Mutual Fund Size versus Fees: When big boys become bad boys

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Abstract

In this paper, we use a comprehensive dataset of equity mutual funds covering 30 countries to study the effects of mutual fund size on fund fees. We show that the level of fees vary substantially for funds with different assets under management not only across countries, confirming the results in Khorana, Servaes, and Tufano (2008), but also within countries. We also show that competition in the fund management industry explain these differences. In countries with more competitive fund industries, fees decline as funds get larger while, in countries where there is less competition in the fund industry, fund size increases fees. This is because investors are not flow-fee sensitive to larger funds in countries where mutual funds face little competition.

JEL Classification: G15; G23; G32

Keywords: Mutual fund fees; Mutual fund size; Flow-fee sensitivity; Mutual fund industry competition

1. Introduction

Several studies show that, in the U.S., mutual fund fees decline as funds get larger. These studies include Baumol, Goldfeld, Gordon, and Koehn (1990), Malhotra and McLeod (1997), Gil-Bazo and Ruiz-Verdú (2009), Elton Gruber, and Blake (2012), and different research reports by the Investment Company Institute (1999, 2004, 2013a, and 2013b). This seems to indicate that mutual fund management companies are performing in the interest of their investors. As funds grow, they are expected to realize economies of scale - certain fund costs, including accounting and audit fees, director's fees, and transfer agency fees are more or less fixed, regardless of fund size - and they pass on these economies to investors in the form of lower percentage fees for large funds.

Mutual fund fees are also expected to decline as the fund industry in a country expands and matures due to operational efficiencies. According to the 2013 Investment Company Institute report on expenses and fees, in the U.S., since 1993, the average expense ratio of actively managed equity funds has declined 30 basis points to 77 basis points. In Europe, the level of expense ratios is significantly higher. The 2013 report on fund fees in Europe, prepared for the European Fund and Asset Management Association (EFAMA), indicates that the average annual expense ratio paid by a retail equity fund shareholder is about 175 basis points, which represents roughly 100 basis points more than the average annual expense ratio charged in the U.S. The level of fees charged by mutual funds in Europe is, therefore, much higher when compared with their peers in the U.S.

Khorana, Servaes and Tufano (2008) study mutual fund fees in 18 countries around the world. The authors remark the "increasing public attention" paid to mutual fund fees not only in the U.S. but around the world, and find that, although the mutual fund structure is comparable across countries, the level of fees charged vary substantially from country to

country. Their results show that significant cross-country differences remain after controlling for fund level characteristics, including fund size, fund family size, fund age, and fund investment objectives. The level of economic development, financial markets and mutual fund industry development, investor characteristics (like education and wealth), and the level of investor protection in the country explain these differences.

In a recent working paper, Keswani, Miguel, and Ramos (2016) show that investor's cultural background determines how mutual fund managers manage their portfolios. More particularly, they show that culture determines the flow-performance sensitivity and how investors react to fees. Less flow-performance sensitivity leads to less risk-taking by fund managers and lower performance. Less flow-fee sensitive leads mutual fund companies to charge higher fees. These findings are in line with the results in Gil-Bazo and Ruiz-Verdú (2009), and Evans and Fahlenbrach (2012) that more performance-sensitive investors are also more fee-sensitive. The results are not only statistically but also economically significant and remain robust after controlling for country level variables used by Khorana, Servaes and Tufano (2008).

In this paper, we hypothesize that the level of development in the country and investor's behaviour, do not only explain differences in mutual fund fees across countries, but also have a bearing on explaining differences in the level of fees charged by mutual funds with different amounts of assets under management within each country.

More particularly, we would expect that, in countries, like the U.S., were financial markets are more developed, and therefore the mutual fund industry is more competitive, that as funds get larger mutual fund managers will put an additional effort in order to be more efficient and pass these efficiency gains on to their investors in the form of lower fees. By contrast, in countries like Portugal, where funds do not face or face little competition, larger

funds will have an additional incentive to increase fees taking advantage of their dominant position in the market and of the lack of alternative investment opportunities for investors.

We would also expect to find even greater differences between the level of fees charged by smaller and larger funds across countries during periods of market distress, in particular during the 2007-2008 financial *crisis* or in periods of higher market returns. This is because, in these periods, larger funds domiciled in less competitive markets, where investors are less flow-fee sensitive, will have an additional incentive to increase more (decrease less) the level of fees charged to investors.

Our results confirm our main hypothesises. First we find that level of fees change significantly not only across countries but also within countries. Out of 30 countries in our sample, we find that in nine countries funds classified at the top size quintile charge statistically significant less fees than funds classified at the bottom size quintile, including Australia, Canada, Finland, France, Japan, Norway, Spain, the U.K., and the U.S. However, this is not the case in the majority of the countries in our sample. In eight countries, including Denmark, Germany, Malaysia, Netherlands, Portugal, South Africa, Switzerland, and Thailand, funds in the fifth size quintile charge statistically significant more fees than funds in the first size quintile, and, in the remaining 13 countries, there is no statistically significant difference between fees charged by top and bottom size quintile funds. We then analyze the impact of size on the level of fees charged for countries with different levels of competition in the fund management industry. Following the studies on the worldwide fund industry (e.g., Khorana, Servaes, and Tufano, 2005, and 2008, and Ferreira, Keswani, Miguel, and Ramos, 2013), we proxy for mutual fund industry competition using different variables, including fund industry age, fund industry size, the fund industry Herfindahl index, fund industry equity size as a percentage of stock market capitalization, the market share of top 5 fund management companies, and the number of funds in the mutual fund industry.

The results show that in more competitive fund industries, i.e., older and larger fund industries, industries with higher number of funds, and industries where assets are less concentrated in few management companies, TSC decreases as funds grow in size. Next we look at the effect of competition in the mutual fund industry on the flow-fee sensitivity of larger funds. We find that in more competitive fund industries the level of flows into larger funds decrease significantly when fees increase, while in less competitive fund industries fees have no impact on flows. Finally, we study the effect of market distress on the level of fees charged by larger funds. The results show that during the financial crisis period larger funds decreased significantly the level of fees in more competitive mutual fund industries while, in less competitive mutual fund industries, the amount of fees charged by larger funds has increased. Less competition in the fund industry also leads larger funds to charge more fees when the returns in the market increase.

Using an international sample that includes equity mutual funds from 30 countries around the world this paper is the first to study differences in the level fees charged by funds with different assets under management across countries at different stages of development. This is also the first study analysing the impact of competition on the flow-fee sensitivity across countries and its role on the level of fees charged by larger funds. Additionally, we are also the first to show that larger funds respond differently, increasing or decreasing fees in periods of market distress, depending on whether they are integrated in more or less competitive industries. In addition to the contribution to the academic literature and to the practitioners, this study will also contribute to help regulators and legislators in their quest for bringing more clarity and transparency on investment fees. Investing in mutual funds offer the advantages of diversification and professional management, but the level of fees charged can significantly reduce investor's return. The 2013 EFAMA's report on fees concludes underlying the importance of these topics: "*As mutual funds continue to expand in Europe*

and around the world as the primary vehicle for the public to meet their long-term savings and investment needs, the topics of mutual fund fees and economies of scale continue to grow in importance. Increasing demands for transparency in the context of understanding the overall cost of mutual fund ownership has also been a focus of policy-makers and regulators."

The remainder of the paper is structured as follows. The next section describes the dataset and variables construction. Section 3 studies the relation between fees and size in aggregate and across countries. In Section 4, we explain these differences. Section 5 looks at the flow-fee relation and competition in the fund industry. We study the effect of market distress in Section 6, and Section 7 concludes.

2. Data and Variables Construction

2.1. Sample

Data on equity mutual funds are from the Lipper Hindsight database, which is survivorship-bias free.[1] The Lipper Hindsight database lists multiple share classes as separate funds. Because multiple share classes have the same holdings, the same manager, and the same returns before expenses and loads, we follow Cremers, Ferreira, Matos, and Starks (2015), and Ferreira, Massa, and Matos (2013), and calculate our fund-level variables by aggregating (size weighting) across share classes and eliminate multiple share classes of the same fund. The initial sample contains 47,961 equity funds that invest both domestically and internationally.

The comprehensive nature of the Lipper Hindsight dataset is demonstrated by comparing its contents with Investment Company Institute (ICI) aggregate statistics from 46 countries. At the end of 2010, Lipper Hindsight database reports 26,861 equity funds which represent 97% of the total of 27,754 funds included in ICI statistics. At the same date, Lipper Hindsight and ICI report total net assets (TNA) of equity funds, represented by the sum of all share classes, of $9 trillion and $10.2 trillion respectively. This means that our initial sample of equity funds covers 88% of the total net assets of worldwide equity funds.

We impose a few filters on our final sample. First, the final sample is restricted to actively managed equity funds and excludes closed-end, funds-of-funds, and funds registered for sale in offshore centers such as Luxembourg, Ireland, and the Cayman Islands. Second we exclude institutional funds.[2] Third, in order to ensure that we have sufficient time series observations to calculate risk-adjusted performance measures we impose a minimum of 24

[1] This database has been used by Ferreira, Keswani, Miguel, and Ramos (2012) and (2013), Banegas. Gillen, Timmermann, and Wermers (2013), Cremers, Ferreira, Matos, and Starks (2015), and by Ferreira, Massa, and Matos (2014).

[2] Khorana, Servaes, and Tufano (2008) find that fees differ by clientele type, namely, institutional versus retail investors. Previous studies have also shown differences in how institutional investors and retail investors react to past performance (see, e.g., James and Karceski, 2006). We would expect a similar behavior when it comes to investors' sensitivity to fees.

continuous monthly observations. Fourth, to make our results more meaningful, we also require a minimum of 10 funds at the beginning of each year in each country. Finally, we require funds to have data on size, family size, age, expense ratio, and loads (front-end and back-end loads). This leads to a final sample of 21,452 open-ended actively managed equity funds from 30 countries spanning the period 1998 to 2010. The timeframe we consider includes the stock market run-up observed across countries in 2003 and 2009 as well as the global financial crisis, and therefore is a representative time window as it includes both bull and bear market episodes.

Table 1 presents the number of funds and TNA in each country at the end of our sample period. Columns two and three show aggregate statistics by domicile country, i.e. domestic and international funds. We can see that there are significant differences in the number of funds and their associated TNA across countries. The U.S. is the country with the highest number of funds and by far the largest assets under management. Based on 2010 figures, the U.S. accounts for 18% of the number of funds in our sample and 64% of the total TNA, confirming the much smaller average size of mutual funds outside the U.S. in Ferreira, Keswani, Miguel, and Ramos (2013). Australia, Canada, the U.K., and France represent 11%, 10%, and 8% of the number of funds, but only 2%, 7%, 9%, and 4% of the total TNA, respectively. The last four columns of Table 1 split the sample into domestic and international funds which is done using Lipper data on the fund domicile country and fund geographic investment style. According to Lipper, funds are classified as domestic funds if they invest exclusively in their own country. Lipper classifies funds geographic investment styles into four categories namely domestic; foreign country; regional; or global funds. We classify funds as being international if they invest in countries or regions different from the one where they are located (foreign or regional funds) or if they invest worldwide (global funds). Table 1 shows that, across our sample, domestic funds represent about 41% and 62%

of the total number of funds and the total assets under management, respectively. In the majority of the countries in our sample the number of funds and the TNA represented by international funds is larger. This is not the case of the U.S. where domestic funds are dominant, representing 67% of the number of funds and 71% of the TNA included in our sample of U.S. funds.

