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THE ROLE OF NON-BANK FINANCIAL INSTITUTIONS IN THE INTERMEDIATION OF CAPITAL FLOWS TO EMERGING MARKETS

by Alessandro Moro* and Alessandro Schiavone*

Abstract

This paper compares the behaviour of banks with that of non-bank financial institutions (NBFIs) in the intermediation of portfolio flows to emerging market economies (EMEs). Our analysis shows that investment funds, a key component of NBFIs, tend to reduce their exposure to EMEs more than banks during periods of financial turmoil, such as the Covid-19 pandemic. Moreover, passive funds and exchange-traded funds (ETFs) are more responsive to global shocks than active funds. Global funds show a lower elasticity to financial volatility than regional funds, while the behaviours of institutional and retail funds are quite similar. Regarding the currency composition of portfolio investments in EMEs, investment funds cut their assets denominated in USD in response to global shocks more than those in other currencies. Finally, the portfolio inflows to EMEs with a higher share of portfolio liabilities held by investment funds rather than by banks and other financial intermediaries tend to be more sensitive to the global financial cycle.

JEL Classification: F32, F36, G11, G15, G23.
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Contents

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1. Introduction[1]

Since the global financial crisis (GFC), the role of banks in the intermediation of capital flows towards emerging market economies (EMEs) has declined whereas that of non-bank financial intermediaries has grown substantially. The non-bank financial sector includes different kinds of intermediaries, such as pension funds, insurance companies, money market funds, investment funds. In this paper we focus on the latter, which account for the bulk of the portfolio flows to emerging economies.[2]

Post-GFC reforms contributed to deleveraging by banks, who scaled down non-core assets, such as international claims and EMEs securities, in their balance sheet. By contrast, the low-yield environment prompted international investors to increase their exposure to higher-risk assets, including EMEs securities, through investment funds, whose assets have almost tripled since 2008.

The share of emerging economies' external debt represented by portfolio liabilities has risen significantly, reflecting increased reliance on market-based finance. The growing share of portfolio investments intermediated by mutual funds represents a global trend, even though it is more pronounced for emerging economies (FSB, 2020). This transformation has several implications for borrowing countries: on one hand, a greater diversification of funding sources should reduce costs and liquidity risks; on the other hand, the rising role of investment funds has been associated with more volatile capital flows. The Covid-19 crisis, when global financial conditions deteriorated abruptly, highlighted the destabilising role of investment funds for emerging economies. Asset sales by investment funds were the main driver behind the sudden stop EMEs underwent during the first quarter of 2020 (Eguren Martin et al., 2020). Along these lines, our paper finds evidence that in the period 2014-2020, the reliance of emerging economies on investment funds increased the sensitivity of portfolio inflows to global shocks. While the role of investment funds in causing a sudden stop for EMEs was apparent during the pandemic crisis, our study generalizes this outcome for an extended period by comparing the behaviour of investment funds to that of other financial intermediaries. We find that the sensitivity to global shocks for investment funds is significantly higher in comparison to banks, insurance companies and pension funds.

From a theoretical perspective, investment funds may amplify global shocks through two main channels. First, as end-investors tend to evaluate the performance of funds in which they invest relative to benchmarks, fund managers are prone to herd behaviour (Scharfstein et al., 1990); incentive problems created by delegated management may also increase contagion risks (Broner et al., 2006) and enhance the pro-cyclicality of portfolio flows (Feroli et al., 2014). Second, since end-investors may easily redeem their shares in open-end funds, price movements of fund shares may cause first-mover advantage, increasing the probability of liquidity runs like for banks but without deposit guarantee schemes; therefore, in presence of strong redemption pressures, fund managers may be forced to make fire sales (Morris et al., 2017).

Our study draws on a vast empirical literature analysing the footprint of investment funds in EMEs. While we make use of aggregate data to compare the behaviour of different financial intermediaries, several works use micro data focusing exclusively on investment funds. In this regard, Jotikasthira et al. (2012) find that the higher the share of investment funds in local markets the more sensitive financial conditions in EMEs are to shocks in advanced economies. Shek et al. (2018) argue that, during periods of market turbulence, asset

[1] The views expressed in the paper are those of the authors and do not involve the responsibility of the Bank of Italy. We thank Francesco Paternò, Antonio Di Cesare and two anonymous referees for very helpful comments and suggestions.

[2] In this paper, we use the definition of investment funds to refer to long-term funds and exchange-traded funds (ETFs). Note that definitions about investment funds vary across countries. In the United States, regulated funds include open-end funds—mutual funds and ETFs—as well as unit investment trusts and closed-end funds. The category of mutual funds includes both long-term funds (equity, bond, and mixed/other) and money market funds. In Europe, regulated funds include Undertakings for Collective Investment in Transferable Securities (UCITS)—ETFs, money market funds, and other categories of similarly regulated funds—and alternative investment funds, commonly known as AIFs (ICI, 2021).

managers of open-end mutual funds investing in EMEs bonds tend to amplify asset sales coming from end investors' redemptions. Furthermore, since fund investors tend to consider EMEs securities as a single and homogenous (risky) asset class without differentiating according to country fundamentals, redemption pressures are particularly severe for passive funds, whose investment strategies track market indices (Arslanalp and Tsuda, 2015). The increased popularity of benchmark-driven investment funds, including exchange-traded funds (ETFs), may increase similarity in the behaviours of asset managers, raising the potential for one-sided markets and large price fluctuations in EMEs (Miyajima and Shim, 2014). Converse et al. (2020) find that investors' flows to EME-dedicated ETFs are more sensitive to global financial conditions than EMEs mutual funds and that the larger the penetration of ETFs in local markets the more aggregate portfolio flows to emerging markets are sensitive to global economic conditions. Our analysis builds on these results as we find evidence that the reliance on investment funds, in particular those benchmark-driven, makes EMEs more vulnerable to global shocks. In this regard, our paper relates also to another strand of the literature, which studies the determinants of aggregate capital flows focusing on the distinction between push and pull factors (Forbes and Warnock, 2012; Koepke, 2019). According to Carney (2019), in order to understand better these determinants, it is necessary to account also for 'pipe factors', namely those aspects of the international financial system that interact with push and pull factors, such as the typologies and characteristics of global investors. Our analysis indeed suggests that the rise of mutual funds amplifies the sensitivity of EMEs capital flows to global shocks.

We contribute to the existing literature on the role of non-bank financial intermediaries in the intermediation of portfolio flows to EMEs in several ways. First, we use semi-annual IMF coordinated portfolio investment survey (CPIS) data to illustrate the rise of marked-based finance for EMEs and highlight the increasing role of investment funds. Then, in line with Raddatz and Schmukler (2012), we regress portfolio country shares on a set of push and pull factors separately for investment funds, banks, insurance companies and pension funds. This approach allows us to focus on the portfolio rebalancing mechanism embedded in the financial intermediation of capital flows to emerging economies. Since CPIS data cover almost entirely global portfolio stocks broken down by holding sector and recipient economy, we are able to analyse the determinants of global portfolio investments in EMEs separately for each category of investors. We show that global factors play a crucial role in portfolio rebalancing mechanism across the board, while the impact of domestic variables is more limited. To our knowledge, this paper is the first attempt to study differences across investor types as regards portfolio investments in EMEs. In this respect, we find that in response to global shocks investment funds reduce their exposure to EMEs significantly more than banks, insurance companies and pension funds. However, given the low-frequency of CPIS data, we check the robustness of the previous result by repeating the regression analysis at a quarterly frequency using two distinct sources: Emerging Portfolio Fund Research (EPFR) data for investment funds and BIS locational banking statistics (LBS) for banks. The comparison between the coefficients of global factors confirms again that, in response to global shocks, investment funds tend to cut their exposure in EMEs significantly more than banks. Moreover, results obtained using EPFR data are consistent with those elicited with CPIS data, accounting for the different frequency.

Second, we exploit the EPFR database to analyse the behaviour of different types of investment funds (passive vs. active, specialised vs. global, retail vs. institutional) and investigate the role of US dollar funding for EMEs. As regards asymmetries across fund types, we find that ETFs as well as passive funds rebalance their portfolios substantially, reducing EMEs shares more than active ones (like Converse et al., 2020). Global funds and global emerging markets (GEM) funds show a lower elasticity to financial volatility and are less sensitive to push factors, in line with the results in Brandao-Marques et al. (2015) and against Jotikasthira et al. (2012) and Cerutti et al. (2019). With reference to US dollar funding, we show that in response to global shocks, investment funds tend to reduce relatively more aggressively the share of their portfolio invested in USD-denominated assets as compared to the one invested in assets denominated in other currencies; this topic is currently at the attention of the FSB (see the FSB Chair's letter to G20 FMCBG February 2022).

Finally, we use CPIS information to compute a new measure of investment funds' penetration in EMEs; in line with Converse et al. (2020) and Cerutti (2019), we provide strong evidence that the higher the investment funds' share in their portfolio liabilities, the more sensitive to global factors portfolio inflows to these countries are.

Overall, our study suggests that investment funds may play a destabilising role for emerging economies, enhancing the volatility of capital inflows in response to global shocks. The comparison to other intermediaries, such as banks and institutional investors, indicates that investment funds are relatively more volatile. This finding highlights the need for a macro-prudential approach to the regulation of investment funds, which so far has been mainly inspired to investor protection considerations. In order to address the destabilising role of investment funds, reforms should be adopted to mitigate the risks associated with redemption pressures, pro-cyclicality and herding behaviour.

The rest of the paper is organized as follows: in Section 2 we describe the main data sources used in the paper and illustrate stylised facts about the rise of marked-based financing and the ascending role of investment funds. Section 3 presents our econometric strategy based on portfolio country shares and the framework developed by Raddatz and Schmucker (2012) and illustrates our main results. In Section 4 we extend our analysis to balance of payments data on portfolio inflows following the approach proposed by Converse et al. (2020). Both methodologies support the view that investment funds are more reactive to the fluctuations of the global financial cycle, reducing their exposure to EMEs during periods of financial distress. Section 5 concludes.

2. Data and stylised facts

This section describes the main features of portfolio investments in EMEs from the perspective of asset holders. The rise of market-based finance for EMEs is often associated with the increasing role of NBFIs and the retrenchment of global banks, induced by financial reforms adopted in the aftermath of the global financial crisis. While Balance of payments (BOP) statistics allow to ascertain the rising contribution of portfolio inflows to EMEs external financing, information on the assets held by non-bank financial entities is more fragmented. To overcome this limitation in available data, in this section we combine evidence from different statistical sources, namely BOP and CPIS. We show that after the global financial crisis the share of EMEs portfolio liabilities rose significantly and that these economies became increasingly relying on non-bank financial intermediaries, in particular investment funds. Moreover, in order to qualify better the role of these intermediaries, we use EPFR data, which contain information on portfolio country shares distinguishing across the main types of investment funds.

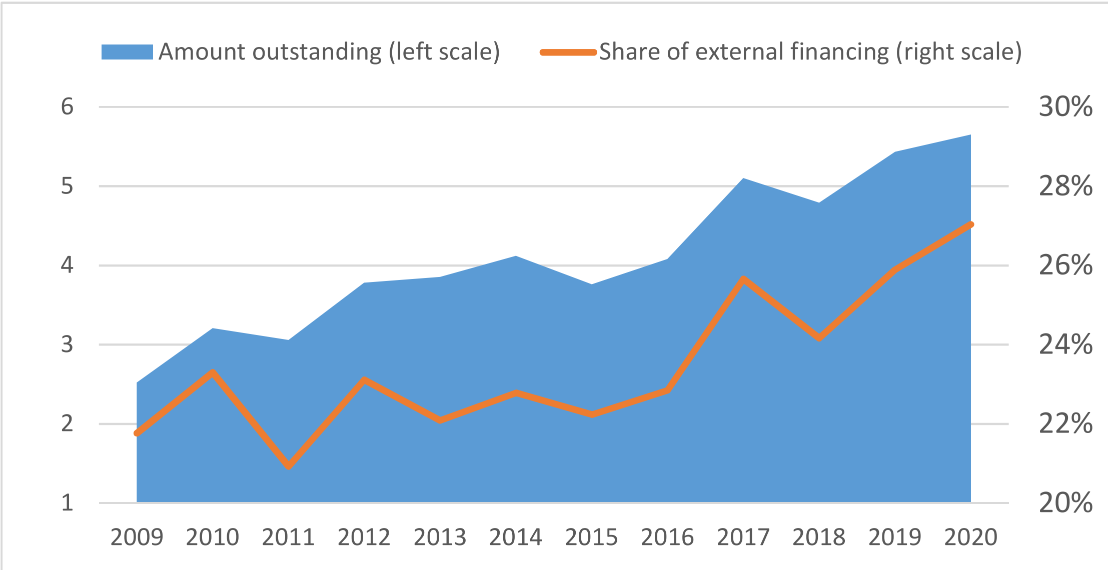
BOP statistics are the most comprehensive data source for capital flows. Trends in portfolio liabilities (as a share of total external debt) show the rise of market-based finance for EMEs. After the global financial crisis, the share of EMEs' external financing represented by portfolio liabilities increased on average from 21 to 27 per cent (Fig. 1).

However, as mentioned above, BOP data do not report the holding sector from the perspective of borrowing countries, and hence they do not allow analysing the role of NBFIs in EMEs external financing. To fill this gap, we use the CPIS database, which provides information about portfolio liabilities by holding sector.[3] Reporting countries represent 98 per cent of global portfolio investments, which makes this dataset unique in terms of statistical coverage and consistency with other macroeconomic statistics. Since sector classification changed in 2013, prior data cannot be used to analyse the role of specific intermediaries. One further limitation of CPIS data is that not all countries provide portfolio assets by sector; as a result, a relevant fraction of implied portfolio liabilities (around 20 per cent at global level) cannot be allocated by holding sector. Since US started

[3] CPIS is a survey conducted by the IMF on portfolio assets held worldwide, broken down by destination country and holding sector. Since 2013, data are reported for the following sectors: banks, money market funds (MMFs), insurance corporations and pension funds (ICPFs), and a residual sector, called other financial corporations – other (OFCs-O), which is the best proxy for the investment fund sector. The category OFCs-O includes non-MMFs, other financial intermediaries except ICPFs, financial auxiliaries, captive financial institutions and money lenders.

to report data by holding sector only in 2014 and given the prominent role of US funds, our analysis focuses on the behaviour of NBFIs in more recent years.[4] A general problem with residency-based statistics, like CPIS, is that they do not record appropriately investments made through financial vehicles located in off-shore markets; in this regard, Coppola et al. (2021) show that CPIS data underestimate the total amount of portfolio investments in EMEs since multinational firms tend to finance a significant part of their funding needs abroad and to repatriate these resources through infra-group loans which are usually recorded in official statistics as FDI inflows. To overcome this problem and obtain data consistent with the nationality principle, they suggest using specific matrices for each pair of countries. Though we convene that CPIS data underestimate the size of portfolio claims to EMEs, we prefer to stick with residency-based data in order to not complicate further our analysis.

Fig. 1: The rise of market-based finance for EMEs
(USD trillion and percentages)



Source: IMF International Investment Position

For a sample of 37 countries accounting for 95 per cent of EMEs' portfolio liabilities, between 2014 and 2020 the share of NBFIs increased from 72 to 76 per cent of total portfolio investments in EMEs; most of this increase is driven by the rise of OFCs-O, whose weight rose from 49 to 56 per cent (Fig. 2). The share of ICPFs remained stable around 16 per cent, while those of banks and MMFs declined over time from 11 and 7 to 9 and 4 per cent, respectively. Trends regarding the increasing role of NBFIs are more striking if we consider an extended period and we keep constant the panel of reporting countries (i.e., if we exclude the US from the sample of creditor countries): between 2009 and 2020 the share of NBFIs increased from 51 per cent to 66 per cent, whereas that of banks decreased from 25 to 14 per cent.

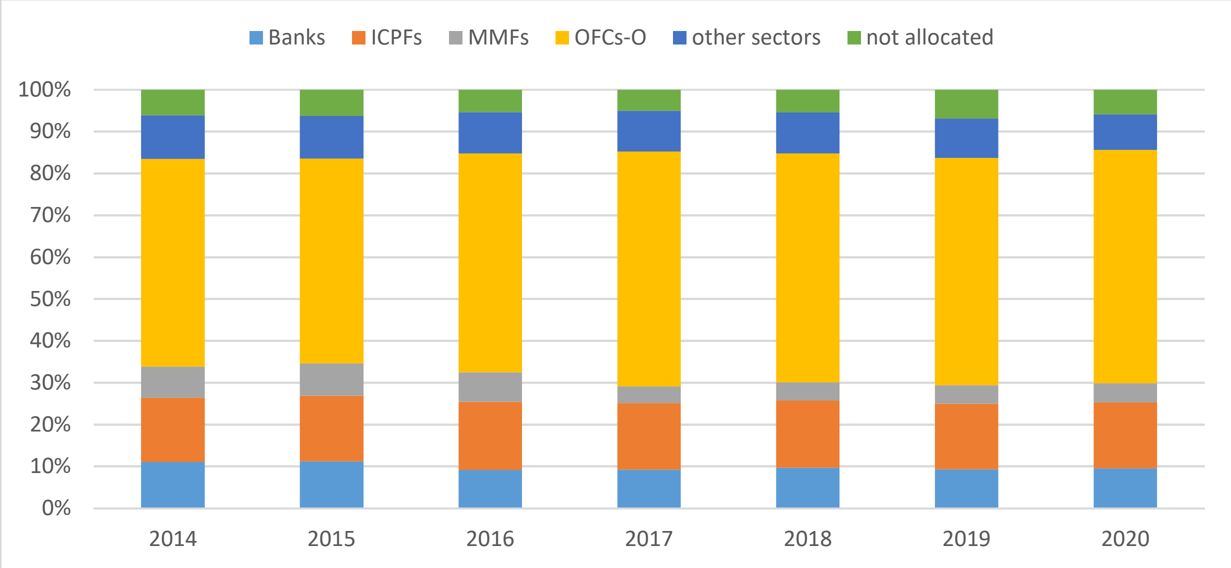
On average, from 2014 to 2020, OFCs-O invested a bigger share of their assets in EMEs (7.5 per cent) compared to banks (5.4 per cent), insurance and pension funds (4.4 per cent) and money market funds (5.5 per cent). Note also that banks and ICPFs tend to invest relatively more in EMEs bonds than equity (see Fig. A1 in the Appendix); by contrast, the share of EMEs bonds held by OFCs-O is lower in comparison to that of equity. Overall, while in EMEs equity markets the footprint of investment funds is far bigger than that of other financial intermediaries, bond investments are less concentrated in terms of holding sector.

After illustrating the prominent role of investment funds in the intermediation of capital flows to EMEs, we use the EPFR database to analyse country allocations by category of investment funds. In order to get data consistent with the definition of portfolio investments, we consider only assets held by EPFR funds in non-domestic countries.

[4]According to the Investment Company Industry (2021), US funds represent 47 per cent of the worldwide asset management industry in terms of total net assets.

As regards investment strategy, we study passive vs. active funds and ETFs.[5] In relation to investor base we distinguish between retail and institutional funds. Finally, we consider the geographic focus of fund assets, distinguishing between global funds, those specialised in EMEs and the others.

Fig. 2: EMEs portfolio liabilities by holding sector
(percentage shares)



Source: IMF CPIS. *Notes:* relative sector shares are computed as fraction of total portfolio investments for countries reporting total assets broken down by holding sector. The sample of borrowing countries is made up of 37 EMEs accounting for 95 per cent of total EMEs portfolio liabilities.

