Investing in a Global World*

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Abstract

We examine active retail mutual funds and institutional products with a mandate to invest in international equity markets between 1991 and 2009. Using global and regional factor models, we find no reliable evidence of alphas in the aggregate or on average. The right tail of the distribution contains some large alphas. Decomposing stock selection from country selection, we find little evidence of superior stock picking abilities in the extreme right tail. Luck versus skill tests show that funds in the tails are there due to luck. Persistence tests also show little evidence of continuation in superior performance.

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1. Introduction

In the Sharpe-Lintner CAPM, all investors should hold the global market portfolio, where global encompasses the world, rather than just the U.S. market portfolio. Even in a multi-factor world, investors should hold globally diversified factor portfolios. The data themselves show potentially large gains to international diversification. Starting perhaps with Grubel (1968), many authors have studied the correlation structure of international equity returns and concluded that investors can benefit from international diversification (see, for example, Levy and Sarnat (1970), Grubel and Fadner (1971), Longin and Solnik (1995, 2001), Ang and Bekaert (2002), Goetzmann, Rouwenhorst, and Li (2005), and many others). One quantification of these benefits comes from De Santis and Gerard (1997), who find that the average premium to international diversification across the G-7 countries is as much as 2.1% per year. Notwithstanding such powerful evidence, or the persuasiveness of both the intuition and the theory, it is functionally difficult for investors to directly invest globally. Frictions play an important, although not uncontroversial, role (see Karolyi and Stulz (2003) for a discussion on disagreement with respect to the importance of frictions). A large literature on home bias bemoans the fact that investors are inadequately diversified and examines a choice list of potential reasons.[1] That list includes sovereign restrictions on capital flows, taxes, transaction costs in trading and rebalancing portfolios, stamp duties, dividend repatriations, exchange rate risk, information differences between local and foreign investors, etc. (see, for example, Stulz (1981)). With so many difficult-to-navigate hindrances to international investment, how is the average investor to act on the apparent wisdom of international diversification?

The answer lies in delegated portfolio management. A professional portfolio manager can produce investment vehicles that reduce the per investor cost of investing in global capital markets. Such a manager can coordinate information acquisition, hedge (or not) exchange rate risk, monitor political risk, handle tax issues, and deal with the innumerable and interminable details necessary for transacting in a global market. Most importantly, the portfolio manager can likely do so at a price that is substantially lower than the investor could achieve on his/her own. At the end of 2009, an individual investor domiciled in the U.S. could invest in over 600 U.S.-registered equity mutual funds which would provide her with some degree of international

[1] Early papers on the home bias puzzle include French and Poterba (1991), Karolyi and Stulz (2003), and Ahearne, Griever and Warnock (2004). Stulz (2005) and French (2008) show that the home bias of U.S. investors has declined over time. See also Hau and Rey (2008) and Chan, Covrig, and Ng (2005).

diversification. Large institutional investors are no less fortunate: at the end of 2009, plan sponsors, endowments and foundations could invest in over 700 institutional investment products whose mandates were either international (ex-U.S.) or global. The Investment Company Institute reports that at the end of 2009, about 9% of all U.S. mutual funds were international equity funds. Yet, despite its size and the potential benefits to investors, this large and increasingly important arm of delegated portfolio management has received little academic attention.

In this paper, we study: (a) U.S.-registered active retail mutual funds that allow individual U.S. investors to invest in global equities, and (b) active institutional products that allow plan sponsors, endowments, and foundations to invest in global equities.[2] Unlike other recent papers in this area (which we discuss later), we have a singular purpose: to understand the returns delivered by these investment vehicles. Institutional funds need not be restricted to U.S.-domiciled investors and can easily be transfigured for non-U.S. sponsors. Similarly, although our retail funds are registered in the U.S. (under the 1940 Investment Company Act), there is little that prevents fund families from marketing a single portfolio strategy using different funds in different countries. Creating such clone funds requires registration and compliance with local regimes, well within the capabilities of global fund management companies. From an economic perspective, two such funds are similar if not identical.

Our sample of retail funds starts with 122 funds in 1991 with over $29 billion in assets and grows to 623 funds at the end of 2009 with $909 billion in assets. Institutional funds are larger than retail mutual funds both in number and size; they grow from 211 funds with an asset value of $141 billion in 1991, to 777 funds that collectively manage $1.2 trillion in 2009. Both data sources have good, if not comprehensive, cross-sectional coverage. They are also free of survivorship bias, exhibiting attrition rates of over 3% per year.

We conduct inferences using global and regional (developed versus emerging markets) CAPM, three and four-factor models. As dependent variables, we use three types of returns. Equal-weighted fund returns tell us about the performance of the average fund, value-weighted fund returns permit us to make statements about what the industry as a whole delivers, and fund-specific returns allow us to examine the cross-sectional distribution of alphas.

[2] Henceforth, we refer to these as retail and institutional funds respectively. We do so for convenience but note that the latter are not "funds" per se. They are more appropriately thought of as strategies from which separate accounts for plan sponsors are derived, and which are represented by composite returns (see Goyal and Wahal (2008) for precise descriptions).

The alphas of equal- and value-weighted mutual fund and institutional fund returns are indistinguishable from zero using three- and four-factor models; on average or on aggregate, there are no risk-adjusted excess returns to be had. To estimate fund-specific alphas, we require a minimum number of returns. Since worse performing funds are more likely to die early, this truncates the distribution of funds from the left, resulting in a sample that is more likely to have positive alphas. Ignoring this truncation, the right tail shows some very large alphas. For instance, for global institutional (retail) funds, the 95th percentile of alphas using global four-factor models is 2.8% (2.2%) per quarter. The 95th percentiles for developed and emerging market funds are a bit smaller but economically still large. There are at least two potential explanations for these large alphas. One possibility is that the managers of these funds generate superior performance through stock and/or country-selection. Another is that the alphas in the tails are not due to genuine skill but merely luck.

To understand stock versus country selection, for each fund, we calculate the difference between the actual fund return and the return that an investor would have earned with the same country weights but earning passive country index returns. This decomposition shows some statistical evidence in favor of security selection at the extreme right tail of the distribution of alphas. But its economic importance for investors is questionable – there are very few funds with such ability. We also investigate the country selection process itself and find that country weight changes are uncorrelated with prior returns. An exception is that when active international funds enter a country, they do so after positive returns. If there is genuine alpha in the right tail, our results show that a modest amount comes from security selection; therefore, we can only conclude that the residual must come from country selection.

To determine whether funds in the tails are there because they have genuine skill or are merely lucky, we perform simulations in the spirit of Kosowski et al. (2006) and Fama and French (2010). These simulations, which essentially compare simulated *t*-statistics under the null of no alpha to actual *t*-statistics, show no evidence of skill – funds that appear in the tails are likely there by chance. Suppose one considers the 95th percentile of the cross-sectional distribution of *t*-statistics of four-factor alphas for institutional developed (emerging) market funds: here the percentage of simulated *t*-statistics that are greater than actual *t*-statistics is 47.8% (5.5%). The equivalent number for retail funds is 24.3% (29.8%).

Fund investors are, of course, more interested in whether there are ex-ante rules which allow them to choose subsequent winners over a certain period. However, tests of persistence show very little persistence beyond one year. Similar to Carhart (1997), momentum accounts for a large part of the continuation of performance; four-factor alphas are quite a bit smaller than three-factor alphas. We also find that, in spite of the absence of persistence, investors supplying capital to these funds chase returns, much like their counterparts in active domestic equity funds.

Where does this leave the average investor? All our results are generated using returns that are gross of fees. Expense ratios generally vary between 1% and 2% per year, further eroding any risk-adjusted excess return that an investor might hope for. The results, therefore, imply that the average investor is better off diversifying internationally using low-cost passive instruments; a statement that echoes decades of research on asset management in the U.S.[3]

The similarity in the lack of excess performance by domestic and international equity managers is far from obvious ex ante. It is not an uncommon belief that markets outside of the most developed ones are less efficient and therefore exploitable by active fund managers (see Bekaert and Harvey (2002) for academic evidence on relative inefficiency of emerging markets). All else equal, this implies that the search for alpha (by academics and practitioners alike) would be more fruitful in international (ex-U.S.) markets. The performance of U.S.-based international equity managers is, therefore, an open empirical question. The evidence that we provide is direct and therefore important to be prescriptive.

Our paper contributes to the enormous literature on market efficiency. Tests of market efficiency can be conducted in two broad ways. The first analyzes predictable patterns in stock returns (serial correlation, deriving profitable trading strategies based on observable characteristics, etc.). The second analyzes whether some groups of investors earn abnormal returns.[4] The prior literature on efficiency of foreign markets has primarily concentrated on the first kind of these tests (see Griffin, Kelly and Nardari (2010) and references therein). Our paper analyzes market efficiency from the second perspective. The absence of alphas in our sample implies that money managers are unable to "beat the market" and, thus, provides prima facie

[3] The issue of whether low-cost passive instruments that generate exposures to common factors are available to investors is an interesting and practical one, but outside the boundary of our paper. Cremers et al. (2011) report that indexing is rare in the 30 countries that they examine.

[4] Both kinds of tests have their advantages and disadvantages. The first one is direct but it is hard to deal with issues such as time variation in expected returns, joint hypotheses problems, trading costs, etc. The second one tackles the issue head-on in the sense that if professional investors cannot generate alpha then, as Rubinstein (2001) points out, the case for efficient markets is strong.

evidence of market efficiency. An important caveat is that we analyze a particular group of investment channels – it could very well be that U.S. investors investing through other channels, or non-U.S. investors investing through non-clone funds, realize alphas in these same markets. Thus, we can only claim to find evidence of market efficiency from the point of view of investors using these vehicles.

Our paper also quite naturally contributes to the academic debate on the relative information advantage of domestic versus foreign investors. It has been frequently argued that local investors are better informed by virtue of being more familiar with the environment, having better access to information, and being physically closer to local firms (Chan, Menkveld and Yang (2007)). In fact, the existence of home bias can be viewed as a reflection of the informational disadvantage of foreign investors relative to local investors (Brennan and Cao (1997) and Kang and Stulz (1997)). On the other hand, a number of studies document that foreign investors have superior information, typically reaching this conclusion by examining the aggregate post-trade performance of foreign versus domestic investors. For example, Froot, O'Connell, and Seasholes (2001) and Froot and Ramadorai (2008) find that foreign purchases predict prices in foreign markets. Our analysis of disaggregated returns earned by foreign investors allows us to provide direct evidence on the informational advantage, or lack thereof, of foreign investors.

Finally, our paper fits into the broad literature on the performance of delegated asset managers. The vast majority of that literature is U.S.-focused, with some recent notable exceptions. Khorana, Servaes, and Tufano (2005, 2009) try to understand the size and fee structure of the mutual fund industry around the world. There are numerous studies that examine the performance of funds in non-U.S. countries (see, for example, Panetta and Cesari (2002) and Blake and Timmermann (1998)) with mixed conclusions. There are three recent studies with a broader international perspective. Ferreira, Miguel, and Ramos (2009) study domestic and international equity funds across 27 countries, but their interest is in scale issues and cross-sectional determinants of performance differences. Didier, Rigobon, and Schmukler (2011) seek to understand why U.S. funds that invest overseas invest in a relatively small number of securities. Cremers et al. (2011) study funds from 30 countries and find that closet indexing is common and that explicit indexing is rare. If that is the case, then the representative investor in our paper is somewhat hapless – she has to pay the costs of active management but receives

returns that are no better than those that might be available from a passive portfolio. The unanswered question is why passive investing is not more widespread.

The remainder of the paper is organized as follows. Section 2 describes the mutual fund and institutional data, as well as our procedures for factor construction. Section 3 contains our results. Section 4 concludes.

2. Data

Our analysis requires data from multiple sources. In this section, we describe the basic elements of the data and our sampling procedures, as well as descriptive statistics for these data.

2.1. Institutional Funds

Data on global institutional products come from Informa Investment Solutions (IIS), a firm that provides data, services and consulting to plan sponsors, investment consultants and investment managers. We refer to these products as "funds" in the text but they are more appropriately thought of as strategies from which multiple products (funds, separate accounts, etc.) are derived. Although the data are self-reported, plan sponsor oversight, the threat of and actual regulatory audits, monitoring by investment consulting firms, and GIPS compliance requirements ensure accuracy (see www.gipsstandards.org). The sample period is from 1991 to 2009.

The database contains descriptions of investment style, which we use to identify equity funds that are either international or global in nature and to assign benchmark indices. This eliminates domestic equity, fixed income and balanced funds. We also eliminate all passive funds. Since our interest is in internationally diversified funds, we remove all country specific funds or funds with narrow mandates such as 'Asia Pacific' or 'Emerging Markets Latin America.' We thus keep only funds with mandates to invest globally (MSCI benchmark = AC World Index), developed markets (MSCI benchmark = World Index), and emerging markets (MSCI benchmark = Emerging Markets).[5] This gives us a sample of 1,218 institutional funds.

For this sample, we gather quarterly returns that are net of trading costs but gross of fees. We also collect annual fee schedules, portfolio turnover, and assets under management. Asset

[5] Some funds have international (ex-U.S.) rather than global mandates. We ignore this distinction and classify an international fund with a developed markets mandate as a developed markets fund. Funds with EAFE mandates (essentially excluding North America) are also classified as developed market funds.

information is not available for all funds. The data also contain self-reported quarterly country weights for each fund, although the weight may have a reporting delay (i.e. the weight may not be at the end of the quarter but rather during the quarter). These country weights are available for the period 1996 to 2009. Some data items are cross-sectional, such as investment style and manager-identified benchmark.

