On the International Transmission of Shocks: Micro-Evidence from Mutual Fund Portfolios

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Abstract

This paper uses micro-level data on mutual funds from different financial centers investing in equity and bonds to study how financial investors and managers behave and transmit shocks across countries. The paper finds that the volatility of mutual fund investments is driven quantitatively by both the underlying investors and fund managers through (i) injections/redemptions into each fund and (ii) managerial changes in country weights and cash. Both investors and managers respond to country returns and crises and adjust their investments substantially, for example, generating large reallocations during the global crisis. Their behavior tends to be pro-cyclical, pulling out of countries during bad times and increasing their exposures when conditions improve. Managers actively change country weights over time, although there is significant short-run pass-through from returns to these weights. Capital flows from mutual funds do not seem to have a stabilizing role and expose countries in their portfolios to foreign shocks.

JEL Classification Codes: F32, F36, G11, G15, G23

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1. Introduction

The global financial crisis of 2008 has reignited the interest in the behavior of financial intermediaries in both propelling risk taking and propagating shocks across markets and countries. In fact, several papers argue that financial intermediaries were at the core of the global financial crisis, as well as in some of the previous crises in emerging economies. In particular, the literature stresses that market participants have incentives to take too much risk during good times and become risk averse and retrench when shocks hit the financial system.[1] Countries and companies facing short-term and foreign currency debt are then exposed to these shocks and became financially constrained as liquidity in the financial system dries up.

In a world where most assets are intermediated, two types of market participants become essential to understand the behavior of the financial system: (i) the underlying investors delegating their assets to financial institutions and (ii) the managers allocating portfolios. Investors tend to channel the bulk of their international investments through financial intermediaries, pouring funds into those institutions when they wish to diversify internationally and withdrawing their funds when they favor local assets. Managers, in turn, need to deal with these shocks from the investors and with shocks to the assets they hold by deciding how much cash to accumulate and in which countries to invest. The shocks managers face can be large. For example, during the 1998 Russian crisis and the 2008 global crisis, financial institutions faced severe margin calls, liquidity shortages, and withdrawals from underlying investors leading to the collapse of Long-term Management Company (LTCM), Bear Stearns, and Lehman Brothers, and pushing the entire world financial system to the brink of a meltdown.[2] Furthermore, principal-agent problems affect how managers are monitored by investors and their own supervisors, which can generate incentives for portfolio managers to herd, avoid arbitrage opportunities that are profitable in the long run, and deviate from the optimal portfolios for the underlying investors.[3]

While the literature argues that the supply side of funds is important, detailed and direct evidence on how financial intermediaries behave around crises is rather limited. Some papers analyze the case of bank flows, whereas others study mutual fund flows across

[1] See Broner et al. (2010, 2011), Forbes and Warnock (2010), and Milesi-Ferretti and Tille (2010), among many others.

[2] The literature has stressed the importance of short-term funding by financial institutions, which in turn triggers collapses when liquidity vanishes. See, among others, Brunnermeier (2009), Gorton and Metrik (2009), Shin (2009), and Raddatz (2010).

[3] See, for example, Scharfstein and Stein (1990), Rajan (2005), Stein (2005, 2009), and Calomiris (2008).

countries.[4] Although very informative about the behavior of institutional investors, these studies tend to focus on aggregate investment flows into different countries. Therefore, they mostly miss important micro aspects of the risk taking of fund managers and the underlying investors, which seem essential to understand how financial intermediaries transmit shocks.[5]

In this paper, we use a micro-level dataset on mutual funds to shed new light on how managers and investors behave in tranquil and crisis times when investing across countries. In particular, we study the behavior of equity and bond investments of global and emerging market mutual funds based in international financial centers. The main data consist of portfolio weights and assets invested in each country around the world for 1,076 equity and bond mutual funds on a monthly basis during 15 years, January 1996 and November 2010. The data cover allocations for many different types of funds, both actively and passively managed, with different investment scopes (global, emerging markets, Asia, Europe, Latin America, and so forth).

The paper contributes to the literature by analyzing micro evidence on the behavior of (i) injections/redemptions (driven by the underlying investors) and (ii) country weights (which are at the sole discretion of the managers).[6] In particular, we are interested in understanding the contribution of the underlying investors and managers to the transmission of shocks and crises, with particular attention to the 2008 global financial crisis. We explore several related questions of interest. Do mutual funds help transmit crises, as the literature has argued for financial intermediaries? Specifically, what was their behavior during the global crisis? More generally, what is the role of investors and managers? How volatile are injections? To what extent do weights remain constant over time? To the extent that weights change, how much are they the cause of price shocks versus actual buying/selling in different countries or regions? How long does it take for weights to adjust to shocks? Lastly, how much of the volatility of capital flows is driven by the behavior of the underlying investors and how much by the behavior of mutual fund managers? Are capital flows and retrenchments largely driven by inflows into and out of investment funds that lead them to liquidate positions across

[4] See, for example, Borensztein and Gelos (2003), Martinez Peria et al. (2005), Broner et al. (2006), Hau and Rey (2006), Cetorelli and Goldberg (2009), and Fratzscher (2011).
[5] Three exceptions that stand out and are discussed in more detail below are: Kaminsky et al. (2004), Hau and Rey (2008), and Jotikasthira et al. (2010).
[6] Henceforth, we just use the term "injections" to refer to injections/redemptions, understanding that redemptions correspond to negative injections.

countries to maintain portfolio weights, or by active changes in these country weights by fund managers?

The main results of the paper can be summarized as follows. Both investors and managers change their investments substantially and are sensitive to crises and shocks. During good times, funds receive injections from investors and managers invest more in the countries that are doing well, while reducing their cash positions. During bad times, the opposite occurs. Moreover, mutual funds with good performance are the ones that receive more injections. The evidence is inconsistent with the view that country weights are constant. In fact, weights change substantially over time indicating that managers play a significant active role in the propagation of crises. For example, at the height of the global crisis, mutual funds experienced large portfolio shifts, retrenching from European and emerging economies and reallocating to the U.S. Part of the fluctuation in weights is driven by price shocks. As valuations change, managers let their portfolios adjust accordingly in the short run with a sizeable pass-through from prices to weights. But another part is driven by active reallocations across countries, which allow managers to adjust their portfolios over time. When computing capital flows to countries, the evidence suggests that both the underlying investors and managers are important. Naturally, managers are particularly relevant for active funds. Capital flows intermediated by international mutual funds do not seem to have a stabilizing role and neither managers nor investors seem to be exploiting potential arbitrage opportunities by being contrarian, particularly during crisis times. In sum, the evidence suggests that the behavior of both the underlying investors and managers tends to be pro-cyclical, helping transmit foreign shocks across countries in their portfolios.

This paper relates to several strands of literature, part of which is already cited above. First, there is an extensive literature on the origins and propagation of financial crises, and a growing literature on the global financial crisis that tries to understand why a relatively small shock in the U.S. subprime sector resulted in a global recession and the near collapse of many financial institutions and markets. Several papers in this literature conclude that financial institutions play an important channel of the transmission of shocks across countries, producing large fluctuations in capital flows.[7] While some papers argue that foreign investors are more fickle than domestic investors, other papers claim that deep-pocket foreign investors

[7] See, for example, Calvo and Mendoza (1998), Kaminsky and Reinhart (1999), Goldstein and Pauzner (2001), Kyle and Xiong (2001), Kodres and Pritsker (2002), Shiller (2008), Pavlova and Rigobon (2008), Coffey et al. (2009), Dooley and Hutchinson (2009), Eichengreen et al. (2009), Hellwig (2009), and Mishkin (2011).

constitute a stabilizing force, acting counter-cyclically and entering countries at fire-sale prices. This paper contributes to this literature by studying in detail one important part of foreign investors, international mutual funds, which channel substantial savings across countries. This is useful because most of the evidence on the transmission of shocks tends to be aggregate (using capital flows, bank flows, foreign direct investment, and portfolio flows) and focuses less on financial institutions, which are at the core of the transmission of crises. One advantage of mutual funds relative to other institutions, like banks, is that one can gain more granularity and work with entire portfolios, linking movements in asset allocations to capital flows. This is helpful because, while there is much discussion on portfolio reallocations, there is limited information on how portfolios are allocated and managed.

Second and related to the above, as financial institutions gain importance and channel a large fraction of domestic savings, there is increasing interest on how investors and managers behave and interact and how they respond to shocks, especially as principal-agent problems abound. Some of the questions of interest include: How much do managers diversify risk? Does risk taking change over time and with shocks, such as liquidity shortages? Do managers take advantage of arbitrage opportunities? What role do investors play in disciplining managers through injections and redemptions? While most of the literature is based on the U.S. financial system investing domestically, similar question arise at the international level, with some progress in that area as well.[8] This paper contributes to that literature by measuring the shocks faced by managers investing internationally and the way they respond to those shocks. In particular, this paper disentangles the actions of investors injecting and withdrawing capital from open-ended funds, possibly as a way to discipline managers, and the behavior of managers actively allocating country portfolios and reacting to shocks from investors and returns. The reactions of investors and managers are key to understand why financial institutions propagate crises.

At least three other papers have already started to uncover the behavior of investors and managers at the international level and are good complements to this paper. Kaminsky et al. (2004) study momentum trading by investors and managers of Latin American equity funds during the Asian crisis. Hau and Rey (2008) use data on equity funds to study whether foreign

[8] See, for example, Grinblatt and Titman (1992), Jegadeesh and Titman (1993), Grinblatt et al. (1995), Carhart (1997), Chevalier and Ellison (1997), Shleifer and Vishny (1997), Wermers (1999), and Gompers and Metrick (2000) for the U.S. domestic literature, and Kang and Stulz (1997), Choe et al. (1999), Dahlquist and Robertsson (2001), Kim and Wei (2002), Chan et al. (2005), Gelos and Wei (2005), and Boyer et al. (2006) for the international literature.

exchange and equity risk measures trigger rebalancing behavior at the fund and stock level. Jotikasthira et al. (2010) analyze how the movements in outside investors' flows force significant changes in the funds' portfolio allocations to emerging markets that drive emerging market equity returns, correlations between emerging markets, and the betas of emerging markets on developed markets.

The rest of the paper is organized as follows. Section 2 briefly describes the data and provides some basic statistics of the mutual fund investments across countries. Section 3 discusses the shocks to managers and studies the variation in fund allocations, or the manager's decisions. Section 4 analyzes how managers and investors react to crises. Section 5 studies how the variations in the investors' and managers' responses affect capital flows to different countries. Section 6 concludes.

2. Data and Summary Statistics

In this paper, we use a micro-level dataset consisting of an unbalanced panel of 1,140 international equity mutual funds and 121 international bond funds containing the country portfolios of these funds on a monthly basis over the period December 1995 to November 2010 for equity funds and July 2002 to November 2010 for bond funds. The dataset come from EPFR Global and includes active and dead cross-regional and regional equity and bond funds registered in various domiciles globally. These funds invest in over 124 developed and emerging markets around the world. For each fund and month, the dataset contains the total net asset value (or TNA) of the fund denominated in U.S. dollars, the percentage of the fund's assets allocated to each country (which we will refer henceforth as *country weights*), and the percentage held in cash. The dataset has actively and passively managed funds with different investment scopes: global, emerging markets, Asia (alternatively including the Pacific region and excluding Japan, or "ex-Japan"), the "BRIC" countries (originally coined to refer to Brazil, Russia, India, and China), Europe (separately for all the continent and for emerging countries), Latin America, and Middle East and Africa. The data also contain information on the fund domicile, the family (investment or asset management company), and main currency denomination. We will generally use the term "fund type" to refer to any of these dimensions of fund characteristics, clarifying the precise dimension when necessary.

To perform the empirical analysis, we clean the original data in standard ways, reducing the sample in about 15% and the total of funds to 1,076 starting in 1996.[9] The final dataset on country allocations contains 7,429,000 observations of the investments of the included mutual funds across countries and time. There is substantially more data (cross sectional and time series) and variety of funds for equity funds than for bond funds. For this reason we report more results for equity than for bonds and place more weight on the former.[10]

We complement the analysis by collecting additional data from other sources aimed mainly to compute the inflows and outflows to funds and countries. To compute the monthly injections into each fund, we collect data on fund prices/returns (Net Asset Values, NAV) from Bloomberg and Datastream (DS) that we matched to the corresponding funds from EPFR Global by name and family. We were able to match about 90% of the funds in our cleaned sample, ending up with 896 and 106 equity and bond funds with return data, respectively.[11] Analyses that require fund return information below will be restricted to this subset of funds.

In addition, our EPFR Global data do not contain information on the inflows or outflows of money from the funds to the countries. To compute these flows we need data on the returns of the investments of funds in each of the countries. Since we do not know the detailed portfolio of each fund within a country, we are forced to use country-level indexes to compute returns and assume throughout the paper that all funds investing in a country experience the same return to their investments in that country, disregarding country-return heterogeneity across funds.[12] To this end we collect monthly, dividend-adjusted price indexes in US dollars for the stock markets (MSCI Standard Index, S&P Broad Market Index, and local sources for a

[9] We conduct two basic cleanings. First, we remove fund-time periods where the data was reported at a frequency other than monthly. This excludes some funds that reported quarterly data during part of the sample period. Second, we exclude funds that report data for less than 12 months in the entire sample (unless they are present until the end of the sample period).

[10] Equity mutual funds cover the period, January 1996-November 2010, contain nine types of funds (of global and regional nature), and a total of 965 mutual funds, yielding a total of 6,867,500 usable observations. Instead, bond mutual funds cover only July 2002-November 2010, encompass just two types of funds (global and global emerging markets), and include a total of 111 mutual funds. The total number of observations (country weights and cash) for bond funds is 561,500.

[11] Information on ISIN is not available for the EPFR Global mutual funds, so we had to match the return data with the EPFR Global data according to the mutual fund name and family, using an algorithm that compares the (Levenshtein) distance across names (which takes into account the minimum number of insertions, deletions, or substitutions necessary to change one string into the other). We then manually screen out incorrect matches and complete the matching process. This procedure yields 896 matches for equity funds and 106 matches for bond funds (over 90% of the sample). The total number of observations of fund prices is 255,510

[12] We believe this is a reasonable approximation given the documented synchronicity of returns across assets within countries, especially in developing countries (Morck et al., 2000). Furthermore, we find a strong correlation between the return of a fund computed directly from its NAV and the return computed from the portfolio of country investments and country-level returns, which gives additional validity to our approximation.

total of 86 countries) and bond markets (JP Morgan sovereign bond index for 78 countries) in which mutual funds invest.[13] In the rest of the paper, analyses that require country-return information will be restricted to those countries and time-periods where we could gather these data.

Table 1 shows the characteristics of the cleaned mutual fund sample (without constraining by return price availability). Panel A reports sample characteristics by equity/bond funds. There are 965 equity funds (85% of the entire original sample) from January 1996 to November 2010, with a median number of 47 observations per fund. There are a total of 111 bond funds (92% of the entire original sample) from July 2002 to November 2010, with a median number of 34 observations per fund. Panel B reports the number of funds and observations by different partitions. Of the total sample, 95% is actively managed and the rest passively managed. Also, almost 65% of the funds have their investment scope in Asia (excluding Japan), global markets, global emerging markets, or Europe. Finally, Table 1 documents the number of funds and observations by domicile. The funds are primarily domiciled in developed market jurisdictions, in fact, 80% of the funds are domiciled (in order of importance by the number of funds) in Luxembourg, the U.S., the U.K., and Ireland, with the lion's share (37%) in Luxembourg. Appendix Table 1 classifies funds by mutual fund family. Average total net assets (first computed within fund, and then across all funds) is around 620 million U.S. dollars for both equity and bond funds.

Figure 1 shows the evolution of total assets (TNAs) in all equity and bond funds by region. Panel A plots total assets for equity funds between January 1996 and December 2000 and between June 2001 and November 2010.[15] Panel B displays total assets for bond funds between July 2002 and November 2010. The figure shows not only the large increase in total asset over time, but also the sharp declines around crises, particularly around the Asian and Russian crises and the global financial crisis. A similar pattern is observed for bond funds. The figure also shows that, as a set, bond funds are much smaller than equity funds (100 versus 599 billion U.S. dollars by November 2010), even though the mean fund is of a similar size.

[13] Time coverage for stock market indexes is January 1999-November 2010, and for bond market indexes is July 2002-November 2010. The total number of observations of stock and bond market indexes across countries and over time is 23,272.

[15] The division between both time frames in equity funds is an important one due to the relevance of global equity funds. EPFR Global starts reporting information for global equity funds in June 2001. The introduction of this type of funds adds nearly 90,000 million U.S. dollars to the total assets in all equity funds.

Mutual funds specialize along several dimensions. The most important are geographical regions, market segments (e.g. emerging and developed), and types of assets (equity or bonds). The specialization of funds largely determines the broad patterns of their asset allocation, as it is shown in Table 2. The table shows the mean portfolio weight invested in a geographical/market segment region by different types of equity and bond funds, along the number of funds included in each category. The regional classification corresponds to that used by EPFR Global (see Appendix Table 2). The mean portfolio weights reported in the table correspond to the average across funds of the mean regional weight of all funds within a category.