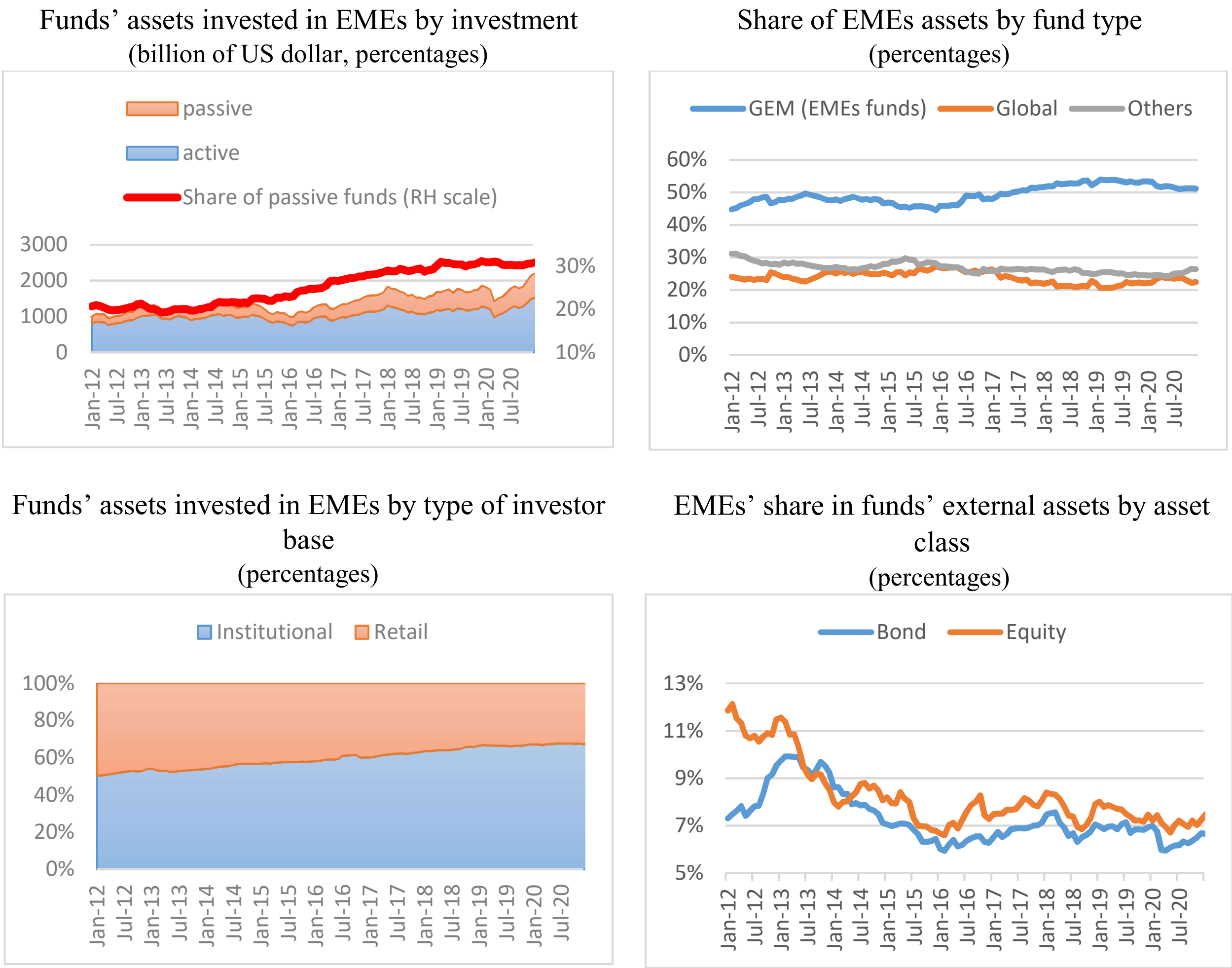
The aggregate size of EMEs' securities held by EPFR funds is consistent with evidence from CPIS data, suggesting that the sample covered by EPFR data is highly representative of funds investing in EMEs.[6] The top-left panel in Fig. 3 shows the increased share of passive funds from 20 to 30 per cent of total industry's assets towards EMEs; the rise has been particularly striking for ETFs (from 14 to 21 per cent), that on average account for 72 per cent of the EMEs assets held by passive funds. Global funds specialised in emerging economies play a primary role, accounting for half of the total of EMEs assets under management, while the share of purely global funds as well as other funds, typically those having a regional focus, varies between 20 and 30%. (upper-right panel in Fig. 3).

The distinction between retail and institutional funds allows us to appreciate how the investor base evolved over time in favour of the latter (bottom-left panel in Fig. 3). Finally, after a significant fall between 2013 and 2015, triggered by the taper tantrum, in more recent years the share of assets invested in EMEs fluctuated between 6 and 9 per cent for both bonds and equity, in line with evidence from CPIS data (bottom-right panel in Fig. 3).

[5] ETFs can be considered similar to passive funds as investment decisions are based on replicating the performance of benchmarks. Unlike open-end funds, ETF shares are continuously traded on equity exchanges, allowing investors to buy or sell shares at any time at the current market price. When the value of ETFs' shares differs from the value of underlying assets, authorized investors, typically large financial institutions, may create or redeem ETFs' shares exploiting arbitrage opportunities. As EFTs shares are traded in developed market, to the extent underlying assets are represented by EMEs securities, the creation and redemption of ETFs' shares generate cross-border capital flows.

[6] At the end of 2019, for a sample of 28 EMEs the value of portfolio liabilities from other financial corporations amounted to USD 1.6 trillion according to CPIS, compared to 1.8 resulting from EPFR. As explained above, the estimates based on CPIS data are biased downward owing to a large fraction of unallocated assets.

Fig. 3: Main trends in mutual funds' investments in EMEs



Source: EPFR

3. Regressions on country shares

The econometric analysis aims at estimating how reactive EMEs portfolio shares are to global financial cycle fluctuations, considering different types of financial intermediaries (banks, insurance companies and pension funds, investment funds) and different fund categories (active, passive, etc.). The CPIS dataset allows us to explore the first dimension, i.e. the heterogeneity across different financial intermediaries, while with the EPFR database it is possible to compare different fund types. Financial intermediaries decide on the cross-country allocation of the funds they manage while inflows/outflows into/out financial intermediaries are at the discretion of the underlying investors. Though funding and liquidity risks vary across financial intermediaries owing to several factors including the investor base, regulation and financial back-stops, a deep discussion of these aspects is beyond the scope of this paper. Therefore, we focus on the investment choices of financial intermediaries rather than on the behaviour of ultimate investors; in this regard, the adoption of the econometric specification of Raddatz and Schmukler (2012), which is based on country share regressions, is suited to study the portfolio rebalancing mechanism across different financial intermediaries. Moreover, since CIPS data contain information exclusively on the stocks of portfolio investments, the specification of a model based on country shares allows us to compare results obtained with the CPIS to those from alternative data sources (like the EPFR database). However, using the same approach for different financial intermediaries requires to be cautious in assessing their response to global shocks, since it may depend also on sector-specific factors which we do not account for.

We regress country shares on a set of global variables, controlling for valuation effects and countries' macroeconomic conditions. We compare the coefficients of global factors to assess in relative terms the sensitivity of each category of intermediary and the implications for emerging markets.

3.1 Computation of country shares in intermediaries' portfolios

The CPIS dataset provides semi-annual bilateral data on assets $A_{s,o,d,t}$, where *s* represents the holding sector, *o* the country where the financial intermediaries are located (*origin country*), *d* the country where the corresponding liabilities have been issued (*destination country*), *t* the time when the stock are measured at market prices. Starting from 2013, data are broken down by holding sector *s*, distinguishing between banks, money market funds (MMFs), insurance corporations and pension funds (ICPFs), and a residual sector, called other financial corporations – other (OFCs-O), which is the best proxy for the investment fund sector (see footnote 3). In the CPIS database, assets (*A*) are classified as bond (*B*) or equity (*E*). Given this information, it is possible to calculate sector-specific country portfolio weights for each country of destination *c* and time period *t*, distinguishing by asset category (bond or equity), as:

$$Q_{s,c,t} = \frac{\sum_o A_{s,o,c,t}}{\sum_o \sum_d A_{s,o,d,t}}, A \in \{B, E\} \quad (1)$$

Fig. A2 in the Appendix shows the evolution over time of the portfolio shares of the main emerging markets calculated with CPIS data for banks, ICPFs and OFCs-O and considering bond and equity holdings.

Hence, the CPIS dataset allows us to study the heterogeneity across intermediary sectors by comparing the portfolio rebalancing mechanism of different types of financial intermediaries. In order to explore the heterogeneity within the fund sector, we rely on another dataset, i.e. the EPFR database, which provides monthly information on assets $A_{c,t}$ held by a given fund category (*s*) and allocated in country *j* at time *t*.[7] This database distinguishes between different types of funds (such as active and passive, institutional and retail) and taking into account some features, like asset type (bond or equity), geographic focus (e.g. global funds versus funds specialized in emerging economies), and currency denomination. Knowing the total asset holdings (*A*) of a given fund category (*s*) in all the countries of destination (*d*) at time *t*, $\sum_d A_{s,d,t}$, we compute the country share for any given fund category (*s*) for any country of destination *c* at time *t* as follows:

$$Q_{s,c,t} = \frac{A_{s,c,t}}{\sum_d A_{s,d,t}}, A \in \{B, E\} \ (2)$$

In the rest of the paper, we slightly simplify the notation removing the subscript *s* denoting intermediary sectors and investment fund categories, since we run regressions for each intermediary sector and fund category, separately (see next subsection). Given that the EPFR dataset does not contain information on banks, in order to analyse the behaviour of banks relative to investment funds, we also use data on banks' bond holdings from the BIS LBS database.

Fig. A3 in the Appendix shows the dynamics over time of the portfolio shares of investment funds, separately for bond and equity holdings. By comparing these time series with the shares of OFCs-O in Fig. A2, it is possible to observe that the ranking of the EMEs in which investment funds allocate their assets is substantially the same in both datasets.

3.2 Econometric specification

Adapting the specification in Raddatz and Schmukler (2012) to our data, it is assumed that the (log) share ($Q_{c,t}$) of emerging market *c* in the portfolio of financial intermediaries evolves over time *t* according to the following expression:

[7] Unlike most studies using EPFR data, we do not use fund level data since, as explained in the introduction, we aim to explore the role of investment funds from a macroeconomic perspective, in order to bridge the gap between aggregate portfolio dynamics and stylized facts concerning the asset management sector.

$$\Delta\log Q_{c,t} = \theta + \phi\left(R_{c,t} - R_t\right) + \beta LF_{c,t-1} + \gamma GF_t + \lambda_c + \eta_{c,t} \quad (3)$$

where $R_{c,t}$ is the return from the investment in country *c* from *t-1* to *t* (or, equivalently, the log change of asset prices from *t-1* to *t* in country *c*), R_t is the portfolio return of intermediaries (calculated as the weighted average of country-specific returns with weights given by the previous period country shares $Q_{c,t-1}$), $LF_{c,t-1}$ are country-specific macroeconomic and financial factors (lagged one period to mitigate endogeneity concerns), GF_t is a set of global variables, λ_c are country fixed effects and $\eta_{c,t}$ is the error term. Equation (3) is estimated separately for each type of financial intermediaries and for each category of funds (distinguishing between bond and equity) using CPIS and EPFR data, respectively. In particular, our main interest is the comparison of the semi-elasticities of portfolio country weights to global factors (γ) across different sectors of financial intermediaries and fund categories.

The validity of equation (3), which rules out the information on the origin country, relies on two main assumptions: (i) the origin country is irrelevant given that financial intermediaries located in different countries are subject to the same global shocks; (ii) there are no financial industry-specific variables in origin countries that correlate with global factors. These simplifying assumptions are necessary given the aggregated nature and low-frequency of our dataset, which suggest a parsimonious reduced-form approach.

Note that though Raddataz et al. (2012) use equation (3) to study investment funds, the underlying logic may be applied to other financial intermediaries as well. Indeed, the term $(R_{c,t} - R_t)$ is a measure of pro-cyclicality as it indicates how intermediaries rebalance their portfolios taking into account relative returns, a behaviour consistent with return chasing and momentum trading strategies. As regards the other components, we assume that portfolio allocation decisions hinge on both local and global factors. The former include pull factors that are local macroeconomic and financial variables ($LF_{c,t-1}$) which determine the attractiveness of a given country for international investors. Global factors (GF_t) may affect the portfolio rebalancing mechanism through balance-sheet constraints. During period of distress in global financial markets, ultimate investors are likely to redeem their shares in open end investment funds; as a result of redemption pressures, portfolio managers are induced to sell assets in order to raise liquidity. In this context, portfolio rebalancing may occur if asset managers decide to curtail investments in some countries more than in others. Concerning banks, forced sales of international securities may be associated with large shocks in wholesale funding markets. A way to generalize equation (3) to all typologies of financial intermediation is to assume that financial intermediaries are subject to a value-at-risk constraint (Miranda-Agrippino and Rey, 2020): when financial volatility rises, intermediaries are forced to deleverage since the amount of risk they can bear is more limited. Depending on the way intermediaries rebalance their portfolios, the impact on capital flows may vary across destination countries and, hence, country share may be accordingly affected. In this regard, it is well known that during crises financial intermediaries tend to rein in risky assets, contributing to fire sales. An analytical derivation of equation (3) with a discussion of the main hypothesis is provided in the Technical appendix. Moreover, in Table A1 in the Appendix we provide empirical evidence on the presence of unit roots in the dynamics of country (log) shares that justifies the adoption of a specification in first differences as in expression (3).

Local factors include macroeconomic variables, such as real year-on-year GDP growth, GDP per capita, public debt to GDP ratio, and financial variables, like monetary policy rate, CPI inflation rate, variation in domestic (nominal effective) exchange rate, indexes of financial openness (Chinn and Ito, 2006) and capital restrictions (Fernandez et al., 2016).[8] Global variables are the CBOE implied volatility index (VIX), the US monetary policy rate (or, as a robustness check, the shadow federal funds rate calculated by Wu and Xia, 2016), the slope of the US yield curve, measured as the difference between the U.S. sovereign 10-year yield and the US

[8] The capital restrictions index of Fernandez et al. (2016) is specific for each type of capital flows but it covers a more limited sample of countries. For this reason, we use the Chinn-Ito index in the semi-annual regressions on country shares estimated with a larger set of countries (CPIS data) and we employ the Fernandez's index in the quarterly regressions on capital inflows (BOP data) estimated with a smaller number of EMEs. Given that these two indicators have an annual frequency, they have poor explanatory power in the monthly regressions with EPFR data and hence are removed from those regressions.

monetary policy rate (or the shadow federal funds rate), and the St. Louis Fed Financial Stress Index, as alternative indicator for financial volatility relative to the VIX for a robustness exercise.[9] For measuring relative returns we use the JPM total return index for bond and the MSCI index for equity. Table A4 in the Appendix provides the list of variables included in the regressions, organised according to the traditional classification in pull (local factors and returns) and push factors (global variables), together with a description, the frequency, the data source and the expected impact on the dependent variable. All the variables employed in the analysis are winsorised at 1 per cent level in each tail in order to limit the influence of outliers. Table A5 presents some descriptive statistics on the dependent (Table A5a) and independent variables (Table A5b) employed in our regressions.

3.3 Results: heterogeneity across financial intermediaries

In this section we compare the responses to global shocks of different financial intermediaries. We use semi-annual CPIS to estimate the semi-elasticity of EMEs' country shares to fluctuations of the VIX for three types of financial intermediaries: Banks, ICPFs and OFCs-O. In principle, this distinction is available starting from the first semester of 2013 but we remove the observations in 2013 since the United States do not report their asset holdings in the CPIS during that period. The last available observation is the second semester of 2020, so that we are able to include the Covid-19 crisis in our analysis The sample includes 37 emerging market economies, accounting for more than 91 per cent of the stock of bond liabilities and around 99 per cent of equity liabilities in EMEs in 2020 (the complete list of countries is displayed in Table A6 of the Appendix).

Table 1 shows the results of the estimation of equation (3) for the three financial intermediary categories, separately for bond and equity holdings. The sample of countries and the time periods are the same for all the three types of intermediaries. The semi-annual dimension of the dataset does not allow to identify the contribution of a rich set of global factors: for this reason, we include as a global factor only the VIX. On the other hand, given the relatively higher cross-section dimension, we include a wider set of country-specific controls than in the other specifications.

Regarding bond holdings, the coefficient associated to the VIX is negative, as expected, and statistically significant. Its effect is much greater for OFCs-O, meaning that, in response to global shocks, they reduce their exposure to emerging markets significantly more than banks and ICPFs. In particular, if the VIX increases by one standard deviation, the shares invested in emerging markets are reduced by 8.5 per cent over a semi-annual horizon if we consider investment funds, 6.4 per cent considering insurance and pension funds and only 5 per cent looking at banks. The differences in the reactions of financial intermediaries are even clearer considering equity holdings: the coefficient of the VIX is not significant for banks, while it is significant for ICPFs and OFCs-O. Quantitatively, a one standard deviation increase in the VIX leads to a 9.8 (9.0) percentage decline in the equity shares invested by OFCs-O (ICPFs) in EMEs. With reference to equity investment decisions by banks, the milder effect of global shocks can be explained taking into account that for these intermediaries equity holdings represent a limited portion of their total assets (see Section 2).

We test whether the coefficients associated to the VIX are statistically different among the three types of financial intermediaries (for technical details see the Appendix and Table A2) and we find that the difference between the semi-elasticity of OFCs-O and that of banks is significant at 5 per cent level for both bond and equity holdings. There are also significant differences at 10 and 5 per cent level in the reactions of EMEs country shares to global shocks between ICPFs and banks for bond and equity holdings, respectively.

The impact of asset price changes is generally significant for all intermediaries and in each asset class. For this set of regressions based on semi-annual data, we refrain from drawing any conclusion about the pro-cyclicality associated with asset price changes since for this aim higher frequency and more granular data are needed.

While global factors captured by the VIX affect portfolio rebalancing across-the-board, local macroeconomic conditions have little impact instead. Though striking, this result is not surprising since previous studies have pointed out that while push factors have become more important as a result of the increasing financial

[9] These high-frequency indicators are aggregated at quarterly and semi-annual level with time averages.

integration of emerging economies, the importance of pull factors has declined after the global financial crisis; one reason is that the low-interest environment induced investors to seek higher returns neglecting country-specific risks. Moreover, at least part of the effects of domestic conditions might be reflected in country-specific rates of return ($R_{c,t}$) and the impact of slow-moving indicators (e.g., GDP per capita, financial openness, etc.) might be absorbed by country fixed effects (λ_c).

Table 1: Regressions on country shares using CPIS data. Semi-annual estimates

	CPIS					
	Bond			Equity		
$\Delta\log Q_{c,t}$	(1) Banks	(2) ICPFs	(3) OFCs-O	(4) Banks	(5) ICPFs	(6) OFCs-O
VIX_t	-0.772*	-0.987***	-1.303***	0.324	-1.386***	-1.509***
	(0.381)	(0.344)	(0.321)	(0.641)	(0.460)	(0.477)
$R_{c,t} - R_t$	2.300**	3.848***	2.134**	0.304	1.026**	0.907***
	(0.901)	(0.834)	(0.868)	(0.228)	(0.493)	(0.251)
$\Delta\log GDP_{c,t-1}$	0.476	4.720**	2.342	1.862	2.243	1.422
	(1.205)	(2.108)	(1.472)	(1.172)	(2.610)	(2.078)
$GDPpc_{c,t-1}$	0.0214	-0.0203	0.00696	-0.0234	0.00629	0.0175
	(0.0159)	(0.0164)	(0.0133)	(0.0152)	(0.0219)	(0.0229)
$MPrate_{c,t-1}$	-1.812	1.601	0.205	2.342*	-0.646	1.781
	(2.304)	(1.054)	(0.525)	(1.265)	(1.873)	(1.908)
$Inflation_{c,t-1}$	0.0424	0.410	0.210	-0.352	0.831**	-0.521
	(0.533)	(0.313)	(0.324)	(0.451)	(0.379)	(0.329)
$\Delta\log ExRate_{c,t-1}$	-0.460	-0.397	-0.570	-0.0841	0.362	-1.301**
	(0.613)	(0.425)	(0.449)	(0.593)	(0.387)	(0.589)
$PublicDebt_{c,t-1}$	0.284	-0.166	-0.150	-0.293	0.0859	0.185
	(0.207)	(0.195)	(0.270)	(0.358)	(0.212)	(0.408)
$ChinnIto_{c,t-1}$	-0.234	-0.0714	-0.283	0.589*	-0.325	-0.689
	(0.151)	(0.257)	(0.328)	(0.341)	(0.359)	(0.552)
Constant	-0.241	0.510	0.240	0.0347	0.148	0.0475
	(0.307)	(0.336)	(0.375)	(0.339)	(0.370)	(0.627)
Observations	518	518	518	518	518	518
R-squared	0.030	0.099	0.085	0.042	0.063	0.045

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 37 countries observed in the 2014s1-2020s2 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

As a robustness exercise, in Table A7 in the Appendix the lagged returns $(R_{c,t-1} - R_{t-1})$ are included in the regression as a measure of market past performance (as in Brandao-Marques et al., 2015). However, this variable is not statistically significant while the effects of the VIX are unchanged. Results are also robust by removing China, which is far less exposed to global financial cycle fluctuations than the other EMEs, from the sample (Table A8 in the Appendix).

Since the semi-annual frequency of the CPIS database might not allow us to measure accurately the impact of the global financial cycle fluctuations, in order to address this potential limitation and compare the behaviour of investment funds against banks, we repeat the regression analysis using quarterly data from other statistical sources, namely EPFR for investment funds and BIS-LBS for banks. Estimates are calculated with a sample of 23 countries, between 2012 and 2020, that account for 85 per cent of the stock of bond liabilities and 98 per cent of equity liabilities in EMEs in 2020. Even though the sample is much smaller compared to that of the CPIS database, its representativeness is still very high (see Table A6 in the Appendix). The higher frequencies allow us to specify a richer set of global variables, including also the US monetary policy rate e the slope of the US yield curve (Table 2).

