Decomposing International Portfolio Flows*

Shaghil Ahmed\textsuperscript{a}, Stephanie E. Curcuru\textsuperscript{a}, Francis E. Warnock\textsuperscript{b,c,d}, Andrei Zlate\textsuperscript{a,e}

\textsuperscript{a} Board of Governors of the Federal Reserve System
\textsuperscript{b} Darden Graduate School of Business, University of Virginia
\textsuperscript{c} Globalization and Monetary Policy Institute, Federal Reserve Bank of Dallas
\textsuperscript{d} National Bureau of Economic Research
\textsuperscript{e} Federal Reserve Bank of Boston, Department of Supervision, Regulation and Credit

September 14, 2016
Prepared for the SUERF/PSE/CEPII Conference “Rethinking Capital Controls and Capital Flows”
PRELIMINARY AND SUBJECT TO CHANGE

Abstract

International portfolio flows can be decomposed into a number of components. We present various decompositions—some based on flow data, others based on portfolio holdings data—that separate flows or changes in holdings into what we refer to a baseline component and a more active component. The underlying components behave very differently from one another and from aggregate top-line flow measures.

* This paper has been lightly circulated under various titles including “The Two Components of International Capital Flows”. The views in this paper are solely the responsibility of the authors and should not be interpreted as reflecting the views of any other person associated with the Federal Reserve System. The authors thank McKinsey Global Institute for data on the size of global financial assets. We also thank for helpful comments on this or earlier versions Joshua Aizenman, John Burger, Marcos Chamon, Roberto Chang, Aitor Erce, Barry Eichengreen, Jeff Frankel, Vahagn Galstyan, Steve Kamin, Anton Korinek, Signe Krogstrop, Philip Lane, Alessandro Rebucci, Eric van Wincoop, Adrien Verdelhan, Shang-Jin Wei, James Yetman and participants in seminars or conferences at Asian Development Bank, Banco Central de Chile, Bangko Sentral ng Pilipinas, Bank Negara Malaysia, BIS Asia Pacific Office, Barcelona GSE Summer Forum, BOK/KIEP/PIIE, CEMLA/World Bank/Banca d’Italia, ECB, Federal Reserve Board of Governors, HKMA/ECB/Fed/Dallas Fed, IMF, NBER, Trinity College Dublin/CEPR, RBNZ, and Seoul National University.
1. Introduction

Capital flows have increased in magnitude and importance over the past few decades as the world has transitioned from relatively closed (from a financial perspective) to rather open. Policymakers in open economies struggle with whether and how to manage capital flows. Yet to manage flows requires an understanding of the sources, otherwise we risk addressing symptoms (capital flows) rather than root causes.

In this paper we hope to improve our understanding of capital flows by highlighting that flows can have various components. We provide a decomposition of capital flows into “portfolio growth” and “reallocated” components that is in line with the work of Kraay and Ventura (2000, 2003) and Tille and van Wincoop (2010). In addition, as the portfolio growth/reallocated flow decomposition is somewhat ad hoc, we also examine two decompositions using data on portfolio positions (rather than flows). One is based on the Grinblatt, Titman and Wermers (1995) measure of active (and passive) portfolio reallocations. The other is a new measure, normalized relative weight, that uses positions data to capture active portfolio reallocations.

Our flow decompositions are based on the notion that there is some baseline level and constellation of flows. Baseline flows could arise from the portfolio growth component of Kraay and Ventura (2000, 2003) and Tille and van Wincoop (2010), in which today’s new savings are allocated according to yesterday’s portfolio weights; in that case, the overall level of baseline flows is based on the amount of new savings, and the constellation (i.e., the allocation) of those flows is determined by existing portfolio weights (however they may have been formed). Alternatively, baseline flows could arise from a two-fund theorem in which investors hold some combination of a risk-free asset and the market portfolio; in that case, the baseline level of flows would still be due to the amount of new savings, but the constellation of flows would be driven by weights in the market portfolio.
The notion that capital flows have some baseline component that is not based on a current period reoptimization of portfolio weights might seem anathema to economists. But there is ample evidence that inertia—due to both behavioral characteristics and transaction costs—figures prominently in economic and financial decision making. Inattention and inertia influence homeowners’ refinancing behavior (Andersen et al. 2015) and individuals’ decisions on retirement savings (Madrian and Shea 2001, Benartzi and Thaler 2013, Chetty et al. 2014). Investors’ inertia coupled with transaction costs can lead to sluggish adjustments of portfolios—for example, the Friedman (1977) “optimal marginal adjustment”—and, in turn, impact corporate financing strategies (Baker, Coval and Stein 2007). Behavioral characteristics such as inertia can affect decisions on how and when to adjust portfolios.

But it is not just inertia that can lead to baseline flows. Institutional features of the financial intermediation industry could lead to baseline flows that are heavily driven by the constellation of the global market portfolio. Investment managers’ incentives are geared toward their performance vis-à-vis some benchmark index (Basak and Pavlova 2013), agency frictions can cause managers to stay close to benchmarks (Buffa, Vayanos and Woolley 2014), and many who claim to be active investors actually stay quite close to benchmark allocations (Cremers and Petajisto 2009). In a world in which many professional investors manage to size-based benchmarks and most capital flows are intermediated by professionals (as opposed to households’ direct purchases of international securities), the geography of baseline flows will be heavily driven by the constellation of the global market portfolio.

Thus, baseline flows can be motivated different ways and with different theories and evidence. But however we think about baseline flows, another component of flows will be based on more active decisions. In the language of Kraay and Ventura (2000, 2003) and Tille and van Wincoop (2010), the

---

1 This latter point is about “closet indexers”. Cremers and Petajisto (2009) showed that while 15% of US mutual funds were explicitly managed to a benchmark, the allocations of another 30% were so close to benchmark weights that they could be called closet indexers. See also Wahal and Wang (2011) and, in an international context, Cremers et al (2016). On the effects of changes in benchmark weights on asset allocation and capital flows, see Raddatz et al. (2014).
other component is “portfolio change” or “reallocation” flows that alter portfolio weights. From the two-
fund theorem or behavioral characteristics/institutional features lens, the other component would be
portfolio reallocations that actively change portfolio weights relative to market weights.

