Push Factors and Capital Flows to Emerging Markets:

Why Knowing Your Lender Matters More Than Fundamentals

Eugenio Cerutti, Stijn Claessens, and Damien Puy[1]

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Abstract

This paper assesses the co-movements in gross capital inflows for a sample of 21 advanced countries (ACs) and 33 emerging markets (EMs) between 2001 and 2015. Although we do not find a global financial cycle affecting all countries, we detect large co-movements among inflows to EMs, in particular among bank-related and portfolio bond and equity inflows. Focusing on EMs, we investigate what factors determine the sensitivities of countries' capital inflows to changes in global conditions. We find that market structure characteristics (especially the composition of investor bases) better explain countries' sensitivities than countries' (institutional) fundamentals, with findings robust to among others excluding the global financial crisis.

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I. INTRODUCTION

The phrase "global financial cycle" is being used much more often over the last few years. The notion is that a set of common factors drives financial conditions in a large set of countries, with little respect to recipients' domestic economic, financial and institutional conditions and policies. Empirical evidence (notably Rey, 2013) indeed shows high correlations among many countries' interest rates, asset prices, domestic credit and other financial variables for both advanced countries (ACs) and emerging markets (EMs). This has led to a growing literature on the causes and consequences of such a global financial cycle. A number of recent papers have documented how certain conditions, notably in ACs, can drive capital flows globally. Although the specific factors and their importance vary across studies, a consensus has emerged on the role of U.S. monetary policy, the supply of global liquidity (especially in US dollars) and global risk aversion in helping explain the high synchronicity (see Milesi-Ferretti and Tille, 2011, Shin, 2012, Rey, 2013, Cerutti, Claessens, and Ratnovski, 2016, among others).

The phenomenon of large co-movements in financial conditions is not new, however, and neither is the literature analyzing it. When it comes to capital flows, episodes of large, widespread waves of non-resident capital flowing to and from ("gross inflows") have over decades led researchers to investigate the importance of common factors.[2] This literature started with Calvo, Leiderman, and Reinhart (1993, 1996) and saw a large increase in the 1990s (among many others, Chuhan, Claessens, and Mamingi, 1998). A special focus of the empirical literature has been on capital inflows to EMs, given their high co-movement, relatively large volume, and high volatility, and because they appear to affect recipients' economic conditions (exchange rate, current account) more so than for advanced countries (e.g., Forbes and Warnock, 2012; Fratzscher, 2012; Broner et al., 2013). The use of unconventional monetary policy (UMP) by several advanced countries in the last years has also been found to drive asset prices and bond and equity inflows, in particular to EMs (e.g., Fratzscher, Lo Duca, and Straub, 2013 and 2016; Ahmed and Zlate, 2014; Bowman, Londono, and. Sapriza, 2015).

While some existing evidence suggests a limited ability of countries to insulate themselves from such commonality (through, for example, the use of specific exchange rate policies, e.g., Obstfeld, 2015), countries seem to be not affected equally by changes in global factors. This was highlighted by the sudden (and unexpected) deterioration in financial conditions during the so-called "taper-tantrum" around May 2013. While almost all EMs experienced

[2] Consistent with the residence criterion of balance-of-payments statistics, we use the term capital gross "inflows" to refer to changes in the financial liabilities of a domestic country vis-à-vis non-residents, and "outflows" refer to changes in financial assets of residents of a country. As such inflows and outflows can be positive and negative during any given quarter.

negative inflows during this episode, some were much less affected than others (Sahay et al, 2014). Ahmed et al. (2014) showed that this differentiation across EMs was not unique to the 2013 episode. The greater exposure of EMs compared to ACs to global factors, and the differentiation among EMs naturally raises the question of the reasons behind such heterogeneity. Why are some countries more sensitive in their gross inflows to global factors than other countries? Put differently, when global economic and financial conditions change, why are some countries more likely to lose (or gain) relatively more inflows?

Unfortunately, as it stands, the literature has made limited progress in understanding why countries are differentially exposed to global common factors through variations in their capital flows. In their study of gross flows to and from a sample of 50 (emerging and advanced) countries, Forbes and Warnock (2012) identify surges and stops using a dummy variable, preventing an analysis of (different) magnitudes of capital flows across countries. Although Ghosh et al (2014) study the determinants across EMs of surges in inflows, the authors restrict their analysis to net capital flows, which can follow very different dynamics, as net flows reflect both non-residents and residents' actions. Indeed, studying sudden stops rather than surges, Calderon and Kubota (2013) document large differences in factors correlated with sudden stops between those stops driven by large, declining aggregate inflows vs. those driven by increasing outflows. And although Fratzscher (2012) finds that common shocks affect capital flow dynamics across countries in heterogeneous ways, reflecting varying macro and institutional fundamentals in recipient markets, with results strongest for EMs, he focuses on mutual funds flows, a very small subset of gross capital inflows, making it hard to derive general conclusions about the (differential) impact of changes in global conditions.[3]

In this paper, in order to identify common cross-country dynamics, we first conduct a systematic analysis of the co-movement of gross capital inflows to 21 ACs and 33 EMs using quarterly balance-of-payments (BOP) data for the period 2001-2015. After compiling our panel dataset, we use a latent factor model in the spirit of Kose, Otrok and Whiteman (2003) to extract the common dynamics in gross inflows, distinguishing between world factors affecting all countries and sub-group factors (e.g., for specific income levels or regional groupings). Using a latent factor approach provides a very general way to identify commonality in flows and avoids having to determine which specific factors drive the commonality. The model is applied to different types of gross flows, using the standard BOP

[3] Fratzscher (2012) uses EPFR mutual fund flows, which represent only a small subset of non-resident portfolio flows to EMs. In addition, FDI and bank flows, which represent a high share of EMs' external funding, were excluded from the analysis. While Prachi et al. (2014), and Ahmed et al. (2014), Aizenman et al. (2014) and Eichengreen and Gupta (2014) also address the issue of investors' differentiation across markets in times of stress, these studies all focus on the dynamics of prices in recipient markets - rather than non-resident flows to -, and restrict their attention to very short-lived episodes of financial stress, typically days/weeks around stress episodes.

distinction between FDI inflows, Portfolio Equity flows, Portfolio Bonds flows, and Other Investment (OI) to Banks and OI to Non-Banks.

Our results from this analysis first confirm several findings in the literature on co-movements among capital inflows. First, we find that high co-movement is not a general phenomenon. More specifically, we find clearly that there is no "world factor" driving inflows to all countries, i.e., EMs and ACs combined. Rather, the co-movement among capital inflows largely exists among EMs: we identify very precisely common factors among inflows to EMs, while common factors for ACs are generally much less precisely estimated, suggesting that there are structural differences in how lenders and investors treat ACs vs. EMs. Second, although co-movement is high for capital inflows to EMs, it also varies greatly by type of flow. Specifically, we confirm that only bank-related and portfolio bond and equity inflows co-move substantially across EMs, while FDI and Other Investments (OI) to non-banks do not.[5] This analysis using a rigorous methodology thus supports the focus in the literature on (some types of) gross inflows to EMs and qualifies the existence of a global financial cycle affecting capital flows to all countries in the world.[6]

Continuing the focus on capital inflows to EMs, the most synchronized, we show in the second part of the paper that the sensitivities to common dynamics vary greatly across EMs. Whereas some EMs display very low sensitivity to the common dynamics in all types of flows, others, such as Brazil, Turkey and South-Africa, are highly sensitive in all types. Another group, including countries such as India, Mexico, Pakistan, Philippines, and Uruguay, displays a high sensitivity in only one (or two) types. We also find that once we control for the presence of the EM common factor, regional common factors among EMs are less important.

Retaining our focus on capital inflows to EMs, we next focus on the "why" part of the question under analysis. We study how macroeconomic and institutional fundamentals and financial market characteristics—including newly developed metrics to assess the composition of countries' foreign investor bases—relate to the observed cross-country heterogeneity in sensitivities to common factors. Importantly, we do not find that as a general

[5] This differentiation is important since FDI constitutes the largest share of capital inflows in EMs for example.

[6] In our robustness tests, we show that this is not the case for gross capital outflows, where there is a global co-movement among all countries. This commonality in outflows likely reflects general risks-on and risks-off motives among investors in both EMs and ACs. In the working paper version of our paper (IMF/15/127), we alos show that, while there are statistically significant relationships between commonly used push factors (US monetary policy, global liquidity or risk aversion) and our latent factors, these factors are unable to capture fully the actual co-movement observed in the data (R-squares are about 0.65-0.75) and the relative importance of specific global push factors for the common dynamics varies by type of flows.

proposition "good" fundamentals, in the form of a high quality of institutions or low public debt, tend to insulate countries from changes in the global conditions. Only in the case of portfolio bond inflows, do we find that countries with higher levels of debt and more flexible foreign exchange regimes are more sensitive to global factors. However, this result disappears once the Global Financial Crisis is excluded from the sample. We do find that financial market characteristics, rather than macroeconomic or institutional fundamentals, very robustly explain the cross-sectional dispersion in sensitivities. In particular, we find that portfolio flows (both equity and bond) inflows to EMs that rely heavily on international mutual funds are more sensitive to changes in global conditions. Similarly, bank inflows to EMs relying on global banks are significantly more sensitive to global liquidity factors. Beside the composition of the country's foreign investor bases, we also find a strong role for liquidity measures in the case of equity flows. Inclusion in a global index and a greater liquidity of the local equity market make these inflows substantially more sensitive.

Overall, our findings suggest that after controlling for fundamental characteristics and other factors, countries with a high exposure to "fickle investors" and deeper local financial markets, rather than those with sounder institutional or macroeconomic fundamentals, can expect to receive (or lose) more non-resident funding when global financial conditions improve (or deteriorate). This finding does not mean that borrowers' fundamentals do not matter in shaping other properties of capital inflows. As many contributions have convincingly shown (e.g., Alfaro et al. 2008), countries with poorer macroeconomic or institutional fundamentals tend to receive less capital inflows. Different from this "level" effect, however, as our study analyzes countries' sensitivities to global factors, our findings suggest that the traditional "push factor" literature may have over-stated the importance of fundamentals in shaping countries' sensitivities at the expense of other important determinants.

