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How ETFs Amplify the Global Financial Cycle in Emerging Markets*

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Abstract

Since the early 2000s exchange-traded funds (ETFs) have grown to become an important investment vehicle worldwide. In this paper, we study how their growth affects the sensitivity of international capital flows to the global financial cycle. We combine comprehensive fund-level data on investor flows with a novel identification strategy that controls for unobservable time-varying economic conditions at the investment destination. For dedicated emerging market funds, we find that the sensitivity of investor flows to global financial conditions for equity (bond) ETFs is 2.5 (2.25) times higher than for equity (bond) mutual funds. In turn, we show that in countries where ETFs hold a larger share of financial assets, total cross-border equity flows and prices are significantly more sensitive to global financial conditions. We conclude that the growing role of ETFs as a channel for international capital flows amplifies the incidence of the global financial cycle in emerging markets.

JEL Classification: F32, G11, G15, G23

Keywords: exchange-traded funds; mutual funds; global financial cycle; global risk; push and pull factors; capital flows; emerging markets

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1 Introduction

Recent work has documented how changes in US financial conditions are transmitted to other countries in a so-called global financial cycle (Rey, 2015). While much of this research has focused on bank flows (Bruno and Shin, 2015b,a), changes in US monetary policy and risk appetite are also transmitted via portfolio flows (Forbes and Warnock, 2012; Fratzscher, 2012; Avdjiev et al., 2017). At the same time, it is clear that exposure to the global financial cycle varies across countries (Cerutti et al., 2017; Choi et al., 2017) and over time (Ahmed and Zlate, 2014). Indeed, as shown by the green line in Figure 1, portfolio capital flows to emerging markets have become more sensitive to increases in global financial stress over the last 15 years. This increased sensitivity has coincided another shift over the same period: the growing importance of exchange traded funds (ETFs) in the financial markets of emerging economies, illustrated by the blue line in Figure 1. Are these two trends related? And if so, how? In this paper we show that ETFs have indeed amplified the transmission of global financial shocks to emerging economies and present evidence suggesting that this is due to the particular pool of investors who favor ETFs.

The growing importance of ETFs is not limited to emerging markets. Even as the mutual fund industry has expanded rapidly in recent years, accounting for US$20 trillion in assets worldwide (Khorana et al., 2005; ICI, 2017) and acting as an important channel for cross-border portfolio capital flows (Didier et al., 2013), the assets of ETFs have grown even faster. The share of fund assets held by ETFs has gone from only 3.5 percent in 2005 to 14 percent in 2017 (Figure 2). Indeed, the rising popularity of ETFs has been one of the most notable developments in the fund industry over the past decade (Cremers et al., 2016). Nonetheless the rise of ETFs has been particularly striking for emerging markets (EM) funds, where the ETF asset share reached 20 percent in 2017.[1]

In this paper we show that the growing role of ETFs as a channel for international capital flows has amplified the transmission of global financial shocks to emerging economies. We explore the relationship between the growth of ETFs and the sensitivity of EM capital flows to global

[1]ETFs account for an even larger share (25 percent) of the assets of equity funds dedicated to investing in emerging markets. While the share of EM bond funds assets held by ETFs is much lower, it has been growing very rapidly. Prior to 2006 there were essentially no EM bond ETFs.

factors—also referred to as push factors—in two steps. First, we present robust evidence that fund-level investor flows to ETFs respond more to changes in global financial conditions than flows to traditional mutual funds. By contrast ETF flows respond less, if at all, to changing economic conditions in the countries in which the ETFs invest. Second, we show that where ETFs hold a larger share of the host country's market capitalization, both aggregate portfolio flows and equity returns are more sensitive to global factors. These findings indicate that the rise of ETFs as a vehicle for international capital flows has amplified the effects of the global financial cycle in emerging markets. Why do ETFs alter the behavior of cross-border financial flows in this way? Our findings are consistent with the hypothesis put forward by Nam (2017) and Dannhauser (Forthcoming) that ETFs attract investors who value the greater liquidity offered by ETFs and who are relatively uninformed about the fundamentals of the assets they trade.

Our analysis uses comprehensive data from EPFR Global on monthly investor flows to mutual funds and ETFs over the period 1997 to 2017.[2] The dataset contains more than 33,000 mutual funds and more than 6,000 ETFs, with more than US$29 trillion in assets under management at the end of June 2017. Beyond its extensive coverage, this database has several appealing features. First, it contains the investor flows to each mutual fund or ETF. Second, it provides information on each fund's investment scope, indicating the country or set of countries where the fund invests. Importantly, the coverage of the dataset is sufficiently broad that the investment scope varies for ETFs and mutual funds, so that both categories include global, regional, and dedicated country funds. In addition, EPFR provides information on each fund's location, allowing us to control for domicile-specific push factors and thus focus on the effects of truly global factors.

Our novel empirical approach exploits these features of the data. We examine how investor flows into funds respond to global push factors and test whether the response differs for mutual funds and ETFs. We also control for economic conditions in each fund's investment destination. Because we are studying investor flows into funds, we control for these so-called pull factors at the investment-scope rather than at the country level. We do this in two ways, in separate sets

[2]Throughout the paper we use the term investor flows and fund flows interchangeably to refer to end investors' purchases and redemptions of shares in mutual funds and ETFs.

of regressions. First, we construct a measure of economic conditions at the investment scope level by averaging the growth in industrial production (IP) across the countries included in each fund scope. Second, we use investment-scope-time fixed effects to absorb any time-varying, investment-scope-specific factors that might affect fund flows. This allows us to cleanly identify how global factors differentially affect flows going into ETFs versus mutual funds.

Consistent with previous research on fund flows, we find that increases in global financial stress are negatively related to investor flows into both mutual funds and ETFs. However, we go on to show that the sensitivity of ETFs flows to these push factors is significantly larger than for mutual funds investing in emerging markets, a fact previously undocumented in the literature.[3] Quantitatively, the sensitivity of fund flows to push factors is almost 2.5 times bigger for equity ETFs, and 2.25 times larger for bond ETFs, than it is for mutual funds. Our coefficient estimates imply that if ETF flows had the same sensitivity to global financial conditions as mutual funds, outflows during the 2013 Taper Tantrum would have been roughly 20 percent smaller in dollar terms, an economically important but nonethless plausible magnitude. This result is robust to the inclusion of fund- and investment-scope-time fixed effects, as well as time-varying controls such as past performance and financial conditions in the domicile of the fund. Moreover the use of alternative measures of global financial conditions and the exclusion of the period corresponding to the 2007/2008 global financial crisis do not alter our main conclusions.

Overall, the results of our fund-level analysis are consistent with the view that ETFs appeal to investors who value liquidity and who are relatively inattentive to local economic conditions in the countries where the funds invest. We show that flows to large and thus typically low-cost mutual funds do not behave differently than flows to other mutual funds, suggesting it is not cost that differentiates ETFs. Likewise, we show that flows to passive mutual funds are not more sensitive to global conditions than flows to active funds, indicating that it is not passive management that makes ETFs different. The key features that define ETFs are their low cost, their passive management, and their liquidity—ETFs are continuously traded while mutual funds are not. By process of

[3]Importantly, because we are doing our analysis at a monthly frequency, this finding is not a mechanical result of the fact that ETFs are continuously traded while mutual funds are not.

elimination, our results therefore suggest that the liquidity of ETFs attracts investors who behave differently. At the same time we show that at the monthly frequency, mutual fund investors respond to changes in economic conditions in the countries where these funds invest, but ETF investors do not. This somewhat surprising finding is in fact consistent with Israeli et al. (2017), who find that US stock prices respond less to firm-specific information about future earnings when ETFs hold a larger share of the stock. Thus, our results support the hypothesis that ETFs attract investors to whom liquidity is particularly appealing but who are relatively inattentive to shifts in local factors.

Having used fund-level data to clearly identify the greater sensitivity of ETF flows to global financial conditions, we then show that our findings have economically significant implications at the aggregate level. Analyzing a panel of 43 emerging markets, we regress total portfolio equity flows from abroad on our measure of global financial stress, allowing the coefficient to vary with the share of each country's equity market held by foreign ETFs. We find that in countries where ETFs hold a larger share of the equity market, aggregate portfolio equity inflows are more sensitive to global financial conditions. We then repeat the exercise using aggregate equity market returns as the dependent variable, and find similar results. Quantitatively, a one- standard-deviation increase in the share of local equity held by ETFs is associated with an a response of portfolio equity inflows that is 2.5 times higher. For stock prices, a similar increase in the ETF share is associated with an exposure to global factors almost 1.4 times larger. It follows that, while the low costs and high degree of liquidity offered by ETFs may attract new investors to the EM asset class, the benefits of a broader investor base for EM issuers may be partially offset by the fact that the greater sensitivity of ETF flows deepens exposure to the global financial cycle, raising the volatility of financing conditions in recipient economies.[4]

One potential concern with our results is endogeneity. It is certainly plausible that financial institutions create ETFs to cater to investors seeking exposure to volatile or high-beta markets. With this in mind, throughout the paper we take steps to verify that the results do in fact reflect a causal effect of ETFs on the sensitivity of capital flows to global financial conditions. In our fund-

[4]See Converse (2018) for a detailed exploration of the negative effects of capital flow volatility on the real economy in emerging markets.

level analysis, we include investment scope-time fixed effects. This means that we are comparing ETF flows with the flows into mutual funds which have *the same investment destination*, and that we are controlling for all factors that vary over time within that investment destination. This ensures that our results are not driven by ETFs tending to invest in volatile markets while mutual funds invest in less volatile places.

Turning to our aggregate-level results, two strong conditions must hold for our main finding (namely, that total portfolio equity flows and stock prices are more sensitive to changes in global financial conditions where ETFs hold a larger share of the market) to be explained by reverse causality. First, it must be the case that the launch of an ETF in a volatile market does *not* attract new investors to that market. If the launch of ETFs investing in a volatile market *does* draw in new investors, the responsiveness of total portfolio equity capital flows (measured as a share of the recipient economy's GDP) will increase, and the introduction of the ETF will have had a causal effect on that responsiveness. Second, for reverse causality to explain our results it must *also* be the case that the ETF launch did *not* lead those investors who had exposure to that that market to change their behavior by reacting more to global financial shocks. Both of these assumptions seem implausible since the appeal of ETFs relative to other investment vehicles is that they are low cost, and thus attract to new investors, and more liquid, which likely prompts a change the behavior of investors.

Finally, we also address concerns about the endogeneity of the ETF share variable used in our aggregate analysis by performing a robustness check in which we include only holdings by multi-country ETFs, for which holdings of a given country's assets are mechanically determined by benchmark weights. As documented in Raddatz et al. (2017), these benchmark weights are exogenously determined by the financial institutions that construct benchmark indexes, and thus are not driven by desire to facilitate investment in particularly volatile or high-beta markets. This exercise therefore our that findings are not driven by the endogenous creation of ETFs to service high-beta markets.

Our paper relates to four strands of the literature. In addition to the already mentioned body of

work on the global financial cycle, we contribute to the large literature on the drivers of capital flows to emerging markets (Ahmed and Zlate, 2014) and the relative importance of global push factors and local pull factors (Forbes and Warnock, 2012; Cerutti et al., 2015), in particular work using mutual fund data to explore the issue (Fratzscher, 2012). In this context, Jotikasthira et al. (2012) also study withdrawals and redemptions by end investors and how they affect the transmission of shocks across countries but do not differentiate between types of funds as we do.[5] Similar to our work, some previous research has examined how the behavior of international capital flows differs depending on the type of institution or investor with which the originate. In one of the first papers making use of mutual fund data, Borensztein and Gelos (2003) compare capital flows via open-ended funds with those via-closed ended funds. Whereas Raddatz and Schmukler (2012) and Miyajima and Shim (2014) study whether the portfolio decisions of fund managers differ from those of end investors, we analyze the differences in the behavior of end investors in two different types of funds—ETFs and traditional mutual funds.[6] In a closely related paper, Brandao-Marques et al. (2015) do compare the sensitivity of ETFs and mutual funds in the EPFR data, but study country flows rather than fund flows, so that they capture the combined responses of fund managers and end-investors. Additionally, Brandao-Marques et al. (2015) restrict their analysis to fund-level data while we also provide evidence on aggregate macro financial variables such as capital inflows and country asset prices.[7]

Third our paper relates to the rapidly growing literature studying the consequences of the growth of ETFs for financial markets and economic activity. Broadly speaking, our paper contributes that literature, nearly all of which has focused on US financial markets, by examining the consequences of ETFs for emerging markets. To our knowledge, the one paper that does analyze the effects of ETFs in an international context is Baltussen et al. (2016), who show that ETF ownership is associated with greater negative serial correlation, a phenomenon closely related to

[5] In their paper Jotikasthira et al. (2012) build empirical evidence at the international level based on a large literature both theoretical (Shleifer and Vishny (1997)) and empirical (Coval and Stafford (2007)) on asset fire sales.

[6] In related papers Levy-Yeyati and Williams (2012) and Raddatz et al. (2017) show how the decisions of managers to follow benchmark indexes might transmit shocks across countries.

[7] More broadly, this study is related to a large literature studying international mutual funds and how these institutional investors affect international financial markets and asset prices. See among others Kaminsky et al. (2004); Gelos and Wei (2005); Broner et al. (2006); Gelos (2011); Shek et al. (2015); Forbes et al. (2016).

the volatility we study in this paper. Our findings complement work by (Ben-David et al., 2014) showing that US stocks with a greater ETF ownership share exhibit higher return volatility in two ways. First, our results confirm that equity flows and stock prices are more volatile in *international* markets with greater ETF ownership. Second, we highlight a specific mechanism through which ETFs boost volatility, by increasing sensitivity to global financial shocks. Our finding that the relative importance of global as opposed to local factors is greater for ETF investor flows is consistent with Da and Shive (2017), who find that ETF ownship increases comovment in U.S. equity returns, and with Israeli et al. (2017), who find that ETF ownership increases returns synchronicity and reduces the response of US stock prices to firm-specifics earnings information.