Not surprisingly, funds invest mainly in the region/market segment they target. For instance, "Asia ex-Japan" equity funds invest 96% of their portfolio in developed and emerging Asia. Similarly, Latin America equity funds invest 97% of their portfolio in Latin America. Nonetheless, most fund types invest around 5% of their assets outside their target region/segment and in cash. Cash holdings are a small but non-trivial part of fund portfolios. The holding of liquid assets may be due to the need to meet redemptions or to keep injections until they are properly allocated. Some funds might also hold liquidity to be able to invest quickly if opportunities arises (cash-in-the market). Perhaps consistently with this latter possibility, active equity and bond funds hold much more cash than their passive counterparts. Active equity (bond) funds hold 3.4% (5.7%) of assets in cash on average, while passive equity (bond) funds only hold 0.5% (2%).

Funds specialized in multi-regional market segments show some interesting patters of asset allocation. For instance, global emerging market funds invest mainly in emerging Asia, followed by Latina America, emerging Europe, and emerging Middle-East and Africa. Global equity funds invest mainly in developed Europe, North America, and developed Asia, but within emerging markets follow a similar relative pattern as global emerging market funds. These rankings suggest that funds invest across regions in a manner that is roughly consistent with each region's market size. These patterns are also observed across the countries included in a region. For instance, Latin America equity funds invest most of their assets in Brazil, emerging Europe funds in Russia, and Asia ex-Japan funds in China and India (Appendix Table 3).

Bond funds and comparable equity funds allocate their portfolios across regions in roughly the same manner. The main difference is that while emerging Asia is the main

investment destiny of emerging equity funds, emerging bond funds invest mainly in Latin America, followed by emerging Europe, and with emerging Asia in a far third place. This probably reflects the relative size and development of Latin American sovereign bond markets relative to Asian bond markets, which are, in relative terms, much more largely concentrated on corporate bonds (IMF, 2002). Bond funds also hold more cash on average than equity funds (8.55% of portfolio for global bond funds compared to 2.87% of portfolio for global equity funds).

Although mutual funds invest in regions, countries, and segments in a manner that is consistent with their specialization, the total assets (TNA) they hold in target countries experience important variations that roughly coincide with the cycles of international capital flows. Figure 2 plots the evolution of the median growth rate of total assets held by equity funds (Panel A) and bond funds (Panel B) in a typical country.[16] It shows periods of expansion that coincide with tranquil times for the global economy, followed by contractions that roughly match periods of global turmoil. For instance, Panel A shows a clear expansion at the beginning of the sample period (1996) until the beginning of the Asian crisis, followed by a short lived expansion that collapses during the Russian crisis. It similarly shows the expansion following the 2001 crisis that lasted until the beginning of the global financial crisis. The pattern of asset evolution for bond funds, reported for the shorter period for which bond-fund data are available, shows a similar picture. At the regional level, there is more variation in the growth rate of fund assets on the median country (unreported), but the overall pattern of expansions and contractions coinciding with regional crises persists.

Overall, the basic statistics reported in this section indicate that the mutual funds in our sample allocate funds across countries and regions in a manner that is consistent with their specialization, and also change their total holdings in different countries in a way that follows periods of global expansions and contractions. These findings provide support for the use of EPFR Global funds to understand the behavior of global investors.

[16] Growth rates are computed considering only continuing funds (those present both at t and t-1) and as a share of the average between assets in t and t-1. Then, the median country is obtained considering the median of growth rates in different countries at a certain point in time.

3. Shocks to Managers and Portfolio Reallocations

Mutual fund managers decide on the allocation of the funds they manage, but the size of these funds depends on the returns of their previous investments and on the injection (redemptions) of flows into (out of) the fund. While the return of a fund depends on its past investments, the exact realization of the return is stochastic and can be considered as a shock to the fund manager. Similarly, while the performance of a fund may affect its injections and redemptions, ex-post these inflows and outflows are at the discretion of the underlying investors and largely outside the control of the manager.

Mutual funds assets fluctuate importantly. During 1996-2010, the median growth rate of assets across equity funds fluctuate between -30% and 20%, with a time average of 0.35% and a standard deviation of 7.44% (Figure 3, Panel A, and Table 3 Panel A). Fluctuations in the median growth rate of assets are somewhat smaller among bond funds, moving between -20% and 10% during 2002-2010 (time average and standard deviation of 1.09% and 3.70%, respectively).

Table 3 shows interesting variation in the growth rate of assets of funds specialized in different regions/segments. Among equity funds, those specialized in Emerging Europe, Middle East, and Africa, and those specialized in Emerging Europe experienced the highest growth in assets and the highest variability of this growth. On the contrary, funds specialized in Europe experienced the lowest growth rate of assets. Similarly, among bond funds the highest growth rates (and highest standard deviations) occurred for global emerging funds. Thus, at the total net assets level, the data show a shift in favor of emerging markets during the period of analysis.

Similarly to the evolution of total assets to the median country shown in Figure 2, the evolution of the median growth of assets to mutual funds is characterized by lengthy periods of expansion followed by shorter periods of sharp contractions that roughly coincide with periods of international financial turmoil. For instance, equity funds' assets experience large declines in 1997-1998, 2001, and 2008. Because of sample restrictions, among bond funds we only observe the drop in assets of 2008.

Fund's assets may grow because of higher returns of their investments or because of injections to the fund by underlying investors. In fact, the growth rate of fund i's total assets, $\hat{A}_{it}$ can be trivially written as

$$\hat{A}_{it} = r_{it} + f_{it}, \quad (1)$$

(1)where r_{it} are the (net) returns to fund i at time t, and $f_{it} = F_{it}/A_{it-1}$ is the injections to the fund F_{it} expressed as a fraction of the fund's initial assets A_{it-1}. While injections and not directly observable, we can estimate them. To do so, we compute individual fund returns on a given month using data from Bloomberg and Datastream and obtain injections from the difference between the change in total net assets and individual returns. More formally,

$$F_{it} = A_{it} - A_{it-1}R_{it}, \quad (2)$$

where R_{it} is the gross rate of returns to fund i at time t, computed as P_{it}/P_{it-1}, with P_{it} being the fund price or net asset value (NAV, adjusted by dividend payments).[17]

The evolution of the returns and injections for the median fund is shown in Panels B and C of Figure 3, and summary statistics are reported in Table 3. For the median equity and bond funds, both returns and injections experience significant fluctuations during the sample period. Fluctuations in fund returns are much more volatile than those in injections for equity funds (standard deviation of 6.23% and 2.05%, respectively), while for bond funds the volatility of these components is similar (standard deviations of 2.53% and 2.05%, respectively). This is consistent with equity returns being more volatile than those of fixed income securities (Schwert, 1989; Andersen et al., 2007). Both components also exhibit a similar time pattern, which also coincides with that of the growth rate of assets, suggesting that the components do not cancel each other, but instead reinforce themselves. Both returns and injections expand during good times and experience severe contractions during periods of financial turmoil. Across types of funds by target region, the most salient pattern is the large growth in injections to funds specialized in BRICs during the period.

The relative variability of returns and injections for equity and bond funds maps into their ability to explain the variance of the growth rates of assets within funds. Among equity funds, the variances of returns and injections explain roughly the same fraction of the variability of the growth rate of assets (Table 3, Panel B). On average, the variances of returns

[17] A fund's net asset value (NAV) corresponds to the total net assets (A_{it}) divided by the number of shares (N_{it}). Thus, the ratio of NAV in two consecutive periods correspond to the ratio of the total asset values times the inverse ratio of total shares $NAV_{it}/NAV_{it-1} = (A_{it}N_{it-1})/(A_{it-1}N_{it})$. The flows into the fund can also be expressed as the increase (decrease) in shares times the value of the share $F_{it} = (N_{it} - N_{it-1})A_{it-1}R_{it}/N_{it-1}$. Replacing this in equation (2) we obtain that the gross returns correspond to the ratio of net asset values. The only caveat respect to our calculation is that total net assets discount the value of a fund's liabilities, such as the fees paid to the managers. However, if these fees are proportional to the assets under management they would only bias the levels of the variables but cancel out when computing the returns and flows relative to initial assets.

and injections explain 47% and 53% of funds' assets growth variability, respectively.[18] Among bond funds, however, the volatility of injections is behind most of the overall variability in assets growth, explaining 89% of it. Returns variation explains only 11% of these fluctuations. Both among equity and bond funds, the pattern observed for different fund types is similar to that documented for all funds. These results show that price fluctuations are important drivers of the variation of the gross asset positions of investors, especially in equity, which is consistent with valuation effects having potentially important consequences for movements in net foreign asset positions too (Gourinchas and Rey, 2007).

The variance decompositions reported above consider the whole period with available data. However, it is possible that the relative contributions of returns and injections varies between tranquil and crisis periods. This is indeed the case. Table 4 shows that return variability plays a much more important role during crisis times. For instance, during the global crisis the contribution of return variability to overall variance of equity funds was 67%, compared to a 37% contribution in the four years leading to the beginning of the crisis. Among bond funds, the contribution of returns variability increases from 12% in tranquil times to 19% during crisis times. These broad patterns are relatively stable across fund types and across crises.

The previous results show that, at the fund level, both returns and injections contribute to the variability of assets' growth. They also show that returns and injections vary across time in a manner that is consistent with the international business cycle. It is, therefore, possible that the ability of returns and funds to explain variations in assets comes mainly from all these series sharing a common time component, but this is not the case, especially for injections. While a common time component can explain 59% and 20% of the variability (for equity and bond funds respectively) of fund returns, the same component explains only 5% and 9%of the variability of injections.[19]

A fund manager's main decision is how to allocate his available funds across the different assets where he may invest; in particular, across the countries where the fund specializes. This decision may be driven by long-run structural factors behind the fund's

[18] Following Klenow and Rodriguez-Clare (2005) we have equally imputed the covariance term to each component (returns and injections). That is, the share of the variance of the growth of assets explained by returns equals the ratio of the variance of returns plus the covariance between returns and injections to the variance of the growth of assets. The contemporaneous covariance between returns and injections is small and negative.

[19] These figures correspond to the overall R^2 of an OLS regression between each of these variables and a set of month fixed effects.

strategic asset allocation (expected returns, covariance of assets across countries, benchmark being followed, and so forth), but it may also depend on short-run variations in these or other factors. Faced with shocks to the return of their investments or to the injections by underlying investors, fund managers may or may not decide to reallocate their investments within and across countries. To study the extent to which funds' managers vary their country allocations over time, we look at the variation of their country portfolio weights. This is important because weights that are relatively stable imply that only fluctuations in funds' assets (either because of returns or injections) will impact capital flows. On the other hand, country weights that experience non-trivial fluctuations in time indicate that managers' decisions on how to let weights adjust to relative price changes, or how to buy and sell assets differentially in different countries will play a role in international capital markets.

To get a first look at the variation in country weights in fund's portfolios, we compute coefficients of variation (CVs) of the weights for different regions and types of funds. These CVs correspond to the standard deviation of regional and country weights across funds and within-funds (over time) relative in both cases to the corresponding average weight across funds (reported in Table 2). Thus, we normalize the across-funds and within-funds standard deviations by the same value to ease comparison. Table 5 shows the CVs for the funds' weights in different regions and in cash for funds investing in different geographical areas and market segments. The table also shows the CV for the "relevant region," that is the region in which the funds invest the most. In this case, the CV is computed using country allocations within that region instead of regional ones, with the median CV across funds being reported. For each type of fund, the table highlight in boldface the CVs associated with the most important region in the fund's portfolios.

Table 5 shows substantial variation in regional and country weights across and within funds. Across funds, there is variation in regional weights even within funds focusing on the same markets. Of course, that variation is smaller in funds focused on narrowly defined regions (e.g. Latam), and larger in funds that are multi-regional (global). In all cases, the variation in regional weights is much larger for regions outside the main focus of the funds. For the same type of regional funds, there is much more variation in these marginal investments. Something similar is observed with the allocations on cash (Column (9)). Furthermore, Column (10) shows that there is important variation across funds in the weights allocated to countries within their "relevant region" (the set of countries that are the main focus of the funds). The CVs in these

cases are typically larger than 1, which means that, for a given country in the region, the standard deviation of country weights across funds is larger than the corresponding average weight. Within the relevant region, different funds follow different investment strategies.

The variation within funds is smaller than across funds, suggesting that different strategic allocations are behind differences in weights across funds. Nonetheless, there still is important variation in the regional allocation over time. For example, the CV for the emerging Asia allocation of Asia (ex-Japan) funds is 0.26 across funds and 0.12 within funds, so within fund variation in regional weights is about half of the cross-sectional variation. This pattern remains the same for all regions, cash, and the countries within the relevant region. Not surprisingly, the CVs are smaller for the relevant region of each fund, confirming that there is more variation in allocations to marginal regions. For example, funds dedicated to Asia vary less their overall Asia allocations than their Latin America ones. The table also shows that funds also vary substantially across time their allocation to countries within the relevant regions (Column (10)). The within fund CVs are again about half of the across fund CVs, but of the same order of magnitude than the average weights in each country. This indicates substantial within fund variation in country allocations. Understandably, the variation in country weights is larger than that of the main target region. Namely, Asia funds switch among countries in Asia more than what they switch in and out of Asia, since they have to be invested in that region.

Table 6 shows similar estimates of the CVs, but partitioning the sample by active and passive funds. The table shows that the CVs of are larger for active funds than for passive funds when considering the within-fund variation. That is, managers of active funds seem to be more active than those of passive funds. This pattern does not hold for the CVs across funds, denoting similar differences in strategic allocation across passive and active funds, due for instance to the tracking of different benchmarks. In sum, the CVs show that weights vary as expected but also that there is substantial variation in weights, that is, weights do not remain constant across countries and regions, across and within funds. Of course, these results do not explain what drives the changes in weights; in particular to what extent this variation is driven by prices. While prices will tend to affect weights, a topic we explore in the next section, they cannot be the sole source of variation since active funds display larger CVs than passive ones. If weights varied only with returns, one would expect that the CVs of passive and active funds would not be very different.

4. Behavior of Investors and Managers

The evidence above shows that both the underlying investors and managers change their positions over time, but tells us little about the ultimate determinants of mutual fund investments across countries. For instance, it does not show us how investors and managers respond to crises and shocks. These responses are crucial to understand if this type of financial intermediaries may contribute or dampen the transmission of crises across countries. To advance in our understanding of these determinants, we model how injections and weights vary over time using some parsimonious models that, nonetheless, capture basic and important properties of their behavior.

A fund's underlying investors may link their injections into the fund to attributes that vary at the fund level and over time. Therefore, to study the behavior of injections in a parsimonious manner we regress them on variables measuring the occurrence of crises (both at the countries of destiny and origin of a fund and at the global level), returns of the fund, and returns of its country of origin.[20] This allows us to test, for example, if investors inject more resources into a fund when it is performing well as previously shown for US mutual funds by Chevalier and Ellison (1997) among others. It also permits us to estimate how investors react to changes in the conditions experienced by the countries in which the fund invests, measured by crisis at the country of destiny. Furthermore, investors are also affected by shocks such as global crises and changes in the conditions at their country of origin, which can lead to change their investments in the type of international mutual funds we analyze. During good times, investors may feel richer and desire to invest more internationally and diversify risk, and vice versa. But it could also be the case that investors prefer to invest more internationally when conditions in their home countries worsen, since international markets might provide in relative terms better prospects. Ex-ante, all these effects are not obvious. Investors can react to different types shocks pro-cyclically, counter-cyclically, or not react at all.

In the regressions, we normalize the injections to a fund (given by Equation (2) above) by the fund's average assets instead of its initial assets to isolate fluctuations in injections from

[20] Injections are measured as a ratio to average assets within a certain fund. This allow us to normalize flows by the average size of funds and also isolate the variation coming directly from injections without taking into account the variability coming from a fund's assets. This would be the case if we used flows normalized by assets from the previous month.

fluctuations in initial assets.[21] To differentiate these normalized injections from those used in most of the paper, we denote them by $\tilde{f}_{it}$ instead of f_{it}. We sequentially regress these injections on a weighted country crisis dummy, a dummy variable taking the value 1 during periods of global turmoil, lagged fund returns, and the returns of the fund's country of origin.[22] In addition, the regressions include, alternatively, fixed effects at the fund, month, and country of origin-month levels. Standard errors are clustered at the country of origin-month levels to control for correlation in injections to funds located in the same country.[23]

The results, reported in Table 7 show that injections to both equity and bond funds fall when the countries of destiny are affected by crises (Column (1)) and in periods of global crisis (Column (2)). On the contrary, injections increase in response to the lagged returns of the fund (Column (3)), which are presumably observable by underlying investors, and in response to increases in the contemporaneous returns in the country of origin of the fund (Column (4)), which captures local conditions. Interestingly, both among equity and bond funds, the coefficient on lagged fund returns is lower than that for country of origin returns. One can interpret this difference as suggesting that, at least in this sample, wealth effects are stronger than substitution effects (across funds). A decline in local conditions does not itself lead investors to increase their investments in international funds to take advantage of equity return differentials or "carry-trade" effects (in cases where these declines are associated with low interest rates). Nonetheless, controlling for the conditions in the country of origin, more money flows (or less money gets out) into (out of) the best performing funds.