2.2. Retail Funds

We start with all mutual funds in the CRSP Mutual Fund database from 1991 to 2009, so as to match the sample of institutional funds. To this universe, we apply a sequence of filters. We retain only funds for which the Lipper Asset Code is equity. This eliminates fixed income funds (including money market and convertible bond funds), real estate funds, and balanced funds. One way to separate international/global equity funds from domestic equity funds is to employ the 'product type' field maintained by CRSP that explicitly identifies international funds. However, an examination of the raw data shows that this field is frequently missing and omits many international/global equity funds. Therefore, we manually examine fund objectives (labeled 'Lipper Class Names' by CRSP) to extract a relevant list of funds. Roughly speaking, it includes all funds identified with 'global' and 'international' monikers, as well as some regional funds. These procedures generate a list of international/global equity funds. From this list, we further remove funds that CRSP identifies as being variable annuity or index funds. Unfortunately, these programmatic filters are still inadequate. Therefore, based on the fund's name, we eliminate single-country funds, sector/industry funds, levered funds, and any remaining index funds. This leaves us with a group of funds whose investment objective is to invest globally or in developed and/or emerging markets.

Some of our tests require each fund to have a benchmark index. For each fund, we use a sequential process to assign a benchmark to each fund. First, we use the fund's prospectus benchmark as reported in the Morningstar Direct database. Second, we examine documents filed by the fund with the SEC, typically in the EDGAR filing system or through commercial reference databases. Third, if the above procedures are unable to assign a benchmark, we use the Lipper Class Name provided by CRSP to assign a benchmark that approximates that class name. In the majority of cases, the benchmark indices established using these procedures are MSCI-based. In cases where a fund designates a non-MSCI index as its benchmark, we map it to an

equivalent MSCI index. This allows us to use a manageable number of indices and also enables comparisons with institutional funds.

The above process delivers a sample of 1,107 funds for our sample period. For these funds, we extract data on returns, TNA, 12b-1 fees, management fees, expense ratios and portfolio turnover from CRSP. Since these data items are at the fund class level, we aggregate them to a fund level using a two step process. CRSP does not match fund classes with parent funds for global funds, so we manually assign multiple classes of a fund to a unique fund identifier. Frequently, such assignment is obvious from the fund's name (e.g. Aberdeen International Equity Fund Class A Shares and Aberdeen International Equity Fund Class B Shares). In some cases, however, this again requires background research from public sources (typically the fund's website, Lipper or Morningstar). Once unique fund identifiers are assigned, we calculate TNA-weighted averages across all fund classes for the variables of interest.

We obtain country weight information from the Morningstar Direct database. The weights are reported monthly for each fund class. As before, we map each fund class to unique fund identifiers. As a check on these self-reported weights, we also design a web-crawler to access mandatory weights reported on Form N-Q to the SEC. These data are only available after 2003, and filings are at the end of the first and third quarter. Nonetheless, they allow us to verify the accuracy of the self-reported weights.

2.3. Factors

We conduct performance evaluation using alphas from factor models. There is, however, little consensus about the right asset pricing model. Fama and French (1998) demonstrate the failure of the international CAPM and propose a two-factor model that includes a value factor. Griffin (2002) asks whether these factors should be local or global. Hou, Karolyi, and Kho (2011) find that momentum and value factors capture much of the common variation in global stock returns.

There is also little consensus about the right way to construct factors. Fama and French (1998) and Griffin (2002) construct world factors using country-specific breakpoints and then employ country (total market capitalization) weights to aggregate across countries. Hou, Karolyi, and Kho (2011) construct factors using global, rather than country-specific, breakpoints. Finally,

Fama and French (2011) examine variation in value and momentum premiums across size groups by constructing factors using global or regional size breakpoints.

Some of the variation in construction methods is undoubtedly due to views about market integration. The precise nature of the tests (for instance, if one is interested in variations of premiums across size groups) also influences methodological choices. Unlike the above authors, we have no asset pricing purpose and therefore take a stripped down approach to performance assessment. Given the weight of the above-cited literature, we focus our attention on three- and four-factor alphas. With respect to factor construction, we follow the approach used by Ken French as detailed on his website and largely following Fama and French (1998). That is, we first construct factors for each country using country-specific breakpoints, and then aggregate these country-specific factors to the appropriate region (or world) based on the country's market capitalization. That way, for example, small stocks in Thailand are separated from large stocks in Thailand; using global breakpoints, most stocks in Thailand would enter into a small stock portfolio. We believe our approach makes both economic and practical sense: many portfolio managers make a distinction between small and large stocks within a country.[6]

We construct separate factors for global, developed, and emerging markets. Aside from being intuitively appealing, this geographic classification has an added advantage in that it reflects the way that many practitioners think about these issues; ex-U.S. or global funds are frequently characterized as 'Developed Market' funds, 'Emerging Market' funds, or 'EAFE' funds. For each of these regions, we construct a market factor (MktmRf), size factor (SMB), value factor (HML), and momentum factor (UMD). Further details on factor construction are provided in Appendix A.

2.4. Descriptive Statistics

2.4.1. Institutional Funds

Panel A of Table 1 shows the number of institutional funds, average and total assets, average portfolio turnover rates and fee schedules in each year. Generally, the number of funds and total assets increase over time. In 2008, concomitant with the market break, both the number of funds and total assets decline. Despite that decline, the average annual growth rate in the

[6] Our UMD factor sorts stocks within a country. Thus, the momentum factor does not directly pick up on across country momentum.

number of global institutional funds (total assets) over this sample period is 7.9% (13.4%). At the end of the time series, there are 777 funds with over $1.2 trillion invested.

Average portfolio turnover varies from a minimum of 52% per year in 1991 to a maximum of 83% in 2000, but averages about 65%. Fees reported in the panel are constructed from fee schedules based on investments of $10m, $50m and $100m. These schedules are nominal and represent an upper limit; actual fees are typically lower and are individually negotiated by plan sponsors. There appears to be a slight increase in average stated fees over time but the increase is gradual. Not surprisingly, fees are lower for large investment mandates, reflecting expected quantity discounts. The stated fees are higher than those for domestic equity funds. For instance, in 2009, the average $10m, $50m and $100m fees in our global funds are 0.87%, 0.78% and 0.72% respectively. The equivalent fees for domestic equity reported by Busse, Goyal, and Wahal (2010) are 0.81%, 0.69%, and 0.64% respectively.

We also show the number of funds and total assets for global, developed and emerging markets funds separately for 1991, 1998 and 2009. Particularly noticeable is the dramatic increase in assets devoted to emerging market funds, from $3.3 billion in 1991 to over $200 billion in 2009.

2.4.2. Retail Funds

Panel A of Table 2 shows that the sample of retail mutual funds also experiences growth over time. The number of funds (total assets under management) grows from 122 ($29 billion) in 1991 to 623 ($909 billion) in 2009, representing a 10.1% (22.5%) annual increase. Together with institutional funds, at the end of 2009, these investments represent just under 5% of the total world market capitalization of $45 trillion (World Federation of Exchanges). Average turnover over the entire sample period is 75%, somewhat higher than for institutional funds. This could be because retail portfolios are constructed differently, or, just as likely, because retail fund flows have higher variability than institutional flows. The last three columns of the panel show actual 12b-1 fees, expense ratios and management fees for funds in each year. CRSP does not record 12b-1 and management fees until 1993 and 1999 respectively, but expense ratios are available for the entire time series. Expense ratios generally increase from 1991 to the early 2000s and decline thereafter. Expense ratios are between 1.7% and 2.0%. In contrast, the Investment Company Institute (2009) reports average expense ratios for all stock funds declining from

1.28% in 2000 to 0.99% in 2008. As before, Panel B shows the number of funds and total assets under management separately for global, developed and emerging market funds. Again, there is dramatic growth in both the number of funds and assets under management directed towards emerging markets.

2.4.3. Global Returns and Factors

Table 3 shows average annual returns, standard deviations and *t*-statistics of factor mimicking portfolios for the market factor (based on MSCI returns in excess of the U.S. T-bill rate), the SMB factor, the HML factor and the momentum factor (UMD). In addition to global factors, we also show returns for developed and emerging markets separately (Panels B and C respectively).

Fama and French (1998) report a global market return (not excluding a risk free rate) of 9.6% for 13 major countries between 1975 and 1995 with a standard deviation of 15.67%. Hou, Karolyi and Kho (2011) find an excess global market return of 5.6%. Fama and French (2011) report an annual market premium for developed markets of 4.7%. The global market risk premium in our data is 5.17% per year with a standard deviation of 17%.

Our estimate of the size premium is 1.19% (*t*-statistic of 1.13), 1.30% (*t*-statistic of 1.15) and −0.62% (*t*-statistic of -0.21) for global, developed, and emerging markets, respectively. The value premium estimates are much larger than those for the size premium for all regions. For instance, the value premium is 7.22% for developed markets and 13.23% for emerging markets. Our size and value premium estimates for developed markets are comparable to those reported by Fama and French (2011) (size premium of 1.08% and value premium of 5.52%). Momentum effects are strong in developed markets (premium of 9.83% with a *t*-statistic of 2.99) but weak in emerging markets (premium of 4.26% with a *t*-statistic of 1.12).

3. Results

3.1. Methodology

We calculate abnormal performance based on alphas from factor models. We use factors corresponding to the CAPM, Fama and French (1993) three-factor model, and the Carhart (1997) four-factor model to provide as much information as possible to the reader. But we conduct the majority of inferences using a four-factor approach.

Recall that our sample excludes country-specific or industry-specific funds; the fund returns that serve as our dependent variables are those that invest globally, or in large geographic regions such as developed or emerging markets. Whether one should use the global, developed, or emerging markets versions of the factors to assess performance depends on the investment mandate of the funds themselves. Funds that have a mandate to invest globally should be evaluated with global factor models. In turn, funds that invest in developed markets should be evaluated using factors for developed markets, and funds that invest in emerging markets should be evaluated using factors from emerging markets.[7] We estimate alphas of global funds from global markets factors. However, the restrictions of developed/emerging market funds on where they can invest are somewhat nebulous (i.e. funds have some latitude in what they regard as a "developed" or "emerging" market). We, therefore, cannot assume that the countries actually covered under the mandate of the fund are identical to our (MSCI) definitions of developed and emerging market regions.[8] In our data, developed market funds hold 8.1% of their assets in what MSCI classifies as emerging market countries; and emerging market funds hold 8.4% of their assets in developed countries. Given the looseness of the country investment opportunity set and the ability of fund managers to define their own universe, we evaluate developed market funds using both developed and emerging market factors. Similarly, for emerging market funds, we use factor models with both developed and emerging market factors.

To summarize, we estimate the following time-series regressions:

$$R_{it} - R_{ft} = \alpha_{ig} + \beta'_{ig} F_{gt} + e_{it} \quad (1)$$

$$R_{it} - R_{ft} = \alpha_{ide} + \beta'_{id} F_{dt} + \beta'_{ie} F_{et} + u_{it} \quad (2)$$

where F's are factors, subscripts g, d, and e refer to global market capitalization-weights, developed, and emerging markets weights, respectively. R_{ft} is the U.S. one-month Treasury Bill rate.

The dependent variables in these regressions consist of (a) equal-weighted returns of all funds, (b) value-weighted returns of all funds where the weight is the assets under management

[7] The choice of the factors (i.e. whether they are global or regional) for performance evaluation is independent of the debate on whether markets are integrated or segmented. For instance, even under the null of perfectly integrated markets, the right factors for a fund with a mandate to invest only in emerging markets are emerging market factors.

[8] For instance, in May 2010, Israel was reclassified by MSCI from an emerging market to a developed market. An active fund could regard Israel as a developed market prior to that reclassification. If we do not use emerging market factors as regressors, this fund's loading on Israel would not show up in our developed market factors (which do not include Israel).

in the prior year for institutional funds and in the prior quarter for mutual funds, or (c) individual fund returns. Equal-weighted returns give us a sense of what the average fund delivers. Value-weighted returns provide information about what the industry as a whole delivers.

We use the highest frequency of data available; for retail mutual funds we estimate regressions using monthly returns while for institutional funds we use quarterly data. Retail funds are net of fees, so to compare them to institutional funds, we add one-twelfth of the annual expense ratio back to the monthly return. We report all alphas in percent per quarter, even for regressions using monthly frequency.

3.2. Average and Aggregate Performance

Table 4 shows factor models for equal- and value-weighted returns for institutional and retail funds. Panels A and B show models for institutional funds using global factors and developed/emerging market factors respectively. Panels C and D show the same specifications for retail funds. Panels A and C show alphas for global funds. Panels B and D show alphas for developed market and emerging market funds. We report both factor loadings and alphas. The latter are highlighted in the interest of readability. The numbers in parentheses next to the coefficients are *t*-statistics.

Panel A shows that the market beta of all institutional funds is close to one. There is a considerable size tilt. Lower SMB loadings for regressions with value-weighted aggregate returns than those using equal-weighted average returns are evidence of the fact that larger funds invest in higher market-capitalization securities. Loadings on the value factor are significant only using value-weighted aggregate returns implying that smaller funds have no distinct preference for value or growth stocks. Momentum loadings are small and insignificant. These loadings mirror those reported by Fama and French (2010) for the sample of U.S. retail mutual funds. The time-series fit of these models is quite good with adjusted-R^2 of around 95% for the four-factor model.

Turning to estimates of alphas, the equal-weighted one-factor alpha for all institutional funds is 0.65% per quarter with a *t*-statistic of 2.10. Using a three-factor model reduces the alpha by half to 0.32% with correspondingly reduced statistical significance (*t*-statistic=1.02). Adding momentum shrinks alpha further, to about 0.17%, again statistically indistinguishable from zero. Alphas for value-weighted returns do not fare much better. Alphas from all models are

statistically insignificant. The point estimates of alphas for three- and four-factor models are negative.