Our goal in this paper is to bring the notion that capital flows have baseline and a more active
components to the empirical analysis of international portfolio flows. In theoretical work, this distinction
already figures prominently; see, for example, Kraay and Ventura (2000, 2003) on current account
dynamics and the Tille and van Wincoop (2010) model of international capital flows. A recognition of the
notion that overall flows might be comprised of two components—one baseline, one based on more active
portfolio reallocations—that may themselves have very different determinants might improve our ability
to understand international capital flows.

Bringing this distinction to empirical work is not straightforward. When using flow-based
measures it is difficult to disentangle the active and passive components in a meaningful way. However,
with stock-based measures, when such data are available, the decomposition is more straightforward. One
way to do the decomposition with stock-based data is to start with changes in portfolio weights, compute
the passive change in these weights as resulting solely from relative valuation changes, and compute the
active change in the weights as portfolio reallocations relative to buy-and-hold weights. Such a
decomposition is feasible (and we do it in this paper) but the data requirements—returns on country $i$’s
securities, returns on the investors’ holdings in county $i$ and in their entire portfolio—are onerous. We
propose another, more easily constructed stock-based measure: the normalized relative weight. We will
develop this measure in detail, but briefly relative weight is a country’s share in investors’ portfolios
relative to its share in a global benchmark portfolio, and normalized relative weight controls for the degree
of home bias on home securities to better isolate active portfolio reallocations.
To illustrate the two components, we use a dataset of U.S. investors’ flows to and portfolios in emerging market equities. The reader should note that our goal here is not to find the perfect estimated equation that explains capital flows—we leave that substantial and difficult undertaking for others—but rather to provide a way forward for the literature by illustrating the importance of distinguishing between baseline and more active components of flows when considering the determinants of flows.

Our analysis is mainly through simple graphs and reduced-form regressions. In recent years, many researchers (e.g., Fratzcher et al (2012) and Moore et al (2013)) and policymakers have wondered if the Federal Reserve’s large scale asset purchases (LSAP) program, generally loosely referred to as quantitative easing (QE), prompted large EME inflows or, in the words of Brazilian President Rousseff, “a monetary tsunami.” And, indeed, our graphs show that top-line flow measures show that around the time of QE programs (especially the first QE program) inflows to EMEs surged and the share of EMEs in US portfolios increased. But the relative weight measure that isolates active reallocations does not show the same increase, suggesting that post-GFC flows into EME equities were not due to active reallocations of equity portfolios toward EMEs. Measures that combine two components tell one story about the impact of QE, while a measure that isolates an active component tells another. Similar results come through simple reduced-form regressions that attempt to shed light on possible drivers of flows. In particular, the factors that drive active reallocations differ from the drivers of more passive measures. Conclusions about drivers of capital flows depend on whether the measure includes both components or isolates the active portion.2

One important caveat is that since we focus on one asset class—equities, because of the greater granularity of data on equity portfolios—our analysis does not capture switches between different asset

---

2 A recognition that headline data can comprise two or more components that are fundamentally different is evident in related work. For example, in a theoretical model Ghironi, Lee and Rebucci (2015) show the importance of decomposing net foreign asset positions into underlying components.
classes. If investors actively switch between bonds and equities, for example, as a result of the changes in the factors we have considered, this may show up as passive flows due to portfolio changes since our measured portfolio consists only of equities. We briefly address this point in Section 5.

Our work rests on the long empirical literature on international capital flows that dates at least as far back as Calvo, Leiderman and Reinhart (1993, 1996). Other seminal contributions include Bohn and Tesar (1996), Brennan and Cao (1997), and Chuhan, Claessens, and Mamingi (1998). A short list of more recent papers includes Griffin, Nardari and Stulz (2004), Galstyan and Lane (2013), Broner et al. (2013), Fratzscher (2012), and Forbes, Fratzscher and Straub (2013). These papers, and others, use many measures of capital flows, some flow-based and others based on the change in stocks, including the dollar amount of flows (Chuhan et al. 1998), flows normalized by average past flows (Brennan and Cao 1997), log changes in portfolio positions (Galstyan and Lane 2013), flows as a percent of lagged portfolio size (Forbes, Fratzscher and Straub 2013), changes in the portfolio share (Fratzscher et al. 2012), flows scaled by local market capitalization (Griffin, Nardari and Stulz 2004; Edison and Warnock 2008), flows scaled by assets under management (IMF 2014), and flows scaled by local GDP (Milesi-Ferretti and Tille 2011; Ahmed and Zlate 2014; IMF 2011). All of these measures combine components; the distinction between components has been largely absent from the empirical literature on international portfolio flows.³

The paper proceeds as follows. In Sections 2 and 3 we decompose flow- and portfolio-based measures and illustrate the importance of differentiating between the various components through a set of simple graphs. In Section 4 we present simple reduced-form regressions.⁴ In Section 5 we briefly discuss the implications of extending our relative weight measure to a case where the portfolio includes all asset classes so that we can assess the issue of active switching between asset classes. Section 6 concludes.

³ There are exceptions. Curcuru et al. (2011, 2014) explicitly consider both total capital flows and active reallocations defined as deviations from a buy-and-hold benchmark. See also Raddatz et al. (2014) on the benchmark effect.
⁴ The regressions use the new Ahmed et al (2016) capital flow management (CFM) measure that goes some way toward capturing changes in the intensity of capital controls over time.
$2. \text{Decomposing Capital Flows}$

Our main analysis will be based on a quarterly dataset that covers the time period 2002 – 2012 for a set of seventeen countries: India, Indonesia, Korea, Philippines, Taiwan, and Thailand; Argentina, Brazil, Chile, Colombia, and Mexico; Czech Republic, Hungary, and Poland; and Israel, Turkey, and South Africa. The set of countries is determined by the availability of data for regressions we present in Section 3. For ease of exposition and because we do not want to introduce a new acronym, we will refer to the group as EMEs, even though at least two are clearly developed countries. Also, our focus is on equity flows, not because we feel that equity flows are necessarily the most important type of flow, but because data availability for equities allows us to readily consider a range of decompositions (described below).