The regression in Column (5) includes all the previous variables simultaneously and shows similar coefficients than those obtained in the single-variable regressions, except for the impact of country crisis on equity funds. This indicates that while in some cases the country-crisis variable is capturing the variation coming from periods of global turmoil, the potential

[21] Results using injections normalized by initial assets, available upon request, are qualitatively and quantitatively similar to those reported here but estimators are less precise because of the additional volatility of the denominator in the expression.

[22] The weighted country crisis dummy is constructed using yearly country crisis data, weighted by the fund's country portfolio weights at the beginning of the year. The crisis variable comes from Broner et al. (2010) and dates a crisis (takes the value 1) the year when a country suffers at least a banking, debt, or currency crisis, according to indicators widely used by the literature. The periods of global turmoil are: July 1997-December 1997 (the Asian crisis), August 1998-December 1998 (the Russian crisis), March 2001-December 2001 (the dotcom bust, September 11, and the Enron scandal), and September 2008-June 2009 (the global financial crisis). Fund returns are computed from fund-price data. Returns of the fund's country of origin are measured using a broad equity price index from the country where the fund is located. Funds that are domiciled in Luxembourg are matched with country returns from Belgium since there is no available index for bonds and equity from Luxembourg.

[23] Clustering estimations by month yields very similar results to using cluster by country of origin-month

correlation between global crises and returns at the fund and country level is not behind the significant results obtained in the previous columns.

The regressions in Columns (6) and (7) add time (month) and country of origin-time fixed effects to the regression in Column (5), respectively. In both cases, and among equity and bond funds, the impact of country crisis declines and becomes statistically insignificant (the global crisis variable is dropped from the regression in both cases because it varies only with time). This confirms that the identification of the coefficient in Column (1) come mainly from a common, time-varying component, and not from the idiosyncratic incidence of crises in individual countries. Lagged fund returns and country returns remain statistically significant, except when including country of origin-month fixed effects for bond funds, where the coefficient for these returns retains the magnitude but becomes marginally significant (with a p-value of 0.11).

The results above show that the underlying investors respond to local and international conditions when deciding whether to inject or withdraw money from mutual funds. On the other hand, fund managers must choose how to allocate or liquidate positions in response to these injections/redemptions and to the realized returns of their investments. It is this response (or lack thereof) that ultimately determines the net inflows/outflows to the countries where each fund invests.

To empirically study the behavior of fund managers in their portfolio allocations, we start with the following identity that relates the country portfolio weights of a fund in two subsequent periods

$$w_{ijt} = w_{ijt-1}\frac{\left(R_{ijt} + f_{ijt}\right)}{\left(R_{it} + f_{it}\right)}, \tag{3}$$

where w_{ijt} is the portfolio weight of fund i in country j at time t, R_{ijt} and R_{it} are the gross returns of the investments of the fund in country j and across its whole portfolio, respectively. As explained in section 2, for data availability reasons we assume that the returns of all i funds investing in a country j are identical; that is that $R_{ijt} = R_{jt}$ constant across funds. Finally, f_{ijt} is the net flows of money from fund i to country j at time t, expressed as a fraction of the fund's initial assets in the country A_{ijt-1}, and f_{it} is the injection/redemption of funds into (out of) fund i by its underlying investors, expressed as a fraction of the initial assets of the fund A_{it-1}.

The expression in Equation (3) simply states that the weight of a country in a fund's portfolio at the end of time t depends on the country's initial portfolio weight, the return of the fund's investment in the country, the return of the whole fund's portfolio, the funds new net inflows in and out of a country, and the fund's injections/redemptions. Intuitively, in absence of any type of flows (by the fund across countries or to the fund), the portfolio weight of a country would increase (decrease) only if the country assets have a higher (lower) return than those of other countries in the fund's portfolio. Henceforth, we will refer to the counterfactual country portfolio weight in absence of any new flows or injections, $w_{ijt}R_{jt}/R_{it}$ as the *buy-and-hold weight*. The presence of injections adds another layer of variation in relative weights because they would require the fund to allocate new money across countries or to liquidate positions that may result in changes in portfolio weights. Furthermore, the flows to different countries do not need to be linked to injections. Even in the absence of the latter, managers might decide to change country weights by reallocating funds across countries. In sum, while Equation (3) is an identity, it does not imply any specific behavior for country portfolio weights at time t because funds have the liberty, in principle, to relocate funds across countries as they see fit through variations in f_{ijt} to achieve a given portfolio composition.

The expression in Equation (3) is a useful starting point to analyze the behavior of portfolio weights. Log-linearizing that equation around a state with gross returns equal to 1 and zero injections, one obtains the following expression

$$\omega_{ijt} = \omega_{ijt-1} + \left(r_{jt} - r_{\mathrm{it}}\right) + \left(f_{ijt} - f_{it}\right) + \theta_{it} + \epsilon_{ijt}, \tag{4}$$

where ω_{ijt} is the log of w_{ijt}, lowercase r represent the corresponding net returns associated with the gross returns described above, and θ_{it} and ϵ_{ijt} are the main components of a second order approximation error. We have separated the two components because the θ_{it} term that contains expressions on r_{it}^2 and f_{it}^2 may become especially important when these variables significantly deviate from the approximation point. It may be, therefore, useful to control for them in a non-parametric manner. This expression clearly shows that in the absence of relative flows $\left(f_{ijt} - f_{it}\right)$ there is complete pass-through from relative returns $\left(r_{jt} - r_{it}\right)$ into weights (to a first order log approximation).

Transforming the identity in Equation (4) into an estimable equation requires an expression for the relative flows. Intuitively, relative flows will depend on the portfolio weight a fund wants to have in a given country at a point in time and on its current portfolio weight on

that country. If the former is greater than the latter the fund will try to move relatively more money into the country and vice-versa. This intuition can be captured by a simple partial adjustment model,

$$f_{ijt} - f_{it} = \lambda\left(\omega^*_{ijt} - \widetilde{\omega}_{ijt}\right) + \chi_{ijt} \tag{5}$$

where ω^*_{ijt} is the (log) *desired weight* in the country, and $\widetilde{\omega}_{ijt} = \omega_{ijt-1} + \left(r_{jt} - r_{\text{it}}\right)$ is the (log) buy-and-hold weight with which fund i wakes up before any flows or injections are realized. The parameter λ captures the fund's speed of adjustment toward its desired weight. A value of λ equal to 1 implies that the fund immediately adjusts its weights to its desired level through movements in relative flows, and a value smaller than 1 means that adjustment costs preclude a fund from immediately reaching its target.

This simple description of flows is completely agnostic about the desired portfolio weight ω^*_{ijt}, which is likely the outcome of a fund's optimal portfolio allocation. However, one can relate these desired weights to country and fund characteristics by allowing them to vary parametrically with them. In particular, we consider the following equation for log desired weights

$$\omega^*_{ijt} = \delta_{ij} + \eta\left(r_{jt} - r_{it}\right) + \psi X_{ijt} + \nu_{ijt}, \tag{6}$$

where δ_{ij} is a fund-country fixed effect, X_{ijt} is a vector of additional observable determinants of the desired weight, ν_{ijt} is an error term, and the rest of the notation is the same as above. Although admittedly arbitrary, this specification is also very flexible and embeds several alternative forms for the desired weights. For instance, if η and ψ are both equal to zero, and δ_{it} is different from zero, it implies that a fund's desired country weights are roughly constant. On the other hand, if η is different from zero, it means that the desired weight responds to changes in relative returns. The X_{ijt} variables allow us to test for other possible determinants of desired weights.

Replacing Equations (5) and (6) in Equation (4), and assuming for now that $\psi = 0$ we obtain the following estimable equation

$$\omega_{ijt} = (1-\lambda)\omega_{ijt-1} + (1 - \lambda(1 - hh\eta))\left(r_{jt} - r_{it}\right) + \lambda\psi X_{ijt} + \lambda\delta_{ij} + \theta_{it} + \lambda\nu_{ijt} + \chi_{ijt} + \epsilon_{ijt}, \text{ or}$$

$$\omega_{ijt} = \alpha\omega_{ijt-1} + \beta\left(r_{jt} - r_{it}\right) + \gamma X_{ijt} + \tilde{\delta}_{ij} + \theta_{it} + u_{ijt}, \tag{7}$$

where $\gamma = \lambda\psi$, $\tilde{\delta}_{ijt} \equiv \lambda\delta_{ijt}$, and $u_{ijt} = \lambda\nu_{ijt} + \chi_{ijt} + \epsilon_{ijt}$ It is apparent that the coefficients on lagged weights α and in relative returns β embed both the pure buy-and-hold effect (which is captured by the 1 embedded in the coefficient) and the response of relative flows to these variables due to adjustment costs (λ) and to the response of desired country weights (η).

The simple framework described above allows us to use the parameters estimated from Equation (7) to learn about the determinants of the behavior of portfolio managers. For instance, a coefficient on log lagged weights smaller than 1 provides information on the extent of adjustment costs. The smaller the coefficient α, the larger is the implied λ and the smaller the adjustment costs. Similarly, finding a coefficient on relative returns, β, different from 1 does not provide immediate evidence that portfolio managers adjust their desired weights ω^*_{ijt} in response to returns because it may just come from the presence of costs of adjusting portfolio weights ($\beta = 1 - \lambda$ when $\eta = 0$). What really provides information about the relation between returns and desired weights is the difference between the coefficient estimated for lagged (log) weights and the coefficient on relative returns, which corresponds to $\lambda\eta$. A coefficient on relative returns smaller than the coefficient for lagged weights means that η is negative and that desired weights and, hence, relative flows, decline with relative returns (inducing a contrarian movement in flows). On the contrary, a larger coefficient means that desired weights and relative flows increase with relative returns, consistently with these flows following momentum.

Notice also that the model described by Equation (6) corresponds to a dynamic panel and that omitting the fund-country fixed effect, or cleaning it by taking differences will result in inconsistent parameters, especially for the lagged weights (Arellano and Bond, 1991). Estimating the fixed effects using the Least Squares Dummy Variable estimator is still asymptotically biased, but the bias is of the order of $1/T$, where T is the time-series length of the typical fund. Since T is relatively large (50 observations for the median fund), this bias is small. Including and estimating the fixed effects is important. Notice also that under the null that $\lambda = 0$, which occurs if there is an infinite cost of adjusting weights, the specification above implies that the process for (log) weights has a unit root and that standard t-stats cannot be

reliably used. We addressed this concern in several manners and it does not affect significantly our findings.[24]

Table 8 reports estimates of Equation (6) for equity funds (Panel A) and bond funds (Panel B). The regression includes country weights in the relevant region of a fund (i.e. countries in the main scope of investment, see section 2), and excludes cash weights, which are separately analyzed below. The first five columns report the parameters of equation (6) including different combinations of fixed effects. The results in Column (1) include no fixed effects, while the results in Column (2) include fund and date fixed effects The results in Column (2) show that the coefficients are very similar to those without fixed effects and that these sources of variation do not have explanatory power. Results controlling for shocks to the fund at the country of origin level (unreported) are also similar to those obtained without fixed effects and to those obtained with fund and date fixed effects, indicating that shocks at the level of country of origin do not play an important role in the dispersion of portfolio allocations. In both cases, the coefficient on relative returns is significantly smaller than that for lagged weights (see the row at the bottom of each panel displaying the p-values of the test of equality of coefficients), which would suggest that relative inflows attenuate the impact of relative returns on weights moving counter-cyclically.

The conclusions from the first three columns of Table 8 are not robust to the inclusion of other shocks. Columns (3), (4), and (5) include, alternatively and jointly, fund-date fixed effects and country of destiny-fund fixed effects (θ_{it} and $\tilde{\delta}_{ij}$ above, respectively).

The results in Column (3), which include fund-date fixed effects, exhibit a significant increase in the coefficient for relative returns. They indicate that the under-reaction of weights to relative returns documented in the initial columns is largely due to fund level, time varying shocks, such as those to injection and fund returns that are part of the approximation error in Equation (4). For instance, in the nonlinear version of the identity (Equation (3)) the impact of fund returns on weights depends, among other things, on its injections. If these injections are large, weights would be mainly driven by these injections and respond relatively less to returns. Furthermore, from an econometric standpoint, these fixed effects also control for time

[24] First, standard panel unit root tests reject the hypothesis of a unit root in log weights. Second, we also estimate specifications where the dependent variable is the difference between log current weights and the buy and hold benchmark. These differences should be stationary under both the null of a unit root and the alternative. Finally, as we report next, we estimate the specification at longer frequencies (semi-annual and annual) that make very unlikely that the cost of adjusting weights is as high as to make α statistically indistinguishable from zero.

variation in the within-fund, across-countries, dispersion of weights (which is captured in the average log weight), and identifies the importance of relative returns using only within fund across countries variation in returns and allocations. Interestingly, when including the country of destiny-fund fixed effects (Column (4)), the coefficient on lagged weight declines significantly relative to the other columns. This is consistent with the existence of a bias due to the presence of a fixed component in the desired weight that a fund wants to maintain in a given country. Correcting for this bias through the inclusion of a fixed effect yields a much higher implied speed of convergence towards the desired weight.[25]

Finally, the regression in Column (5) in Table 8 includes only the two sets of fixed effects that have some impact on the coefficients: country of destiny-fund fixed effects (that capture the constant component of desired weights) and fund-date fixed effects (that capture idiosyncratic shocks to the fund). The results show that at monthly level there is an important degree of pass-through of relative returns to weights, and that funds significantly overreact to relative returns differentials: they increase (decrease) their relative flows to countries experiencing higher (lower) relative returns beyond the pure pass-through impact. This suggests that, overall, mutual funds are slightly pro-cyclical in their allocations. The regression in Column (7) further investigates the pro-cyclicality of fund allocations by adding a country-crisis dummy to the specification to test if funds react specially to crises periods. The results show that funds decrease their exposure to countries that experiencing crises. A crisis results in a 1.6% decline in the weights assigned to the affected country, on top of the decline implied by the relative returns, which indicate over-reaction relative to the (sluggish) pass-through implied by the coefficient on (log) lagged weights.

The last two columns of Table 8 repeat the specification in Column (6) using data aggregated at different frequencies. The results show that the importance of pass-through declines at lower frequencies, as funds have more time to adjust their positions to their target weights after changes in relative prices. Similarly, the importance of country crises increases as funds adjust. Nonetheless, it is still the case that the difference in coefficients between lagged weights and relative returns imply that funds over-react to changes in relative prices relative to

[25] The regressions estimated above constitute a dynamic panel model. It is well known the inconsistency of estimators in these models when there are fixed effects and lagged dependent variables. This creates direct problems for the difference equation used to clean for the fixed effects in short panels. However, when the fixed effects can be estimated, as it is our case, the asymptotic bias of these estimators is of the order of 1/T where T is the time dimension of the panel. In our case, the typical number of observations of a fund is large enough for this problem to be considered second order.

the buy-and-hold benchmark: an increase (decline) in relative returns in a country raises (reduces) the positions of funds in that country above what is implied by the pure relative price effect and the speed of adjustment. This is consistent with desired weights adjusting in response to changes in relative returns and with funds slowly adjusting to these desired weights from the buy-and-hold positions as time goes on.

The results for bond funds (Table 8, Panel B) are broadly similar to those for equity funds, but while the coefficients move in the same manner when various fixed effects are added, among these funds there is always under-reaction to returns: the coefficient on relative returns is always smaller than that of lagged weights, except when looking at annual frequencies. Bond funds seem to behave in a more contrarian way in the short run. This behavior may result from a lack of ability to quickly liquidate bonds of countries suffering strong reversals because of the lower liquidity of some bond markets. Thus, in the short run these funds may be forced to liquidate positions in countries that do relatively better off in order to meet redemptions, but as they can slowly accommodate their positions they react pro-cyclically to return differentials.

The log transformation used to derive Equation (7) and the regressions reported in Table 8 discards the information contained in the zero weight countries. It is not obvious if these zeroes should or not be included because some cases may correspond to countries that are out of the scope of investment of a fund for reasons we do not observe (prospectus or underlying unobserved benchmark). To check the concern that the zeroes may contain useful information while minimizing the probability of zeroes that are related to the scope of the fund, we re-estimate the regressions in Table 9 in levels including only the zeroes corresponding to countries that are in the region or market segment declared as part of the scope of the fund. To maintain consistency with the equation in logs, we include as explanatory variables the level of the buy-and-hold weight and the country's relative returns expressed as the ratio of the gross returns of the country and the portfolio. This specification also has the advantage of being comparable with that estimated by Hau and Rey (2008). The results are consistent with those obtained with the specification in levels, despite significantly increasing the number of observations (from 460,000 to 740,000). They suggest the presence of large adjustment costs and under-reaction to returns (contrarian trading) without considering fund-country and fund-time fixed effects, but smaller adjustment costs and slight overreaction to returns (momentum trading) when the full set of fixed effects are considered. Furthermore, the results again show smaller adjustment costs and larger overreaction to returns when the time period is

lengthened. As before, bond funds seem to under-react to relative returns (Panel B) except when looking at annual data (Column (9)).