The sample of 'all funds' includes developed and emerging markets funds for which we have argued that one should not use global factors (we recommend using developed and emerging market factors). The results for the sample of global funds in Panel A are thus more appropriate. However, the pattern of loadings and alphas is very similar for 'all funds' and 'global only' funds.

Panel B of Table 4 presents the results for institutional funds using factors from developed and emerging markets. As before, we present results for all funds to be complete but focus our discussion on developed and emerging market funds. As expected, developed markets funds have higher market loadings on the developed market factor than on the emerging market factor. Their loadings on the emerging market SMB, HML, and UMD factors are, in general, small and statistically insignificant. However, developed market funds have high and statistically significant loadings on the developed market versions of the HML and UMD factors (especially compared to loadings of global funds on global factors). One-factor alphas are large for equal-weighted average returns. However, alphas from the three- and four-factor models are small and/or negative. In fact, the four-factor alpha using value-weighted aggregate returns of developed market funds is −0.63% per quarter with a *t*-statistic of −2.16.

Unsurprisingly, emerging markets institutional funds load more heavily on the market factor from emerging markets than on the market factor from developed markets. Their loadings on size, value and momentum factors (both developed and emerging) are generally small. The only exception is the negative loading on the emerging markets SMB factor, which indicates that emerging markets funds tend to shy away from small-cap stocks in emerging markets. The adjusted-R^2 of factor models is slightly higher for emerging markets funds than that for developed markets funds, although both are in excess of 95%. The alphas for emerging markets funds are positive, but statistically insignificant (with the exception of the one-factor alpha from equal-weighted average returns). Perhaps more noticeable is the fact that emerging market fund alphas are higher than developed market fund alphas. The implication is that while emerging market funds are not able to deliver absolute alphas, on a relative basis, they are more successful than developed market funds.

Results for retail funds are presented in Panels C and D of Table 4. Model fit, as measured by adjusted-R^2, is lower in all specifications for retail funds than it is for institutional funds. This might be a reflection of less diversified portfolios for retail funds or it might reflect that retail funds hold some fraction of their assets in cash. Didier, Rigobon, and Schmukler (2011) report that the median number of stocks held by such retail funds is 95, suggesting that the former is the case. There is one notable difference between the factor loadings of global institutional and retail funds: the coefficient on HML is systematically higher (and frequently statistically significant) in institutional funds. This is especially the case using value-weighted aggregate returns. For example, for global funds (Panels A and C), the coefficient on HML in the four-factor model is 0.227 (*t*-statistic=4.99) for institutional funds but −0.060 (*t*-statistic=−1.54) for retail funds. Apparently, value strategies are more popular among plan sponsors than among retail investors.

Alphas for retail funds show similar patterns to that of institutional funds. They are statistically insignificant and decrease in magnitude as one goes from a one-factor model to a four-factor model. There are, however, two noteworthy differences. First, alphas for value-weighted aggregate returns are higher than those for equal-weighted average returns for retail funds (the opposite is true for institutional funds). This means that larger retail funds deliver better risk-adjusted performance than their smaller counterparts, and is consistent with Ferreira, Miguel, and Ramos (2009) who report that the negative relation between size and performance in domestic funds does not seem to be present in international funds. Second, in general, the magnitude of alphas is higher for value-weighted aggregate retail funds than it is for institutional funds (the reverse is true for equal-weighted averages). There are several potential explanations. As forcefully argued by Lakonishok, Shleifer and Vishny (1992), it could be that agency costs are higher in institutional funds than in retail funds. It is also possible that scale economies are different for retail versus institutional funds. Our data do not allow us to distinguish between these two (non-mutually exclusive) alternatives.

Regardless of the differences between institutional and retail funds, the data do not speak highly of the ability of the average fund to deliver alpha relative to even the simplest factor models. Moreover, the industry as a whole does not deliver risk-adjusted excess returns. It is useful to keep in mind that our alphas are generated from returns that are gross of fees. At the end of 2009, the average fee for institutional funds with a mandate of $50 million was 0.78%,

and for retail funds, the average expense ratio was 1.50%. Thus, net of fees, investors receive alphas that are at best zero, but most likely negative.

3.3. The Distribution of Performance

The inability of the average fund, or of the industry as a whole, to deliver alpha does not mean some funds cannot and do not do so. No active fund wants to regard itself as average, and no active investor wants to think of herself as picking the average fund. We, therefore, turn our attention to the examination of the cross-sectional distribution of performance across funds.

In Table 5, we tabulate various percentiles of alphas based on individual fund regressions for institutional (Panel A) and retail (Panel B) funds, and show the percentage of alphas that are positive (or negative) and statistically significant. The former gives us a sense of the overall distribution while the latter gives us a sense of the statistical significance of these alphas. We show these distributions for global funds, developed market funds, and emerging market funds, evaluated with appropriate factor models.

Ideally, we would like to estimate regressions for each fund and examine the full distribution of coefficients. But this requires a long time series of returns for both dead and live funds. We, therefore, require a minimum number of observations before we estimate the factor model regressions for individual funds. Since dead funds are more likely to underperform, by requiring a minimum time series of returns, we induce an upward bias in the distribution of alphas.

For retail funds, we require a minimum of 24 monthly returns to estimate factor models. Since our returns data for institutional funds are quarterly, we require 20 quarterly returns. These restrictions reduce the number of institutional (retail) funds from 1,218 (1,107) to 904 (892), a truncation of about 25% (20%). Thus, the upward bias induced by truncation is similar and large for both samples. We bear this in mind when examining the tails.

Global institutional funds have a median (global) three-factor alpha of 0.44% per quarter. But adding the momentum factor shrinks that alpha to 0.22% per quarter. At the 90^{th} percentile, the quarterly four-factor alpha is 1.92%. If we assess statistical significance at the 5% level and use four-factor alphas, 11.63% of institutional funds have positive and significant alphas.

For global retail funds, the median fund does not do as well; the (global) four-factor alpha is slightly negative. But the 90^{th} percentile of four-factor alpha is still large, at 1.55%. Moreover,

at the 5% level of significance, 8.70% of retail funds have positive and statistically significant alphas.

The median institutional and retail developed market fund has four-factor alphas that are quite negative, at −0.39% and −0.22%, respectively. But at the 90th percentile, institutional (retail) four-factor alphas for developed market funds are 0.88% (0.79%). Assessing statistical significance at the 5% level, only 3.75% (4.50%) of institutional (retail) funds have positive and significant alphas.

There is a similar pattern in emerging market funds, but the right skewness in alphas is larger. The 90th percentile of institutional (retail) funds has a four-factor alpha of 1.60% (1.30%) per quarter. Moreover, at the 5% level, 9.48% (4.76%) of institutional (retail) funds have positive and significant alphas.

The center of the distribution of alphas can be inferred from the results on equal-weighted aggregate returns in Table 4, although not exactly because of the truncation described above. We already know that four-factor alphas for institutional funds are highest for emerging market funds and lowest (negative) for developed market funds. There is a similar pattern for retail funds with the exception that global retail funds have negative alphas while global institutional funds do not. These facts are reflected in the right or left shift (from zero) of the distribution of alphas reported in Table 5. What cannot be inferred from Table 4, and is therefore new in Table 5, is the wide spread in the tails of the distribution.

Where does this leave us? Clearly the right tail of the distribution generates impressive performance. Ignoring issues of model error and statistical inference for the moment, and focusing solely on magnitudes, a quarterly alpha between 1% and 2% cannot be ignored.[9] From an economic perspective, these alphas justify the expense ratios reported in Tables 1 and 2. In the next section, we attempt to understand the source of this abnormal performance.

3.3.1. Country versus Security Selection

Consider a simple performance attribution of fund returns. Letting w_{ict} (w_{bct}) be the weights in country *c* at time *t* by fund *i* (benchmark *b*), R_{ict} be the returns generated by fund *i* in

[9] As a specification check, we also include lagged values of factors in the models in tables 4 and 5. We do not report values in tables but in the vast majority of cases, there are only minor variations in alphas. The only noticeable difference comes in value-weighted aggregate alphas for global institutional funds, where the alphas become more negative and sometimes statistically significant.

country *c* at time *t*, and R_{bct} be the benchmark market return in country *c* at time *t*, it is easily verified that:

$$R_{it} - R_{bt} = \sum_c w_{ict-1} R_{ict} - \sum_c w_{bct-1} R_{bct}$$
$$= \sum_c (w_{ict-1} - w_{bct-1}) R_{bct} + \sum_c w_{ict-1} (R_{ict} - R_{bct}) \quad (3)$$

The first term on the right-hand side is the contribution to excess returns due to country selection, while the second term is the contribution due to security selection. To determine whether the alphas in the right tail come from security selection by fund managers, we calculate this security selection component for fund *i* as follows:

$$SR_{it} = R_{it} - \sum_c w_{ict-1} R_{bct} \,, \quad (4)$$

where we use the country index return from MSCI as R_{bct} and weights reported by the funds themselves as w_{ict-1}.

We then estimate time-series factor models on this security-selection return. Country weights for institutional funds are available only from 1996. Even after this time period, this information is missing for many funds. Further imposing the requirement of at least 20 quarters shrinks the sample to only 345 funds (from 1,218 funds). For retail mutual funds, coverage is equally sparse, and we can only estimate models for 422 funds. The number of funds in sub-categories (global, developed, and emerging) is, obviously, even smaller. Particularly noteworthy is the fact that for retail emerging market funds, we cannot estimate factor models at all. Given that, the numbers reported below for the cross-sectional distribution of alphas/excess returns should be interpreted with care.

Table 6 shows the distribution of results for various percentiles of alphas and/or excess returns. We also show the percentage of positive/negative and significant alphas at various levels of significance. For global institutional funds, at the 5% level of significance, there are 9.43% of funds with significantly positive alphas using the four-factor model. At the same level of significance, there are 7.41% of retail funds with positive and statistically significant excess returns. The numbers are similar for developed and emerging market funds. In developed market funds, at the 5% level of significance, 5.02% (5.79%) of institutional (retail) funds have significant alphas using a four-factor model. And in emerging market funds, the equivalent figure for institutional funds is 3.77%.

On the surface, some of these statistics, particularly for global funds, suggest some successful stock picking ability. But we urge caution. There are only 53 (104) global institutional

(retail) funds with adequate data. Therefore, using a 5% cutoff, the data imply that there are really only two funds in this extreme right tail, among those with adequate data. Subtracting stock selection from realized returns, the "left-over" portion is of course country selection. To the extent that there is true alpha, therefore, it must come from country selection. Next we turn to the issue of how funds choose countries.

3.3.2. Country Momentum

There are a myriad of reasons that might cause a fund to under- or over-weight a country relative to market capitalization weights. For instance, risk management reasons might cause portfolio managers to cap a portfolio's exposure to a country. More directly, country bets on performance might cause a fund to place a larger or smaller weight on a country. One candidate that lends itself to empirical testing is past country returns (country momentum). To test whether funds select countries based on past returns, we adopt the method of Grinblatt, Titman, and Wermers (1995) and calculate the following measure of trading on country momentum:

$$ITM_{it}(k,l) = \sum_c (w_{ict} - w_{ict-l})(R_{bct-k} - R_{bt-k}) \,, \qquad (5)$$

where R_{bct-k} is the country index return for country *c* at time *t-k*, and R_{bt-k} is the average return of the MSCI benchmark for fund *i*. For example, for emerging market funds, we use the MSCI Emerging Markets Index to represent R_{bt-k}, but for developed markets, we use the MSCI Developed Markets Index. This measure of country momentum is thus a cross-product of country weight changes and prior period country returns.

Since the reporting of country weights for institutional funds is quarterly, we use *l*=1 for both retail and institutional funds. We allow *k* to take on values of zero through four (*k*=4 corresponds to an across-country momentum strategy based on annual returns). Different values of *k* allow us to examine the importance of different past returns on the decision to change portfolio holdings. Generally, when *k*=0, the return is contemporaneous with weight changes. The consequence is that, strictly speaking, we cannot interpret our measure as reflecting momentum trading. This is certainly true for retail funds where weights are identified at month-end. However, for institutional funds, there is potentially an observation delay; weights reported at the end of the quarter might reflect weights during the quarter. Therefore, we opt to report results for k=0 for both sets of funds so that the reader has full information.

Badrinath and Wahal (2002) show that the entry and exit of countries to and from the portfolio can distort our measure in equation (5). Across all fund-quarter observations, entry and exit constitute 6.4% and 6.2% of country weight changes. We, therefore, report separate estimates for 'entered countries' (when a fund first establishes a position in country *c*), 'exited countries' (when a fund sells its entire position), 'adjustments to existing countries' (when the country weight is non-zero at the beginning and end of period *l*), as well as for the entire portfolio.

We calculate the ITM_{it} measure for each fund in each period. We then calculate the cross-sectional mean in each period. We finally report the time-series means and medians of these measures for institutional funds (Panel A) and retail funds (Panel B) in Table 7. Since ITM measures across periods are unlikely to be independent, we calculate *t*-statistics using a Fama and MacBeth (1973) approach, generating standard errors from the time-series averages. We also report the percentage of funds with positive time-series mean estimates of the ITM. All ITM measures are multiplied by 100.