By analyzing how ETFs contribute to the international transmission of changes in global financial conditions, this paper complements the work of Dannhauser and Hoseinzade (2017) showing that ETFs propagated the effect of the 2013 Taper Tantrum episode in U.S. corporate bond markets. Our results regarding ETF investors' lack of sensitivity to local factors are consistent with Nam (2017), who develops a model in which the creation of ETFs draws in uninformed investors who had not previously traded the underlying asset because of high trading costs. In particular, our findings complements the evidence of this effect in the US corporate bond market presented in Nam (2017) by studying another market in which the underlying assets of ETFs can be costly to trade. Our paper also relates to the model developed by Bhattacharya and O'Hara (2017), in which ETFs investing in hard-to-trade assets lead to stronger shock propagation as well as rational herding. While their focus is on shocks unrelated to fundamentals, our paper is concerned with financial shocks that likely do affect emerging markets' fundamentals. Nonetheless the amplification mechanisms they model may help to explain the greater sensitivity of ETF flows that we identify.

Finally, our paper relates to the literature on the drivers of investor flows into managed funds (for a survey see Christoffersen et al., 2014), which has explored in depth the relationship between fund flows and performance. We take on board the insights from this literature by controlling for the past performance of funds in our main specifications, but study how another set of variables—global financial conditions and local economic conditions in the countries where the funds invest—affect flows to different types of funds.

The rest of the paper is structured as follows. Section 2 presents information on the institutional details and the mechanics of ETFs. Section 3 details the data. Section 4 presents our empirical strategy and results concerning the sensitivity of fund flows to global factors. Section 5 analyzes the aggregate implications, particularly the link between ETF participation and the global financial cycle. Section 6 concludes.

2 ETFs and Institutional Details

This section presents a brief description of the structure and functioning of exchange traded funds (ETFs), focusing on the ways in which they differ from traditional mutual funds.[8]Like a mutual funds, an ETF is an investment vehicle which owns a basket of underlying assets, usually stocks or bonds.[9] Often the basket is constructed to track the performance of a particular index. Although actively managed ETFs do exist, they are rare– of more than 700 ETFs in our dataset which focus on emerging markets, only 7 are actively managed.

When open-ended mutual fund investors buy or sell shares, they enter into a transaction with the fund, and the price at which the transaction happens is determined by the fund's net asset value (NAV) at the end of the trading day on which the buy or sell request is made. By contrast, ETF shares are continuously traded on equity exchanges, allowing investors to buy or sell shares at any time at the current market price. In this sense ETFs are like closed-end mutual funds, which also have exchange-traded shares. The continuous trading of ETF shares not only makes them easy for investors to buy and sell at low cost, but also greatly reduces the need for the fund to hold a cash allocation to satisfy redemptions, eliminating the cash drag that is an implicit cost mutual fund investing.

Whereas closed-end mutual funds have a fixed number of shares, set at the fund's IPO, ETF

[8]This section is informed by the concise and insightful institutional detail in Ben-David et al. (2014) and Da and Shive (2017), as well as the comprehensive chapter by Deville (2008).

[9]There are also other types of ETFs, for example, commodity ETFs. Because the EPFR data contain only equity and bond ETFs, here we limit our discussion to these ETF types. In markets outside the U.S., there are also synthetic ETFs which replicate the performance of a designated basket of securities through the trading of derivatives. While flows in and out of synthetic ETFs do not directly generate capital flows, they nonetheless affect asset prices.

shares can be created or redeemed. Indeed, the creation and redemption of ETF shares ensures that the value of the ETF's shares outstanding closely tracks the basket of underlying assets. The ETF has a number of so-called authorized participants (APs), large financial institutions that can create or redeem shares in the fund. To create new ETF shares, an AP buys up the underlying assets and exchanges them for fund shares. When an AP redeems shares, it returns shares to the fund administrators and receives the corresponding quantity of underlying assets.

If the value of ETF shares differs from the value of the underlying basket, there is an arbitrage opportunity for the fund's APs. For example, when an ETF's outstanding shares are more valuable than the underlying, an AP can buy up the underlying, exchange it for fund shares, then sell the fund shares at a profit. These sales will cause the price of the ETF shares to fall until the ETF and the underlying are equal in value. Of course, if the underlying assets are relatively illiquid, there is scope for the price of the ETF to diverge from the underlying since arbitrage will not always be possible.

Importantly, although shares in the emerging market ETFs in our sample are generally traded on exchanges in developed markets, the creation and redemption process nonetheless means that investor flows into these funds generate cross border capital flows. For example, should end investors' purchases of ETF shares push their price above that of the underlying asset, the ETF's APs will buy the underlying assets and redeem them to make an arbitrage profit. Because the APs are generally large financial institutions in countries with developed financial markets, their purchase of the underlying asset represents a foreign purchase of an emerging market asset, classified as a gross portfolio capital inflow in the balance of payments.

3 Data

3.1 Fund Flows Data

We obtain monthly fund-level data on mutual funds and ETFs from the commercial data provider EPFR Global.[10] The dataset includes both equity and bond funds, with the data on equity funds covering the period January 1997 to August 2017 and the bond fund data running from January 2002 to August 2017. The data are an unbalanced panel with funds both entering and leaving the sample, so that the data do not suffer from survivorship bias. The full EFPR database contains 33,019 mutual funds (of which roughly 65 percent are equity funds) and 6,431 ETFs (of which 80 percent are equity funds). At the end of June 2017, EPFR funds held US$26.4 trillion in assets under management, accounting for approximately 66 percent of the total worldwide assets of mutual funds and ETFs.[11] Official data on US holdings of foreign assets show that US-domiciled mutual funds held around US$1.7 trillion in emerging market assets, and US funds tracked by EFPR hold roughly 50 percent of these (TIC, 2017).[12]

Our primarily variable of interest is investor flows (F_{it}), defined as the US dollar value of the net purchases or redemptions of shares in each fund i in each month t.[13] Throughout our analysis, we normalize flows into each fund by its assets under management at the end of the previous month (A_{it-1}) so that our measure of fund flows is $\left(f_{it} = \frac{F_{it}}{A_{it-1}}\right)$. Importantly, the dataset includes a field classifying each fund according to what we refer to as its investment scope, meaning the country or group of countries where the fund invests. Example of multi-country investment scope categories include "Global Emerging Markets" and "Latin America Regional." See Appendix Table A4 for a list of the investment scope categories in the dataset and how many funds and observations are assigned to each.

In addition, EPFR also provides data on each fund's performance, meaning the month-on-

[10] For detailed variable definitions and sources see Table A1.
[11] According to ICI (2017) the total assets of the fund industry are roughly US$40 trillion.
[12] Here we compare the holdings of US-domiciled funds with US data on overseas holdings because most countries do not yet report the institutional sector of asset holders.
[13] We use the fund flows variable generated by EPFR, which is calculated by subtracting the change in the fund's net asset value (NAV) from the change in the fund's total assets.

month percent change in the fund's net asset value (NAV). Throughout our analysis, we control for the lagged performance of each fund relative to the average performance of funds with the same investment scope. EPFR also provides a host of other fund characteristics which we use in our analysis, such as each fund's domicile and it's declared benchmark.

We clean the EPFR dataset using procedures standard in research using fund-level data, dropping funds with less than one year of data and funds with average assets lower than US$10 million. In addition, we drop funds with extreme values of performance and inflows (measured as a share of lagged assets), specifically funds with observations in the top and bottom one percent for these variables. Because our analysis is focused on the role of mutual funds in international capital flows, we exclude from the dataset funds which can be characterized as domestic. This includes funds investing only in the country in which they are domiciled, but also funds domiciled in a country that is included in the fund's investment scope (e.g. a Latin America regional fund domiciled in Brazil). See Table A5 for the number of funds and observations in each domicile in our cleaned dataset.

This procedure leaves us with 12,852 mutual funds and 2,525 ETFs in our dataset. Table 1 presents summary statistics and provides a first glimpse of our main result. The volatility of fund flows normalized by assets is much larger for ETFs than for mutual funds.[14] The greater volatility of ETF investor flows can be seen even more clearly in Figure 3, where we plot the aggregate fund flows normalized by aggregate initial assets for the two types of funds. Even after the global financial crisis, fund flows for ETFs appear to be much more volatile and less persistent than investor flows for mutual funds.

3.2 Additional Variables

We analyze the drivers of fund flows using data on pull and push factors. Our main measure of global push factors is the St. Louis Fed Financial Stress Index, which is the first principal component of 18 mostly US financial variables including interest rates, spreads, and equity and

[14]Table A6 contains summary statistics for the assets under management of funds.

bond market implied volatility. Putting changes in the financial stress index in context, the index jumped by 1.5 standard deviations following the September 11, 2001 terrorist attacks and during the 2013 Taper Tantrum. During the 2011 peak of the Eurozone crisis and after the 2015 surprise devaluation of the Chinese currency, the index increased by roughly two standard deviations.

In robustness checks, we use a variety of other commonly used measures of risk sentiment and liquidity conditions. As indicators or risk, we employ the Chicago Board Options Exchange Market Volatility Index (VIX), the effective yield of the Bank of America Merrill Lynch US High Yield Master II Index (US HY), and the spread between 3-month LIBOR and 3-month Treasury Bill (TED spread). Following the literature, we also run our analysis using the effective federal funds rate (FF Rate) to measure global financial conditions. Since the US policy rate was at the zero lower bound for a substantial portion of our sample period, we also make use of the shadow federal funds rate developed by Wu and Xia (2016) (FF Shadow Rate). With the exception of the shadow fed funds rate, which is made available by the Atlanta Fed, our risk and monetary policy variables were obtained from the Federal Reserve Economic Data (FRED) system at the end of each month.[15] Our analysis also takes into account push factors specific to each fund's home country. Specifically, we use monthly stock market returns measured in dollars from MSCI for the domicile country reported by EPFR. For funds domiciled in financial centers, we assign the major stock market most closely associated with the financial center as its home market.[16]

To capture pull factors for fund investors we use the month-on-month change in country-specific seasonally adjusted industrial production (IP) indexes from the IMF's International Financial Statistics (IFS) database.[17] For multi-country funds, we construct investment scope-level aggregate pull factors by taking the cross-country median value for IP growth for the countries within the fund's scope.[18] Our results are not sensitive to the method used to aggregate across

[15] For summary statistics on these global factors see Table A2.

[16] Funds domiciled in Ireland, the British Virgin Islands, and the Channel Islands were matched with UK stock market returns. Funds domiciled in other Caribbean financial centers were matched with US stock returns. Funds domiciled in Luxembourg were assigned German equity returns.

[17] IP data were seasonally adjusted using the X12-ARIMA method developed by the U.S. Census Bureau. For summary statistics on IP growth see Table A3.

[18] Funds to which EPFR has assigned the same investment scope classification may invest in a slightly different set of countries (e.g. not all EM Asia funds invest in Taiwan). In constructing our aggregates, we use the set of countries which MSCI assigns to each country group each period. As a result, the set of countries included in each

countries in each investment scope; using the mean value of IP growth or taking a weighted average produced quantitatively similar results. In robustness checks, we also include monthly one year ahead forecasts of short-term interest rates in the economies included in each fund scope, obtained from Consensus Economics.

4 Empirical Strategy and Results

4.1 Empirical Strategy

The dependent variable in our fund-level regressions is investor flows into each fund, which allows us to avoid constructing estimates of capital flows at the fund-country-time level as has been common in the literature. More specifically, we use the following baseline specification:

$$f_{it} = \theta_i + \beta GF_t + \gamma(GF_t * ETF_i) + \lambda LF_{it} + \eta(LF_{it} * ETF_i) + \sum_{k=1}^{3} \delta_k R_{it-k} + \varepsilon_{it} \quad (1)$$

where f_{it} is investor flows into fund fund i during month t, normalized by the fund's assets at the start of month t. The variable GF_t ("Global Factor") is a measure of global financial conditions, LF_{it} ("Local Factor") captures pull factors in the fund's investment destination, ETF_i is a dummy equal to one if the fund is an ETF, and ε_{it} is an error term. This baseline specification includes fixed effects at the fund level θ_i. Since a large body of work has shown that past performance affects fund flows, we include three lags of the fund's returns relative to other funds with the same investment scope (R_{it}).

Throughout the paper we try to keep the specification parsimonious and therefore include generally only one pull and one push factor in each regression. For GF_t our main variable is the Saint Louis Fed Financial Stress Index, a broad measure of global financial conditions.[19] Fund flows f_{it} represent a *change* in end investors' holdings of fund i, which could be due reallocation across

category varies over time. For example, we include Greece in "Emerging Europe" after November 2013, when it was downgraded from MSCI's developed markets index.

[19] In Section 4.4 we show that using narrower various narrower measures of global risk sentiment and liquidity conditions does not alter our results.

funds or to a change in the size of the portfolio of investors who hold fund i. We therefore include the global factor variable in differences, so that β represents the change in investors' holdings of fund i in response to a change in global financial conditions at time t.[20] The sum $\beta+\gamma$ captures the sensitivity of ETF investor flows to push factors, and the focus of our analysis is γ, the difference in sensitivity between ETF flows and mutual fund flows.

The focus of this paper is the difference in the responses of ETF and mutual fund investor flows to *global* financial shocks, but we do include a local factor in our regression and allow its coefficient to differ for ETFs for two reasons. First it allows us to verify that our results are in line with other research on the drivers of fund flows. And second, knowing η—the differential response of ETF investor flows to local factors—may help us better understand our results regarding γ. Our main measure of local factors, often referred to as pull factors in the literature on the drivers of capital flows, is month-on-month growth in industrial production (as described in Section 3). We use IP because measures local returns (interest rates or equity returns) would raise serious concerns about endogeneity bias, since large fund flows can generate price changes (as documented in, for example, Jotikasthira et al., 2012).[21] Because we are analyzing fund flows (as opposed to country flows), we must make a methodological choice regarding how to measure pull factors for multi-country funds. In our main specifications, we use the median industrial production growth for the group of countries included in the fund's investment scope, but our results are robust to the mean and the GDP-weighted average IP growth. The response of ETF investor flows to pull factors is given by $\lambda+\eta$, with η the difference in sensitivity relative to mutual fund flows.