As shown in Section 3 (Table 2), both equity and bond funds maintain a fraction of their assets in cash. This cash is typically used as a buffer to place money before and after buying and selling assets, to meet redemptions, and may also be strategically used to take advantage of sudden investment opportunities. The regressions in Table 10 characterize the behavior of the cash weights in logs. In unreported results, we also ran the same regression for cash in levels, obtaining similar results. The specifications are analogous to those reported above, with gross cash returns assumed to equal 1 so that relative returns correspond to (minus) fund net returns (specification in logs) and the inverse of funds' gross returns (specification in levels). Since cash weights vary only in the fund-time dimension, we limit the set of fixed effects included.

The results in Tables 10 show much faster speed of adjustment for cash weights with coefficients on lagged (log) cash weights and adjusted weights much smaller than 1. The results for relative returns also suggest overreaction to returns (Columns (1) and (2)). A decline in fund returns results in a larger increase in cash than that consistent with pass-through and incomplete adjustment. In other words, funds accumulate extra cash in bad times and reduce these positions in good times. The results in Column (3), which include time fixed effects, show that most of the overreaction of cash weights to returns results from variation in global conditions. After controlling for those fixed effects, the coefficient on returns, while still positive, becomes smaller than that of lagged weights and not significant. This simply says that the variation in the cross-sectional dispersion of cash weights does not relate strongly to the variation in the cross-sectional dispersion of fund returns. Going back to the specification without time fixed effects, the regression in Column (4) shows that the variables capturing the prevalence of country and global crises are associated with both an increase in cash and a decline in the coefficients for relative returns, confirming the results in Column (3) that, to an important extent, the relevance of relative returns come from global conditions. Columns (5) and (6), focusing on the results at different frequencies show again a large increase in the speed of adjustment and a smaller, and vanishing, role for relative returns; indicating that at lower frequencies cash weights tend to go back to a relatively fixed target level. However, even at this level of aggregation country and global crises can explain some of the variation in cash weights.

The response of cash weights to returns is much different in bond funds. Among these funds, cash moves in opposite direction to returns, even though pass-through would suggest a positive response. Bond funds seem to accumulate cash when fund returns are high (low relative returns). This result may be due to the stronger response of injections to returns among bond funds (see Table 7): a high return results in injections that are temporarily parked in cash. Similarly, a bad fund return may require a decline in cash while the fund meets redemptions. Why is this effect dominant only for bond funds? As pointed out above, the stronger response of injections to fund returns in bond funds may be part of the explanation. Another explanation is that, since bond funds hold more cash on average (Table 2), they are better able to respond to injections/redemptions through variations in cash without having to liquidate assets or relocate money across countries. This is only a proximate explanation because, of course, the level of cash held by bond funds is an endogeneous choice. Nonetheless, one can rationalize both the level and cyclical fluctuations in cash if the bond markets where international funds invest are less liquid than the corresponding equity markets, so that funds cannot quickly adjust positions to meet redemptions without taking large losses through fire sale prices, which may lead them to keep and use more cash. Results in levels including the zero cash weights are qualitatively similar to those in logs (unreported).Whereas the tables above show the behavior of weights during all crises in the sample, we next take a closer look at the evolution of weights around the global financial crisis. Figures 4 and 5 show, respectively, the weights for equity and bond funds, with global funds at the top part and global emerging funds at the bottom part. The figures illustrate the evolution of weights for some of the main regions of investment within emerging and developed countries. In particular, they show the weights in emerging economies (emerging Asia, emerging Europe, and Latin America), developed Europe, and North America for global funds and emerging Asia, emerging Europe, and Latin America for global emerging funds. The figures report both the actual weights and the buy-and-hold weights, computed for each period as described above, and continuously re-balanced during the window; that is, the buy-and-hold weight at each month is based on the *actual* lagged weight and *contemporaneous* relative returns. This re-balancing minimizes the differences between actual and buy-and-hold weights relative to a counterfactual where the weights are kept fixed at the beginning of the period and only relative returns are allowed to vary. The figures also mark some of the main events around the global crisis: the nationalization of Northern Rock, the collapses of Bear Stearns and Lehman Brothers, and the near collapse of AIG.

The figures show several interesting features of the data and confirm the patterns documented above. First, weights fluctuate substantially over time. Second, actual weights differ in many cases significantly from the buy-and-hold weights, despite the continuous rebalancing, indicating that managers are actively reallocating their portfolios. Third, there are substantial reallocations across regions especially at times of stress, which roughly coincide with differences in relative returns, and some of which revert over time. For example, the figures for equity funds show that, even though the epicenter of the crisis was in the U.S., managers started liquidating their exposure to emerging economies after the collapse of Bears Stearns while they increased their exposure to North America. This is consistent with a relatively smaller collapse in some asset prices in the US than, for instance, in Emerging Asia, as shown in the regressions above. Only in early 2009 managers started reversing that trend. Among global emerging funds, managers sold their positions in emerging Europe and Latin America and moved to emerging Asia. For example, between June 2008 and July 2009 the mutual fund exposure in Asia increased from 45% to 55%, while they decreased from 14% to 9% in emerging Europe (after having dropped to 7%) and from 24% to 21% in Latin America. Among bond funds, the large substitution took place between developed Europe and North America among global emerging funds, when managers reduced their exposure to Europe from 51% in March 2008 to 31% in November 2008 and increased their share in North America from 7% to 19% during the same period. Global emerging funds sold their positions in emerging Europe and bought assets in emerging Asia after August 2008. Furthermore, cash positions increased for both equity and bond funds during the crises (not reported), also as predicted by the previous results.

5. Gross and Net Country Flows: The Role of Investors and Managers

We have shown above that both injections and returns are significant to explain fluctuations in the total assets of mutual funds, that injections respond to country and fund conditions, and that fund managers respond to injections and returns by changing their country portfolio weights. In this section, we study how these different forces contribute to explain the gross and net flows of capital to different countries. "Gross flows" are the growth rate of the total assets invested by mutual funds in a country (including returns of past investments), and "net flows"

are inflows/outflows of money (gross flows minus the return in each country).[26] Our goal is to quantify the relative importance of the underlying investors and managers in explaining these flows.

The assets held by mutual funds in a country j trivially correspond to the sum of the assets held in that country by each one i of the funds that invest in that country

$$A_{jt} = \sum_i A_{ijt}.$$

Taking log differences we obtain the following decomposition for the growth rate of total assets in a country (gross flows)

$$\hat{A}_{jt} = \sum_i s_{ijt-1}\hat{w}_{ijt} + \sum_i s_{ijt-1}\hat{A}_{it}, \quad (8)$$

where $\hat{A}_{jt}$ denotes the growth rate of total mutual funds' assets in country j at time t, $s_{ijt} = A_{ijt}/A_{jt}$ is the share of total country j assets represented by fund i, $\hat{w}_{ijt}$ is the growth of the weight of country j in the portfolio of fund i between $t-1$ and t, and $\hat{A}_{it}$ is the growth in total assets of fund i in the same interval.

Equation (8) states that gross flows of money from mutual funds to a country may increase because funds increase the weight of that country in their portfolio, or because the total assets of the funds investing in the country are increasing. The economic interpretation of these two components as capturing the contribution of fund managers versus underlying investors require to take a stance on the scope of activities within the realm of decision of each of these two sets of market participants. Assuming that changes in weights are the managers' choice and the growth rate of the funds' assets is exogenously determined, one may interpret the first component as corresponding to managers' decision and the second to "other," including underlying investors. This is one of the decompositions we estimate below.

As shown in Equation (4) above, the first component in Equation (8), the weight of a country in the portfolio of a fund, may grow because of increases in that country's returns. Whether one should attribute that increase to a manager's decision, as in the interpretation above, is open to debate and depends on what is the "passive benchmark" (the counterfactual weight under a "passive" strategy) one has in mind. Attributing the whole growth in weights to

[26] Note that this is a specific definition of gross and net flows that fits well with the discussion on this paper, but literature has employed the terms with many other meanings. For our computations, we use the growth rates of total and net assets between two consecutive periods in a country using only the funds that have investments in that country in both periods. That is, we do not include entry-exit in the calculations. The reason is that we don't know whether entry-exit in our sample corresponds to real entry-exit or variations in data coverage.

managers is akin to having the past period's weight as the passive benchmark. One way of tackling this concern, which is equivalent to considering a different benchmark, is to re-arrange Equation (8) in a way that removes changes in relative returns from the first term

$$\hat{A}_{jt} = \sum_i s_{ijt-1}\left(\widehat{\omega}_{ijt} - \left(r_{jt} - r_{it}\right)\right) + \sum_i s_{ijt-1}\left(\hat{A}_{it} + \left(r_{jt} - r_{it}\right)\right),$$
$$\hat{A}_{jt} = \sum_i s_{ijt-1}\left(\widehat{\omega}_{ijt} - \left(r_{jt} - r_{it}\right)\right) + \sum_i s_{ijt-1}\left(f_{it} + r_{jt}\right), \quad (9)$$

where the second step uses Equation (1) to substitute for $\hat{A}_{it}$. In this decomposition, the first component corresponds to the growth in weights that is not related to returns and depends only on relative flows from fund i to country j, $f_{ijt} - f_{it}$ (see Equation (4) above). This way of measuring the contribution of managers implicitly assumes a buy-and-hold strategy as the passive benchmark and only considers deviations from buy-and-hold weights as responsibility of the managers. The second component has not clear economic interpretation and embeds the other two forces that drive the growth in total assets: injections and the return of the country.

Net flows to a country (growth in total assets net of returns) can be similarly decomposed as follows to isolate the contribution of total changes in weights:

$$f_{jt} = \sum_i s_{ijt-1}\widehat{\omega}_{ijt} + \sum_i s_{ijt-1}\left(f_{it} - \left(r_{jt} - r_{it}\right)\right). \quad (10)$$

As in Equation (8), the first term in Equation (10) allows us to separate the contribution of the total growth in weights to net flows, but in this case the second term embeds the contribution of injections net of relative returns. Finally, the decomposition above can be further re-arranged to isolate the contribution of the growth in weights net of returns (relative flows) and injections to net flows, in the following manner

$$f_{jt} = \sum_i s_{ijt-1}\left(\widehat{\omega}_{ijt} - \left(r_{jt} - r_{it}\right)\right) + \sum_i s_{ijt-1} f_{it}$$
$$f_{jt} = \sum_i s_{ijt-1}\left(f_{ijt} - f_{it}\right) + \sum_i s_{ijt-1} f_{it}. \quad (11)$$

A nice feature of the decomposition in Equation (11) is that both terms have a very clear economic interpretation. The first term is the change in weights net of relative returns, which corresponds to relative flows of managers to a country, and the second corresponds to injections/redemptions into the fund. The flows of fund's money to country j increase either because the fund has injections by underlying investors that are proportionally allocated to all countries, or because the fund's manager is putting relatively more money into the country.

These four possible decompositions (Equations (8)-(11)) offer a broad picture of the role of managers and investors in explaining gross and net flows of capital to countries under two

extreme assumptions about manager's passive benchmarks. The results of these decompositions are reported in Table 11 for gross flows and Table 12for net flows. Each table reports two panels corresponding to each of the two decompositions presented: equations (8) and (9) (equations (10) and (11)) in panels A and B of Table 11 (Table 12), respectively Each panel reports two sets of results the average contribution of each of the two components to the level and variance each type of flow. To illustrate what the tables report, take the example of gross flows in Panel A of Table 11, which comes from Equation (8). The calculation for the section of the panel labeled as "Shares" is as follows: for each country and time we compute the share of each component (growth in weights and growth in fund's assets) in the growth in the country's gross assets. We then compute for each country the average over time of each of these components, and finally take their average across all countries in each of the groupings described in the rows. The right side of each panel in each table (Variance Decomposition) reports a standard variance decomposition exercise for each type of flow, where we assess the share of the total variance of gross and net flows that can be attributed to each component. We again first conduct the variance decomposition at the country level and then average across countries to reach the figures reported in the tables. Since the two terms are not orthogonal, as in Table 3 we follow Klenow and Rodriguez-Claire (2005) and impute the covariance term equally to each component.

Table 11 shows that both components of Equation (8) have roughly similar impact on the level and fluctuations in gross assets. That is, the growth of weights and the growth of fund assets are not very different in explaining the gross flows into countries. However, for all countries, and in most regions, the total growth of weights explains a smaller share of the growth rate of gross assets than of its variance (Panel A), and the growth in weights adjusted by relative returns explains a smaller share of the growth of gross assets than of its variance (Panel B). This pattern suggests that the trend of gross flows is slightly dominated by the growth of fund's assets, but that most fluctuations around that trend come from the growth in weights. The only exception are developing (non-emerging) countries where the growth in weights also explains a large share of the growth in gross assets. This indicates that these countries have benefited from net reallocation vis-à-vis other regions.

Somewhat different results are displayed in Panel B of Table 11, which shows the decompositions associated with Equation (9). The results suggest that the growth rate of weights net of returns explains a smaller share of both the level and variance of the growth rate

of assets. This indicates that the comparatively larger variance contribution of the growth in weights on gross flows is largely due to fluctuations in relative returns that are correlated with the movement in gross flows.

In sum, Table 11 shows that variations in the assets of funds resulting at least partly from the behavior of underlying investors explain an important share of the level and variation of gross flows. However, the relative importance of managers versus investors for gross flows depends on whether one considers changes in weights due to variations in returns part of manager's choices. In this latter case, managers explain about 60% of the variance of gross flows. Otherwise they explain a nontrivial, but smaller 30% of the variation.

Table 12 shows the decompositions of net flows corresponding to equations (10) and (11). The results are clearly different from those for gross flows. In this case, the first component, associated with manager's behavior, explains a larger share of the level and variance of these flows, regardless of the focus on total growth in weights or growth adjusted by relative returns. Net flows are more closely linked to managerial discretion than gross flows, since they abstract from the effect of returns on the growth of asset holdings. For all countries, the growth of weights explains on average 78% of the level of net flows, and 77% of their variance. The growth rate of adjusted weights explains 88% of the level of net flows and 85% of their variance. The second term, associated with either injections adjusted by relative returns (Equation (10) and Panel A) or total injections (Equation (11) and Panel B), explains between 10% and 20% of the level and variance of net flows. The pattern is very similar across groups of countries. A comparison between the results in Panel A and B of Table 12 also shows that the role of manager's behavior is larger when it is associated with changes in weights adjusted by relative returns (equivalent to relative flows) than when considering the total growth of weights. Net flows are more closely associated, at least on a monthly frequency, with relative flows allocated by managers across countries than with movements in returns.

In summary, tables 11 and 12 show that both managers and underlying investors play a significant role in explaining the level and fluctuations of international gross and net flows but the relative importance of each of them varies with the type of flow. Generally speaking, for gross flows, managers explain a share of the level and variance of flows of around 50%, when not adjusting for returns and depending on the specific decomposition and region. For net flows, however, the bulk of the level and variance of flows (between 77% and 88%) can be explained by manager's behavior. Managerial discretion, measured as deviations of country

allocations from past ones or from buy-and-hold allocations, is very important in explaining the flows or withdrawals of new money from countries.

Tables 13 and 14 show similar decompositions for all countries but different groups of funds. In each case, the gross and net flows to a country correspond only to the flows coming from that subset of funds. The tables also show at the bottom of each panel similar decompositions to those reported for all countries in Tables 11 and 12 but at different frequencies: semi-annual and annual instead of monthly.

Not surprisingly, the growth of total or return adjusted weights, capturing manager's behavior, explains always a much larger fraction of the level and volatility of gross and net flows for active funds than passive funds. For instance, Panel A of Table 14 shows that the growth of weights accounts for 78% of the level and variance of net flows for active funds, versus 29% and 45% for passive funds, respectively. When looking at adjusted weights the difference in the contribution of manager's behavior for net flows between active and passive funds is even larger: 87% of the level and variance for active funds, and 15% of the level and 31% of the variance for passive funds respectively. Namely, the gross and net flows of capital from passive funds to countries respond mainly to the behavior of underlying investors. Regarding the difference between bond and equity funds, manager's behavior seems to play a slightly larger role among bond funds than equity funds, both for gross and net flows.

The last three rows of each panel in Tables 13 and 14 show the various decompositions at monthly, semi-annual, and annual frequency. The clear pattern is that for both, levels and variances of gross and net flows, the role of manager's behavior (captured by the growth of total and return adjusted weights) declines with the increase in the length of the period of analysis. Although as seen in Section 6, the ability of managers to change country weights with respect to a buy-and-hold benchmark increases with time, it is also the case that underlying investors can also react further to fund's performance, country conditions, or other shocks increases. As the frequency of observations decline, this investor side seems to become relatively more important.