Our findings relate to the literature in several respects. First, although we rely on a different methodology, they naturally relate to the literature on global ("push") factors and their impacts on capital flows (see Koepke, 2015 for a review). The use of latent factors (rather than observed proxies) to capture the co-movement in the data avoids the problem of choosing specific factors, the significance of which has been found to vary systematically across studies and samples. In addition, contrary to many contributions, our analysis largely relies on disaggregated flows. Besides highlighting the wide heterogeneity in the behavior of different types of flows, our approach makes clear that the sensitivity of countries to global factors is not universal and identical across type of flows. In fact, most EMs are found to be relatively more sensitive to EM common factors through one or two types of flows only. Second, our findings on the important roles of financial market characteristics for various types of flows relate to recent findings on the pro-cyclical behavior of global, non-resident investors, the specific factors driving these investors' behavior vis-à-vis EMs, and related

their impact on the variability of countries' external financing. As documented by Bruno and Shin (2015a and 2015b), large, international active banks expand and contract their cross-border claims in part in response to monetary policy in advanced countries, notably in the U.S. As the global supply of credit expands (contracts), it tends to be directed at the margin towards (away from) riskier countries, including EMs. Related, financial markets in economies more internationalized and with a larger foreign (bank) presence, which typically are EMs, have been found to be more affected by global financial and monetary conditions (e.g., Cetorelli and Goldberg, 2012a, 2012b).[8]

In terms of portfolio flows, investors such as mutual funds have been found to transmit shocks in advanced countries to a wide range of markets and often independently of the state of fundamentals. Raddatz and Schmukler (2012) and Puy (2015) show that international fund flows tend to be highly pro-cyclical, in particular for EMs, with funds reducing their exposure to all countries when financial conditions deteriorate at home (i.e., in advanced markets) and increasing them when conditions at home improve, with little consideration for countries' circumstances, i.e., capital flows from mutual funds do not seem to have a stabilizing role but rather expose countries in their portfolios to foreign shocks. Using data on global mutual funds, Jotikasthira et al. (2012) also show that funding shocks originating in ACs, i.e., where funds are domiciled, can translate into fire sales (and purchases) for countries included in their portfolios, in particular for EMs. Although the behavior of specific classes of global investors (banks or funds) has been well documented and has been receiving increasing attention from policymakers, we are the first, to our knowledge, to show that the type of investor base and the state of development of the local financial markets importantly shapes the responses to global monetary and financial developments for capital inflows to specific countries. More recently, using German confidential, security-level data on the behavior of individual investors, Timmer (2016) confirms the importance of monitoring investor bases for financial stability as investment funds and banks are found to exacerbate price dynamics by reacting pro-cyclicaly in response to price changes (as opposed to pension funds and Insurance companies).

The rest of the paper proceeds as follows. Section 2 describes the data and the empirical methodology we use. Section 3 presents the results and puts our analysis in the context of the existing theoretical and empirical literature. Section 4 provides information on a number of the robustness checks, including an analysis of co-movement in capital outflows. The last section concludes with broader lessons and outstanding issues for policy and research.

[8] In periods of acute stress, as during the 2007-09 financial crisis, global banks can play a large role in transmitting stress to other economies, including to EMs, as Cetorelli and Goldberg (2012b), Cerutti and Claessens (2014), Claessens and van Horen (2014) and others have shown.

II. DATA AND METHODOLOGY

This section introduces the dependent and independent variables we use and the various country characteristics we explore to explain the sensitivities of specific type of flows to common dynamics. It also describes the econometric methodology.

A. Dataset

We study gross capital inflows to from 21 ACs and 33 EMs (Table 1 provides the exact sample of countries). We also collect data on capital outflows that are used in the robustness section. Both data on inflows and outflows are obtained from the IMF's Balance of Payment (BOP) database, which covers transactions by foreign residents (a resident of the rest of the world) in domestic financial instruments and by residents in foreign financial instruments. These capital flows data are reported both in total and by their components: FDI flows, Portfolio Equity flows, Portfolio Bonds flows, Other Investment (OI) to Banks and OI to Non-Banks. FDI involves a controlling claim in a company (a stake of at least 10 percent), either by the setting up new foreign operations or the acquisition of a company from a domestic owner. Portfolio investment covers holdings of bonds and equity that do not lead to a controlling stake. "Other investment" includes a broad residual array of transactions/holdings between residents and nonresidents, such as loans, deposits, trade credits etc. Within this category, following Milessi-Ferretti and Tille (2011), we separate out those transactions or holdings in which the domestic counterpart is a bank (OI to Banks) from those with other counterparts (OI to Non-Banks).[9]

We focus on quarterly capital flows during the period 2001Q1-2015Q4.[10] All series are measured in US dollars and normalized by the recipient (inflows) or originating (outflows) country's GDP (also measured in US dollars at a quarterly frequency).[11] As an illustration, Figure 1 (top panel) reports separately aggregate gross inflows to ACs and EMs in our sample over the period expressed as a percentage of the aggregate GDP of the countries. The bottom panel shows similar data, but instead of aggregating across ACs and EMs, the country median, and the 25^{th} and 75^{th} percentiles are plotted for each grouping. Both figures show that capital inflows to ACs are typically much larger than those to EMs, that there is some cyclicality in both cases (e.g., increases in inflows before the global financial crisis).

[9] Since OI to Non-Banks is more of a residual category, its data quality is much less and it displays many outliers. This likely explains why our model cannot identify a cycle (global, ACs or EMs specific common factors) for this type of flow. We consequently do not further analyze it.
[10] In the case of gross outflows, the distinction between portfolio debt and equity is not available.
[11] Even though BOP data are available before 2001, we start our analysis in 2001 since we use other capital flow data (e.g., EPFR fund flows), which lack consistent coverage before the 2000s. In addition, going further back in time would imply an important loss of cross-sectional coverage (both in the number of countries and the extent of disaggregation by type of gross capital inflow), crucial for the identification of common factors.

The explanatory variables we use to identify the determinants behind sensitivities in how EMs' capital flows respond to global factors are grouped under variables capturing fundamentals and market characteristics respectively. Variables in each group are presented below while details on definitions, sources, frequency are reported in Table 2 and summary statistics are reported in Table 3. For the country fundamentals, which include macroeconomic and institutional characteristics, we follow the existing literature. Macroeconomic fundamentals include a country's level of trade openness (i.e., exports and imports as percent of GDP), the level of its public debt (as a percent of GDP), the level of its foreign exchange reserves (as a percent of GDP), its foreign exchange regime (fixed vs. degree of floating, with higher scores indicating more flexibility), and its average real GDP growth rate. A country's institutional quality is proxied by its ICRG Rule of Law and Investor Protection indexes (with higher score indicating better institutions).

In assessing the characteristics of recipient financial markets, we build on the existing literature, but go further. For each recipient country, whenever possible, we assess the following four dimensions: (i) the degree of its foreign openness; (ii) the size of the recipient respective market; (iii) the liquidity of the recipient respective market; and (iv) the composition of the recipient's foreign investor base. We identify proxy variables for each of these dimensions (except for a liquidity measure for the market of OI to Banks inflows, which is not applicable). For presentational simplicity, the table below summarizes the variables used for each of these four dimensions and types of flows (as noted, Table 2 provides more details on each variable).

Although many of these variables are commonly used in the literature to assess different market characteristics, we developed some new variables that proxy for the importance of some type of investors relevant to each specific capital inflows. In particular, because a decomposition of BOP flows by type of foreign investor is not available, we compute, for each EM and each asset in our sample, the correlation between BOP recorded inflows on the one hand, and inflows reported directly by specific types of investors on the other. As we do this for each type of flows, three correlations are computed for each country in our sample: (i) the correlation between BOP-reported portfolio equity flows and equity flows coming from international equity funds as reported by EPFR Global; (ii) the correlation between BOP-reported portfolio bond flows and bond flows coming from international bond funds as reported by EPFR Global; and (iii) the correlation between BOP-reported OI to Banks flows and global bank flows as reported in the BIS Locational International Banking Statistics. In all cases, we interpret a high correlation as a sign that aforementioned investors (funds and global banks in core countries) account for most of the movements in capital inflows to (or out of) the given economy, or at least are representative of the general movements in that specific capital inflow. See further the Annex for a thorough discussion of (the construction of) these variables.

Summary of Explanatory Variables for Market Characteristics

	Foreign Openness	Size	Liquidity	Composition of the Foreign Investor Base
Equity Market	Stock of Foreign Equity funding/GDP	Local size: Stock market Capitalization/GDP Relative to EMs: Stock of Foreign Equity/Total Stock of foreign equity in EMs	- Stock Market turnover (as % of Market Cap) - Listed in MSCI benchmark (Emerging or Frontiers)	- Share of Foreign Equity funding coming from ACs - Correlation of BOP equity flows with EPFR equity flows
Bond Market	Stock of Foreign Bond funding/GDP	Local size: Bond market Capitalization/GDP Relative to EMs: Stock of Foreign Equity/Total Stock of foreign equity in EMs	Listed in EMBI benchmark	- Share of Foreign Bond funding coming from ACs - Correlation of BOP bond flows with EPFR bond flows
Banking Sector	Stock of Foreign Bank Claims/GDP	Private credit /GDP		- Correlation of BOP bank flows with BIS global bank flows.

B. Econometric Framework

In this section, we explain the two-step methodology used in the paper. As a first step, we build on the business cycles synchronization approach introduced by Kose, Otrok and Whiteman (2003) and estimate the following latent factor models for each type of capital inflow:

$$y_{i,t} = \beta_i^{Global} f_t^{Global} + \beta_i^{IncomeGroup} f_t^{IncomeGroup} + \varepsilon_{i,t} \qquad (1)$$

where $y_{i,t}$ is the (normalized) inflow of a specific type to country *i* in quarter *t*, f_t^{Global} is the (unobserved) factor affecting all countries in our sample at time t, $f_t^{IncomeGroup}$ is the (unobserved) income group factor (ACs or EMs) affecting all countries belonging to the respective group at time t, and β_i^{Global} and $\beta_i^{IncomeGroup}$ designate country-specific factor loadings measuring the responses of country *i* to the common and regional factors respectively. Finally, $\varepsilon_{i,t}$ is an unobserved, country-specific residual.

Since we are not able to identify a global factor f_t^{Global} in any type of inflows, and only marginal commonality among capital inflows to ACs, we turn, in a second step, to inflows to

EMs. In practice, we estimate a similar specification to equation (1), but only among EMs and using regions as the second common factors:

$$y_{i,t} = \beta_i^{EM} f_t^{EM} + \beta_i^{Region} f_t^{Region} + \varepsilon_{i,t} \quad (1')$$

where we distinguish in the region group among four regions, namely: (i) Latin America (ii) Asia (iii) Emerging Europe and (iv) Other. This specification allows us to check whether the co-movement we observe among EMs is mostly driven by dynamics common to all EMs, or by strong regional dynamics (e.g. Latin America or Emerging Europe) in the background.

Because we allow factors to follow AR processes, the model in (1) and (1') is in fact a dynamic latent factor model. More precisely, we assume that idiosyncratic factors follow an AR(*p*) process:

$$\varepsilon_{i,t} = \rho_{i,1}\varepsilon_{i,t-1} + \rho_{i,2}\varepsilon_{i,t-2} + \cdots + \rho_{i,p}\varepsilon_{i,t-p} + u_{i,t} \quad (2)$$

where $u_{i,t} \sim N(0, \sigma_i^2)$ and $E(u_{i,t}, u_{i,t-s}) = 0$ for $s \neq 0$ and the global (or EM) and IncomeGroup (c.q. Regional) factors follow the respective AR(q) processes. So, using equation (1') notation:

$$f_t^{EM} = \rho_1 f_{t-1}^{EM} + \rho_2 f_{t-2}^{EM} + \cdots + \rho_q f_{t-q}^{EM} + u_t^{EM} \quad (3)$$

$$f_{j,t}^{Region} = \rho_{1,j} f_{t-1}^{Region} + \rho_{2,j} f_{t-2}^{Region} + \cdots + \rho_{q,j} f_{t-q}^{Region} + u_{j,t}^{Region} \quad (4)$$

where $u_t^{EM} \sim N(0, \sigma_{EM}^2)$, $u_{j,t}^{Region} \sim N(0, \sigma_j^2)$ and $E(u_t^{EM}, u_{t-s}^{EM}) = E(u_{j,t}, u_{j,t-s}) = 0$ for $s \neq 0$.