Beyond this baseline specification, we use an alternative approach exploiting higher dimensional fixed effects as follows:

$$f_{it} = \theta_i + \theta_{st} + \gamma(GF_t * ETF_i) + \eta(LF_{it} * ETF_i) + \sum_{k=1}^{3} \delta_k R_{it-k} + e_{it}, \tag{2}$$

[20] More specifically we first difference the global factor variable when the level can be negative and take log differences when the levels are strictly positive.

[21] While fund flows can also affect the cost of capital in the countries where the fund invests, in turn affecting real investment and thus industrial production, this effect is unlikely to work within a single month.

where θ_{st} are fixed effects at the investment scope-time level. This set of fixed effects absorbs all time-varying shocks non-parametrically at the investment scope level. Thus, we can more cleanly identify the difference in sensitivities coming from the difference in the type of fund. For instance, if financial institutions create ETFs to service country or regions with higher sensitivity to push factors, this would generate a high γ in Equation 1 even if ETF flows per se were not more sensitive. The use of scope-time fixed effects addresses this concern because it allows us to compare the sensitivities of ETFs and mutual funds with the same investment scope, controlling for any time varying factors specific to the investment scope.[22]

4.2 Main Results

We begin by estimating equation 1 separately for funds investing in developed markets and those targeting emerging markets (Table 2).[23] Consistent with previous work, the results show that an increase in global financial stress is associated with a reduction in investor flows to both equity (panel A) and bond funds (panel B). This is true for funds investing in developed markets and those targeting emerging markets (Columns 1 and 4). For developed market funds, the sensitivity of ETFs to both push and pull factors is not significantly different from that of traditional mutual funds (Columns 2-3). However, estimates for funds investing only in emerging markets indicate that ETF flows are significantly more sensitive to push factors than mutual fund flows (Columns 5-6). Indeed, ETF flows' exposure to our global factor is almost 2.5 times bigger for equity funds (Panel A) and 2.25 times larger for bond funds (Panel B).[24] The differences between our findings for developed market funds and those for EM funds lead us to exclusively study EM funds in the remainder of the paper.[25]

[22] In principle the structure of our database allows us to use fixed effects at finer levels, such as the fund domicile-investment scope-time level, or the benchmark-time level. However, especially for bond funds, there are too few ETFs within these more granular sub-categories. We therefore favor the investment scope-time fixed effects for most of the paper.

[23] While all our regressions contain fund performance controls, we do not report the estimated coefficients for compactness. Full results including our estimates for δ_{it-k} in equations 1 and 2 are presented in Table A8.

[24] This is calculated as $\frac{\beta+\gamma}{\beta}$ where the numerator is the sensitivity of ETFs flows to the global factor, while the denominator is the sensitivity of mutual fund flows to the global factor.

[25] We do investigate the responses of developed market ETFs in detail in appendix table A7. We find that dedicated developed market ETFs do appear more sensitive to global financial conditions once we modify our dataset in two ways. First, we re-include funds investing in the country where they are domiciled. We do this because in developed

To ensure that our main parameter of interest, γ in equations 1 and 2, is well identified, we next estimate equation 2, which includes investment scope-time fixed effects. Including this set of fixed effects allows us to compare ETFs with mutual funds that have the same investment scope and also control for any time-varying determinants specific to that investment scope. Again, this strategy helps us control for the fact that financial institutions may choose to create ETFs specifically to cater to investment scope categories which, for other reasons, exhibit more volatility in fund flows. We are comparing ETFs and mutual funds that invest in the *same* markets at the *same* time. The resulting point estimates for γ (found in column 6) are somewhat smaller in magnitude than those in column 5, which is consistent with endogenous ETF creation generating an upward bias in our estimates of equation 2. Nonetheless, the coefficients on the global factor-ETF interaction term do not change dramatically and remain significant.

Our regression results imply that the greater sensitivity of ETF flows has an economically significant effect on the size of flows to dedicated emerging market funds. To illustrate this, we analyze the 2013 Taper Tantrum in light of our results. Following Fed Chairman Ben Bernanke's May 22, 2013 comments regarding the possibility of scaling back the Federal Reserve's asset purchase program, investors withdrew US$38 billion (2.8 percent of fund assets) from dedicated EM funds in June 2013, of which US$11.5 billion came out of ETFs. Concurrently, the St. Louis Fed Financial Stress index that is our main measure of global financial conditions increased by 1.5 standard deviations. The coefficient estimates in column 5 of Table 2 imply that approximately US$26.3 billion (1.9 percent of assets) of the total outflow can be attributed to the increase in financial stress that followed Bernanke's speech. If we impose on ETF flows the sensitivity that we estimate for mutual fund flows, the outflow due to financial stress would have been US$20.8 billion (1.5 percent of fund assets). This back of the envelope counterfactual calculation thus implies that the extra sensitivity of ETF flows boosted outflows by US$5.5 billion or 1.3 percent of fund assets, an economically important but at the same time not implausibly large effect.

As we show in Section 4.4, our results are robust to excluding the global financial crisis from

markets these funds cater to foreign as well as domestic investors, unlike in EMs where their investor base is largely domestic. Second, we exclude DM funds investing exclusively in German, Japanese, and U.S. government bonds, which are widely considered safe-haven assets.

our sample; however, we do find substantial time variation in the relationship between our global push factor and fund flows to ETFs. Figure 4 plots the 36-month rolling slope of a regression of aggregate fund flows on our chosen measure of global financial conditions. Except for a brief period after the 2008 global financial crisis the sensitivity of ETF flows to push factors is greater (in absolute terms) than for traditional mutual funds. Moreover, the sensitivity of investor flows into ETFs has been increasing steadily since 2012 while the sensitivity of mutual fund flows has essentially remained constant over the period. This suggests that the rising sensitivity of aggregate flows to dedicated EM funds that we highlighted in the introduction is due not only to the growing use of ETFs as a channel for cross-border investment but also to the increase in the sensitivity of ETF flows.

Turning to so-called pull factors, which measure economic conditions in the countries where the funds invest, we find that flows to dedicated EM mutual funds are positively related to economic conditions in the funds' investment destination, although the coefficient is not significant for bond funds. The evidence also suggests that flows to ETFs, whether equity or bond funds, do not respond to pull factors. This is captured in the row of the table labeled "Local Factor ETF" in the bottom section of Table 2, which gives the ETF-specific coefficient ($\lambda + \eta$ in equation 1), and the row below, which gives the p-value from a test of the null that this coefficient is equal to zero. In the robustness section below, we show that these findings are not altered if we include the expected short-term term interest rate as a pull factor or vary the way we aggregate across countries when calculating pull factors for global and regional funds. Thus it appears that while ETF investor respond strongly to changes in global financial conditions, they respond little if at all to changes in local economic conditions in the particular countries where the ETF invests.[26]

[26] We also test whether flows to mutual funds and ETFs respond differently to lagged fund performance and find they do not (these results are available on request). Once again, the inclusion of these additional interaction terms does not substantially change our coefficient estimates for global factors.

4.3 Alternative Hypotheses and Specifications

We now examine in more detail our main finding that ETF flows respond more to changes in global financial conditions. First, we verify that shifts in ETF flows that we identified in the previous section do in fact represent a response to changes in global financial conditions, rather than financial shocks in particular countries where funds are domiciled. Second, we explore what what specific features of ETFs are associated with greater sensitivity to global conditions. And third, we test how the results vary when we run our regressions at longer frequencies.

In order to verify that the shocks we identify are truly global, we now run a set of regressions in which we control for push factors that are specific to the country where each fund is domiciled. In particular, we include in our baseline specification the stock market returns in each fund's domicile country in order to capture financial conditions at home for the fund's investors (Table 3). Notice that higher stock market returns at home are associated with larger investor flows to EM funds (Column 1), presumably reflecting portfolio rebalancing to maintain a desired weight on EM assets as the size of investors' total portfolios grows. Despite its importance, the inclusion of this variable does not alter our main conclusions. ETF flows are still significantly more exposed to the global factor than mutual fund flows (Columns 2-3). Furthermore, the effect is now larger for both equity (Panel A) and bond funds (Panel B). In column 4, we introduce domicile-investment scope-time fixed effects to our estimation. In doing so, we control for other time-varying unobservables that might be affecting fund flows at the fund domicile or investment scope level. For example, one might think that central bank policy rates at the fund domicile might play a role on top of stock market returns. This specification controls for such factors, and the results remain very similar to our baseline. Nonetheless, stock market returns in the domicile of the fund do seems to be an important explanatory variable, and we therefore include this variable as a fund-level control in the rest of the estimations presented in this section.

Does the greater sensitivity that we have identified come from some feature specific to ETFs? Or is that sensitivity related to fund characteristics which in turn are positively correlated with ETF status, but which can also be features of mutual funds? The average emerging market ETF

in our sample is around 50 percent larger than the average mutual fund, so we test whether it is in fact large funds that are more sensitive to changes in global financial conditions (Table 4). We allow the coefficient on the global factor to vary according to the size of the fund by interacting the global factor with a dummy variable equal to one if the fund is large, experimenting with two different thresholds for what constitutes a large fund (US$100 and US$250 million). Large equity mutual funds do not seem to have a significantly higher sensitivity to global factors (Table 4, Panel A). While large bond funds do have a higher exposure to our measure of push factors, they are nonetheless significantly less sensitive than ETFs (Panel B).

Another key characteristic of ETFs is their passive management strategy.[27] We therefore next examine whether passively managed mutual funds are more sensitive to changes in global financial conditions than are actively managed mutual funds. The results presented in Table 5 show that passive equity and bond funds are not significantly different from other mutual funds, and further that the change in specification does not alter the estimated coefficients on the global factor-ETF interaction. We therefore conclude that it is not ETFs' passive management that sets them apart from mutual funds in terms of their sensitivity to global shocks.

Because country-specific ETFs are much less common than country-specific mutual funds, there is a concern that our results may reflect differences in the sensitivity of flows to multi-country (global and regional) funds relative to that of single-country funds, rather than any feature specific to ETFs. This is a particularly important concern given that global and regional funds may cater to less specialized, possibly less sophisticated, investors who are more sensitive to changes global financial conditions. However, these concerns are dispelled in Table 6, where we estimate equations 1 and 2 separately for, on the one hand, global and regional funds (in columns 1 and 2) and on the other hand country funds (in columns 3 and 4). For equity funds, results for the two groups are qualitatively and quantitatively similar (Panel A). In the case of bond funds, we cannot reject the null that flows to country-specific ETFs have the same sensitivity to global financial conditions as country-specific mutual funds, but this is likely due to the small number of country-specific

[27] While active ETFs do exist, there are very few. Our dataset includes more than 700 ETFs investing in emerging markets, of which only seven are actively managed.

bond funds in our sample. Our dataset contains 98 country-specific EM bond funds, of which only eight are ETFs. In any case when we formally test the null hypothesis that country funds have the same sensitivity to global factors as do global and regional funds (columns 5 and 6 of Table 6), we fail to reject the null. Overall then the results presented in Table 6 demonstrate that the greater sensitivity of ETF flows to global financial conditions which we have identified is not merely a reflection of the the prevalence of multi-country ETFs, but rather some other feature of this type of fund.

The results in Table 6 also provide further support for our secondary finding that ETF flows respond little if at all to so-called pull factors in the investment destination. Because we calculate pull factors for multi-country funds by averaging across the countries in the funds' investment scope, the lack of a statistically significant response by ETF investors could be the result of attrition bias generated by measurement error in our local factor. However, in columns 3 and 4 of Table 6 we see that ETF flows do not respond to the local factor even when we limit our sample to country-specific funds, for which such measurement error is not a concern.

We have have now ruled out a number of competing explanations for our baseline results. Neither the size, nor the passive management strategy, nor the multi-country investment scope of ETFs explain their greater sensitivity to changes in global financial conditions relative to traditional mutual funds. Taken together, the findings in this section also suggest that it is not the case that ETFs' low fees explain their greater sensitivity. This is because the lowest cost mutual funds are large, passively managed, or both, and we have confirmed that these characteristics on their own do not induce higher responsiveness to global shocks. By process of elimination, our results are therefore consistent with our view that the distinctive characteristic of ETFs is the enhanced liquidity they provide, due to the fact that ETF shares can be traded intra-day while mutual fund shares cannot.[28]

Having explored whether particular features of ETFs explain their greater sensitivity, we now analyze how our findings depend on the investment horizon by re-estimating our baseline spec-

[28] At the same time, note that because we are studing flows at a monthly frequency, the greater sensitivity we encounter is not a *mechanical* result of the fact that ETF shares can be traded intra-day.

ifications for 3- and 6-month frequencies (Table 7). Once again, we find that ETFs fund flows are significantly more sensitive to push factors than flows to mutual funds, and in fact the excess sensitivity appears even larger for bond funds than in the monthly regressions. With respect to pull factors, both equity and bond ETFs flows now behave differently than they did in our monthly frequency regressions. Whereas flows into equity ETFs were not sensitive to local conditions in our monthly frequency analysis, at the quarterly and 6-month frequency equity ETF flows are positively associated with IP growth in the investment destination, as is the case for mutual funds (in Table 7 this can be seen by looking at the p-values associated the "local factor ETF" coefficient). By contrast, investor flows to bond ETFs remain uncorrelated with pull factors over longer horizons. Overall, the analysis of flows at a lower frequency provides further evidence that country capital flows channeled via ETFs are much more sensitive to push factors than regular mutual funds, regardless of the investment scope.[29]

4.4 Robustness

We study the robustness of the results reported above along four different dimensions. First, we exclude the period of the global financial crisis of 2007/2008, dropping the months between March 2007 until March 2009 from our estimations (Table 8). We do this because crisis periods tend to disproportionately increase the cross-country correlation of financial variables (Forbes and Rigobon, 2002). However the results in Table 8 confirm that when we exclude the global financial crisis, the sensitivity of fund flows to ETFs is still still significantly larger than for mutual funds, both for equity and bond funds. Similarly, our finding that investor flows to ETFs are not significantly associated with local pull factors remains once we remove the crisis period from our sample.