2.2 Mutual fund fees: calculating total shareholder costs

The investment in mutual funds comprises the payment of fees. Fund management fees pay for the ongoing annual costs of running the fund and are charged to investors as a fixed percentage of the value of assets under management. Additionally, mutual funds also charge investors other operating costs including, administration, custodian/trustee, registration, accounting and auditing, and legal fees, which are taken directly out of the fund net assets by the managing company. The fund's expense ratio (in the U.S.) or the total expense ratio (TER) (in Europe), usually expressed as a percentage of the total assets under management, includes all annual expenses levied by a fund on its investors (covering annual management fees and the additional operating costs). Furthermore, most funds also charge loads – front-end and or back-end loads -, which are one-time fees that typically go to pay the sales intermediary. Front-end loads are upfront fees paid at the time of purchasing while back-end loads are exit fees paid when the investment is redeemed.[3]

Because loads are paid when entering or exiting the fund, an accurate indication of the true annual expenses charged by a fund on its investors needs to take into account these one-

[3] After 1980, in the U.S., mutual funds may also charge investors 12b-1 fees, which are included in the expense ratio. 12b-1 fees - named after the Security Exchange Commission's rule that allows a fund to pay distribution fees out of fund assets only if the fund has adopted a plan (12b-1 plan) authorizing their payment – like loads, are used to cover distribution expenses. Based on different combinations of loads and 12b-1 fees, some funds offer investors different types of share classes that invest in the same pool of assets and have the same investment objectives and policies. Class A shares charge typically higher front-end loads and lower 12b-1 fees, while class B shares might not charge any front-end load, but might charge as well a contingent deferred sales load (CDSL), which represents the fee paid by investors when redeeming their investments, and a 12b-1 fee. Class C shares might charge a 12b-1 fee and a CDSL or a front-end load. The CDSL charged by class C share are lower and eventually eliminated earlier (usually after one year) than class B's CDSL (eliminated after six or seven years).

time fees. Our measure of fees is total shareholder costs (TSC), which is calculated by adding the fund's expense ratio to the fund's annualized front-en and back-end loads. We annualize loads by dividing it over the investor's holding period. Because we do not have data on actual holding periods, we follow Sirri and Tufano (1998) and Gil-Bazo and Ruiz-Verdu (2009) and assume a seven-year holding period:[4]

$$\text{TSC} = \text{Expense ratio} + (\text{front-end load} + \text{back-end load})/7. \qquad (1)$$

Panel A of Table 2 presents descriptive statistics on TSC by year for funds within each country, and Figure 1 represents the average TSC charged by country during the sample period, with countries sorted from the smallest to the largest TSC. To assure that extreme values do not drive our results, we winsorize TSC by country at the bottom and top 1% level of the distribution. Consistent with Khorana, Servaes, and Tufano (2008) we find that TSC varies substantially across countries. Poland is by far the country where mutual funds have highest TSC. The average TSC in Poland is 4.12% which represents 0.52% more than the average TSC charged in Argentina, the country with the second highest average TSC (3.60%), and about three times the average TSC in Netherlands (1.39%), the country where investors on average are less levied. The U.S. is the fifth country from the bottom with an average TSC of 1.76%, which represents less 0.43% than the average TSC charged outside the U.S. (2.19%), and less 0.30% of the average TSC charged across all countries in our sample (2.06%). By looking at the standard deviation we have a first insight of the TSC variation within each country. The standard deviation of the TSC across all countries in our sample is 0.82% which, comparing to an average TSC of 2.06%, indicates a large variation in the TSC across funds. The standard deviations also vary significantly across countries.

[4] Our results remain similar if we add one-fifth of the loads charged to investors in the manner of Khorana, Servaes, and Tufano (2009).

Argentina is the country with the highest standard deviation (2.10%), while India is the country with the lowest (0.28%).

To better understand differences in TSC within different countries, we look at the level of fees charged in each country by funds with different assets under management. We therefore start by splitting up funds according to last year fund size quintiles – Table 3 presents the average size by fund size quintile in each country - and proceed calculating the average TSC in each country for each fund-size quintile. The results of doing this are presented in Panel B of Table 2. From this table, we can see that there are not only substantial differences in the average TSC across country-quintiles, but that there are as well significant differences between TSC charged across fund size quintiles within each country. The last two columns of Panel B of Table 2 present the difference between the average TSC charged by funds in the fifth size quintile and funds in the first size quintile and the *p-value* of a *t-test* testing whether the difference is statistically significant in each country. Figure 2 represents the TSC in the first and fifth fund size quintiles and this difference graphically for each country. We find that in 17 out of 30 countries in our sample the average TSC charged by funds classified in the fifth fund-size quintile is lower than the average TSC charged by funds classified in the first fund-size quintile. However, we also find that funds classified in the first fund-size quintile present higher TSC in 13 countries. These differences are statistically significant for 15 and six countries, respectively. Figure 2, shows that the U.S. is the country where TSC decrease more with size, while Poland is the country with the highest difference between the TSC charged by larger funds and smaller funds. In the U.S., the average TSC charged by larger funds is 0.73% lower than the average TSC charged by smaller funds, while in Poland larger funds charge on average more 0.67% than smaller funds. Interestingly, by comparing the rank of the countries in Figure 2 with the same rank in Figure 1, we can see that countries where larger funds charge higher (lower) TSC do not

match the ones where we find higher (lower) TSC. For example, South-Africa is one of the countries with lowest average TSC and is the second country where larger funds charge more fees. On the other side, Hong-Kong funds charge on average more TSC than the majority of the countries in our sample and is one of the countries where larger funds charge less fees. The correlation coefficient between the two ranks of countries presented in Tables 1 and 2 is even negative (-0.09).

2.3 Additional mutual fund characteristics

Table 4 presents summary statistics of the additional fund-level variables by country averaged across fund years used in our study.[5]

Fund performance is measured using raw returns and four-factor alpha. The calculation of total returns assumes that dividends are immediately reinvested. Our raw returns are gross of taxes and net of total expenses (annual fees and other expenses). Risk-adjusted performance is calculated using the four-factor Carhart (1997) model using market, size, value, and momentum factors. Four factor alpha is calculated in different ways for domestic and international funds. For domestic funds, we construct monthly benchmark factors for each individual country using all stocks included in the Datastream/Worldscope database. The market return is computed using the value-weighted average return in local currency of all stocks in each country in each month. To form the size, the book-to-market, and the momentum portfolios and factors for each country in each month, we follow the procedure described in Fama and French (1992).[6]

Each quarter alpha (for months t-3 to t-1) is calculated as follows. We first regress the previous 36 months of fund excess returns (t-39 to t-4) on the local (as given by the fund

[5] To ensure that extreme values do not drive our results, flows, expense ratios and loads are winsorized by country at the bottom and top 1% level of the distribution.
[6] See Ferreira, Keswani, Miguel, and Ramos (2013) for details about how we construct our factors.

domicile) factors, and store the estimated betas.[7] We then calculate the quarterly alpha, as the difference between excess returns in months t-3 through t-1 and the predicted return based on factor realizations in t-3 through t-1 and factor loadings from the t-39 to t-4 regressions. [8]

For international funds, we calculate alphas the same way except that we use the investment region market, size, value and momentum factors in the regressions (calculated as value-weighted averages of the corresponding factor for all countries in the region in which the fund invests. The fund investment region is based on the Lipper geographic focus field, which can be a single country, a geographic region, or global. We map the geographic focus into five regions (Asia-Pacific, Europe, North America, and Emerging Markets), plus the World for global funds. Table 4 presents averages of our performance measures by country.[9] Italy is the country with the lowest average raw return, while India and Indonesia are the countries with the highest. Four-factor alphas are higher in South Korea and Hong Kong and lower in Argentina and Spain. Table 4 also presents annual averages for fund family size, flows, fund age, the number of countries where the fund is sold, the standard deviation of fund returns, and loadings on SMB and HML factors. Fund flows, the standard deviation of fund returns, and loadings on SMB and HML factors are also winsorized by country at the bottom and top 1% level of the distribution.[10] Family size is much larger in the U.S. than elsewhere, and the U.K and the U.S. are the countries with oldest funds. Following Chevalier and Ellison (1997), Sirri and Tufano (1998), and others, we define the new money growth rate as the net growth in TNA, not due to dividends and capital gains on the assets under

[7] To calculate excess returns we use as risk-free rates of return the interbank middle interest rates for each country, with the exception of the United States, for which we use Treasury bill rates from the U.S. Federal Reserve. Data on interbank middle interest rates are drawn from Datastream.

[8] We use at least 24 monthly observations to estimate fund alphas if fewer than 36 monthly return observations are available. To calculate excess returns we use as risk-free rates of return the interbank middle interest rates for each country, with the exception of the United States, for which we use Treasury bill rates from the U.S. Federal Reserve. Data on interbank middle interest rates are drawn from Datastream.

[9] To ensure that extreme values do not drive our results, performance measures are winsorized by country at the bottom and top 1% level of the distribution.

[10] To make sure that multicollinearity among these variables is not driving our results, we have run a pairwise correlation matrix (not reported). We find that correlation coefficients are low, suggesting that this variables may be included together.

management but to new external money. Fund flow for fund *i* in country *c* at year *t* is calculated as:

$$Flow_{i,c,t} = \frac{TNA_{i,c,t} - TNA_{i,c,t-1}(1+R_{i,c,t})}{TNA_{i,c,t-1}}, \qquad (2)$$

where $TNA_{i,c,t}$ is the total net asset value in local currency of fund *i* in country *c* at the end of year *t*, and $R_{i,c,t}$ is fund *i*'s raw return from country *c* in year *t*. Equation (2) assumes flows occur at the end of each year, as we have no information regarding the timing of new investment.[11] Poland is the country where funds on average get highest inflows while South Korean funds as suffer the highest outflows.

The countries where funds are registered for sale in higher number of countries are Hong Kong and Belgium. Brazil is the county where mutual funds load more on SMB while the loading on HML is higher in Malaysia.

3. Explaining the relation between TSC and size

In this section we study the relation between fund's TSC and fund's Size. In Section 2.2 we show that fund's TSC vary substantially across countries. We also show fund's size varies across countries. We start by analyzing the aggregate impact of size on TSC and we move on and split funds into size quintiles to account for the non-linear relationship between TSC and Size. We first pool the data across all countries in our sample, and we also present the results for each of the 30 countries in our sample. Our aim is to show how different this relation is across and within countries.

3.1 TSC and aggregate size across countries

To study the relation between fund's TSC and fund's Size, we estimate the following

[11] Sirri and Tufano (1998) show that results are not sensitive to this assumption. Our results do not change whether flows are assumed to occur at the beginning or middle or continuously throughout the period.

equation:

$$TSCi_t = a + b \cdot Size_{t-1} + c \cdot X_{t-1} + \varepsilon_t \quad (3)$$

in which TSC in a given year are regressed on prior year fund size ($Size_{t-1}$) – Size is the log of the fund's TNA in millions of U.S. dollars - together with a set of lagged control variables (X_{t-1}) that the literature (see, e.g., Gil-Bazo and Ruiz-Verdú, 2009, and Khorana, Servaes, and Tufano, 2008) as shown to have a bearing on explaining mutual fund's TSC.

