(–2.68)	(–3.38)	(–4.14)	(–1.39)	(–4.41)	(–1.54)
Age (log)	–0.0067***	–0.0118***	–0.0058***	–0.0126***	–0.0058***	–0.0111***
	(–6.41)	(–15.58)	(–6.65)	(–11.95)	(–5.36)	(–14.96)
Age x Performance	0.0392***	0.0326***	0.0433***	0.0313***	0.0469***	0.0344***
	(4.31)	(6.44)	(6.16)	(7.17)	(4.40)	(7.88)
Volatility	0.0040	–0.0094	0.0153	–0.0097	0.0255	–0.0074
	(0.37)	(–0.89)	(1.03)	(–1.01)	(1.47)	(–0.76)
Size (log)	–0.0070***	–0.0057***	–0.0059***	–0.0061***	–0.0048***	–0.0061***
	(–10.21)	(–12.60)	(–9.82)	(–14.86)	(–7.86)	(–15.67)
Flows	0.1574***	0.1655***	0.1690***	0.1602***	0.1932***	0.1516***
	(15.01)	(22.52)	(18.97)	(20.12)	(19.90)	(20.46)
TER	–0.0847	–0.3467***	–0.3311***	–0.1452**	–0.2138**	–0.1713***
	(–0.92)	(–7.54)	(–3.16)	(–2.13)	(–2.02)	(–2.97)
Loads	–0.0659**	–0.0472**	–0.0265	–0.0645***	0.1023*	–0.0704***
	(–2.36)	(–2.12)	(–0.76)	(–3.21)	(1.87)	(–3.75)
SMB	–0.0106***	–0.0048**	–0.0131***	–0.0056**	–0.0155***	–0.0002
	(–4.07)	(–2.29)	(–5.07)	(–2.41)	(–5.40)	(–0.11)
HML	–0.0052**	0.0037***	–0.0060***	0.0045***	–0.0068**	0.0039***
	(–2.32)	(3.07)	(–3.47)	(3.42)	(–2.52)	(3.09)
Countries sold	0.0050***	0.0014***	0.0007**	0.0041***	–0.0007	0.0023***
	(8.02)	(5.12)	(2.28)	(9.49)	(–0.19)	(8.52)
Change in convexity *(High–Mid)*	0.0429*	–0.0419*	0.0443**	–0.0517**	0.0421*	–0.0383**
Wald test (*p*–value)	(0.06)	(0.07)	(0.04)	(0.04)	(0.08)	(0.02)
Change in convexity *(High–Low)*	0.0807***	–0.0548**	0.0857***	–0.0629***	0.0771***	–0.0612***
Wald test (*p*–value)	(0.00)	(0.03)	(0.00)	(0.01)	(0.01)	(0.01)
Adjusted R–squared	0.067	0.071	0.082	0.063	0.118	0.057
Number of observations	108,078	292,987	143,579	257,486	79,997	321,068

Table IA9

Flow–performance sensitivity and fund's affiliation with large families across countries – Fama–Macbeth

In this table, we run the identical analysis to Table 3 – Panel A, Columns (2–7), except that we use Fama–Macbeth cross–sectional regressions. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