Figure 1 shows EME balance of payments (BOP) equity inflows—that is, Rest of the World flows into recipient-country equities—scaled by recipient-country market capitalization.\(^5\) As is well known, EME BOP equity inflows plummeted during the GFC but surged afterwards. The post-GFC surge in flows occurred at the same time as the Fed’s QE policies—shown as bars depicting the size of LSAPs as a percent of US GDP—and appeared to have abated somewhat during pauses in QE, prompting many to wonder if QE led investors to reallocate to EMEs (e.g., Fratzcher et al (2012) and Moore et al (2013)).

QE policies might have led to a reallocation toward EME equities. But behind an aggregate flow measure such as BOP equity inflows are baseline flows and reallocation flows. Without examining the components, we do not know how much of the flow dynamics were due to baseline flows and how much were truly active portfolio reallocations to EMEs. We assess this using various decompositions.

One way to decompose international portfolio flows follows from Kraay and Ventura (2000, 2003) and Tille and van Wincoop (2010). Let \(\omega_{i,t}\) be the weight of asset \(i\) in an investor’s portfolio in period \(t\).

---

\(^5\) Similar figures for flows scaled by recipient-country GDP are in the appendix.
and \( S_{t+1} \) be the flow of new savings in period \( t+1 \). Define portfolio growth flows, \( S^{PG} \), to be new savings deployed according to last period’s weights (that is, \( \omega_{i,t} S_{t+1} \)). Then total flows are portfolio growth flows (new savings allocated based on existing weights) plus “reallocation” flows (\( S^{Realloc} \), flows that are allocated differently than existing portfolio weights). Thus,

\[
\text{Gross Capital Flows} = S = S^{PG} + S^{Realloc} \tag{1}
\]

\[
S^{PG} = \omega_{i,t} S_{t+1} \tag{2}
\]

\[
S^{Realloc} = S - S^{PG} = S - \omega_{i,t} S_{t+1} \tag{3}
\]

While there is nothing sacred about this decomposition—indeed, Kraay and Ventura (2000, page 1137) proposed it as “a reasonable guess”—it provides one useful way to decompose flows into baseline and more active components that is also simple: baseline flows are the Kraay and Venture (2000) portfolio growth flows, easily constructed as new savings times last period’s portfolio weights, and reallocation flows are the residual.

At this point we will switch from BOP flows (from the rest of the world into EME equities) to U.S. flows into EME equities for the simple reason that the detailed information available for U.S. flows into (and portfolios in) EME equities will enable various decompositions.

Compared with BOP flows, topline US equity flows to EMEs (Figure 2a) tell a similar but not identical story. That is, whether one refers to BOP or U.S. data, flows into EME equities paused around the GFC and then increased during the QE period, consistent with the notion that Fed policy led to massive switching from AEs to EMEs.

Figure 2b shows baseline flows as given by the portfolio growth component. Two things jump out. One, portfolio growth flows have not been negative in this sample (and indeed in the post-WWII era). US
savings in a quarter, while sometimes near zero, has not been negative, indicating that every quarter US investors have more funds to allocate to all financial assets (including EME equities). Put another way, EMEs should expect quarter after quarter to receive some positive baseline flows from the US. Two, portfolio growth flows are not economically insignificant; they are a substantial portion of topline flows.\(^6\)

Figure 2c shows the residual, reallocation flows. US reallocation flows to EME equities are sometimes positive, sometimes negative, with no clear trend. Reallocation flows were strongly positive in 2005, turned negative well before the GFC (in 2006), and since the GFC have been at times positive but often negative. While we caution that reallocation flows are calculated as a residual, Figure 2c combined with Figure 2b suggests that any persistent inflows received by EMEs after the GFC were due much more to baseline flows than active reallocations.\(^7\)

3. Portfolio-based Decompositions

Any flow measure combines baseline flows with more active reallocation flows. The decomposition in equations (1) – (3) is admittedly ad hoc, but it is clear that portfolio growth has occurred (Figure 3). Empirical work focused on flows often assumes, whether stated or not, that financial wealth is constant. Bohn and Tesar (1996) and Brennan and Cao (1997) recognized this, making clear that portfolio choice was made with respect to the size of the portfolio (financial wealth). Both controlled for changes in financial wealth by including a measure of U.S. equity returns in their regressions, but such control is imperfect. Financial wealth (Figure 3, thick line) is far from constant, evolving because of new savings

---

\(^6\) An aside on U.S. flows into all foreign equities (i.e., not just into our EME sample of countries): Over the period 2011-2013 if U.S. investors allocated new savings (which averaged $1100 billion) to foreign equities according to existing portfolio weights (a roughly 9 percent weighting), annual U.S. flows into foreign equities would have averaged $98 billion, or about 76 percent of the recorded $128 billion in annual flows. Baseline flows computed by the portfolio growth component can be quite large.

\(^7\) Not only are reallocation flows calculated as a residual, but once we move to country-by-country analysis we must confront the unfortunate fact that the geography of bilateral capital flow data is notoriously inaccurate due to a well-documented financial center bias (see for example Warnock and Cleaver 2003). Thus, blind application of the portfolio growth / reallocation decomposition to bilateral flow data will produce flow components that suffer from a financial center bias.
(Figure 3, thin line), which maps directly into the Tille and van Wincoop (2010) concept of portfolio growth, as well as valuation changes on existing assets. Flows-based empirical work must recognize this fact highlighted by Tille and van Wincoop (2010).

Keeping in mind that financial wealth changes through time—portfolio growth occurs and is driving at least some of the capital flows one might want to study—we next turn to measures that are immune to changes in the size of the portfolio.

3.1 Active and Passive Changes in Portfolio Shares

The share of EME equities in U.S. investors’ global (i.e., including US) equity portfolios, depicted in Figure 1 (bottom graph), will not change if new savings allocated based on past weights (i.e., with pure portfolio growth flows). The weight of EMEs in US equity portfolios increased until the GFC, then fell and resumed increasing during QE1. While immune to changes in the size of the portfolio, portfolio shares still combine two components—portfolio shares can change because of active or passive reallocations—so Figure 1 doesn’t actually tell us whether US investors switched toward EME equities during QE1 or if this was just a passive increase in US portfolios (because EME equity markets could have outperformed without active reallocations). But with portfolio data—that is, data on the allocations within investors’ portfolios—various decompositions that isolate active portfolio reallocations are possible.