Given that the factors themselves are unobservable, standard regression methods do not allow for estimation of the model. We therefore rely on Bayesian techniques as in Kose, Otrok and Whiteman (2003) for the estimation. As is standard in the literature, as a first step, we normalize the sign of the factor/loadings by (i) restricting the loading on the world factor for the first country in our sample to be positive and (ii) restricting the loadings on the regional factor for one country in each region to be positive. Second, to normalize the scales, we assume that each of the factor variances are equal to 1. Note that these normalizations do not affect any of the results and simply allow for the identification of the model. Finally, we use Bayesian techniques with data augmentation to estimate the parameters and factors in (1)-(4). This implies simulating draws from complete posterior distribution for the model parameters and factors and successively drawing from a series of conditional distributions using a Markov Chain Monte Carlo (MCMC) procedure. Posterior distribution properties for the model parameters and factors are based on 300,000 MCMC replications after 30,000

burn-in replications.

Following Kose, Otrok and Whiteman (2003), we use the following conjugate priors when estimating the model:

$$\left(\beta_i^{EM}, \beta_i^{Region}\right)' \sim N(0, I_2) \quad (5)$$

$$\left(\rho_{i,1}, \dots, \rho_{i,p}\right)' \sim N(0, diag(1, 0.5, \dots, 0.5^{p-1}) \quad (6)$$

$$\left(\rho_1, \dots, \rho_q\right)' \sim N(0, diag(1, 0.5, \dots, 0.5^{q-1}) \quad (7)$$

$$\left(\rho_{1,j}, \dots, \rho_{q,j}\right)' \sim N(0, diag(1, 0.5, \dots, 0.5^{q-1}) \quad (8)$$

$$(\sigma_i^2)' \sim IG(6, 0.001) \quad (9)$$

Where i=1,…,54 when using equation (1) or i=1,..,33 when using equation (1'); and IG denotes the Inverse Gamma distribution, implying a rather diffuse prior on the innovations variance. We also assume that the AR processes in (2)-(4) are stationary. In practice, in our implementation, we set the length of both the idiosyncratic and factor auto-regressive polynomials to 2. However, other (non-zero) values for p and q were tried with no substantial differences in the results. Similarly, reasonable deviations in priors did not generate any notable differences in the results presented below.

As described, the latent factors are estimated first using all countries, but allowing for sub-common factors for ACs and EMs. Since we do not detect commonality among capital inflows to ACs, we then estimate (1') using only EMs separately and focus our efforts on explaining the cross-country heterogeneity we observe in the factor loadings β_i^{EM}, which measures the contemporaneous impact of a sudden change in the direction of common factors.

III. RESULTS

This section first presents the results of the factor estimations for all countries combined, and then for EMs. We then turn to discuss the cross sectional dispersion we observe in β_i^{EM} and to analyze the drivers of the cross-country heterogeneity in the sensitivities of countries' capital inflows to global factors.

A. Latent Factor Estimations Results

The factor decomposition outlined above yields the following two important results. First, when using the full sample of 54 countries in (1), the model fails to identify a global common factor for any type of capital inflows, and identifies very imprecise co-movement in capital inflows to ACs (with the exception of bond inflows to ACs). On the other hand, the model identifies very precise co-movement in gross capital inflows to EMs. Second, although co-

movement to EMs is clear, the dynamics of the EM-specific factors vary significantly by asset class.

The first finding is clear in Figure 2, which plots the global, EMs, and ACs common factors identified by the model in (1). The global common factors (blue lines in Figure 2) for all four types of capital inflows are almost always very close to zero and display very little variation. This is as well the case for the ACs common sub-factors (red lines in Figure 2), which, with the exception of bond portfolio inflows, are quite flat around zero. In contrast, the sub-factors for capital inflows to EMs (green line in Figure 2) are well estimated for all type of assets, with movements coinciding with global events such as the GFC or the 2013 "taper-tantrum." On this basis, we conclude that is only meaningful to speak about common dynamics in case of capital inflows to EMs.

The second finding is confirmed when we re-estimate the model in equation (1') using only EMs in our sample.[12] The model identifies clear co-movement in Portfolio Equity inflows, Portfolio Bond inflows and OI Banks inflows across EMs (Figure 3). However, this is not the case for FDI inflows to EMs, where the common factor as displayed in Figure 3 is now relatively flat and poorly estimated, with only some small positive upticks just before the global financial crisis.

In general, these and other comparisons confirm the literature's general focus on capital inflows to EMs, and not on capital inflows to ACs. They also confirm findings in the literature that different assets (Equity, bond and bank flows) respond to different global common forces, with FDI to EMs being not much affected. Consistent with these findings, we then focus the next part of our analysis on describing and explaining the cross-country difference in sensitivities of equity, bond and bank inflows to changes in global conditions.

B. Factor Loadings and Variance Decompositions across EMs

The quantitative importance of the common dynamics for capital inflows varies a lot across EMs and types of flows. This heterogeneity in country sensitivities is reflected in Figure 4 that shows the β_i^{EM} coefficients estimated with equation (1') for equity, bond, and bank flows respectively. In the case of equity flows, we find that a unit deviation in the common EM factor will generate, on impact, about a 0.85 standard deviation in equity flows to Pakistan and a 0.65 standard deviation in equity flows to India. In contrast, countries like Chile, Lithuania, or Israel do not experience any significant change in their foreign equity funding. Similarly, although bond flows to Indonesia and South Africa react strongly to the common

[12] We also estimated a version of equation (1') where only ACs were used. The results also indicate that there is little co-movement of capital inflows to ACs, with the exception of portfolio bond flows.

EM factor, bond flows to Bulgaria, China, Colombia and Estonia are almost insensitive to the common dynamics.

Because the variance decompositions are a function of β_i^{EM}, the strong heterogeneity we observe in Figure 4 in factor loadings naturally carries over to the variance decompositions. Table 4 reports the share of variance accounted for by the common and regional factors. Intuitively, this variance decomposition provides a measure of the importance of these two factors in driving the external funding of each country over the sample period. Note that because the model was not able to identify precisely any co-movement structure in the FDI inflows, only the results for Portfolio Equity and Bond flows and OI to Bank flows are reported.

Table 4 (and Figure 4) highlights that while co-movements of capital inflows can be high, not all countries or types of flows are equally exposed to changes in global conditions, with substantial heterogeneity across EMs and across the different types of assets for the same country. We can broadly identify three groups of countries. The "high sensitivity" group contains countries that are relatively sensitive in all components, such as Brazil, Turkey and South-Africa. The "asymmetric" group features countries with a high sensitivity in only one (or two) components, such as India, Mexico, Pakistan, and Philippines. Interestingly, the highest sensitivities across all asset types are in this group. For instance, in the case of Bulgaria, India and Pakistan, more than half of the variance in their equity flows is accounted for by the two common factors, implying that, to a great extent, both countries gain (or lose) equity funding whenever other countries do. Finally, the "insensitive" group includes countries such as Argentina, Chile, Croatia and Peru that display low relative sensitivity in all capital flow types.

C. What Drives the Impact of Global Factors Across Countries?

We now investigate what makes a country more or less sensitive to changes in global factors. Why do some countries always gain (or lose) more inflows relative to other countries when global conditions in change? Taking an empirical approach, we investigate whether those macroeconomic and institutional fundamentals or financial market characteristics typically mentioned in the literature or otherwise might explain such heterogeneity. In practice, this means that we regress the estimated factor loadings β_i^{EM} for each asset (separately) on our two sets of variables introduced in Section 2, those fundamental-related and those market-structure based.[13] Formally, we estimate separately for each type of flow the following cross-

[13] We use β_i^{EM} because we are mostly interested in explaining the differences in sensitivities "on impact", i.e., when common conditions change. Similarly, as shown in the working paper version, the analysis on the cross-country heterogeneity in θ_i^{EM} (i.e., considering the share of the total variance for country i attributable to the common factor) yields similar results.

sectional regressions:

$$\beta_i^{EM} = \alpha Fundamentals_i + \beta Market\ characteristics_i + \varepsilon_i \qquad (10)$$

Before turning to our key findings, we acknowledge that our analysis is subject to some limitations. By construction, estimations are based on a small sample of 33 cross-country observations (for each asset). Given the sample size, using all (14) fundamental-related and market-structure based variables at once is therefore economically infeasible. To overcome these constraints, we use the following strategy: we first regress for each flow the β_i^{EM} on the fundamentals and market variables separately. We then combine the variables that are significant in each category (if any) in one regression. To confirm that this procedure yields stable results, we also conduct a Bayesian Model Averaging exercise (presented in the robustness section). At this point, however, we like to emphasize that all results presented below are very robust to the issue of model uncertainty.

Table 5 provides the benchmark results, which are as follows. First, for the case of equity and bank flows, higher betas do not coincide with "weaker" fundamentals such as lower growth, higher debt level or poor institutions (columns 1-3 and 7-9).[14] As far as bond flows are concerned (columns 4-6), we find that countries with higher level of debt and more flexible foreign exchange regimes are more sensitive to common, global factors. Second, in term of market characteristics, we find that equity markets that are more liquid (as measured by their turnover ratio) and belong to the MSCI Frontier index have higher sensitivities. This suggests that investors are more willing to move funds in and out of these capital markets in response to change in global conditions as they are less concerned about adverse price consequences (e.g., higher big-ask spreads or price pressures). In terms of bank inflows, foreign openness makes flows less sensitive to global factors, but a greater local market size makes flows more sensitive, somewhat similar to the finding for equity flows.

Third, and most importantly, we find that our proxies for the importance of global investors (international mutual funds in the case of equity and bond flows, and global banks in the case of OI to Bank flows) are all highly significant and indicate a strong quantitative impact for all types of assets. For instance, we find that going from a zero to a perfect (one) correlation increases the predicted response to a shock in the common factor by 0.5 for equity flows, 0.3 for bond flows and 0.3 for bank flows. Given the general levels of the betas, as also depicted in Figure 3, these are large effects. Ranking all factors by their economic importance, we find that most of the cross sectional variation in loadings can be explained by the market-related variables.

[14] While bank flows seem to be sensitive to the exchange rate regime (column 7), this result disappears once we control for market characteristic and structure variables (column 9).