Second, we control for the fact that investor flows to ETFs exhibit different long-term trends than flows to mutual funds. As noted in the introduction, the share of fund assets held by ETFs has risen steadily over the last 15 years. This growth is largely due to ETFs receiving steadily

[29]The previous finding on country funds also confirm the (lack of) sensitivity of ETFs to pull factors, which remains unchanged when we focus solely on country funds (Panel A, Column 3 of Table 6). Note that our measure of local factors for global and regional funds is a weighted cross-country average, which may weaken the accuracy with which our model measures country-specific conditions, a concern that is not applicable to country funds.

growing inflows during the period. To ensure that our results are not an artifact of the upward trend in ETF flows over the period we analyze, we run a set of regressions that include fixed effects at the fund domicile-year-ETF level. In other words, we interact a set of dummy variables for the funds' country of domicile with our ETF dummy and a full set of year fixed effects. We include the domicile fixed effects in this interaction to account for the fact that the rise in the popularity of ETFs has been more pronounced in some countries than in others. Thus this specification also verifies that our results are not driven by, for example, U.S. investors being more sensitive to global shocks and also more eager to shift to using ETFs as an investment vehicle. Results from these regressions are presented in Table 9 and are qualitatively similar to our baseline specification.

Third, we show that our results are robust to using a different measures of global financial shocks. We begin by using three common measures of global risk appetite: the VIX, the TED spread, and the US high yield spread (Table 10). For equity funds, our findings are very similar to the baseline: ETF flows always exhibit higher sensitivity to the global variable than mutual fund flows, while ETFs flows response to local factors is not significantly different from zero. Flows to EM bond funds do not exhibit elevated sensitivity to the VIX or the TED spread, but do respond significantly more than EM mutual fund flows to changes in the US high yield spread. In the first two columns of Table 11 we verify that when we measure global financial conditions using the first principal component of these variables (PCA1) to measure global push factors, the results are very similar to our baseline for both equity and bond funds.

In columns 3 to 6 of Table 11 we capture global financial shocks using two different measures of U.S. monetary policy. Because the U.S. policy rate was at the zero lower bound for a substantial part of the period we analyze, we not only re-run our specification using the fed funds rate, but also with the so-called shadow fed funds rate developed by Wu and Xia (2016). Here again we see that ETFs fund flows respond much more strongly to changes in financial conditions than do mutual fund flows. All in all, our findings are robust to the use of different variables to capture changes in global financial conditions.

Fourth, we demonstrate that our core results do not change when we use alternative measures

of local economic conditions—the local factor in specifications 1 and 2. Recall that because we are analyzing flows to funds, many of which invest in multiple countries, we need to average any measure of local conditions across the countries within the fund's investment scope. In columns (1) and (2) of Table 12 we average using the unweighted mean of month-on-month growth across countries, while in columns 3 and 4 we take the GDP-weighted average. The results are very similar to those in Table 2. In columns 5 to 8 of Table 12 we include a measure of local financial conditions, the Consensus forecast for the country's short-term interest rate in the following year. Whether we include this variable on its own (columns 5 and 6) or alongside our measure of real conditions (columns 7 and 8), our finding that ETF flows are more sensitive to changes in global financial conditions remains. Moreover, the response of ETF flows to changes in local economic conditions is never significantly different from zero.

5 From Fund to Country: ETFs and the Global Financial Cycle in Emerging Markets

Having presented evidence that investor flows into dedicated emerging market ETFs are more sensitive to changes in global conditions than flows into EM mutual funds, in this section we ask whether this greater sensitivity affects countries' exposure to the global financial cycle at the aggregate level. After all, ETFs account for less that half of EM mutual fund assets, and mutual funds are only a subset of cross-border investors. We address this question in two steps. First, we present graphical evidence suggesting that ETFs have boosted the sensitivity of aggregate fund flows to global financial conditions in the period since the global financial crisis. Second, we provide a quantitative assessment of this enhanced sensitivity for capital flows and prices at the country level.

An examination of the changing sensitivity of total fund flows to emerging markets highlighted in the introduction to this paper strongly suggests that it is a result of the greater sensitivity of ETF flows to global financial shocks. Figure 5 shows this by plotting the 36-month rolling slope

coefficient, but this time for the aggregate flows into all funds (the green line). We compare this with the slope for flows into traditional mutual funds (the red line). The sensitivity of flows to all funds spiked during the financial crisis but fell back to its pre-crisis value relatively quickly. Sensitivity jumped again around the time of the Euro crisis in 2011, but rather than returning to its previous level it has remained elevated or even increased. A look at the sensitivity of traditional mutual funds shows that the sensitivity of their investment flows to global financial conditions did fall after the Euro crisis. Thus, Figure 5 demonstrates that the growing importance of ETFs in the fund industry combined with the rise in ETF flows' sensitivity over the last several years (recall Figure 1 and the associated discussion) has resulted in fund flows overall becoming more sensitive, that is, more closely linked to global factors.

To formally explore the macro-level implications of our fund-level results, we construct a measure of ETFs' market penetration in each country, defined as the share of the country's equity market capitalization held by ETFs:

$$\text{ETF Share}_{ct} = \frac{\sum_{i \in ETF} w_{ict} A_{it}}{\text{Mcap}_{ct}} \tag{3}$$

where w_{ict} is the share of fund i's assets invested in country c at time t, and A_{it} is the fund's total assets under management measured in U.S. dollars.[30] In using share of outstanding held by ETFs to measure their importance, we follow previous work analyzing the effects of ETF ownership on the behavior of US stock returns (Glosten et al., 2016; Israeli et al., 2017). Both w_{ict} and A_{it} are obtained from EPFR. The numerator thus captures the dollar value of ETFs' assets in country c at time t, while the denominator is the stock market capitalization of country c (Mcap_{ct}, also measured in U.S. dollars).

We test whether capital flows and asset prices are more exposed to global factors in countries

[30] Throughout this section we focus on portfolio equity flows and equity prices. We do this because both portfolio capital flows and bonds prices are much more diverse and more difficult to aggregate. For instance, portfolio debt liability flows in the balance of payments include purchases of both sovereign and corporate securities, both of which may be denominated in either domestic or foreign currency. Accordingly, there are separate price indexes for sovereign and corporate debt in domestic and foreign currency. We therefore restrict our analysis to the aggregate implications for equity.

with a greater ETF presence using the following specification:

$$y_{ct} = \theta_z + \beta GF_t + \mu(GF_t * \text{Share ETF}_{ct-1}) + \delta(\text{Share ETF}_{ct-1}) + \nu_{ct} \tag{4}$$

where y_{ct} is the aggregate variable of interest, either quarterly portfolio equity liability flows from the balance of payments or monthly MSCI country stock market returns. The global factor GF_t is defined as before. We lag the ETF share variable one period to avoid reverse causality, since large capital inflows in period t could mechanically boost the ETF share for the same period. We also include a set of either time or country fixed effects (θ_z, where $z = c, t$). In equation 4, μ captures how the sensitivity of capital flows and prices to global factors vary with the presence of ETFs.

The results of our macro-level regressions, presented in Table 13, suggest that a greater ETF share is associated with a higher aggregate exposure to global financial shocks for both equity flows (Panel A) and stock market prices (Panel B). We first confirm that portfolio equity inflows and local equity returns are negatively related to increases the global financial stress index that we use to measure global shocks (column 1). The results presented in column 2 indicate that the association is larger (in absolute value) when the ETF share of the local equity market is greater (Column 2). The result holds even when we include time fixed effects and concentrate on the cross-country variation in the ETF share (Column 3). Thus, our findings at the micro level also have implications for aggregate financial variables.

How large is the effect? With the ETF share of equity assets at its mean (ETF $\text{Share}_{ct} = 0.477$ percentage points), the country's inflows beta with respect to the global financial conditions is -0.083; for a country with an ETF share one standard deviation (0.737 percentage points) higher, this beta increases to -0.211 (in absolute terms), which implies an exposure 2.55 times higher. The conclusions are qualitatively similar when looking at aggregate stock market returns (Panel B). Increasing the ETF share by one standard deviation relative to the average ETF share, the beta associated with the global factor is 1.36 times higher. Thus the effects are economically as well as statistically significant.

In columns 4 and 5, we verify that it is not holdings of equity by investment funds more generally that is associated with higher sensitivity to changes in global financial conditions. We include alongside the ETF share the share of assets held by mutual funds (Mutual Fund Share) and interact this variable with the global factor. Both with country- and time-fixed effects, the interaction of this variable with the global factor is not statistically significant in almost all specifications (it is only significant at the 10 percent level for returns), whereas the coefficient of ETF share remains stable and highly significant.

One potential concern about these estimates is that of omitted variable bias. For instance, greater financial integration may lead to an increase in both the ETF share and the equity market co-movement with global factors. To address this, in column 1 of Table 14 we replace the ETF share with an ordinal variable (MSCI EM) indicating the country's MSCI classification—frontier, emerging, or developed.[31] Many ETFs track MSCI indexes, and more ETFs track MSCI's emerging market index than its frontier index, while even more ETFs track the MSCI developed market index. Thus the degree to which ETFs own the local market is correlated with the country's MSCI classification. However as demonstrated in Raddatz et al. (2017), the timing of changes in MSCI classification is largely exogenous. Thus our MSCI variable can be regarded as an arguably exogenous proxy for the ETF share variable, which we interact with the global factor in a regression that also includes country fixed effects. Re-estimating equation 4 using the MSCI classification as a proxy for ETF share (again, column 1 of 14), we find that the interaction term is onceagain negative and significant. Since we include country fixed effects in the regression and focus on within-country variation, this implies that MSCI upgrades of a country are associated with an increase in the exposure of capital flows and equity returns to global financial conditions.

Another concern is that of reverse causality. New ETFs are not set up for exogenous reasons. They are usually created in response to demand from investors. For example, if there are investors who would like to quickly move in and out of risky assets, asset managers will likely set up ETFs

[31] In particular, this variable takes the value 0 if a country is classified as frontier/standalone, 1 if it is an emerging market, and 2 if it is classified as a developed market. Our sample includes a broad category of emerging markets, not only emerging markets by the MSCI classification but also the rest of developing economies included in EPFR data. These are classified by MSCI into standalone or frontier markets. Our sample also includes countries that have shifted from being classified as emerging to developed markets by MSCI,such Israel.

that provide exposure to those assets. We address this concern about endogeneity in two ways. We first note that for endogenous ETF creation to drive our results, two very specific and arguably implausible conditions must hold. We then conduct a robustness test in which we examine a subset of cross-border ETF holdings which previous work suggests are exogenously determined.

Under what conditions would reverse to causality rather than a causal relationship explain our finding that total portfolio equity flows and stock prices are more sensitive to global factors where ETFs hold a larger share of the market? First, it must be the case that the launch of an ETF in a volatile market does *not* attract new investors to that market. If the launch of ETFs investing in a volatile market *does* draw in new investors, the responsiveness of total portfolio equity capital flows (measured as a share of GDP) will increase, and the introduction of the ETF will have had a causal effect on that responsiveness. Second, for reverse causality to explain our results it must *also* be the case that the ETF launch did *not* lead those investors who had exposure to that that market to change their behavior by reacting more to global financial shocks. Both of these assumptions seem implausible since the appeal of ETFs relative to other investment vehicles is that they are low cost, and thus attract to new investors, and more liquid, which likely prompts a change the behavior of investors.

Nonetheless, to confirm that the creation of ETFs to provide access to already volatile or high-beta markets does not drive our results, in columns 2 to 5 of Table 14 we focus the relationship between ETF holdings which are *exogenously* determined and sensitivity to global financial shocks. In particular we construct an ETF share measure which includes only the emerging market assets held by global and regional ETFs (as opposed to country specific funds). Because these funds' holdings are diversified across countries, it is less likely that their holdings are endogenously determined by a desire to access high-beta emerging markets. More importantly, these funds' holdings of any particular country's stocks are largely determined by benchmark weights, as documented by Raddatz et al. (2017). As a result, we can be confident that the share of a given country's market capitalization held by this subset of ETFs is not endogenously determined. When when redo our analysis using this exogenous measure of ETF holdings in Table 14, we find results very similar to those in Table 13. Once again, both flows and returns respond more to changes in global financial

conditions in markets where ETFs own a larger share of the equity market capitalization.

Our findings regarding the macro-level implications of ETFs' growing role in cross-border capital flows are summarized in Figure 6. We plot the relationship between, on the one hand, the cross-sectional betas for portfolio equity inflows (the left panel) and stock market returns (the right panel) for the 2000-2017 period and, on the other hand, the average share of assets held by ETFs for a given country and period. Furthermore, we find that the inclusion (exclusion) from important benchmark indexes tracked by ETF investors raises (reduces) the country's betas, even when we look exclusively at the cross-section of countries, which is again consistent with the hypothesis that ETFs amplify the incidence of global factors on local markets.

6 Conclusion

Since the early 2000s, the asset management industry has undergone a significant change as the assets under management of ETFs have expanded rapidly. In this paper, we present evidence that the growing role of ETFs as a channel for cross-border capital flows has increased the exposure of emerging markets to the global financial cycle. We use detailed monthly micro data at the fund level from 1997 until 2017 to document that investor flows into dedicated emerging market ETFs are more more sensitive to global push factors than flows into emerging market mutual funds. This difference is economically large, with betas to global factors almost 2.5 times bigger for equity ETFs, and 2.25 time bigger for bond ETFs, relative to non-ETFs. By contrast, while flows into mutual funds respond to changes in local economic conditions, ETF flows do not. Our findings are robust to the inclusion of fund and investment scope-time fixed effects, time-varying fund controls such as past performance and economic conditions in the domicile of the fund. The results are very similar for global and country funds, and are not affected by the exclusion of the 2007/2008 global financial crisis from the sample.

In addition, we demonstrate that our findings have important implications for aggregate cross-border capital flows: we find that greater holdings of equity by foreign ETFs is associated with a

higher exposure to global financial conditions both for aggregate portfolio equity flows and stock market returns. These results are not only statistically significant, but of economic importance. A one standard deviation increase in the percentage of local assets held by ETFs implies a sensitivity to global financial shocks that is 2.5 times in terms of portfolio equity flows and almost 1.4 times larger for prices.