We use fund family size, measured as the total net assets in millions of U.S. dollars of total equity funds in the same management company excluding the own fund TNA. Following the literature, we would expect TSC to be lower for larger fund complexes as a \result of economies of scale (see, e.g., Khorana, Servaes, and Tufano, 2008) and/or because investors tend to buy more lower cost funds, as they have learned to avoid mutual fund expenses (Barber, Odean, and Zheng, 2005). Mutual fund age is expected to capture experience effects and therefore fund age should behave like previous measures of scale, as older funds would also be expected to minimize their operating costs and levy less investor. But the literature as shown that mutual funds target different clienteles and more experienced funds may actually charge more to their investors. Khorana, Servaes, and Tufano (2008) find that fund age increase TSC in their international sample. Like Gil-Bazo and Ruiz-Verdú (2008), we also include the fund's total risk (volatility) in the previous year measured by the standard deviation of the fund's monthly returns over the previous 36 months. More risk-taking is expected to be associated with more active management and therefore more expenses. By controlling for the number of countries where a fund is registered to sell, like in Khorana, Servaes, and Tufano (2008), we take into account the possibility that an increase in the number of countries where a fund is sold may influence the level of fees charged to investors. Gil-Bazo and Ruiz-Verdú (2009) and Khorana, Servaes, and Tufano (2008), also control for different investment objectives across funds. Because we do not have access to

fund style information for many countries in our dataset, we imply fund style by using loadings on SMB and HML factors as additional. For domestic funds, we use the domestic SMB and HML and, for international and global funds we use the region or the world SMB and HML factors, respectively. As we would expect the average fund size in each country to increase across time, the coefficient on $Size_{t-1}$ will be influenced by this time trend. To address this question, we also include a time trend variable in our regressions, defined as the number of years elapsed since 1997. If TSC represents how much investor pay in order to get the service provided by the mutual fund, and this service is portfolio management, the level of fees charged should reflect fund's risk-adjusted performance and, therefore, we include last year net performance, measured using four-factor alpha, in our regressions. Gil-Bazo and Ruiz-Verdú (2008) and Christoffersen and Musto (2002) show that funds with less flow-performance sensitive investors tend to charge more fees, exploiting the low elasticity of demand to performance. Ferreira, Keswani, Miguel, and Ramos (2012) find marked differences in the flow-performance relationship across countries. We therefore would expect different flow-performance sensitivities to impact differently on the level of fees charged across countries, and also control for the flow-performance sensitivity. We use a dummy variable that takes the value of one if the fund's flow-performance sensitivity is above median in each country-year.[12] Finally, we also include fund type fixed effects (domestic, foreign, regional, and global), investment region fixed effects (Africa, Asia-Pacific, Europe, North America, and Emerging Markets) across our regressions and, when we pool the data across countries, country fixed effects. Fund type fixed effects are expected to

[12] We estimate the sensitivity of flows to past performance for each country-period in our data set by running the following regression where *i* corresponds to the fund, *c* to the country and *t* to the time period

$$\text{Flows}_{i,c,t} = \alpha + \beta_{c,t}\,\text{Performance}_{i,c,t-1} + \eta_{c,t}\,X_{i,c,t} \qquad (4)$$

where X contains a set of fund specific control variables like fund size and age, lagged flows that have been shown to determine flows by the prior literature (see, e.g., Sirri and Tufano (1998), and Huang, Wei, and Yan (2007), and Ferreira, Keswani, Miguel, and Ramos (2012)).

capture the impact of geographic dispersion, as international and global funds are expected to offer wider investment diversification opportunities to their investors, and this may result in higher costs in the form of higher expense ratios and or higher loads (Khorana, Servaes, and Tufano, 2008). Investment region fixed effects capture specific characteristics of the region where the fund invests. This classification is based on the fund´s investment region using data on fund's geographic investment style provided by Lipper database. Standard errors are clustered at the country-year level.

Table 6 Panels A and B, present the results of our regressions. In Panel A, we first pool the data across countries, in columns (1) to (3). Because the U.S. represents by far the largest number of funds in our sample, we also include the results when excluding the U.S., in columns (4)-(6), for the U.S., columns (7)-(9) and, the last column, column (10), presents the differences between U.S. and non-U.S. when we rerun the regression in column (3) adding a dummy variable that takes the value of one if the country is the U.S. a zero otherwise. Panel B of Table 6 presents the coefficients on *Size* when running the same regression, as in Column (3) of Panel A, country by country for the remain 29 countries in our sample.

The results in Panel A of Table 6, show a negative relation between *TSC* and *Size*, indicating that fund's *TSC* decreases as *Size* increase. This result remains whether we pool the 30 countries in our sample, when we exclude the U.S. or when we run the regressions only for U.S. funds, and are consistent with the results for the U.S. in Gil-Bazo and Ruiz-Verdú (2009), and in Khorana, Servaes, and Tufano (2008) when using an international sample. However, the coefficient on size for the U.S. is much higher than the coefficient for non-U.S. countries, and the difference presented in column (10) is statistically significant. TSC are much more sensitive to fund's size in the U.S. than outside the U.S. To clarify the economic importance of these results, the estimated coefficients on columns (6) and (7) imply

that a one-standard deviation increase in fund size is associated with a reduction in TSC of 16 basis points (0.025 x ln(556.96) for non-U.S. funds and of 53 basis points (0.081 x ln (5885.18)) for U.S. funds. We go on to check the results on the remaining control variables. Consistent with Khorana, Servaes, and Tufano (2008), fund age increases TSC outside the U.S., and increases in the U.S., which confirms the results in Gil-Bazo and Ruiz-Verdú (2008). We also find a statistically significant difference when comparing the U.S. to the non-U.S. sample indicating that older funds tend to decrease more TSC in the U.S. than outside the U.S. Family size decreases TSC both for non-U.S. funds and the impact is even larger for U.S. funds. While return's volatility increases significantly TSC in the U.S., consistent with Gil-Bazo and Ruiz-Verdú (2008), the results for Non-U.S. countries indicate a negative relation between funds TSC and volatility. The number of countries where the fund is sold increases significantly TSC outside the U.S., consistent with Khorana, Servaes, and Tufano (2008) but as no impact for U.S funds. As we would expect, funds that play more small caps charge more fees, which is consistent with the results in Chen, Hong, Huang, and Kubik (2004) that show that funds that invest in small stocks have stronger decreasing returns to scale as these funds have to face higher costs, namely price impact costs. On the opposite, funds that play more value stocks charge significantly lower fees but only in the U.S. as the results are not significant outside the U.S. Time trend is negatively related to TSC, indicating that fees decline over time, but only in the U.S. To put these results in perspective, in the U.S., over the 13-year period in our sample, the average TSC as decreased by 25 basis points (0.007 x 13). In the U.S., the coefficient on last year alpha is negative and statistically significant, indicating that as performance increases TSC decreases. Interestingly, outside the U.S., performance seems to increase TSC, although the results are not statistically significant. Finally, confirming the results in Gil-Bazo and Ruiz-Verdú (2009) and Christoffersen and Musto (2002), our results show a negative relation between fund's TSC and fund's flow-

performance sensitivity, indicating that funds with investors that are less flow-performance sensitive charge higher fees. Although the results are consistent for both, U.S. and non-U.S. funds, our results show that the impact of flow-performance sensitive in TSC is much higher (four times higher) in the U.S.

Looking at the results for the remaining 29 countries in our sample, presented in Panel B of Table 6, we find that the coefficient on size varies significantly across countries. Like in the U.S., size decreases TSC in a statistically significant way in more 11 countries in our sample. However, for the majority of countries in our sample (18), size does not significantly decrease the level of fees charged to investors. More particularly, in 14 countries size has no statistically significant impact on TSC, and in four countries, namely Belgium, Poland, Portugal, and South Africa, TSC increase as funds grow. These differences across countries are not only statistically significant but also economically significant. To put these figures in perspective, a one-standard deviation increase in fund size is associated with a 148 (0.259 x ln(303.25) basis points reduction in the TSC paid by an investor in Hong-Kong, the country with the highest negative coefficient, while the same variation in fund size is associated with a 101 basis points (0.18 x ln(280.41)) increase in the TSC paid by a Polish investor, the country with the highest positive coefficient.

3.2 TSC and fund size across different size quintiles

In Section 3.1 we show that size affects TSC differently across countries in our sample. From the results in Table 3, Panel B, where we present the average TSC by country fund size quintiles, we would expect the relationship between TSC and size to be non-linear and therefore the level of fees charged to investors to change substantially not only across countries but also within countries. We move on to analyze the impact of fund size on the TSC charged to investors across funds with different sizes within each country. To do so, we

run the regression in equation (3) with one single difference. We now split up funds in each country into quintiles according to last year fund size:

$$TSC_t = a + bi \cdot qi_{t-1}.Size_{t-1} + c \cdot X_{t-1} + \varepsilon_t \qquad (5)$$

Where qi_{t-1} represents last year fund size quintile, with $i = 1,...,5$. Like in equation (3), we add to the regression the same set of of fund's characteristics that the literature has shown to explain fund's TSC.

We run the regression country by country and we also present the results when pooling the data for the 30 countries in our sample and when pooling the data and excluding the U.S. The results of doing so are presented in Table 7. After controlling for fund's characteristics, we find that, in nine out 30 countries in our sample, that funds classified at the top size quintile charge statistically significant less fees than funds classified at the bottom size quintile, including Australia, Canada, Finland, France, Japan, Norway, Spain, the U.K., and the U.S. However, this is not the case in the majority of the countries in our sample. In eight countries, including Denmark, Germany, Malaysia, Netherlands, Portugal, South Africa, Switzerland, and Thailand, funds in the fifth size quintile charge statistically significant more fees than funds in the first size quintile, and, in the remaining 13 countries, there is no statistically significant difference between fees charged by top and bottom size quintile funds. When pooling the data, whether including or not the U.S., the results show than top size quintile funds charge, on average, less fees.

4. Explaining differences in the relation between fund's TSC and fund's size across countries

In the previous section we show that TSC varies substantially not only across countries, confirming the results in Khorana, Servaes, and Tufano (2008) but we also show that there are significant differences in the level of fees charged within countries. More

particularly, we show that while in some countries TSC decreases as fund grows, there are countries where size has no impact on the level of fees charged to investors, while in other countries, larger funds actually increase TSC. In this section we aim to explain why these differences exist. Why would size decrease TSC in some countries and increase in other?

Our hypothesis is that the level of competition in the fund industry does not only explain differences in mutual fund fees across countries as in Khorana, Servaes, and Tufano (2008), but also have a bearing on explaining differences in the level of fees charged by mutual funds with different amounts of assets under management within each country. More particularly, we would expect that, in countries like the U.S., were fund industry is more competitive, that as funds get larger mutual fund managers will put an additional effort in order to be more efficient and pass these efficiency gains on to their investors in the form of lower fees. By contrast, in countries like Portugal, where funds do not face or face little competition, larger funds will have an additional incentive to increase fees taking advantage of their dominant position in the market and also taking advantage of mutual investors' passiveness imposed by the lack of investment opportunities.

We begin by investigating this prediction by regressing TSC on fund's size, like in equation (3), except that now we also add proxies for fund industry competition to our regression and we also interact fund size with these proxies. More specifically, we interact fund size with a dummy variable that takes the value of one for countries with above-median fund industry competition and zero for funds below-median fund industry competition. We use a number of different proxies for mutual fund industry competition including fund industry age, fund industry size, the fund industry Herfindahl index, fund industry equity size as a percentage of stock market capitalization, the market share of top 5 fund management companies, and the number of funds in the mutual fund industry. These variables have been used as proxies for mutual fund industry development and competition in studies of the

worldwide fund industry (e.g., Khorana, Servaes, and Tufano (2005); Khorana, Servaes, and Tufano (2008); and Ferreira, Keswani, Miguel, and Ramos (2013)). Because the U.S. is by far the country with the largest number of funds and assets under management in our sample, we present the regressions excluding U.S. funds.[13] We expect funds in countries with above-median levels of fund industry competition to decrease TSC as their size gets larger. The results of these regressions, presented in Table 8, are consistent with our predictions. In more competitive fund industries, i.e., older and larger fund industries, industries with higher number of funds, and industries where assets are less concentrated in few management companies, TSC decreases as funds grow in size.

5. The flow-fee relation, fund size and fund industry competition

In the previous section we show that the level of competition in the fund industry explains differences in the TSC charged by funds with different amounts of assets under management within each country. In this section we study the effect of competition on the sensitivity of flows to fees, size, and more particularly if the flow-fee sensitivity differs for funds with different assets under management. We would expect to find that, in countries where there is less competition in the fund industry, that: (1) investors are less sensitive to fees; (2) investors are more sensitive to fund's size, i.e, are expected to invest more in larger funds as there are not as many investment opportunities; and (3) investors are less sensitive to fees charged by larger funds.

To test these hypotheses, we start by regressing yearly flows on yearly TSC and fund's size and a set of control variables that the literature as show to explain fund flows. We also run additional specifications where we add to the previous regression the interaction between Size and TSC. Following Sirri and Tufano (1998) we include fund family size and age. We

[13] In untabulated tables we run the regressions including the U.S. and, as we would expect, the results remain even more statistically significant.

also include last year flows, as in Cashman, Deli, Nardari and Villupuram, to control for autocorrelation in fund flows. Like Barber, Odean, and Zheng (2005) we include the monthly standard deviation of the fund's returns over the previous 36 months to account for fund's volatility and last year performance measured by the four-factor alpha. Finally, we add to the regression the number of countries where the fund is sold and control for different investment objectives across funds using loadings on SMB and HML factors, like Ferreira, Keswani, Miguel, and Ramos (2012).