For each category, funds establish positions in countries after positive returns. For example, for global (retail) institutional funds, the average value of $ITM_{it}(k,l)$ at k=4 is 0.133 (0.107) with a *t*-statistic of 3.51 (3.51). Similarly, the averages for developed and emerging market funds are reliably positive. These funds also exit after positive returns. The average $ITM_{it}(k,l)$ at k=4 for developed institutional (retail) funds is −0.05 (−0.095) with a *t*-statistic of −4.12 (−3.49). Finally, adjustments to countries to which funds' already have exposure do not appear to be reliably related to past country returns. Since the momentum estimates for entry are similar in magnitude to the contrarian estimates for exit, they essentially offset each other. The net effect, combining entry, exit and adjustments, is that entire portfolio country weight changes are unrelated to past country returns. The implication is that the choice of investing in a country is not related to country momentum.

3.4. True Alphas: Luck versus Skill

The evidence thus far shows little superior performance on average or in aggregate, but substantial alphas in the right tail. Of course, it is entirely possible that these alphas are not true in the sense that they are not a reflection of skill but merely due to luck. We use simulation approaches to disentangle the two. We use the approach of Kosowski et al. (2006), as modified

by Fama and French (2010), bootstrapping returns under the null of zero alpha with 5,000 simulation draws. We base inference on the entire cross-section of simulated *t*-statistics.[10] In doing so, we sample the fund and factor returns jointly to account for common variation in fund returns not accounted for by factors. This is all the more important in our setting because model error is larger than in U.S. domestic equity (adjusted-R^2's are often 98% or 99% for U.S. domestic equity mutual funds).

Table 8 shows percentiles of actual and average simulated *t*-statistics, as well as the percentage of simulation draws that produce a *t*-statistic greater than the corresponding actual value. If we conduct statistical inference based on a 5% cutoff, evidence of skill would come from fewer than 5% of the simulations being greater than actual. The results are presented separately for global, developed, and emerging funds with the appropriate factor model. We present results only for four-factor alphas. As in the calculation of individual fund alphas, we require a minimum of 20 quarters (24 months) of observations for institutional (retail) funds.

Consider global institutional funds (Panel A). At the 95th percentile, there is a hint of skill as the sample *t*-statistic is greater than the average simulated *t*-statistic, and the percentage of simulated *t*-statistics greater than the sample is only 3.2%. However, that is not the case at the 99th percentile, where the percent of simulated *t*-statistics is greater than the actual in 8.3% of cases. Moreover, looking at developed and emerging market funds, there is very little evidence of skill. At the 95th percentile, for developed (emerging) market funds, 47.8% (5.5%) of simulated *t*-statistics are greater than the actual.

For global retail funds, at the 95th percentile, the percentage of simulated *t*-statistics greater than average is 2.7%. But in developed and emerging market funds, at the 95th percentile, there are 24.3% and 29.8% of cases in which the simulated *t*-statistics are greater than the actual *t*-statistics. Thus, for global funds, both institutional and retail, there is some modest evidence of skill. But for developed and emerging market funds, the simulations are quite unequivocal; there seems to be no evidence of skill in the right rail of the distribution. The implication is that the noticeably large alphas in the right tail in Table 5 are most likely there due to chance.

3.5. Performance Persistence

[10] We prefer to conduct inference based on *t*-statistics rather than alphas since, by definition, *t*-statistics control for the precision of the alpha.

Our measures of performance so far are all ex-post in the sense that they are measured over some past data period. From a practical viewpoint, it is perhaps more important to assess whether there are ex-ante rules based on past performance which can be used to select funds that have superior subsequent performance. In this section, we investigate persistence in fund returns.

Persistence tests can also be viewed as an alternative way to think about the alphas in the right tail; if funds simply have large alphas because of luck in one year, they should not continue to have large alphas in future years. The downside of persistence tests is that, since the ranking of funds is based on short-term performance, we may not find evidence of persistence because the allocation of funds to winners and losers may be based on noisy realized returns. However, as we will see shortly, we find significant patterns in three-factor alphas (which are substantially reduced by the addition of the momentum factor). These patterns allay the fears that we are sorting solely on noise.

We sort funds into quintiles using returns during a ranking period and examine returns in a post-ranking period. The first quintile contains the worst-performing funds, and the last quintile contains the best-performing funds. After sorting into performance quintiles, we compute equal-weighted quintile returns over subsequent evaluation horizons. We then roll forward in time, producing a non-overlapping time series of concatenated returns. With these returns, we estimate factor models as described in equations (1) and (2). We use four different post-ranking horizons: one-quarter, first-year, second-year, and third-year.

When the ranking period is one year, the post-ranking period ranges from one year to three years (portfolios are rebalanced annually). We examine returns in the first year, second year, and third year of the post-ranking period. When the ranking period is less than a year, we use one-quarter returns for ranking institutional funds and one-month returns for ranking retail funds; portfolios are rebalanced quarterly and monthly respectively. Table 9 shows the alphas from these models for various combinations of funds and factors.

There is evidence of short-term persistence for both institutional and retail global funds (Panel A). The difference in four-factor alphas between the best performing and worst performing quintile is 0.72% (*t*-statistic=1.10) for institutional funds and 1.22% (*t*-statistic=2.94) for retail funds. The higher difference for retail funds comes largely due to poor performance in the worst performing funds (the four-factor alpha of the first quintile is −0.49% with a *t*-statistic of −1.89).

Beyond the first quarter, there is little evidence of persistence in performance. The estimates of three-factor alpha are high and statistically significant for the first post-ranking year. However, similar to Carhart (1997), incorporating momentum reduces these estimates. There is no evidence of persistence even with the three-factor model in the second and the third post-ranking year. Retail funds exhibit higher persistence than institutional funds judged by the difference in alphas of the fifth and the first quintile. However, a closer inspection of the quintile alphas reveals that the winner quintiles are less persistent for retail funds than for institutional funds. Loser retail quintiles on the other hand continue their poor performance.

Panel B shows persistence results for developed funds. For these funds, there is very little evidence of even short-term persistence. Conditioning on momentum reduces alpha estimates significantly for institutional funds. For instance, the three- and four-factor alphas for the first post-ranking year are 1.49% and −0.15%, respectively, for the 5−1 long-short quintile portfolio. Looking at the winner quintile itself, the four-factor alphas are negative at all horizons. Retail funds again show more evidence of persistence based on 5−1 long-short quintile portfolio alphas. And again, much of this is due to continued poor performance of loser quintiles; there is not much difference in alphas of the fifth quintile for retail versus institutional funds.

Results for emerging funds in Panel C also do not provide much evidence of persistence. One notable feature of these results is the absence of poor performance for loser retail quintiles. Furthermore, 5−1 long-short quintile alphas are statistically insignificant for both three- and four-factor models for both institutional and retail funds (the only exception is the three-factor alpha at the one-month horizon for retail funds).

3.6. Cashflow and Returns

Rational investors should withdraw money from poorly performing funds and reallocate this money towards good performers, if they have the expectation that this will improve future performance. Our results thus far, however, do not inspire much confidence in the ability of international funds (whether institutional or retail) to deliver risk-adjusted excess returns and/or show persistence in performance. In spite of similarly documented absence of alphas for domestic mutual funds, the extant literature finds that past performance is an important

determinant of cash flows to these funds.[11] We, thus, explore in this subsection whether investors in our set of active international funds also engage in this return-chasing behavior.

We measure fractional asset flows, CF_{it} , for each fund *i* during the year *t* as:

$$CF_{it} = \frac{A_{it} - A_{it-1}(1+R_{it})}{A_{it-1}} , \quad (6)$$

where A_{it} is the dollar amount of assets in fund *i* at the end of year *t*, and R_{it} is the return on fund *i* during year *t*. We then estimate the following cross-sectional Fama and MacBeth (1973) regressions:

$$CF_{it+1} = \gamma_{0t} + \gamma_{1t} CF_{it} + \gamma_{2t}(R_{it} - R_{bt}) + \gamma_{3t} LA_{it} + \gamma_{4t} LA_{it}^2 + u_{it+1}, \quad (7)$$

where LA_{it} is the log of assets. We estimate these regressions annually and report the time-series averages of the coefficients in Table 10. The numbers in parentheses are *t*-statistics, corrected for serial correlation in time-series estimates. The regressions are estimated for all funds as well as separately for each category of funds.

Flows are persistent, and unsurprisingly, smaller for larger funds. More importantly, prior returns are strongly positively related to future flows for all kinds of funds. These results are consistent with those of Del Guercio and Tkac (2002) and Heisler et al. (2007). They are also consistent with the evidence reported in Goyal and Wahal (2008) that plan sponsors use performance as a screening device in selecting investment managers. These results are also similar to those reported elsewhere in the literature. For instance, we find that a two standard deviation change in lagged excess returns leads to a 30.4% increase in cash flows for the sample of all retail funds. In comparison, Gruber (1996) reports that a movement from the 6th to the 10th decile in performance results in cash inflows of 31%. Similarly, our estimate of coefficient γ_2 on lagged excess returns for the sample of institutional funds of 2.04 is very close to the estimate 1.85 reported for the sample of domestic institutional funds by Busse, Goyal, and Wahal (2010).

At the same time, though, there are interesting differences between our sample of institutional and retail funds. First, cashflows are more persistent for retail funds than for institutional funds. This is especially surprising given the fact that institutional mandates for investments are lumpy, while retail investors can withdraw their money at any time. We also find that the flow-performance relation (coefficient γ_2 on lagged excess returns) is stronger for global

[11] See Chevalier and Ellison (1997), Edelen (1999), Patel, Zeckhauser, and Hendricks (1994), and Sirri and Tufano (1998) for a partial list of studies that document the investor flows / fund returns relation in the context of domestic mutual funds.

and developed institutional funds, but weaker for emerging institutional funds compared to their retail counterparts (in fact, there is no statistically significant relation between past returns and cashflows for emerging market institutional funds).

Past research also documents that the relation between past returns and future cashflows is not linear but convex. We investigate this in our sample by sorting funds into quintiles each year based on their benchmark-adjusted performance. Cashflows in the subsequent year are then averaged across the years, and we plot in Figure 1 these average cashflows as a function of the performance quintile (quintile 1 contains the worst performing funds, and quintile 5 contains the best performing funds). The convexity in the relationship of flows to past returns is readily apparent for both institutional and retail funds across all classes of funds. The only exception to the rule is that poorly performing institutional emerging market funds attract disproportionately high cashflows.

Overall, the evidence is that investors in international funds are not immune from the return chasing behavior documented for domestic fund investors, despite the lack of persistence in performance. The literature has proposed several explanations for this seemingly incongruous behavior (see Zheng (2008) for a review of this literature). Generally, these reasons are either behavioral in nature or represent rational responses under constraints. Specific tests require account-level information of investors and/or holdings, which are beyond the scope of our data or paper.

4. Conclusions

Investors access global equity markets using (retail) mutual funds and/or through institutional funds. Using factor models that include size, value and momentum, we find very little evidence of superior performance in actively-managed funds. This is true on average and in aggregate. The tails contain some large alphas, but here the superior performance appears to come from very few funds. Regardless, even in the tails, it is difficult to argue that superior performance comes from skill – there is little evidence of stock picking ability, and simulations suggest that funds in the right tail are largely there due to luck. Finally, there is virtually no evidence of persistence.

Could one have anticipated the above results from the rather voluminous literature on domestic equity mutual funds (and, to some extent, hedge funds)? We believe such a

presumption is premature. The efficiency of less-developed international markets, as well as the relative informational advantage of local versus foreign investors, are open empirical questions. Therefore, one cannot automatically assume that just because domestic equity managers are or are not able to deliver superior performance, that ex-U.S. and global investment vehicles would or would not be able to do so. It is to know this answer that we bring evidence to bear.

Appendix A: Factor construction

A.1. Data Issues

We obtain a time series of market and accounting information for a broad cross-section of firms globally from Datastream. We start with an unconstrained universe of all firms on 46 countries in the MSCI All Country Index between 1991 and 2009.[12] This universe includes both live as well as dead stocks, ensuring that the data are free of survivorship bias. To this, we apply the following sequence of filters that are derived from the extensive data investigations conducted by Ince and Porter (2006), Hou, Karolyi, and Kho (2011), and Griffin, Kelly, and Nardari (2010):

1. We require that stocks have data from Datastream and Worldscope. The former is the source for market data whereas the latter contain necessary accounting data.
2. We only retain issues that are listed as equity and require that they be from the firm's primary exchange. The latter, along with another Datastream supplied field, serves to remove duplications.
3. We eliminate all non-local firms with a GEOG code different from the local market.
4. When a security dies, the post-death time series contains returns that are marked as zero, which we eliminate.
5. We employ a text search algorithm to eliminate securities that are not common stock. This ensures that preferred stock, trusts, warrants, rights, REITS, closed-end funds, ETFs and depository receipts (GDRs and ADRs) not caught by the above screens are eliminated from the data.
6. We compute returns using the return index (which includes dividends) supplied by Datastream. Since both return indexes and market capitalization are provided in local currency, we convert them to US$ equivalents using the conversion function built into Datastream.
7. We set returns to missing for a stock when it rises by 300% or more during one month and drops by 50% or more the following month (or falls and subsequently rises). We also treat as missing returns greater than the top 0.1% or less than the bottom 0.1% of the returns of all stocks in a country over time.

After this data cleansing, we impose some basic data requirements to calculate factor returns. For a country to have a non-missing factor for a particular month, we require at least five stocks per portfolio used to create the factor. For example, typical double-sorted factors that use a 3×2 sort require at least 30 stocks (six portfolios multiplied by five stocks).