To sum up, the results show that EMs' sensitivities to the common dynamics vary across countries and type of flows, with the nature of the investor base displaying the more important role in explaining the cross-country differences. Macroeconomic fundamentals (the level of debt and the type of exchange rate regimes) seem to be playing a role only in the case of bond flows. More generally however, there is no evidence that macroeconomic performance (e.g., public debt, growth) or institutional fundamentals (e.g., Investment Climate and Rule of Law) play roles in explaining variations in sensitivities of countries' capital inflows to global factors.

D. Robustness and Extensions

This section provides a number of robustness checks. First, we show that the variables significant in the benchmark regression analyses are very robust to changes in covariates. Given the limited cross section at our disposal and the relatively larger number of explanatory variables, the strategy we used to identify robust correlates could provide relatively sensitive results. To address this issue, we use a Bayesian Model Averaging (BMA) for each regression.[15] In practice, BMA methods run the maximum combination of models and provide estimates and inference results that take into account the performance of the variable not only in the final "reported" model but over the whole set of possible specifications. After performing this robustness test, we find that the significance of investor base variables in the OLS regressions are always robust variables in the Bayesian averaging exercise (Table 6).

Second, we investigate differences over time, in part to check if results are driven by the large co-movements during the global financial crisis (GFC), and in part to check whether there are structural breaks in the various relationships. We split the sample in two, before and after the GFC, i.e., 2000-2007 and 2010-2015. We then rerun then the common factor model for both sub-periods and re-estimate the cross-country relationships of the respective periods' country betas with the countries' fundamental and market characteristics. Tables 7 and 8 provide the pre- and post-GFC regression results.

We find that the determinants of the betas are not purely a reflection of the GFC, but reflect structural relationships during other periods of variations in global conditions. The regression results show again that the most consistent set of statistically significant variables are the market structure ones. In the pre-crisis period, only the debt to GDP ratio is statistically significant for bond flows and the exchange rate regime and the law and order index for bank flows (Table 7, columns 4, 7 and 9). After the crisis, only the real GDP growth rate is statistically significant for equity flows (Table 8, column 1) and the exchange rate regime for

[15] From a technical point of view, the BMA technique used here follows Fernandez, Ley, and Steel (2001).

bond flows (Table 8, column 4). As such, almost all fundamentals are consistently not very important. In contrast, both before and after the crisis, a number of market and investor base variables are statistically significant. The most consistently significant are the correlations with the investor bases, both for bond and equity flows, and some of the equity liquidity and inclusion measures which are significant both before and after the crisis.[16]

Lastly, we analyze the co-movements of gross capital outflows, from both EMs and ACs to explore whether the presence of a global common factor is also a feature of capital outflows. Estimating equation (1) using capital outflows from the 54 countries instead of capital inflows, we get interesting insights that put into perspective our findings for capital inflows. Unlike the case of capital inflows, we find a significant global common factor in portfolio investments when including in the analysis both ACs and EMs. This is shown in Figure 5 by the variation in the global common factor for portfolio outflows, and even more so for bank related outflows (as expected, there is little common variation in FDI outflows, as was the case for inflows). This commonality is likely capturing that general risks-on and risks-off motives among investors in both EMs and ACs that in turn lead to commonality in outflows. The EM sub-factors estimated using equation (1) are, however, no longer as significant as was in the case of capital inflows, suggesting less EM-specific commonalities.

IV. Conclusion and Policy Implications

We document that the commonality among capital flows is the highest for gross inflows to EMs. After analyzing the sensitivity of countries to global factors, we find that the cross-country differences in EM sensitivities are, to a great extent, a function of market characteristics. In particular, the nature of a country's foreign investor base (the larger the role of international mutual funds in the case of equity and bond flows, and of global banks in the case of bank inflows) mostly explains the higher sensitivity of some EMs to global push factors. Macroeconomic fundamentals seem to be playing a role in explaining the heterogeneity of cross-country sensitivities only in the case of bond flows through the type of exchange rate regime. And we do not find evidence that institutional fundamentals (e.g., Investor Protection, Rule of Law) or measures of macroeconomic performance (higher growth, lower debt) have a role in explaining variations in EMs' sensitivities to global factors.

[16] In our working paper version (IMF WP/15/267), we argued that the GFC was not driving the results because when comparing factor loadings with actual retrenchments in capital flows during the GFC and the Taper Tantrum, we found that in the overwhelming majority countries with higher betas also suffered a deeper retrenchment in flows in both episodes. This evidence showed that our approach indeed captures the actual sensitivity to global factors of most EMs during periods of sharp movements.

Although these results have potentially important implications for EMs, they require careful interpretation. First, we emphasize that our findings do not mean that borrowers' fundamentals do not matter in shaping other crucial properties of capital flows to EMs. As many contributions have convincingly shown, countries with better macroeconomic and institutional characteristics tend to receive more capital inflows. Different from this "level" effect, however, our findings suggests that the traditional "push factor" literature may have over-stated the importance of fundamentals in also shaping sensitivities to external shocks at the expense of other important determinants. In other words, good fundamentals may lead to large inflows, but do not assure a country's insulation from global shocks.

From a policy perspective, our analysis implies that authorities in EMs should put greater efforts into collecting information about their foreign investor base and the roles of large banks, funds or asset management companies in their capital inflows. While systematic and reliable information on the decomposition of foreign holdings by type of investors is still insufficient, despite recent efforts (e.g., Arslanalp and Tsuda, 2014), our analysis already shows that some measures can be created and used to assess countries' sensitivities for a large sample of countries. For individual countries, better measures of investor bases are likely feasible.

Finally, we emphasize that further research is needed to understand the final, overall impact of global factors at the country level. Although some countries might be highly sensitive to global factors, a number of parameters could dampen the overall impact of such triggers of positive (or negative) inflows. For instance, the presence of a large pool of domestic investors absorbing the assets liquidated by foreigners leaving the country, when global conditions change, could mitigate the final price and overall financial and economic impacts of sudden reversal in inflows. Further examining differences between how non-resident and resident flows, and related asset prices, react to global factors, and analyzing how these differences may relate to macroeconomic conditions and local institutional set ups constitute useful research avenues that we leave for the future.

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Table 1. Sample of Countries

Advanced Economies	Emerging Markets 1/	
United States	Argentina[LA]	Poland[EE]
United Kingdom	Belarus[EE]	Republic of Korea[AS]
Austria	Brazil[LA]	Romania[EE]
Denmark	Bulgaria[EE]	Russian Federation[EE]
France	Chile[LA]	Slovak Republic[EE]
Germany	China, Mainland[AS]	Slovenia[EE]
Italy	Colombia[LA]	South Africa[OT]
Netherlands	Croatia[EE]	Thailand[AS]
Norway	Czech Republic[EE]	TurkeyEE
Sweden	Estonia[EE]	UkraineEE
Switzerland	Hungary[EE]	Uruguay[LA]
Canada	India[AS]	Venezuela, Rep. Bol.[LA]
Japan	Indonesia[AS]	
Finland	Israel[OT]	
Greece	Kazakhstan	
Iceland	Latvia[EE]	
Ireland	Lithuania[EE]	
Portugal	Mexico[LA]	
Spain	Pakistan[AS]	
Australia	Peru[LA]	
New Zealand	Philippines[AS]	

Note: The subscript denotes the region used in the estimation of equation 1', with LA= Latin America, AS=Asia, EE=EasternEurope, and OT=Other countries. Unlike the WP version, Malaysia was excluded from the sample due to missing data when performing the update.

Table 2. Variable Definitions, Frequency and Sources

Variable	Definition	Frequency	Source
Capital Flows			
Capital inflows	Gross inflow as % GDP, total and by component	Quarterly	IMF Balance of Payment Statistics (BPM 6)
Global Bank flows	inflow as % GDP	Quarterly	Bank of International Settlements - Locational Statistics
Mutual Fund Flows	inflow as % GDP	Quarterly	EPFR
Macroeconomic and Institutional fundamentals			
Trade Openness	(X+M)/GDP	Average	WEO database
Public Debt	as % GDP	Average	WEO database
Reserves	as % GDP	Average	WEO database
FX regime	1 to 13	Average	Ilzetzki, Reinhart, Rogoff (2004) - updated version
Real GDP Growth	%, annual	Average	WEO database
Rule of Law	Index from 1 to 10	Average	ICRG
Investor Protection	Index from 1 to 10	Average	ICRG
Market Characteristics			
Foreign Openness	Stock of foreign equity, bond or bank claims/GDP	Average	IIP for bond and equity, BIS for bank claims
Stock Market Capitalization	Stock Market Cap/GDP	Average	World Bank Financial Development Database
Bond Market Capitalization	Bond Market Cap/GDP	Average	World Bank Financial Development Database
Private Credit	Bank Credit to the Private Sector/GDP	Average	World Bank Financial Development Database
Relative Market Size	Stock of foreign equity (or bond)/total stock of foreign equity (or bond) in EMs	Average	IIP
Stock Market Turnover	Sum of shares traded over the period/Stock Market Cap	Average	World Bank Financial Development Database
Share of Funding coming from Advanced Economies	Sum of Bond (Equity) coming from AEs/Total Bond (Equity) Funding	Average	CPIS
MSCI EM	Country listed in the MSCI Emerging index	Dummy	Morgan Stanley
MSCI FM	Country listed in the MSCI Frontier Market index	Dummy	Morgan Stanley
EMBI EM	Country listed in the EMBI Emerging index	Dummy	JP Morgan

Notes: Averages are taken on the relevant sample: full sample averages cover 2001-2015; pre and post-crisis averages cover 2001-2007 and 2010-2015 respectively. A higher value of the ICRG index indicates better institutions. Higher values of the FX regime indicates more flexibility.

Table 3. Raw Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Fundamentals					
Trade Openness	33	83.93	40.38	25.95	174.78
Public debt	33	40.88	18.74	6.49	76.73
Reserves	33	19.06	9.10	6.97	41.26
FX regime	33	8.29	3.04	2.00	13.00
Real GDP Growth	33	3.99	1.66	1.54	9.63
Rule of Law	33	3.60	1.00	1.54	5.00
Investor Protection	33	8.81	1.74	3.73	11.25
Equity Market Characteristics					
Foreign Openness -Equity	33	7.4	7.9	0.1	29.3
Local Market Size (Stock Market Cap/GDP)	32	41.9	40.6	0.0	202.0
Relative Market Size (% Stock)	33	2.9	4.7	0.0	17.4
Stock Market Turnover	33	44.1	53.5	0.0	200.2
MSCI EM Country	33	0.6	0.5	0.0	1.0
MSCI FM Country	33	0.3	0.4	0.0	1.0
Share of equity funding from Advanced Economies	33	75.5	17.6	23.2	96.2
BOP equity correlation with EPFR flows	31	0.2	0.2	-0.4	0.7
Bond Market Characteristics					
Foreign Openness -Bond	33	11.7	7.0	0.7	33.5
Local Market Size (Bond Market Cap/GDP)	32	11.7	6.9	1.0	27.9
Relative Market Size (% Stock)	33	2.9	4.2	0.0	19.3
EMBI Country	33	0.6	0.5	0.0	1.0
Share of bond funding from Advanced Economies	33	76.2	15.3	26.1	96.3
BOP bond correlation with EPFR flows	33	0.2	0.2	-0.5	0.6
Banking Market Characteristics					
Foreign Openness - BIS Bank Claims	33	10.0	9.0	1.3	41.9
Private Credit/GDP	33	50.6	31.6	12.0	137.9
BOP OI-Bank correlation with BIS flows	33	0.1	0.2	-0.5	0.6

Notes: Summary statistics are reported for the full sample. Correlations of EPFR flows and BOP flows were not available for Uruguay and Belarus. Stock Market Capitalization was missing for Belarus.