The results of these regressions are present in Table 9. Panel A of Table A presents the results when we pool the 30 countries in our sample, in Columns (1) and (2), when excluding the U.S. from the previous regressions, in Columns (3) and (4), and for the U.S. Columns (1), (3), and (5) show a negative relation between flows and TSC, consistent with higher fees leading to less flows (see, e.g., Barber, Odean, and Zheng, 2005). Because we want to study whether investor's sensitivity to fees is different for funds with different assets under management, we add to the regressions the interaction between fund's size and TSC, in Columns (2), (4), and (6). When we pool all the countries or when excluding the U.S., in Columns (2) and (4), respectively, the results from the regressions show that the coefficient on the interaction is not statistically significant. This indicates that the size of the fund has no impact on the flow-fee relationship. However, when we run the same regression only for U.S. funds, in Column (6), the interaction between size and TSC is negative and statistically significant, meaning that, in the U.S., the flow-fee sensitivity is significantly higher when larger funds increase their fees. Because the U.S. is by far the country with the most competitive mutual fund industry in the world, we would expect this result as a first indication that competition in the fund industry is likely to explain differences in the flow-fee sensitivity across countries. We therefore move on and add competition to our regressions. We proxy for mutual fund industry competition using the same proxies we use in Section 4,

namely, fund industry age, fund industry size, the fund industry Herfindahl index, fund industry equity size as a percentage of stock market capitalization, the market share of top 5 fund management companies, and the number of funds in the mutual fund industry. In Table 9, Panel B, we start by running the same regression as in Panel A, Column (3) - to make sure that our results are not driven by the U.S., we exclude the U.S. from our regressions -, except that we also include in the regression the above mentioned proxies for competition in the fund industry, and TSC interacted with a dummy variable that takes the value of one for countries with above-median fund industry competition. As we would expect, the results in Panel B show that competition increases investor's sensitivity to TSC. In more competitive fund industries, funds that increase their TSC suffer significantly higher withdrawals as investors are able to more easily find alternative investment opportunities. On the opposite, in countries where funds face little competition, investors are left with less investment opportunities and become less fee-sensitive.

Overall, in this section we show that fund TSC affects fund flows but the effect is significantly higher in countries where mutual funds face higher competition. Additionally, we also show that fund's size impacts on the flow-fee sensitivity and that, in countries where there is more competition in the mutual fund industry, investors react significantly more to an increase in TSC led by larger funds.

6. Explaining the relation between fund TSC and fund size across countries: the effect of the market distress

In this section, we examine the effect of the market distress in the level of TSC charged by funds across and within countries in our sample. We expect market distress to affect the level of fees funds charge to investors. During these periods both fund's operational expenses and fund's performance are likely to change and will determine changes

in fund fees. Fund management companies will also take into investor's willingness to accept these changes, which are also expected to be influenced by the overall market sentiment/momentum. In periods of market downturns most investors are probably less open to an increase in fees than in bull market periods. Additionally, we anticipate that fund's size will determine on how much fund fees change during these periods, and if, as we show in Section 4, competition in the fund industry explains differences in the level of fees charged by funds with different assets under management, we would also expect competition to explain differences in the level of fees charged by funds with different assets under management during periods of market turmoil.

To test these hypotheses, we start by looking at the impact of market distress on fund's TSC. We use two variables as measures of market distress. The first variable is a dummy variable *crisis*, which takes the value of 1 for years 2007 and 2008, and zero otherwise. The second variable is a measure of market overall returns, *market return*, which is the average of fund's investment region market return in each year of our sample period. We therefore run the same regressions as in Columns (3), (6) and (9) of Table 6, Panel A, respectively for the whole sample, excluding the U.S. and only for the U.S. except that now we also include our variables of market distress. We move on and also run the same regressions including the interaction between fund size and both variables of market distress. The results of doing so are presented in Table 10, Panels A and B, for *Crisis* and market return, respectively.

Column (1) of Table 10, Panel A, shows that when pooling the 30 countries *Crisis* has a positive and statistically significant impact on TSC, i.e., *Crisis* increases the level of fees charged. When we disaggregate our sample into non-U.S. countries and the U.S., the results in Columns (3) and (5), show that the impact of *Crisis* in TSC is much higher for non-U.S.

funds. When we add to the regression the interaction between fund size and *Crisis*, in columns (2), (4), and (6) the results show that in non-U.S. countries, size has no impact on the level of fees charged during the crisis period, while in U.S. larger funds have decreased the level of fees charged to investors during this period.

Moving to our second proxy for market distress, the results in Panel B of Table 10, show a positive, although not statistically significant, relation between TSC and fund's investment region market return when we pool our data in Column (1), indicating that fund management companies charge more fees when market returns are higher. By running the regression separately for non-U.S. and U.S. funds, we show that these results are driven by non-U.S. funds. This is because while outside the U.S. the relation between TSC and *market return* is positive and significant, in the U.S., this relation is significantly negative, indicating that U.S. fund management companies decrease TSC when *market return* increases. We also add to the regressions the interaction between fund's size and market return in columns (2), (4), and (6). The results on the interaction show that fund's size has a negative impact on TSC when we pool the countries in Column (2), meaning that when market returns are higher larger funds increase less fees. However, these results are also driven by U.S. funds, as the interaction is not statistically significant outside the U.S. (see Columns (6) and (4), respectively).

To analyse the effect of competition in the fund industry in periods of market distress, we rerun the regression on Columns (4) of Table 10, Panels A and B, partitioning countries on the basis of whether the proxy for competition in the fund industry for the country concerned is above or below the median level for the countries in our sample. Panels C and D of Table 10 present these results for *Crisis* and *Market return*, respectively, using the same proxies for competition as in previous sections of the paper. We focus our analysis on the

coefficient on the interaction between fund size and fund TSC. We expect larger funds to increase more (or decrease less) TSC in countries with above median levels of fund competition. Both, the results on the interaction between *Crisis* and *Size* and *Market return* and *Size* show that that our predictions are correct. While in countries with less competitive fund industries larger funds charge significantly more fees during periods of market distress, competition in the fund industry leads larger funds to charge less fees during these periods.

7. Conclusion

Khorana, Servaes and Tufano (2008) show that fees charged by mutual funds vary considerably from country to country. They also show that the level of economic development, financial markets and mutual fund industry development, investor characteristics (like education and wealth), and the level of investor protection in the country explain these differences. In this paper we show that fees charged by mutual funds vary not only across countries but also within countries. More specifically, we find that the level of fees charged by funds with different assets under management vary significantly from country to country. Out of 30 countries in our sample, we find that, in nine countries, that funds classified at the top size quintile charge significantly less fees than funds classified at the bottom size quintile, in eight countries, larger funds charge significantly more fees than smaller funds, while in the remaining 13 countries, there is no significant difference between fees charged by funds at the top and at the bottom size quintiles. We also find that the level of competition in the mutual fund industry explain these differences. Less competition in the mutual fund industry leads larger funds to charge more fees. This is because in less competitive fund industries mutual fund investors are less sensitive to increasing fees charged by larger funds. Finally our results also show that in periods of market distress larger funds tend to increase more the level of fees charged in countries with less competitive mutual fund

industries. Overall our study shows that competition in the fund management industry determines the level of fees charged by funds with different assets under management.

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Figure 1 – Average TSC by country

The figure below presents average of annual TSC in percentage across funds by country from 1998 to 2010 reported in Panel A of Table 2. Countries are sorted from the smallest to the largest TSC.

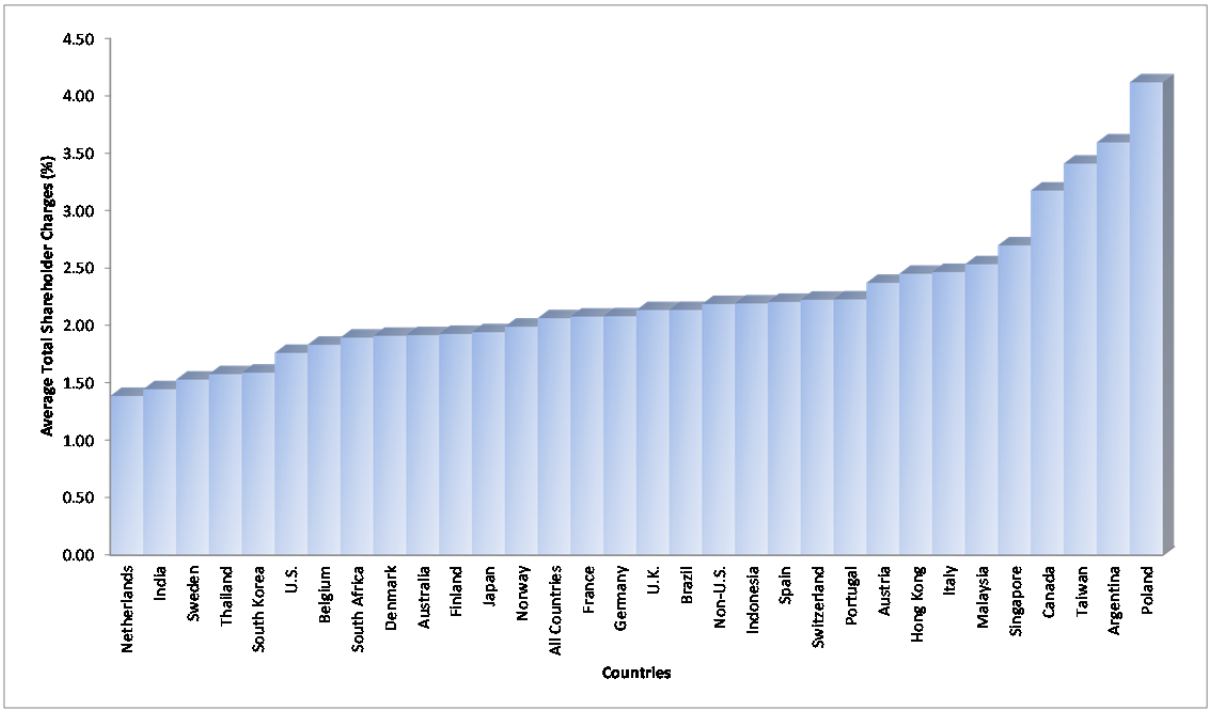

Figure 2 – Average TSC by first and fifth fund size quintiles by country

The figure below presents average of annual TSC in percentage across last year 1th and the 5th fund size quintiles, and the difference between the average TSC charged by funds in 5th and the 1st fund size quintiles within each country from 1998 to 2010 reported in Panel B of Table 2. Countries are sorted from the smallest to the largest difference between the average TSC charged by funds in 5th and the 1st fund size quintiles.