Table 2: Regressions on country shares using EPFR and LBS data. Quarterly estimates

	Full sample (2012-2020)		Pre-pandemic period (2012-2019)		No China	
	EPFR	LBS	EPFR	LBS	EPFR	LBS
$\Delta\log Q_{c,t}$	(1) OFCs-O	(2) Banks	(3) OFCs-O	(4) Banks	(5) OFCs-O	(6) Banks
VIX_t	-0.807***	-0.471***	-0.763*	-0.228	-0.819***	-0.462***
	(0.250)	(0.133)	(0.369)	(0.339)	(0.259)	(0.136)
$MPrate_{US,t}$	-5.903***	-3.783***	-5.072***	-4.208**	-6.007***	-3.745***
	(1.713)	(1.240)	(1.703)	(1.751)	(1.798)	(1.307)
$YieldCurve_{US,t}$	-6.925***	-4.164***	-6.072***	-4.320***	-7.019***	-4.236***
	(1.421)	(1.028)	(1.577)	(1.348)	(1.498)	(1.071)
$R_{c,t} - R_t$	0.982**	0.384	1.198***	0.389	1.070***	0.402
	(0.357)	(0.232)	(0.384)	(0.249)	(0.351)	(0.239)
$\Delta\log GDP_{c,t-1}$	0.0209*	0.00984	-0.00643	0.0198	0.0165	0.0110
	(0.0112)	(0.0101)	(0.0105)	(0.0139)	(0.0109)	(0.0129)
$MPrate_{c,t-1}$	0.140	-0.0445	0.0776	0.234	0.122	-0.0810
	(0.499)	(0.672)	(0.499)	(0.594)	(0.501)	(0.681)
$Inflation_{c,t-1}$	0.300	0.397	0.274	0.109	0.305	0.411
	(0.365)	(0.391)	(0.334)	(0.354)	(0.366)	(0.394)
$\Delta\log ExRate_{c,t-1}$	-0.246	0.0506	-0.269	0.0518	-0.237	0.0442
	(0.349)	(0.309)	(0.377)	(0.400)	(0.356)	(0.317)
Constant	0.268***	0.159***	0.250***	0.126**	0.272***	0.158***
	(0.0722)	(0.0426)	(0.0851)	(0.0593)	(0.0748)	(0.0440)
Observations	782	782	690	690	748	748
R-squared	0.103	0.047	0.103	0.045	0.106	0.047

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012q3-2020q4 period in columns (1) and (2). 23 countries observed in the 2012q3-2019q4 period in columns (3) and (4). 22 countries observed in the 2012q3-2020q4 period in columns (5) and (6). Significance level: *** p<0.01, ** p<0.05, * p<0.1.

In particular, we compare the estimates obtained considering the bond shares of investment funds (EPFR data) and those of banks (LBS data) during the entire period considered (2012-2020). We focus on bond holdings for two reasons: first, LBS report specifically only bank bond holdings and, secondly, the share of equity held by banks is quite limited. Results confirm that banks exhibit a lower semi-elasticity to global variables. From the comparison of EPFR and LBS data, the difference between the semi-elasticity of investment funds and that of banks to changes in the VIX is statistically significant at 10 per cent level (see Table A2 in the Appendix). From a quantitative point of view, a one standard deviation increase in the VIX leads to a reduction of 5.2 per cent in the bond shares invested by OFCs-O in EMEs and of 3.1 per cent in the shares invested by banks, considering a quarterly horizon. The Covid-19 shock has increased the value of these semi-elasticities, as it can be appreciated by comparing the estimates referring to the entire period with those calculated restricting the sample to the pre-pandemic period (2012-2019). The exclusion of China from the sample does not alter importantly the estimated coefficients.

Focusing on the comparison of CPIS and EPFR data, the most interesting aspect is that the quarterly EPFR semi-elasticities of country shares to the VIX are close to half of the semi-annual estimates calculated in Table 1 with CPIS data, as it should be from a theoretical point of view given our specification (even for banks the estimate of the coefficient associated to the VIX calculated using LBS data is in line with that obtained considering the CPIS database).[10] In order to stress the comparability between the two data sources, Table A9 in the Appendix compares directly the results with EPFR data aggregated at the semi-annual level with those obtained using the CPIS database, considering the 23 countries that are in common to the two databases observed in the 2014-2020 period. The estimated semi-elasticities to the VIX are quite similar.

Results in Table 1 and 2 show that the banking sector seems to be less sensible to fluctuations of the global financial cycle than the non-banking financial intermediation, especially investment funds. These findings also suggest that banks tend to reduce their exposure to emerging markets less than NBFIs during periods of financial turmoil. This might be due to the effects of the more stringent macro-prudential measures for the banking sector adopted after the global financial crisis (e.g., the countercyclical capital buffers) that might have increase the resilience of banks to global shocks (IMF, 2020). On the other hand, the higher semi-elasticity to the VIX of OFCs-O (investment funds) may be explained considering that these intermediaries are subject to redemption pressures during periods of financial distress and, in order to face liquidity constraints, they rebalance their portfolios, reducing their exposures toward emerging countries. Another explanation is that investment funds are prone to herd behaviour and display "flight-to-quality" during phases of heightened volatility (Feroli et al., 2014).

3.4 Results: heterogeneity across fund categories

Using monthly EPFR data it is possible to compare the semi-elasticities of country shares to global factors across different fund categories. In particular, we can distinguish between active and passive funds (looking also at a particular category of passive funds, i.e. the exchange-traded funds, ETFs), institutional and retail funds, global funds, global emerging markets funds (GEM) and funds with a regional investment focus (the complement set with respect to global and GEM funds). We also take into account the currency in which fund assets are denominated. Our analysis builds on previous studies investigating differences across fund investment types and the implications for EMEs portfolio inflows (Brandao-Marques et al., 2015; Converse et al., 2020). In this respect, we contribute to the literature by including the Covid-19 shock in our regression analysis, as in Affinito and Santioni (2021), and taking into account the share of EME assets denominated in US dollar. Unlike Affinito and Santioni (2021), who focus on the behaviour of investment funds during the Covid-19 crisis using granular data, we cover a more extended time period employing aggregate data. Another difference is that we focus on the portfolio rebalancing mechanism of funds by looking into country shares, rather than analysing gross inflows which depend on asset managers' investment decisions as well as end-investors' flows to funds.

Table 3 and 4 show the results of country share regressions using monthly EPFR data on 23 EMEs for the 2012-2020 period,[11] considering bond and equity holdings, respectively. Our results show that global factors play a prominent role in portfolio management across the board. It is important to stress that using monthly data we are able to disentangle the effect of each global factor. In fact, the coefficients associated to the VIX, the US monetary policy rate and the slope of the US yield curve are all negative and highly statistically significant. This means that, as expected, investment funds reduce their exposure towards emerging economies in response to an increase in financial market volatility, in monetary rates or in the spread between the return on 10-year US bond rates and short-term interest rates. Like in Brandao-Marques et al. (2015), the semi-

[10] In fact, if we write compactly equation (3) as $\Delta \log Q_{c,t} = \phi\left(R_{c,t} - R_t\right) + \varphi X_{c,t} + \eta_{c,t}$, where vector $X_{c,t}$ includes both local and global factors and t denotes quarter, by backward substitution we obtain that the semi-annual variation is given by:

$$\log Q_{c,t} - \log Q_{c,t-2} = \phi\left(\tilde{R}_{c,t} - \tilde{R}_t\right) + 2\varphi \bar{X}_{c,t} + \eta_{c,t} + \eta_{c,t-1}$$

in which $(\tilde{R}_{c,t} - \tilde{R}_t)$ are changes of asset prices from *t-2* to *t* and $\bar{X}_{c,t} = \left(X_{c,t} + X_{c,t-1}\right)/2$. Therefore, if φ is the marginal effect on a quarterly basis, 2φ should be the impact coherent with a semi-annual aggregation of the quarterly data. The same logic applies to the comparison of monthly and semi-annual estimates: monthly coefficients should be one sixth of the semi-annual coefficients.

[11] We choose 2012 as the beginning of the period to be as coherent as possible with the previous analysis based on CPIS data and because some relevant information, such as country returns, are available for a sufficient number of countries only starting from 2012.

elasticities to global factors calculated for debt securities tend to be slightly more negative than those estimated for the equity component. Regarding the other control variables, estimates based on bond shares are quite similar to those obtained considering equity shares. Local macroeconomic and financial conditions are generally not significant in both bond and equity regressions. On the other hand, valuation effects are positive and highly significant in almost all regressions in both asset classes. In the following discussion, we analyse differences across fund types with regards to their sensitivity to global variables, focusing in particular on VIX shocks.

Coefficients associated to global factors are statistically different across fund categories (see Table A3 in the Appendix for a formal significance test). According to the estimates, passive funds are more reactive than active funds, meaning that they reduce their exposure to emerging markets in response to changes of the VIX more than active funds. In particular, a one standard deviation increase of the VIX leads to a reduction of 2.3 per cent of the bond shares invested in EMEs by passive funds and of 1.8 per cent by active funds. The effects for equity shares are 1.5 and 1.2 per cent, respectively. The ETFs' semi-elasticity to global factors is even more negative than standard passive funds (the semi-elasticities to a one standard deviation increase of the VIX are 2.8 and 1.6 per cent for bond and equity shares, respectively). We conjecture that this result may be due to the fact that passive funds and ETFs investing in EMEs assets are more subject to redemption pressures during periods of market turbulence, as shown by Converse et al. (2020). In this regard, Shek et al. (2018) find that redemption pressures induce asset managers of global bond funds investing in EMEs to conduct discretionary sales reducing EMEs bond holdings to a greater extent than that implied by ultimate investors' outflows. This findings suggests that in aggregate terms fund flows not only determine the overall size of assets under management but they may also affect portfolio country shares, in line with our framework. Note also that passive funds and ETFs display a higher sensitivity to relative returns; this finding may suggest that these funds mechanically sell assets of countries that have seen their shares reduced in global indexes, whereas active funds tend to deviate from the benchmark in the attempt to deliver a better performance.

On the other hand, there is little difference in the behaviour of institutional and retail funds. Looking at bond shares the semi-elasticity to the VIX is 1.9 per cent for both fund categories. Institutional funds reduce their equity share in EMEs by 1.3 per cent when the VIX increases by one standard deviation while retail funds lower their equity shares by 1.1 per cent. While one should expect retail funds being more fickly, empirical evidence showed that institutional funds are more stable during normal times but they rebalance heavily their portfolio during phased of high volatility (IMF, 2014; IMF, 2015).

Looking at investment focus, global funds and GEM funds represent a more stable source of capital flows than other funds, such as those having a regional focus. This result is presumably driven by the behaviour of end-investors, who tend to diversify risk during periods of financial turmoil, reallocating their investments from dedicated funds to more diversified global funds. This finding is consistent with the results in Brandao-Marques et al. (2015) and in contrast with other authors (e.g., Cerutti et al., 2019), who argue that global funds may stoke contagion effects across economies since shocks in advanced economies induce end-investors to redeem their shares and rebalance their portfolio towards more liquid assets, like money market funds. According to our estimates, the semi-elasticity to the VIX is not statistically significant for global and GEM funds investing in bonds, while it is only 0.9 for GEM funds investing in equity.

Finally, looking at currency denomination, investment funds tend to reduce the portion of their EMEs bonds denominated in US dollars relatively more than that in other currencies. The semi-elasticity to a one standard deviation increase of the VIX is 2 per cent for the US dollar component and only 1.6 per cent for the other currencies. This probably reflects their need to raise dollar liquidity to face redemption pressures during phases of tensions in money markets (Morris et al., 2017). This finding is consistent with the GFSR report (IMF, 2020) showing that hard currency bond spreads are more sensitive to global shocks than local currency bonds. A further explanation is that funds facing large outflows tend to follow a pecking order selling first more liquid assets (Ma et al., 2020). In this regard, when the US dollar appreciates in response to a global shock while local currency bond markets become dysfunctional, EMEs funds may decide to sell USD denominated assets to raise the liquidity needed to meet large redemptions.

As shown above with the quarterly regressions, the Covid-19 shock has increased the sensitivity of EMEs country shares to changes in global financial market conditions, making the coefficients associated to global factors more negative after the shock: this can be appreciated by comparing results in Table 3 and 4 with those reported in Table A10 and A11 in the Appendix (for bond and equity holdings, respectively), where regressions for each fund type are estimated with pre-pandemic observations (2012-2019).

The results shown in Table 3 and 4 are robust substituting the VIX with the St. Louis Fed Financial Stress Index, which captures more specifically liquidity conditions in US money markets (as shown in Table A12 and A13 in the Appendix), including the lagged value of returns (Table A14 and A15 for bond and equity holdings, respectively) and excluding China from the sample (Table A16 and A17). Moreover, as a further robustness exercise, the effective US monetary policy rate is replaced by the shadow federal funds rate (Wu and Xia, 2016) in Table A18 and A19 of the Appendix. In fact, the period considered in our analysis is characterised by the quantitative easing implemented by the FED, with the effective nominal rate approaching the zero lower bound. The difference between the 10-year rate and the shadow rate is also included in the regression analysis. Results are very much in line with those reported in Table 3 and 4.

4. Regressions on portfolio inflows

Former regressions on portfolio country shares show that investment funds reduce their shares invested in EMEs more than other financial intermediaries in response to global shocks. This should be reflected in official Balance of Payments (BOP) data on portfolio inflows, in the sense that countries more exposed to non-bank financial intermediation, in particular investment funds, should also exhibit more volatile (i.e., more sensitive to the global financial cycle) portfolio inflows. In this respect, Cerutti et al. (2019) find that the economies that are relatively more exposed to global funds are more sensitive to global shocks and experience more volatile capital flows. Jotikasthira et al. (2012) construct a measure of emerging market capital subject to portfolio rebalancing from investment funds and find that countries featuring higher levels of this indicator are more subject to fire sales and experience negative price externalities in response to shocks in advanced economies.

In order to analyse how the reliance on investment funds affects the sensitivity of EMEs portfolio flows to global shocks, we construct a new measure of investment funds' market penetration in each country ($IFP_{c,t}$) calculated using CPIS data. The indicator for a given country *c* and period *t*[12] is defined as the country's assets held by investment funds - approximated using the holding sector OFCs-O in the CPIS database - over the total assets invested in the country by all financial intermediaries:

$$IFP_{c,t} = \frac{A_{OFC,c,t}}{\sum_s A_{s,c,t}} \quad (4)$$

Fig. 4 (upper left panel) shows the values of the shares (average over the 2015-2020 period) for a selected number of EMEs. Then, following Converse et al. (2020), the weight defined in (4) is interacted with global variables and these interactions are included in a standard regression in which BOP portfolio inflows (as a percentage of GDP) are regressed on measure of push/global (GF_t) and pull/local ($LF_{c,t-1}$) factors:

[12] CPIS data allow constructing the share of assets held by OFCs-O with a semi-annual frequency. Then, a linear interpolation method is used to calculate a quarterly measure. This procedure is justified considering that the share of assets held by a given financial intermediary in a country adjusts slowly over time. Furthermore, we calculate a quarterly measure of investment funds' penetration using EPFR data. However, EPFR data are available only for a limited number of EMEs and we lose one third of the observations in the regression analysis. Consequently, we do not find a significant impact using such indicator based on EPFR data.

Table 3: Regressions on bond country shares using EPFR data. Monthly estimates

	Bond										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.290***	-0.271***	-0.358***	-0.432***	-0.290***	-0.286***	0.105	-0.0664	-0.378***	-0.312***	-0.239***
	(0.0532)	(0.0533)	(0.0566)	(0.0528)	(0.0525)	(0.0555)	(0.0984)	(0.0607)	(0.0834)	(0.0531)	(0.0562)
$MPrate_{US,t}$	-2.246***	-2.179***	-2.487***	-3.112***	-2.141***	-2.338***	-0.726	-0.524	-1.734	-2.340***	-2.349***
	(0.450)	(0.442)	(0.503)	(0.439)	(0.436)	(0.498)	(0.976)	(0.520)	(1.092)	(0.437)	(0.528)
$YieldCurve_{US,t}$	-2.732***	-2.661***	-2.618***	-3.272***	-2.556***	-2.870***	-0.890	-0.443	-2.780**	-2.761***	-3.253***
	(0.470)	(0.466)	(0.521)	(0.451)	(0.448)	(0.524)	(0.984)	(0.494)	(1.220)	(0.453)	(0.583)
$R_{c,t} - R_t$	0.976***	0.925***	1.278***	1.272***	1.006***	0.914***	0.874***	1.157***	0.447	1.041***	0.761***
	(0.145)	(0.144)	(0.144)	(0.145)	(0.150)	(0.140)	(0.227)	(0.196)	(0.268)	(0.147)	(0.145)
$\Delta\log GDP_{c,t-1}$	0.0321	0.0482	-0.00704	0.0163	0.000388	0.0899*	0.0140	0.00797	-0.0269	0.0129	0.145**
	(0.0586)	(0.0602)	(0.0574)	(0.0664)	(0.0660)	(0.0483)	(0.0939)	(0.0919)	(0.160)	(0.0606)	(0.0557)
$MPrate_{c,t-1}$	0.0367	0.0522	0.00390	0.000899	0.00775	0.0825	-0.0836	0.0444	-0.422	0.0187	0.0725
	(0.110)	(0.108)	(0.127)	(0.126)	(0.112)	(0.115)	(0.133)	(0.126)	(0.274)	(0.109)	(0.125)
$Inflation_{c,t-1}$	0.0966	0.0836	0.142	0.139	0.120	0.0753	0.256	0.139	0.464	0.116	0.0939
	(0.0847)	(0.0825)	(0.0999)	(0.0995)	(0.0934)	(0.0798)	(0.152)	(0.108)	(0.366)	(0.0889)	(0.0913)
$\Delta\log ExRate_{c,t-1}$	0.0295	0.0227	0.0183	0.0825	0.00790	0.0574	0.0709	-0.0525	0.348	0.0315	0.0208
	(0.0830)	(0.0858)	(0.0816)	(0.0861)	(0.0827)	(0.0862)	(0.134)	(0.0822)	(0.210)	(0.0807)	(0.109)
$Constant$	0.0977***	0.0919***	0.117***	0.138***	0.0959***	0.0965***	0.000341	0.0151	0.122***	0.103***	0.0911***
	(0.0183)	(0.0183)	(0.0194)	(0.0175)	(0.0176)	(0.0196)	(0.0307)	(0.0192)	(0.0353)	(0.0178)	(0.0204)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	1980	2415	2415
R-squared	0.064	0.058	0.076	0.104	0.067	0.056	0.014	0.040	0.022	0.071	0.038

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Regressions on equity country shares using EPFR data. Monthly estimates

	Equity										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.194***	-0.177***	-0.231***	-0.247***	-0.207***	-0.176***	-0.0530	-0.132**	-0.195***	-0.202***	-0.177***
	(0.0444)	(0.0445)	(0.0455)	(0.0458)	(0.0451)	(0.0460)	(0.0825)	(0.0516)	(0.0284)	(0.0449)	(0.0500)
$MPrate_{US,t}$	-1.303***	-1.320***	-1.322***	-1.157**	-1.249***	-1.464***	-0.970	-0.422	-0.754**	-1.267***	-1.460***
	(0.353)	(0.337)	(0.426)	(0.467)	(0.369)	(0.347)	(0.898)	(0.378)	(0.337)	(0.358)	(0.355)
$YieldCurve_{US,t}$	-1.493***	-1.502***	-1.577***	-1.563***	-1.543***	-1.497***	-1.697*	0.121	-1.662***	-1.454***	-1.572***
	(0.335)	(0.342)	(0.391)	(0.412)	(0.360)	(0.327)	(0.884)	(0.401)	(0.310)	(0.348)	(0.342)
$R_{c,t} - R_t$	0.521***	0.506***	0.550***	0.561***	0.528***	0.509***	0.670***	0.430***	0.699***	0.528***	0.473***
	(0.0841)	(0.0810)	(0.0909)	(0.0949)	(0.0875)	(0.0753)	(0.130)	(0.0975)	(0.0567)	(0.0868)	(0.0778)
$\Delta\log GDP_{c,t-1}$	-0.0905	-0.0776	-0.119	-0.110	-0.0951	-0.109	-0.0847	-0.0621	0.00502	-0.111	-0.0424
	(0.0806)	(0.0817)	(0.0794)	(0.0722)	(0.0786)	(0.0913)	(0.178)	(0.0455)	(0.0805)	(0.0769)	(0.0699)
$MPrate_{c,t-1}$	-0.128	-0.0993	-0.209	-0.213	-0.169	-0.112	0.0689	-0.134	-0.0319	-0.151	-0.0703
	(0.134)	(0.133)	(0.151)	(0.155)	(0.154)	(0.135)	(0.130)	(0.144)	(0.0470)	(0.141)	(0.116)
$Inflation_{c,t-1}$	0.0757	0.0658	0.105*	0.110*	0.0899*	0.0569	-0.0894	0.0993	0.0822	0.0795	0.0771
	(0.0517)	(0.0520)	(0.0531)	(0.0551)	(0.0496)	(0.0558)	(0.109)	(0.0828)	(0.0653)	(0.0523)	(0.0596)
$\Delta\log ExRate_{c,t-1}$	-0.306***	-0.330***	-0.244***	-0.200***	-0.256***	-0.358***	-0.513**	-0.217***	-0.323***	-0.283***	-0.302***
	(0.0548)	(0.0536)	(0.0580)	(0.0566)	(0.0566)	(0.0630)	(0.189)	(0.0661)	(0.0530)	(0.0542)	(0.0632)
$Constant$	0.0618***	0.0589***	0.0726***	0.0719***	0.0656***	0.0606***	0.0305	0.0248	0.0416***	0.0648***	0.0542***
	(0.0171)	(0.0173)	(0.0182)	(0.0189)	(0.0179)	(0.0179)	(0.0279)	(0.0172)	(0.0119)	(0.0174)	(0.0178)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	2132	2415	2415
R-squared	0.069	0.065	0.070	0.073	0.067	0.065	0.032	0.032	0.190	0.068	0.053

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

$$\frac{Inflows_{c,t}}{GDP_{c,t}} = \alpha + \beta GF_t + \gamma GF_t * IFP_{c,t-1} + \delta IFP_{c,t-1} + \theta LF_{c,t-1} + \lambda_c + \varepsilon_{c,t} \quad (5)$$

where λ_c are country-specific fixed effects. The idea behind equation (5) is that countries with a higher investment funds' market share should be more exposed to global financial cycle fluctuations and, consequently, their portfolio flows should be more negatively impacted during periods of higher financial tensions ($\gamma < 0$).