6. Conclusions

This paper has shown that mutual funds help transmit crises across countries and that their behavior is driven by both the underlying investors and managers. The global crisis was no exception, when there were large reallocations across countries and regions. In particular, the

paper has shown that investors react to shocks by pulling out of funds that invest in countries undergoing crises and during global crisis times. In addition, investors put more capital into funds that have shown to do relatively well and when conditions in their country of origin improve. This pro-cyclical reaction of investors is matched with a similar behavior by fund managers, who face not only the shocks from investors injecting and redeeming capital but also from returns to the countries in which they invest. Managers react to these shocks partly by allowing weights to adjust according to returns and partly by moving allocations into countries that are doing relatively well. This adjustment of managers takes place over time, with the pass-through from returns to weights diminishing at lower frequencies. During crises, managers also tend to accumulate more cash. All these patterns are consistent with how investors and managers behaved during the global crises, when there was retrenchment from emerging economies and Europe and a reallocation towards the U.S., even though the latter was the epicenter of the crisis.

The analysis in this paper suggests that in a world where investors discipline managers through injections and redemptions and where they suffer shocks, managers of open-ended funds might have difficulties taking advantage of arbitrage opportunities and react counter-cyclically, for example by buying assets internationally at fire-sale prices. Therefore, the evidence is not consistent with international deep-pocket investors (mutual funds in this case) playing a stabilizing role, who in turn might appear fickle. Furthermore, to the extent that investors become large when aggregated, they can affect market returns. As a consequence, the behavior of this type of financial intermediaries can exacerbate cycles and generate contagion effects across countries.

While this paper has been able to document some important stylized facts and advance in our understanding of how financial intermediaries behave and what is behind that behavior, several questions remain for further research. For example, it would be useful to study to what extent the active reallocations of fund managers correspond to managers following certain unobservable benchmarks or to their idiosyncratic appetite for risk. Moreover, it would be helpful to understand better how different mutual funds relate to each other in their international investments. Do they show herding behavior? Do they follow each other? Furthermore, it would be useful to know what is behind the differences in the results between bond and equity funds. For example, is it because the markets for these securities are really different or because of the sample composition? Lastly, while the analysis in this paper is very

detailed, one could move to an even finer level of granularity, though for a more restricted time period, to understand the composition of investments at the asset level. Such analysis would shed light on what types of securities mutual funds invest and how they specifically manage their portfolios.

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Table 1
Mutual Fund Database

Panel A presents data of mutual funds from the EPFR Global database by equity and bond mutual funds. Column (1) presents the number of funds in each category. Column (2) presents the number of observations among all funds within the same category. Columns (3) and (4) present the first and last date, respectively, in which there is data available in each category. Column (5) presents the median number of monthly reports within funds. Panel B presents the number of funds and observations for equity and bond funds by different partitions. Funds are divided between active and passive strategy regarding their investment behavior, by target region, and according to the country in which the fund is based.

A. Sample Characteristics

	Number of Funds	Number of Observations (Fund-Month)	Min Date	Max Date	Median Observations per Fund (Months)
	(1)	(2)	(3)	(4)	(5)
Equity Funds	965	54,940	Jan. 96	Nov. 10	47
Bond Funds	111	4,492	Jul. 07	Nov. 10	34

B. Number of Funds and Observations by Different Cuts

	Number of Funds	Number of Observations (Fund-Month)		Number of Funds	Number of Observations (Fund-Month)
	(1)	(2)		(1)	(2)
By Strategy					
Active Funds	1,025	58,383	Passive Funds	51	1,049
By Target Region					
Equity Funds			**Equity Funds**		
Asia Ex-Japan	201	13,365	Global Emerging	187	12,972
BRIC	18	610	Latin America	91	6,068
Emerg. Europe, Middle East, and Africa	38	1,253	Pacific	41	2,442
Emerging Europe	91	6,580	**Bond Funds**		
Europe	143	4,824	Global	30	1,096
Global	155	6,826	Global Emerging	81	3,396
By Domicile					
Australia	5	167	Hong Kong	2	38
Austria	5	533	Ireland	104	5,571
Bahamas	3	56	Isle of Man	1	35
Bahrain	4	119	Japan	7	250
Belgium	5	295	Jersey	6	377
Bermuda	2	212	Luxembourg	400	21,528
British Virgin Islands	8	502	Mauritius	1	26
Canada	32	1,897	Netherlands Antilles	2	78
Cayman	15	881	Netherlands	4	239
Denmark	22	1,063	Singapore	3	198
Finland	9	321	Sweden	1	30
France	22	1,328	Switzerland	19	1,298
Germany	22	634	United Kingdom	137	9,313
Guernsey	15	1,138	U.S.A.	220	11,305

Table 2
Weights in Mutual Funds by Geographical Regions

Panel A reports the average weights of individual equity funds in each of the geographical regions reported in the columns, and in cash. Panel B reports the average weights for bond funds. Columns (2)-(10) are obtained by calculating the average weights within fund over time, and then obtaining the reported mean across funds. Funds are divided according to their target region. The geographical region with the greatest average for each type of fund is marked in bold.

A. Equity Funds

		Average Weight (%)								
	Number of Funds	Developed Asia and Pacific	Developed Europe	Emerging Asia	Emerging Europe	Latin America	Middle East and Africa	North America	Other	Cash
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Asia Ex-Japan	201	32.83	0.04	**63.20**	0.00	0.00	0.01	0.00	0.02	3.89
BRIC	18	0.97	0.01	**46.46**	16.84	32.58	0.00	0.00	0.91	2.22
Emerg. Europe, Middle East, and Africa	38	0.07	1.10	0.00	14.12	0.00	**77.44**	0.00	0.19	7.09
Emerging Europe	91	0.06	4.08	0.41	**91.17**	0.15	0.43	0.00	0.06	3.62
Europe	143	0.14	**97.16**	0.07	0.34	0.08	0.26	0.05	0.04	1.85
Global	155	16.59	**41.52**	5.03	0.64	2.29	1.28	28.57	1.20	2.87
Global Emerging	187	2.54	1.05	**46.01**	12.03	22.87	10.97	0.01	1.20	3.32
Latin America	91	0.00	0.02	0.00	0.00	**97.06**	0.00	0.00	0.04	2.88
Pacific	41	**66.79**	0.13	29.91	0.00	0.00	0.00	0.00	0.13	3.04
Investor Type										
Active	917	12.89	21.09	25.46	12.01	14.72	5.33	4.60	0.50	3.40
Passive	48	12.67	33.65	17.63	10.98	12.04	7.92	4.63	0.01	0.47

B. Bond Funds

		Average Weight (%)								
	Number of Funds	Developed Asia and Pacific	Developed Europe	Emerging Asia	Emerging Europe	Latin America	Middle East and Africa	North America	Other	Cash
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Global	81	10.62	**35.72**	3.78	2.42	4.21	0.90	29.74	3.44	8.55
Global Emerging	30	0.83	0.30	13.62	27.78	**43.42**	7.32	0.05	2.23	4.45
Investor Type										
Active	108	3.57	10.14	10.74	20.62	32.67	5.49	8.29	2.63	5.66
Passive	3	0.00	0.00	18.84	32.05	38.18	8.79	0.13	0.00	2.00

Table 3
Growth Rate of Assets, Returns, and Injections to Mutual Funds

This table presents descriptive statistics for the growth rate of total assets, returns, and injections over initial assets in mutual funds, and the variance descomposition of the growth rate of assets for mutual funds. Panel A presents the mean, standard deviation, and variance decomposition for equity funds, and Panel B for bond funds. Columns (1) - (3) present the mean growth rate of assets, returns and injections over initial assets. The reported values are obtained by obtaining first the median fund for each month, and then obtaining the mean for each of the variables across time. Column (4) is obtained by calculating the standard deviation within fund and then the median across funds for each target region. Columns (5) and (6) are obtained by calculating the variance within fund for the fund returns and injections over initial assets, and decompose them as a share of the variance of growth rate of assets. Since the two terms are not orthogonal, the covariance term is imputed equally to each component.

A. Equity Funds

	Mean			**Standard Deviation**	**Variance Descomposition**	
	Growth Rate of Assets	Returns	Injections/ Initial Assets	Growth Rate of Assets	Returns	Injections/ Initial Assets
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)
All Equity Funds	0.35%	0.59%	-0.20%	10.34%	47.24%	52.76%
Asia Ex-Japan	0.15%	0.54%	-0.32%	10.25%	41.12%	58.88%
BRIC	1.69%	1.67%	4.31%	13.82%	54.82%	45.18%
Emerg. Europe, Middle East, and Africa	2.07%	1.11%	0.86%	14.57%	33.26%	66.74%
Emerging Europe	2.01%	1.32%	0.87%	12.69%	48.22%	51.78%
Europe	-0.45%	0.13%	-0.76%	9.61%	38.39%	61.61%
Global	0.17%	0.39%	-0.11%	6.96%	54.69%	45.31%
Global Emerging	0.83%	0.84%	0.12%	9.67%	49.57%	50.43%
Latin America	1.38%	1.30%	0.25%	13.11%	48.34%	51.66%
Pacific	0.70%	0.82%	-0.26%	7.98%	45.56%	54.44%

B. Bond Funds

	Mean			**Standard Deviation**	**Variance Descomposition**	
	Growth Rate of Assets	Returns	Injections/ Initial Assets	Growth Rate of Assets	Returns	Injections/ Initial Assets
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)
All Bond Funds	1.09%	0.82%	0.47%	8.66%	11.37%	88.63%
Global	0.61%	0.31%	0.60%	7.39%	9.31%	90.69%
Global Emerging	1.10%	0.88%	0.45%	10.54%	9.74%	90.26%

Table 4
Variance Decomposition of the Growth Rate of Assets during the Global Financial Crisis and Tranquil Times

Panel A and panel B report the variance descomposition of the growth rate of assets during the global financial crisis and tranquil times for equity funds and bond funds, respectively. Injections are obtained at the fund level, as the difference between the Total Net Assets (TNA) and lagged TNA multiplied by returns. Columns (1)-(6) are obtained by computing the variance within funds and then across funds for the respective target region. Since the two terms are not orthogonal, the covariance term is imputed equally to each component.

A. Variance Decomposition for Equity Funds

Period	Before Global Financial Crisis (Jan. 2003-Feb. 2007)		Global Financial Crisis Narrow Window (Mar. 2008-Dec. 2009)		Global Financial Crisis Wide Window (Mar. 2007-Oct. 2010)	
	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)
All Equity Funds	36.74%	63.26%	67.01%	32.99%	57.65%	42.35%
Asia Ex-Japan	35.97%	64.03%	71.11%	28.89%	57.41%	42.59%
BRIC	41.53%	58.47%	72.15%	27.85%	61.45%	38.55%
Emerg. Europe, Middle East, and Africa	17.47%	82.53%	60.51%	39.49%	52.81%	47.19%
Emerging Europe	40.07%	59.93%	69.37%	30.63%	63.54%	36.46%
Europe	19.98%	80.02%	51.33%	48.67%	44.36%	55.64%
Global	37.06%	62.94%	65.40%	34.60%	60.44%	39.56%
Global Emerging	33.54%	66.46%	70.15%	29.85%	64.71%	35.29%
Latin America	32.60%	67.40%	71.20%	28.80%	58.96%	41.04%
Pacific	37.38%	62.62%	65.15%	34.85%	58.90%	41.10%

B. Variance Decomposition for Bond Funds

Period	Before Global Financial Crisis (Jan. 2003-Feb. 2007)		Global Financial Crisis Narrow Window (Mar. 2008-Dec. 2009)		Global Financial Crisis Wide Window (Mar. 2007-Oct. 2010)	
	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets	Returns	Injections/ Initial Assets
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)
All Bond Funds	12.36%	87.64%	18.78%	81.22%	11.82%	88.18%
Global	5.18%	94.82%	2.66%	97.34%	4.45%	95.55%
Global Emerging	12.90%	87.10%	26.23%	73.77%	20.59%	79.41%

Table 5
Coefficients of Variation in Mutual Funds

This table reports the coefficients of variation (CVs) by target region in each of the geographical regions and cash of the funds investing in different areas of the world. The CVs are calculated as the standard deviation over time, relative to the regional or country mean, of the weights for different regions and different types of fund. All the CVs use the mean of the weights of individual equity funds in each of the geographical regions and cash, as reported in the columns. Columns (2)-(9) are obtained by calculating means of weights within funds, and then obtaining the average across funds. To calculate the coefficients across funds, the standard deviation is calculated across funds after obtaining the mean within funds. For the coefficients within funds, the standard deviation is calculated within funds, then the CV is calculated within funds, and averaged across funds. Column (10) reports the CV only for the relevant region, which is the region with the highest mean weight. The CV is calculated for each country in those regions, and then the median across countries is calculated for the relevant region. The relevant region is marked in bold for each type of fund.

			Coefficient of Variation								
	Number of Funds		Developed Asia and Pacific	Developed Europe	Emerging Asia	Emerging Europe	Latin America	Middle East and Africa	North America	Cash	Within Relevant Region
	(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Equity Funds											
Asia Ex-Japan	201	Across Funds	0.48	5.52	**0.26**	8.04	11.26	5.75	10.74	1.27	**1.28**
		Within Funds	0.20	2.29	**0.12**	3.81	7.97	1.65	5.49	1.03	**0.58**
BRIC	18	Across Funds	2.08	4.24	**0.11**	0.39	0.26	4.24	2.30	0.93	**3.36**
		Within Funds	0.70	2.83	**0.08**	0.15	0.06	3.68	7.25	0.72	**1.71**
Emerg. Europe, Middle East, and Africa	38	Across Funds	5.52	2.52	-	1.75	-	**0.34**	-	0.84	**2.23**
		Within Funds	0.41	0.83	-	0.20	-	**0.09**	-	0.76	**0.41**
Emerging Europe	91	Across Funds	9.54	1.07	9.45	**0.11**	9.53	4.02	6.34	1.23	**2.14**
		Within Funds	0.86	0.74	0.60	**0.06**	0.58	0.86	5.64	0.99	**1.05**
Europe	143	Across Funds	3.23	**0.04**	6.60	3.08	3.45	4.26	4.41	1.05	**0.95**
		Within Funds	1.37	**0.02**	0.75	0.88	1.28	0.59	2.21	1.06	**0.49**
Global	155	Across Funds	0.46	**0.32**	1.08	2.30	1.41	1.32	0.71	1.15	**1.17**
		Within Funds	0.16	**0.10**	0.32	0.66	0.42	0.47	0.11	0.72	**0.56**
Global Emerging	187	Across Funds	1.18	1.61	**0.17**	0.31	0.21	0.28	9.30	0.85	**0.69**
		Within Funds	0.65	1.08	**0.13**	0.23	0.17	0.25	1.33	0.93	**0.53**
Latin America	91	Across Funds	9.54	9.20	7.03	-	**0.03**	9.54	6.32	0.89	**1.25**
		Within Funds	2.54	0.94	7.80	-	**0.03**	1.92	4.28	1.12	**0.97**
Pacific	41	Across Funds	**0.26**	4.15	0.55	6.40	-	6.40	6.40	0.90	**0.87**
		Within Funds	**0.08**	1.05	0.18	9.38	-	3.58	4.45	0.78	**0.31**
Bond Funds											
Global	30	Across Funds	0.91	**0.50**	1.91	1.56	1.73	1.21	0.63	1.22	**1.51**
		Within Funds	0.29	**0.20**	0.38	0.49	0.35	0.96	0.21	0.46	**0.69**
Global Emerging	81	Across Funds	3.42	2.10	0.52	0.24	**0.26**	0.73	4.29	1.78	**1.66**
		Within Funds	0.44	1.84	0.25	0.16	**0.13**	0.32	3.16	1.21	**0.82**

Table 6
Coefficients of Variation in Mutual Funds by Investment Strategy

This table reports the coefficients of variation by type of fund in each geographical regions and in cash. All the CVs use the mean as the average weight within fund. The CV across funds is obtained by calculating the standard deviation across funds after obtaining the mean within funds. The CV within funds is obtained by calculating the standard deviation within funds, then the CV is calculated within funds, and then averaged across funds.