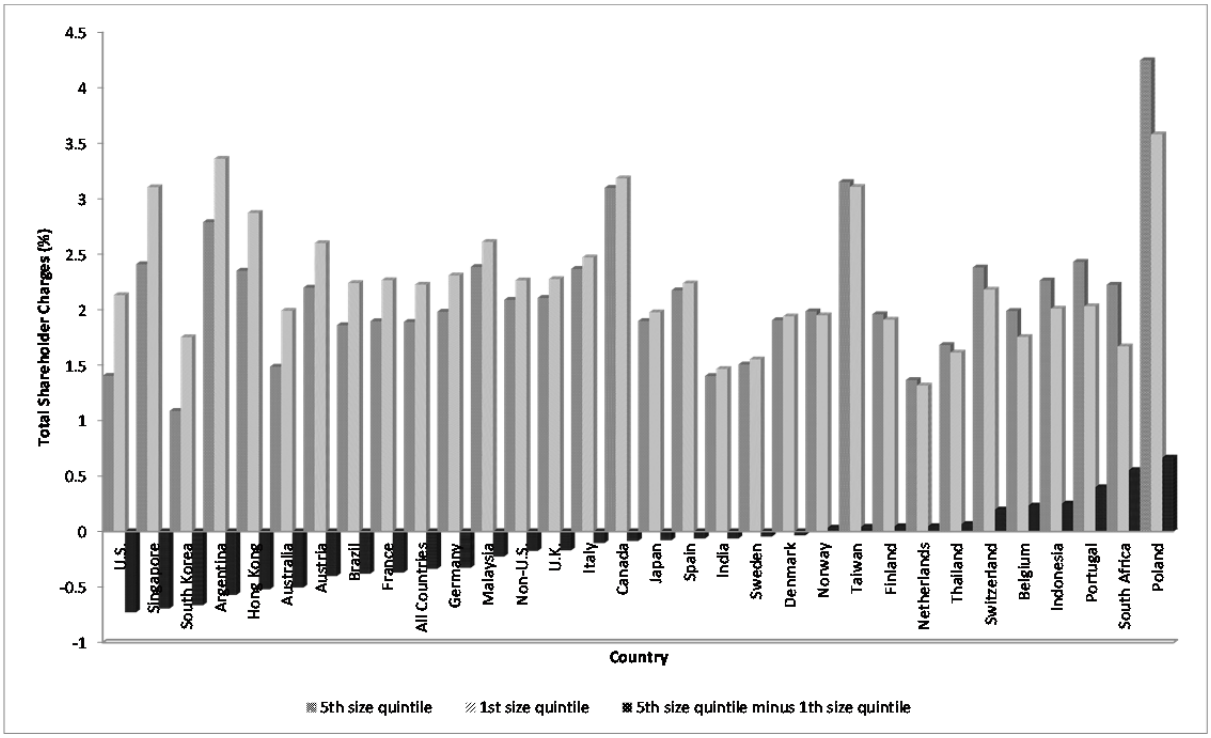

Table 1 – Number and Size of Mutual Funds by Country

This table presents the number of funds and total net assets (TNA) under management (sum of all share classes in U.S. dollars millions) of the sample of funds by country where the funds are legally domiciled at the end of 2010. Funds are classified as domestic or international if the geographical focus of the investment is equal or not to the fund domicile country, respectively. The sample is restricted to open-end and actively managed equity funds drawn from the Lipper database. Off-shore funds are excluded.

	All Funds		Domestic Funds		International Funds	
Country	Number of Funds	TNA ($ million)	Number of Funds	TNA ($ million)	Number of Funds	TNA ($ million)
Argentina	49	294	17	156	32	137
Australia	1,310	97,434	349	50,053	961	47,380
Austria	153	13,745	11	1,374	142	12,372
Belgium	421	21,382	13	1,406	408	19,976
Brazil	336	28,250	287	20,977	49	7,272
Canada	1,199	312,902	372	186,310	827	126,592
Denmark	195	28,972	21	3,115	174	25,857
Finland	166	26,388	27	5,306	139	21,082
France	971	185,083	195	41,379	776	143,703
Germany	300	117,169	46	34,568	254	82,601
Hong_Kong	72	12,222	6	1,893	66	10,329
India	188	33,667	188	33,667		
Indonesia	26	3,963	26	3,963		
Italy	142	32,733	31	4,510	111	28,223
Japan	665	62,691	363	32,698	302	29,992
Malaysia	181	8,223	113	7,004	68	1,220
Netherlands	97	31,181	21	5,968	76	25,213
Norway	144	38,183	50	13,195	94	24,987
Poland	49	6,399	31	5,576	18	823
Portugal	63	2,196	18	506	45	1,689
Singapore	205	12,636	9	1,522	196	11,114
South_Africa	124	22,409	105	20,918	19	1,491
South_Korea	385	22,246	247	14,942	138	7,304
Spain	267	12,948	69	2,435	198	10,513
Sweden	248	109,749	98	62,212	150	47,537
Switzerland	221	27,795	52	13,353	169	14,442
Taiwan	222	15,813	149	10,424	73	5,389
Thailand	135	4,835	116	4,708	19	127
U.K.	894	422,243	345	199,190	549	223,052
U.S.	2,020	3,092,031	1,350	2,182,787	670	909,244
	0					
Non-U.S.	9,428	1,713,748	3,375	783,328	6,053	930,420
All countries	11,448	4,805,779	4,725	2,966,115	6,723	1,839,664

Table 2 - Descriptive statistics of fund TSC by country.

This table presents descriptive statistics of TSC in percentage across funds by country from 1998 to 2010. Panel A presents mean, standard deviation, median, and minimum and maximum of annual TSC, and the number of fund-year observations. Panel B presents the average TSC in percentage across last year fund size quintiles within each country. The last two columns of Panel B present, respectively, the difference between the average TSC charged by funds in 5th and the 1st fund size quintiles within each country, and the p-value of a test of whether this difference is statistically significant. TSC are winsorized by country at the 1st and 99th percentiles.

Panel A – Descriptive statistics across funds by country

Country	Mean	Standard deviation	Median	Minimum	Maximum	Number of observations
Argentina	3.60	2.10	3.06	1.28	9.64	127
Australia	1.92	0.84	1.86	0.39	3.71	2,614
Austria	2.37	0.48	2.36	1.18	4.09	1,050
Belgium	1.83	0.55	1.81	0.37	3.14	2,126
Brazil	2.14	1.47	2.00	0.33	6.00	838
Canada	3.18	1.24	3.51	0.25	6.09	5,233
Denmark	1.91	0.48	1.86	0.80	3.56	1,181
Finland	1.93	0.68	1.89	0.38	3.87	910
France	2.08	0.58	2.08	0.44	3.58	8,158
Germany	2.08	0.42	2.09	0.62	3.59	2,799
Hong Kong	2.45	0.74	2.55	0.73	4.39	305
India	1.44	0.28	1.39	1.25	2.64	896
Indonesia	2.19	0.62	2.07	1.14	3.82	115
Italy	2.47	0.48	2.40	1.13	4.16	2,230
Japan	1.94	0.46	1.99	0.84	3.42	4,097
Malaysia	2.53	0.42	2.43	0.87	4.36	812
Netherlands	1.39	0.49	1.47	0.15	2.69	833
Norway	1.99	0.55	2.10	0.20	2.65	1,079
Poland	4.12	0.95	4.57	1.00	5.14	209
Portugal	2.23	0.50	2.36	0.50	3.60	399
Singapore	2.70	0.60	2.61	0.87	4.35	882
South Africa	1.90	0.66	1.92	0.50	3.79	404
South Korea	1.59	1.14	1.00	0.20	3.50	1,534
Spain	2.21	0.53	2.34	0.35	3.10	2,262
Sweden	1.53	0.46	1.56	0.40	2.98	1,923
Switzerland	2.22	0.62	2.22	0.16	3.48	1,223
Taiwan	3.41	1.01	3.30	0.96	6.77	1,160
Thailand	1.58	0.44	1.64	0.45	2.76	735
U.K.	2.13	0.51	2.27	0.20	3.54	6,675
U.S.	1.76	0.62	1.74	0.53	3.40	21,467
Non-U.S.	2.19	0.86	2.16	0.15	9.64	52,809
All Countries	2.06	0.82	2.04	0.15	9.64	74,276

Panel B - Average TSC in percentage across fund-size quintiles by country

	Fund size quintiles					5th size quintile minus 1th size quintile	
Country	1th	2th	3rd	4th	5th	Difference	(p-value)
Argentina	3.36	3.05	2.93	3.33	2.79	-0.57**	(0.03)
Australia	1.99	2.27	2.16	1.67	1.49	-0.51***	(0.00)
Austria	2.60	2.45	2.39	2.23	2.20	-0.41***	(0.00)
Belgium	1.75	1.72	1.80	1.92	1.99	0.24***	(0.00)
Brazil	2.24	2.17	2.08	1.90	1.86	-0.38***	(0.00)
Canada	3.18	3.22	3.11	3.20	3.10	-0.09	(0.11)
Denmark	1.94	1.97	1.83	1.92	1.91	-0.03	(0.45)
Finland	1.91	1.87	1.94	1.97	1.96	0.05	(0.46)
France	2.27	2.19	2.05	1.99	1.90	-0.37***	(0.00)
Germany	2.31	2.08	2.04	1.99	1.98	-0.33***	(0.00)
Hong Kong	2.87	2.40	2.42	2.20	2.35	-0.52***	(0.00)
India	1.47	1.46	1.45	1.41	1.40	-0.06**	(0.03)
Indonesia	2.01	2.53	2.13	2.07	2.26	0.25*	(0.10)
Italy	2.47	2.47	2.55	2.48	2.37	-0.1***	(0.00)
Japan	1.98	1.95	1.92	1.98	1.90	-0.08***	(0.01)
Malaysia	2.61	2.60	2.60	2.49	2.39	-0.23***	(0.00)
Netherlands	1.32	1.43	1.44	1.43	1.37	0.05	(0.42)
Norway	1.95	2.04	1.98	2.05	1.99	0.04	(0.56)
Poland	3.58	3.91	4.44	4.37	4.25	0.67***	(0.00)
Portugal	2.03	2.04	2.29	2.38	2.43	0.4***	(0.00)
Singapore	3.10	2.78	2.60	2.59	2.41	-0.69***	(0.00)
South Africa	1.67	1.82	1.74	2.02	2.22	0.55***	(0.00)
South Korea	1.75	1.84	1.77	1.48	1.09	-0.66***	(0.00)
Spain	2.24	2.20	2.18	2.24	2.17	-0.06	(0.12)
Sweden	1.55	1.53	1.52	1.55	1.51	-0.05	(0.15)
Switzerland	2.18	2.21	2.13	2.24	2.38	0.2***	(0.00)
Taiwan	3.11	3.49	3.52	3.47	3.15	0.04	(0.59)
Thailand	1.61	1.49	1.54	1.62	1.68	0.07	(0.23)
U.K.	2.28	2.11	2.11	2.08	2.11	-0.17***	(0.00)
U.S.	2.13	1.88	1.80	1.65	1.40	-0.73***	(0.00)
Non-U.S.	2.26	2.23	2.18	2.16	2.09	-0.17***	(0.00)
All Countries	2.23	2.13	2.07	2.01	1.89	-0.34***	(0.00)

Table 3 - Descriptive statistics of fund size by country.

This table presents descriptive statistics of fund's size, measured by fund's TNA in millions of U.S. dollars at the end of each year. Descriptive statistics include mean, standard deviation and the average TNA for each fund size quintile.

		Standard	Quintiles				
Country	Mean	deviation	1th	2nd	3rd	4th	5th
Argentina	7.61	16.13	0.55	1.41	2.79	5.96	29.05
Australia	146.11	472.85	1.49	8.36	26.71	83.28	612.87
Austria	96.60	182.86	5.93	20.65	45.26	85.33	328.88
Belgium	77.95	181.78	5.90	16.27	34.42	68.96	266.73
Brazil	80.91	156.03	3.01	11.98	30.26	68.17	293.95
Canada	304.82	705.79	7.98	32.48	83.83	211.18	1190.62
Denmark	127.59	252.63	10.89	28.83	58.46	131.42	415.68
Finland	132.97	169.57	14.14	38.57	76.12	157.71	387.63
France	179.30	452.13	6.26	22.11	55.33	136.79	677.65
Germany	352.24	887.78	10.63	33.44	79.32	210.91	1436.44
Hong Kong	182.36	303.73	10.34	40.51	98.70	222.62	575.20
India	126.75	220.22	4.50	17.55	46.06	126.18	445.58
Indonesia	102.93	241.55	1.16	6.54	21.92	83.62	442.73
Italy	274.78	370.23	24.21	77.08	146.85	295.79	838.91
Japan	81.80	277.19	3.07	9.40	20.95	47.16	329.86
Malaysia	44.55	77.97	2.32	10.30	20.67	43.06	149.78
Netherlands	301.50	811.00	11.13	36.22	81.39	194.51	1211.19
Norway	161.55	508.10	6.90	24.59	50.76	104.54	637.10
Poland	158.21	280.41	10.99	46.34	104.37	174.13	500.89
Portugal	47.31	62.95	5.26	14.15	26.88	54.04	145.21
Singapore	55.17	100.99	3.84	11.80	26.03	54.82	183.62
South Africa	157.28	365.11	10.43	30.54	63.61	136.33	556.67
South Korea	48.02	206.48	0.40	1.61	4.04	14.32	223.19
Spain	68.69	146.06	5.49	14.22	28.27	57.97	239.67
Sweden	339.71	537.01	15.27	58.57	144.45	336.67	1151.41
Switzerland	192.10	309.07	18.24	55.58	110.35	204.17	582.10
Taiwan	61.58	79.49	10.87	19.96	35.12	64.77	179.20
Thailand	19.85	48.45	1.94	4.76	8.31	16.61	69.88
U.K.	436.57	933.89	20.25	70.98	165.00	376.43	1553.89
U.S.	1571.02	5885.18	19.84	92.28	265.56	770.98	6713.39
Non-U.S.	206.51	556.96	9.31	31.41	72.08	166.34	760.62
All Countries	600.87	3257.76	12.33	49.00	128.01	341.05	2491.68

Table 4 – Mutual fund characteristics

This table reports means of fund characteristics by country. The sample includes open-end actively managed equity funds from the Lipper database for the 1998-2010 period. Standard deviations across all funds are in parenthesis. See Appendix for variables definitions.