Table 5: Regressions on portfolio inflows using BOP data. Quarterly estimates

$Inflows_{c,t}/GDP_{c,t}$	(1) Total	(2) Bond	(3) Equity	(4) Total	(5) Bond	(6) Equity
VIX_t	0.325*	0.315*	0.0368	0.301	0.286	0.0504**
	(0.167)	(0.159)	(0.0279)	(0.178)	(0.182)	(0.0227)
$VIX_t * IFP_{c,t-1}$	-0.886*	-0.801*	-0.150*	-0.896*	-0.793*	-0.198**
	(0.434)	(0.398)	(0.0794)	(0.455)	(0.452)	(0.0715)
$MPrate_{US,t}$				0.0129	-0.349	0.328**
				(1.209)	(1.367)	(0.137)
$MPrate_{US,t} * IFP_{c,t-1}$				-1.164	-0.0531	-1.069***
				(2.956)	(3.309)	(0.366)
$YieldCurve_{US,t}$				-1.593	-0.599	-0.226
				(1.797)	(1.969)	(0.512)
$YieldCurve_{US,t} * IFP_{c,t-1}$				1.389	-0.871	0.395
				(4.635)	(5.121)	(1.520)
$IFP_{c,t-1}$	0.166*	0.144*	0.0308**	0.143	0.141	0.0423*
	(0.0830)	(0.0772)	(0.0143)	(0.113)	(0.122)	(0.0247)
$\Delta \log GDP_{c,t-1}$	-0.0196	-0.0258	0.0119	0.0349	0.0160	0.0187
	(0.0414)	(0.0398)	(0.0118)	(0.0486)	(0.0454)	(0.0127)
$MPrate_{c,t-1}$	-0.0345	-0.0420	-0.000895	-0.00371	-0.0189	0.00423
	(0.0830)	(0.0818)	(0.0110)	(0.0848)	(0.0834)	(0.0102)
$Inflation_{c,t-1}$	-0.0232	-0.0265	0.0115	-0.0166	-0.0102	0.00712
	(0.0446)	(0.0432)	(0.00797)	(0.0438)	(0.0421)	(0.00858)
$\Delta \log ExRate_{c,t-1}$	-0.0213	-0.00956	-0.00418	-0.0342	-0.0250	-0.00351
	(0.0276)	(0.0259)	(0.00526)	(0.0285)	(0.0263)	(0.00612)
$PublicDebt_{c,t-1}$	-0.0164	-0.00441	-0.0156	-0.0376	-0.0177	-0.0171*
	(0.0424)	(0.0348)	(0.00979)	(0.0393)	(0.0348)	(0.00858)
$CapitalControl_{c,t-1}$	0.0161	0.0152	-0.00357*	-0.00130	0.0116	-0.00445*
	(0.0402)	(0.0138)	(0.00200)	(0.0356)	(0.0127)	(0.00232)
$Constant$	-0.0463	-0.0466	0.000898	-0.00212	-0.0225	-0.00000
	(0.0331)	(0.0346)	(0.00397)	(0.0443)	(0.0463)	(0.0111)
Observations	696	672	648	696	672	648
R-squared	0.198	0.192	0.192	0.213	0.202	0.206

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 29 countries observed in the 2015q1-2020q4 period in portfolio inflows regressions. 28 (27) countries in bond (equity) inflows regressions. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

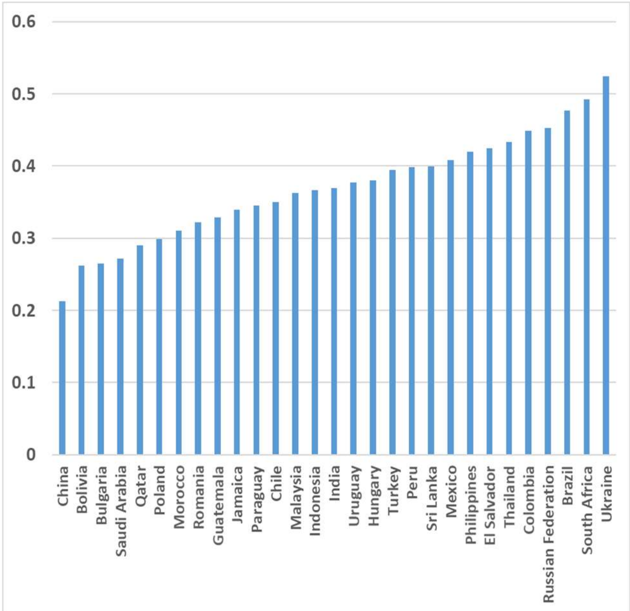
Equation (5) is estimated using quarterly BOP data on 29 countries for the 2015-2020 period.[13] The sample accounts for 88 per cent of the stock of bond liabilities and 98 per cent of equity liabilities in EMEs in 2020.

[13] We exclude the observations in the 2013q1-2013q4 period because the shares of investment funds in 2013 are not comparable to those evaluated in the following periods due to the lower number of countries reporting statistics in the CPIS database in the first and second semester of 2013. Then, since we use the lag of annual variables, the estimation period starts effectively in 2015. Moreover, when we slit portfolio inflows in bond and equity flows, we lose a few observations since some countries do not report this decomposition or do not report equity inflows.

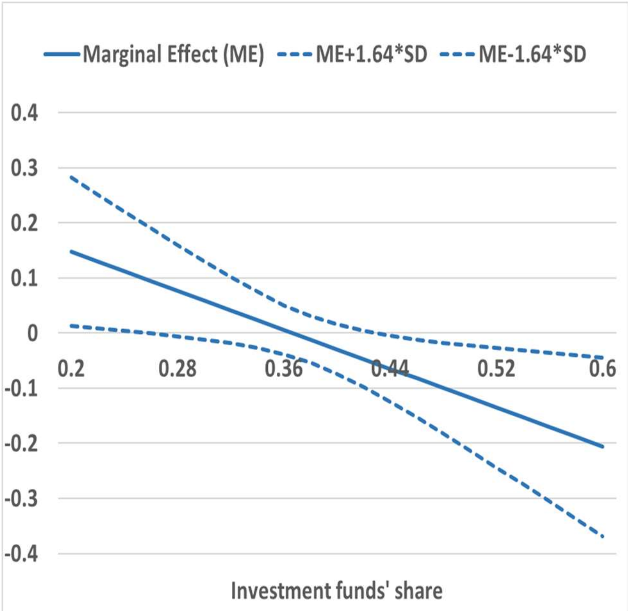
The estimation is performed for total portfolio inflows, as well as for debt and equity inflows separately. Results are displayed in Table 5. In the first three columns only the VIX and its interaction with the investment funds' weight are included as global factors while, in the last three regressions, we add also the US monetary policy rate and the slope of the US yield curve (together with their interactions) as additional push variables.

Fig. 4: Investment funds' shares and their impact on the transmission of global shocks

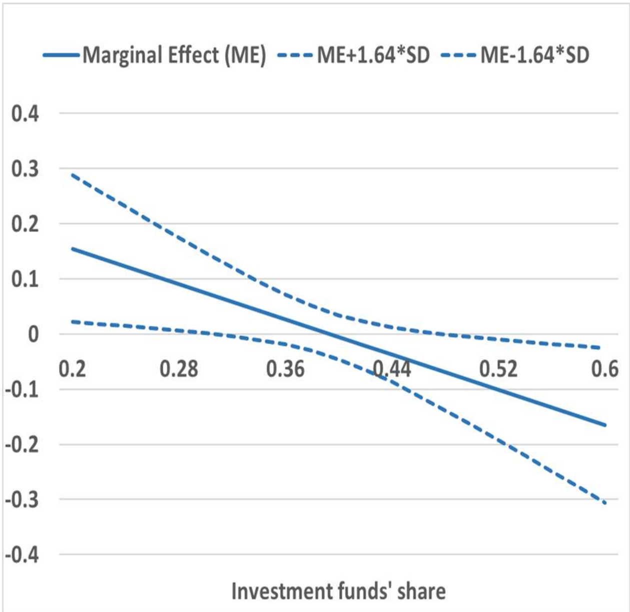
Investment funds' shares by country



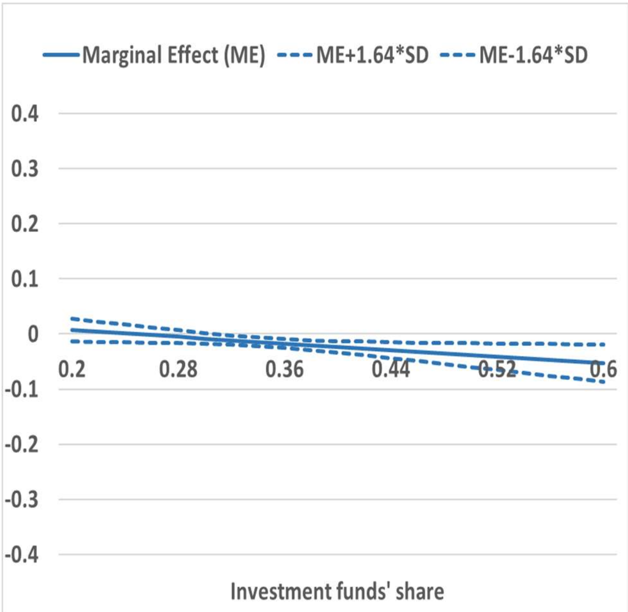
Marginal effect of the VIX on (total) portfolio inflows



Marginal effect of the VIX on (debt) portfolio inflows



Marginal effect of the VIX on (equity) portfolio inflows



Considering total portfolio inflows (column 1 in Table 5), the effect of the interaction term is negative and statistically significant (at 10 per cent level), as expected. Estimates show that the effect of the VIX is negative when the share of investment funds exceeds a threshold close to 36 per cent (Fig. 4, upper right panel). The decomposition of portfolio inflows between bond and equity (column 2 and 3 in Table 5 and bottom panel in Fig. 4) reveals a higher negative impact of changes in the interaction between the VIX and the investment funds' share for debt securities than for equities, confirming the results of regressions on country shares with the EPFR sample. Interestingly, the coefficient associated to the investment funds' share is positive and significant (at least at the 10 per cent level) in all the three regressions, meaning that a higher share in the financial intermediation of investment funds implies, on average, higher portfolio inflows (especially debt inflows) in a country. However, these greater capital flows are also more sensible to the fluctuations of the global financial cycle, as shown by the negative coefficient of the interaction term. These findings suggest that the reliance on investment funds is associated with higher inflows but also with an enhanced sensitiveness to global shocks. Once the other global factors are included, they seem to be quite irrelevant in explaining the variability of portfolio inflows, with the only exception of the US monetary policy rate in the equity regression. Local macroeconomic and financial factors are generally not statistically significant.

Results are robust substituting the VIX with the St. Louis Fed Financial Stress Index, as shown in Table A20 in the Appendix. Moreover, the negative effect of the interaction between the VIX and investment funds' share is even bigger controlling for the shadow federal funds rate and excluding China from the sample (see Table A21 in the Appendix).

Such kind of regressions shows the importance of taking into account, beyond the traditional distinction between push and pull factors, the role of pipes, i.e. the types and the relative importance of the different financial intermediaries that intermediate capital flows to emerging markets (Carney, 2019). The omission of pipes can explain the reason why some recent studies (e.g., Forbes and Warnock, 2021) do not find a significant effect of traditional global factors on the probability of occurrence of extreme capital flow episodes in the post global financial cycle period (BIS, 2021). In fact, the growing role of non-bank financial intermediation and the different reactions of banks and investment funds during period of financial distress suggest the importance of controlling for the interaction between traditional global variables and the share of investment funds' in the intermediation of capital flows.

5. Concluding remarks

Our analysis, which covers different types of financial intermediaries, shows that global factors (VIX, FED rates, term-spread) play a crucial role in portfolio rebalancing mechanism across the board, while the impact of domestic variables is more limited. We provide robustness check using several indicators for global factors. This evidence can be rationalised considering the low-interest rate environment that prevailed after the global financial crisis, which has induced financial intermediaries to seek higher returns neglecting country-specific risks.

Looking into how different types of intermediaries react to global shocks, we find that investment funds reduce their exposure to EMEs more than banks, insurance companies and pension funds. To the best of our knowledge there is no other crossed evidence on the behaviour of different intermediaries in the existing literature on the intermediation of capital flows to emerging economies. Moreover, we provide evidence that the sensitivity of investment funds and their impact to EMEs portfolio inflows were enhanced during the Covid-19 crisis. We check the robustness of these findings using alternative data sources (i.e., CPIS and EPFR); using the same methodology for different datasets, we obtain consistent estimates of the sensitivity of EMEs country shares to changes in the global variables. Moreover, we find heterogeneity across different types of investment funds. In particular, ETFs as well as passive funds rebalance their portfolios substantially, reducing EMEs shares more than active ones, consistently with Converse et al. (2020). Global funds and global emerging markets (GEM) funds show a lower semi-elasticity to financial volatility; conversely, funds with a regional focus are more sensitive to push factors, in line with Brandao-Marques et al. (2015) and against Jotikasthira et al. (2012) and Cerutti et al. (2019). In response to global shocks, we find that investment funds tend to reduce the share of their EMEs assets denominated in USD. This topic is currently at the attention of the FSB (see the FSB Chair's letter to G20 FMCBG February 2022). Furthermore, considering BOP data on portfolio inflows, we provide evidence on the fact that higher investment funds' shares in EMEs portfolio liabilities are associated to more sensitive portfolio inflows to global factors in these countries, in line with other recent studies (e.g., Cerutti et al., 2019). For countries where investment funds represent an important source of external funding, the sensitivity to global shocks is enhanced for bond inflows relative to equity inflows.

The empirical evidence collected in our analysis points to the systemic risks connected with the pro-cyclicality, herding behaviour and highly correlated asset movements stemming from the NBFI sector. Regulators should pay particular attention to mitigate the effects on the financial system and the real economy stemming from the increasing role of NBFIs in the intermediation of capital flows. This implies the adoption of a macro-prudential approach in the oversight of the asset management industry and a strengthened coordination among regulators and international organisations.

Finally our study highlights the issue of data gaps in international statistics regarding capital movements, as available data do not allow to disentangle the component of portfolio inflows intermediated by NBFIs. In order to properly assess the macro-financial risks associated with the increasing role of NBFI, an option could be the enhancing of the collection of country bilateral data on portfolio investments. As stressed in this paper, the CPIS database is currently the only source to provide information of the assets held by non-bank financial intermediaries at bilateral level. However, this source features several limitations; in particular, given the semi-annual frequency, these data are not suited to analyse the impact of fast-moving variables on the behaviour of financial intermediaries; moreover, because of the voluntary nature of the CPIS survey, some countries do not report full information by holding sector, limiting the scope of any analysis based on this database. While private provider microdata may help to fill this gap, they have their own limitations, since they cover only a portion of the universe of non-bank financial intermediaries and their consistency with international statistics and supervisory reporting needs to be assessed carefully.

Technical appendix

Derivation of the specification based on portfolio country shares

The chosen econometric specification broadly follows Raddatz and Schmukler (2012). The starting point is the identity that relates the country portfolio weights of a given financial intermediary sector or fund group,[14] in two subsequent periods:

$$Q_{c,t} = Q_{c,t-1} \frac{(R_{c,t} + f_{c,t})}{(R_t + f_t)} \quad (A1)$$

where $Q_{c,t}$ is the portfolio weight of the destination country c at time t, $R_{c,t}$ and R_t are the gross returns of the investments of financial intermediaries in country c and across their whole portfolio, respectively. $f_{c,t}$ is the ratio between the net flow of money from financial intermediaries to destination country c at time t ($F_{c,t}$) and the assets invested in country c in the previous period ($A_{c,t-1}$). f_t is the ratio between injection/redemption into (out of) financial intermediaries by their underlying investors (F_t) and financial intermediaries' initial assets (A_{t-1}).[15] Identity (A1) applies to both bond and equity asset holdings. A proof of identity (A1) is the following:

$$Q_{c,t} = \frac{A_{c,t}}{A_t} = \frac{A_{c,t-1}R_{c,t} + F_{c,t}}{A_{t-1}R_t + F_t} = \frac{A_{c,t-1}(R_{c,t} + F_{c,t}/A_{t-1})}{A_{t-1}(R_t + F_t/A_{t-1})} = Q_{c,t-1}\frac{(R_{c,t} + f_{c,t})}{(R_t + f_t)} \quad (A2)$$

According to expression (A1), the weight of a country in financial intermediaries' portfolio at the end of time t depends on: (i) the previous period country portfolio weight; (ii) the return of the intermediaries' investment in that country; (iii) the return of the whole portfolio; (iv) the net inflows (outflows) into (out of) the country, and (v) final investors' inflows/outflows into (out of) financial intermediaries, which is equivalent to the net inflows (outflows) of financial intermediaries into (out of) the entire set of destination countries.

For data availability reasons we assume, as in similar analysis (e.g., Raddatz and Schmukler, 2012; Brandao-Marques et al., 2015), that the bond (equity) returns of all intermediaries investing in country c are identical.[16] These country-specific bond (equity) returns are calculated as the first-difference of the logarithm of the corresponding bond (equity) US dollar-denominated country index. Furthermore, we construct financial intermediaries' portfolio returns as the weighted average of country returns, using the previous period portfolio weights:

$$R_t = \sum_{c \in S} Q_{c,t-1} R_{c,t} + \left(1 - \sum_{c \in S} Q_{c,t-1}\right) R_t^G \quad (A3)$$

[14] Unlike Raddatz and Schmukler (2012) who analyse data at single fund level, we have more aggregated information. In fact, we study portfolio rebalancing across different financial intermediary sectors (using CPIS data) and fund categories (with EPFR data).

[15] Given the information content of the employed datasets (CPIS, EPFR, LBS), $A_{c,t}$ includes the assets invested in country c by non-resident financial intermediaries.

[16] Although standard in this stream of literature, this assumption implies that the effects of exchange rate movements on the returns of investors are not explicitly considered. In order to take into account these effects, microdata on assets included in investors' portfolios and their currency composition would be needed, together with country-specific data on local currency and US dollar-denominated asset returns. In the absence of such data, the variation of the (nominal effective) exchange rate is included among regressors to mitigate this concern.