Overall, our results suggest that greater use of ETFs as a conduit for capital flows to emerging markets has increased the exposure of these economies to the global financial cycle. Our findings also present one example of how the rising popularity of passively managed, benchmarked instruments contributes to market co-movement and capital flows synchronicity at the expense of local fundamentals. Finally, the results presented here raise the question of why ETF flows respond differently to global and local factors, whether this is due to the perceived liquidity of ETFs shares or differences in the investor base of ETFs. This is a natural line for future research.

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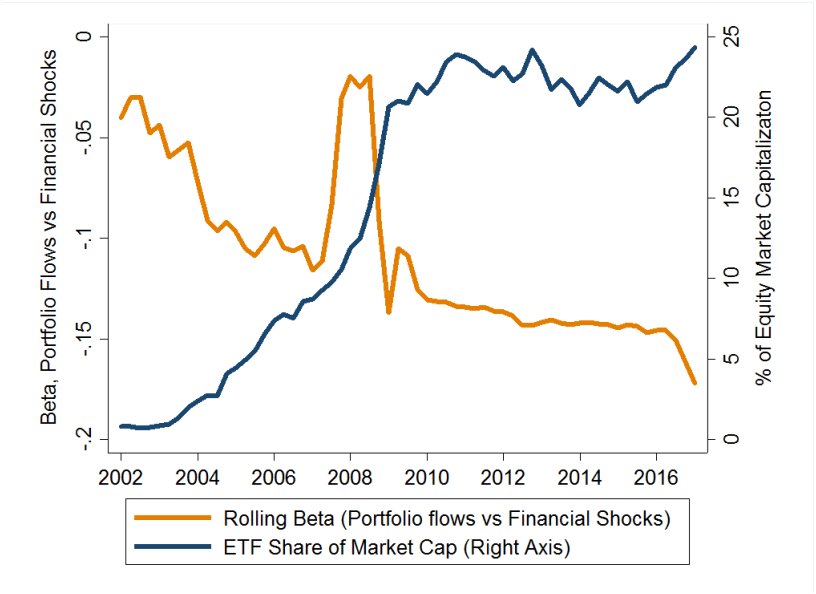
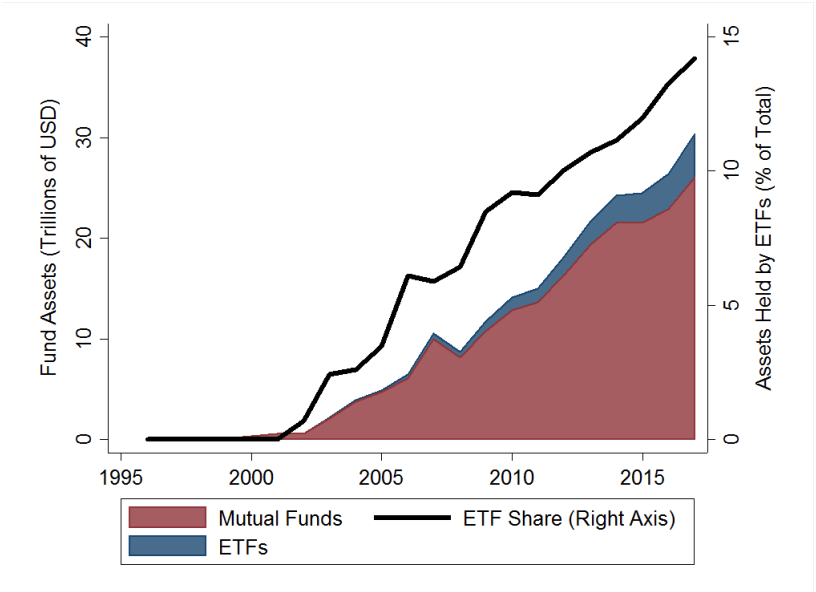
Figure 1: ETF Market Share and Emerging Markets' Exposure to Global Financial Shocks



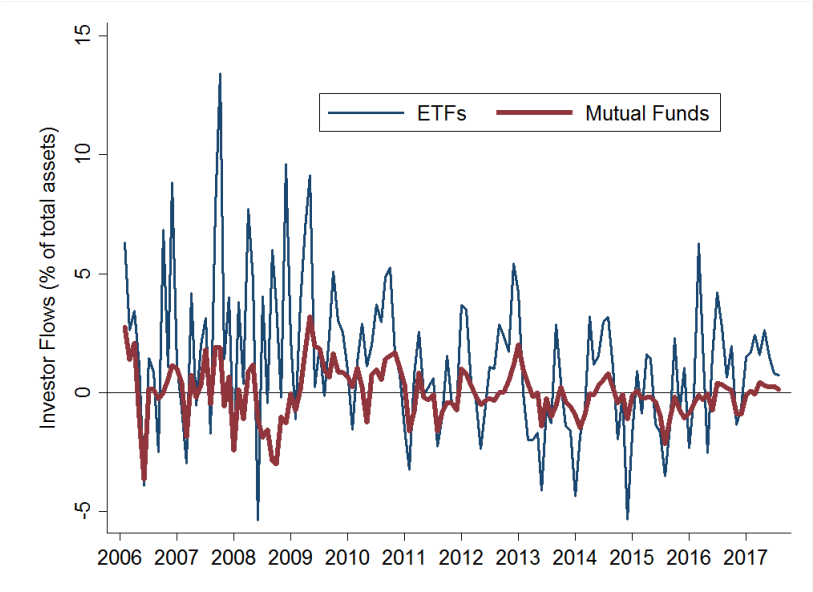
Note: This figure shows the portfolio equity liability flows to emerging markets as a share of GDP. Rolling beta is the slope of a 36-month rolling regression of the portfolio equity liability flows over GDP versus the difference in the St. Louis Financial Stress Index. ETF Market Share (right axis) represents the assets under management held by equity ETF divided by the total assets under management of all emerging market funds in percentage.

Figure 2: The Growth of ETFs



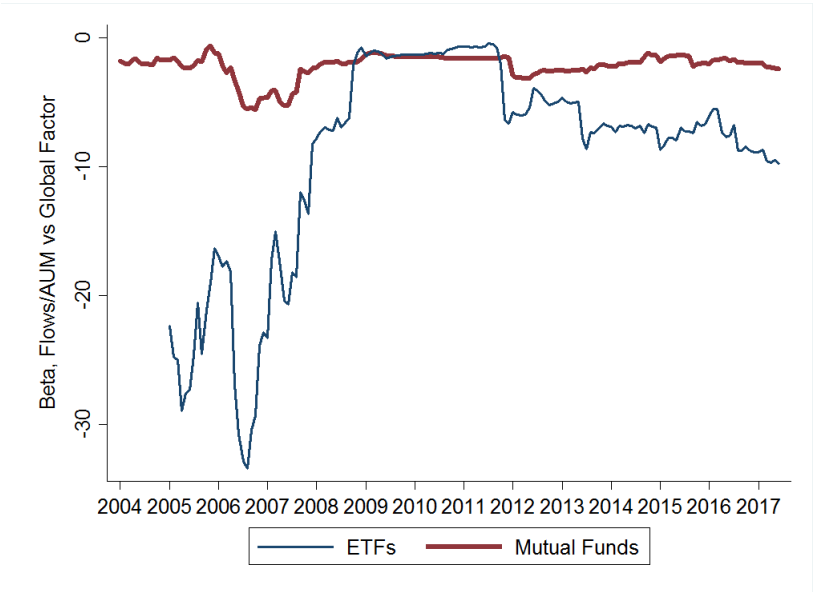
Note: This figure shows the assets under management of ETF and non-ETF in the EPFR data. The data is at plotted at the end of each year. Share ETF (right axis) represents the assets under management held by ETF divided by the total assets under management of all funds in percentage.

Figure 3: Fund Flow Volatility, ETFs vs Mutual Funds



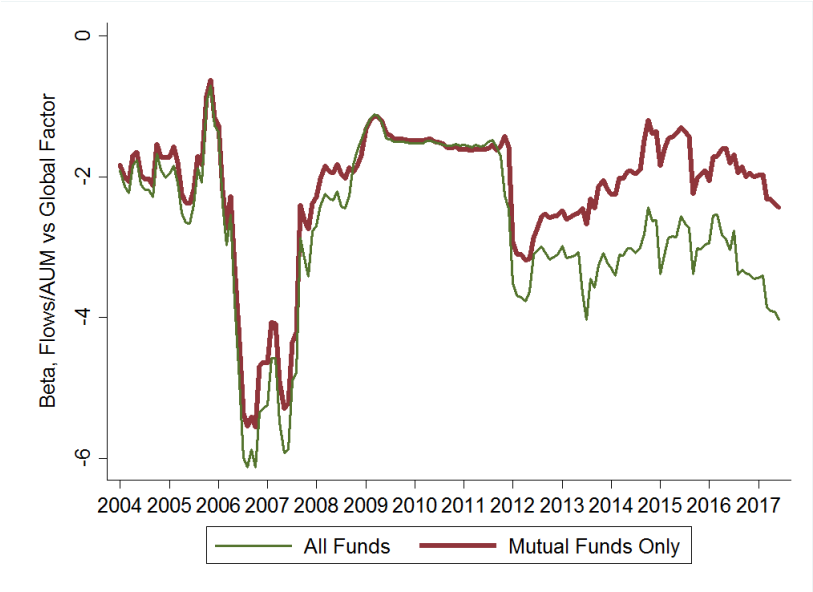
Note: This figure depicts the time evolution of investor flows over initial assets for ETFs and non-ETF funds. Investor Flows are the sum of injections and redemptions at each point in time. AUM are the initial assets under management aggregated at each point in time.

Figure 4: Sensitivity to Global Factors, ETFs vs Mutual Funds



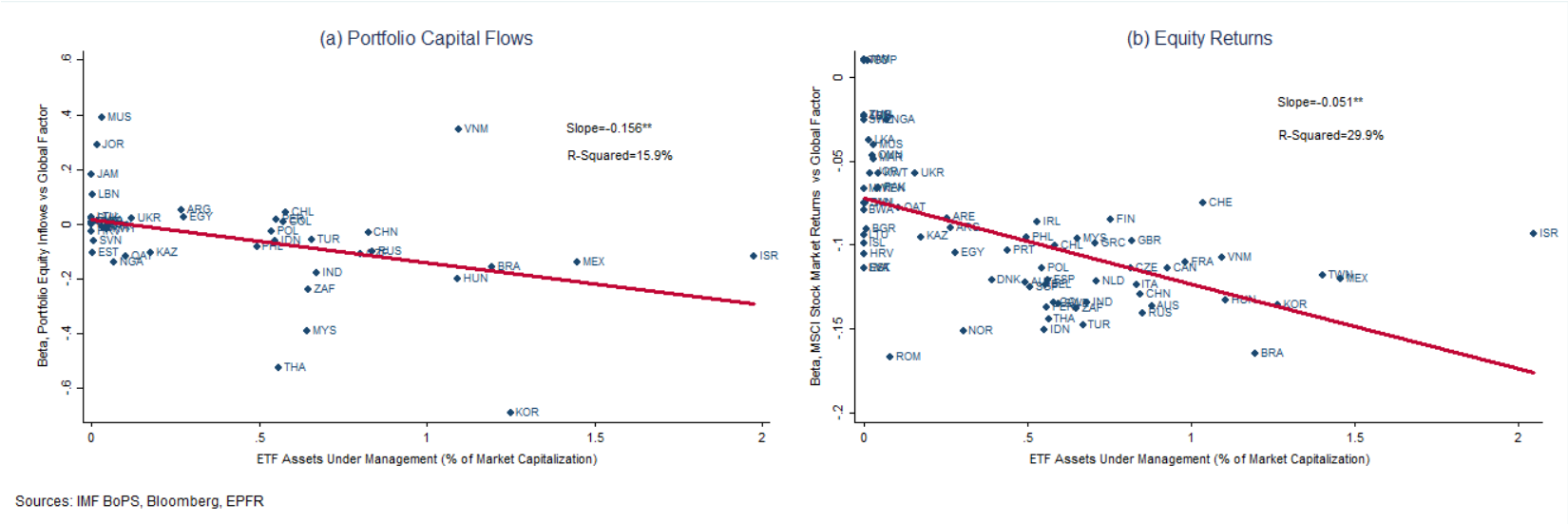
Note: This figure presents the sensitivity of investor flows to global factors for ETF and non-ETF. The beta flows/AUM to Global Factor is the slope of a 36-month rolling regression of the aggregate investor flows over initial assets versus the difference in the St. Louis Financial Stress Index.

Figure 5: Aggregate Sensitivity to Global Factors, All Funds vs ETFs



Note: This figure shows the sensitivity of aggregate investor flows to global factors. The beta flows/AUM to Global Factor is the slope of a 36-month rolling regression of the aggregate investor flows over initial assets versus the difference in the St. Louis Financial Stress Index.

Figure 6: Country Betas and ETF Share of Market Capitalization



Note: This figure depicts the exposure to global factors and the relationship with the presence of ETFs in each emerging country. The left panel shows the coefficient of a regression of Balance of Payments Portfolio Equity Inflows to the difference in the St. Louis Financial Stress Index in the vertical axis. The right panel presents in the vertical axis the coefficient of a regression of MSCI stock market returns for each country to the difference in the St. Louis Financial Stress Index. These regressions are for the period 2010-2017. The horizontal axis for both panels indicates the equity assets held by ETFs in each country divided by the total stock market capitalization. Slope and R-squared refers to the corresponding statistics for the linear fit of the scatter plot.