Country	Raw returns (% year)	Four-factor alpha (% year)	TNA family ($ million)	Flows (% year)	Age (years)	Countries fund sold (% year)	Standard deviation (% year)	SMB	HML
Argentina	22.40	-6.89	48	13.64	8.56	1.00	54.28	0.03	0.02
Australia	1.56	-2.75	6,089	-0.23	9.17	1.13	49.96	-0.10	-0.11
Austria	7.77	-1.48	1,580	3.47	10.54	2.56	41.81	0.11	-0.01
Belgium	5.60	-0.80	13,440	-6.03	8.08	3.21	35.01	-0.02	-0.05
Brazil	13.84	-2.24	4,224	-5.36	8.70	1.00	84.04	0.49	-0.07
Canada	5.28	-2.21	12,263	11.98	12.29	1.00	40.12	0.15	-0.01
Denmark	10.79	0.62	1,943	20.69	11.22	1.96	43.61	0.02	-0.11
Finland	11.16	2.92	2,714	18.99	8.30	1.56	46.39	0.11	0.00
France	2.33	-2.24	6,343	6.94	12.39	1.36	41.02	0.11	0.00
Germany	5.11	-2.39	13,291	-4.22	14.27	1.92	40.89	0.00	-0.06
Hong Kong	13.56	6.05	3,621	14.58	15.99	3.36	47.15	0.07	-0.16
India	35.38	0.48	1,734	15.01	8.26	1.46	67.07	-0.31	0.35
Indonesia	37.54	2.07	239	41.59	8.99	1.05	72.10	-0.11	0.05
Italy	0.70	-3.38	4,503	-5.59	10.22	1.02	31.90	-0.06	-0.10
Japan	4.65	1.65	8,517	-14.12	9.44	1.00	40.09	0.12	0.04
Malaysia	12.06	-1.08	765	-7.63	11.50	1.10	35.40	-0.01	0.47
Netherlands	6.38	-1.84	3,254	0.76	12.95	1.26	41.28	0.01	-0.10
Norway	13.94	1.70	2,311	11.79	10.64	1.57	47.45	0.17	0.00
Poland	12.21	-0.44	464	63.66	7.66	1.00	56.48	-0.41	-0.06
Portugal	4.38	-2.37	369	3.79	10.09	1.09	41.32	0.15	-0.11
Singapore	13.97	1.83	863	0.54	9.90	1.25	41.27	0.03	-0.09
South Africa	14.07	0.72	1,536	5.95	9.69	1.00	58.13	-0.28	-0.14
South Korea	22.22	8.14	2,236	-37.98	6.42	1.00	60.12	0.19	-0.47
Spain	3.71	-4.02	1,548	4.97	9.36	1.02	39.16	-0.16	-0.02
Sweden	10.03	-0.45	11,466	7.09	12.82	1.42	45.96	-0.06	-0.20
Switzerland	7.94	-0.28	8,744	-0.71	15.43	1.47	40.04	0.05	-0.03
Taiwan	15.21	-0.62	846	1.81	10.20	1.01	53.28	0.10	0.28
Thailand	25.21	0.84	326	-11.03	8.95	1.00	56.15	-0.23	0.18
U.K.	8.38	1.02	9,426	5.12	16.51	2.05	38.11	0.23	-0.03
U.S.	7.76	1.32	64,067	8.42	14.43	1.05	39.00	0.06	-0.06
Non-U.S.	7.56	-0.69	6,939	2.04	11.64	1.47	43.08	0.07	-0.03
	(28.31)	(10.92)	-9,982	(60.73)	-7.82	-1.59	(17.50)	(0.40)	(0.44)
All Countries	7.62	-0.11	23,450	3.88	12.44	1.35	41.90	0.07	-0.04
	(0.28)	(0.12)	-82,153	(61.33)	-9.49	-1.36	(17.18)	(0.37)	(0.43)

Table 5 – Country characteristics

This table reports means of country characteristics, proxing for the competition in the mutual fund industry, by country. The sample period is from 1998 to 2010. See Appendix for variables definitions. Standard deviations across all countries are in parenthesis.

Country	Fund industry age (years)	Fund industry size	Fund industry Herfindahl	Fund industry equity size (% mkt cap)	Fund industry top five share (%)	Fund industry number of funds
Argentina	49	5,041	0.15	1.80	73.73	62
Australia	43	1,148,516	0.04	38.49	36.39	4,153
Austria	51	105,458	0.13	22.40	67.49	420
Belgium	60	114,923	0.32	26.47	89.90	627
Brazil	52	778,583	0.11	5.35	59.15	916
Canada	76	563,422	0.05	13.98	38.77	2,038
Denmark	45	79,172	0.10	16.84	60.42	241
Finland	20	57,759	0.16	13.69	75.19	222
France	42	1,430,097	0.06	23.60	42.53	1,752
Germany	57	299,536	0.16	10.67	78.92	549
Hong Kong	46	418,591	0.24	38.63	88.30	92
India	43	82,268	0.09	2.42	58.09	300
Indonesia	12		0.26		84.92	53
Italy	22	401,967	0.09	13.56	53.69	373
Japan	41	560,239	0.11	10.92	61.03	1,279
Malaysia	48		0.22		69.07	250
Netherlands	77	96,202	0.13	8.06	70.88	181
Norway	13	50,718	0.17	13.51	81.01	189
Poland	15	22,285	0.11	4.56	64.96	104
Portugal	21	22,171	0.18	3.21	86.99	68
Singapore	48		0.06	6.42	45.41	289
South Africa	43	104,668	0.09	3.40	59.31	219
South Korea	38	227,653	0.14	7.19	64.82	722
Spain	48	293,203	0.10	9.11	60.12	500
Sweden	48	141,644	0.16	22.91	73.13	327
Switzerland	68	148,698	0.21	5.67	80.60	328
Taiwan	24	55,863	0.06		44.76	292
Thailand	12		0.12		66.85	192
U.K.	72	616,213	0.03	15.23	25.51	1,800
U.S.	80	8,800,312	0.05	28.86	40.83	4,227.57
Non-U.S.	50	574,129	0.10	0.16	0.54	1,202
	(18)	(501,999)	(0.07)	(0.09)	(0.19)	(973)
All Countries	59	3,040,421	0.08	0.20	0.50	2,076
	(20)	(3,956,835)	(0.06)	(0.10)	(0.17)	(1,616)

Table 6 – The worldwide relation between fees and size

This table presents the results of yearly panel regressions of fund's fees on selected fund characteristics in the 1998-2010 period. Panel A presents the results when the funds are pooled across the 30 countries our sample, excluding the U.S. and only for the U.S., Panel B presents the results country by country for the remaining 29 countries in our sample. The dependent variable is the fund's total expense ratio, calculated as the sum of the expense ratio and annualized loads (front-end and back-end loads). The independent variables include last year fund's TNA and control variables lagged by one year. See Appendix for variable definitions. Regressions include a time trend variable, country, investment region (Africa, Asia-Pacific, Europe, North America, and Emerging Markets), and fund type (domestic, foreign, regional, and global) fixed effects. Robust t-statistics clustered by country-year (when countries are pooled) or by fund (when regressions are run separately for each country) are reported in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A – All countries, non-U.S. and U.S.

	All countries			Non-U.S.			U.S.			U.S. vs Non-U.S.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Size	-0.036***	-0.037***	-0.037***	-0.024***	-0.025***	-0.025***	-0.060***	-0.059***	-0.061***	-0.038***
	(-8.03)	(-8.18)	(-8.25)	(-4.58)	(-4.72)	(-4.77)	(-8.97)	(-8.82)	(-9.05)	(-5.68)
Age	-0.005	-0.004	-0.006	0.021	0.023	0.022	-0.023	-0.025	-0.029*	-0.056***
	(-0.43)	(-0.38)	(-0.55)	(1.34)	(1.45)	(1.37)	(-1.44)	(-1.57)	(-1.86)	(-3.32)
Family size	-0.115***	-0.115***	-0.115***	-0.081***	-0.081***	-0.081***	-0.157***	-0.157***	-0.156***	-0.072***
	(-12.65)	(-12.62)	(-12.64)	(-7.12)	(-7.09)	(-7.09)	(-20.36)	(-20.29)	(-20.19)	(-5.87)
Stdev	-0.000	-0.000	-0.000	-0.002**	-0.002**	-0.002**	0.001**	0.001***	0.001***	0.003***
	(-0.26)	(-0.35)	(-0.34)	(-2.32)	(-2.50)	(-2.49)	(2.54)	(2.98)	(2.88)	(3.36)
Countries fund sold	0.034***	0.034***	0.034***	0.032***	0.032***	0.032***	-0.005	-0.006	-0.006	-0.030***
	(6.30)	(6.28)	(6.28)	(5.96)	(5.91)	(5.90)	(-0.11)	(-0.14)	(-0.15)	(-3.38)
SMB	0.168***	0.168***	0.168***	0.154***	0.153***	0.153***	0.264***	0.266***	0.263***	0.092***
	(9.73)	(9.54)	(9.54)	(7.55)	(7.44)	(7.44)	(9.26)	(9.31)	(9.22)	(2.82)
HML	-0.031**	-0.028**	-0.028**	-0.024	-0.016	-0.016	-0.066***	-0.072***	-0.071***	-0.050**
	(-2.49)	(-2.22)	(-2.19)	(-1.47)	(-0.97)	(-0.95)	(-4.05)	(-4.45)	(-4.39)	(-2.30)
Time trend	-0.008**	-0.008**	-0.008**	-0.000	0.001	0.001	-0.019***	-0.020***	-0.019***	-0.019***
	(-2.36)	(-2.35)	(-2.32)	(-0.03)	(0.12)	(0.13)	(-11.33)	(-11.67)	(-11.46)	(-3.63)
Alpha		0.001	0.001		0.001	0.001		-0.001***	-0.001***	-0.003**
		(0.62)	(0.64)		(1.25)	(1.25)		(-5.46)	(-5.34)	(-2.30)
F-P sensitivity			-0.028***			-0.016			-0.065***	-0.049***
			(-3.22)			(-1.57)			(-2.78)	(-2.85)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
Adjusted R-squared	0.375	0.375	0.375	0.353	0.353	0.353	0.334	0.335	0.336	0.386
Number of observations	74,276	74,276	74,276	52,809	52,809	52,809	21,467	21,467	21,467	74,276