A.2. Factor Construction

We use dollar-denominated returns throughout our analysis, which presumes that global investors can costlessly hedge deviations from purchasing power parity or ignore deviations. To establish size breakpoints, we sort all stocks in a country into two groups, small (S) and big (B), based on their market capitalization as of June of year *t*. Book-to-market ratios are computed by dividing book value for the fiscal year ending in year *t*-1 by market capitalization at the end of

[12] Like Hou, Karolyi and Kho (2011), we use data from Datastream for U.S. firms as well. They verify that U.S. factors constructed from Datastream are very similar to those constructed from CRSP/Compustat.

December of year *t*-1. These values are used to generate breakpoints corresponding to low (L), medium (M) and high (H) portfolios. The low and high portfolios correspond to the 30^{th} and 70^{th} percentile respectively, with medium being between those two. For momentum portfolios, stocks in each country are sorted into quintiles based on returns from *t*-13 to *t*-2. As with value, stocks are sorted into loser (L), neutral (N), and winner (W) portfolios, again using the 30^{th} and 70^{th} percentiles as breakpoints.

For each size, value and momentum portfolio, we compute monthly value-weighted returns from July of year *t* through June of year *t*+1. We compute country specific factor returns as the difference in average returns across size groups. After computing the above country-specific factor returns, we generate global factors by combining country-specific factors using each country's total market capitalization at the end of the previous year. We also produce separate factors for developed and emerging markets, weighting each country by its market capitalization within the group that it belongs to.

References

Ahearne, Alan, William Griever, and Francis Warnock, 2004, Information Costs and Home Bias: An Analysis of U.S. Holdings of Foreign Equities, *Journal of International Economics* 62, 313–336.

Ang, Andrew and Geert Bekaert, 2002, International Asset Allocation with Regime Shifts, *Review of Financial Studies* 15, 1137–1187.

Badrinath, S.G. and Sunil Wahal, 2002, Momentum Trading by Institutions, *Journal of Finance* 57, 2449–2478.

Bekaert, Geert and Campbell R. Harvey, 2002, Research in Emerging Markets Finance: Looking to the Future, *Emerging Markets Review* 3, 429–48.

Blake, David and Allan Timmermann, 1998, Mutual Fund Performance: Evidence from the UK, *Review of Finance* 2, 57–77.

Brennan, Michael J. and Henry Cao, 1997, International Equity Portfolio Flows, *Journal of Finance* 52, 1851–1880.

Busse, Jeffrey A., Amit Goyal, and Sunil Wahal, 2010, Performance and Persistence in Institutional Investment Management, *Journal of Finance* 65, 765–790.

Carhart, Mark, 1997, On Persistence in Mutual Fund Performance, *Journal of Finance* 52, 57–82.

Chan, Kalok, Vicentiu Covrig, and Lilian Ng, 2005, What Determines the Domestic Bias and Foreign Bias: Evidence from Mutual Fund Equity Allocations Worldwide, *Journal of Finance* 60, 1495–1534.

Chan, Kalok, Albert J. Menkveld, and Zhishu Yang, 2007, The Informativeness of Domestic and Foreign Investors' Stock Trades: Evidence From the Perfectly Segmented Chinese Market, *Journal of Financial Markets* 10, 391–415.

Chevalier, Judith and Glenn Ellison, 1997, Risk Taking by Mutual Funds as a Response to Incentives, *Journal of Political Economy* 105, 1167–1200.

Cremers, Martijn, Miguel Ferreira, Pedro Matos, and Laura Starks, 2011, The Mutual Fund Industry Worldwide: Explicit and Closet Indexing, Fees, and Performance, Working paper.

De Santis, Giorgio and Bruno Gerard, 1997, International Asset Pricing and Portfolio Diversification with Time-Varying Risk, *Journal of Finance* 52, 1881–1912.

Del Guercio, Diane and Paula A. Tkac, 2002, The Determinants of the Flow of Funds of Managed Portfolios: Mutual Funds vs. Pension Funds, *Journal of Financial and Quantitative Analysis* 37, 523–557.

Didier, Tatiana, Roberto Rigobon, and Sergio Schmukler, 2011, Unexploited Gains from International Diversification: Patterns of Portfolio Holdings Around the World, Working paper, World Bank.

Edelen, Roger, 1999, Investor Flows and the Assessed Performance of Open-End Mutual Funds, *Journal of Financial Economics* 53, 439–466.

Fama, Eugene F. and Kenneth R. French, 1993, Common Risk Factors in the Returns on Stocks and Bonds, *Journal of Financial Economics* 33, 3–56.

Fama, Eugene F. and Kenneth R. French, 1998, Value versus Growth: The International Evidence, *Journal of Finance* 53, 1975–1999.

Fama, Eugene F. and Kenneth R. French, 2010, Luck Versus Skill in the Cross Section of Mutual Fund Returns, *Journal of Finance* 65, 1915–1947.

Fama, Eugene F. and Kenneth R. French, 2011, Size, Value, and Momentum in International Stock Returns, CRSP Working paper No. 11-10.

Fama, Eugene F. and James D. MacBeth, 1973, Risk, Return and Equilibrium: Empirical Tests, *Journal of Political Economy* 81, 607–636.

Ferreira, Miguel, Antonio Miguel, and Sofia Ramos, 2009, The Determinants of Mutual Fund Performance: A Cross-Country Study, Working paper.

French, Kenneth R. and James Poterba, 1991, Investor Diversification and International Equity Markets, *American Economic Review* 81, 222–226.

French, Kenneth R., 2008, The Cost of Active Investing, *Journal of Finance* 63, 1537–1573.

Froot, Kenneth A., Paul G. J. O'Connell, and Mark S. Seasholes, 2001, The Portfolio Flows of International Investors, *Journal of Financial Economics* 59, 151–193.

Froot, Kenneth A. and Tarun Ramadorai, 2008, Institutional Portfolio Flows and International Investments, *Review of Financial Studies* 21, 937–971.

Goetzmann, William, Geert Rouwenhorst, and Lingfeng Li, 2005, Long Term Global Market Correlations, *Journal of Business* 78, 1–38.

Gompers, Paul and Andrew Metrick, 2001, Institutional Investors and Equity Prices, *Quarterly Journal of Economics* 116, 229–259.

Goyal, Amit and Sunil Wahal, 2008, The Selection and Termination of Investment Managers by Plan Sponsors, *Journal of Finance* 63, 1805–1847.

Griffin, John M., 2002, Are the Fama-French Factors Global or Country Specific, *Review of Financial Studies* 15, 783–803.

Griffin, John M., Patrick J. Kelly, and Federico Nardari, 2010, Do Market Efficiency Measures Yield Correct Inferences? A Comparison of Developed and Emerging Markets, *Review of Financial Studies* 23, 3225–3277.

Grinblatt, Mark, Sheridan Titman, and Russell Wermers, 1995, Momentum Investing Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior, *American Economic Review* 85, 1088-1105.

Grubel, Herbert G., 1968, Internationally Diversified Portfolios, American *Economic Review* 58, 1299–1314.

Grubel, Herbert G. and Kenneth Fadner, 1971, The Interdependence of International Equity Markets, *Journal of Finance* 26, 89–94.

Gruber, Martin, 1996, Another Puzzle: The Growth in Actively Managed Mutual Funds, *Journal of Finance* 51, 783–810.

Hau, Harald and Hélène Rey, 2008, Home Bias at the Fund Level, *American Economic Review* 98, 333–338.

Heisler, Jeffrey, Christopher Knittel, John Neumann, and Scott Stewart, 2007, Why do Institutional Plan Sponsors Fire their Investment Managers? *Journal of Business and Economic Studies* 13, 88–115.

Hou, Kewei, G. Andrew Karolyi, and Bong Chan Kho, 2011, What Factors Drive Global Stock Returns? *Review of Financial Studies*, forthcoming.

Ince, Ozgur S. and R. Burt Porter, 2006, Individual Equity Return Data From Thomson Datastream: Handle with Care!, *Journal of Financial Research* 29, 463–479.

Investment Company Institute, 2010, *2010 Investment Company Fact Book*, Investment Company Institute.

Kang, Jun-Koo and René Stulz, 1997, Why is There a Home Bias? An Analysis of Foreign Portfolio Equity Ownership in Japan, *Journal of Financial Economics* 46, 3–28.

Karolyi, Andrew and René Stulz, 2003, Are Assets Priced Locally or Globally?, in George Constantinides, Milton Harris, and René Stulz (eds.), *The Handbook of the Economics of Finance*, North Holland.

Khorana, Ajay, Henri Servaes, and Peter Tufano, 2005, Explaining the Size of the Mutual Fund Industry around the World, *Journal of Financial Economics* 78, 145–185.

Khorana, Ajay, Henri Servaes, and Peter Tufano, 2009, Mutual Fund Fees Around the World, *Review of Financial Studies* 22, 1279–1310.

Kosowski, Robert, Allan Timmermann, Russ Wermers, and Hal White, 2006, Can Mutual Fund "Stars" Really Pick Stocks? New Evidence From a Bootstrap Analysis, *Journal of Finance* 61, 2551–2595.

Lakonishok, Josef, Andrei Shleifer, and Robert W. Vishny, 1992, The Structure and Performance of the Money Management Industry, *Brookings Papers: Microeconomics*, 339–379.

Levy, Haim and Marshall Sarnat, 1970, International Diversification of Investment Portfolios, *American Economic Review* 60, 668–675.

Longin, François and Bruno Solnik, 1995, Is the Correlation in International Equity Returns Constant: 1960-1990? *Journal of International Money and Finance* 14, 3–26.

Longin, François and Bruno Solnik, 2001, Extreme Correlation of International Equity Returns, *Journal of Finance*, 651–678.

Panetta, Riccardo and Fabio Cesari, 2002, The Performance of Italian Equity Funds, *Journal of Banking and Finance* 26, 99–126.

Patel, Jayendru, Richard Zeckhauser, and Darryll Hendricks, 1994, Investment Flows and Performance: Evidence from Mutual Funds, Cross-Border Investments and New Issues, in Ryuzo Sato, Richard M. Levitch, and Rama V. Ramachandran (eds.), *Japan, Europe and the International Financial Markets: Analytical and Empirical Perspectives*, Cambridge University Press, New York, NY.

Rubinstein, Mark, 2001, Rational Markets: Yes or No? The Affirmative Case, *Financial Analysts Journal* 57, 15–29.

Sirri, Erik and Peter Tufano, 1998, Costly Search and Mutual Fund Flows, *Journal of Finance* 53, 1589–1622.

Stulz, René, 1981, On the Effects of Barriers to International Investment, *Journal of Finance* 36, 923–934.

Stulz, René, 2005, The Limits of Financial Globalization, *Journal of Finance* 60, 1595–1638.

Zheng, Lu, 2008, The Behavior of Mutual Fund Investors, in Anjan V. Thakor and Arnoud W.A. Boot (eds.), *Handbook of Financial Intermediation and Banking*, North-Holland.

Table 1: Descriptive Statistics for Institutional Funds

The sample consists of all funds reported by the data provider, Informa Investment Solutions (IIS), with an investment style designated as global or international equity between 1991 and 2008. Assets are in millions of dollars, turnover is in percent per year, and fees are in percent per year.

Panel A: By Year

	Number of funds	Total assets	Average assets	Average turnover	Fees		
					$10M	$50M	$100M
1991	211	141,571	757	52.6	0.87	0.75	0.65
1992	253	89,844	399	55.8	0.85	0.72	0.64
1993	308	174,652	677	57.9	0.86	0.72	0.64
1994	364	242,453	758	53.9	0.89	0.73	0.64
1995	429	309,099	818	54.5	0.89	0.74	0.65
1996	488	428,753	1,028	54.0	0.87	0.73	0.64
1997	541	648,428	1,400	63.2	0.88	0.73	0.64
1998	588	698,818	1,387	67.9	0.87	0.74	0.65
1999	632	1,005,410	1,831	73.1	0.86	0.74	0.66
2000	655	916,673	1,622	83.2	0.86	0.75	0.67
2001	693	841,721	1,431	80.5	0.89	0.75	0.67
2002	713	823,683	1,344	71.4	0.87	0.76	0.68
2003	719	1,189,642	1,871	70.5	0.86	0.76	0.68
2004	748	1,558,364	2,354	67.5	0.85	0.76	0.68
2005	778	1,873,300	2,692	66.1	0.85	0.76	0.69
2006	813	2,387,371	3,226	66.5	0.87	0.76	0.69
2007	850	2,746,766	3,464	66.5	0.87	0.77	0.71
2008	842	1,409,145	1,874	72.6	0.87	0.77	0.72
2009	777	1,201,898	2,568	66.0	0.87	0.78	0.72

Panel B: By fund type

	1991		1998		2009	
	Number Of funds	Total Assets	Number Of funds	Total Assets	Number Of funds	Total Assets
Global	31	55,648	89	168,862	177	216,593
Developed	168	82,608	447	721,811	503	781,999
Emerging	12	3,315	96	114,738	97	203,307

Table 2: Descriptive Statistics for Retail Funds

The sample consists of all active global or international retail mutual funds listed in the CRSP Mutual Fund Database between 1991 and 2009. Sector funds, single-country funds and index funds are excluded. Class-level information is aggregated to the fund level using TNA-weighted averages. Assets are in millions of dollars, turnover is in percent per year, and fees are in percent per year.