In calculation (A3) the first term captures the weighted average return of the countries included in our sample ($c \in S$), for which we have information both on returns and portfolio weights, while, in the second term, we use a global index to approximate the returns of the remaining countries that are not included in the sample.[17] As indexes, we use the country-specific and global MSCI for equity; with regards to bond returns, we choose the JPM total return index for the countries included in the sample and the Bloomberg Barclays global aggregate as the global index. Log-linearizing equation (A1) around a steady state with gross returns equal to one and zero inflows/outflows, one obtains the following expression:

$$\Delta \log Q_{c,t} = \left(R_{c,t} - R_t\right) + \left(f_{c,t} - f_t\right) + \varepsilon_{c,t} \quad (A4)$$

in which $\varepsilon_{c,t}$ is the approximation error. According to the literature on international capital flows (Koepke, 2019), the net flow of money to country c ($f_{c,t}$) is the result of the allocation decisions of financial intermediaries, which may reflect country returns ($R_{c,t}$) as well as previous period local macroeconomic and financial factors ($LF_{c,t-1}$) and global variables (GF_t). On the other hand, final investors' inflows (outflows) into (out of) financial intermediaries are more likely to depend on intermediaries' portfolio returns (R_t) and global variables (GF_t). Accordingly, the following specification is adopted to proxy the unobserved term $f_{c,t} - f_t$:[18]

$$f_{c,t} - f_t = \theta + \alpha\left(R_{c,t} - R_t\right) + \beta LF_{c,t-1} + \gamma GF_t + \lambda_c + \xi_{c,t} \quad (A5)$$

where λ_c are country-specific fixed effects parametrised as deviations from an average baseline (θ), i.e. such that $\sum_c \lambda_c = 0$. Finally, replacing equation (A5) back in (A4), the estimable equation becomes:

$$\Delta \log Q_{c,t} = \theta + (1+\alpha)\left(R_{c,t} - R_t\right) + \beta LF_{c,t-1} + \gamma GF_t + \lambda_c + \varepsilon_{c,t} + \xi_{c,t} \quad (A6)$$

Which is equal to equation (3) by posing $\phi = 1 + \alpha$ and $\eta_{c,t} = \varepsilon_{c,t} + \xi_{c,t}$. In the estimation of such equation, we do not face a degrees of freedom problem since $\sum_{c \in S} Q_{c,t} < 1$. In fact, we consider a subsample of countries, i.e. the most relevant EMEs. As an example, in the period 2012-2020 the share of emerging countries in the portfolio of investment funds does not exceed 10 per cent in the case of the bond component and 12 per cent as regards the equity component (see Fig. 3). In principle, the problem could be more relevant for funds specialised in EMEs (GEM funds). However, even for this specific type of investment funds, the sum of the shares of the countries included in our sample is always less than one: considering the bond component, the sum of the shares in the portfolio of these intermediaries fluctuates around 73 per cent while, considering equity investments, the sum of the shares stands at around 70 per cent.

The difference of returns $\left(R_{c,t} - R_t\right)$ is strongly correlated with the global variables GF_t, because changes in the global financial conditions are reflected in returns (Miranda-Agrippino and Rey, 2020). In line with Brandao-Marques et al. (2015), in order to disentangle more clearly the impact of valuation effects from that of global variables, we substitute the difference of returns with the residuals of a regression of the $\left(R_{c,t} - R_t\right)$ term on the global factors GF_t.

Unit root tests

Unlike Raddatz and Schmukler (2012), we adopt a specification in first differences in equation (3). In fact, both the visual inspection of the time series (see Fig. A2 and A3) and formal unit root tests reveal the presence of unit roots in the dynamics of country (log) portfolio weights. Table A1 reports the statistic and the p-values of the Hadri LM test for panel data (Hadri, 2000), in which the null hypothesis is that all panels are stationary

[17] This is a standard approximation in empirical works, see e.g. Brandao-Marques et al. (2015).
[18] In equation (A5) we include returns at time *t* as in Raddatz and Schmukler (2012). An alternative specification is the one of Brandao-Marques et al. (2015), who specify a regression with lagged returns as a measure of past market performance and to mitigate endogeneity concerns. In Table A7 and A14-15 we estimate our model with lagged returns showing that the main results of our analysis are still robust to this change in the specification.

against the alternative that some panels contain a unit root. It is possible to observe that the test clearly rejects the null hypothesis of stationarity and trend stationarity both in CPIS and EPFR country (log) shares.

Similar conclusions can be reached considering alternative tests. For instance, the augmented Dickey–Fuller test (Levin et al., 2002) for panel data does not reject the null hypothesis of unit root in the monthly series of EPFR country (log) shares.

Table A1: Hadri unit root LM test on country (log) shares

		CPIS			EPFR
		Banks	ICPFs	OFCs-O	OFCs-O
		Trend not included			
Bond	Statistic	16.2	24.3	22.5	181.7
	p-value	0.0	0.0	0.0	0.0
Equity	Statistic	13.6	12.7	14.0	132.2
	p-value	0.0	0.0	0.0	0.0
		Trend included			
Bond	Statistic	7.9	11.6	9.4	99.0
	p-value	0.0	0.0	0.0	0.0
Equity	Statistic	9.1	14.6	8.9	114.7
	p-value	0.0	0.0	0.0	0.0

Notes: The null hypothesis is that all panels are (trend) stationary against the alternative that some panels contain unit roots. Test statistic robust to heteroscedasticity.

Tests on heterogeneity

In order to understand whether the coefficients of equation (3) are significantly different across intermediary sectors (Banks, ICPFs and OFCs-O), an auxiliary regression is estimated pooling together the data on these three types of financial intermediaries and interacting the variables of the equation with a set of dummies identifying each intermediary. More precisely, the auxiliary regression is the following:

$$\begin{aligned}\Delta\log Q_{c,t} = \theta_0 + \theta_1 D_{OFC} + \theta_2 D_{ICPF} + \gamma_0 GF_t + \gamma_1 GF_t * D_{OFC} + \gamma_2 GF_t * D_{ICPF} + \phi_0\left(R_{c,t} - R_{s,t}\right) \\ + \phi_1\left(R_{c,t} - R_{s,t}\right) * D_{OFC} + \phi_2\left(R_{c,t} - R_{s,t}\right) * D_{ICPF} + \beta LC_{c,t-1} + \lambda_c + \eta_{s,c,t} \quad (A7)\end{aligned}$$

In which D_{OFC} is the dummy for investment funds (OFCs-O) and D_{ICPF} is the indicator for insurance companies and pension funds (ICPFs). In particular, we are interested in the heterogeneity of the parameters associated to global variables (γ_1, γ_2) and, to a less extent, of the valuation effects (ϕ_1, ϕ_2). The effects of local macroeconomic and financial conditions, as well as the country fixed effects, are assumed constant across intermediary groups.[19]

Table A2 shows that results of the estimation of equation (A7) using semi-annual CPIS data for bond (column 1) and equity holdings (column 2) and quarterly EPFR/LBS data on bond shares (column 3). Only the interaction terms are shown because they measure the degree of heterogeneity among intermediary groups. Looking at the estimates based on CPIS data, the difference between the semi-elasticity to the VIX of OFCs-O and that of banks is significant at 5 per cent level for both bond and equity holdings. There is also a significant difference in the reactions of bond and equity shares to global shocks between banks and ICPFs at 10 and 5

[19] Local macroeconomic and financial conditions are usually not significant in the regressions estimated separately for each type of intermediaries (shown in the main text). Moreover, a formal equality test on the coefficients of local variables does not reject the hypothesis that their effects are constant across financial intermediaries.

per cent level, respectively. Similarly, from the comparison of EPFR and LBS data it is possible to detect a significant difference at 10 per cent level in the reactions of investment funds and banks to changes in the VIX.

Table A2: Heterogeneity across financial intermediary groups (estimates of interaction terms)

	CPIS		EPFR-LBS
$\Delta\log Q_{c,t}$	(1) Bond	(2) Equity	(3) Bond
$VIX_t * D_{OFC}$	-0.902** (0.431)	-1.336** (0.636)	-0.339* (0.192)
$VIX_t * D_{ICPF}$	-0.872* (0.446)	-1.322** (0.587)	
$MPrate_{US,t} * D_{OFC}$			-2.113 (1.590)
$YieldCurve_{US,t} * D_{OFC}$			-2.579 (1.513)
$(R_{c,t} - R_t) * D_{OFC}$	0.216 (0.904)	0.568* (0.300)	0.673* (0.324)
$(R_{c,t} - R_t) * D_{ICPF}$	1.941** (0.876)	0.701 (0.491)	
D_{OFCs}	0.179** (0.0794)	0.288*** (0.102)	0.116* (0.0589)
D_{ICPFs}	0.207** (0.0818)	0.285*** (0.104)	
Observations	1554	1554	1496
R-squared	0.051	0.030	0.074

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 37 countries observed in the 2014s1-2020s2 period in columns (1) and (2). 22 countries (China is excluded) observed in the 2012q3-2020q4 period in column (3). Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Analogously, we test the heterogeneity across investment fund categories using monthly EPFR data. In particular, we make a pairwise comparison between: (i) active and passive funds; (ii) institutional and retail funds; (iii) Global and GEM funds versus funds with a regional focus (defined as the complement set with respect to global and GEM funds); (iv) assets in US dollars and those in other currencies. The auxiliary regression is similar to the previous one:

$$\Delta\log Q_{c,t} = \theta_0 + \theta_1 D + \gamma_0 GF_t + \gamma_1 GF_t * D + \phi_0(R_{c,t} - R_{s,t}) + \phi_1(R_{c,t} - R_{s,t}) * D + \beta LC_{c,t-1} + \lambda_c + \eta_{s,c,t} \quad (A8)$$

where D represents one of the two fund categories in each pairwise comparison: for instance, when we compare active and passive funds, $D = 0$ for active funds and $D = 1$ for passive ones. Table A3 shows the results of the estimation of equation (A8), for bond and equity holdings respectively.

In summary, passive funds react significantly more than active funds to variations in global factors while global and GEM fund shares are less sensible to the fluctuations of the global financial cycle. This behaviour can be observed both for bond and equity holdings. There are no significant differences in the reactions of institutional and retail funds with regards to bond shares, while equity shares of retail funds are less reactive than those of institutional funds. Finally, only USD bond shares are traded differently from those in other currencies during periods of financial distress, while the USD equity component behaves exactly as that of other currencies.

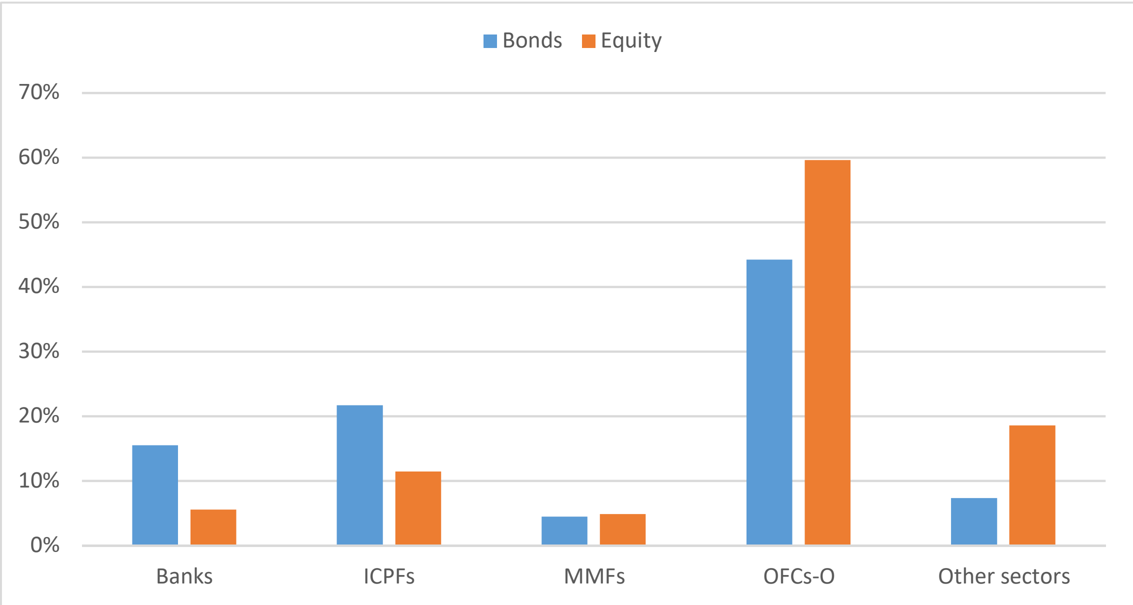
Table A3: Heterogeneity across fund groups (estimates of interaction terms)

	Bond			
$\Delta \log Q_{c,t}$	(1)	(2)	(3)	(4)
$D = 0$	Active	Institutional	Global + GEM	NON-USD
$D = 1$	Passive	Retail	Regional	USD
$VIX_t * D$	-0.0850***	-0.00325	-0.407***	-0.0699***
	(0.0156)	(0.0129)	(0.0763)	(0.0175)
$MPrate_{US,t} * D$	-0.405**	-0.0387	-1.373	-0.239
	(0.166)	(0.136)	(1.062)	(0.164)
$YieldCurve_{US,t} * D$	-0.0469	-0.174	-2.217*	0.233
	(0.144)	(0.131)	(1.141)	(0.216)
$(R_{c,t} - R_t) * D$	0.346***	-0.0883*	-0.554	0.274***
	(0.0465)	(0.0451)	(0.351)	(0.0619)
D	0.0254***	0.00323	0.108***	0.0113*
	(0.00505)	(0.00443)	(0.0319)	(0.00592)
Observations	4830	4830	6527	4830
R-squared	0.068	0.061	0.015	0.051
	Equity			
$\Delta \log Q_{c,t}$	(1)	(2)	(3)	(4)
$D = 0$	Active	Institutional	Global + GEM	NON-USD
$D = 1$	Passive	Retail	Regional	USD
$VIX_t * D$	-0.0579***	0.0380**	-0.106***	-0.0231
	(0.0166)	(0.0166)	(0.0352)	(0.0228)
$MPrate_{US,t} * D$	-0.158	-0.174	0.117	0.0211
	(0.267)	(0.186)	(0.411)	(0.192)
$YieldCurve_{US,t} * D$	-0.237	0.0976	-0.732	-0.0553
	(0.275)	(0.192)	(0.534)	(0.208)
$(R_{c,t} - R_t) * D$	0.0491*	-0.0257	0.157**	0.0523
	(0.0259)	(0.0222)	(0.0727)	(0.0336)
D	0.0118	-0.00545	0.0161	0.00761
	(0.00785)	(0.00605)	(0.0145)	(0.00712)
Observations	4830	4830	6679	4830
R-squared	0.068	0.066	0.045	0.060

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Additional figures and tables

Fig. A1: EMEs bonds and equity by holding sector
(average of percentage shares, 2014-2020)

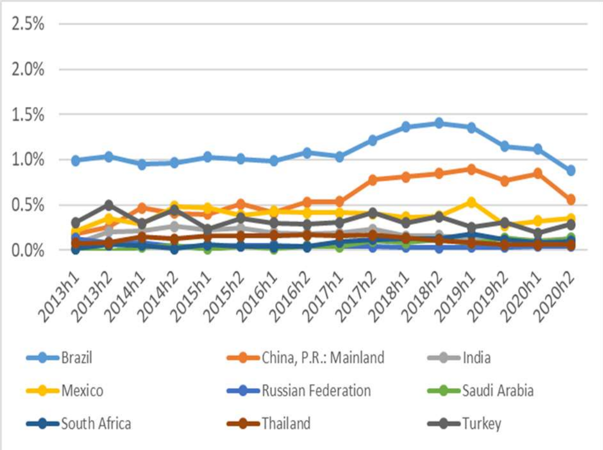


Source: IMF CPIS. *Notes:* relative sector shares are computed as fraction of total portfolio investments for countries reporting total assets broken down by holding sector. The sample of borrowing countries is made up of 37 EMEs accounting for 95 per cent of total EMEs portfolio liabilities.

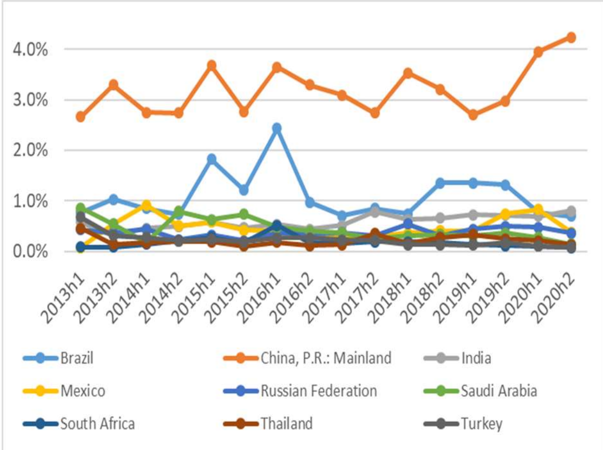
Fig. A2: Portfolio country shares in CPIS