Table 4. Variance Decompositions Results

This table reports, for each country in our sample, the (mean) of the share of variance accounted for by common and regional factors, as presented in Section 2, with results by type of flows reported under the corresponding column.

	Portfolio Equity		Portfolio Bond		OI to Banks	
Country	EM common	Regional	EM common	Regional	M commo	Regional
Argentina	24%	7%	9%	8%	17%	7%
Belarus	1%	0%	8%	3%	10%	0%
Brazil	30%	6%	30%	10%	32%	11%
Bulgaria	14%	62%	1%	6%	6%	40%
Chile	1%	6%	4%	9%	4%	7%
China,P.R.: Mainland	19%	2%	5%	7%	36%	7%
Colombia	1%	10%	2%	16%	6%	9%
Croatia	3%	0%	1%	12%	7%	6%
Czech Republic	1%	10%	3%	19%	15%	2%
Estonia	1%	90%	4%	2%	1%	49%
Hungary	1%	0%	16%	6%	2%	26%
India	41%	29%			7%	2%
Indonesia	18%	9%	38%	6%	18%	14%
Israel	1%	27%	14%	31%	1%	49%
Kazakhstan	29%	1%	20%	3%	2%	39%
Korea, Republic of	7%	5%	8%	12%	24%	32%
Latvia	1%	1%	3%	5%	5%	55%
Lithuania	2%	16%	9%	14%	2%	71%
Mexico	8%	7%	31%	7%	14%	13%
Pakistan	58%	17%	13%	6%	1%	17%
Peru	3%	5%	5%	2%	23%	4%
Philippines	40%	2%	14%	16%	7%	3%
Poland	2%	2%	20%	21%	1%	22%
Romania	9%	1%	10%	3%	2%	59%
Russian Federation	9%	2%	12%	7%	27%	35%
Slovak Republic	0%	1%	17%	4%	5%	9%
Slovenia	30%	1%	5%	4%	5%	62%
South Africa	15%	14%	29%	27%	14%	8%
Thailand	27%	11%	14%	12%	15%	13%
Turkey	26%	21%	32%	4%	27%	7%
Ukraine	2%	0%	7%	4%	14%	56%
Uruguay	2%	12%	22%	24%	1%	3%
Venezuela, Rep. Bol.	0%	6%	8%	3%	1%	16%

Note: Bond flows data are available only since 2010 for India.

Table 5. Explaining Countries' Sensitivities to Global Factor (Full Period)

This table presents the results of the estimation of regression (1') of countries' sensitivities in each type of flow on the set of macro, institutional and market characteristics presented in Section 2. Definitions, sources and frequency of all variables are presented in Table 2. Columns (1), (4) and (7) report the results when only macroeconomic and institutional fundamentals are used as regressors. Columns (2), (5) and (8) report results only when market characteristics are used. Finally, columns (3), (6) and (9) report results when using as regressors the variables that are found significant in each sub-group. Asterisks denote significant coefficients, with ***, **, * indicating significance at 1%, 5%, and 10% percent level, respectively.

	Equity Beta			Bond Beta			Bank Beta		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fundamentals									
Trade Openness	-0.002			0.001			-0.001		
Public Debt	0.001			0.004**		0.002*	-0.002		
Reserves	-0.002			-0.005			0.004		
FX Regime	0.012			0.03**		0.018**	0.03**		0.011
Real GDP Growth	0.038			0.022			0.029		
Law and Order	0.018			-0.027			-0.038		
Investor Protection	-0.013			-0.003			-0.017		
Market Characteristics									
Foreign Openness		-0.003			0.002			-0.011***	-0.01**
Local Market Size (%GDP)		0.001			-0.003			0.002***	0.002**
Relative Market Size (% Stock)		-0.001			0.005				
MSCI EM		0.006							
MSCI Frontier Market		0.24*	0.23**						
EMBI EM					-0.019				
Stock Turnover Ratio		0.002***	0.002***						
Share of Funding from AE		0.002			0.002				
Correlation with EPFR (or BIS) flows		0.512***	0.538***		0.47***	0.298**		0.29*	0.285*
constant	0.24	-0.138	0.008	-0.05	0.057	-0.013	0.13	0.11	0.02
R-sq	0.25	0.61	0.59	0.46	0.40	0.48	0.36	0.43	0.45

Standard errors in parentheses

="* p<0.10 ** p<0.05 *** p<0.01"

Table 6. Bayesian Averaging Results

This table reports the results of the Bayesian Averaging obtained for the Equity, Bond and Bank regressions presented in Table 5. Given the limited cross section, standard regression methods could fail to select robust relations. To address this issue and confirm the significance of the variables, we use a Bayesian Model Averaging technique presented in Fernandez, Ley, and Steel (2001). Intuitively, the objective of Bayesian Model Averaging is to address the problem of model uncertainty by (i) running the maximum combination of models and (ii) providing estimates and inference results that take into account the performance of the variable not only in the final "reported" model but over the whole set of specifications. In practice, these two steps boil down to estimating a parameter of interest conditional on each model in the model space and computing the unconditional estimate as a weighted average of the conditional estimates. Along with coefficients and t-statistics, the table reports individual Post-Inclusion Probabilities (PIPs). In line with Magnus et al. (2010), variables with the highest PIPs are considered robust. The variables highlighted in bold are statistically significant in Table 5, columns (3), (6) and (9).

Equity- Bayesian Averaging				Bond- Bayesian Averaging				Bank - Bayesian Averaging			
	Coef.	t-Stat	PIP		Coef.	t-Stat	PIP		Coef.	t-Stat	PIP
Trade Openness	-0.001	-0.57	0.31	Trade Openness	0.000	0.22	0.12	Trade Openness	0.000	-0.3	0.17
Public debt	0.000	0.05	0.07	**Public debt**	**0.001**	**0.54**	**0.3**	Public debt	0.000	-0.37	0.2
Reserves	-0.001	-0.33	0.15	Reserves	-0.002	-0.53	0.29	Reserves	0.000	0.15	0.11
FX regime	0.001	0.19	0.1	**FX regime**	**0.012**	**0.81**	**0.48**	**FX regime**	**0.004**	**0.45**	**0.25**
Real GDP Growth	0.007	0.4	0.2	Real GDP Growth	0.000	-0.06	0.08	Real GDP Growth	0.004	0.33	0.17
Rule of Law	-0.006	-0.27	0.13	Rule of Law	-0.002	-0.18	0.1	Rule of Law	-0.003	-0.2	0.12
Investor Protection	-0.002	-0.22	0.11	Investor Protection	0.001	0.11	0.1	Investor Protection	0.000	-0.04	0.11
Foreign Equity Stock/GDP	0.00	0.1	0.08	Foreign Bond Stock/GDP	0.000	0.11	0.08	**Foreign BIS Claims Stock/GDP**	**-0.009**	**-1.48**	**0.77**
Stock Market Capitalization (%GDP)	0.00	0.08	0.07	Bond Market Capitalization (%GDP)	0.000	0.04	0.09	**Private credit/GDP**	**0.001**	**0.83**	**0.49**
Relative Equity Size	0.00	0.04	0.07	Relative Market Size	0.000	0.12	0.08				
MSCI EM Benchmark	-0.01	-0.16	0.12	EMBI Benchmark (dummy)	0.001	0.06	0.08				
MSCI Frontier Market Benchmark	**0.13**	**1.01**	**0.59**								
Stock Turnover Ratio	**0.00**	**1.62**	**0.81**								
Share of Funding from AE	0.00	0.14	0.08	Share of Funding from AE	0.000	0.19	0.1				
Correlation with EPFR Equity flows	**0.32**	**1.2**	**0.68**	**Correlation with EPFR Bond flows**	**0.333**	**1.62**	**0.81**	**Correlation w/ BIS flows**	**0.133**	**0.67**	**0.4**

Table 7. Explaining Countries' Sensitivities to Global Factor: Pre-Crisis Sample

This table presents the results of the estimation of the regression of countries' sensitivities in each type of flow on the set of macro, institutional and market characteristics for the pre-crisis period 2001Q1-2007Q4. Definitions, sources and frequency of all variables are presented in Table 2. Columns (1), (4) and (7) report the results when only macroeconomic and institutional fundamentals are used as regressors. Columns (2), (5) and (8) report results only when market characteristics are used. Finally, columns (3), (6) and (9) report results when using as regressors the variables that are found significant in each sub-group. Asterisks denote significant coefficients, with ***, **, * indicating significance at 1%, 5%, and 10% percent level, respectively.

	Equity Beta			Bond Beta			Bank Beta		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fundamentals									
Trade Openness	0.003			-0.001			0.000		
Public Debt	0.007			0.010***		0.005	0.000		
Reserves	0.029			-0.010			-0.0002		
FX Regime	0.050			0.003			-0.004***		-0.0019**
Real GDP Growth	0.044			0.038			-0.001		
Law and Order	-0.012			-0.063			0.009*		0.007**
Investor Protection	-0.099			0.000			0.002		
Market Characteristics									
Foreign Openness		0.012			0.000			0.001*	0.0005
Local Market Size (%GDP)		0.000			-0.002			0.000	-0.000**
Relative Market Size (% Stock)		-0.027			0.013**	0.008			
MSCI EM		0.108							
MSCI Frontier Market		0.717***	0.656***						
EMBI EM					0.098				
Stock Turnover Ratio		0.006***	0.005***						
Share of Funding from AE		0.003			-0.003				
Correlation with EPFR (or BIS) flows		0.66**	0.705**		0.640***	0.474***		0.011	0.003
constant	-0.247	-0.372	-0.57	0.04	0.268	-0.070	0.01	0.06	0.007
R-sq	0.23	0.55	0.5	0.55	0.62	0.63	0.4	0.24	0.42

Standard errors in parentheses

="* p<0.10 ** p<0.05 *** p<0.01"

Table 8. Explaining Countries' Sensitivities to Global Factor: Post-Crisis Sample

This table presents the results of the estimation of the regression of countries' sensitivities in each type of flow on the set of macro, institutional and market characteristics for the post-crisis period 2010Q1-2015Q4. Definitions, sources and frequency of all variables are presented in Table 2. Columns (1), (4) and (7) report the results when only macroeconomic and institutional fundamentals are used as regressors. Columns (2), (5) and (8) report results only when market characteristics are used. Finally, columns (3), (6) and (9) report results when using as regressors the variables that are found significant in each sub-group. Asterisks denote significant coefficients, with ***, **, * indicating significance at 1%, 5%, and 10% percent level, respectively.