Table 1: Summary Statistics: Fund Flows over Initial Assets

Panel A: Equity Funds						
	All Sample		Developed Markets		Emerging Markets	
	(1)	(2)	(3)	(4)	(5)	(6)
	ETF	Non-ETF	ETF	Non-ETF	ETF	Non-ETF
Mean	0.85	-0.14	0.93	-0.19	0.64	-0.05
Standard Deviation	9.20	5.97	9.43	5.86	8.54	6.23
p10	-7.07	-4.48	-7.24	-4.38	-6.72	-4.73
p25	-0.77	-1.74	-0.77	-1.71	-0.77	-1.82
Median	0.00	-0.30	0.00	-0.36	0.00	-0.16
p75	2.39	0.98	2.68	0.95	1.45	1.05
p90	10.10	4.48	10.48	4.27	9.03	4.96
Number of Funds	1858	9150	1380	6621	479	2551
Observations	109888	657800	81050	457014	28838	200786
Panel B: Bond Funds						
	All Sample		Developed Markets		Emerging Markets	
	(1)	(2)	(3)	(4)	(5)	(6)
	ETF	Non-ETF	ETF	Non-ETF	ETF	Non-ETF
Mean	1.30	0.02	1.26	-0.05	1.58	0.23
Standard Deviation	9.85	6.45	9.88	6.19	9.70	7.18
p10	-7.14	-5.01	-7.14	-4.84	-7.13	-5.56
p25	-0.53	-1.93	-0.51	-1.88	-0.63	-2.10
Median	0.00	-0.18	0.00	-0.24	0.00	-0.03
p75	3.66	1.43	3.62	1.34	4.15	1.73
p90	11.82	5.50	11.62	5.11	12.85	6.81
Number of Funds	406	3595	353	2738	53	859
Observations	20447	202285	17732	151399	2715	50886

Note: This table reports the summary statistics for fund flows over initial assets (in percentage) for the sample used in the main analysis for the all the sample, developed and emerging market funds. The sample is divided into ETF and non-ETF. Panel A shows statistics for equity funds and Panel B for bond funds. Fund flows over initial assets are winsorized at the 1 and 99 percent level.

Table 2: Developed versus Emerging Markets

Panel A: Equity Funds						
Dependent Variable: Fund Flows over Initial Assets	Developed Markets			Emerging Markets		
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-0.997***	-0.941***		-2.118***	-1.857***	
	(0.198)	(0.158)		(0.344)	(0.305)	
Local Factor	0.058	0.073*		0.170***	0.187***	
	(0.044)	(0.043)		(0.047)	(0.045)	
Global Factor*ETF		-0.485	-0.438		-2.733***	-2.256***
		(0.552)	(0.472)		(0.607)	(0.519)
Local Factor*ETF		-0.097	-0.065		-0.133	0.030
		(0.108)	(0.103)		(0.087)	(0.073)
Fund Performance Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	No	Yes	No	No	Yes
Local Factor ETF		-0.025			0.054	
P-value		0.824			0.584	
Observations	467,681	467,681	467,263	210,392	210,392	209,696
N. of Funds	7,840	7,840	7,840	2,908	2,908	2,899
R^2	0.077	0.077	0.104	0.064	0.064	0.138
Panel B: Bond Funds						
Dependent Variable: Fund Flows over Initial Assets	Developed Markets			Emerging Markets		
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-1.367***	-1.380***		-3.294***	-3.169***	
	(0.258)	(0.253)		(0.475)	(0.460)	
Local Factor	0.158*	0.153		0.099	0.116	
	(0.095)	(0.104)		(0.127)	(0.123)	
Global Factor*ETF		0.242	-0.148		-3.948**	-3.030*
		(0.829)	(0.779)		(1.951)	(1.823)
Local Factor*ETF		0.047	0.261**		-0.352	-0.255
		(0.141)	(0.125)		(0.332)	(0.359)
Fund Performance Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope-Time FE	No	No	Yes	No	No	Yes
Local Factor ETF		0.200			-0.236	
P-value		0.070			0.524	
Observations	142,806	142,806	142,600	50,510	50,510	50,029
N. of Funds	3,046	3,046	3,042	910	910	901
R^2	0.088	0.088	0.115	0.092	0.092	0.177

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects dividing funds into developed and emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Fund Performance Controls indicates whether the regression includes three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 3: Controlling for Domicile-Specific Push Factors

Panel A: Equity Funds				
Dependent Variable: Fund Flows over Initial Assets	(1)	(2)	(3)	(4)
Global Factor	-1.512***	-1.248***		
	(0.319)	(0.271)		
Local Factor	0.176***	0.193***		
	(0.045)	(0.043)		
Stk Mkt at Fund Domicile	5.032***	5.164***	1.573*	
	(1.062)	(1.011)	(0.834)	
Global Factor*ETF		-2.945***	-2.265***	-2.789***
		(0.740)	(0.646)	(0.762)
Local Factor*ETF		-0.136	0.028	0.172*
		(0.086)	(0.073)	(0.098)
Stk Mkt at Fund Domicile*ETF		-2.393	0.078	0.165
		(2.639)	(2.254)	(2.946)
Fund Performance Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	No	Yes	No
Domicile-Inv. Scope*Time FE	No	No	No	Yes
Local Factor ETF		0.057		
P-value		0.563		
Observations	210,194	210,194	209,498	195,690
N. of Funds	2,906	2,906	2,897	2,750
R^2	0.065	0.066	0.138	0.216
Panel B: Bond Funds				
Dependent Variable: Fund Flows over Initial Assets	(1)	(2)	(3)	(4)
Global Factor	-2.577***	-2.391***		
	(0.489)	(0.465)		
Local Factor	0.117	0.137		
	(0.124)	(0.119)		
Stk Mkt at Fund Domicile	5.462***	5.943***	4.173**	
	(2.083)	(2.056)	(1.699)	
Global Factor*ETF		-5.970***	-4.768**	-7.038***
		(2.276)	(2.132)	(2.363)
Local Factor*ETF		-0.374	-0.267	-0.119
		(0.322)	(0.354)	(0.396)
Stk Mkt at Fund Domicile*ETF		-14.464**	-11.459*	-13.875**
		(5.843)	(6.000)	(6.766)
Fund Performance Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	No	Yes	No
Domicile-Inv. Scope*Time FE	No	No	No	Yes
Local Factor ETF		-0.237		
P-value		0.517		
Observations	50,510	50,510	50,029	48,254
N. of Funds	910	910	901	870
R^2	0.093	0.094	0.177	0.226

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Stk Mkt at Fund Domicile is the difference in logs of the MSCI stock market index in the domicile of each fund. Fund Performance Controls indicates whether the regression includes three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 4: ETFs or Large Funds?

Panel A: Equity Funds Dependent Variable: Fund Flows over Initial Assets	Asset threshold for classifying funds as "large"			
	(1) 100M	(2) 100M	(3) 250M	(4) 250M
Global Factor	-1.076***		-1.174***	
	(0.272)		(0.264)	
Global Factor*ETF	-2.802***	-2.411***	-2.705***	-2.341***
	(0.645)	(0.523)	(0.652)	(0.534)
Local Factor	0.192***		0.192***	
	(0.043)		(0.043)	
Local Factor*ETF	-0.134	0.028	-0.134	0.028
	(0.086)	(0.073)	(0.086)	(0.073)
Global Factor*>100M	-0.319*	-0.225		
	(0.183)	(0.189)		
Global Factor*>250M			-0.260	-0.175
			(0.185)	(0.158)
Fund Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope-Time FE	No	Yes	No	Yes
Local Factor ETF	0.058		0.058	
P-value	0.547		0.547	
Observations	210,194	209,498	210,194	209,498
N. of Funds	2,906	2,897	2,906	2,897
R^2	0.066	0.138	0.066	0.138
Panel B: Bond Funds Dependent Variable: Fund Flows over Initial Assets	Asset threshold for classifying funds as "large"			
	(1) US100M	(2) 100M	(3) 250M	(4) 250M
Global Factor	-1.926***		-2.020***	
	(0.443)		(0.467)	
Global Factor*ETF	-4.401**	-3.715*	-4.300**	-3.571*
	(2.030)	(1.905)	(2.013)	(1.915)
Local Factor	0.136		0.135	
	(0.119)		(0.119)	
Local Factor*ETF	-0.372	-0.265	-0.372	-0.264
	(0.331)	(0.360)	(0.331)	(0.360)
Global Factor*>100M	-0.761*	-0.898**		
	(0.398)	(0.399)		
Global Factor*>250M			-0.886***	-0.991***
			(0.328)	(0.296)
Fund Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope-Time FE	No	Yes	No	Yes
Local Factor ETF	-0.237		-0.237	
P-value	0.526		0.526	
Observations	50,510	50,029	50,510	50,029
N. of Funds	910	901	910	901
R^2	0.094	0.177	0.094	0.177

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. >100M (>250M) is a dummy variable that is 1 when the assets under management in a fund at a given point in time are larger than 100 (250) millions USD. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 5: ETFs or Passive Funds?

Dependent Variable: Fund Flows over Initial Assets	Equity Funds		Bond Funds	
	(1)	(2)	(3)	(4)
Global Factor	-1.271***		-2.453***	
	(0.277)		(0.476)	
Global Factor*ETF	-2.608***	-2.274***	-3.877**	-3.116*
	(0.620)	(0.522)	(1.948)	(1.836)
Global Factor*Passive	-0.177	0.082	-3.304	-2.357
	(0.667)	(0.692)	(2.354)	(2.429)
Local Factor	0.194***		0.138	
	(0.043)		(0.119)	
Local Factor*ETF	-0.135	0.030	-0.375	-0.266
	(0.086)	(0.073)	(0.332)	(0.360)
Local Factor*Passive	-0.080	0.075	-0.453*	-0.112
	(0.152)	(0.153)	(0.240)	(0.243)
Fund Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope-Time FE	No	Yes	No	Yes
Local Factor ETF	0.058		-0.237	
P-value	0.547		0.526	
Observations	210,194	209,498	50,510	50,029
N. of Funds	2,906	2,897	910	901
R^2	0.066	0.138	0.093	0.177

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Passive is a dummy variable that is 1 when the fund is passive but not an ETF. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 6: Global/Regional versus Country Funds

Panel A: Equity Funds
Dependent Variable: Fund Flows over Initial Assets

	Global/Regional Funds Only		Country Funds Only		Full Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-1.205***		-1.500***		-1.135***	
	(0.249)		(0.441)		(0.252)	
Global Factor*ETF	-3.019***	-2.640***	-1.996***	-1.872***	-3.018***	-2.655***
	(0.809)	(0.727)	(0.661)	(0.591)	(0.825)	(0.737)
Local Factor	0.167***		0.237***		0.192***	
	(0.053)		(0.044)		(0.043)	
Local Factor*ETF	0.154	0.253**	-0.334***	-0.172**	-0.133	0.029
	(0.142)	(0.124)	(0.082)	(0.077)	(0.085)	(0.073)
Global Factor*Country Fund					-0.496	
					(0.333)	
Global Factor*Country Fund*ETF					1.022	0.824
					(0.831)	(0.854)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes
Local Factor ETF	0.321		-0.097		0.059	
P-value	0.046		0.277		0.541	
Observations	150,851	150,832	59,342	58,666	210,194	209,498
N. of Funds	1,987	1,987	921	912	2,906	2,897
R^2	0.070	0.121	0.056	0.176	0.066	0.138

Panel B: Bond Funds
Dependent Variable: Fund Flows over Initial Assets

	Global/Regional Funds Only		Country Funds Only		Full Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-2.479***		-2.030**		-2.481***	
	(0.499)		(1.024)		(0.488)	
Global Factor*ETF	-4.094*	-3.424*	-1.758	2.562	-4.109*	-3.431*
	(2.156)	(1.963)	(4.169)	(4.189)	(2.157)	(1.972)
Local Factor	0.154		0.016		0.136	
	(0.133)		(0.131)		(0.119)	
Local Factor*ETF	-0.502	-0.291	0.488	0.479	-0.375	-0.262
	(0.384)	(0.360)	(0.411)	(0.954)	(0.332)	(0.358)
Global Factor*Country Fund					0.591	
					(0.874)	
Global Factor*Country Fund*ETF					2.893	6.113
					(5.124)	(4.499)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes
Local Factor ETF	-0.348		0.504		-0.239	
P-value	0.418		0.164		0.521	
Observations	47,060	46,964	3,450	3,065	50,510	50,029
N. of Funds	812	809	98	92	910	901
R^2	0.092	0.167	0.090	0.299	0.093	0.177

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. Global indicates that the estimation is performed only for funds with a global or regional mandate. Country signals that the regression is for country funds only. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Country Fund is a dummy indicating whether a fund is a country fund. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 7: Longer Horizons Estimations

Panel A: Equity Funds				
Dependent Variable: Fund Flows over Initial Assets	Frequency			
	Quarterly		6-Month Periods	
	(1)	(2)	(3)	(4)
Global Factor	-0.853		-0.063	
	(0.601)		(0.974)	
Global Factor*ETF	-5.018***	-4.343***	-7.545**	-5.688**
	(1.726)	(1.470)	(3.077)	(2.726)
Local Factor	0.649***		1.050***	
	(0.107)		(0.219)	
Local Factor*ETF	0.205	0.463**	0.428	0.677
	(0.227)	(0.200)	(0.512)	(0.528)
Fund Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes
Local Factor ETF	0.854		1.478	
P-value	0.001		0.029	
Observations	208,134	200,756	199,787	199,091
N. of Funds	2,906	2,888	2,895	2,885
R^2	0.112	0.203	0.154	0.252
Panel B: Bond Funds				
Dependent Variable: Fund Flows over Initial Assets	Frequency			
	Quarterly		6-Month Periods	
	(1)	(2)	(3)	(4)
Global Factor	-2.004		-2.607	
	(1.275)		(1.794)	
Global Factor*ETF	-12.249***	-9.996***	-19.000***	-14.767***
	(3.262)	(3.373)	(4.518)	(4.097)
Local Factor	0.597**		1.373***	
	(0.299)		(0.454)	
Local Factor*ETF	-0.716	-0.666	-1.913**	-1.345
	(0.648)	(0.702)	(0.879)	(0.856)
Fund Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes
Local Factor ETF	-0.119		-0.540	
P-value	0.883		0.655	
Observations	49,877	49,401	46,881	46,422
N. of Funds	910	901	906	898
R^2	0.150	0.253	0.198	0.302

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Fund flows are cumulative during an horizon of 3 and 6 months and are divided by the initial assets. Panel A shows the results for equity funds and Panel B for bond funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in logs of the variable indicated at the top of each column. ETF is a dummy indicating whether a fund is an ETF or not. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 8: Time Robustness (Excluding the Global Financial Crisis)