A) Banks

Bond

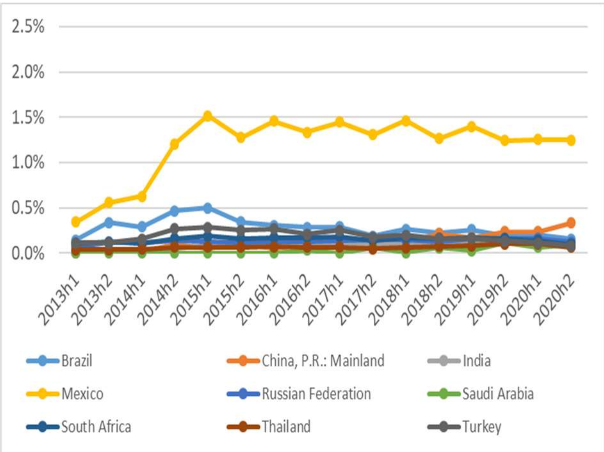


Equity

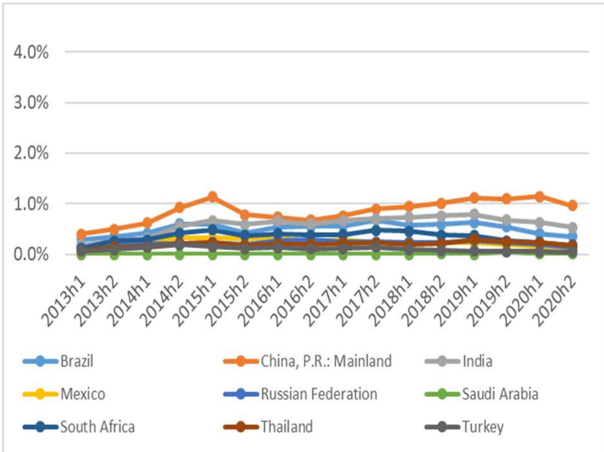


B) ICPFs

Bond

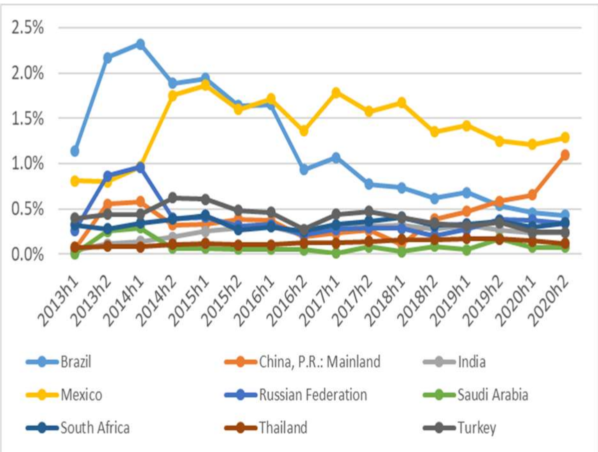


Equity

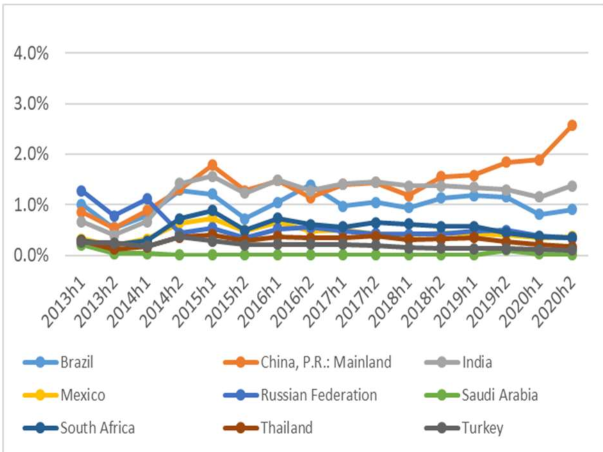


C) OFCs-O

Bond



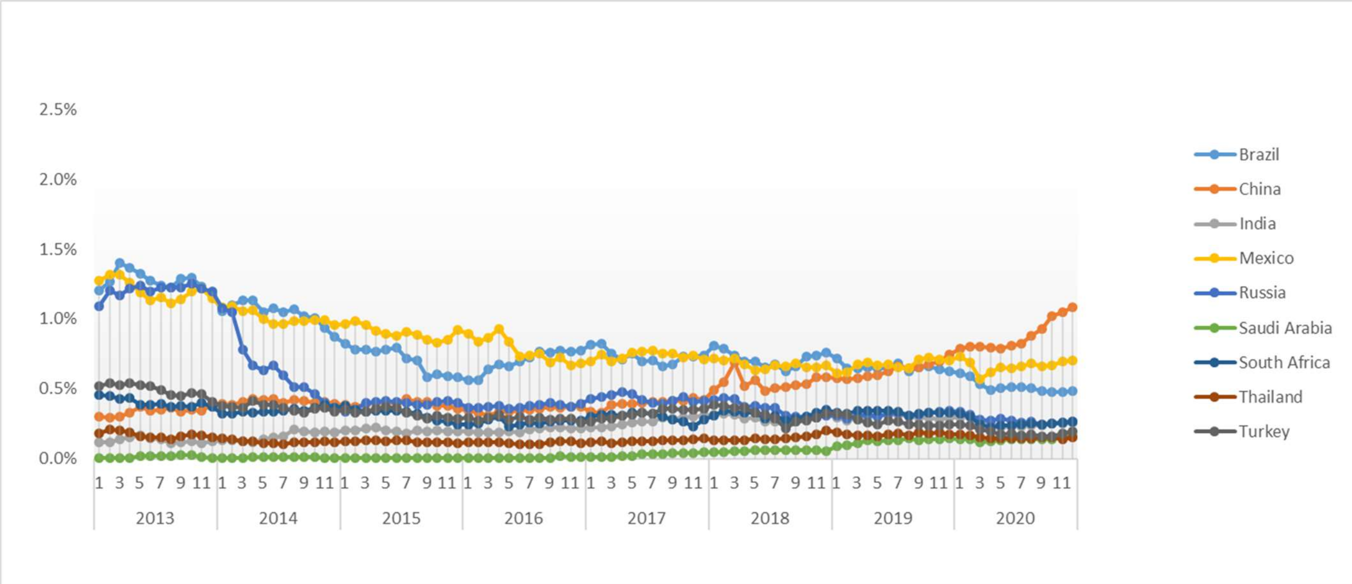
Equity



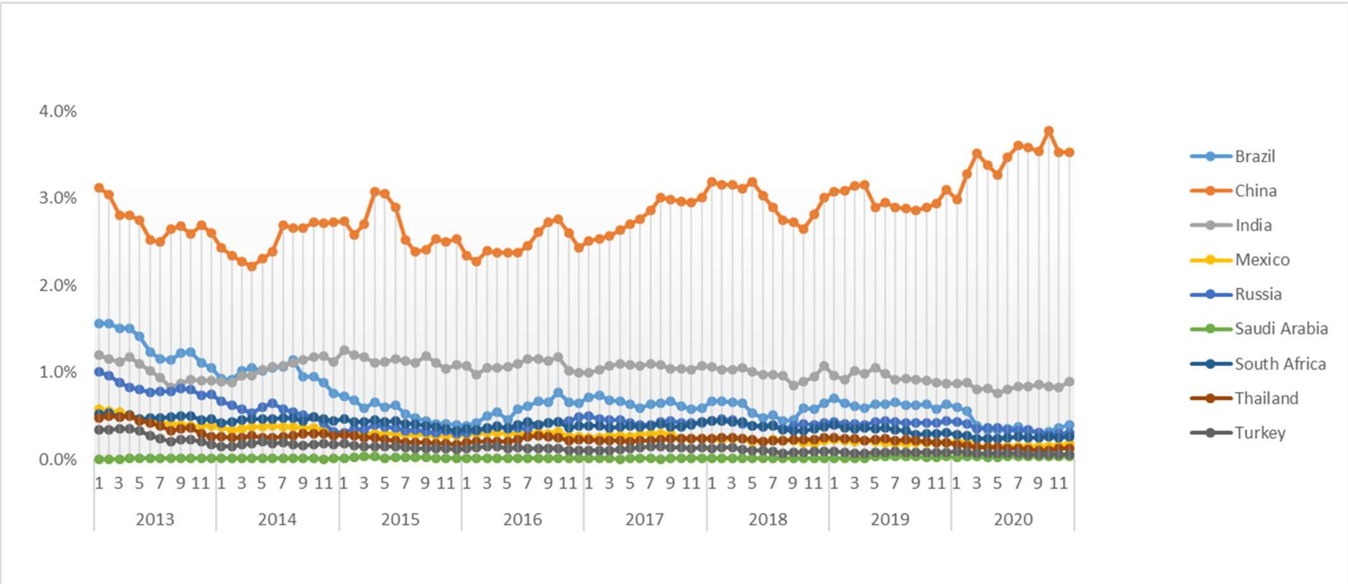
Source: IMF CPIS.

Fig. A3: Portfolio country shares in EPFR

Bond



Equity



Source: EPFR

Table A4: List of variables included in the regressions

Variables	Description	Frequency	Source	Expected sign
	Dependent variables			
$Q_{c,t}$	Share of assets allocated to EMEs	Monthly (EPFR)/ quarterly (LBS) / semi-annual (CPIS)	CPIS, EPFR, LBS	
$Inflows_{c,t}$	Bond and equity inflows to EMEs	Quarterly	IFS statistics	
	Push factors			
VIX_t	Chicago Board Options Exchange's implied volatility index	Daily	Chicago Board Option Exchange (CBOE)	(-)
$MPrate_{US,t}$	US monetary policy rate	Monthly	IFS statistics	(-)
$ShMPrate_{US,t}$	Shadow federal funds rate	Monthly	Federal Reserve Bank of Atlanta	(-)
$YieldCurve_{US,t}$	Difference between U.S. sovereign 10-year yield and US monetary policy rate	Monthly	Federal Reserve Bank of St. Louis and IFS statistics	(-)
$ShYieldCurve_{US,t}$	Difference between U.S. sovereign 10-year yield and shadow federal funds rate	Monthly	Federal Reserve Bank of Atlanta and IFS statistics	(-)
$FRED_t$	St. Louis Fed Financial Stress Index, Index	Weekly	Federal Reserve Bank of St. Louis	(-)
	Pull factors			
$R_{c,t}, R_t$	JPM total return index and Bloomberg Barclays global aggregate for bond; global annd country-specific MSCI index for equity	Monthly	Global Economic Monitor (GEM), Refinitiv, Bloomberg	(+)
$\Delta\log GDP_{c,t-1}$	Domestic year-on-year real GDP growth	Quarterly (IFS)/annual (WEO)	IFS statistics, WEO database	(+)
$GDPpc_{c,t-1}$	Domestic GDP per capita, constant prices (Purchasing power parity; 2017 international dollar)	Annual	WEO database	(+)
$MPrate_{c,t-1}$	Domestic monetary policy rate	Monthly	IFS statistics	(+)
$Inflation_{c,t-1}$	Domestic annual CPI inflation	Monthly	IFS statistics	(?)
$\Delta\log ExRate_{c,t-1}$	Variation in domestic (nominal effective) exchange rate, defined such that an increase represents an appreciation of domestic currency	Monthly	IFS statistics	(?)
$PublicDebt_{c,t-1}$	Domestic public debt to GDP ratio	Quarterly	IFS statistics	(-)
$ChinnIto_{c,t-1}$	Chinn-Ito index of financial openness	Annual	Chinn and Ito (2006)	(+)
$CapitalControl_{c,t-1}$	Fernandez et al. (2016)'s index of capital control restriction	Annual	Fernandez et al. (2016)	(-)
	Pipes			
$IFP_{c,t}$	Investment funds' share of country external liability	Semi-annual	CPIS	(?)

Table A5a: Descriptive statistics (dependent variables)

	N	Mean	SD	Min	Max
		Dependent variables			
		$Q_{c,t}$ *CPIS*			
Bond (Banks)	592	0.001	0.002	0.000	0.014
Equity (Banks)	592	0.002	0.005	0.000	0.042
Bond (ICPFs)	592	0.001	0.002	0.000	0.015
Equity (ICPFs)	592	0.001	0.002	0.000	0.012
Bond (OFCs-O)	592	0.002	0.003	0.000	0.023
Equity (OFCs-O)	592	0.001	0.003	0.000	0.026
		$Q_{c,t}$ *EPFR*			
Bond (all)	2592	0.003	0.003	0.000	0.014
Equity (all)	2592	0.003	0.006	0.000	0.038
Bond (passive)	2592	0.002	0.002	0.000	0.013
Equity (passive)	2592	0.003	0.005	0.000	0.033
Bond (active)	2592	0.003	0.003	0.000	0.015
Equity (active)	2592	0.003	0.007	0.000	0.045
Bond (ETFs)	2592	0.002	0.002	0.000	0.014
Equity (ETFs)	2592	0.004	0.008	0.000	0.053
Bond (inst.)	2592	0.003	0.002	0.000	0.013
Equity (inst.)	2592	0.003	0.007	0.000	0.040
Bond (retail)	2592	0.003	0.003	0.000	0.017
Equity (retail)	2592	0.003	0.005	0.000	0.034
Bond (global)	2592	0.005	0.006	0.000	0.034
Equity (global)	2592	0.003	0.007	0.000	0.038
Bond (GEM)	2592	0.031	0.027	0.000	0.116
Equity (GEM)	2592	0.029	0.049	0.000	0.352
Bond (regional)	2592	0.000	0.001	0.000	0.006
Equity (regional)	2592	0.002	0.004	0.000	0.023
Bond (USD)	2592	0.002	0.002	0.000	0.012
Equity (USD)	2592	0.003	0.006	0.000	0.038
Bond (non-USD)	2592	0.003	0.004	0.000	0.034
Equity (non-USD)	2592	0.003	0.007	0.000	0.041
		$Q_{c,t}$ *LBS*			
Bond (Banks)	828	0.002	0.004	0.000	0.030
		$Inflows_{c,t}/GDP_{c,t}$			
Total	696	0.012	0.054	-0.265	0.593
Bond	672	0.011	0.053	-0.263	0.588
Equity	648	0.000	0.008	-0.037	0.055

Table A5b: Descriptive statistics (independent variables)

	N	Mean	SD	Min	Max
		Push factors			
VIX_t	105	0.167	0.065	0.101	0.577
$MPrate_{US,t}$	105	0.007	0.008	0.001	0.024
$ShMPrate_{US,t}$	105	-0.001	0.016	-0.030	0.025
$YieldCurve_{US,t}$	105	0.014	0.008	-0.005	0.028
$ShYieldCurve_{US,t}$	105	0.022	0.017	-0.004	0.056
$FRED_t$	105	-0.311	0.566	-0.911	3.753
		Pull factors			
		Monthly			
$MPrate_{c,t-1}$	2415	0.054	0.042	0.001	0.270
$Inflation_{c,t-1}$	2415	0.042	0.043	-0.016	0.260
$\Delta\log ExRate_{c,t-1}$	2415	-0.004	0.023	-0.104	0.053
$R_{c,t}$ *bond*	2415	0.004	0.024	-0.094	0.068
$R_{c,t}$ *equity*	2415	0.000	0.059	-0.221	0.149
R_t *bond*	105	0.002	0.012	-0.028	0.028
R_t *equity*	105	0.008	0.037	-0.095	0.086
		Quarterly			
$\Delta\log GDP_{c,t-1}$	638	0.033	0.025	-0.054	0.082
$\Delta\log NEER_{c,t-1}$	638	-0.006	0.034	-0.210	0.077
		Annual			
$GDPpc_{c,t-1}$	241	20.377	16.589	4.550	101.001
$PublicDebt_{c,t-1}$	241	0.492	0.254	0.034	1.219
$ChinnIto_{c,t-1}$	241	0.534	0.352	0.000	1.000
$CapitalControl_{c,t-1}$	241	0.470	0.308	0.000	1.000
		Pipes			
$IFP_{c,t}$	638	0.371	0.085	0.122	0.579

Table A6: List of countries included in the regressions for each dataset

CPIS (N=37)		EPFR (N=23)		BOP (N=29)	
Angola	Oman	Brazil	South Africa	Bolivia	Qatar
Brazil	Pakistan	Chile	Thailand	Brazil	Romania
Bulgaria	Paraguay	China	Turkey	Bulgaria	Russia
Chile	Peru	Colombia	Ukraine	Chile	Saudi Arabia
China	Philippines	Egypt		China	South Africa
Colombia	Poland	Hungary		Colombia	Sri Lanka
Croatia	Qatar	India		El Salvador	Thailand
Egypt	Romania	Indonesia		Guatemala	Turkey
El Salvador	Russia	Malaysia		Hungary	Ukraine
Georgia	Saudi Arabia	Mexico		India	Uruguay
Guatemala	South Africa	Morocco		Indonesia	
Hungary	Sri Lanka	Oman		Jamaica	
India	Thailand	Pakistan		Malaysia	
Indonesia	Tunisia	Peru		Mexico	
Jamaica	Turkey	Philippines		Morocco	
Kuwait	Ukraine	Poland		Paraguay	
Malaysia	Uruguay	Romania		Peru	
Mexico	Venezuela	Russia		Philippines	
Morocco		Saudi Arabia		Poland	

Table A7: Regressions on country shares with lagged returns using CPIS data. Semi-annual estimates

	CPIS					
	Bond			Equity		
$\Delta\log Q_{c,t}$	(1) Banks	(2) ICPFs	(3) OFCs-O	(4) Banks	(5) ICPFs	(6) OFCs-O
VIX_t	-0.751*	-0.836**	-1.292***	0.246	-1.466***	-1.580***
	(0.392)	(0.374)	(0.336)	(0.621)	(0.451)	(0.495)
$R_{c,t-1} - R_{t-1}$	1.122	0.0148	1.106**	-0.427	-0.0373	-0.0840
	(0.962)	(0.718)	(0.527)	(0.538)	(0.395)	(0.496)
$\Delta\log GDP_{c,t-1}$	0.837	5.010**	2.818*	1.974	2.571	1.717
	(1.171)	(1.897)	(1.447)	(1.349)	(2.600)	(1.844)
$GDPpc_{c,t-1}$	0.0153	-0.0309	0.00102	-0.0239	0.00162	0.0133
	(0.0143)	(0.0186)	(0.0135)	(0.0155)	(0.0212)	(0.0241)
$MPrate_{c,t-1}$	-1.304	2.596**	0.681	2.475**	-0.0309	2.337
	(2.186)	(1.073)	(0.558)	(1.149)	(1.822)	(1.987)
$Inflation_{c,t-1}$	0.0539	0.336	0.241	-0.377	0.781**	-0.570*
	(0.459)	(0.317)	(0.326)	(0.428)	(0.372)	(0.285)
$\Delta\log ExRate_{c,t-1}$	-0.499	-0.217	-0.635	0.363	0.638	-1.014
	(0.589)	(0.408)	(0.449)	(0.872)	(0.622)	(0.850)
$PublicDebt_{c,t-1}$	0.237	-0.232	-0.193	-0.276	0.0962	0.190
	(0.203)	(0.207)	(0.283)	(0.373)	(0.218)	(0.399)
$ChinnIto_{c,t-1}$	-0.301**	-0.189	-0.342	0.529	-0.426	-0.769
	(0.125)	(0.293)	(0.314)	(0.382)	(0.312)	(0.544)
Constant	-0.0927	0.754*	0.379	0.0821	0.268	0.158
	(0.280)	(0.380)	(0.377)	(0.350)	(0.369)	(0.634)
Observations	518	518	518	518	518	518
R-squared	0.025	0.063	0.077	0.043	0.046	0.036

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 37 countries observed in the 2014s1-2020s2 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Regressions on country shares using CPIS data and excluding China. Semi-annual estimates

	CPIS					
	Bond			Equity		
$\Delta\log Q_{c,t}$	(1) Banks	(2) ICPFs	(3) OFCs-O	(4) Banks	(5) ICPFs	(6) OFCs-O
VIX_t	-0.768*	-1.042***	-1.364***	0.326	-1.383***	-1.554***
	(0.379)	(0.355)	(0.335)	(0.660)	(0.470)	(0.479)
$R_{c,t} - R_t$	2.370**	3.844***	2.046**	0.262	1.059**	0.957***
	(0.920)	(0.846)	(0.884)	(0.240)	(0.517)	(0.262)
$\Delta\log GDP_{c,t-1}$	0.307	4.796**	2.645*	1.934	2.192	1.331
	(1.192)	(2.122)	(1.455)	(1.198)	(2.640)	(2.073)
$GDPpc_{c,t-1}$	0.0259	-0.0187	0.000899	-0.0291*	0.00648	0.0199
	(0.0161)	(0.0176)	(0.0118)	(0.0160)	(0.0233)	(0.0245)
$MPrate_{c,t-1}$	-1.869	1.553	0.260	2.464*	-0.650	1.705
	(2.316)	(1.052)	(0.498)	(1.297)	(1.891)	(1.939)
$Inflation_{c,t-1}$	0.0221	0.404	0.205	-0.330	0.831**	-0.544
	(0.537)	(0.311)	(0.328)	(0.450)	(0.383)	(0.339)
$\Delta\log ExRate_{c,t-1}$	-0.477	-0.397	-0.619	-0.0629	0.375	-1.341**
	(0.622)	(0.433)	(0.448)	(0.604)	(0.391)	(0.604)
$PublicDebt_{c,t-1}$	0.283	-0.0918	-0.138	-0.353	0.0738	0.202
	(0.170)	(0.184)	(0.241)	(0.312)	(0.187)	(0.358)
$ChinnIto_{c,t-1}$	-0.240	-0.0761	-0.284	0.610*	-0.319	-0.695
	(0.153)	(0.248)	(0.327)	(0.350)	(0.363)	(0.571)
Constant	-0.322	0.459	0.363	0.157	0.151	0.00927
	(0.296)	(0.367)	(0.351)	(0.339)	(0.395)	(0.628)
Observations	504	504	504	504	504	504
R-squared	0.031	0.098	0.089	0.043	0.063	0.045

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 36 countries observed in the 2014s1-2020s2 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Regressions on country shares using CPIS and EPFR data. Semi-annual estimates

	OFCs-O			
	CPIS		EPFR	
$\Delta\log Q_{c,t}$	(1) Bond	(2) Equity	(3) Bond	(4) Equity
VIX_t	-1.162***	-0.993**	-0.990***	-0.604***
	(0.343)	(0.389)	(0.339)	(0.171)
$R_{c,t} - R_t$	1.401**	0.834***	1.529***	0.405***
	(0.508)	(0.200)	(0.352)	(0.138)
$\Delta\log GDP_{c,t-1}$	0.837	1.081	0.344	0.225
	(1.404)	(1.567)	(1.491)	(0.901)
$GDPpc_{c,t-1}$	0.0263	-0.0171	0.0286**	-0.0185
	(0.0184)	(0.0157)	(0.0120)	(0.0177)
$MPrate_{c,t-1}$	-0.825	-0.0681	-0.418	-1.240
	(1.158)	(0.873)	(1.450)	(1.430)
$Inflation_{c,t-1}$	0.821	2.079**	1.058*	0.885
	(1.327)	(0.869)	(0.551)	(0.880)
$\Delta\log ExRate_{c,t-1}$	-0.695	-0.416	-0.390	-0.585**
	(0.493)	(0.293)	(0.327)	(0.224)
$PublicDebt_{c,t-1}$	-0.396	0.247	0.111	-0.176
	(0.404)	(0.507)	(0.251)	(0.262)
$ChinnIto_{c,t-1}$	-0.516	-0.268	-0.159	-0.223
	(0.344)	(0.323)	(0.282)	(0.182)
Constant	0.131	0.366	-0.374	0.625
	(0.486)	(0.424)	(0.267)	(0.372)
Observations	322	322	322	322
R-squared	0.123	0.112	0.190	0.096

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2014s1-2020s2 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A10: Regressions on bond country shares with EPFR data excluding the Covid-19 shock. Monthly estimates