				Coefficient of Variation								
	Investment Strategy	Number of Funds		Developed Asia and Pacific	Developed Europe	Emerging Asia	Emerging Europe	Latin America	Middle East and Africa	North America	Other	Cash
Equity Funds	Active	917	Across Funds	1.46	1.65	1.10	2.23	1.94	2.92	2.87	2.94	1.12
			Within Funds	0.20	0.08	0.14	0.12	0.09	0.19	0.12	0.94	0.93
	Passive	48	Across Funds	2.05	1.27	1.51	2.51	1.99	3.02	3.16	3.68	2.96
			Within Funds	0.03	0.02	0.02	0.02	0.02	0.04	0.05	0.73	0.89
Bond Funds	Active	108	Across Funds	2.00	1.82	0.77	0.62	0.63	0.99	2.00	1.16	1.58
			Within Funds	0.31	0.23	0.27	0.18	0.14	0.37	0.22	0.79	0.91
	Passive	3	Across Funds	-	-	0.20	0.03	0.04	0.06	1.73	-	1.04
			Within Funds	-	-	0.02	0.01	0.01	0.01	2.00	-	0.47

Table 7
Determinants of Injections

This table presents the results of ordinary least squares regressions of the injections scaled by the average amount of assets on different variables, for mutual funds on a monthly frequency. Panel A presents the results for equity funds and Panel B, for bond funds. The country crisis variable is a weighted dummy that indicates if a country has a banking, debt, or currency crisis during a given year, multiplied by the funds portfolio in each country in a crisis. Global crisis is a dummy variable that indicates periods of crisis (Jul 1997 - Dec 1997, Aug 1998 - Dec 1998, Mar 2001 - Dec 2001, and Sept 2008 - Jun 2009). Country of origin returns are the returns from country indexes in the fund domicile. Country of origin crisis is a dummy indicating if the mutual fund country of origin is in crisis. Fund fixed effects are included in every case, and alternatively, fixed effects at the month, and country of origin-month levels are included. Standard errors are clustered by country of origin-month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Standard errors are presented in parentheses. The regressions are run with constant, but it is not reported in the table.

A. Equity Funds

	Injections/Average Assets						
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Country Crisis	-0.048 ***				-0.003	-0.009	-0.013
	(0.014)				(0.012)	(0.010)	(0.011)
Global Crisis		-0.018 ***			-0.008 **		
		(0.001)			(0.004)		
Lagged Fund Returns			0.161 ***		0.119 ***	0.171 ***	0.178 ***
			(0.024)		(0.023)	(0.033)	(0.039)
Country of Origin Returns				0.261 ***	0.222 ***	0.135 ***	
				(0.024)	(0.023)	(0.028)	
Time Fixed Effect	No	No	No	No	No	Yes	No
Country of Origin-Time Fixed Effect	No	No	No	No	No	No	Yes
No. of Observations	41,232	41,232	40,492	39,479	38,764	38,764	40,492
R-squared	0.035	0.036	0.047	0.050	0.065	0.114	0.174
Adj.R-sq	0.016	0.017	0.028	0.031	0.046	0.092	0.090

B. Bond Funds

	Injections/Average Assets						
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Country Crisis	-0.081 ***				-0.070 ***	-0.018	-0.031
	(0.021)				(0.018)	(0.016)	(0.023)
Global Crisis		-0.038 ***			-0.028 ***		
		(0.006)			(0.008)		
Lagged Fund Returns			0.229 **		0.205 **	0.126 *	0.107
			(0.111)		(0.102)	(0.070)	(0.067)
Country of Origin Returns				0.464 ***	0.468 ***	0.337 ***	
				(0.148)	(0.127)	(0.121)	
Time Fixed Effects	No	No	No	No	No	Yes	No
Country of Origin-Month Fixed Effect	No	No	No	No	No	No	Yes
No. of Observations	3,520	3,520	3,445	3,261	3,196	3,196	3,445
R-squared	0.061	0.065	0.073	0.068	0.092	0.156	0.266
Adj. R-sq	0.038	0.041	0.051	0.044	0.069	0.107	0.087

Table 8
Behavior of Log Country Weights

Panel A and B present the results of ordinary least squares regressions of the log country weights on different variables, for equity funds and bond funds respectively.The country crisis variable is a dummy that indicates if a country had a banking, debt, or currency crisis during a given year. Relative returns is the log ratio of gross country returns to gross fund returns. Estimations are performed at different frequencies indicated in the table, including different combinations of fixed effects. Only countries in the relevant region are considered for each type of fund. Results for the Wald test are presented at the bottom of each panel. P-values are reported for the null hypothesis indicated in the first column. Errors are clustered by country of origin-month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Standard errors are presented in parentheses.

A. Equity Funds

	Log Country Weights							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Monthly						Semi Annual	Annual
Log Lagged Weights	0.986 ***	0.982 ***	0.983 ***	0.901 ***	0.901 ***	0.901 ***	0.569 ***	0.314 ***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.011)	(0.025)
Relative Returns	0.630 ***	0.666 ***	1.012 ***	0.608 ***	0.980 ***	0.977 ***	0.906 ***	0.727 ***
	(0.008)	(0.028)	(0.012)	(0.025)	(0.011)	(0.011)	(0.025)	(0.033)
Country Crisis						-0.016 ***	-0.040 **	-0.058 ***
						(0.003)	(0.016)	(0.022)
Fund Fixed Effect	No	Yes	No	No	No	No	No	No
Date Fixed Effect	No	Yes	No	No	No	No	No	No
Fund-Date Fixed Effect	No	No	Yes	No	Yes	Yes	Yes	Yes
Country of Destiny-Fund Fixed Effect	No	No	No	Yes	Yes	Yes	Yes	Yes
Log Lagged Weights=Relative Returns	0.000 ***	0.000 ***	0.012 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***
No. of Observations	458,458	458,458	458,458	458,458	458,458	458,458	62,949	26,018
R-squared	0.966	0.966	0.969	0.968	0.971	0.966	0.908	0.891

B. Bond Funds

	Log Country Weights							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Monthly						Semi Annual	Annual
Log Lagged Weights	0.974 ***	0.970 ***	0.970 ***	0.871 ***	0.866 ***	0.866 ***	0.449 ***	0.102 *
	(0.002)	(0.003)	(0.003)	(0.008)	(0.009)	(0.009)	(0.037)	(0.058)
Relative Returns	0.257 ***	0.265 ***	0.586	0.236 ***	0.564 ***	0.567 ***	0.377 ***	0.365 ***
	(0.037)	(0.061)	(0.093)	(0.054)	(0.086)	(0.086)	(0.117)	(0.124)
Country Crisis						-0.016	-0.025	-0.040
						(0.011)	(0.051)	(0.083)
Fund Fixed Effect	No	Yes	No	No	No	No	No	No
Date Fixed Effect	No	Yes	No	No	No	No	No	No
Fund-Date Fixed Effect	No	No	Yes	No	Yes	Yes	Yes	Yes
Country of Destiny-Fund Fixed Effect	No	No	No	Yes	Yes	Yes	Yes	Yes
Log Lagged Weights=Relative Returns	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.000 ***	0.528	0.018 **
No. of Observations	39,183	39,183	39,183	39,183	39,183	39,183	5,035	1,959
R-squared	0.941	0.942	0.946	0.946	0.950	0.950	0.869	0.878

Table 9
Behavior of Country Weights

Panel A and B present the results of ordinary least squares regressions of the country weights on different variables, for equity funds and bond funds respectively. Weights that are zeros are excluded from all estimations. Relative returns is the difference of net returns of country index and fund returns. Estimations are performed at different frequencies indicated in the table, including different combinations of fixed effects. Only countries in the relevant region are considered for each type of fund. Errors are clustered by country of origin-month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Standard errors are presented in parentheses.

A. Equity Funds

	Country Weights							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Monthly						Semi Annual	Annual
Lagged Weights*Rel. Returns	0.988 ***	0.985 ***	0.988 ***	0.903 ***	0.916 ***	0.916 ***	0.650 ***	0.459 ***
	(0.002)	(0.002)	(0.002)	(0.012)	(0.009)	(0.009)	(0.041)	(0.047)
Relative Returns	-3.151 ***	-3.091 ***	-0.012	-2.801 ***	0.136 *	0.127 *	0.923 ***	1.162 ***
	(0.829)	(0.882)	(0.077)	(0.727)	(0.073)	(0.072)	(0.107)	(0.152)
Country Crisis						-0.100 ***	-0.407 ***	-0.645 ***
						(0.021)	(0.085)	(0.118)
Fund Fixed Effect	No	Yes	No	No	No	No	No	No
Date Fixed Effect	No	Yes	No	No	No	No	No	No
Fund-Date Fixed Effect	No	No	Yes	No	Yes	Yes	Yes	Yes
Country of Destiny-Fund Fixed	No	No	No	Yes	Yes	Yes	Yes	Yes
No. of Observations	741,776	741,776	741,776	741,776	741,776	741,776	105,222	44,146
R-squared	0.984	0.984	0.986	0.985	0.987	0.987	0.951	0.934

B. Bond Funds

	Country Weights							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Monthly						Semi Annual	Annual
Lagged Weights*Rel. Returns	0.972 ***	0.971 ***	0.971 ***	0.862 ***	0.863 ***	0.863 ***	0.439 ***	0.054
	(0.003)	(0.004)	(0.004)	(0.011)	(0.012)	(0.012)	(0.064)	(0.136)
Relative Returns	-2.146 ***	-2.131 ***	-1.311 ***	-1.895 ***	-1.138 ***	-1.136 ***	-0.281	0.791
	(0.149)	(0.170)	(0.288)	(0.141)	(0.247)	(0.247)	(0.352)	(0.656)
Country Crisis						-0.092	-0.279	-0.459
						(0.061)	(0.370)	(0.622)
Fund Fixed Effect	No	Yes	No	No	No	No	No	No
Date Fixed Effect	No	Yes	No	No	No	No	No	No
Fund-Date Fixed Effect	No	No	Yes	No	Yes	Yes	Yes	Yes
Country of Destiny-Fund Fixed	No	No	No	Yes	Yes	Yes	Yes	Yes
No. of Observations	93,819	93,819	93,819	93,819	93,819	93,819	13,116	5,508
R-squared	0.963	0.963	0.963	0.966	0.966	0.966	0.891	0.873

Table 10
Behavior of Log Cash Weights

Panel A and B present the results of ordinary least squares regressions of the log cash weights on different variables, for equity funds and bond funds respectively.The country crisis variable is a weighted dummy that indicates if a country had a banking, debt, or currency crisis during a given year, multiplied by the funds portfolio in each country in a crisis. The global crisis variable is a dummy that indicates periods of crisis (Asian, Russian, 2001, and global financial crisis). The origin returns variable are the returns from the country indices of the country were the fund is domiciled. Estimations are performed at different frequencies indicated in the table, including different combinations of fixed effects. Results for the Wald test are presented at the bottom of each panel. P-values are reported for the null hypothesis indicated in the first column. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Standard errors are presented in parentheses.

A. Equity Funds

	Log Cash Weights					
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Monthly				Semi Annual	Annual
Log Lagged Weights	0.587 ***	0.389 ***	0.361 ***	0.377 ***	0.112 ***	-0.083
	(0.006)	(0.008)	(0.008)	(0.009)	(0.024)	(0.050)
Relative Returns	0.739 ***	0.718 ***	0.151	0.505 ***	0.176 ***	-0.206 *
	(0.071)	(0.094)	(0.094)	(0.094)	(0.058)	(0.121)
Country Crisis				0.096 *	0.125	0.573 **
				(0.051)	(0.158)	(0.285)
Global Crisis				0.156 ***	0.117 **	0.096
				(0.018)	(0.049)	(0.096)
Origin Returns				-0.152	-0.424 ***	-0.058
				(0.115)	(0.098)	(0.118)
Fund Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	No	No	Yes	No	No	No
Log Lagged Weights=Relative Returns	0.033 **	0.000 ***	0.026 **	0.176	0.281	0.300
No. of Observations	33,681	33,681	33,681	32,416	4,226	1,515
R-squared	0.347	0.433	0.452	0.434	0.435	0.524

B. Bond Funds

	Log Cash Weights					
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Monthly				Semi Annual	Annual
Log Lagged Weights	0.654 ***	0.449 ***	0.445 ***	0.433 ***	0.119	-0.382 **
	(0.022)	(0.029)	(0.029)	(0.030)	(0.078)	(0.173)
Relative Returns	-0.676 *	-0.656	-1.269 **	-0.623	0.111	0.819 *
	(0.389)	(0.447)	(0.607)	(0.453)	(0.314)	(0.465)
Country Crisis				-0.534 ***	-1.172 *	-2.184 *
				(0.172)	(0.669)	(1.073)
Global Crisis				-0.026	-0.045	0.415 **
				(0.047)	(0.141)	(0.200)
Origin Returns				0.201	0.998	-0.330
				(0.521)	(0.948)	(0.924)
Fund Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	No	No	Yes	No	No	No
Log Lagged Weights=Relative Returns	0.000 ***	0.013 **	0.005 ***	0.020 **	0.982	0.012 **
No. of Observations	2,857	2,857	2,857	2,745	333	117
R-squared	0.437	0.510	0.533	0.507	0.528	0.660

Table 11
Decomposition of Gross Flows by Regions

This table presents the decomposition of gross flows into the growth rate of country weights and the growth rate of total mutual fund assets, for different regions. Panel A presents de decomposition without adjusting the weights for returns, while in panel B, weights are adjusted for returns. Shares are calculated as the median share of individual components for each country, averaged across time, and then averaged across all countries in each region. The variance descomposition is obtained by taking the variance of each individual component at the country level, and then averaged across countries. Since the two terms are not orthogonal, the covariance term is imputed equally to each component. Outliers are filtered by the share of the first component associated with weights. We considered only observations within the 10th and 90th percentile of the share of the 1st component.

A. Without Adjusting Weights for Returns

	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Region	Growth Rate of Weights	Growth Rate of Fund Assets	Growth Rate of Weights	Growth Rate of Fund Assets
All Countries	46.5%	53.5%	59.0%	41.0%
Asia	40.5%	59.5%	55.9%	44.1%
Developed Countries	37.5%	62.5%	46.8%	53.2%
Developing Countries	64.3%	35.7%	78.8%	21.2%
Eastern Europe	47.7%	52.3%	65.5%	34.5%
Emerging Countries	36.1%	63.9%	49.8%	50.2%
Latin America	44.2%	55.8%	56.3%	43.7%

B. Adjusting Weights for Returns

	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Region	Return-Adjusted Growth Rate of Weights	Other	Return-Adjusted Growth Rate of Weights	Other
All Countries	22.4%	77.6%	32.1%	67.9%
Asia	-1.4%	101.4%	5.7%	94.3%
Developed Countries	18.5%	81.5%	27.4%	72.6%
Developing Countries	46.5%	53.5%	61.4%	38.6%
Eastern Europe	29.6%	70.4%	43.6%	56.4%
Emerging Countries	-1.8%	101.8%	2.6%	97.4%
Latin America	21.0%	79.0%	32.4%	67.6%

Table 12
Decomposition of Net Flows by Regions

This table presents the decomposition of net flows into the growth rate of country weights and the growth rate of total mutual fund assets, for different regions. Panel A presents de decomposition without adjusting the weights for returns, while in panel B, weights are adjusted for returns. Shares are calculated as the median share of individual components for each country, averaged across time, and then averaged across all countries in each region. The variance descomposition is obtained by taking the variance of each individual component at the country level, and then averaged across countries. Since the two terms are not orthogonal, the covariance term is imputed equally to each component. Outliers are filtered by the share of the first component associated with weights. We considered only observations within the 10th and 90th percentile of the share of the 1st component.

A. Without Adjusting Weights for Returns

	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Region	Growth Rate of Weights	Other	Growth Rate of Weights	Other
All Countries	78.0%	22.0%	77.4%	22.6%
Asia	76.7%	23.3%	66.1%	33.9%
Developed Countries	80.8%	19.2%	83.0%	17.0%
Developing Countries	78.6%	21.4%	80.7%	19.3%
Eastern Europe	73.5%	26.5%	71.8%	28.2%
Emerging Countries	74.0%	26.0%	66.9%	33.1%
Latin America	71.8%	28.2%	75.2%	24.8%

B. Adjusting Weights for Returns

	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Region	Return-Adjusted Growth Rate of Weights	Injections	Return-Adjusted Growth Rate of Weights	Injections
All Countries	88.4%	11.6%	84.8%	15.2%
Asia	91.6%	8.4%	84.6%	15.4%
Developed Countries	93.9%	6.1%	87.2%	12.8%
Developing Countries	89.9%	10.1%	91.3%	8.7%
Eastern Europe	85.0%	15.0%	86.3%	13.7%
Emerging Countries	79.9%	20.1%	74.2%	25.8%
Latin America	74.8%	25.2%	75.3%	24.7%

Table 13
Decomposition of Gross Flows by Type and Frequency

This table presents the decomposition of gross flows into the growth rate of country weights and the growth rate of mutual funds' assets by different breakdowns. Panel A presents de decomposition without adjusting the weights for returns, while in panel B, weights are adjusted for returns. Shares are calculated as the median share of individual components for each country, averaged across time, and then averaged across all countries in each region. The variance descomposition is obtained by taking the variance of each individual component at the country level, and then averaged across countries. Since the two terms are not orthogonal, the covariance term is imputed equally to each component. Outliers are filtered by the share of the first component associated with weights. We considered only observations within the 10th and 90th percentile of the share of the 1st component.