3.1.1 The Decomposition

Let $\omega_i$ be the weight of country $i$ in the investors’ portfolio. Then the change in portfolio share is:

$$\Delta \omega_{i,t+1} = \omega_{i,t+1} - \omega_{i,t},$$

(4)

The change in portfolio shares can be decomposed into two components:

$$\Delta \omega = \Delta \omega_{\text{val}} + \Delta \omega_{\text{Realloc}},$$

(5)
where the $t+1$ subscript is omitted, $\Delta \omega^{val}$ is the change in the portfolio share that is due entirely to relative price changes (at constant weights) and $\Delta \omega^{Realloc}$ is the active change in portfolio weights (which is also total flows less portfolio growth flows scaled by the initial asset position). Let $R_i$ and $R_P$ be gross returns on country $i$ equities and the entire portfolio, respectively. Then the passive change in portfolio weights is $\omega_{i,t}^* (R_i/R_P - 1)$ and the active change is $\omega_{i,t+1} - \omega_{i,t}^* (R_i/R_P)$. The overall change in portfolio share has the two components (passive and active): \(^8\)

$$
\Delta \text{Portfolio Share} = \text{Passive Change} + \text{Active Change} = \omega_{i,t}^* (R_i/R_P - 1) + \omega_{i,t+1} - \omega_{i,t}^* (R_i/R_P) \tag{6}
$$

which sums to $\omega_{i,t+1} - \omega_{i,t}$, as in (4). As with capital flows data, off-the-shelf measures of changes in portfolio shares will conflate two components, in this case passive and active reallocations. But with portfolio share data, one can isolate active reallocations as long as $R_i/R_P$ can be computed. In practice, accurate data on returns are rarely available, but if returns data are available then this way of isolating the active portion is cleaner than doing so through flow data.

The above provides a simple but informative decomposition. Flows can be such that they do not change portfolio weights (that is, portfolio growth flows due to new savings allocated according to existing weights) and other flows can explicitly change portfolio weights (“reallocations” flows). When using capital flow data—whether we are just describing, plotting, or trying to ascertain the determinants of flows—we almost exclusively use total flows. However, it could be that portfolio growth flows and reallocation flows behave very differently. If so, we would learn more if we disentangle the two. A difficulty with the decomposition in (6) is that it relies on accurate data on returns, data that are rarely available.

---

\(^8\) This decomposition is used in Grinblatt, Titman and Wermers (1995) and Curcuru et al. (2011) to form various momentum measures.
3.1.2 Active and Passive Portfolio Changes in Pictures

[Insert description of Figure 4]

3.2 Normalized Relative Weight

Another decomposition is based on a measure we call normalized relative weight, which readily isolates a set of investors’ active portfolio reallocations and has only limited data requirements.

3.2.1 The Measure

Define relative weight as a country’s share in the investors’ portfolios relative to its share in a benchmark such as the global market portfolio. That is, for US investors the relative weight on country $i$’s equities can be expressed as

$$RW_{i}^{US} = \frac{\omega_{i}^{US}}{MC_{i}/MC_{world}}$$ (7)

where $MC_{i}$ and $MC_{world}$ denote the market capitalizations of country $i$ and the world.

Equation (8) is a straightforward summary measure of the degree of over- or underweighting of country $i$ in investors’ portfolios. But the first difference of (7) is influenced by relative price changes if portfolio and market capitalization weights differ, as they usually will. A simple fix is to normalize relative weight by the home country’s relative weight on its own securities. That is, define US investors’ normalized relative weight on country $i$ as their relative weight on country $i$ securities—country $i$’s share in US investors’ portfolios divided by its share in the global market—divided by US investors’ relative weight on US securities:

---

9 The level of (7), a common measure of home bias defined relative to the global benchmark as used in Ahearne et al. (2004) and many others, assumes that the world portfolio is the benchmark.

10 An example sheds light on why. Consider a situation in which there is a home bias in U.S. investors’ portfolios in which the weight on U.S. equities exceeds their weight in world markets. An increase in foreign country $i$’s prices would increase the numerator in (7) more than the denominator, causing the ratio to increase. Intuitively, since country $i$’s equities are underweight in U.S. portfolios, the value of country $i$’s equities rises more relative to the U.S. portfolios than to the world market capitalization, leading to an increase in $RW_{i}^{US}$. 

11
\[ \text{Normalized relative weight} = \frac{\text{Relative weight}}{\text{Relative weight}} = \frac{RW_i^\text{US}}{RW_i^\text{US}} \]

Normalized relative weight—essentially, relative weight in which the degree of home bias on investors’ home securities is controlled for—is easily computed and isolates active reallocations.

To see that normalized relative weight is not affected by passive reallocations due to relative price changes, assume for simplicity a two-country world. Denote the quantity of Home investors’ holdings of Home and Foreign equities by \( Q^H \) and \( Q^F \). Denote supply with overbars; supply of Home and Foreign equities is \( \bar{Q}^H \) and \( \bar{Q}^F \). Let \( P^H \) and \( P^F \) be the prices of Home and Foreign equities. Therefore, the total value of Home investors’ holdings of Home and Foreign equities is \( P^H Q^H + P^F Q^F \); for simplicity call that \( X_1 \). The world market capitalization is \( P^H \bar{Q}^H + P^F \bar{Q}^F \); call that \( X_2 \). The weight of Foreign equities in Home portfolios is \( P^F Q^F / X_1 \) and their weight in world market is \( P^F \bar{Q}^F / X_2 \). Define Home investors’ relative weight in Foreign equities—Foreign equities’ weight in Home portfolios relative to their weight in the world market portfolio—as

\[ RW_F^H = \frac{P^F Q^F}{X_1} / \frac{P^F \bar{Q}^F}{X_2}. \]  

Similarly, Home investors’ relative weight in Home equities is

\[ RW_H^H = \frac{P^H Q^H}{X_1} / \frac{P^H \bar{Q}^H}{X_2}. \]

The defined normalized relative weight, \( RW_F^H / RW_H^H \), can then be expressed as:

\[ RW_F^H / RW_H^H = \frac{Q^F / \bar{Q}^F}{Q^H / \bar{Q}^H}. \]  

As (9) shows, normalized relative weight—the share of Foreign equities owned by Home investors divided by the share of Home equities owned by Home investors—is not a function of prices.