	Bond										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.200***	-0.185**	-0.232***	-0.391***	-0.247***	-0.151*	0.521***	-0.146*	-0.262	-0.266***	-0.0253
	(0.0690)	(0.0688)	(0.0785)	(0.0757)	(0.0714)	(0.0800)	(0.164)	(0.0784)	(0.159)	(0.0690)	(0.0916)
$MPrate_{US,t}$	-1.700***	-1.695***	-1.801***	-2.210***	-1.393***	-2.285***	-0.292	-0.280	-1.368	-1.617***	-2.665***
	(0.453)	(0.449)	(0.490)	(0.430)	(0.439)	(0.532)	(1.112)	(0.457)	(1.147)	(0.441)	(0.580)
$YieldCurve_{US,t}$	-2.244***	-2.227***	-1.927***	-2.396***	-1.789***	-2.903***	-0.532	-0.171	-2.503*	-2.068***	-3.591***
	(0.525)	(0.529)	(0.530)	(0.465)	(0.499)	(0.609)	(1.174)	(0.432)	(1.281)	(0.503)	(0.681)
$R_{c,t} - R_t$	1.043***	0.990***	1.391***	1.401***	1.078***	1.023***	0.942***	1.311***	0.529**	1.123***	0.808***
	(0.164)	(0.163)	(0.162)	(0.164)	(0.176)	(0.165)	(0.309)	(0.238)	(0.203)	(0.169)	(0.172)
$\Delta\log GDP_{c,t-1}$	0.0524	0.0551	0.101	0.133	0.0517	0.102	0.0158	-0.0612	0.0409	0.0589	0.174
	(0.133)	(0.135)	(0.120)	(0.137)	(0.138)	(0.122)	(0.198)	(0.205)	(0.298)	(0.133)	(0.116)
$MPrate_{c,t-1}$	0.0174	0.0164	0.0431	0.0551	0.0233	0.0139	-0.192	0.00966	-0.545**	0.0326	-0.0401
	(0.144)	(0.143)	(0.153)	(0.143)	(0.145)	(0.160)	(0.233)	(0.149)	(0.261)	(0.142)	(0.173)
$Inflation_{c,t-1}$	0.112	0.105	0.157*	0.142	0.135	0.104	0.259	0.148	0.616*	0.125	0.140
	(0.0835)	(0.0841)	(0.0858)	(0.0907)	(0.0912)	(0.0822)	(0.163)	(0.100)	(0.322)	(0.0837)	(0.102)
$\Delta\log ExRate_{c,t-1}$	0.0535	0.0511	0.0182	0.104	0.0169	0.0775	0.00164	-0.0750	0.393*	0.0475	0.0445
	(0.0953)	(0.0976)	(0.0997)	(0.108)	(0.105)	(0.108)	(0.179)	(0.0951)	(0.200)	(0.0982)	(0.134)
$Constant$	0.0723***	0.0697***	0.0763***	0.104***	0.0691***	0.0790***	-0.0659	0.0253	0.0963**	0.0778***	0.0712**
	(0.0244)	(0.0243)	(0.0249)	(0.0232)	(0.0241)	(0.0271)	(0.0498)	(0.0216)	(0.0457)	(0.0237)	(0.0287)
Observations	2139	2139	2139	2139	2139	2139	1868	2139	1721	2139	2139
R-squared	0.048	0.044	0.057	0.079	0.050	0.044	0.016	0.042	0.018	0.054	0.033

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2019m12 period.
Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A11: Regressions on equity country shares with EPFR data excluding the Covid-19 shock. Monthly estimates

	Equity										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.119	-0.0994	-0.170	-0.163	-0.126	-0.108	0.0647	-0.159	0.0563	-0.118	-0.137
	(0.103)	(0.101)	(0.105)	(0.105)	(0.107)	(0.0988)	(0.137)	(0.121)	(0.0511)	(0.104)	(0.109)
$MPrate_{US,t}$	-1.111***	-1.218***	-1.058**	-0.886*	-1.104***	-1.177***	-0.122	-0.503	-0.363	-1.133***	-1.167***
	(0.280)	(0.273)	(0.379)	(0.428)	(0.307)	(0.265)	(0.964)	(0.341)	(0.357)	(0.287)	(0.289)
$YieldCurve_{US,t}$	-1.423***	-1.527***	-1.444***	-1.423***	-1.532***	-1.294***	-0.995	-0.0736	-1.227***	-1.455***	-1.373***
	(0.278)	(0.308)	(0.348)	(0.378)	(0.310)	(0.290)	(1.029)	(0.340)	(0.332)	(0.292)	(0.292)
$R_{c,t} - R_t$	0.571***	0.558***	0.603***	0.611***	0.576***	0.563***	0.808***	0.438***	0.755***	0.575***	0.531***
	(0.0859)	(0.0831)	(0.0928)	(0.0972)	(0.0893)	(0.0767)	(0.141)	(0.100)	(0.0619)	(0.0890)	(0.0781)
$\Delta\log GDP_{c,t-1}$	-0.137	-0.140	-0.183	-0.164	-0.148	-0.181	0.0854	-0.235**	-0.00877	-0.154	-0.116
	(0.101)	(0.103)	(0.107)	(0.105)	(0.106)	(0.111)	(0.225)	(0.0943)	(0.112)	(0.102)	(0.112)
$MPrate_{c,t-1}$	-0.0892	-0.0697	-0.170	-0.164	-0.139	-0.0594	0.259	-0.210	-0.0171	-0.119	-0.0555
	(0.0899)	(0.0835)	(0.104)	(0.109)	(0.111)	(0.0785)	(0.184)	(0.176)	(0.0614)	(0.0992)	(0.0984)
$Inflation_{c,t-1}$	0.0725	0.0622	0.101**	0.105*	0.0864*	0.0579	-0.0124	0.0627	0.0907*	0.0782	0.0662
	(0.0444)	(0.0440)	(0.0474)	(0.0507)	(0.0456)	(0.0482)	(0.118)	(0.0787)	(0.0519)	(0.0464)	(0.0550)
$\Delta\log ExRate_{c,t-1}$	-0.261***	-0.279***	-0.203***	-0.155**	-0.214***	-0.316***	-0.541**	-0.147*	-0.291***	-0.250***	-0.276***
	(0.0630)	(0.0648)	(0.0640)	(0.0661)	(0.0660)	(0.0736)	(0.193)	(0.0776)	(0.0526)	(0.0590)	(0.0858)
$Constant$	0.0483**	0.0482*	0.0601**	0.0552**	0.0531**	0.0450*	-0.0252	0.0457	-0.00669	0.0516**	0.0454*
	(0.0231)	(0.0235)	(0.0240)	(0.0245)	(0.0247)	(0.0222)	(0.0275)	(0.0302)	(0.0119)	(0.0236)	(0.0260)
Observations	2139	2139	2139	2139	2139	2139	1868	2139	1868	2139	2139
R-squared	0.069	0.067	0.068	0.068	0.065	0.067	0.041	0.027	0.206	0.066	0.057

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2019m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A12: Regressions on bond country shares with the financial stress index using EPFR data. Monthly estimates

	Bond										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
$FRED_t$	-0.0351***	-0.0330***	-0.0403***	-0.0470***	-0.0363***	-0.0331***	-0.0119	-0.00799	-0.0424***	-0.0375***	-0.0288***
	(0.00493)	(0.00490)	(0.00530)	(0.00477)	(0.00495)	(0.00512)	(0.00890)	(0.00590)	(0.00737)	(0.00500)	(0.00533)
$MPrate_{US,t}$	-2.208***	-2.152***	-2.284***	-2.819***	-2.160***	-2.230***	-1.845*	-0.504	-1.552	-2.288***	-2.314***
	(0.420)	(0.413)	(0.466)	(0.410)	(0.418)	(0.455)	(0.890)	(0.530)	(0.973)	(0.410)	(0.494)
$YieldCurve_{US,t}$	-2.549***	-2.498***	-2.230***	-2.755***	-2.431***	-2.617***	-2.071**	-0.389	-2.394**	-2.551***	-3.098***
	(0.376)	(0.372)	(0.432)	(0.361)	(0.365)	(0.426)	(0.876)	(0.436)	(1.060)	(0.362)	(0.501)
$R_{c,t} - R_t$	0.923***	0.874***	1.239***	1.241***	0.942***	0.875***	0.665**	1.149***	0.393	0.986***	0.716***
	(0.160)	(0.159)	(0.159)	(0.158)	(0.165)	(0.154)	(0.248)	(0.197)	(0.256)	(0.162)	(0.158)
$\Delta\log GDP_{c,t-1}$	0.110*	0.121**	0.0765	0.125**	0.0802	0.164***	0.0127	0.0217	0.101	0.0961*	0.210***
	(0.0535)	(0.0545)	(0.0561)	(0.0594)	(0.0599)	(0.0478)	(0.0888)	(0.0924)	(0.160)	(0.0549)	(0.0560)
$MPrate_{c,t-1}$	0.109	0.120	0.0817	0.101	0.0822	0.152	-0.0910	0.0567	-0.257	0.0960	0.133
	(0.114)	(0.113)	(0.132)	(0.130)	(0.114)	(0.121)	(0.147)	(0.121)	(0.296)	(0.113)	(0.131)
$Inflation_{c,t-1}$	0.0929	0.0801	0.139	0.135	0.116	0.0721	0.258	0.138	0.426	0.112	0.0914
	(0.0768)	(0.0759)	(0.0894)	(0.0931)	(0.0857)	(0.0713)	(0.157)	(0.107)	(0.403)	(0.0814)	(0.0827)
$\Delta\log ExRate_{c,t-1}$	0.00226	-0.00358	-0.000665	0.0652	-0.0248	0.0373	-0.0255	-0.0561	0.323	0.00332	-0.00192
	(0.0891)	(0.0916)	(0.0870)	(0.0887)	(0.0878)	(0.0938)	(0.148)	(0.0809)	(0.218)	(0.0862)	(0.117)
$Constant$	0.0294***	0.0280***	0.0314***	0.0331***	0.0281***	0.0281***	0.0386**	-0.000433	0.0278	0.0297***	0.0345***
	(0.00647)	(0.00651)	(0.00703)	(0.00588)	(0.00599)	(0.00749)	(0.0160)	(0.00560)	(0.0217)	(0.00604)	(0.00865)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	1980	2415	2415
R-squared	0.068	0.061	0.077	0.105	0.072	0.058	0.012	0.040	0.023	0.076	0.040

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A13: Regressions on equity country shares with the financial stress index using EPFR data. Monthly estimates

	Equity										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
$FRED_t$	-0.0223***	-0.0205***	-0.0241***	-0.0253***	-0.0234***	-0.0207***	-0.0122	-0.0114**	-0.0251***	-0.0230***	-0.0204***
	(0.00401)	(0.00409)	(0.00392)	(0.00387)	(0.00394)	(0.00448)	(0.00974)	(0.00457)	(0.00335)	(0.00399)	(0.00458)
$MPrate_{US,t}$	-1.225***	-1.251***	-1.114***	-0.921**	-1.147***	-1.410***	-1.164	-0.215	-0.751**	-1.175***	-1.386***
	(0.303)	(0.288)	(0.366)	(0.401)	(0.314)	(0.305)	(0.842)	(0.309)	(0.314)	(0.306)	(0.299)
$YieldCurve_{US,t}$	-1.310***	-1.337***	-1.244***	-1.193***	-1.329***	-1.347***	-1.853**	0.400	-1.538***	-1.252***	-1.401***
	(0.276)	(0.281)	(0.330)	(0.343)	(0.304)	(0.270)	(0.881)	(0.349)	(0.261)	(0.298)	(0.262)
$R_{c,t} - R_t$	0.513***	0.499***	0.543***	0.554***	0.520***	0.501***	0.668***	0.427***	0.691***	0.520***	0.466***
	(0.0849)	(0.0821)	(0.0918)	(0.0961)	(0.0881)	(0.0766)	(0.129)	(0.0983)	(0.0566)	(0.0874)	(0.0791)
$\Delta\log GDP_{c,t-1}$	-0.0452	-0.0377	-0.0673	-0.0538	-0.0460	-0.0692	-0.0912	-0.0280	0.0432	-0.0637	-0.000846
	(0.0810)	(0.0813)	(0.0811)	(0.0742)	(0.0794)	(0.0903)	(0.173)	(0.0462)	(0.0767)	(0.0775)	(0.0691)
$MPrate_{c,t-1}$	-0.0887	-0.0645	-0.163	-0.162	-0.126	-0.0773	0.0578	-0.103	0.00337	-0.109	-0.0340
	(0.137)	(0.135)	(0.156)	(0.160)	(0.157)	(0.137)	(0.112)	(0.148)	(0.0570)	(0.145)	(0.117)
$Inflation_{c,t-1}$	0.0749	0.0650	0.103	0.108	0.0888	0.0563	-0.0878	0.0978	0.0837	0.0786	0.0762
	(0.0605)	(0.0598)	(0.0645)	(0.0684)	(0.0601)	(0.0630)	(0.108)	(0.0884)	(0.0615)	(0.0625)	(0.0672)
$\Delta\log ExRate_{c,t-1}$	-0.306***	-0.329***	-0.236***	-0.190***	-0.255***	-0.359***	-0.522**	-0.204***	-0.325***	-0.282***	-0.302***
	(0.0579)	(0.0564)	(0.0621)	(0.0602)	(0.0602)	(0.0655)	(0.197)	(0.0714)	(0.0533)	(0.0577)	(0.0641)
Constant	0.0159*	0.0172*	0.0164	0.0117	0.0162*	0.0193*	0.0222	-0.00876	-0.00378	0.0168*	0.0121
	(0.00861)	(0.00873)	(0.00960)	(0.0101)	(0.00916)	(0.00965)	(0.0144)	(0.00530)	(0.00692)	(0.00853)	(0.00708)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	2132	2415	2415
R-squared	0.069	0.065	0.068	0.071	0.066	0.065	0.031	0.030	0.190	0.068	0.053

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A14: Regressions on bond country shares with lagged returns using EPFR data. Monthly estimates

	Bond										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.274***	-0.255***	-0.342***	-0.415***	-0.273***	-0.272***	0.110	-0.0479	-0.389***	-0.296***	-0.224***
	(0.0534)	(0.0534)	(0.0566)	(0.0542)	(0.0530)	(0.0554)	(0.0992)	(0.0621)	(0.0875)	(0.0537)	(0.0554)
$MPrate_{US,t}$	-2.206***	-2.138***	-2.452***	-3.077***	-2.099***	-2.301***	-0.734	-0.481	-1.806	-2.302***	-2.306***
	(0.463)	(0.457)	(0.510)	(0.457)	(0.451)	(0.509)	(0.992)	(0.537)	(1.098)	(0.449)	(0.537)
$YieldCurve_{US,t}$	-2.798***	-2.720***	-2.719***	-3.371***	-2.623***	-2.932***	-0.895	-0.501	-2.901**	-2.834***	-3.294***
	(0.487)	(0.486)	(0.517)	(0.463)	(0.466)	(0.536)	(0.992)	(0.509)	(1.231)	(0.464)	(0.600)
$R_{c,t-1} - R_{t-1}$	-0.0621	-0.0920	0.0629	0.0735	-0.0733	-0.0522	-0.0680	0.0111	0.443	-0.0344	-0.143
	(0.145)	(0.141)	(0.180)	(0.138)	(0.142)	(0.150)	(0.235)	(0.152)	(0.408)	(0.145)	(0.160)
$\Delta\log GDP_{c,t-1}$	0.0420	0.0575	0.00640	0.0290	0.0106	0.0990*	0.0219	0.00998	-0.0191	0.0234	0.152**
	(0.0607)	(0.0625)	(0.0592)	(0.0696)	(0.0685)	(0.0497)	(0.0929)	(0.0964)	(0.162)	(0.0630)	(0.0573)
$MPrate_{c,t-1}$	0.110	0.123	0.0943	0.0893	0.0834	0.151	-0.0180	0.102	-0.413	0.0952	0.133
	(0.108)	(0.105)	(0.125)	(0.127)	(0.112)	(0.112)	(0.126)	(0.132)	(0.285)	(0.109)	(0.119)
$Inflation_{c,t-1}$	0.0585	0.0466	0.0956	0.0932	0.0806	0.0398	0.227	0.118	0.465	0.0760	0.0625
	(0.0899)	(0.0872)	(0.108)	(0.106)	(0.0990)	(0.0843)	(0.151)	(0.112)	(0.378)	(0.0943)	(0.0952)
$\Delta\log ExRate_{c,t-1}$	0.0224	0.0222	-0.0190	0.0446	0.00256	0.0494	0.0656	-0.0342	0.241	0.0181	0.0315
	(0.0804)	(0.0840)	(0.0735)	(0.0860)	(0.0795)	(0.0835)	(0.134)	(0.0879)	(0.160)	(0.0773)	(0.108)
$Constant$	0.0930***	0.0871***	0.112***	0.133***	0.0909***	0.0921***	-0.00311	0.0105	0.125***	0.0986***	0.0866***
	(0.0188)	(0.0189)	(0.0195)	(0.0182)	(0.0181)	(0.0201)	(0.0317)	(0.0199)	(0.0357)	(0.0183)	(0.0209)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	1980	2415	2415
R-squared	0.036	0.033	0.037	0.059	0.036	0.034	0.009	0.015	0.022	0.039	0.027

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A15: Regressions on equity country shares with lagged returns using EPFR data. Monthly estimates

	Equity										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.188***	-0.167***	-0.235***	-0.253***	-0.203***	-0.169***	-0.0362	-0.135**	-0.175***	-0.199***	-0.164***
	(0.0462)	(0.0458)	(0.0478)	(0.0477)	(0.0467)	(0.0482)	(0.0910)	(0.0520)	(0.0352)	(0.0472)	(0.0496)
$MPrate_{US,t}$	-1.376***	-1.373***	-1.442***	-1.290**	-1.332***	-1.529***	-1.049	-0.530	-0.818*	-1.353***	-1.491***
	(0.369)	(0.341)	(0.451)	(0.493)	(0.391)	(0.346)	(0.889)	(0.389)	(0.404)	(0.378)	(0.345)
$YieldCurve_{US,t}$	-1.595***	-1.574***	-1.749***	-1.752***	-1.658***	-1.588***	-1.750*	-0.0272	-1.688***	-1.574***	-1.610***
	(0.350)	(0.345)	(0.417)	(0.437)	(0.379)	(0.334)	(0.864)	(0.401)	(0.417)	(0.366)	(0.338)
$R_{c,t-1} - R_{t-1}$	0.105*	0.0758	0.170***	0.184***	0.116**	0.0945	0.0487	0.123*	0.0325	0.122**	0.0452
	(0.0554)	(0.0552)	(0.0543)	(0.0534)	(0.0501)	(0.0628)	(0.131)	(0.0613)	(0.0698)	(0.0527)	(0.0637)
$\Delta\log GDP_{c,t-1}$	-0.0526	-0.0380	-0.0852	-0.0762	-0.0575	-0.0715	-0.0314	-0.0288	0.0617	-0.0745	-0.00268
	(0.0841)	(0.0846)	(0.0840)	(0.0775)	(0.0829)	(0.0933)	(0.181)	(0.0523)	(0.0824)	(0.0808)	(0.0761)
$MPrate_{c,t-1}$	-0.102	-0.0744	-0.180	-0.183	-0.142	-0.0866	0.106	-0.106	0.00615	-0.124	-0.0478
	(0.128)	(0.128)	(0.144)	(0.146)	(0.147)	(0.129)	(0.133)	(0.141)	(0.0762)	(0.135)	(0.113)
$Inflation_{c,t-1}$	0.100	0.0925	0.124*	0.129*	0.114*	0.0820	-0.0508	0.113	0.124	0.103	0.105
	(0.0651)	(0.0653)	(0.0636)	(0.0625)	(0.0589)	(0.0713)	(0.148)	(0.0670)	(0.110)	(0.0633)	(0.0679)
$\Delta\log ExRate_{c,t-1}$	-0.236*	-0.229*	-0.245*	-0.217*	-0.199	-0.279**	-0.314	-0.261**	-0.0834	-0.232*	-0.175
	(0.125)	(0.121)	(0.131)	(0.125)	(0.121)	(0.131)	(0.332)	(0.110)	(0.0918)	(0.122)	(0.121)
$Constant$	0.0590***	0.0549***	0.0727***	0.0727***	0.0633***	0.0575***	0.0245	0.0245	0.0342**	0.0628***	0.0490***
	(0.0165)	(0.0164)	(0.0180)	(0.0186)	(0.0174)	(0.0170)	(0.0291)	(0.0170)	(0.0131)	(0.0170)	(0.0167)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	2132	2415	2415
R-squared	0.014	0.012	0.018	0.020	0.014	0.013	0.005	0.010	0.028	0.014	0.011

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A16: Regressions on bond country shares using EPFR data and excluding China. Monthly estimates