	Population owning shares		Trading Costs		Emerging market	
	Below	Above	Above	Below	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)
Low	0.0531**	0.0286*	0.0492**	0.0443***	0.0618***	0.0476***
	(2.21)	(1.95)	(2.14)	(2.96)	(2.58)	(3.20)
Low x Large fund family	–0.0408**	0.0204	–0.0385**	0.0217	–0.0481**	0.0245*
	(–2.14)	(1.56)	(–1.97)	(1.61)	(–2.38)	(1.66)
Mid	0.0418***	0.0589***	0.0477***	0.0583***	0.0514**	0.0568***
	(5.10)	(9.29)	(3.85)	(9.06)	(–2.30)	(9.04)
Mid x Large fund family	–0.0194*	0.0054*	–0.0096	0.0065*	–0.0191	0.0099**
	(–1.72)	(1.84)	(–0.71)	(1.91)	(–1.27)	(2.43)
High	0.1858***	0.1946***	0.1797***	0.1568***	0.2537***	0.1669***
	(5.09)	(7.89)	(5.06)	(6.02)	(3.62)	(6.74)
High x Large fund family	0.0703**	–0.0603***	0.0683**	–0.0624***	0.1136**	–0.0664**
	(2.09)	(–2.68)	(1.99)	(–2.61)	(2.37)	(–2.51)
Large fund family	0.0073***	0.0052***	0.0043**	0.0072***	0.0227	0.0074***
	(2.93)	(5.08)	(2.19)	(7.18)	(0.73)	(7.44)
Flows category	–0.0081***	–0.0041***	–0.0099*	–0.0048***	–0.0265	–0.0049***
	(–4.78)	(–8.42)	(–1.85)	(–9.79)	(–1.27)	(–9.89)
Star affiliation	0.3169	0.0287	0.3210	0.0594	0.0453	–0.0006
	(1.04)	(0.21)	(0.98)	(0.47)	(0.11)	(–0.01)
Age (log)	0.0016	–0.0090***	–0.0039	–0.0109***	0.0073	–0.0096***
	(0.31)	(–3.75)	(–0.57)	(–4.65)	(0.48)	(–4.10)
Age x Performance	–0.0027	–0.0110***	0.0010	–0.0122***	–0.0022	–0.0113***
	(–1.31)	(–13.86)	(0.52)	(–13.80)	(–0.07)	(–14.89)
Volatility	0.0018	–0.0033*	–0.0098	0.0014	–0.0230	0.0012
	(0.35)	(–1.78)	(–1.67)	(0.66)	(–0.52)	(0.57)
Size (log)	0.0584***	0.0389***	0.0768***	0.0378***	0.0872	0.0390***
	(3.38)	(3.77)	(4.39)	(5.62)	(1.17)	(5.85)
Flows	0.0357*	–0.0421***	–0.0115	–0.0084	0.2742*	–0.0112
	(1.78)	(–3.63)	(–0.61)	(–0.88)	(1.96)	(–1.13)
TER	0.1240***	0.2211***	0.1368***	0.2194***	0.1547*	0.2099***
	(6.48)	(18.61)	(7.14)	(18.05)	(1.87)	(17.27)
Loads	0.7208**	–0.3107***	–0.1048	0.0402	0.3278**	–0.0848
	(2.23)	(–2.74)	(–0.62)	(0.31)	(2.01)	(–0.70)
SMB	–0.0433	0.0335	0.1853*	–0.0290	0.5146***	–0.0434**
	(–0.56)	(1.65)	(1.83)	(–1.44)	(3.20)	(–2.08)
HML	–0.0102**	–0.0039**	–0.0167*	–0.0033*	–0.0824**	–0.0026
	(–2.31)	(–2.11)	(–1.81)	(–1.87)	(–2.39)	(–1.48)
Countries sold	0.0048***	0.0021***	0.0080	0.0028***	0.0133	0.0020***
	(6.60)	(3.90)	(1.10)	(4.14)	(0.64)	(3.72)
Change in convexity *(High–Mid)*	0.0897**	–0.0657**	0.0779**	–0.0689**	0.1327*	–0.0759**
Wald test (p–value)	(0.04)	(0.05)	(0.05)	(0.02)	(0.07)	(0.02)
Change in convexity *(High–Low)*	0.1111***	–0.0807***	0.1068***	–0.0841***	0.1617**	–0.0905***
Wald test (p–value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
Number of observations	108,078	462,354	143,579	426,853	79,997	490,435

Table IA10 Flow–performance sensitivity and fund's affiliation with large families across countries – Additional proxies for investor sophistication

This table presents in Panel A means of additional proxies for investor sophistication by country, including the percentage of adults who are financially literate in the country, the KAOPEN index, a measure of a country's degree of capital account openness, and GDP per capita. In Panel B, we run the identical analysis to Table 3– Panel A, Columns (2–7), except that we proxy for investor sophistication using additional proxies for investor sophistication. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. See Appendix 1 for variable definitions.

Panel A– Additional country–level characteristics by country

Country	Financial literacy (%)	Financial openness (%)	GDP per capita ($)
Argentina	28.00	0.14	10,987
Australia	64.00	0.77	55,082
Austria	53.00	1.00	46,657
Belgium	55.00	1.00	43,497
Brazil	35.00	0.40	11,022
Canada	68.00	1.00	45,261
China	28.00	0.17	6,326
Denmark	71.00	1.00	55,894
Finland	63.00	1.00	45,883
France	52.00	1.00	39,859
Germany	66.00	1.00	41,416
Greece	45.00	0.97	23,902
Hong Kong		1.00	34,672
India	24.00	0.17	1,307
Indonesia	32.00	0.51	3,106
Italy	37.00	1.00	34,716
Japan	43.00	1.00	40,019
Malaysia	36.00	0.33	9,217
Netherlands	66.00	1.00	48,736
New Zealand	61.00	1.00	39,470
Norway	71.00	1.00	80,765
Poland	42.00	0.48	12,404
Portugal	26.00	1.00	21,046
Singapore	59.00	1.00	43,343
South Africa	42.00	0.17	6,608
South Korea	33.00	0.61	23,355
Spain	49.00	1.00	29,699
Sweden	71.00	1.00	49,252
Switzerland	57.00	1.00	75,443
Taiwan	37.00		19,464
Thailand	27.00	0.22	5,058
UK	67.00	1.00	42,856
US	57.00	1.00	46,124
All countries	54.68	0.91	41,020