	Equity Beta			Bond Beta			Bank Beta		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fundamentals									
Trade Openness	-0.001			0.000			0.000		
Public Debt	0.005			-0.001			0.000		
Reserves	-0.001			-0.001			-0.001		
FX Regime	0.049			0.011**		0.002	-0.001		
Real GDP Growth	0.073*		0.024	-0.007			0.005		
Law and Order	-0.044			-0.020			-0.006		
Investor Protection	-0.009			-0.008			-0.005		
Market Characteristics									
Foreign Openness		0.003			0.010			-0.001	
Local Market Size (%GDP)		0.001			0.025			0.000	
Relative Market Size (% Stock)		0.015			0.020				
MSCI EM		-0.081							
MSCI Frontier Market		-0.035							
EMBI EM					0.226				
Stock Turnover Ratio		0.003	0.004***						
Share of Funding from AE		-0.003			0.007				
Correlation with EPFR (or BIS) flows		1.17***	1.10***		0.041**	0.088*		-0.019	
constant	-0.210	0.150	-0.19	0.166	0.460	-0.023	0.09**	0.020	
R-sq	0.340	0.75	0.73	0.31	0.33	0.23	0.36	0.14	

Standard errors in parentheses

="* p<0.10 ** p<0.05 *** p<0.01"

Figure 1. Capital Inflows AC, and EMs – BOP Raw Data

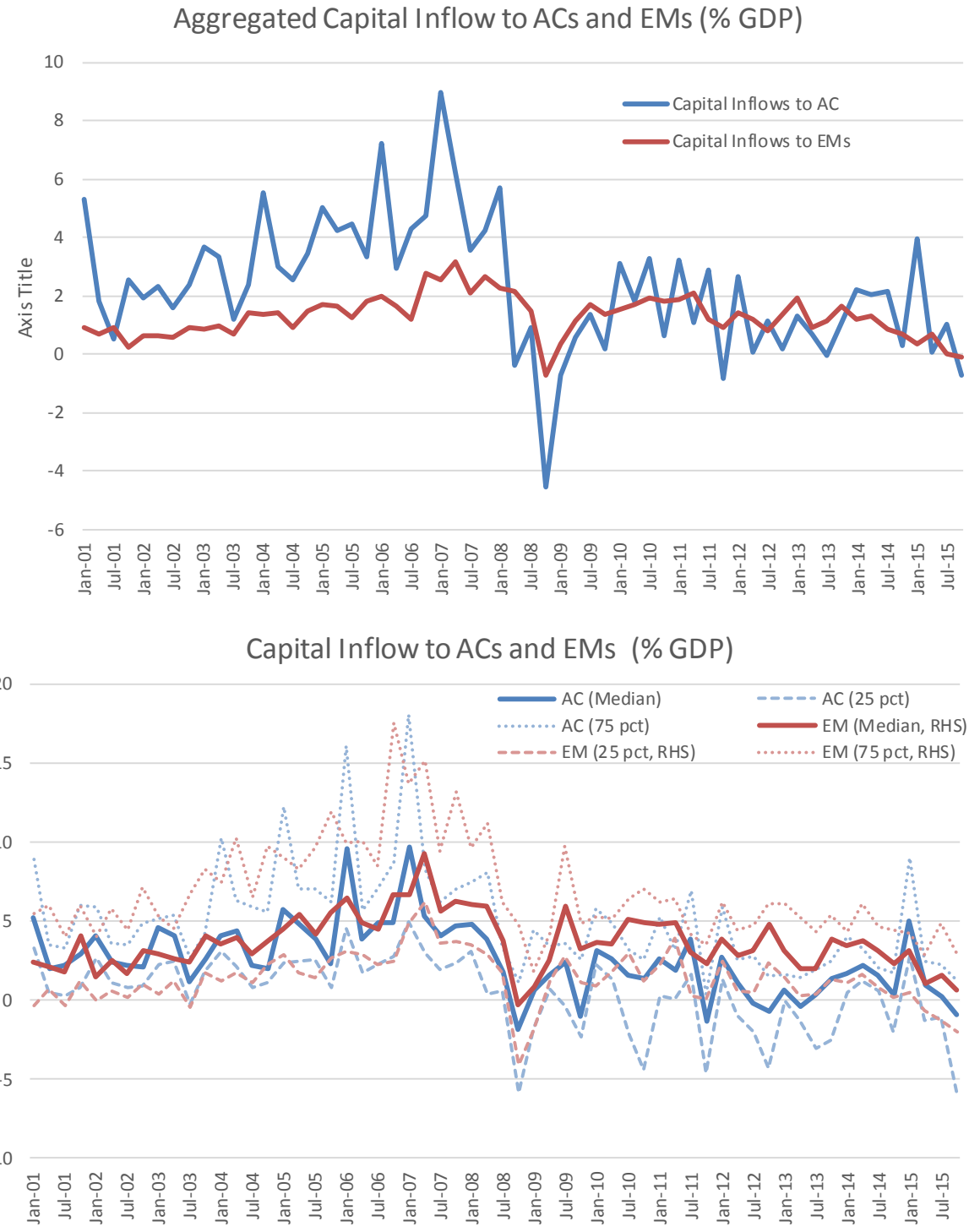

Figure 2. Common Factors All Countries, EMs and ACs – Disaggregated Gross Inflows

This figure plots the posterior mean of the common dynamics estimated using the model in Section 2 and inflows to 54 countries. The various series report the results of the co-movement analysis obtained using disaggregated gross inflows (i.e., distinguishing by type of flow, i.e., equity, bond, OI to bank, and FDI.