Panel B – Country by country

Country	Size t-1		Adjusted R-squared	Number of observations
Argentina	0.039	(0.24)	0.376	127
Australia	-0.022	(-1.33)	0.215	2,614
Austria	-0.180***	(-7.30)	0.349	1,050
Belgium	0.035**	(2.03)	0.360	2,126
Brazil	-0.095*	(-1.79)	0.093	838
Canada	-0.009	(-0.43)	0.118	5,233
Denmark	-0.018	(-0.70)	0.171	1,181
Finland	-0.023	(-0.63)	0.328	910
France	-0.025**	(-2.15)	0.143	8,158
Germany	-0.058***	(-4.05)	0.195	2,799
Hong Kong	-0.259***	(-5.51)	0.633	305
India	0.006	(0.55)	0.153	896
Indonesia	-0.255**	(-2.05)	0.450	139
Italy	-0.046*	(-1.72)	0.085	2,230
Japan	-0.010	(-1.13)	0.353	4,097
Malaysia	-0.014	(-0.68)	0.158	812
Netherlands	0.017	(0.57)	0.296	833
Norway	-0.038	(-1.00)	0.199	1,079
Poland	0.180**	(2.07)	0.135	209
Portugal	0.097***	(3.39)	0.210	399
Singapore	-0.116***	(-3.46)	0.305	882
South Africa	0.150***	(3.17)	0.189	404
South Korea	-0.089***	(-4.66)	0.564	454
Spain	-0.011	(-0.42)	0.081	2,262
Sweden	-0.050***	(-3.27)	0.394	1,923
Switzerland	-0.036	(-1.16)	0.328	1,223
Taiwan	-0.038	(-0.73)	0.088	1,160
Thailand	-0.036	(-0.90)	0.080	735
U.K.	-0.054***	(-4.58)	0.080	6,675

Table 7 – Regressing TSC by fund size quintile

This table presents the results of yearly panel regressions of fund's fees on selected fund characteristics in the 1998-2010 period for each of the 30 countries in our saple. We also include in the two last rows the results when the funds are pooled across the 30 countries our sample and excluding the U.S. The dependent variable is the fund's total expense ratio, calculated as the sum of the expense ratio and annualized loads (front-end and back-end loads). The independent variables include fund's TNA, split across last year fund size quintiles within each country, and control variables lagged by one year (not reported). See Appendix for variable definitions. Regressions include a time trend variable, investment region (Africa, Asia-Pacific, Europe, North America, and Emerging Markets) , and fund type (domestic, foreign, regional, and global) fixed effects. Country fixed effects are included when countries are pooled. Robust t-statistics clustered by country-year (when countries are pooled) or by fund (when regressions are run separately for each country) are reported in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	Fund size quintile											
	1st		2nd		3rd		4th		5th		Adjusted	Number of
Country	Coeff.	(t-stat)	Coeff.	(t-stat)	Coeff.	(t-stat)	Coeff.	(t-stat)	Coeff.	(t-stat)	R-squared	observations
Argentina	0.003	(0.01)	1.042	(0.86)	0.339	(0.32)	0.539	(0.72)	-0.027	(-0.05)	0.392	127
Australia	0.087**	(2.57)	0.055	(1.25)	-0.010	(-0.23)	-0.105***	(-2.74)	-0.113***	(-3.14)	0.258	2,614
Austria	-0.232***	(-4.52)	0.019	(0.68)	0.053	(1.64)	0.037	(1.11)	0.037	(0.99)	0.353	1,050
Belgium	0.062	(1.35)	-0.047**	(-2.19)	-0.033	(-1.24)	-0.034	(-1.15)	-0.021	(-0.63)	0.364	2,126
Brazil	0.105	(0.66)	-0.182	(-1.29)	-0.268*	(-1.92)	-0.190	(-1.35)	-0.178	(-1.26)	0.101	838
Canada	0.154*	(1.86)	-0.072*	(-1.77)	-0.098**	(-1.99)	-0.104*	(-1.94)	-0.130**	(-2.19)	0.121	5,233
Denmark	-0.103**	(-2.45)	0.036	(1.46)	0.015	(0.68)	0.045*	(1.90)	0.058**	(2.21)	0.181	1,181
Finland	0.127	(1.49)	-0.074*	(-1.95)	-0.047	(-1.24)	-0.086*	(-1.93)	-0.094**	(-1.99)	0.335	910
France	0.046	(1.54)	-0.026	(-1.46)	-0.051**	(-2.54)	-0.055**	(-2.57)	-0.054**	(-2.35)	0.146	8,158
Germany	-0.135***	(-3.86)	-0.005	(-0.27)	0.025	(1.33)	0.032	(1.56)	0.054**	(2.38)	0.210	2,799
Hong Kong	-0.332***	(-2.98)	0.054	(0.95)	0.039	(0.54)	0.046	(0.60)	0.061	(0.77)	0.631	305
India	0.034	(1.17)	-0.008	(-0.40)	-0.004	(-0.16)	-0.018	(-0.71)	-0.024	(-0.88)	0.157	896
Indonesia	-0.187	(-1.67)	-0.133	(-1.40)	-0.219**	(-2.62)	-0.178**	(-2.18)	-0.069	(-0.89)	0.517	139
Italy	-0.073	(-1.37)	0.015	(0.78)	0.020	(0.89)	0.024	(0.97)	0.015	(0.56)	0.087	2,230
Japan	0.064**	(2.43)	-0.041**	(-2.32)	-0.053***	(-2.66)	-0.053**	(-2.51)	-0.066***	(-2.95)	0.357	4,097
Malaysia	-0.101**	(-2.14)	0.105***	(2.83)	0.089**	(2.24)	0.080**	(1.98)	0.081*	(1.85)	0.165	812
Netherlands	-0.083*	(-1.90)	0.085***	(3.35)	0.077***	(2.81)	0.081***	(2.74)	0.083***	(2.61)	0.309	833
Norway	0.044	(0.66)	-0.037	(-1.47)	-0.057*	(-1.74)	-0.044	(-1.23)	-0.069*	(-1.69)	0.204	1,079
Poland	0.273	(1.40)	-0.117	(-0.99)	-0.047	(-0.35)	-0.075	(-0.48)	-0.092	(-0.62)	0.130	209

Continued on the next page

Table 7 – Regressing TSC by fund size quintile (Continued)

Portugal	-0.155*	(-1.81)	0.048	(1.29)	0.133**	(2.52)	0.165***	(3.02)	0.185***	(2.91)	0.259	399
Singapore	-0.087	(-0.88)	-0.091*	(-1.80)	-0.082	(-1.39)	-0.031	(-0.50)	-0.033	(-0.47)	0.321	882
South Africa	0.047	(0.77)	0.033	(0.86)	0.012	(0.29)	0.069*	(1.69)	0.077*	(1.70)	0.183	404
South Korea	-0.067	(-1.06)	-0.041	(-0.42)	-0.035	(-0.44)	-0.046	(-0.62)	-0.023	(-0.31)	0.564	454
Spain	0.129**	(2.20)	-0.060**	(-2.13)	-0.082**	(-2.34)	-0.082**	(-2.15)	-0.109**	(-2.56)	0.088	2,262
Sweden	-0.076*	(-1.81)	0.012	(0.62)	0.007	(0.31)	0.013	(0.55)	0.020	(0.72)	0.395	1,923
Switzerland	-0.233***	(-3.17)	0.057*	(1.88)	0.049	(1.36)	0.075*	(1.96)	0.124***	(2.94)	0.352	1,223
Taiwan	-0.043	(-0.27)	0.082	(1.40)	0.115*	(1.77)	0.057	(0.75)	0.019	(0.22)	0.103	1,160
Thailand	-0.151***	(-2.93)	0.043	(0.94)	0.067	(1.47)	0.122***	(2.69)	0.155***	(3.34)	0.083	735
U.K.	-0.026	(-1.44)	-0.034***	(-4.62)	-0.029***	(-3.38)	-0.031***	(-3.22)	-0.020*	(-1.81)	0.087	6,675
U.S.	-0.021	(-1.00)	-0.016*	(-1.92)	-0.019*	(-1.83)	-0.028**	(-2.34)	-0.034***	(-3.09)	0.338	21,467
Non-U.S.	0.001	(0.05)	-0.023***	(-3.19)	-0.025***	(-2.76)	-0.022***	(-3.14)	-0.023**	(-2.50)	0.087	52,809
All Countries	-0.005	(-0.25)	-0.035***	(-4.59)	-0.036***	(-4.60)	-0.037***	(-4.65)	-0.035***	(-4.50)	0.122	74,276

Table 8 – TSC versus size and competition (excluding U.S. funds)

This table presents the results of yearly panel regressions of fund's fees on selected fund characteristics in the 1998-2010 period. The dependent variable is the fund's total expense ratio, calculated as the sum of the expense ratio and annualized loads (front-end and back-end loads). The independent variables include last year fund's TNA, proxies for mutual fund industry competition, last year fund's TNA interacted with proxies for mutual fund industry competition, and control variables lagged by one year (not reported). Proxies for mutual fund industry competition include mutual fund industry age, mutual fund industry size, mutual fund industry Herfindahl index, the size of the mutual fund industry as a percentage of the stock market capitalization, the percentage of assets managed by the five biggest mutual fund management companies in the industry, and the number of funds in the fund industry. See Appendix for variable definitions. Regressions include a time trend variable, investment region (Africa, Asia-Pacific, Europe, North America, and Emerging Markets), and fund type (domestic, foreign, regional, and global) fixed effects. Robust t-statistics clustered by country-year are reported in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Size	0.007	0.024**	-0.045***	0.002	-0.034***	0.005
	(0.69)	(2.22)	(-8.71)	(0.18)	(-5.22)	(0.46)
Size x MFI age	-0.035***					
	(-3.38)					
Size x MFI size		-0.056***				
		(-4.69)				
Size x MFI Herfindahl			0.053***			
			(5.25)			
Size x MFI equity size/mcap				-0.030**		
				(-2.29)		
Size x MFI top 5 share					0.029***	
					(3.02)	
Size x MFI number of funds						-0.036***
						(-3.16)
MFI age	0.191					
	(1.51)					
MFI size		0.029***				
		(3.02)				
MFI Herfindahl			-1.625**			
			(-2.17)			
MFI equity size/mcap				0.226		
				(0.94)		
MFI top 5 share					-0.678**	
					(-2.54)	
MFI number of funds						-0.402***
						(-3.36)
Adjusted R-squared	0.082	0.088	0.104	0.098	0.108	0.093
Number of observations	52,809	49,960	52,809	49,618	52,809	52,809

Table 9 – The flow-fee relation, fund size and fund industry competition

This table presents the results of yearly panel regressions of fund flows on selected fund characteristics in the 1998-2010 period. Panel A presents the results when the funds are pooled across the 30 countries in our sample, excluding the U.S., and only for the U.S., Panel B presents the results when countries are split below and above media, taking into account the level of competition in the mutual fund industry concerned. Proxies for mutual fund industry competition include mutual fund industry age, mutual fund industry size, mutual fund industry Herfindahl index, the size of the mutual fund industry as a percentage of the stock market capitalization, the percentage of assets managed by the five biggest mutual fund management companies in the industry, and the number of funds in the fund industry. The dependent variable is the annual fund flows, calculated as in equation (2). The independent variables are fund's TSC, size, fund's TSC interacted with size, and control variables (not reported), all lagged by one year. See Appendix for variable definitions. Regressions include a time trend variable, investment region (Africa, Asia-Pacific, Europe, North America, and Emerging Markets), and fund type (domestic, foreign, regional, and global) fixed effects. Robust t-statistics clustered by country-year are reported in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: The flow-fee relation and fund size