Dependent Variable: Investor Flows over Initial Assets	Equity Funds		Bond Funds	
	(1)	(2)	(3)	(4)
Global Factor	-1.746***		-3.480***	
	(0.321)		(0.860)	
Global Factor*ETF	-2.817***	-2.607***	-5.301**	-5.033**
	(0.731)	(0.592)	(2.062)	(2.004)
Local Factor	0.195***		0.091	
	(0.047)		(0.125)	
Local Factor*ETF	-0.147	0.029	-0.247	-0.180
	(0.089)	(0.076)	(0.332)	(0.372)
Fund Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes
Local Factor ETF	0.049		-0.157	
P-value	0.635		0.683	
Observations	194,390	193,744	46,632	46,196
N. of Funds	2,885	2,875	905	898
R^2	0.069	0.139	0.100	0.182

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. All the estimations exclude the months between March 2007 and March 2009. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 9: Controlling for Long-Term Trends in Investor Flows

Dependent Variable: Fund Flows over Initial Assets	Equity		Bond	
	(1)	(2)	(3)	(4)
Global Factor	-1.266***		-2.198***	
	(0.213)		(0.416)	
Global Factor*ETF	-1.699***	-1.652***	-2.625**	-2.240**
	(0.470)	(0.417)	(1.206)	(1.130)
Local Factor	0.044		0.049	
	(0.035)		(0.091)	
Local Factor*ETF	-0.177**	-0.082	-0.237	-0.212
	(0.073)	(0.072)	(0.287)	(0.313)
Fund Performance Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes
Fund Domicile-ETF-Year FE	Yes	Yes	Yes	Yes
Local Factor ETF	-0.133		-0.188	
P-value	0.098		0.571	
Observations	210,189	209,493	50,509	50,028
N. of Funds	2,906	2,897	910	901
R^2	0.091	0.148	0.129	0.190

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 10: Global Factor Robustness - Part 1

Panel A: Equity Funds						
Dependent Variable: Fund Flows over Initial Assets	Global Factor Variable:					
	VIX		TED Spread		US High Yield Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-0.188		-0.961***		-3.806***	
	(0.386)		(0.256)		(1.018)	
Global Factor*ETF	-2.402***	-1.834**	-1.289*	-1.609***	-6.270***	-7.157***
	(0.894)	(0.718)	(0.740)	(0.575)	(2.073)	(1.781)
Local Factor	0.196***		0.188***		0.184***	
	(0.044)		(0.044)		(0.042)	
Local Factor*ETF	-0.167*	0.004	-0.149*	0.010	-0.136*	0.022
	(0.091)	(0.077)	(0.083)	(0.071)	(0.082)	(0.069)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes
Local Factor ETF	0.030		0.039		0.048	
P-value	0.774		0.682		0.601	
Observations	210,194	209,498	210,194	209,498	210,194	209,498
N. of Funds	2,906	2,897	2,906	2,897	2,906	2,897
R^2	0.064	0.138	0.065	0.138	0.067	0.138
Panel B: Bond Funds						
Dependent Variable: Fund Flows over Initial Assets	Global Factor Variable:					
	VIX		TED Spread		US High Yield Spread	
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-2.603***		-1.391**		-7.031***	
	(0.780)		(0.648)		(1.649)	
Global Factor*ETF	-1.173	-1.129	-1.067	-1.803	-10.441***	-10.445***
	(1.625)	(1.469)	(2.311)	(1.977)	(3.972)	(3.307)
Local Factor	0.145		0.131		0.164	
	(0.122)		(0.118)		(0.117)	
Local Factor*ETF	-0.413	-0.280	-0.425	-0.301	-0.331	-0.211
	(0.337)	(0.363)	(0.336)	(0.363)	(0.328)	(0.352)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes
Local Factor ETF	-0.269		-0.295		-0.167	
P-value	0.489		0.440		0.652	
Observations	50,510	50,029	50,510	50,029	50,510	50,029
N. of Funds	910	901	910	901	910	901
R^2	0.091	0.177	0.090	0.177	0.094	0.177

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in logs of the variable indicated at the top of each column. ETF is a dummy indicating whether a fund is an ETF or not. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 11: Global Factor Robustness - Part 2

Panel A: Equity Funds

Dependent Variable: Fund Flows over Initial Assets	Global Factor Variable:					
	PCA1		FFunds Rate		FF Shadow Rate	
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-0.270***		0.291		-0.188	
	(0.056)		(0.459)		(0.386)	
Global Factor*ETF	-0.362***	-0.421***	-4.704***	-2.994**	-2.402***	-1.834**
	(0.099)	(0.088)	(1.553)	(1.350)	(0.894)	(0.718)
Local Factor	0.182***		0.194***		0.196***	
	(0.044)		(0.044)		(0.044)	
Local Factor*ETF	-0.141*	0.016	-0.147*	0.017	-0.167*	0.004
	(0.079)	(0.066)	(0.088)	(0.074)	(0.091)	(0.077)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes
Local Factor ETF	0.041		0.047		0.030	
P-value	0.643		0.644		0.774	
Observations	204,181	203,567	210,194	209,498	210,194	209,498
N. of Funds	2,906	2,897	2,906	2,897	2,906	2,897
R^2	0.069	0.139	0.064	0.138	0.064	0.138

Panel B: Bond Funds

Dependent Variable: Fund Flows over Initial Assets	Global Factor Variable:					
	PCA1		FFunds Rate		FF Shadow Rate	
	(1)	(2)	(3)	(4)	(5)	(6)
Global Factor	-0.479***		1.834		-0.563	
	(0.094)		(1.342)		(1.009)	
Global Factor*ETF	-0.411**	-0.430**	-14.136***	-10.676**	-4.651**	-3.830**
	(0.206)	(0.174)	(5.340)	(4.869)	(1.961)	(1.556)
Local Factor	0.142		0.156		0.149	
	(0.115)		(0.118)		(0.127)	
Local Factor*ETF	-0.368	-0.255	-0.549	-0.398	-0.524	-0.368
	(0.339)	(0.362)	(0.336)	(0.351)	(0.331)	(0.354)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes
Local Factor ETF	-0.226		-0.393		-0.375	
P-value	0.555		0.312		0.328	
Observations	50,510	50,029	50,510	50,029	50,510	50,029
N. of Funds	910	901	910	901	910	901
R^2	0.096	0.177	0.090	0.177	0.090	0.177

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the first principal component of the log differences of the VIX, TED Spread and US high yield spread for the first two columns. For Columns (3)-(6), it is the first difference of the variable indicated at the top of each column. ETF is a dummy indicating whether a fund is an ETF or not. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 12: Local Factors Robustness

Panel A: Equity Funds

Dependent Variable: Fund Flows over Initial Assets

	Aggregation Method:							
	Mean		GDP-Weighted Mean					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Global Factor	-1.295***		-1.267***		-1.206***		-1.181***	
	(0.276)		(0.270)		(0.277)		(0.270)	
Global Factor*ETF	-2.603***	-2.280***	-2.616***	-2.275***	-3.362***	-2.845***	-3.341***	-2.796***
	(0.618)	(0.521)	(0.620)	(0.518)	(0.669)	(0.618)	(0.685)	(0.622)
IP Growth	0.125***		0.256***				0.236***	
	(0.031)		(0.045)				(0.046)	
IP Growth*ETF	-0.051	0.045	-0.125	0.086			-0.080	0.108
	(0.068)	(0.061)	(0.102)	(0.090)			(0.122)	(0.118)
Expected Short-Term Interest Rate					-0.204***		-0.203***	
					(0.055)		(0.053)	
Expected Short Rate*ETF					0.062	-0.225*	0.070	-0.224
					(0.127)	(0.131)	(0.137)	(0.138)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes	No	Yes
IP Growth ETF	0.074		0.130				0.156	
P-value	0.341		0.237				0.237	
Short Rate ETF					-0.142		-0.133	
P-value							0.385	
Observations	210,194	209,498	210,194	209,498	170,490	170,326	168,327	168,164
N. of Funds	2,906	2,897	2,906	2,897	2,394	2,391	2,392	2,389
R^2	0.066	0.138	0.066	0.138	0.071	0.133	0.073	0.132

Panel B: Bond Funds

Dependent Variable: Fund Flows over Initial Assets

	Aggregation Method:							
	Mean		GDP-Weighted Mean					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Global Factor	-2.481***		-2.432***		-2.464***		-2.419***	
	(0.477)		(0.474)		(0.499)		(0.492)	
Global Factor*ETF	-3.848**	-3.086*	-3.936**	-3.127*	-4.283**	-3.740**	-4.322**	-3.776**
	(1.936)	(1.828)	(1.951)	(1.843)	(1.978)	(1.833)	(1.988)	(1.852)
IP Growth	0.089		0.249*				0.240*	
	(0.080)		(0.137)				(0.139)	
IP Growth*ETF	-0.244	-0.192	-0.120	-0.075			-0.122	-0.030
	(0.237)	(0.248)	(0.416)	(0.465)			(0.437)	(0.479)
Expected Short-Term Interest Rate					-0.270***		-0.249**	
					(0.100)		(0.104)	
Expected Short Rate*ETF					0.950	1.304*	0.982	1.354*
					(0.906)	(0.764)	(0.909)	(0.773)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope*Time FE	No	Yes	No	Yes	No	Yes	No	Yes
IP Growth ETF	-0.155		0.130				0.118	
P-value	0.586		0.771				0.802	
Short Rate ETF					0.680		0.734	
P-value					0.471		0.439	
Observations	50,510	50,029	50,510	50,029	49,056	48,777	48,721	48,456
N. of Funds	910	901	910	901	871	864	871	864
R^2	0.093	0.177	0.094	0.177	0.094	0.174	0.094	0.173

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Panel A shows the results for equity funds and Panel B for bond funds. As indicated above the columns, IP Growth the either the mean (columns (1) and (2)) or GDP-weighted monthly industrial production growth for the investment scope of each fund (columns (3)-(8)). Expected Short Rate is the GDP-weighted average of the Consensus forecast for rates in each country in the fund's investment scope. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Fund Controls indicates whether the regression includes fund control variables. These variables are the three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level and the difference in logs of the MSCI stock market index in the domicile of each fund. IP Growth ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Short Rate ETF and it's p-value are defined analogously. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 13: ETF share and the Sensitivity of Aggregate Equity Flows and Returns

Panel A:
Dependent Variable: Balance of Payments Portfolio Equity Inflows (% of GDP)

	(1)	(2)	(3)	(4)	(5)
Global Factor	-0.332**	-0.091		-0.121	
	(0.137)	(0.189)		(0.167)	
Global Factor*ETF Share		-0.676***	-0.662***	-0.722***	-0.711***
		(0.184)	(0.222)	(0.233)	(0.258)
ETF Share		-0.116	-0.035	-0.116	0.032
		(0.084)	(0.089)	(0.084)	(0.095)
Global Factor*Mutual Funds Share				0.021	0.022
				(0.039)	(0.046)
Mutual Fund Share				0.008	-0.058
				(0.031)	(0.035)
Country FE	Yes	Yes	No	Yes	No
Time FE	No	No	Yes	No	Yes
Observations	1,922	1,922	1,920	1,922	1,920
N. of Countries	40	40	40	40	40
R^2	0.180	0.183	0.040	0.183	0.042

Panel B:
Dependent Variable: MSCI Country Stock Markets Returns

	(1)	(2)	(3)	(4)	(5)
Global Factor	-0.118***	-0.106***		-0.104***	
	(0.015)	(0.017)		(0.018)	
Global Factor*ETF Share		-0.042***	-0.038***	-0.039***	-0.034***
		(0.010)	(0.007)	(0.011)	(0.007)
ETF Share		-0.007**	0.000	-0.007**	-0.001
		(0.003)	(0.001)	(0.003)	(0.001)
Global Factor*Mutual Funds Share				-0.002	-0.002
				(0.002)	(0.002)
Mutual Fund Share				0.001	0.001
				(0.001)	(0.001)
Country FE	Yes	Yes	No	Yes	No
Time FE	No	No	Yes	No	Yes
Observations	7,755	7,755	7,751	7,755	7,751
N. of Countries	49	49	49	49	49
R^2	0.181	0.188	0.413	0.189	0.413

Note: This table reports the OLS coefficients from a regression of Balance of Payments Portfolio Equity Liability Flows over GDP (Panel A) or MSCI Country Stock Market Returns (Panel B) on different explanatory variables and different sets of fixed effects for emerging markets at the quarterly frequency. Global Factor is the difference in the St. Louis Financial Stress Index. ETF Share is the assets under management of equity ETFs divided by the total equity market capitalization. Non-ETF Share is the assets under management of equity of funds that are not ETFs divided by the total equity market capitalization. MSCI EM is a variable that is 0 when a country is a frontier markets or standalone market under, 1 when it is an emerging market, and 2 when it is a developed market under MSCI classification scheme. All the estimations are for the period 2000-2017. Panel A estimations are at the quarterly frequency and Panel B at the monthly frequency. The dependent variable is winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table 14: ETF share and the Sensitivity of Aggregate Equity Flows and Returns, Robustness

Panel A:
Dependent Variable: Balance of Payments Portfolio Equity Inflows (% of GDP)

	(1)	(2)	(3)	(4)	(5)
Global Factor	-0.035	-0.113		0.092	
	(0.240)	(0.192)		(0.237)	
Global Factor*MSCI EM	-0.473**				
	(0.229)				
MSCI EM	0.112				
	(0.212)				
Global Factor*ETF Share (excl. Country Funds)		-0.952***	-1.008***	-0.245	-0.171
		(0.236)	(0.207)	(0.190)	(0.240)
ETF Share (excl. Country Funds)		-0.243*	-0.304*	-0.235*	0.072
		(0.132)	(0.164)	(0.124)	(0.160)
Global Factor*MF Share (excl. Country Funds)				-0.249***	-0.264***
				(0.084)	(0.089)
Mutual Fund Share (excl. Country Funds)					-0.132***
					(0.042)
Country FE	Yes	Yes	No	Yes	No
Time FE	No	No	Yes	No	Yes
Observations	1,922	1,922	1,920	1,922	1,920
N. of Countries	40	40	40	40	40
R^2	0.181	0.182	0.041	0.184	0.046