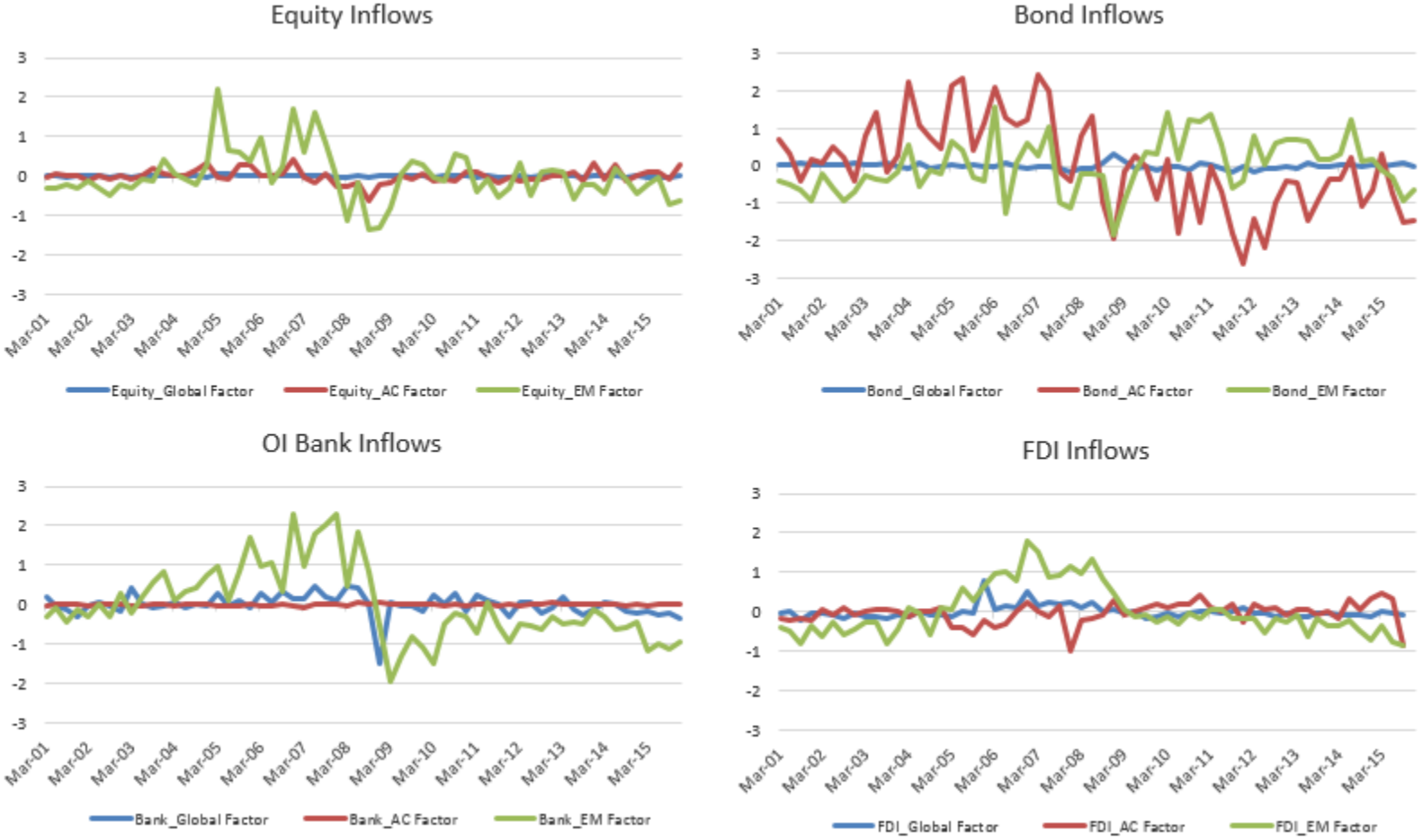

Figure 3: Estimated Common Factors for Capital Inflows to EMs

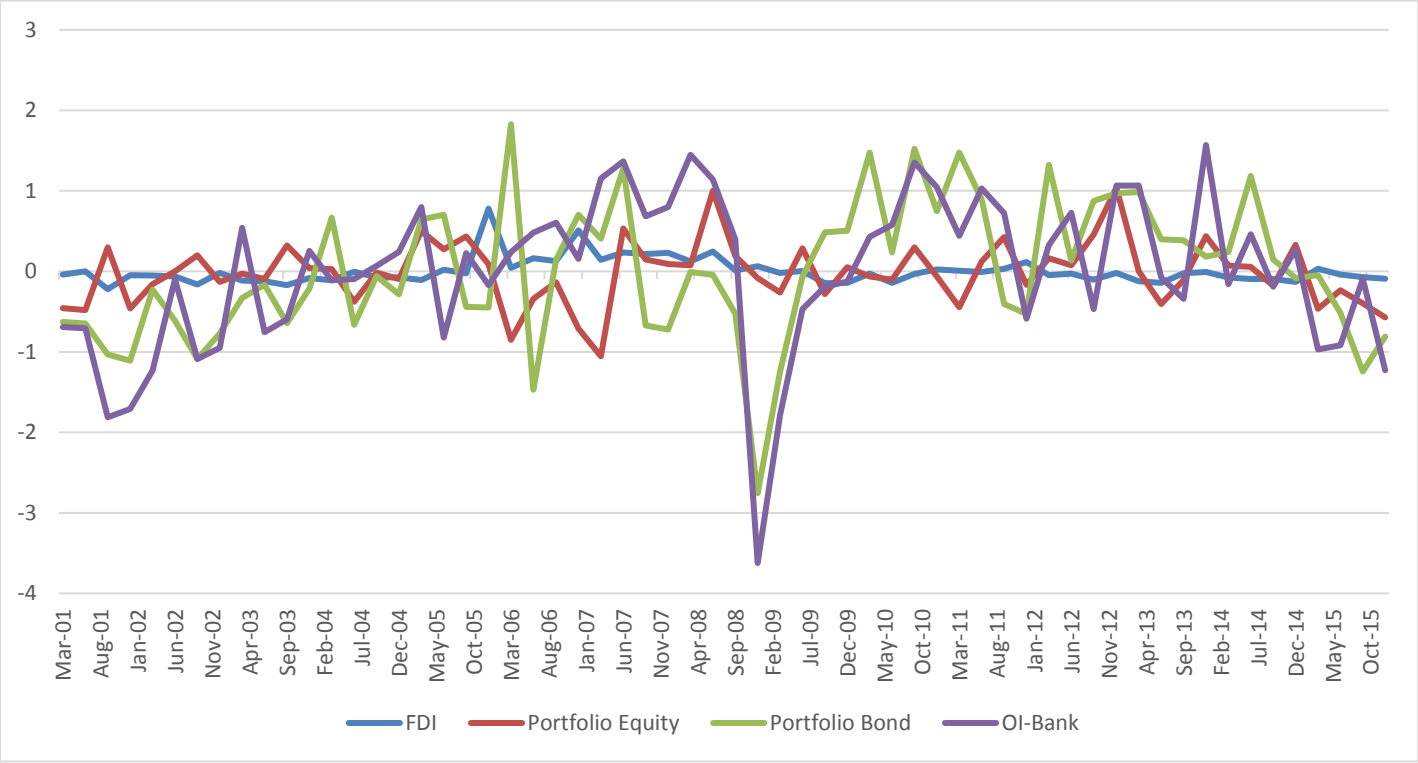

Figure 4. Estimated Betas

Equity Flows

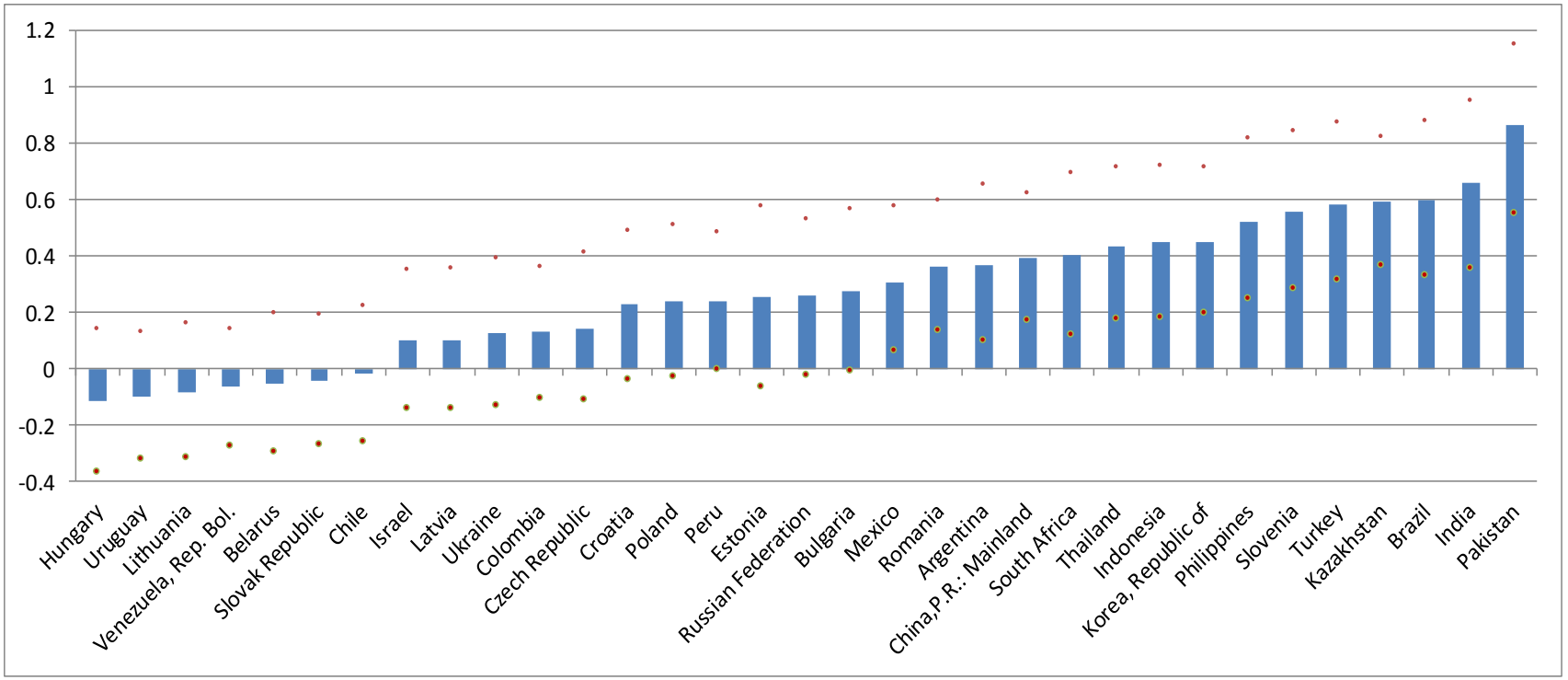

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Figure 4. (Continued)

Bond Flows

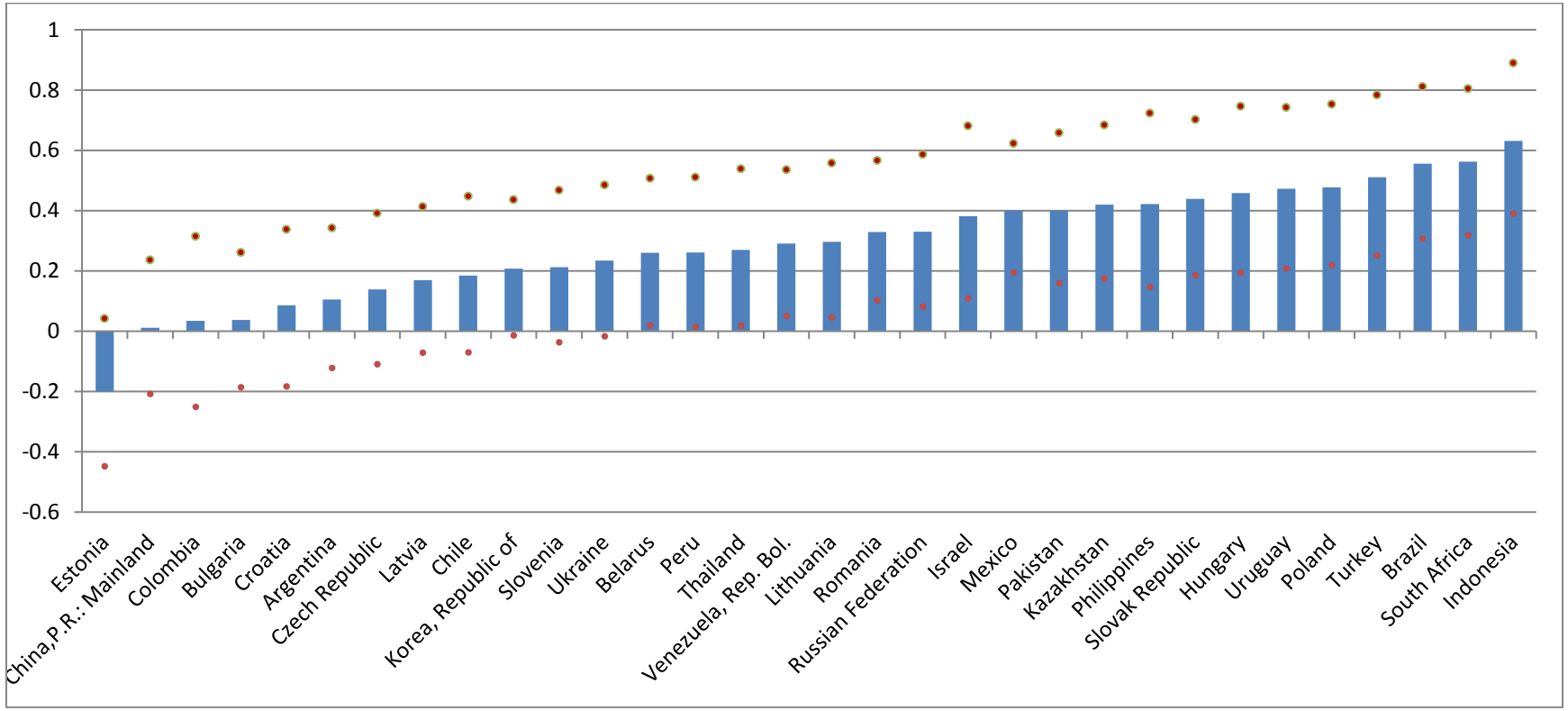
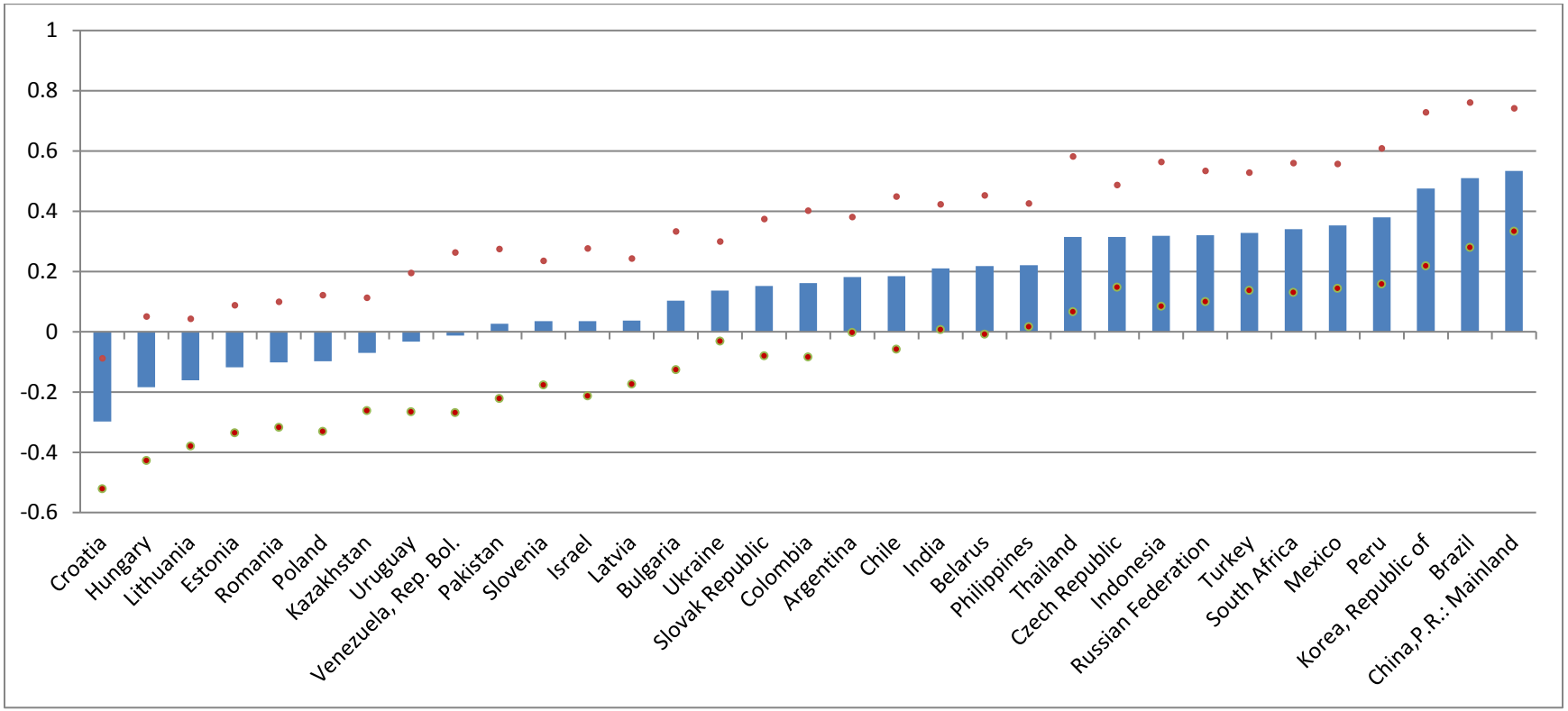