Panel B– Regressions with additional country–level characteristics

	Financial Literacy		Financial openness		GDP per capita	
	Below	Above	Below	Above	Below	Above
	(1)	(2)	(3)	(4)	(5)	(6)
Low	0.0374**	0.0412***	0.0382**	0.0471***	0.0424***	0.0315***
	(2.11)	(4.17)	(2.36)	(4.19)	(3.27)	(2.86)
Low x Family size	–0.0323**	0.0287***	–0.0300**	0.0227**	–0.0376***	0.0234**
	(–2.17)	(2.64)	(–2.03)	(2.29)	(–2.66)	(2.48)
Mid	0.0363***	0.0400***	0.0348***	0.0406***	0.0212***	0.0464***
	(6.91)	(14.88)	(8.15)	(13.98)	(6.15)	(17.43)
Mid x Family size	–0.0106*	0.0097**	–0.0082	0.0060*	–0.0027	0.0043*
	(–1.65)	(2.19)	(–1.32)	(1.88)	(–0.69)	(1.93)
High	0.2116***	0.1740***	0.2087***	0.1787***	0.2190***	0.1731***
	(8.21)	(11.36)	(7.75)	(11.29)	(9.36)	(10.09)
High x Family size	0.0361*	–0.0429**	0.0591***	–0.0416**	0.0553***	–0.0467***
	(1.81)	(–2.39)	(2.63)	(–2.37)	(3.85)	(–2.96)
Large fund family	0.0041**	0.0072***	0.0054***	0.0072***	0.0045***	0.0072***
	(2.24)	(10.21)	(4.41)	(10.07)	(3.46)	(9.37)
Flows category	0.0862	0.1317**	0.2813***	0.0251	–0.0141	0.1824***
	(0.57)	(2.13)	(4.70)	(0.43)	(–0.33)	(3.16)
Star affiliation	–0.0085***	–0.0019***	–0.0093***	–0.0008	–0.0001	–0.0026***
	(–3.69)	(–4.37)	(–6.17)	(–1.49)	(–0.09)	(–3.77)
Age (log)	–0.0085***	–0.0130***	–0.0178***	–0.0121***	–0.0078***	–0.0140***
	(–12.22)	(–19.25)	(–13.11)	(–17.78)	(–7.19)	(–21.53)
Age x Performance	0.0439***	0.0422***	0.0365***	0.0459***	0.0306***	0.0430***
	(3.91)	(9.11)	(3.98)	(9.63)	(4.02)	(8.68)
Volatility	0.0130	–0.0171**	0.0030	–0.0216**	0.0042	–0.0134
	(0.65)	(–2.02)	(0.23)	(–2.42)	(0.36)	(–1.64)
Size (log)	–0.0036***	–0.0059***	–0.0039***	–0.0061***	–0.0055***	–0.0059***
	(–4.54)	(–20.46)	(–8.13)	(–19.86)	(–10.10)	(–16.90)
Flows	0.1958***	0.1910***	0.2034***	0.1906***	0.1773***	0.1953***
	(18.00)	(31.15)	(21.68)	(28.82)	(21.84)	(29.85)
TER	–0.5327***	–0.1917***	–0.3165***	–0.2140***	–0.1878*	–0.3098***
	(–2.78)	(–3.60)	(–3.06)	(–3.29)	(–1.68)	(–6.81)
Loads	0.0036	–0.0313*	–0.0531	–0.0211	–0.2059***	0.0115
	(0.07)	(–1.73)	(–0.93)	(–1.22)	(–8.45)	(0.56)
SMB	–0.0151***	–0.0005	–0.0111***	0.0004	–0.0021	–0.0076***
	(–4.57)	(–0.36)	(–4.90)	(0.24)	(–1.35)	(–4.51)
HML	–0.0038	0.0017	–0.0052**	0.0028**	0.0013	–0.0009
	(–1.38)	(1.12)	(–2.24)	(2.25)	(0.86)	(–0.59)
Countries sold	0.0035***	0.0023***	0.0080***	0.0022***	0.0050***	0.0014***
	(2.69)	(8.73)	(3.14)	(8.14)	(6.94)	(5.64)
Change in convexity *(High–Mid)*	0.0461**	–0.0517**	0.0671**	–0.0476**	0.0573***	–0.0503***
Wald test (*p*–value)	(0.04)	(0.02)	(0.04)	(0.03)	(0.00)	(0.00)
Change in convexity *(High–Low)*	0.0681**	–0.0707***	0.0891***	–0.0643***	0.0923***	–0.0694***
Wald test (*p*–value)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
Adjusted R–squared	0.116	0.081	0.110	0.082	0.068	0.091
Number of observations	145,375	421,986	103,991	454,847	184,776	385,656