---

11 We thank Eric van Wincoop for pushing us toward this algebraic illustration.

12 Continuing with the example with home bias in U.S. portfolios, an increase in foreign country \( i \)'s prices would cause the U.S. investors’ relative weight on U.S. securities \( (RW_{iUS}^\text{US}) \) to also rise, pushing it in the same direction as the relative weight on country \( i \)'s securities \( (RW_{iUS}^\text{US}) \) discussed earlier. Intuitively, since country \( i \)'s equities are underrepresented in U.S. portfolios, the share of U.S. equities in U.S. portfolios declines less than their share in world market capitalization, which causes \( RW_{iUS}^\text{US} \) to rise. As a result, the increase in country \( i \)'s prices causes both the numerator and the denominator in equation (8) to rise, and so the passive changes due to relative asset prices do not affect \( NormRW_i^\text{US} \).
3.2.2 Some Numeric Examples

Normalized relative weight is simple to calculate—it is easily constructed with data that tends to be accurately measured (portfolio weights and market capitalizations)—but perhaps not intuitive to the reader, so next we provide some numerical examples. Table 1 depicts a 2-period example with three countries, which we call US (which is the home market), AEs, and EMEs. In period 1, prices are set at 1, US and AE markets are identical in size ($Q^{US}=Q^{AE}=1$), and EMEs are half that size ($Q^{EME}=0.5$), meaning that the weights in world markets are 0.4, 0.4, and 0.2. Also, in period 1 US investors have a home bias—US equities have a higher weight in US portfolios (60%) than in the world market portfolio (40%). Reflecting this, US relative weight on US equities is greater than 1 (1.5). At the same time, US investors are underweight both AE and EME markets, so US relative weight on those markets is less than one. The underweight on EMEs is more severe: their weight is 0.2 in the world portfolio but only 0.1 in US portfolios, for a relative weight of 0.5 (their weight in US investors’ portfolio is half their weight in the world portfolio), whereas in AE markets US investors are at 75% of the benchmark weight. Normalized relative weight on AE and EME markets, computed as their relative weights divided by US relative weight on US equities, are also less than one at 0.5 and 0.33, respectively.

We discuss four scenarios for period 2. Scenario (a) depicts flows due solely to portfolio growth. New savings are allocated according to period 1 weights. Flows occur, and prices increase. Portfolio weights do not change because we assumed the price increases were identical, so there were no relative price changes. Relative weights also do not change.

Scenario (b) is the same as (a) but prices increase more in the relatively less liquid EMEs. Flows occur, and this time the portfolio weight on EMEs increases because of the relative price change. Relative weight changes slightly; normalized relative weight does not change at all.
Scenario (c) has active reallocations from US and AE equities to EME equities. Capital flows occur—US gross sales of AE equities, US gross purchases of EME equities—and these are all active (selling US equities, selling AE equities, buying EME equities). Portfolio weights change, as do relative weights (both raw and normalized).

Scenario (d) is one of rebalancing in which US investors have a preferred allocation of 60% US, 30% AE, and 10% EME. EME prices increased relative to US and AE, so to rebalance US investors sell EME equities. The sales of EME equities restore the initial portfolio weights. This rebalancing is an active decision: active flows (out of EME equities) occurred and relative weights adjust.

In all of the numerical examples, capital flows occurred. But in two scenarios (a and b) there were no active portfolio reallocations. When using capital flows data, we must realize that some portion of flows can be termed baseline; capital flows data do not isolate active portfolio reallocations.

### 3.2.3 Relative Weight in Pictures

In Figure 5 we depict the normalized relative weight (eq. 8) of EME equities in US investors’ portfolios. The relative weight measure appears to indicate that the QE-period increase of EME equities in US portfolios was due not to active reallocations but to passive ones. EMEs’ normalized relative weight did not increase, suggesting that US investors did not actively increase portfolio allocations to EME equities (relative to the value-weighted benchmark). Any increase in EMEs’ share in US portfolios was likely due to the strong performance of EME equity markets (i.e., relative price effects). And during the GFC the decline of EME equities in US portfolios was likely due to valuation effects rather than active switching, as normalized relative weight fell only modestly in the second half of 2008.\(^{13}\)

---

\(^{13}\) This is consistent with evidence from another asset class, EME local currency bonds. Burger et al (2015) finds that US investors did not actively switch out of EME local currency bonds during the GFC. But it also opens up the question, which we don’t consider here, of what caused the strong performance of EME equity markets.
4. The Components in Regressions

Figures 1, 2, 4 and 5 showed that flows, portfolio shares, and measures that focuses on active portfolio reallocations tell very different stories. The figures aggregated all 17 EMEs and so say nothing about any particular country. To assess differences country-by-country, we next turn to simple reduced form regressions.

We include as explanatory variables some traditional factors; see, for example, the long-standing empirical literature on capital flows that focuses on push (global) and pull (local) factors, including the seminal papers Calvo, Leiderman and Reinhart (1993, 1996) and Chuhan, Claessens, and Mamingi (1998). We also include the new Ahmed et al (2016) capital controls measure, a measure that gets at changes in the intensity of capital controls and so can gauge the impact of the small changes that many countries have been implementing.

The reader should note that our goal is not to provide a definitive explanation of capital flows but to use our regression analysis to illustrate that different measures tell different stories.

4.1 Possible Drivers of Capital Flows

We next describe four types of explanatory variables: standard push/pull factors such as differentials in growth, returns, and interest rates; a measure of exchange rate valuation; unconventional monetary policy by the Federal Reserve; and a new capital controls measure.