A. Without Adjusting Weights for Returns

	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Type	Growth Rate of Weights	Growth Rate of Fund Assets	Growth Rate of Weights	Growth Rate of Fund Assets
Active	49.3%	50.7%	57.9%	42.1%
Passive	21.7%	78.3%	32.0%	68.0%
Equity	47.5%	52.5%	54.6%	45.4%
Bond	66.6%	33.4%	82.2%	17.8%
Frequency				
Monthly	46.5%	53.5%	59.0%	41.0%
Semi-Annual	33.7%	66.3%	40.7%	59.3%
Annual	26.2%	73.8%	35.2%	64.8%

B. Adjusting Weights for Returns

	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Type	Return-Adjusted Growth Rate of Weights	Other	Return-Adjusted Growth Rate of Weights	Other
Active	21.7%	78.3%	32.0%	68.0%
Passive	-8.9%	108.9%	-7.1%	107.1%
Equity	18.3%	81.7%	25.2%	74.8%
Bond	60.9%	39.1%	80.5%	19.5%
Frequency				
Monthly	22.4%	77.6%	32.1%	67.9%
Semi-Annual	17.0%	83.0%	23.9%	76.1%
Annual	15.7%	84.3%	21.1%	78.9%

Table 14
Decomposition of Net Flows by Type and Frequency

This table presents the decomposition of net flows into the growth rate of country weights and the growth rate of mutual funds' assets by different breakdowns. Panel A presents de decomposition without adjusting the weights for returns, while in panel B, weights are adjusted for returns. Shares are calculated as the median share of individual components for each country, averaged across time, and then averaged across all countries in each region. The variance descomposition is obtained by taking the variance of each individual component at the country level, and then averaged across countries. Since the two terms are not orthogonal, the covariance term is imputed equally to each component. Outliers are filtered by the share of the first component associated with weights. We considered only observations within the 10th and 90th percentile of the share of the 1st component.

A. Without Adjusting Weights for Returns

	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Type	Growth Rate of Weights	Other	Growth Rate of Weights	Other
Active	77.6%	22.4%	77.7%	22.3%
Passive	29.1%	70.9%	44.7%	55.3%
Equity	73.1%	26.9%	73.9%	26.1%
Bond	71.7%	28.3%	82.4%	17.6%
Frequency				
Monthly	78.0%	22.0%	77.4%	22.6%
Semi-Annual	74.9%	25.1%	70.8%	29.2%
Annual	69.3%	30.7%	61.6%	38.4%

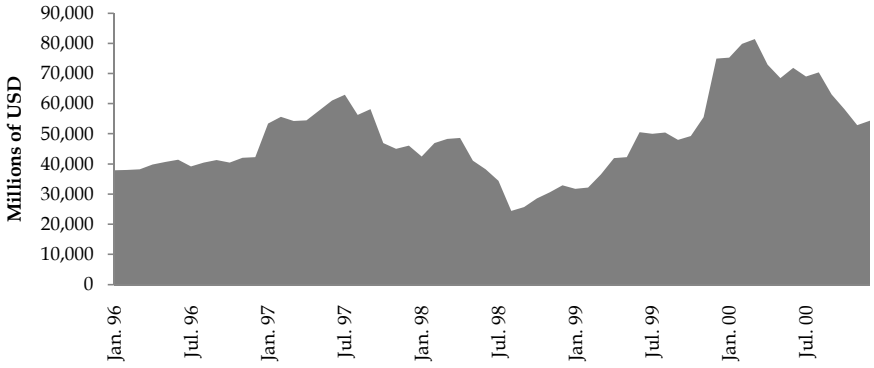
B. Adjusting Weights for Returns

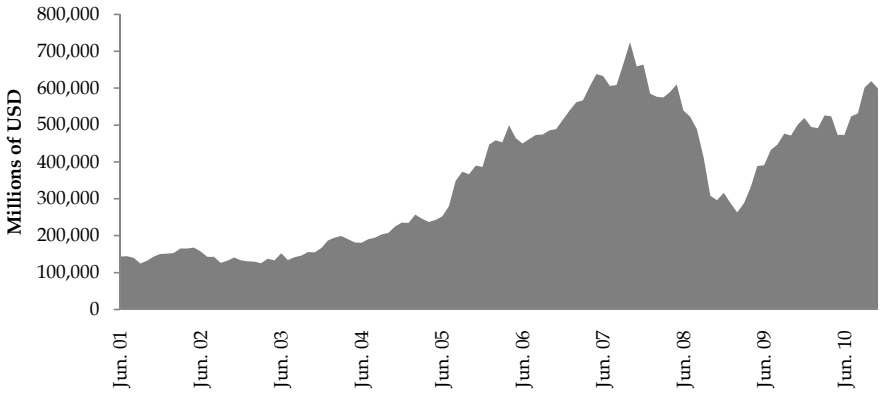
	Shares (% of Country Growth Rate)		**Variance Decomposition (% of Variance of Country Growth Rate)**	
Type	Return-Adjusted Growth Rate of Weights	Injections	Return-Adjusted Growth Rate of Weights	Injections
Active	87.4%	12.6%	86.8%	13.2%
Passive	15.0%	85.0%	30.9%	69.1%
Equity	85.9%	14.1%	85.6%	14.4%
Bond	73.8%	26.2%	89.0%	11.0%
Frequency				
Monthly	88.4%	11.6%	84.8%	15.2%
Semi-Annual	83.3%	16.7%	78.9%	21.1%
Annual	80.6%	19.4%	73.0%	27.0%

Figure 1
Evolution of Total Assets in Mutual Funds

Panel A presents the total amount of assets in equity funds by geographical regions. The right side figure, presents the period from January 1996 to December 2000, and the left side figure presents the period from June 20001 to November 2010. Panel B presents the total amount of assets in bond funds by geographical regions for the whole period, July 2002 to November 2010. In both panels, assets were aggregated at a certain point in time for a certain region to compute these figures.

A. Equity Funds





B. Bond Funds

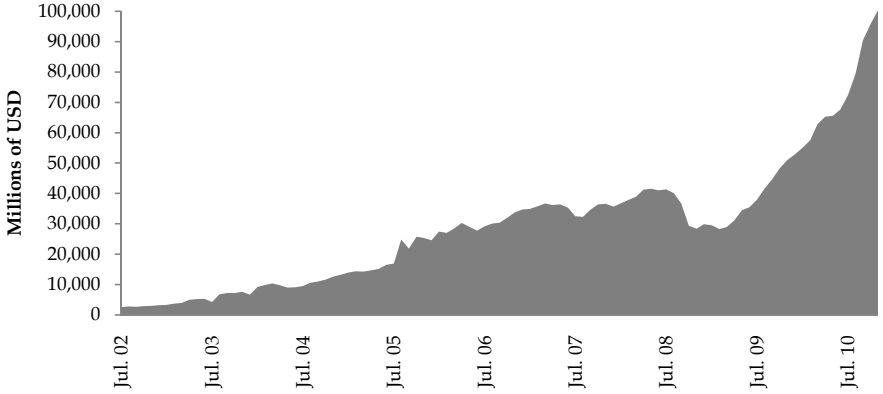
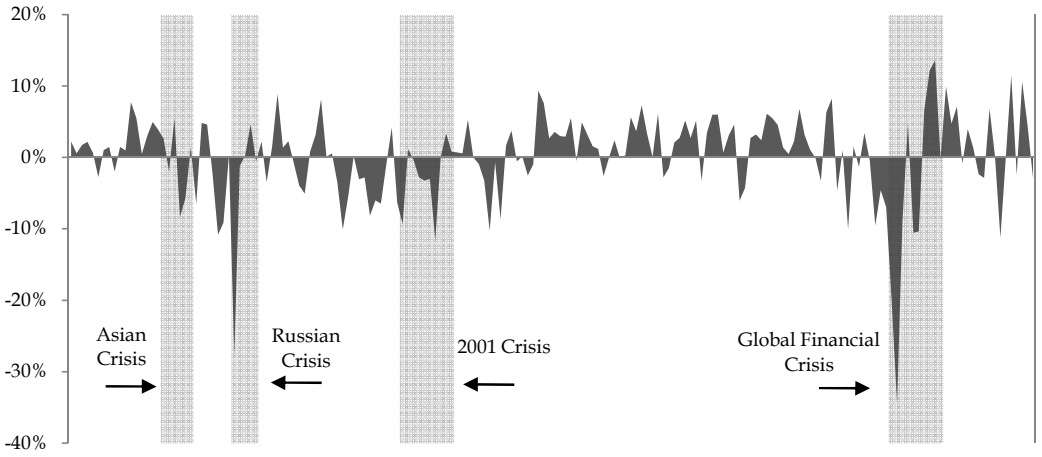


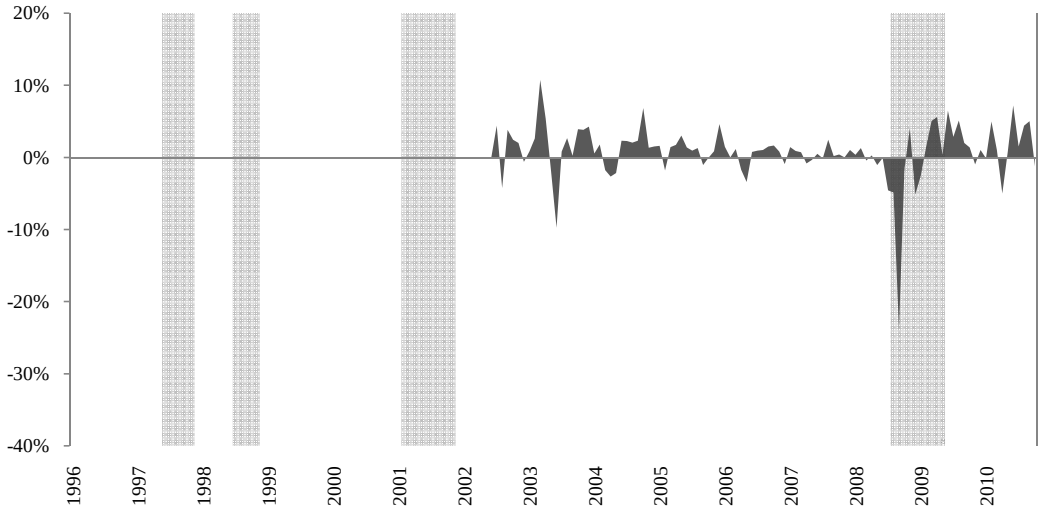
Figure 2
Growth Rate of Total Assets for the Median Country

Panel A presents the growth rate of the total amount of assets for the median country in equity funds. Panel B presents the growth rate of the total amount of assets for the median country in bond funds. Growth rates are obtained as a share of the average amount of assets between t and t-1, considering only funds present both at t and t-1. The median country is obtained considering the median of the growth rates for different countries in each month. Shaded areas indicate times of global turmoil.

A. Equity Funds



B. Bond Funds



C. Growth Rate of Total Assets for the Median Country

	Mean	Median	Std. Deviation
Equity Funds	0.11%	0.76%	6.15%
Bond Funds	0.82%	1.05%	3.82%

Figure 3
Median Growth Rate of Assets, Returns, and Injections to Mutual Funds

Panels A, B and C present, respectively, the median of the growth rate, the median of the fund returns, and the median of the flows of the total amount of assets over initial assets for bond and equity funds. All variables are calculated within funds, and then the median is obtained considering only continuing funds at a certain point in time. Shaded areas indicate times of global turmoil.

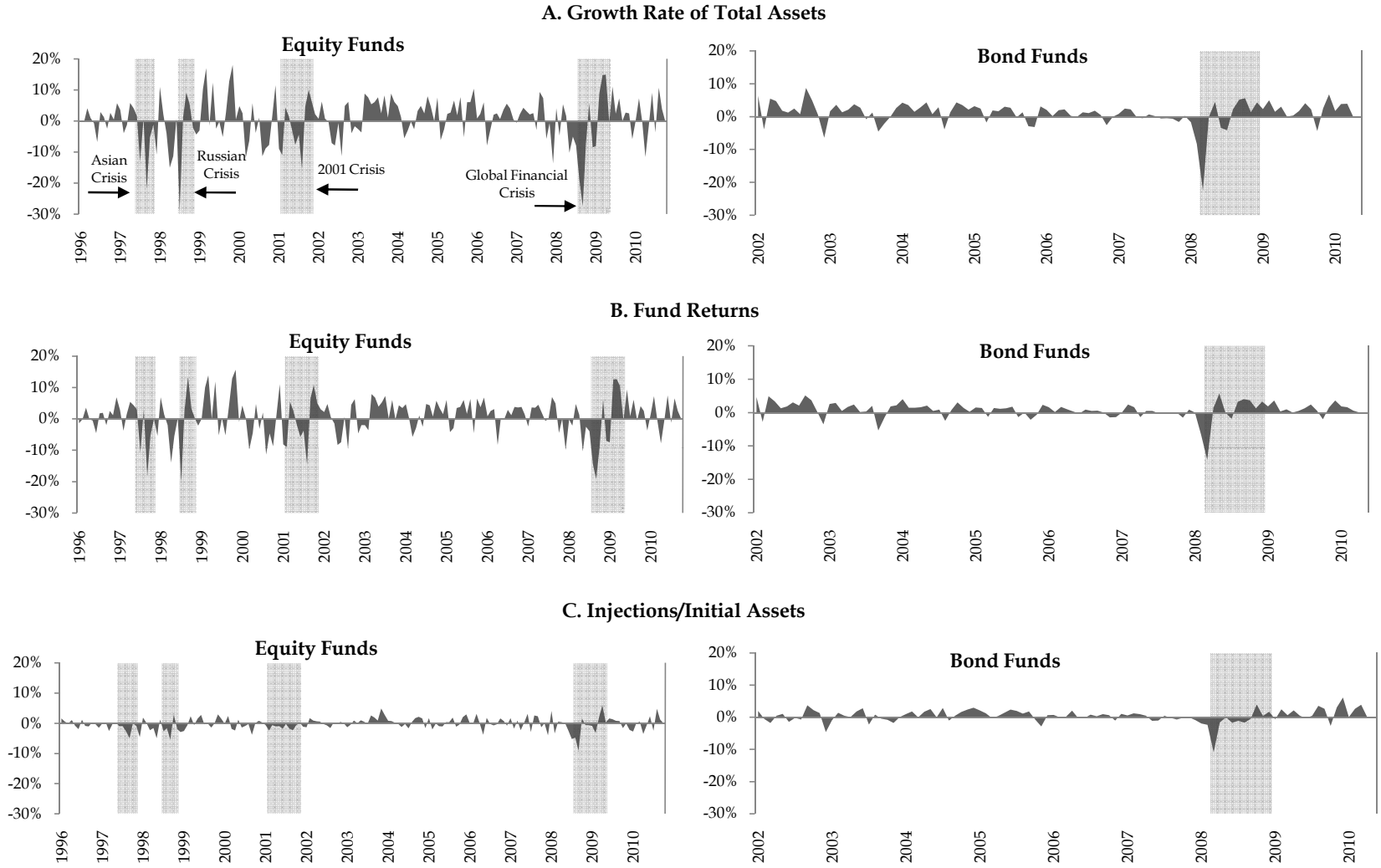


Figure 4
Portfolio Weights around the Global Financial Crisis in Equity Funds

This figure presents the evolution of the average weights in different regions during the global financial crisis of 2008-2009. Only countries with data for country indexes are considered to compute weights. Regions are aggregated according to EPFR classification. In each figure, are presented two series of weights, one using current prices (black) and one using constant prices from Jan 2007 (C.P., grey). Weights at constant prices are constructed deflating assets by country indexes. Only funds that had complete coverage for the period under study (Jan. 2007 - Dec. 2009) are considered. Grey bars indicate times of stock market turmoil or the fall of financial institutions. In chronological order, they represent: the nationalization of Northern Rock (Sep. 2007), the Bear Stearns collapse (Mar. 2008), the Lehman Brothers collapse (Sep. 2008), and the AIG near collapse (Mar. 2009).