Panel A: By Year

	Number of funds	Total assets	Average assets	Average turnover	Fees		
					12b1	ExpRatio	Mgmt
1991	122	29,433	239	89.0	--	1.73	--
1992	168	35,877	230	12.0	0.00	1.51	--
1993	219	81,857	405	71.3	0.23	1.72	--
1994	292	115,033	411	68.7	0.24	1.67	--
1995	352	144,328	426	62.5	0.28	1.68	--
1996	405	212,383	540	74.3	0.31	1.78	--
1997	477	273,938	593	70.1	0.30	1.80	--
1998	539	310,838	563	61.5	0.26	1.68	--
1999	585	449,833	772	81.0	0.25	1.69	0.83
2000	586	417,658	694	96.6	0.50	1.67	0.87
2001	597	335,704	563	104.6	0.54	1.70	0.87
2002	565	282,643	499	103.9	0.55	1.78	0.82
2003	528	411,026	783	82.2	0.53	1.79	0.81
2004	496	550,250	1,100	86.6	0.49	1.67	0.84
2005	507	736,976	1,396	78.9	0.48	1.63	0.85
2006	546	1,016,884	1,822	68.4	0.47	1.58	0.89
2007	586	1,241,573	2,133	62.3	0.45	1.50	0.85
2008	620	655,228	1,040	64.9	0.47	1.49	0.92
2009	623	909,322	1,464	83.4	0.57	1.50	0.78

Panel B: By fund type

	1991		1998		2009	
	Number Of funds	Total Assets	Number Of funds	Total Assets	Number Of funds	Total Assets
Global	42	9,267	174	136,686	205	279,333
Developed	77	20,003	322	292,381	323	527,350
Emerging	3	164	89	20,766	95	102,639

Table 3: Factors

Details of the data and construction of country-specific factors are provided in Appendix A. Country-specific factors are based on value-weighted dollar returns. Global factors are constructed by aggregating country-specific factors based on country market capitalization at the beginning of the year. Developed and emerging market factors are built using country weights for the subset of countries in that category. All returns are in percent per year.

	MktmRf	SMB	HML	UMD
Panel A: Global Factors				
Mean	5.17	1.19	7.90	9.26
Standard Deviation	17.02	4.59	9.96	13.22
t-statistic	1.32	1.13	3.46	3.03
Panel B: Developed Market Factors				
Mean	4.89	1.30	7.22	9.83
Standard Deviation	16.69	4.94	10.32	14.25
t-statistic	1.28	1.15	3.05	2.99
Panel C: Emerging Market Factors				
Mean	11.66	-0.62	13.23	4.26
Standard Deviation	28.38	13.06	18.23	16.48
t-statistic	1.79	-0.21	3.12	1.12

Table 4: Average and Aggregate Alphas and Factor Loadings

We form portfolios from individual funds. Portfolios are both equal- and value-weighted (we value weight based on asset size from December of the prior year). Returns are gross of fees. We report alphas and betas from time-series regressions of these portfolios on different factor models. There are two different kinds of factors models. The first one includes global factors (Panels A and C) and the second one includes developed and emerging factors (Panels B and D). We use three combinations of factors—the one-factor model corresponds to just the market factor (MktmRf), the three-factor model corresponds to the three Fama and French (1993) factors (MktmRf, SMB, and HML), and the four-factor model adds the momentum factor to the mix (MktmRf, SMB, HML, and UMD). Regression frequency is quarterly for institutional funds (Panels A and B) and monthly for mutual funds (Panels C and D). All alphas are in quarterly percent. Numbers in parenthesis are *t*-statistics. 'All funds' includes all funds, 'Global funds' includes funds with global mandates, 'Developed funds' includes funds with mandates to invest in developed countries (as defined by MSCI) and 'Emerging funds' includes funds with mandates to invest in emerging countries (as defined by MSCI). The sample period is 1991 to 2009.

Panel A: Institutional Funds, Global Factors

	Equal-weighted average			Value-weighted aggregate		
All Funds						
Alpha	0.653 (2.10)	0.327 (1.02)	0.169 (0.46)	0.314 (1.22)	-0.112 (-0.43)	-0.231 (-0.76)
MktmRf	1.048 (28.78)	1.053 (28.82)	1.072 (25.18)	1.039 (34.56)	1.064 (35.58)	1.078 (30.92)
SMB		0.510 (3.88)	0.521 (3.94)		0.347 (3.22)	0.355 (3.27)
HML		0.106 (1.69)	0.122 (1.87)		0.163 (3.17)	0.175 (3.26)
UMD			0.044 (0.87)			0.033 (0.79)
adj-R^2	91.79	93.13	93.11	94.16	95.20	95.18
Global Funds						
Alpha	0.724 (2.62)	0.505 (1.83)	0.229 (0.73)	0.381 (1.62)	-0.166 (-0.75)	-0.236 (-0.92)
MktmRf	1.014 (31.43)	1.007 (31.90)	1.040 (28.76)	1.017 (36.93)	1.057 (41.69)	1.065 (35.96)
SMB		0.516 (4.54)	0.536 (4.76)		0.307 (3.36)	0.312 (3.38)
HML		0.058 (1.07)	0.086 (1.55)		0.220 (5.07)	0.227 (4.99)
UMD			0.076 (1.78)			0.019 (0.55)
adj-R^2	93.02	94.45	94.62	94.85	96.37	96.34

Panel B: Institutional Funds, Developed and Emerging Factors

	Equal-weighted average			Value-weighted aggregate		
All Funds						
Alpha	0.422 (1.95)	0.215 (0.89)	-0.188 (-0.65)	0.138 (0.67)	-0.237 (-1.09)	-0.537 (-2.04)
MktmRf(D)	0.754 (20.73)	0.783 (20.68)	0.814 (20.87)	0.816 (23.67)	0.857 (25.10)	0.880 (24.67)
SMB(D)		0.153 (1.57)	0.146 (1.53)		0.065 (0.74)	0.060 (0.69)
HML(D)		0.055 (1.22)	0.087 (1.89)		0.115 (2.80)	0.138 (3.28)
UMD(D)			0.095 (2.39)			0.070 (1.92)
MktmRf(E)	0.251 (11.62)	0.236 (10.33)	0.249 (10.87)	0.194 (9.46)	0.188 (9.12)	0.198 (9.42)
SMB(E)		-0.040 (-1.21)	-0.032 (-1.00)		-0.040 (-1.35)	-0.035 (-1.17)
HML(E)		0.021 (0.86)	0.038 (1.57)		0.034 (1.58)	0.047 (2.12)
UMD(E)			-0.017 (-0.60)			-0.010 (-0.40)
adj-R^2	96.19	96.35	96.56	96.42	96.91	96.99
Developed Funds						
Alpha	0.409 (1.79)	0.159 (0.62)	-0.282 (-0.92)	0.123 (0.55)	-0.267 (-1.10)	-0.632 (-2.16)
MktmRf(D)	0.856 (22.32)	0.889 (22.04)	0.923 (22.25)	0.883 (23.45)	0.925 (24.24)	0.953 (24.04)
SMB(D)		0.142 (1.37)	0.133 (1.32)		0.066 (0.67)	0.060 (0.62)
HML(D)		0.080 (1.65)	0.115 (2.35)		0.128 (2.78)	0.156 (3.33)
UMD(D)			0.104 (2.48)			0.085 (2.12)
MktmRf(E)	0.144 (6.31)	0.132 (5.41)	0.146 (6.00)	0.116 (5.16)	0.111 (4.82)	0.123 (5.27)
SMB(E)		-0.016 (-0.46)	-0.007 (-0.21)		-0.014 (-0.43)	-0.008 (-0.23)
HML(E)		0.018 (0.73)	0.038 (1.48)		0.031 (1.31)	0.048 (1.92)
UMD(E)			-0.023 (-0.77)			-0.015 (-0.51)
adj-R^2	95.35	95.47	95.75	95.41	95.86	96.02
Emerging Funds						
Alpha	0.601 (2.31)	0.517 (1.80)	0.423 (1.19)	0.407 (1.52)	0.318 (1.05)	0.218 (0.58)
MktmRf(D)	0.138 (3.15)	0.160 (3.57)	0.170 (3.53)	0.163 (3.61)	0.181 (3.83)	0.188 (3.70)
SMB(D)		0.130 (1.13)	0.133 (1.14)		0.070 (0.57)	0.067 (0.54)
HML(D)		0.044 (0.81)	0.051 (0.89)		0.037 (0.66)	0.045 (0.75)
UMD(D)			0.017 (0.34)			0.025 (0.48)
MktmRf(E)	0.908 (34.82)	0.893 (32.92)	0.894 (31.62)	0.889 (33.08)	0.880 (30.78)	0.883 (29.55)
SMB(E)		-0.097 (-2.47)	-0.097 (-2.43)		-0.089 (-2.16)	-0.087 (-2.06)
HML(E)		-0.009 (-0.31)	-0.006 (-0.19)		-0.002 (-0.06)	0.003 (0.09)
UMD(E)			0.017 (0.48)			-0.009 (-0.24)
adj-R^2	97.46	97.64	97.59	97.26	97.35	97.28

Panel C: Retail Funds, Global Factors						
	Equal-weighted average			Value-weighted aggregate		
All Funds						
Alpha	0.329 (1.14)	0.055 (0.21)	-0.049 (-0.18)	0.383 (1.47)	0.168 (0.69)	0.081 (0.32)
MktmRf	1.027 (47.04)	1.035 (50.97)	1.047 (46.93)	0.994 (50.30)	0.998 (53.87)	1.008 (49.48)
SMB		0.479 (8.92)	0.470 (8.71)		0.419 (8.56)	0.412 (8.36)
HML		0.067 (1.65)	0.075 (1.83)		0.048 (1.28)	0.054 (1.44)
UMD			0.036 (1.31)			0.030 (1.19)
adj-R^2	90.73	93.20	93.22	91.80	93.87	93.89
Global Funds						
Alpha	0.191 (0.73)	0.063 (0.27)	-0.074 (-0.30)	0.289 (0.99)	0.311 (1.23)	0.179 (0.68)
MktmRf	0.992 (49.84)	0.988 (54.91)	1.004 (51.01)	0.995 (45.08)	0.975 (50.19)	0.991 (46.53)
SMB		0.443 (9.32)	0.431 (9.07)		0.472 (9.19)	0.461 (8.95)
HML		0.004 (0.10)	0.014 (0.39)		-0.071 (-1.81)	-0.060 (-1.54)
UMD			0.047 (1.95)			0.045 (1.73)
adj-R^2	91.66	94.22	94.29	89.99	93.41	93.47

Panel D: Retail Funds, Developed and Emerging Factors

	Equal-weighted average			Value-weighted aggregate		
All Funds						
Alpha	0.140 (0.61)	-0.004 (-0.02)	-0.192 (-0.84)	0.217 (0.99)	0.107 (0.51)	-0.048 (-0.22)
MktmRf(D)	0.718 (25.86)	0.769 (29.00)	0.782 (29.24)	0.733 (27.71)	0.777 (30.45)	0.788 (30.44)
SMB(D)		0.326 (7.56)	0.316 (7.34)		0.296 (7.12)	0.287 (6.90)
HML(D)		0.051 (1.56)	0.060 (1.86)		0.036 (1.16)	0.044 (1.40)
UMD(D)			0.064 (2.92)			0.053 (2.51)
MktmRf(E)	0.262 (15.32)	0.226 (14.19)	0.230 (14.60)	0.223 (13.72)	0.190 (12.43)	0.194 (12.72)
SMB(E)		-0.007 (-0.40)	-0.005 (-0.31)		-0.005 (-0.32)	-0.004 (-0.23)
HML(E)		-0.001 (-0.08)	0.004 (0.36)		-0.001 (-0.07)	0.003 (0.31)
UMD(E)			-0.025 (-1.41)			-0.022 (-1.29)
adj-R^2	94.27	95.45	95.59	94.37	95.43	95.53
Developed Funds						
Alpha	0.183 (0.73)	-0.043 (-0.18)	-0.248 (-0.99)	0.284 (1.29)	0.078 (0.36)	-0.054 (-0.24)
MktmRf(D)	0.796 (26.33)	0.857 (29.37)	0.872 (29.57)	0.769 (29.12)	0.820 (31.69)	0.829 (31.52)
SMB(D)		0.349 (7.36)	0.337 (7.10)		0.287 (6.81)	0.282 (6.66)
HML(D)		0.095 (2.66)	0.106 (2.96)		0.085 (2.66)	0.091 (2.86)
UMD(D)			0.068 (2.84)			0.048 (2.24)
MktmRf(E)	0.166 (8.95)	0.130 (7.40)	0.134 (7.73)	0.174 (10.69)	0.144 (9.25)	0.147 (9.47)
SMB(E)		0.001 (0.05)	0.002 (0.10)		0.002 (0.13)	0.005 (0.29)
HML(E)		-0.004 (-0.29)	0.002 (0.12)		-0.001 (-0.11)	0.003 (0.26)
UMD(E)			-0.023 (-1.18)			-0.028 (-1.61)
adj-R^2	92.51	93.93	94.10	94.00	94.98	95.07
Emerging Funds						
Alpha	0.346 (1.22)	0.300 (1.00)	0.208 (0.66)	0.221 (0.76)	0.029 (0.09)	-0.073 (-0.22)
MktmRf(D)	0.194 (5.66)	0.214 (5.91)	0.219 (5.91)	0.159 (4.56)	0.181 (4.88)	0.188 (4.93)
SMB(D)		0.151 (2.57)	0.149 (2.50)		0.079 (1.31)	0.075 (1.23)
HML(D)		-0.005 (-0.11)	-0.001 (-0.02)		0.065 (1.43)	0.070 (1.52)
UMD(D)			0.035 (1.18)			0.037 (1.19)
MktmRf(E)	0.839 (39.75)	0.821 (37.88)	0.823 (37.77)	0.846 (39.44)	0.839 (37.65)	0.841 (37.53)
SMB(E)		-0.042 (-1.81)	-0.039 (-1.66)		-0.044 (-1.82)	-0.041 (-1.71)
HML(E)		0.009 (0.57)	0.013 (0.78)		0.012 (0.75)	0.016 (0.94)
UMD(E)			-0.027 (-1.08)			-0.022 (-0.85)
adj-R^2	95.52	95.67	95.67	95.28	95.34	95.33