4.1.1 Standard Push and Pull Factors

The push-pull literature suggests a short list of possible proximate causes of equity flows to EMEs such as differentials in economic growth, returns, and local interest rates, all depicted in Figures 6 and 7.
Economic growth differentials—measured as the difference between four-quarter real GDP growth rates in each EME and an aggregate of AEs (Australia, Canada, the euro area, Japan, Sweden, UK, US)—have been persistent and at times sizeable. Aggregate real GDP growth in EMEs (Figure 6a, top red line) has consistently outpaced that in the AEs (the lower blue line), with the growth differential (the bars) recently fluctuating between a high of over 6 percent in late-2009 and early-2010 (reflecting EMEs’ faster pace of recovery from the crisis) and a low of less than 2 percent in early 2012 (when EME growth had slowed and AEs experienced a short-lived uptick in growth). Policy interest rate differentials (Figure 6b, bars)—computed as the difference between the nominal policy rate for each EME and the U.S. Federal Funds rate—have been positive but have fluctuated notably. During the post-crisis recovery, the differing cyclical positions of the EMEs and AEs called for different monetary policy settings, increasing the policy rate differential in 2010 and 2011.

Other possible proximate causes of equity flows to EMEs, shown in Figure 7a and 7b, are exchange rates and equity returns differentials, both of which affect potential investment returns. Some studies, such as Ghosh et al. (2014) and others, use deviations from long-run real effective exchange rates as a measure of over/under valuation of a currency and find that flows into a country increase when exchange rate measures suggest the currency is undervalued. The equity returns differential, the difference in the equity market return between the EME and the US, is another measure of the relative attractiveness of a country. Because equity market returns have been found to be positively autocorrelated, investors may expect that past positive returns differentials predict future excess returns, increasing flows into that country.

An indicator of global risk appetite (or the lack thereof) is the VIX computed by the Chicago Board Options. The VIX, a measure of the implied volatility of the S&P 500 index, serves as a proxy for the combination of perceived risk and risk aversion. Indeed, Figure 7c shows that at times BOP flows to EMEs (the red line) have been correlated with the VIX index (the blue line, plotted on an inverted scale so that
a movement in the upper direction represents more appetite for risk and less risk aversion). Capital flows to EMEs plunged during the investor panic after Lehman Brothers in 2008 and again as the European situation worsened in the second half of 2011 and in May 2012, although since 2013 changes in flows to EMEs have not been accompanied by corresponding changes in the VIX.

4.1.2 Unconventional Monetary Policy

Another possible driver of EME flows is the LSAP or QE program by the Federal Reserve. LSAPs can be measured many ways (Ahmed and Zlate, 2014). Indicator variables can be used to mark initial announcements and implementation periods of the first three rounds of LSAPs as documented by Gagnon et al. (2011), Krishnamurthy and Vissing-Jorgensen (2011) and Bauer (2012). Another approach is to use yields on 10-year U.S. treasury bonds, either actual (depicted in Figure 8a) or instrumented by actual net asset purchases (the bars in Figure 8a) by the Federal Reserve.\textsuperscript{14} We choose this latter approach. Specifically, we follow Ahmed and Zlate (2014) and split the 10-year Treasury yield into two components: a yield estimated were there no LSAPs (green line in Figure 8b) and the component of the yield that may be due to LSAPs (red line). Specifically, in a first-stage regression we regress Treasury yields on one-quarter ahead Fed net asset purchases over the period from 2002:Q4 to 2013:Q2 (since the QE programs were announced ahead of implementation) and compute the LSAP component of yields as beta*LSAPs. The remaining yield is the non-LSAP component. For the period prior to the first QE program, we set the LSAP component to zero. In our capital flows regressions we include the two components simultaneously.

4.1.3 Capital Controls

Capital controls, long viewed with disfavor in the official international community, have recently become an oft-adjusted policy tool for EMEs. However, most existing measures are not well suited for

\textsuperscript{14} The net asset purchases are obtained as the change in the end-of-quarter total holdings of agency debt securities, mortgage-backed securities, and U.S. Treasury securities expressed in billions of U.S. dollars. For asset holdings, see http://www.federalreserve.gov/datadownload/, under Factors Affecting Reserve Balances (H.4.1).
studying the impact of small changes in capital controls because they are either available only at a low frequency (typically annually), or because they tend to be built from 0/1 indicators on whether controls exist or not, and thus do not capture much of the time variation in the intensity of restrictions. A standard example of the typical limitation is India, which has some sort of capital control across all categories and so would enter most measures as completely closed, whereas in reality India has steadily reduced its restrictions.

We use the new measure of capital flow management (CFM) restrictions designed in Ahmed et al. (2016)—the number of CFM restrictions in place—that addresses these limitations. The measure is a count, over the period from 2002 to 2012, of the number of steps countries undergo to put new restrictions in place, tighten or ease them, or remove them altogether. While based on qualitative information about measures in place, each new measure is considered and added at the exact time it is implemented. The measure is available at a high frequency—it is entered as of implementation date and so can be used with daily data, if desired—and can be disaggregated by asset type (portfolio equity, portfolio bond, FDI, and banking/other). In terms of the Klein (2012) “gates and walls” distinction, our measure is of gates, in the sense that it captures episodic changes in the intensity of restrictions over time since a given start date for a given country and instrument rather than the level of long-standing controls (and so is more suitable for panel studies in which the initial level might be captured by country fixed effects).

Figure 9 depicts, for 18 countries from 2002 through 2012, the cumulative number of measures in place in any given quarter (the blue thick lines) and its first difference (the number of new measures introduced in a quarter, the red thin lines). The measure’s ability to capture gates but not walls is readily apparent. That Malaysia, for example, had some level of controls at the beginning of the sample is not captured by our measure, but its subsequent steps to relax controls are evident. Another example is Brazil.

15 The main source of information is the qualitative narrative description in the “Changes during year” section of the IMF’s AREAER.
The measure captures Brazil’s imposition of a 2-percent tax on foreigners’ investments in fixed income in October 2009, the subsequent two-step tightening (when the tax was raised to 4 percent and then to 6 percent by October 2010) and the removal of the tax in June 2013.