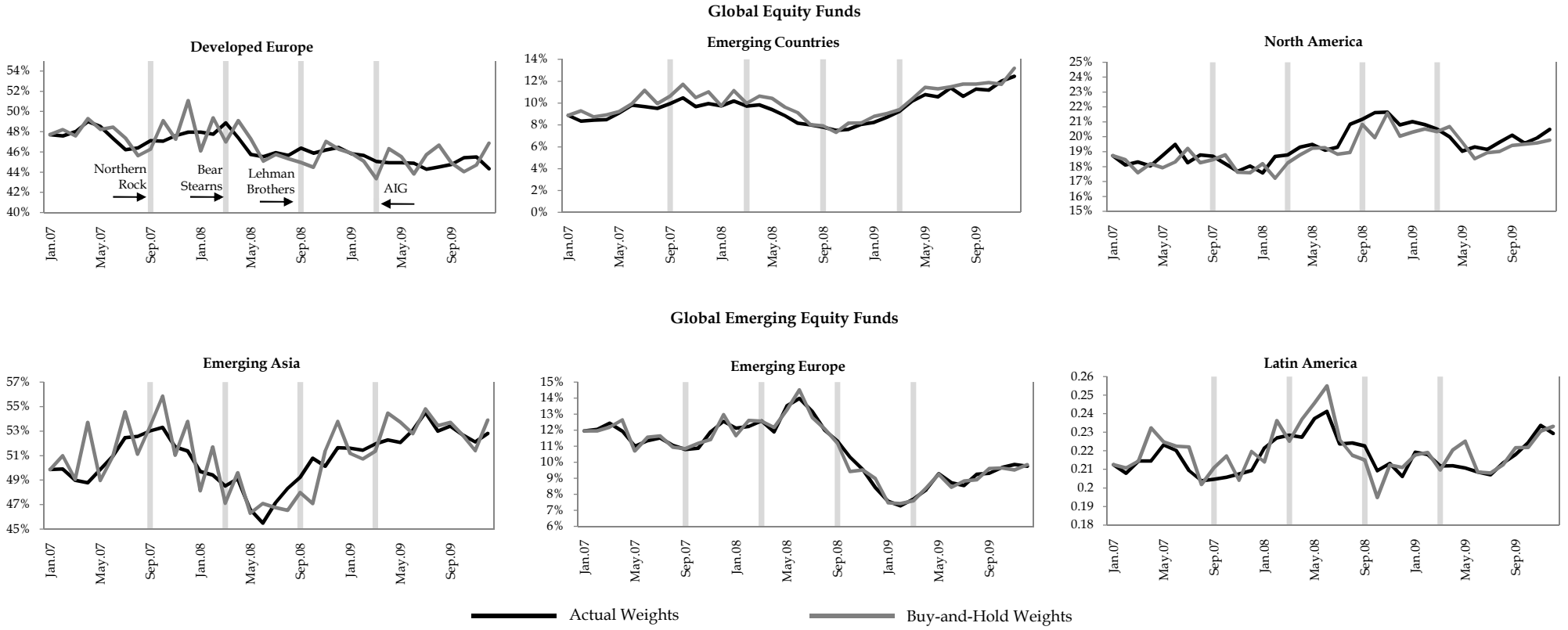
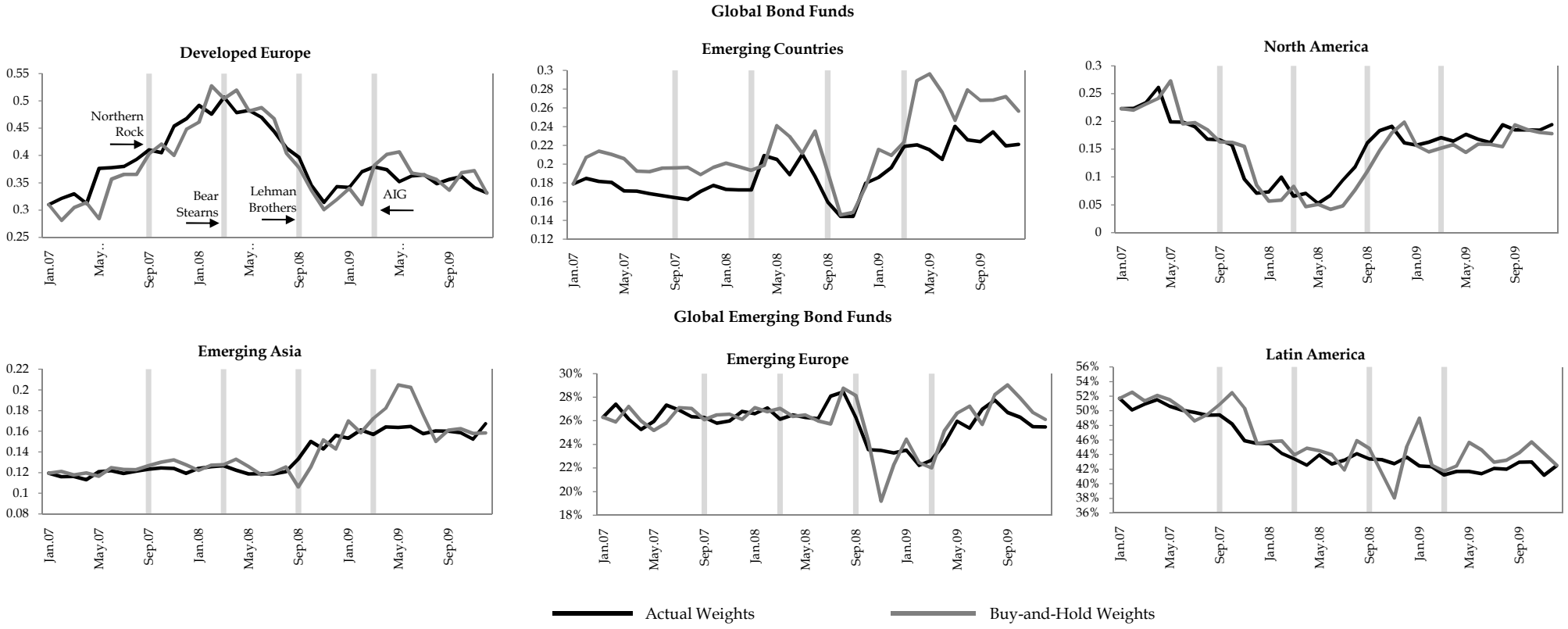


Figure 5
Portfolio Weights around the Global Financial Crisis in Bond Funds

This figure presents the evolution of the average weights in different regions during the global financial crisis of 2008-2009. Only countries with data for country indexes are considered to compute weights. Regions are aggregated according to EPFR classification. In each figure, are presented two series of weights, one using current prices (black) and one using constant prices from Jan 2007 (C.P., grey). Weights at constant prices are constructed deflating assets by country indexes. Only funds that had complete coverage for the period under study (Jan. 2007 - Dec. 2009) are considered. Grey bars indicate times of stock market turmoil or the fall of financial institutions. In chronological order, they represent: the nationalization of Northern Rock (Sep. 2007), the Bear Stearns collapse (Mar. 2008), the Lehman Brothers collapse (Sep. 2008), and the AIG near collapse (Mar. 2009).



Appendix Table 1
Number of Funds by Asset Management Companies

This table presents the number of funds per family for families with at least 2 funds. Other Managers category includes all the families with less than 2 funds in their name.

Management Company	Number of funds	Management Company	Number of funds	Management Company	Number of funds	Management Company	Number of funds
Aberdeen Asset Management	48	Charlemagne Capital Limited	8	ING Investment Management	5	RBC Global Investment Management	3
ABN AMRO Asset Management	8	Clariden Leu	5	Institutional Capital LLC	2	RCM Capital Management	8
Absolute Asia Asset Management	2	Claymore Advisors	2	Invesco Asset Management	46	Rexiter Capital Management	2
Activest	3	Comgest S.A.	16	Investec Asset Management	2	Robeco Asset Management	3
AGF International Advisors	4	Credit Lyonnais International Asset Management	4	ISI - Sydinvest International	6	Schroder Investment Management	40
AIB Govett Asset Management	2	Credit Suisse Asset Management	16	JO Hambro Capital Management	6	Scottish Widows Investment Partnership	3
Algebra Capital	2	Daiwa International Capital Management	2	JPMorgan Asset Management	63	Securities & Inv. Company (SICO)	2
AllianceBernstein Capital Management	3	Deutsche Asset Management	37	Jyske Invest	7	SG Asset Management	2
Allianz Dresdner Asset Management	5	Dexia Asset Management	2	Lazard Asset Management	3	Silk Invest	2
Allianz Global Investors	14	Edinburgh Fund Managers	2	Legg Mason Capital Management	3	Societe Generale Asset Management	8
Amundi Luxembourg SA	5	ERSTE-Sparinvest	2	Lloyd George Management	5	Standard Americas	5
Arisaig Partners	2	Federated Global Investment Management	4	Lombard Odier International Portfolio Advisors	2	State Street Global Advisors	18
Artisan Partners	5	Fidelity Management & Research	9	M&G Investment Management	5	Swisscanto Asset Management	2
Ashmore Inv. Management	13	First State Investments	12	Martin Currie Investment Management	9	T Rowe Price Associates	4
Assenagon Asset Management	3	Foreign & Colonial Emerging Markets	6	Matthews International Capital Management	2	TCW Investment Management	3
Aviva Investors	8	Franklin Templeton Investment Management	35	Mondrian Inv. Partners Limited	2	Thames River Capital	5
AXA Framlington Investment Management	5	Gartmore Investment Limited	29	Morgan Stanley Investment Management	32	Threadneedle Investment Management	15
AXA Inv. Managers	5	Genesis Investment Management	5	Natixis Asset Management	3	Trident Investment Management	2
Baillie Gifford	13	Glitnir Asset Management	5	Nevksy Capital LLP	4	UBS Global Asset Management	16
BankInvest	8	Global Asset Management	7	Nicholas-Applegate Capital Management	2	Union Investment GmbH	6
Baring Asset Management	12	Goldman Sachs Asset Management	4	Nordea Investment Management	2	Van Eck Global Asset Management	4
Batterymarch Financial Management	18	Goodman & Company, Investment Counsel	4	Pictet Asset Management	13	Vanguard Group	2
BCV Asset Management	6	Grantham, Mayo, van Otterloo (GMO)	8	PIMCO	4	Vontobel Asset Management	3
BlackRock Investment Management	55	Griffin Capital Management	2	PineBridge Investments LLC	16	Wells Capital Management	2
BNP Paribas Inv. Partners	27	Halbis Capital Management	11	Pioneer Investment Management	3	WestLB Asset Management	8
Brandywine Asset Management	2	Hansberger Global Investors	3	PowerShares Capital Management	5	William Blair & Co.	7
Capital Invest KAG	2	Henderson Global Investors	11	Putnam Investment Management	10	WisdomTree Asset Mgt./BNY Investment Advisors	2
Capital Research & Management	11	HSBC Asset Management	10	Raiffeisen Capital Management	2	Other Asset Management Companies	83
Total Number of Funds: 1,076							

Appendix Table 2
Country Classification

This table presents the region classification used in this paper, derived from EPFR. Column (8) represents investments in other countries not covered by EPFR in both, equity and bond funds.

Developed Asia and Pacific	Developed Europe	Emerging Europe	Emerging Asia	Middle East and Africa	Latin America	North America	Other
(2)	(5)	(4)	(1)	(6)	(3)	(7)	(8)
Australia	Austria	Albania	Cambodia	Algeria	Argentina	Canada	Other Fixed Income
Hong Kong	Belgium	BalticRepublics	China	Bahrain	Bolivia	USA	Other Equity
Japan	Denmark	Belarus	India	Bangladesh	Brazil		
New Zealand	Finland	Bosnia and	Indonesia	Botswana	Chile		
Papua New Guinea	France	Bulgaria	Korea (North)	Congo-Kinshasa	Colombia		
Singapore	Germany	Croatia	Korea (South)	Egypt	Costa Rica		
	Greece	Cyprus	Malaysia	Gabon	Cuba		
	Iceland	Czech Republic	Mongolia	Ghana	Dominican		
	Ireland	Estonia	Other Asia	Iran	Ecuador		
	Italy	Georgia	Pakistan	Iraq	El Salvador		
	Netherlands	Hungary	Philippines	Israel	Guatemala		
	Norway	Kazakhstan	Sri Lanka	Ivory Coast	Jamaica		
	Other Europe	Latvia	Taiwan	Jordan	Mexico		
	Portugal	Lithuania	Thailand	Kenya	Nicaragua		
	Spain	Macedonia	Turkmenistan	Kuwait	Other Latin		
	Sweden	Moldova	Vietnam	Lebanon	Panama		
	Switzerland	Poland		Libya	Peru		
	United Kingdom	Romania		Malawi	Trinidad and		
		Russia		Mauritius	Uruguay		
		Serbia and		Morocco	Venezuela		
		Slovakia		Namibia			
		Slovenia		Nigeria			
		Tajikistan		Oman			
		Turkey		Other Middle East			
		Ukraine		Qatar			
				Saudi Arabia			
				South Africa			
				Swaziland			
				Tanzania			
				Tunisia			
				Uganda			
				United Arab			
				Yemen			
				Zambia			
				Zimbabwe			

Appendix Table 3
Country Weights in Mutual Funds (Country Examples)

Panel A reports the average weights of individual equity funds in each of the countries reported in the columns. Panel B reports the average weights of individual bond funds.Columns (2)-(9) are obtained by calculating the average weights within fund, and then by obtaining the reported mean across funds. Funds are divided according to their asset class.

A. Equity Funds

		Average Weight (%)							
	Number of Funds	Brazil	China	Germany	India	Japan	Russia	UK	USA
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Asia Ex-Japan	201	0.00	11.16	0.00	5.22	0.03	0.00	0.07	0.00
BRIC	18	32.70	31.42	0.00	15.07	0.00	16.84	0.00	0.00
Emerg. Europe, Middle East, and Africa	38	0.00	0.00	0.00	0.00	0.00	5.35	0.21	0.00
Emerging Europe	91	0.00	0.00	0.00	0.00	0.00	46.14	0.00	0.01
Europe	143	0.00	0.02	17.73	0.08	0.00	0.14	15.11	0.06
Global	155	1.44	1.57	5.76	0.63	11.89	0.38	13.60	24.14
Global Emerging	187	13.04	8.42	0.00	6.94	0.00	5.77	0.06	0.00
Latin America	91	45.59	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Pacific	41	0.00	8.10	0.00	2.92	35.04	0.00	0.21	0.00
Investor Type									
Active	917	7.75	4.83	3.27	2.83	3.46	5.19	4.32	4.27
Passive	48	9.23	8.08	6.55	2.85	5.15	7.09	6.15	4.16

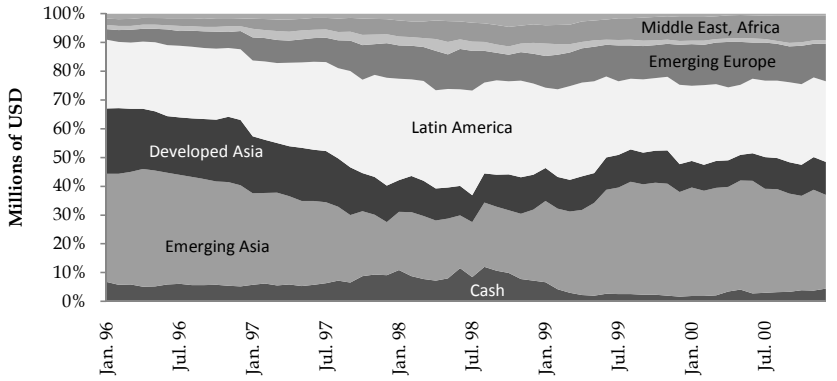
B. Bond Funds

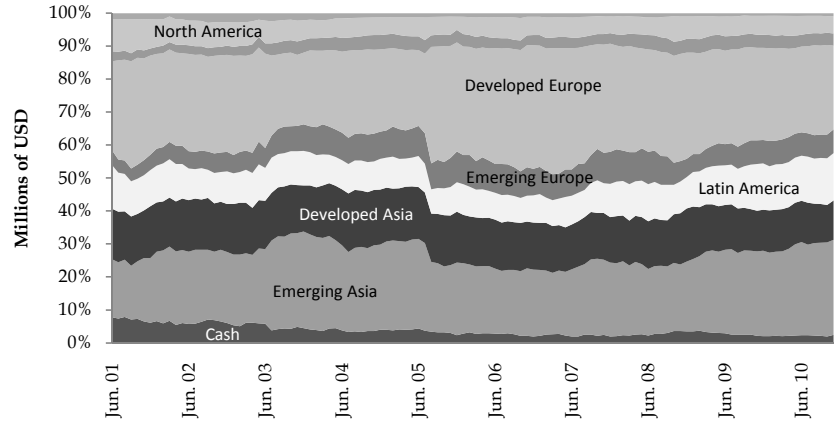
		Average Weight (%)							
	Number of Funds	Brazil	China	Germany	India	Japan	Russia	UK	USA
Fund Target Region	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Global	81	13.44	0.43	0.00	0.58	0.00	8.40	0.00	0.03
Global Emerging	30	1.16	0.00	8.48	0.06	11.11	1.18	9.43	24.76
Investor Type									
Active	108	10.53	0.38	2.48	0.39	2.33	7.58	2.11	7.79
Passive	3	7.50	0.00	0.00	0.00	0.00	7.54	0.00	0.13

Appendix Figure 1
Evolution of the Share of Assets in Mutual Funds by Geographical Regions

Panel A presents the total amount of assets in equity funds by geographical regions. The right side figure, presents the period from January 1996 to December 2000, and the left side figure presents the period from June 20001 to November 2010. Panel B presents the total amount of assets in bond funds by geographical regions for the whole period, July 2002 to November 2010. In both panels, assets were aggregated at a certain point in time for a certain region to compute these figures.

Panel A. Equity Funds





Panel B. Bond Funds