Table 5: Distribution of Individual Fund Alphas

We report percentiles of alphas from time-series regressions of individual funds on factor models. Only institutional funds with more than 20 quarters of data and retail funds with more than 24 months of data are included in the estimation. Regression frequency is quarterly for institutional funds and monthly for mutual funds. All alphas are in percent per quarter. 'Global funds', 'Developed funds' and 'Emerging funds' use MSCI definitions. The sample period is 1991 to 2009

	Global Funds, Global Factors			Developed Funds, Developed and Emerging Factors			Emerging Funds, Developed and Emerging Factors		
	1-factor	3-factors	4-factors	1-factor	3-factors	4-factors	1-factor	3-factors	4-factors
Panel A: Institutional Funds									
Percentiles of alphas									
5	-0.622	-1.087	-1.022	-0.580	-1.584	-2.187	-0.428	-0.601	-1.015
10	-0.144	-0.782	-0.830	-0.379	-1.134	-1.790	-0.228	-0.304	-0.837
50	0.637	0.436	0.218	0.403	-0.022	-0.388	0.585	0.521	0.107
90	1.954	2.048	1.924	1.454	1.575	0.876	1.418	1.770	1.601
95	2.787	2.919	2.765	1.937	2.341	1.388	1.728	2.438	2.438
Percentage of negative and significant alphas									
at 10%	1.74	6.98	3.49	3.91	13.68	21.99	2.59	6.90	4.31
at 5%	0.58	4.07	2.91	1.63	8.79	15.47	0.86	4.31	1.72
at 1%	0.58	0.58	0.00	0.16	3.26	6.35	0.00	0.86	0.00
Percentage of positive and significant alphas									
at 10%	33.14	22.09	16.86	18.40	14.98	5.86	30.17	29.31	18.97
at 5%	22.09	16.28	11.63	11.24	10.42	3.75	20.69	22.41	9.48
at 1%	6.98	8.72	2.91	4.56	2.93	0.98	8.62	9.48	4.31
Number of funds		172			614			116	
Panel B: Retail Funds									
Percentiles of alphas									
5	-1.511	-2.030	-2.087	-1.421	-1.815	-2.166	-1.152	-0.895	-1.133
10	-1.116	-1.341	-1.393	-0.915	-1.221	-1.565	-0.383	-0.559	-0.747
50	0.116	-0.058	0.000	0.066	-0.078	-0.218	0.553	0.408	0.280
90	1.526	1.787	1.553	1.036	1.113	0.792	1.433	1.634	1.297
95	2.018	2.337	2.214	1.530	1.605	1.256	2.382	2.604	1.610
Percentage of negative and significant alphas									
at 10%	7.36	16.39	18.39	7.92	13.70	22.27	2.38	1.59	5.56
at 5%	4.68	9.70	11.04	4.28	8.14	13.70	1.59	0.79	5.56
at 1%	1.34	4.35	4.68	0.43	3.64	6.42	0.79	0.79	1.59
Percentage of positive and significant alphas									
at 10%	13.71	15.05	12.04	14.56	9.21	5.78	28.57	23.81	11.11
at 5%	9.36	11.71	8.70	8.14	6.64	4.50	18.25	12.70	4.76
at 1%	2.68	5.35	3.68	2.78	3.21	1.28	5.56	3.17	3.17
Number of funds		299			467			126	

Table 6: Security Selection

We report percentiles of alphas from time-series regressions of individual funds on different factor models. We calculate synthetic benchmark returns as the product of actual fund country weights and country index returns. The dependent variable is the difference between the actual fund return and this synthetic benchmark return, and is equal to the component of the return due to security selection at the country level ($SR_{it} = R_{it} - \sum_c w_{ict-1} R_{bct}$). Only institutional funds that have more than 20 quarters of data are included in the factor models. Regression frequency is quarterly, and alphas are reported in percent per quarter. The sample period is 1996 to 2009 for institutional funds and 1991 to 2009 for retail funds.

	Global Funds, Global Factors			Developed Funds, Developed and Emerging Factors			Emerging Funds, Developed and Emerging Factors		
	1-factor	3-factors	4-factors	1-factor	3-factors	4-factors	1-factor	3-factors	4-factors
Panel A: Institutional Funds									
Percentiles of alphas									
5	-0.503	-0.931	-0.826	-0.373	-1.433	-1.023	-0.481	-0.960	-1.209
10	-0.334	-0.800	-0.729	-0.199	-1.059	-0.817	-0.387	-0.875	-0.987
50	0.292	0.265	0.113	0.346	0.210	0.076	0.144	0.045	-0.419
90	1.453	2.788	1.278	1.111	1.635	1.044	1.041	1.277	1.187
95	3.052	3.780	3.134	1.464	2.383	1.512	1.111	1.589	1.604
Percentage of negative and significant alphas									
at 10%	1.89	16.98	11.32	3.77	10.88	12.55	3.77	5.66	7.55
at 5%	0.00	11.32	7.55	2.09	5.86	4.60	1.89	3.77	3.77
at 1%	0.00	5.66	1.89	0.84	2.09	1.26	0.00	0.00	0.00
Percentage of positive and significant alphas									
at 10%	13.21	26.42	11.32	19.67	23.01	6.28	20.75	20.75	9.43
at 5%	5.66	18.87	9.43	9.62	15.90	5.02	13.21	11.32	3.77
at 1%	3.77	13.21	3.77	4.18	4.60	1.67	1.89	3.77	1.89
Number of funds		53			239			53	
Panel B: Retail Funds									
Percentiles of alphas									
5	-2.018	-2.243	-2.345	-2.099	-1.989	-2.124	-	-	-
10	-1.451	-1.565	-1.339	-1.232	-1.340	-1.400	-	-	-
50	-0.249	0.026	0.011	-0.703	-0.723	-0.859	-	-	-
90	1.938	2.087	2.252	-0.091	-0.204	-0.256	-	-	-
95	2.459	2.955	3.000	0.303	0.311	0.345	-	-	-
Percentage of negative and significant alphas									
at 10%	11.11	13.58	14.81	13.04	9.94	13.04	-	-	-
at 5%	8.64	12.35	11.11	9.32	5.59	6.83	-	-	-
at 1%	1.23	4.94	3.70	2.48	1.86	3.11	-	-	-
Percentage of positive and significant alphas									
at 10%	9.88	11.11	12.35	6.83	6.83	7.45	-	-	-
at 5%	4.94	8.64	7.41	6.21	4.35	5.59	-	-	-
at 1%	0.00	4.94	4.94	0.62	2.48	2.48	-	-	-
Number of funds		104			318			NA	

Table 7: Changes in Country Weights

We report the Grinblatt, Titman, and Wermers (1995) measure of momentum trading, $ITM_{it}(k,l) = \sum_c (w_{ict} - w_{ict-l})(R_{bct-k} - R_{bt-k})$. We use l=1, which implies that weight changes are calculated over quarterly intervals. We calculate separate values for each fund's entire portfolio, for countries that it entered during the quarter ($w_{ict-l} = 0$), for countries that it exited during the quarter ($w_{ict} = 0$), and for countries where the fund was invested during the entire period. We first calculate the ITM_{it} measure for each fund in each period and then calculate the cross-sectional mean in each period. We finally report the time-series means and medians of these measures. Fama and MacBeth (1972) *t*-statistics are reported in parentheses next to means. The percentage of funds with positive time-series mean estimates of the ITM measure are reported in parentheses next to medians. The number of funds which are used in the calculation is reported next to the category of funds. All ITM measures are multiplied by 100. The sample period is 1996 to 2009 for institutional funds and 1991 to 2009 for retail funds.

	Entire Portfolio		Entered Countries		Exited Countries		Adjustments to Existing Countries	
	Mean (*t*-stat)	Median (% pos.)	Mean (*t*-stat)	Median (% pos.)	Mean (*t*-stat)	Median (% pos.)	Mean (*t*-stat)	Median (% pos.)
Panel A: Institutional Funds								
Global Funds (N=157)								
k=0	0.604 (9.87)	0.512 (86.00)	0.075 (4.68)	0.058 (72.60)	0.018 (1.51)	0.008 (49.00)	0.511 (9.76)	0.408 (87.30)
k=1	-0.012 (-0.27)	-0.022 (43.90)	0.043 (3.08)	0.033 (70.70)	-0.012 (-0.93)	-0.019 (37.60)	-0.043 (-1.04)	-0.026 (36.30)
k=4	-0.158 (-1.46)	-0.221 (32.50)	0.133 (3.51)	0.123 (77.70)	-0.095 (-3.12)	-0.096 (22.30)	-0.196 (-2.07)	-0.224 (28.00)
Developed Funds (N=489)								
k=0	0.504 (11.28)	0.441 (91.60)	0.051 (5.23)	0.041 (77.90)	0.009 (0.93)	-0.003 (46.40)	0.443 (11.10)	0.400 (92.60)
k=1	0.005 (0.15)	0.005 (49.50)	0.033 (3.53)	0.026 (73.60)	-0.017 (-1.69)	-0.019 (31.50)	-0.011 (-0.39)	-0.008 (47.00)
k=4	-0.097 (-1.30)	-0.163 (37.20)	0.102 (4.61)	0.126 (76.90)	-0.095 (-4.12)	-0.103 (19.80)	-0.105 (-1.48)	-0.098 (34.80)
Emerging Funds (N=105)								
k=0	1.442 (9.03)	1.099 (92.40)	0.099 (3.84)	0.049 (64.80)	0.017 (1.15)	0.012 (62.90)	1.326 (9.20)	1.043 (94.30)
k=1	-0.212 (-2.24)	-0.148 (33.30)	0.020 (1.54)	0.019 (49.50)	-0.034 (-1.84)	-0.017 (46.70)	-0.197 (-2.32)	-0.101 (36.20)
k=4	-0.343 (-1.46)	-0.489 (32.40)	0.077 (3.18)	0.045 (50.50)	-0.078 (-2.24)	-0.029 (43.80)	-0.342 (-1.54)	-0.306 (28.60)
Panel B: Retail Funds								
Global Funds (N=144)								
k=0	0.596 (10.71)	0.498 (97.20)	0.073 (5.56)	0.050 (87.50)	0.025 (2.20)	0.006 (43.10)	0.498 (10.24)	0.430 (96.50)
k=1	0.019 (0.43)	-0.005 (52.80)	0.030 (1.51)	0.027 (83.30)	-0.012 (-0.86)	-0.006 (38.20)	0.000 (0.01)	-0.019 (50.00)
k=4	-0.034 (-0.30)	-0.095 (43.10)	0.107 (3.51)	0.098 (82.60)	-0.095 (-2.80)	-0.080 (20.80)	-0.046 (-0.49)	-0.090 (39.60)
Developed Funds (N=428)								
k=0	0.531 (9.04)	0.423 (96.50)	0.043 (3.85)	0.028 (83.90)	0.021 (1.57)	0.001 (47.90)	0.468 (9.28)	0.365 (96.30)
k=1	0.014 (0.38)	0.005 (52.60)	0.028 (2.67)	0.026 (76.20)	-0.008 (-0.87)	-0.021 (33.20)	-0.007 (-0.20)	-0.029 (47.40)
k=4	0.010 (0.11)	-0.066 (44.60)	0.093 (3.53)	0.115 (83.60)	-0.068 (-3.49)	-0.078 (20.30)	-0.015 (-0.18)	-0.072 (39.50)

Table 8: Skill Versus Luck in Individual Fund Alphas

Performance is measured using the four-factor model. We use global factors for global funds and both developed and emerging factors for developed and emerging funds. The table shows percentiles of actual and average simulated *t*-statistics of alphas from these models. We also show the percentage of simulation draws that produce a *t*-statistic greater than the corresponding actual value. Only those institutional funds that have more than 20 quarters of observations and those mutual funds that have more than 24 months of observations are included in the estimation. Regression frequency is quarterly for institutional funds and monthly for mutual funds. The sample period is 1991 to 2009.