Panel B:
Dependent Variable: MSCI Country Stock Markets Returns

	(1)	(2)	(3)	(4)	(5)
Global Factor	-0.105***	-0.103***		-0.094***	
	(0.019)	(0.017)		(0.017)	
Global Factor*MSCI EM	-0.025**				
	(0.012)				
MSCI EM	0.000				
	(0.005)				
Global Factor*ETF Share (excl. Country Funds)		-0.084***	-0.080***	-0.044*	-0.038**
		(0.017)	(0.014)	(0.023)	(0.015)
ETF Share (excl. Country Funds)		-0.016**	-0.001	-0.016**	-0.005
		(0.008)	(0.002)	(0.007)	(0.003)
Global Factor*MF Share (excl. Country Funds)				-0.013***	-0.012***
				(0.005)	(0.004)
Mutual Fund Share (excl. Country Funds)				0.004**	0.001*
				(0.002)	(0.001)
Country FE	Yes	Yes	No	Yes	No
Time FE	No	No	Yes	No	Yes
Observations	7,755	7,755	7,751	7,755	7,751
N. of Countries	49	49	49	49	49
R^2	0.183	0.190	0.415	0.194	0.417

Note: This table reports the OLS coefficients from a regression of Balance of Payments Portfolio Equity Liability Flows over GDP (Panel A) or MSCI Country Stock Market Returns (Panel B) on different explanatory variables and different sets of fixed effects for emerging markets at the quarterly frequency. Global Factor is the difference in the St. Louis Financial Stress Index. ETF Share is the assets under management of equity ETFs divided by the total equity market capitalization. Non-ETF Share is the assets under management of equity of funds that are not ETFs divided by the total equity market capitalization. ETF and Non-ETF Share are computed by using only global or regional funds (i.e. excluding country funds). All the estimations are for the period 2000-2017. Panel A estimations are at the quarterly frequency and Panel B at the monthly frequency. The dependent variable is winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Appendix

Table A1: Variable Definition and Source

Variable	Definition	Source
F_{it}	Injections/Redemptions to fund i at time t in US dollars	EPFR
A_{it}	Assets under management to fund i at time t in US dollars	EPFR
Fund Performance	Portfolio return of each fund minus the average return at the investment scope level	EPFR
STLFSI	St. Louis Financial Stress Index	FRED
VIX	Chicago Board Options Exchange Market Volatility Index	FRED
US HY	Effective yield of the Bank of America Merrill Lynch US High Yield Master II Index	FRED
TED Rate	Spread between 3-month LIBOR and 3-month Treasury Bill	FRED
PCA1	Principal Component of the monthly growth (in logs) of VIX, US HY and TED Rate	Own
FF Rate	Effective Federal Funds Rate	FRED
FF Shadow Rate	Wu-Xia Federal Funds Rate	Atlanta Fed
Median IP Growth	Median of the Monthly Industrial Production Growth at the Investment Scope Level	IMF IFS
Mean IP Growth	Mean of the Monthly Industrial Production Growth at the Investment Scope Level	IMF IFS
GDP Weighted IP Growth	GDP weighted Monthly Industrial Production Growth at the Investment Scope Level	IMF IFS
Stk Mkt at Domicile	Monthly Growth of the MSCI Stock Market Index at the Domicile of the Fund	MSCI

Table A2: Summary Statistics: Global Factors

Summary Statistics Global Variables						
	(1)	(2)	(3)	(4)	(5)	(6)
	St. Louis FSI	VIX	TED Rate	US HY	FF Rate	FF Shadow Rate
Mean	-0.01	-0.00	-0.00	0.00	-0.02	-0.02
Standard Deviation	0.26	0.16	0.22	0.09	0.17	0.20
p10	-0.22	-0.18	-0.29	-0.09	-0.21	-0.25
p25	-0.12	-0.09	-0.14	-0.06	-0.02	-0.08
Median	-0.02	-0.01	-0.00	-0.01	0.00	0.00
p75	0.07	0.07	0.14	0.04	0.02	0.09
p90	0.18	0.18	0.25	0.11	0.15	0.20
Observations	248	248	248	248	248	248

Note: This table reports the summary statistics for the variables used as global factors. The St. Louis FSI, the FF Rate and the FF Shadow Rate are in differences. The VIX, TED Rate, US HY are in differences of logs.

Table A3: Summary Statistics: Local Factors

Industrial Production Growth in Investment Scope									
	All Sample			Developed Markets			Emerging Markets		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Median	Mean	GDP Weighted	Median	Mean	GDP Weighted	Median	Mean	GDP Weighted
mean	0.18	0.18	0.19	0.05	0.05	0.05	0.27	0.26	0.28
sd	2.61	2.63	2.60	2.44	2.46	2.42	2.71	2.74	2.72
p10	-2.23	-2.27	-2.22	-2.22	-2.22	-2.20	-2.25	-2.30	-2.25
p25	-0.76	-0.81	-0.72	-0.81	-0.84	-0.77	-0.72	-0.79	-0.69
p50	0.25	0.25	0.26	0.10	0.10	0.10	0.37	0.35	0.38
p75	1.19	1.24	1.17	0.93	0.98	0.91	1.32	1.38	1.32
p90	2.45	2.50	2.46	2.21	2.25	2.15	2.59	2.65	2.63
N	9424	9424	9424	3699	3699	3699	5725	5725	5725

Note: This table reports the summary statistics for the variables used as local factors. Median, mean and GDP weighted indicates how the monthly growth in industrial production was aggregated at the investment scope level. All the variables are in percentages.

Table A4: Funds by Investment Scope

Panel A: Developed Markets	Equity Funds		Bond Funds	
	(1) Observations	(2) Funds	(3) Observations	(4) Funds
Europe	84007	1221	17180	355
Europe ex-UK	45518	697	39421	847
Global	189738	2928	82413	1397
Global ex-US	67734	868	3820	54
Japan	35554	515	496	9
Pacific	13223	185	148	5
United States	65646	1089	16032	306
Other	36644	530	9621	219
Total	538064	7999	169131	3091
Panel B: Emerging Markets	Equity Funds		Bond Funds	
	(1) Observations	(2) Funds	(3) Observations	(4) Funds
Asia ex-Japan	51377	648	5395	110
China	16299	275	1212	31
Emerging Europe	15610	162	2024	26
Global Emerging Markets	68527	924	40469	652
Greater China	12641	123	68	2
India	10072	156	308	9
Latin America	12691	145	1291	21
Other	42407	617	2834	66
Total	229624	3029	53601	912

Note: This table shows the statistics for the investment scope of the funds. Panel A reports the developed market funds, and Panel B the emerging market funds. Other is a residual category indicating all other domiciles.

Table A5: Funds by Domicile

Panel A: Number of Funds

	Equity Funds			Bond Funds		
	(1) All Sample	(2) DM	(3) EM	(4) All Sample	(5) DM	(6) EM
Canada	522	455	67	78	70	8
France	714	607	109	267	256	11
Germany	296	280	16	118	113	5
Ireland	1188	852	339	440	349	92
Japan	245	125	120	166	91	75
Luxembourg	3303	2366	944	1752	1327	425
Switzerland	270	222	49	181	173	8
United Kingdom	733	521	215	131	118	13
United States	2347	1764	589	474	311	163
Other	1409	827	583	399	286	114
Total	11005	7999	3029	4001	3091	912

Panel B: Number of Observations

	Equity Funds			Bond Funds		
	(1) All Sample	(2) DM	(3) EM	(4) All Sample	(5) DM	(6) EM
Canada	36028	29972	6056	4144	3767	377
France	47004	39530	7474	13647	13033	614
Germany	21715	20496	1219	5952	5639	313
Ireland	73366	48846	24520	26658	20735	5923
Japan	10374	5451	4923	7241	3968	3273
Luxembourg	235145	161760	73385	94549	69651	24898
Switzerland	18518	14610	3908	9250	9096	154
United Kingdom	57137	37372	19765	9302	8293	1009
United States	182008	132528	49480	32289	21478	10811
Other	86393	47499	38894	19700	13471	6229
Total	767688	538064	229624	222732	169131	53601

Note: This table shows the statistics for the domicile of the funds. Panel A reports the number of funds, and Panel B the number of observations in the sample for each domicile. Funds are divided into developed or emerging market funds. Other is a residual category indicating all other domiciles.

Table A6: Summary Statistics: Assets Under Management

Panel A: Equity Funds

	All Sample		Developed Markets		Emerging Markets	
	(1)	(2)	(3)	(4)	(5)	(6)
	ETF	Non-ETF	ETF	Non-ETF	ETF	Non-ETF
Mean	609.40	714.52	569.05	825.99	722.62	460.95
Standard Deviation	2782.76	3649.96	2475.34	4270.73	3501.88	1430.28
p10	12.91	20.00	13.41	23.14	11.72	15.56
p25	27.56	49.32	29.24	57.09	23.27	36.42
Median	86.78	151.16	90.40	171.55	76.68	112.37
p75	315.93	462.10	321.36	518.28	303.65	349.00
p90	1031.81	1296.78	1020.59	1458.55	1065.87	976.13
Number of Funds	1858	9150	1380	6621	479	2551
Observations	110435	658470	81422	457385	29013	201085

Panel B: Bond Funds

	All Sample		Developed Markets		Emerging Markets	
	(1)	(2)	(3)	(4)	(5)	(6)
	ETF	Non-ETF	ETF	Non-ETF	ETF	Non-ETF
Mean	489.09	784.45	457.45	878.80	694.65	504.17
Standard Deviation	1105.49	2356.44	1055.87	2655.26	1367.77	999.38
p10	13.67	28.71	13.60	33.70	14.30	20.25
p25	32.95	76.11	32.85	87.57	34.69	50.83
Median	123.22	221.78	125.90	248.70	105.40	156.59
p75	443.83	670.71	430.55	752.21	569.13	456.71
p90	1273.78	1736.33	1181.92	1877.18	2397.69	1262.66
Number of Funds	406	3595	353	2738	53	859
Observations	20573	202587	17829	151567	2744	51020

Note: This table reports the summary statistics for the assets under management (in millions USD) for the sample used in the main analysis for the all the sample, developed and emerging market funds. The sample is divided into ETF and non-ETF. Panel A shows statistics for equity funds and Panel B for bond funds.

Table A7: Developed Markets - Additional Tests

Developed Market Funds						
	Fund Flows over Initial Assets					
	(1) Equity	(2) Equity	(3) Equity	(4) Bond	(5) Bond	(6) Bond
Local Factor	0.017	0.026		0.179**	0.187**	
	(0.032)	(0.030)		(0.074)	(0.080)	
Global Factor	-1.112***	-0.968***		-1.315***	-1.208***	
	(0.172)	(0.145)		(0.319)	(0.312)	
Local Factor*ETF		-0.055	-0.028		-0.116	0.023
		(0.084)	(0.082)		(0.232)	(0.229)
Global Factor*ETF		-1.065**	-0.967**		-1.762**	-1.914**
		(0.496)	(0.473)		(0.884)	(0.813)
Fund Performance Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Investment Scope-Time FE	No	No	Yes	No	No	Yes
Local Factor ETF		-0.029			0.071	
P-value		0.745			0.727	
Observations	818356	818356	818049	287285	287285	287074
N. of Funds	13107	13107	13107	5387	5387	5382
R^2	0.088	0.088	0.108	0.114	0.114	0.138

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for developed market funds. Coefficients were estimated using data that included domestic funds but excluded funds investing exclusively in Japanese, German, or U.S. government bonds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in the St. Louis Financial Stress Index. ETF is a dummy indicating whether a fund is an ETF or not. Fund Performance Controls indicates whether the regression includes three lags of the portfolio returns of the fund minus the average fund returns at the investment scope level. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. The estimations for bond funds do not have funds investing in government debt of safe heaven countries (Germany, Japan, United States). The estimations do not contain the heighten of the global financial crisis (August 2007, September and October 2008) and contain both domestic and international mutual funds. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.

Table A8: Lagged Performance Coefficients

With Lagged Performance Controls				
	Fund Flows over Initial Assets			
	(1) Equity	(2) Equity	(3) Bond	(4) Bond
Lagged (1) Fund Performance	11.941***	9.072***	-10.187***	19.799***
	(1.631)	(1.351)	(3.413)	(3.186)
Lagged (2) Fund Performance	7.729***	6.925***	-3.959	13.096***
	(1.048)	(0.951)	(3.344)	(3.472)
Lagged (3) Fund Performance	5.788***	5.158***	-1.975	11.361***
	(1.111)	(1.065)	(2.611)	(2.498)
Local Factor	0.187***		0.116	
	(0.045)		(0.123)	
Local Factor*ETF	-0.133	0.030	-0.352	-0.255
	(0.087)	(0.073)	(0.332)	(0.359)
Global Factor	-1.857***		-3.169***	
	(0.305)		(0.460)	
Global Factor*ETF	-2.733***	-2.256***	-3.948**	-3.030*
	(0.607)	(0.519)	(1.951)	(1.823)
Fund FE	Yes	Yes	Yes	Yes
Investment Scope-Time FE	No	Yes	No	Yes
Local Factor ETF	0.054		-0.236	
P-value	0.584		0.524	
Observations	210392	209696	50510	50029
N. of Funds	2908	2899	910	901
R^2	0.064	0.138	0.092	0.177

Note: This table reports the OLS coefficients from a regression of fund flows over initial assets on different explanatory variables and different sets of fixed effects for emerging market funds. Local Factor is the median monthly industrial production growth for the investment scope of each fund. Global Factor is the difference in logs of the variable indicated at the top of each column. ETF is a dummy indicating whether a fund is an ETF or not. Lagged (n) Fund Performance is the nth lag of the portfolio returns of the fund minus the average fund returns at the investment scope level. Local Factor ETF indicates the sum of the coefficients for Local Factors and Local Factors*ETF. P-value shows the significance test for Local Factor ETF = 0. Fund flows over initial assets are winsorized at the 1 and 99 percent level. Driscoll-Kraay robust standard errors in parenthesis. *** p< 0.01, ** p< 0.05, *p< 0.10.