An important question for capital flow research is whether capital controls measures can be considered exogenous in regressions of flows. We do not aim to definitively answer this question here, but note that Fernandez, Rebu, and Uribe (2015) find that annual capital controls measures are remarkably acyclical with respect to output, the current account or the real exchange rate. And even with the higher frequency measure that we use, ACWZ (2016) find that prior to the crisis EMEs implemented capital controls when their economic growth was low relative to AE growth, after the crisis EMEs implemented capital controls amid currency appreciation pressures, but in no sample did they find that flows lead to changes in CFMs, suggesting that at least for the purpose of this paper CFMs can enter our flows regressions as exogenous factors.

4.2 Regression Results

The results of our regressions on the various capital flow measures are in Table 2, which we divide into three panels corresponding to the full sample (quarterly, 2002-2012) and pre- and post-GFC subsamples. All flow-based dependent variables are scaled by recipient-country market capitalization.16 Dependent variables are BOP equity inflows; total, portfolio growth and reallocation US equity inflows; total, active and passive changes in U.S. investors’ global equity portfolio; and changes in normalized relative weight.

---

16 Results for alternative dependent variables—flows scaled by recipient-country GDP and portfolio changes defined relative to US investors’ foreign (i.e., not global) equity portfolio—are in an appendix.
4.2.1 Full Sample Results

In the full sample, Total BOP Flows increase when VIX is low. Total BOP Flows are also higher when EME equity returns are higher and the LSAP effect on Treasury yields larger (ie more negative). The components of US flows provide striking results. First, the coefficients in the regressions on the portfolio growth and reallocation components are very different. In fact, whenever a coefficient is significant for one component, it is either insignificant for the other component or if significant has a different sign. Second, the regressions explain variation in the portfolio growth component far better than for any other dependent variable in our table. The $R^2$ for the portfolio growth component is 0.58, whereas for other regressions it is just 0.05.

The share of a particular EME in US equity portfolios increases when lagged returns are high and during LSAP periods. That is, the portfolio share regressions show that after a quarter in which an EME experiences high returns its share in US portfolios increases; the coefficient on the past quarter’s returns differentials is always significant. We again see a negative and significant coefficient on the LSAPs component of 10-year Treasury yields, suggesting LSAPs were associated with increased weightings on EME vs. US equities. Again, the components of portfolio changes provide striking results. The coefficients in the regressions on the passive and active components are very different; whenever a coefficient is significant for one component, it is either insignificant for the other component or if significant has a different sign.

In the full sample, the normalized relative weight measure that isolates active reallocations is higher when lagged returns differentials are higher, consistent with the Curcuru et al. (2011) finding that U.S. investors buy EME equity markets that recently performed well. Lower 10-year yields and stronger EME growth are associated with greater relative weight on EME equities, while VIX, LSAPs, and CFMs do not have a statistically significant effect.
4.2.2 Pre- and Post-GFC Samples

The second and third panels of Table 2 show results for the pre- and post-GFC samples. Results differ across samples and between the sub-samples and the full sample. But the results that the components of capital flows (portfolio growth and reallocation flows) and of portfolio changes (passive and active) are very different hold in all samples. And CFMs, which are not significant in the full and pre-GFC samples, become significant for some flow measures in the post-GFC period (when they were used more actively). In the post-GFC period, BOP equity inflows and US portfolio shares are lower when CFMs are more restrictive, but we do not see robust evidence that CFMs impact measures of active reallocations.

5. Active Reallocations across Asset Classes

Our analysis of active portfolio changes has been on within-asset-class reallocations. The benchmark was the global equity market and the portfolio considered was U.S. investors’ global equity portfolio. As such, our analysis had nothing to say about switching between asset classes (for example, from bonds to equities) or within other asset classes.17

But the relative weight measure can also be constructed using total financial assets as the benchmark. That is, while our focus remains on EME17 equities, the comparators are the U.S. portfolio measured by all U.S. financial assets (line 9 of Flow of Funds table B.100) and global financial assets (provided by McKinsey Global Institute), such that normalized relative weight will capture US investors’ active switching from EME17 equities to other equities and other asset classes. Even considering all asset classes, normalized relative weight is quite flat: Figure 10 suggests that U.S. flows to EME equities have been in line with those markets’ increased importance in global markets.

17 Burger et al. (2015), a within-asset-class study of local currency bonds, shows that over the 2007-2011 period U.S. investors switched out of US bonds and into local currency foreign bonds, especially EME bonds.
6. Conclusion

Most measures of international capital flows used in the literature combine baseline flows—perhaps calculated as the allocation of new savings according to old portfolio weights—with active portfolio reallocations. We present an admittedly ad hoc decomposition of flow data and also form portfolio-based measures (e.g., normalized relative weight) that isolate active portfolio reallocations.

In a series of simple pictures and reduced-form regressions, we show that different measures of capital flows—from top-line flows to baseline and reallocation flows—and portfolio-based measures yield very different stories. Our results suggest that researchers should be exceedingly careful when selecting a flow measure to analyze the underlying drivers of flows. Our graphical results showed that the post-GFC surge in inflows into EME equities (as a group) is apparent in top-line flows but not in the relative weight measure that isolates active portfolio reallocations. This suggests that the robust inflows experienced by EMEs were not due to active reallocations toward EME equities. Our simple regressions, which focus on the country-by-country determinants of flows, also suggest that VIX, QE and CFMs seem more related to top-line flows rather than active reallocations. Active reallocations appear to be related primarily to an age-old determinant: the level of US long-term interest rates.

While we are confident that our stock-based normalized relative weight measure isolates active portfolio reallocations, we are less sure that there is a clean way to differentiate between the baseline and reallocation components in flow-based measures. That said, an interesting path for future research is to take into account that flows have two components and revisit much of what we have learned about capital flows. For example, we hear that flows are procyclical and volatile. Overall flows may well be procyclical, but is that just due to the baseline component? Is the reallocation component procyclical? Is flow volatility due to the reallocation portion (which is likely) or the baseline component? EMEs on the receiving end of flows should recognize that as a group they will receive about $20 billion of US equity flows per year just
from new savings allocated according to last year’s portfolio weights.\footnote{This calculation is for the 17 countries in our sample plus Malaysia and Romania (which were dropped from our working dataset because of data limitations). For all foreign equities, passive US flows defined this way (new savings allocated at last year’s weights) are running at about $100 billion annually.} The sudden stops literature is likely by design picking up the reallocation portion of flows, but any study of top-line flows in normal periods comingle baseline flows with reallocation flows.