	All countries		Non-U.S.		U.S.		U.S. vs Non-U.S.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TSC	-2.805***	1.074	-1.981**	1.410	-5.296***	-1.658	-2.807**	-2.719
	(-3.48)	(0.55)	(-2.05)	(0.60)	(-8.91)	(-1.06)	(-2.21)	(-0.67)
Size x TSC		-0.551		-0.029		-0.738***		-0.690*
		(-1.49)		(-0.06)		(-2.93)		(-1.88)
Size	-5.175***	-3.203***	-5.039***	-2.968***	-5.777***	-4.506***	-0.749	-1.598
	(-14.01)	(-4.47)	(-10.04)	(-2.85)	(-16.96)	(-7.99)	(-1.18)	(-1.14)
Age	-1.795***	-1.906***	-1.482**	-1.369**	-0.957**	-1.170**	0.346	0.022
	(-3.97)	(-4.19)	(-2.48)	(-2.34)	(-1.96)	(-2.38)	(0.42)	(0.03)
Family size	1.171***	1.172***	0.437	0.491	1.943***	1.964***	1.602***	1.570***
	(5.33)	(5.40)	(1.42)	(1.62)	(10.46)	(10.60)	(4.55)	(4.52)
Flows	0.109***	0.109***	0.068***	0.068***	0.252***	0.252***	0.186***	0.185***
	(6.46)	(6.50)	(5.40)	(5.42)	(19.62)	(19.61)	(8.64)	(8.63)
Stdev	-0.034	-0.030	-0.007	-0.002	-0.088***	-0.091***	-0.074	-0.081
	(-0.82)	(-0.72)	(-0.14)	(-0.04)	(-3.96)	(-4.05)	(-0.88)	(-0.97)
Countries fund sold	2.240***	2.284***	2.310***	2.334***	4.653***	4.296***	2.805***	2.463***
	(5.01)	(5.09)	(4.95)	(5.01)	(4.81)	(4.42)	(2.89)	(2.88)
SMB	2.227	2.349	1.102	1.238	4.080***	3.993***	2.241	2.037
	(1.56)	(1.64)	(0.74)	(0.84)	(3.01)	(2.96)	(0.64)	(0.59)
HML	2.297*	2.361*	0.800	0.836	4.601***	4.683***	3.939	3.988
	(1.85)	(1.89)	(0.74)	(0.77)	(5.39)	(5.51)	(1.26)	(1.27)
Alpha	0.239***	0.238***	0.170***	0.169***	0.308***	0.310***	0.131*	0.133*
	(6.59)	(6.54)	(4.28)	(4.25)	(11.46)	(11.59)	(1.85)	(1.89)
Time trend	-0.287	-0.280	-0.350	-0.358	-0.240**	-0.230**	0.142	0.160
	(-1.56)	(-1.52)	(-1.35)	(-1.38)	(-2.46)	(-2.36)	(0.39)	(0.45)
Country fixed effects	Yes	Yes	Yes	Yes	No	No	No	No
Adjusted R-squared	0.072	0.073	0.065	0.065	0.140	0.140	0.081	0.081
Number of observations	74,276	74,276	52,809	52,809	21,467	21,467	74,276	74,276

Panel B – The flow-fee relation and fund size, and fund industry competition

	MFI age		MFI size		MFI Herfindahl		MFI equity size/mcap		MFI top 5 share		MFI number of funds	
	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Size x TSC	-0.605	-1.114**	-1.071	-0.983*	-1.074***	-0.412	-0.356	-1.732***	-1.391***	-0.640	-0.995	-0.852**
	(-0.79)	(-2.09)	(-1.21)	(-1.75)	(-2.81)	(-0.66)	(-0.45)	(-3.36)	(-2.73)	(-0.89)	(-1.21)	(-2.12)
TSC	-1.056	2.841	5.532	0.911	1.200	-1.529	-6.336*	6.043**	4.506*	-4.775	4.715	-0.030
	(-0.28)	(1.03)	(1.53)	(0.31)	(0.53)	(-0.52)	(-1.83)	(2.37)	(1.86)	(-1.19)	(1.49)	(-0.01)
Size	-3.271*	-3.150***	-6.514***	-2.391*	-3.300***	-3.750***	-6.645***	-0.790	-2.229*	-3.680**	-5.049**	-3.305***
	(-1.92)	(-2.73)	(-2.97)	(-1.96)	(-4.09)	(-2.63)	(-3.62)	(-0.70)	(-1.78)	(-2.49)	(-2.14)	(-4.05)
Adjusted R-squared	0.087	0.045	0.067	0.069	0.075	0.068	0.115	0.050	0.064	0.078	0.065	0.078
Number of observations	25,721	27,088	10,374	39,586	35,432	17,377	11,837	37,845	36,061	16,748	11,381	41,428

Table 10- Explaining the relation between fees and size: The effect of market distress

This table presents the results of yearly panel regressions of fund fees on size, proxies for market distress, and size interacted with proxies for market distress, and control variables lagged by one year. Proxies for market distress include, in Panels A and C, *crisis*, a dummy variable which takes the value of 1 for years 2007 and 2008, and zero otherwise, and in Panels B and D *market return*, which is the average of fund's investment region market return in each year of our sample period. Panels A and B, present the results when the funds are pooled across the 30 countries our sample, excluding the U.S. and only for the U.S., Panels C, and D present the results when countries are split below and above media, taking into account the level of competition in the mutual fund industry concerned. Proxies for mutual fund industry competition include mutual fund industry age, mutual fund industry size, mutual fund industry Herfindahl index, the size of the mutual fund industry as a percentage of the stock market capitalization, the percentage of assets managed by the five biggest mutual fund management companies in the industry, and the number of funds in the fund industry. See Appendix for variable definitions. Regressions include a time trend variable, country, investment region (Africa, Asia-Pacific, Europe, North America, and Emerging Markets), and fund type (domestic, foreign, regional, and global) fixed effects. Robust t-statistics clustered by country-year or by fund (when regressions are run separately for each country) are reported in parentheses. *,**, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Crisis

	All countries		Non-U.S.		U.S.		U.S. vs Non-U.S.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crisis	0.088***	0.108**	0.073***	0.076***	0.045**	0.110***	-0.026	0.030
	(4.59)	(2.07)	(3.93)	(4.17)	(2.61)	(5.13)	(-1.00)	(0.56)
Size	-0.037***	-0.036***	-0.025***	-0.025***	-0.061***	-0.059***	-0.037***	-0.036***
	(-8.28)	(-6.09)	(-4.79)	(-3.75)	(-14.45)	(-12.45)	(-5.67)	(-3.60)
Size x Crisis		-0.005		-0.001		-0.012***		-0.010
		(-0.37)		(-0.09)		(-5.92)		(-0.94)
Country fixed effects	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Adjusted R-squared	0.376	0.376	0.354	0.354	0.337	0.337	0.387	0.387
Number of observations	74,276	74,276	52,809	52,809	21,467	21,467	74,276	74,276

Panel B: Market return

	All countries		Non-U.S.		U.S.		U.S. vs Non-U.S.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Market return	0.030	0.034	0.033*	0.035*	-0.013**	-0.011**	-0.043	-0.044
	(0.98)	(1.09)	(1.69)	(1.74)	(-2.43)	(-2.05)	(-1.35)	(-1.39)
Size	-0.038***	-0.035***	-0.026***	-0.023***	-0.061***	-0.058***	-0.035***	-0.034***
	(-8.55)	(-5.01)	(-4.99)	(-3.01)	(-9.07)	(-8.48)	(-5.34)	(-3.92)
Size x Market return		-0.004		-0.004		-0.006**		-0.001
		(-0.50)		(-0.46)		(-2.52)		(-0.16)
Country fixed effects	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Adjusted R-squared	0.380	0.380	0.357	0.357	0.339	0.339	0.390	0.390
Number of observations	74,276	74,276	52,809	52,809	21,467	21,467	74,276	74,276

Panel C: Crisis and competition

	MFI age		MFI size		MFI Herfindahl		MFI equity size/mcap		MFI top 5 share		MFI number of funds	
	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Size x Crisis	0.016***	-0.019***	0.047***	-0.008***	-0.007**	0.010***	0.059***	-0.005**	-0.008***	0.009***	0.016*	-0.010***
	(4.98)	(-3.97)	(8.85)	(-2.95)	(-2.56)	(3.59)	(6.75)	(-2.14)	(-2.85)	(3.06)	(1.95)	(-3.57)
Crisis	-0.045***	0.112***	-0.040	0.057***	0.054***	-0.008	-0.032***	0.039***	0.061***	-0.001	-0.084**	0.058***
	(-3.84)	(5.02)	(-1.35)	(4.75)	(4.71)	(-0.66)	(-2.63)	(3.50)	(5.19)	(-0.10)	(-2.43)	(5.11)
Size	-0.063***	-0.076***	-0.017	-0.070***	-0.064***	-0.073***	-0.079***	-0.061***	-0.066***	-0.074***	-0.029**	-0.067***
	(-14.04)	(-11.79)	(-1.50)	(-16.33)	(-14.31)	(-16.67)	(-7.84)	(-14.54)	(-14.80)	(-17.13)	(-2.30)	(-16.41)
Adjusted R-squared	0.261	0.390	0.459	0.293	0.347	0.347	0.345	0.352	0.323	0.325	0.443	0.322
Number of observations	39,071	35,908	14,454	56,910	54,062	20,917	14,608	52,719	54,730	20,249	13,823	61,156

Panel D: Market return and competition

	MFI age		MFI size		MFI Herfindahl		MFI equity size/mcap		MFI top 5 share		MFI number of funds	
	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Size x Market return	0.011**	-0.009	0.009**	-0.008	-0.009	0.010*	0.011*	-0.010	-0.008	0.009*	0.014**	-0.007
	(2.30)	(-1.12)	(2.12)	(-1.30)	(-1.35)	(1.96)	(1.77)	(-1.55)	(-1.19)	(1.75)	(2.34)	(-1.18)
Market return	0.014	0.003	0.013	0.011	0.012	0.001	-0.001	0.013	0.011	0.003	-0.002	0.011
	(1.35)	(0.57)	(1.13)	(1.38)	(1.40)	(0.40)	(-0.17)	(1.63)	(1.29)	(0.86)	(-0.46)	(1.46)
Size	-0.017*	-0.026***	-0.006	-0.023***	-0.015*	-0.055***	-0.031*	-0.019***	-0.019**	-0.047***	-0.034***	-0.023***
	(-1.79)	(-3.31)	(-0.55)	(-2.98)	(-1.88)	(-7.64)	(-1.84)	(-2.91)	(-2.40)	(-6.59)	(-3.62)	(-3.11)
Adjusted R-squared	0.343	0.354	0.537	0.300	0.360	0.330	0.359	0.330	0.327	0.473	0.491	0.313
Number of observations	25,721	27,088	10,374	39,586	35,432	17,377	11,837	37,845	36,061	16,748	11,381	41,428

Appendix: Variable definitions

Variable	Definition
Panel A: Fund characteristics	
TSC	Total shareholder costs calculated by adding fund's expense ratio and fund's annualized front-end and back-end loads, as in equation (1)
Raw return	Fund net return in local currency (percentage per year).
Four-factor alpha	Four-factor alpha (percentage per year) estimated with three years of past monthly fund excess returns in local currency. We use local factors (fund domicile) for domestic funds, regional factors for regional funds, and world factors for global funds. Regional factors include Africa, Asia-Pacific, Europe, North America, and Emerging Markets, and the classification is based on the fund´s investment region using data on fund's domicile country and fund's geographic investment style provided by the Lipper database.
Size	Total net assets (TNA) in millions of U.S. dollars (Lipper).
Family size	Family total net assets in millions of U.S. dollars of other equity funds in the same management company excluding the own fund TNA (Lipper).
Age	Number of years since the fund launch date (Lipper).
SMB	Loadings on the small minus big size factor. We use the domestic SMB, for domestic funds, the regional SMB for regional funds, and the global SMB for global funds.
HML	Loadings on the high-minus-low book-to-market factor. We use the domestic HML for domestic funds, the regional HML for regional funds, and the global HML for global funds.
Countries fund sold	Number of countries where a fund is registered to sell (Lipper).
Flow	Percentage growth in TNA (in local currency) in a quarter, net of internal growth (assuming reinvestment of dividends and distributions).
Standard deviation	Annualized standard deviation (percentage per year) of fund returns estimated with three years of past monthly fund returns in local currency.

Panel B: Country characteristics

MFI age	The age of the mutual fund industry calculated as the number of years since the start year (Khorana, Servaes, and Tufano, 2005).
MFI size	The size of the mutual fund industry in each country (ICI).
MFI Herfindahl	The mutual fund industry Herfindahl index calculated as the sum of the squared marked shares (TNA) of the parent management company for equity funds in each country (Lipper).
MFI equity size/mcap	The mutual fund industry equity size as a percentage of the stock the market capitalization in each country (ICI and WDI).
MFI top 5 share	Sum of the market share (TNA) of the top five management companies (equity funds) in each country.
MFI number of funds	The number of primary equity funds in the mutual fund industry in each country.