	Bond										
$\Delta \log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.294***	-0.275***	-0.363***	-0.440***	-0.295***	-0.290***	0.118	-0.0678	-0.393***	-0.318***	-0.239***
	(0.0549)	(0.0550)	(0.0584)	(0.0539)	(0.0541)	(0.0574)	(0.103)	(0.0632)	(0.0868)	(0.0547)	(0.0582)
$MPrate_{US,t}$	-2.245***	-2.176***	-2.527***	-3.147***	-2.124***	-2.366***	-0.651	-0.479	-1.759	-2.329***	-2.346***
	(0.471)	(0.463)	(0.527)	(0.459)	(0.458)	(0.521)	(1.036)	(0.545)	(1.165)	(0.458)	(0.554)
$YieldCurve_{US,t}$	-2.729***	-2.670***	-2.589***	-3.272***	-2.534***	-2.898***	-0.732	-0.398	-2.899**	-2.745***	-3.259***
	(0.491)	(0.486)	(0.544)	(0.470)	(0.467)	(0.546)	(1.030)	(0.516)	(1.304)	(0.472)	(0.610)
$R_{c,t} - R_t$	0.998***	0.949***	1.297***	1.281***	1.031***	0.933***	0.920***	1.180***	0.433	1.064***	0.779***
	(0.144)	(0.143)	(0.144)	(0.146)	(0.149)	(0.140)	(0.227)	(0.197)	(0.277)	(0.146)	(0.145)
$\Delta \log GDP_{c,t-1}$	0.0265	0.0432	-0.0116	0.00963	-0.00792	0.0883*	0.0103	-0.00172	-0.0332	0.00565	0.141**
	(0.0595)	(0.0611)	(0.0584)	(0.0677)	(0.0668)	(0.0493)	(0.100)	(0.0935)	(0.164)	(0.0615)	(0.0568)
$MPrate_{c,t-1}$	0.0336	0.0465	0.0141	0.00534	0.00600	0.0788	-0.0670	0.0371	-0.451	0.0173	0.0607
	(0.111)	(0.109)	(0.126)	(0.126)	(0.114)	(0.116)	(0.133)	(0.127)	(0.275)	(0.111)	(0.126)
$Inflation_{c,t-1}$	0.0925	0.0822	0.128	0.128	0.112	0.0755	0.240	0.134	0.480	0.110	0.0966
	(0.0848)	(0.0830)	(0.0975)	(0.0988)	(0.0932)	(0.0805)	(0.149)	(0.108)	(0.366)	(0.0889)	(0.0926)
$\Delta \log ExRate_{c,t-1}$	0.0154	0.00804	0.00852	0.0691	-0.00583	0.0431	0.0516	-0.0588	0.337	0.0180	0.00446
	(0.0832)	(0.0860)	(0.0824)	(0.0863)	(0.0830)	(0.0865)	(0.136)	(0.0834)	(0.212)	(0.0810)	(0.110)
$Constant$	0.0981***	0.0924***	0.117***	0.139***	0.0961***	0.0972***	-0.00580	0.0145	0.126***	0.104***	0.0910***
	(0.0188)	(0.0188)	(0.0200)	(0.0179)	(0.0181)	(0.0202)	(0.0318)	(0.0199)	(0.0371)	(0.0183)	(0.0210)
Observations	2310	2310	2310	2310	2310	2310	2027	2310	1875	2310	2310
R-squared	0.064	0.058	0.077	0.105	0.068	0.056	0.014	0.040	0.022	0.072	0.038

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 22 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A17: Regressions on equity country shares using EPFR data and excluding China. Monthly estimates

	Equity										
$\Delta\log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.198***	-0.181***	-0.236***	-0.252***	-0.212***	-0.180***	-0.0526	-0.137**	-0.199***	-0.206***	-0.182***
	(0.0465)	(0.0466)	(0.0476)	(0.0478)	(0.0472)	(0.0482)	(0.0864)	(0.0539)	(0.0297)	(0.0470)	(0.0523)
$MPrate_{US,t}$	-1.340***	-1.358***	-1.363***	-1.198**	-1.288***	-1.501***	-1.025	-0.463	-0.742*	-1.307***	-1.489***
	(0.367)	(0.350)	(0.443)	(0.487)	(0.384)	(0.360)	(0.953)	(0.392)	(0.356)	(0.371)	(0.369)
$YieldCurve_{US,t}$	-1.503***	-1.510***	-1.599***	-1.589***	-1.557***	-1.505***	-1.771*	0.120	-1.633***	-1.460***	-1.593***
	(0.351)	(0.358)	(0.410)	(0.433)	(0.377)	(0.343)	(0.935)	(0.420)	(0.327)	(0.365)	(0.358)
$R_{c,t} - R_t$	0.528***	0.513***	0.557***	0.568***	0.536***	0.515***	0.684***	0.434***	0.714***	0.536***	0.476***
	(0.0886)	(0.0854)	(0.0958)	(0.100)	(0.0921)	(0.0794)	(0.138)	(0.102)	(0.0586)	(0.0914)	(0.0821)
$\Delta\log GDP_{c,t-1}$	-0.0900	-0.0771	-0.118	-0.110	-0.0949	-0.108	-0.0773	-0.0633	0.00135	-0.111	-0.0425
	(0.0815)	(0.0826)	(0.0805)	(0.0732)	(0.0796)	(0.0922)	(0.182)	(0.0460)	(0.0810)	(0.0778)	(0.0707)
$MPrate_{c,t-1}$	-0.120	-0.0901	-0.201	-0.207	-0.161	-0.103	0.0718	-0.122	-0.0276	-0.141	-0.0656
	(0.137)	(0.136)	(0.154)	(0.157)	(0.157)	(0.138)	(0.134)	(0.148)	(0.0471)	(0.144)	(0.118)
$Inflation_{c,t-1}$	0.0689	0.0585	0.0986*	0.105*	0.0831	0.0503	-0.0897	0.0875	0.0774	0.0719	0.0721
	(0.0526)	(0.0529)	(0.0544)	(0.0565)	(0.0508)	(0.0567)	(0.108)	(0.0853)	(0.0646)	(0.0534)	(0.0606)
$\Delta\log ExRate_{c,t-1}$	-0.310***	-0.334***	-0.248***	-0.204***	-0.260***	-0.362***	-0.514**	-0.219***	-0.329***	-0.287***	-0.305***
	(0.0547)	(0.0535)	(0.0581)	(0.0567)	(0.0567)	(0.0630)	(0.191)	(0.0667)	(0.0527)	(0.0541)	(0.0634)
$Constant$	0.0622***	0.0593***	0.0733***	0.0729***	0.0661***	0.0608***	0.0309	0.0253	0.0410***	0.0651***	0.0549***
	(0.0177)	(0.0180)	(0.0188)	(0.0196)	(0.0186)	(0.0185)	(0.0293)	(0.0179)	(0.0124)	(0.0180)	(0.0184)
Observations	2310	2310	2310	2310	2310	2310	2027	2310	2027	2310	2310
R-squared	0.068	0.064	0.069	0.072	0.066	0.064	0.031	0.031	0.189	0.067	0.052

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 22 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A18: Regressions on bond country shares with the shadow funds rate using EPFR data. Monthly estimates

	Bond										
$\Delta \log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.297***	-0.278***	-0.364***	-0.438***	-0.296***	-0.294***	0.110	-0.0662	-0.385***	-0.317***	-0.254***
	(0.0544)	(0.0545)	(0.0579)	(0.0541)	(0.0538)	(0.0567)	(0.0995)	(0.0618)	(0.0840)	(0.0544)	(0.0570)
$ShMPrate_{US,t}$	-2.274***	-2.210***	-2.436***	-3.063***	-2.163***	-2.374***	-0.853	-0.503	-1.930*	-2.376***	-2.373***
	(0.436)	(0.428)	(0.492)	(0.425)	(0.423)	(0.488)	(0.945)	(0.508)	(1.088)	(0.423)	(0.522)
$ShYieldCurve_{US,t}$	-2.557***	-2.485***	-2.603***	-3.245***	-2.407***	-2.675***	-0.761	-0.481	-2.349*	-2.603***	-2.941***
	(0.448)	(0.441)	(0.503)	(0.429)	(0.427)	(0.503)	(0.989)	(0.485)	(1.136)	(0.432)	(0.545)
$R_{c,t} - R_t$	0.991***	0.940***	1.284***	1.279***	1.020***	0.931***	0.869***	1.155***	0.474*	1.054***	0.791***
	(0.147)	(0.146)	(0.146)	(0.147)	(0.152)	(0.143)	(0.229)	(0.197)	(0.270)	(0.149)	(0.148)
$\Delta \log GDP_{c,t-1}$	0.0333	0.0492	-0.00477	0.0186	0.00141	0.0909*	0.0136	0.00830	-0.0252	0.0134	0.148**
	(0.0580)	(0.0595)	(0.0585)	(0.0651)	(0.0650)	(0.0489)	(0.0926)	(0.0919)	(0.159)	(0.0602)	(0.0559)
$MPrate_{c,t-1}$	0.0424	0.0581	0.00156	-0.00102	0.0125	0.0891	-0.0742	0.0424	-0.407	0.0243	0.0813
	(0.110)	(0.108)	(0.129)	(0.127)	(0.112)	(0.116)	(0.129)	(0.126)	(0.271)	(0.109)	(0.129)
$Inflation_{c,t-1}$	0.0939	0.0807	0.144	0.141	0.118	0.0721	0.249	0.140	0.458	0.113	0.0903
	(0.0846)	(0.0822)	(0.100)	(0.0991)	(0.0930)	(0.0800)	(0.150)	(0.108)	(0.362)	(0.0886)	(0.0930)
$\Delta \log ExRate_{c,t-1}$	0.0223	0.0160	0.00985	0.0737	0.00160	0.0502	0.0833	-0.0530	0.347	0.0266	0.00441
	(0.0837)	(0.0864)	(0.0834)	(0.0884)	(0.0838)	(0.0865)	(0.133)	(0.0848)	(0.212)	(0.0819)	(0.107)
$Constant$	0.0986***	0.0926***	0.119***	0.139***	0.0967***	0.0973***	-0.00217	0.0154	0.122***	0.104***	0.0932***
	(0.0184)	(0.0184)	(0.0195)	(0.0177)	(0.0177)	(0.0197)	(0.0312)	(0.0191)	(0.0353)	(0.0179)	(0.0205)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	1980	2415	2415
R-squared	0.064	0.058	0.076	0.105	0.067	0.057	0.014	0.040	0.021	0.072	0.041

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A19: Regressions on equity country shares with the shadow funds rate using EPFR data. Monthly estimates

	Equity										
$\Delta \log Q_{c,t}$	(1) All	(2) Active	(3) Passive	(4) ETFs	(5) Institutional	(6) Retail	(7) Global	(8) GEM	(9) Regional	(10) USD	(11) NON-USD
VIX_t	-0.190***	-0.173***	-0.230***	-0.247***	-0.205***	-0.171***	-0.0544	-0.121**	-0.204***	-0.199***	-0.172***
	(0.0440)	(0.0441)	(0.0450)	(0.0452)	(0.0447)	(0.0453)	(0.0840)	(0.0512)	(0.0289)	(0.0446)	(0.0494)
$ShMPrate_{US,t}$	-1.403***	-1.429***	-1.403***	-1.260**	-1.366***	-1.545***	-1.142	-0.446	-0.867**	-1.364***	-1.571***
	(0.358)	(0.349)	(0.422)	(0.459)	(0.376)	(0.353)	(0.832)	(0.392)	(0.319)	(0.364)	(0.363)
$ShYieldCurve_{US,t}$	-1.376***	-1.384***	-1.450***	-1.374***	-1.383***	-1.442***	-1.364	-0.0446	-1.309***	-1.340***	-1.475***
	(0.325)	(0.320)	(0.392)	(0.427)	(0.345)	(0.319)	(0.852)	(0.377)	(0.308)	(0.334)	(0.330)
$R_{c,t} - R_t$	0.521***	0.506***	0.550***	0.560***	0.528***	0.509***	0.669***	0.434***	0.697***	0.528***	0.473***
	(0.0840)	(0.0810)	(0.0908)	(0.0948)	(0.0874)	(0.0752)	(0.130)	(0.0969)	(0.0568)	(0.0867)	(0.0778)
$\Delta \log GDP_{c,t-1}$	-0.0930	-0.0805	-0.121	-0.112	-0.0977	-0.112	-0.0857	-0.0658	0.00403	-0.114	-0.0457
	(0.0789)	(0.0798)	(0.0786)	(0.0717)	(0.0768)	(0.0902)	(0.177)	(0.0497)	(0.0816)	(0.0747)	(0.0707)
$MPrate_{c,t-1}$	-0.120	-0.0906	-0.201	-0.202	-0.158	-0.106	0.0857	-0.139	-0.0170	-0.143	-0.0622
	(0.138)	(0.137)	(0.156)	(0.159)	(0.159)	(0.137)	(0.128)	(0.147)	(0.0425)	(0.146)	(0.120)
$Inflation_{c,t-1}$	0.0700	0.0597	0.0996*	0.103*	0.0830	0.0528	-0.0998	0.100	0.0736	0.0739	0.0712
	(0.0558)	(0.0562)	(0.0560)	(0.0575)	(0.0540)	(0.0600)	(0.110)	(0.0879)	(0.0646)	(0.0561)	(0.0658)
$\Delta \log ExRate_{c,t-1}$	-0.299***	-0.322***	-0.241***	-0.197***	-0.250***	-0.350***	-0.508**	-0.203***	-0.330***	-0.276***	-0.292***
	(0.0545)	(0.0534)	(0.0579)	(0.0566)	(0.0567)	(0.0627)	(0.187)	(0.0666)	(0.0539)	(0.0541)	(0.0629)
Constant	0.0601***	0.0570***	0.0714***	0.0707***	0.0637***	0.0589***	0.0287	0.0228	0.0417***	0.0631***	0.0520***
	(0.0170)	(0.0172)	(0.0182)	(0.0190)	(0.0179)	(0.0177)	(0.0285)	(0.0170)	(0.0121)	(0.0174)	(0.0175)
Observations	2415	2415	2415	2415	2415	2415	2132	2415	2132	2415	2415
R-squared	0.069	0.065	0.070	0.072	0.066	0.065	0.031	0.033	0.191	0.068	0.053

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 23 countries observed in the 2012m4-2020m12 period.
Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A20: Regressions on portfolio inflows with the financial stress index using BOP data. Quarterly estimates

$Inflows_{c,t}/GDP_{c,t}$	(1) Total	(2) Bond	(3) Equity	(4) Total	(5) Bond	(6) Equity
$FRED_t$	0.0341	0.0376*	0.00342	0.0421*	0.0371	0.00892*
	(0.0217)	(0.0214)	(0.00318)	(0.0247)	(0.0246)	(0.00436)
$FRED_t * IFP_{c,t-1}$	-0.0994*	-0.100*	-0.0156*	-0.126**	-0.103*	-0.0326**
	(0.0549)	(0.0526)	(0.00901)	(0.0612)	(0.0575)	(0.0133)
$MPrate_{US,t}$				-0.187	-0.615	0.423**
				(0.960)	(1.089)	(0.156)
$MPrate_{US,t} * IFP_{c,t-1}$				-0.725	0.603	-1.340***
				(2.399)	(2.673)	(0.405)
$YieldCurve_{US,t}$				-2.895	-1.781	-0.396
				(1.711)	(1.716)	(0.504)
$YieldCurve_{US,t} * IFP_{c,t-1}$				5.085	2.346	1.028
				(4.359)	(4.392)	(1.450)
$IFP_{c,t-1}$	-0.00833	-0.0106	-0.00182	-0.0868	-0.0601	-0.00664
	(0.0391)	(0.0439)	(0.00471)	(0.0696)	(0.0697)	(0.0201)
$\Delta\log GDP_{c,t-1}$	-0.0213	-0.0387	0.0237*	0.0499	0.0201	0.0310**
	(0.0491)	(0.0447)	(0.0125)	(0.0592)	(0.0533)	(0.0149)
$MPrate_{c,t-1}$	0.00292	-0.0148	0.0172	0.0466	0.0187	0.0254**
	(0.0810)	(0.0793)	(0.0125)	(0.0858)	(0.0844)	(0.00960)
$Inflation_{c,t-1}$	-0.0163	-0.0243	0.0131	-0.0201	-0.0155	0.00577
	(0.0474)	(0.0454)	(0.00817)	(0.0436)	(0.0418)	(0.00817)
$\Delta\log ExRate_{c,t-1}$	-0.0126	-0.00155	-0.00204	-0.0198	-0.0134	0.00125
	(0.0292)	(0.0265)	(0.00545)	(0.0295)	(0.0263)	(0.00608)
$PublicDebt_{c,t-1}$	-0.00700	0.00692	-0.0156	-0.0336	-0.0124	-0.0165*
	(0.0450)	(0.0360)	(0.00976)	(0.0390)	(0.0338)	(0.00844)
$CapitalControl_{c,t-1}$	0.0195	0.0226	-0.00267*	0.000897	0.0157	-0.00341*
	(0.0461)	(0.0164)	(0.00147)	(0.0378)	(0.0138)	(0.00188)
$Constant$	0.00896	0.00407	0.00748	0.0708	0.0443	0.0107
	(0.0377)	(0.0286)	(0.00599)	(0.0464)	(0.0344)	(0.0116)
Observations	696	672	648	696	672	648
R-squared	0.194	0.189	0.185	0.214	0.201	0.209

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 29 countries observed in the 2015q1-2020q4 period in in portfolio inflows regressions. 28 (27) countries in bond (equity) inflows regressions. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

Table A21: Regressions on portfolio inflows with the shadow federal funds rate using BOP data. Quarterly estimates

	Full sample			No China		
$Inflows_{c,t}/GDP_{c,t}$	(1) Total	(2) Bond	(3) Equity	(4) Total	(5) Bond	(6) Equity
VIX_t	0.293	0.289	0.0429*	0.336	0.340	0.0444*
	(0.177)	(0.182)	(0.0223)	(0.200)	(0.210)	(0.0249)
$VIX_t * IFP_{c,t-1}$	-0.906*	-0.832*	-0.176**	-1.009*	-0.952*	-0.179**
	(0.459)	(0.464)	(0.0714)	(0.513)	(0.526)	(0.0767)
$ShMPrate_{US,t}$	-0.0558	-0.378	0.311**	-0.0976	-0.542	0.363**
	(1.226)	(1.408)	(0.140)	(1.510)	(1.766)	(0.161)
$ShMPrate_{US,t} * IFP_{c,t-1}$	-1.039	-0.0392	-1.026**	-0.964	0.321	-1.147**
	(2.980)	(3.388)	(0.382)	(3.595)	(4.167)	(0.413)
$ShYieldCurve_{US,t}$	-0.736	-0.374	-0.0144	-0.843	-0.449	-0.0193
	(1.453)	(1.629)	(0.328)	(1.726)	(1.983)	(0.371)
$ShYieldCurve_{US,t} * IFP_{c,t-1}$	-0.173	-0.933	-0.120	0.0657	-0.790	-0.0996
	(3.821)	(4.251)	(1.000)	(4.442)	(5.061)	(1.093)
$IFP_{c,t-1}$	0.162	0.152	0.0425*	0.178	0.172	0.0431
	(0.115)	(0.123)	(0.0234)	(0.132)	(0.144)	(0.0253)
$\Delta\log GDP_{c,t-1}$	0.0228	0.00712	0.0185	0.0278	0.0123	0.0184
	(0.0468)	(0.0438)	(0.0126)	(0.0470)	(0.0436)	(0.0128)
$MPrate_{c,t-1}$	-0.00328	-0.0199	0.00601	-0.00672	-0.0257	0.00650
	(0.0846)	(0.0824)	(0.00935)	(0.0864)	(0.0832)	(0.00940)
$Inflation_{c,t-1}$	-0.0168	-0.00959	0.00586	-0.0154	-0.00509	0.00482
	(0.0423)	(0.0405)	(0.00872)	(0.0430)	(0.0408)	(0.00882)
$\Delta\log ExRate_{c,t-1}$	-0.0370	-0.0312	-0.00139	-0.0408	-0.0342	-0.00190
	(0.0276)	(0.0245)	(0.00716)	(0.0281)	(0.0253)	(0.00711)
$PublicDebt_{c,t-1}$	-0.0387	-0.0206	-0.0166**	-0.0392	-0.0206	-0.0169**
	(0.0393)	(0.0343)	(0.00790)	(0.0402)	(0.0354)	(0.00767)
$CapitalControl_{c,t-1}$	0.000638	0.0117	-0.00392*	-0.00151	0.0113	-0.00407*
	(0.0362)	(0.0122)	(0.00211)	(0.0365)	(0.0125)	(0.00208)
Constant	-0.00918	-0.0245	-0.000957	-0.0142	-0.0318	-0.00117
	(0.0419)	(0.0437)	(0.00988)	(0.0480)	(0.0524)	(0.0108)
Observations	696	672	648	672	648	624
R-squared	0.212	0.202	0.208	0.214	0.204	0.207

Notes: Robust standard errors in parentheses clustered at the country level. All regressions include country fixed effects. 29 countries observed in the 2015q1-2020q4 period in in portfolio inflows regressions. 28 (27) countries in bond (equity) inflows regressions. In columns (4)-(6), China is excluded. Significance level: *** p<0.01, ** p<0.05, * p<0.1.

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