	Global Funds, Global Factors			Developed Funds, Developed and Emerging Factors			Emerging Funds, Developed and Emerging Factors		
	Actual	Sim.	%(Sim>Act)	Actual	Sim.	%(Sim>Act)	Actual	Sim.	%(Sim>Act)
Panel A: Institutional Funds									
1	-2.57	-2.94	37.9	-3.97	-3.33	79.1	-1.82	-3.91	2.6
5	-1.52	-1.91	25.0	-2.87	-2.04	91.3	-1.27	-2.06	6.9
10	-1.18	-1.44	30.8	-2.41	-1.55	93.5	-0.99	-1.56	11.2
20	-0.84	-0.93	44.7	-1.74	-1.01	92.7	-0.56	-1.02	12.8
25	-0.69	-0.75	47.9	-1.48	-0.82	91.9	-0.42	-0.82	15.2
40	-0.09	-0.30	26.8	-0.91	-0.34	90.2	-0.03	-0.35	19.0
50	0.24	-0.04	19.6	-0.60	-0.06	90.2	0.22	-0.07	21.4
60	0.65	0.21	9.1	-0.22	0.21	85.5	0.44	0.20	24.0
75	1.22	0.64	4.5	0.38	0.67	75.6	1.13	0.66	11.1
80	1.41	0.81	4.4	0.63	0.85	69.3	1.44	0.84	7.3
90	2.22	1.27	1.4	1.25	1.36	56.3	1.98	1.34	8.8
95	2.57	1.67	3.2	1.78	1.81	47.8	2.66	1.76	5.5
99	3.24	2.37	8.3	2.74	2.83	50.1	3.52	2.77	16.0
Panel B: Retail Funds									
1	-3.71	-2.58	96.3	-3.84	-2.54	97.6	-4.14	-2.91	92.6
5	-2.67	-1.72	97.3	-3.07	-1.70	99.3	-1.30	-1.81	14.5
10	-2.06	-1.32	95.6	-2.49	-1.31	98.7	-1.11	-1.37	28.7
20	-1.57	-0.86	96.1	-1.89	-0.86	97.9	-0.59	-0.90	24.1
25	-1.37	-0.69	96.0	-1.64	-0.69	97.3	-0.28	-0.73	15.1
40	-0.70	-0.26	89.2	-1.11	-0.27	96.1	0.02	-0.29	22.4
50	-0.27	0.00	78.0	-0.73	-0.02	93.5	0.48	-0.03	11.5
60	0.09	0.25	66.9	-0.40	0.23	91.6	0.71	0.23	12.7
75	0.83	0.68	31.6	0.23	0.65	81.7	1.31	0.67	7.2
80	1.09	0.85	24.1	0.48	0.81	75.9	1.44	0.83	8.5
90	1.79	1.31	9.4	1.26	1.26	46.7	1.68	1.30	18.9
95	2.51	1.69	2.7	1.94	1.64	24.3	1.92	1.69	29.8
99	3.59	2.40	1.1	2.73	2.35	21.7	3.29	2.50	11.7

Table 9: Persistence in Performance

We sort funds into quintiles according to the benchmark-adjusted return during a ranking period and hold these portfolios for a post-ranking period. For institutional funds, when the ranking period is one quarter, the post-ranking period is also one quarter (portfolios are rebalanced quarterly). For mutual funds, when the ranking period is one month, the post-ranking period is also one month (portfolios are rebalanced monthly). For all funds, when the ranking period is one year, the post-ranking period ranges from one year to three years (portfolios are rebalanced annually). The first quintile contains the worst-performing funds, and the last quintile contains the best-performing funds. We use global factors for global funds and both developed and emerging factors for developed and emerging funds. We use three combination of factors—the one-factor model corresponds to just the market factor (MktmRf), the three-factor model corresponds to the three Fama and French (1993) factors (MktmRf, SMB, and HML), and the four-factor model adds the momentum factor to the mix (MktmRf, SMB, HML, and UMD). Regression frequency is quarterly for institutional funds and monthly for mutual funds. All alphas are in quarterly percent, and *t*-statistics are reported in parentheses next to alphas. 'All funds' includes all funds, 'Global funds' includes funds with global mandates, 'Developed funds' includes funds with mandates to invest in developed countries (as defined by MSCI) and 'Emerging funds' includes funds with mandates to invest in emerging countries (as defined by MSCI). The sample period is 1991 to 2009.

	Institutional Funds			Retail Funds		
	1-factor	3-factors	4-factors	1-factor	3-factors	4-factors
Panel A: Global Funds, Global Factors						
1-quarter/1-month						
1	-0.092 (-0.27)	-0.722 (-2.06)	-0.037 (-0.10)	-0.703 (-2.62)	-0.984 (-3.67)	-0.485 (-1.89)
3	0.431 (1.50)	0.010 (0.03)	-0.001 (-0.00)	0.051 (0.21)	-0.160 (-0.69)	-0.238 (-0.98)
5	1.593 (2.78)	2.028 (3.33)	0.683 (1.14)	1.361 (2.90)	1.443 (3.56)	0.730 (1.86)
5-1	1.685 (2.44)	2.749 (3.73)	0.720 (1.10)	2.064 (4.21)	2.427 (5.10)	1.215 (2.94)
1st year						
1	-0.085 (-0.24)	-0.601 (-1.56)	-0.211 (-0.49)	-0.312 (-1.11)	-0.579 (-2.06)	-0.254 (-0.90)
3	0.715 (2.16)	0.476 (1.39)	0.349 (0.90)	0.087 (0.35)	-0.062 (-0.26)	-0.184 (-0.74)
5	1.318 (2.49)	1.555 (2.78)	0.430 (0.76)	0.744 (1.63)	0.882 (2.28)	0.375 (0.98)
5-1	1.403 (2.31)	2.157 (3.30)	0.641 (1.01)	1.056 (2.37)	1.462 (3.39)	0.629 (1.57)
2nd year						
1	0.757 (2.07)	0.308 (0.83)	0.324 (0.77)	-0.021 (-0.07)	-0.318 (-1.15)	-0.357 (-1.24)
3	0.405 (1.28)	0.211 (0.66)	-0.201 (-0.58)	-0.047 (-0.18)	-0.156 (-0.63)	-0.289 (-1.12)
5	0.643 (1.46)	0.908 (2.09)	0.679 (1.39)	0.557 (1.46)	0.792 (2.49)	0.630 (1.92)
5-1	-0.114 (-0.25)	0.600 (1.25)	0.355 (0.66)	0.578 (1.84)	1.110 (3.65)	0.987 (3.13)
3rd year						
1	0.700 (1.96)	0.585 (1.76)	0.344 (0.92)	-0.054 (-0.18)	-0.304 (-1.11)	-0.373 (-1.32)
3	0.337 (1.13)	0.164 (0.56)	-0.051 (-0.16)	0.032 (0.12)	0.011 (0.05)	-0.124 (-0.48)
5	0.282 (0.74)	0.269 (0.70)	0.119 (0.27)	0.221 (0.59)	0.357 (1.10)	0.201 (0.60)
5-1	-0.418 (-1.04)	-0.316 (-0.70)	-0.225 (-0.44)	0.275 (0.94)	0.660 (2.24)	0.574 (1.87)

	Institutional Funds			Retail Funds		
	1-factor	3-factors	4-factors	1-factor	3-factors	4-factors
Panel B: Developed Funds, Developed and Emerging Factors						
1-quarter/1-month						
1	0.094 (0.34)	-0.417 (-1.35)	-0.008 (-0.02)	-0.445 (-1.89)	-0.794 (-3.31)	-0.503 (-2.06)
3	0.235 (1.08)	-0.058 (-0.23)	-0.441 (-1.53)	0.102 (0.45)	-0.170 (-0.75)	-0.313 (-1.33)
5	1.044 (2.66)	1.157 (2.49)	-0.195 (-0.42)	1.003 (2.30)	0.930 (2.31)	0.116 (0.30)
5-1	0.950 (2.02)	1.574 (2.91)	-0.187 (-0.36)	1.448 (3.43)	1.724 (4.25)	0.619 (1.77)
1st year						
1	0.142 (0.50)	-0.466 (-1.53)	-0.124 (-0.35)	-0.069 (-0.27)	-0.388 (-1.46)	-0.274 (-0.99)
3	0.328 (1.38)	0.116 (0.42)	-0.262 (-0.81)	0.164 (0.67)	-0.088 (-0.35)	-0.255 (-1.00)
5	0.849 (2.19)	0.983 (2.14)	-0.273 (-0.58)	0.489 (1.21)	0.330 (0.88)	-0.268 (-0.74)
5-1	0.707 (1.45)	1.448 (2.61)	-0.149 (-0.27)	0.558 (1.48)	0.718 (1.98)	0.007 (0.02)
2nd year						
1	0.451 (1.74)	-0.109 (-0.41)	-0.140 (-0.44)	0.266 (0.95)	-0.072 (-0.28)	-0.225 (-0.84)
3	0.272 (1.28)	0.153 (0.62)	-0.268 (-0.96)	0.083 (0.32)	-0.188 (-0.73)	-0.435 (-1.67)
5	0.549 (1.75)	0.779 (2.12)	-0.026 (-0.07)	0.249 (0.80)	0.200 (0.67)	-0.047 (-0.15)
5-1	0.098 (0.32)	0.888 (2.83)	0.114 (0.35)	-0.017 (-0.09)	0.271 (1.38)	0.178 (0.87)
3rd year						
1	0.709 (2.76)	0.464 (1.64)	0.111 (0.34)	0.105 (0.37)	-0.203 (-0.78)	-0.502 (-1.94)
3	0.091 (0.44)	-0.165 (-0.67)	-0.679 (-2.57)	0.033 (0.13)	-0.266 (-1.05)	-0.470 (-1.82)
5	0.252 (0.86)	0.112 (0.31)	-0.458 (-1.15)	0.127 (0.40)	-0.128 (-0.42)	-0.279 (-0.88)
5-1	-0.457 (-1.69)	-0.352 (-1.08)	-0.569 (-1.49)	0.022 (0.12)	0.075 (0.37)	0.224 (1.08)
Panel C: Emerging Funds, Developed and Emerging Factors						
1-quarter/1-month						
1	0.218 (0.83)	0.346 (1.16)	0.544 (1.52)	-0.189 (-0.74)	-0.326 (-1.21)	-0.176 (-0.63)
3	0.627 (2.35)	0.460 (1.53)	0.180 (0.50)	0.303 (1.32)	0.215 (0.89)	0.073 (0.29)
5	0.801 (2.39)	0.597 (1.58)	-0.006 (-0.01)	0.830 (2.43)	0.883 (2.52)	0.415 (1.21)
5-1	0.573 (1.56)	0.252 (0.60)	-0.581 (-1.25)	1.228 (3.27)	1.336 (3.32)	0.666 (1.75)
1st year						
1	0.515 (2.02)	0.630 (2.33)	0.685 (2.11)	0.357 (1.39)	0.398 (1.46)	0.464 (1.65)
3	0.726 (2.58)	0.622 (1.90)	0.452 (1.15)	0.407 (1.70)	0.421 (1.67)	0.174 (0.68)
5	0.677 (2.04)	0.557 (1.52)	-0.110 (-0.26)	0.536 (1.67)	0.380 (1.13)	-0.071 (-0.21)
5-1	0.169 (0.52)	0.002 (0.01)	-0.738 (-1.74)	0.318 (0.92)	0.121 (0.33)	-0.412 (-1.15)
2nd year						
1	0.409 (1.50)	0.433 (1.41)	0.109 (0.31)	0.517 (1.77)	0.479 (1.60)	0.416 (1.36)
3	0.469 (1.72)	0.586 (1.96)	0.444 (1.27)	0.545 (2.39)	0.554 (2.37)	0.380 (1.58)
5	0.759 (2.57)	0.843 (2.56)	0.631 (1.60)	0.686 (2.45)	0.677 (2.39)	0.436 (1.51)
5-1	0.392 (1.86)	0.487 (1.87)	0.522 (1.68)	0.297 (1.07)	0.345 (1.13)	0.183 (0.58)
3rd year						
1	0.562 (2.10)	0.676 (2.24)	0.524 (1.47)	0.167 (0.54)	0.090 (0.27)	-0.076 (-0.22)
3	0.311 (1.09)	0.308 (0.95)	0.232 (0.61)	0.352 (1.28)	0.401 (1.39)	0.193 (0.66)
5	0.669 (2.74)	0.619 (2.18)	0.342 (1.03)	0.648 (2.19)	0.727 (2.41)	0.512 (1.69)
5-1	0.092 (0.34)	-0.095 (-0.29)	-0.223 (-0.58)	0.432 (1.36)	0.575 (1.72)	0.515 (1.48)

Table 10: Cashflow and Returns

We estimate the following Fama and MacBeth (1973) cross-sectional regressions:

$$CF_{it+1} = \gamma_{0t} + \gamma_{1t} CF_{it} + \gamma_{2t}(R_{it} - R_{bt}) + \gamma_{3t} LA_{it} + \gamma_{4t} LA_{it}^2 + u_{it+1},$$

where R_{it} is the return of fund *i* during year *t*, R_{bt} is the benchmark return of fund *i* during year *t*, CF_{it} is the percentage cash flow into fund *i* during year *t*, LA_{it} are the (log) assets under management of fund *i* at the end of year *t*. We estimate the regressions annually and present the time-series averages of these coefficients. The numbers in parentheses are *t*-statistics, corrected for serial correlation in the time-series estimates. The sample period is 1991 to 2009.

	All Funds	Global Funds	Developed Funds	Emerging Funds
Panel A: Institutional Funds				
Constant	0.802 (8.33)	0.661 (5.44)	0.822 (6.20)	0.275 (0.39)
Cashflow	0.128 (6.53)	0.124 (3.57)	0.111 (5.19)	0.168 (2.93)
Excess Returns	2.044 (7.33)	2.223 (2.89)	2.235 (7.52)	1.091 (0.67)
LAssets	-0.084 (-2.78)	-0.050 (-1.31)	-0.127 (-3.20)	0.230 (0.71)
$LAssets^2$	-0.002 (-0.64)	-0.003 (-1.11)	0.003 (1.02)	-0.035 (-1.14)
Panel B: Retail Funds				
Constant	0.890 (5.61)	0.984 (2.67)	0.798 (6.21)	1.185 (2.13)
Cashflow	0.202 (6.85)	0.215 (6.71)	0.192 (7.30)	0.268 (4.32)
Excess Returns	1.671 (5.46)	1.965 (6.49)	1.454 (5.13)	2.248 (2.63)
LAssets	-0.222 (-4.29)	-0.297 (-2.26)	-0.196 (-3.32)	-0.018 (-0.05)
$LAssets^2$	0.014 (2.99)	0.022 (1.93)	0.012 (2.04)	-0.039 (-0.62)

Figure 1: Percentage cash flows and past performance

We sort funds each year into quintiles based on their benchmark-adjusted returns. Quintile 1 is the worst performing funds, and quintile 5 is the best performing funds. The figure then plots the average percentage cash flows during the subsequent year for these quintiles. The sample period is 1991 to 2009.