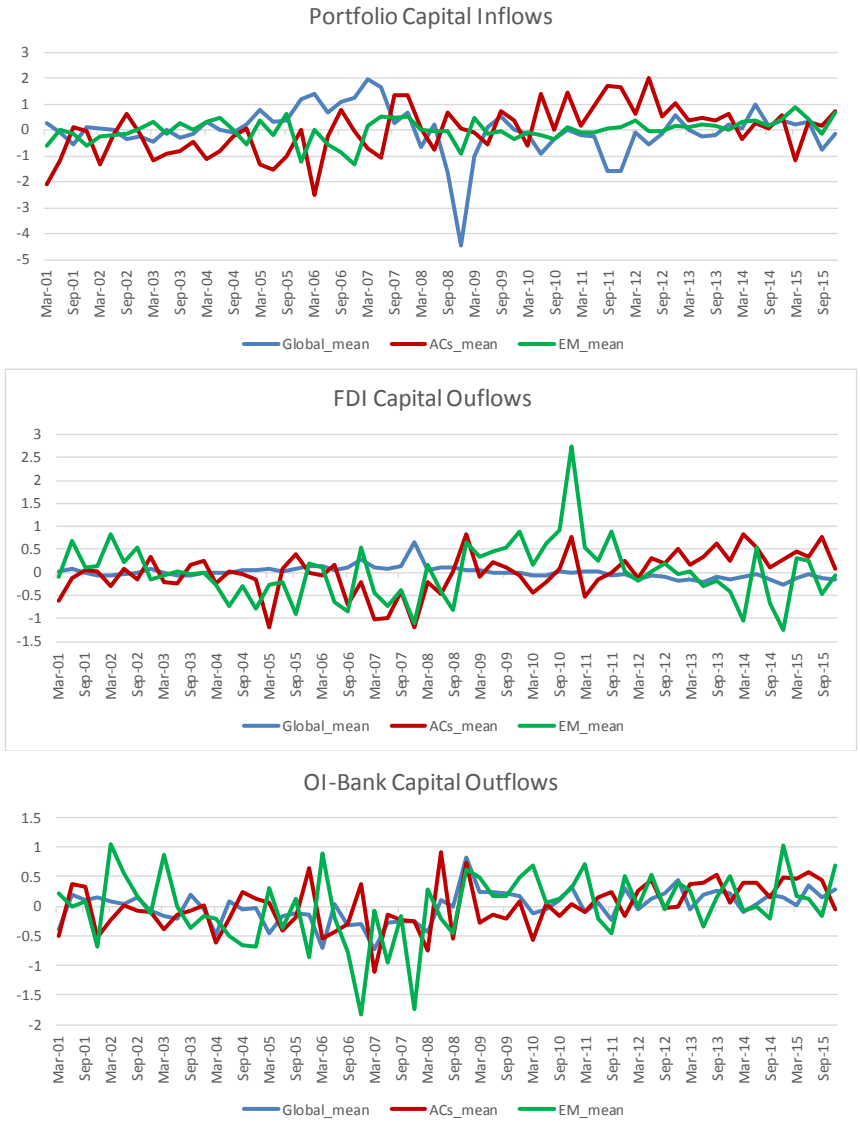
Figure 4. (Continued)

OI to Bank Flows



Note: lower and upper dots on each side of the reported betas report the 5th and 95th percentile of the posterior distribution respectively.

Figure 5. Capital outflows



Annex: Details on Market Structure Variables, and BOP Flows, EPFR Fund flows and BIS banking flows

Because not all variables are applicable (or available) for all assets classes, we provide below a summary of the variables chosen to proxy for these dimensions, as well as their definition. Sources are presented in Table 2.

- **Foreign Openness** and **Size** measures are based on stock variables and are used to proxy for the amount of foreign funding received and the size of the local market, respectively. To distinguish between the local and the relative size of a given market, the stock of foreign equity (or bond) in any given country is normalized (i) by the GDP of the recipient market and (ii) by the total of foreign equity (or bond) into the 34 EMs considered in this paper.

- **Liquidity** measures are standard and rely on trading data when available. In the case of Equity markets, we use the turnover ratio, measured by the total value of shares traded every year divided by the average market capitalization. Because trading statistics are not available for all 34 bond markets on a consistent basis, we proxy for the level of liquidity of bond markets by creating a dummy variable which captures the membership of country to the key EM benchmarks (the JP Morgan EMBI for bond markets and MSCI for equity markets).

- The **Composition of the Foreign Investor Base** captures two characteristics of the lender profile of EMs. First we control for the source of funds by computing the share of the total stock of foreign equity (or bond) funding that is coming from advanced economies.[17] Second we proxy for the importance of international funds and international (or global) banks in the foreign investor base. Because a decomposition of BOP stocks or flows by type of lender type is not available however, we compute, for each country in our sample, the correlation between BOP recorded equity (or bond) flows and EPFR recorded flows, which capture flows from Mutual funds in advanced economies to (or out of) EMs. For Bank flows, we use BIS locational statistics and compute the correlation between BOP recorded bank flows and BIS recorded flows. In both cases we interpret a high correlation as a sign that aforementioned investors (funds and global banks) account for most of the movements in capital inflows to (or out of) any given economy.

In terms of the EPFR and BIS datasets, their coverage and how they relate to BOP recorded flows, the following pertains**.** While the BOP capital flows, EPFR Fund flows and BIS

[17] This includes G10 countries as well as key financial or offshore centers (Luxembourg, Ireland, Cayman, Barbados, Bahamas, Cayman, Guernsey and Jersey).

banking flows are commonly used, we argue that the correlations between the EPFR global data and BIS locational Banking statistics data and their counterparts in the BOP statistics can be good approximations of the importance of mutual funds and global banking intermediaries respectively in driving capital flows to EMs.

EPFR global tracks the performance and asset allocation of a vast number of equity and debt funds domiciled in developed countries and important offshore financial centers. Over time, its coverage has increased significantly, reaching currently a wide industry and geographic coverage. As of recent, the EPFR global collects information from more than 29,000 equity funds and 18,000 fixed-income funds representing US$20 trillion of assets invested in over 80 advanced economies and EMs. As a result of its extensive coverage and quality,[18] EPFR global has been used in a number of recent analyses of funds behavior, including as regard to country capital flows (e.g., Raddatz and Schmukler (2012), Jotikasthira et al. (2012), Fratzscher (2012) and other references therein). In particular, given that an overwhelming majority of funds followed by the EPFR global dataset (i) are located in ACs and (ii) account for a significant share of the external funding received by EMs, its "country flows" dataset has proved to be a good (high frequency) proxy of total gross inflows in (or out) of EMs. For example, Miao and Pant (2012) show that EPFR fund flows correlate well with BOP recorded capital flows into EMs, suggesting that when funds play an important role in the foreign investor base of a given country, EPFR flows act as a timely and accurate proxy for overall portfolio flows.

Two important data issues prevent us from simply relating EPFR flows to BOP recorded flows to assess the importance of funds. First, EPFR only covers a fraction of the mutual fund industry. Second, because EPFR flows are based on dealer transactions, recorded flows are not always consistent with the residency criteria used to record transactions in the BOP data. For instance, when a fund dedicated to India and located in the U.S. sells an Indian bond to another non-resident (which is not covered by EPFR), this sale is recorded as a negative inflow from India in the EPFR data, but does not generate a negative inflow as recorded in India's BOP. As a result, there can be a large discrepancy between BOP and EPFR flows on some occasions (see Koepke and Mohammed, 2014) for a thorough discussion). Relying on correlations, rather than shares in gross inflows, allows us to address these issues.

To proxy the importance of global banks in driving non-resident gross inflows to banks relative to all inflows to banks recorded in the BOP, we use the BIS international banking

[18] The EPFR dataset has been found to be a reliable data source. Comparing TNAs (Total Net Assets) and monthly returns of a subsample of EPFR funds to CRSP mutual fund data, Jotikasthira et al. (2012) found only minor differences between EPFR and CRSP datasets. See Puy (2013) for a thorough discussion of the EPFR dataset.

statistics. The BIS International Banking Statistics (IBS) track internationally active banks' foreign positions through two main datasets: the BIS Consolidated Banking Statistics (CBS) and the BIS Locational Banking Statistics (LBS). We use the BIS LBS instead of BIS CBS because the first dataset provides data following the same residency principle as the one used in BOP data (see Cerutti et al. 2014 for further details). LBS captures the cross-border positions of all banks—defined as "Deposit-taking corporations, except the central bank" in the Balance of Payments Manual (BPM6)—domiciled in the reporting area (about 40 countries, mostly advanced countries and financial centers), including gross positions vis-à-vis their foreign affiliates, against borrower countries. From the LBS data, based on publically available data, it is possible to breakdown how much are gross inflows going to the banking and non-banking sector of each borrower country. We then correlate the LBS data on global banks' claims against the banking sector of each borrower country in our sample with the BOP data on Other Investment to Banks to define the variable we used as a proxy for the composition of the foreign investor base. Note that in addition to global banks, BOP data also include non-banks and banks located outside BIS reporting countries (e.g., . China). Since LBS largely reflects the positions of key major international banking centers (e.g., Minoiu and Reyes, 2013, find that globally top lenders in the LBS dataset are banks operating in Belgium, France, Germany, Japan, Switzerland, U.K., and U.S.) we interpret a high correlation between the selected LBS series and Other Investment to Banks in a given EM as indicating a larger activity of global banks in that borrower country as lenders.