Another implication of our work is that a better understanding of flows requires data on stocks. An example with official U.S. data is that going forward we may well learn more about flows from monthly data on positions. With quality positions data, backing out flows just requires reasonable measures of returns, something difficult but feasible.
References


Gagnon, Joseph, Matthew Raskin, Julie Remache, and Brian Sack, 2011. Large-scale asset purchases by the Federal Reserve: did they work? Staff Reports 441, Federal Reserve Bank of New York.


Data Appendix
Our working sample of 19 countries includes India, Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand; Argentina, Brazil, Chile, Colombia, and Mexico; Czech Republic, Hungary, Poland, and Romania; and Israel, Turkey, and South Africa.
“LSAP” is the change in Federal Reserve holdings of securities (scaled by GDP) starting the in LSAP period of 2008Q3, zero otherwise. Fed securities holdings are from the Fed’s H.4.1 release (http://www.federalreserve.gov/releases/h41/).
“10-year Treasury LSAP” is the estimated effect of LSAPs on 10-year Treasury yields.
“10-year Treasury non-LSAP”, calculated as the 10-year Treasury yield minus “10-year Treasury LSAP”, is the level of the 10-year Treasury yield in the absence of LSAPs.
CFM measures are from Ahmed et al. (2016). The data are posted at http://faculty.darden.virginia.edu/warnockf/ACWZ_CFM_Feb2015.xlsx.
Exchange rate valuation is computed as the percent deviation of the quarterly real effective exchange rate (REER) from the average level of the previous five years. Higher values are associated with a more overvalued exchange rate.
GDP growth differential is the difference in real GDP growth rates between the EME country and an aggregate of advanced economies.
The policy rate differential is the difference in policy rates between the EME country and the US.
Country level GDP and policy rates from Global Financial Data.
VIX is from Bloomberg. Higher values indicate increased expected volatility and/or risk aversion.
Flows vis-à-vis Rest of the World (ROW):
BOP flows, from the IMF, provide data on the dollar amount of flows (gross and net, by major flow type) between the reporting country and ROW. We scale BOP flows by local equity market capitalization and, in an appendix, by recipient-country nominal GDP. Note that the IMF’s change from BPM5 to BPM6 required us splice the now discontinued BPM5 series with the new BPM6 (which only begin in 2006).
US flows to and positions in EME equities:
(Total foreign holdings of US equities, necessary to form the relative weight measure, is from Bertaut and Tryon (2007) through June 2011, and thereafter from the new monthly data on holdings of U.S. long-term securities by foreign residents (http://www.treasury.gov/resource-center/data-chart-center/tic/Pages/ticsec2.aspx).
Equity market capitalization data are from Bloomberg, Datastream and http://www.world-exchanges.org/.
We use the following measures as dependent variables:
BOP Equity Inflows: BOP Gross Equity Inflows, scaled by local GDP or local market capitalization.
USEqFlows: US flows into local equities, scaled by local GDP or local market capitalization.
USPortShare_Global: The share of local equities in US global equity portfolios (first differenced)
Normalized RelWgt_Global: RelWgt_Global—the weight of local equities in US investors’ global equity portfolio divided by their weight in global market capitalization—normalized by the relative weight on home equities (first differenced)
Figure 1. BOP Equity Flows to EMEs

Note: See the Data Appendix for variable definitions.
Figure 2. US Equity Flows to EMEs: Total, Portfolio Growth and Reallocation

Note: See the Data Appendix for variable definitions.
Figure 3: U.S. Financial Wealth and Cumulated Savings (in trillions of US dollars)

Note: Cumulated savings (the thin lower line) are cumulated starting from the 1985 level of financial wealth. Source: FRB’s Financial Accounts of the United States (Z.1 report)
Figure 4. EME Equities in US Global Equity Portfolios: Active and Passive Reallocations

Note: See the Data Appendix for variable definitions.
Figure 5. EME Equities in US Global Equity Portfolios: Normalized Relative Weight

Note: See the Data Appendix for variable definitions.
Figure 6: Possible determinants of flows to EMEs (I)

(a) Real GDP

(b) Policy Interest rate

Sources: Haver Analytics for quarterly real GDP (expressed as the 4-quarter percent change) and the nominal policy interest rates; IMF for flows; and Bloomberg for VIX.
Figure 7: Possible determinants of flows to EMEs (II)
Returns differentials and ER measure

(a) Aggregate EME Real Effective Exchange Rate*

(b) Equity returns

(c) VIX

*The EMEs include: India, Indonesia, Korea, Malaysia, the Philippines, Turkey, Thailand, Argentina, Brazil, Chile, Colombia, Mexico, Israel, Turkey, South Africa, Czech Republic, Hungary, Poland, and Romania. EME average weighted by VIX (1990–2010).

*The EMEs include: India, Indonesia, Korea, Malaysia, the Philippines, Turkey, Thailand, Argentina, Brazil, Chile, Colombia, Mexico, Israel, Turkey, South Africa, Czech Republic, Hungary, Poland, and Romania. EME average weighted by market capitalization.

*Smooth moving average. The dates mark the following events: Sept 16, 2008, Lehman bankruptcy; May 1, 2010, increased concerns over Greece; Aug 1, 2011, increased concerns over Italy and Spain; May 5, 2012, increased concerns over Spanish banks; outcome of Greek elections.
Figure 8: LSAPs

Notes: In Panel A, net asset purchases are obtained as the change in the end-of-quarter total holdings of agency debt securities, mortgage-backed securities, and U.S. Treasury securities by the Federal Reserve. Sources: Bloomberg (for the Treasury bond yield) and the Federal Reserve (for asset purchases). In Panel B, the yield due to LSAPs is estimated by regressing yields on LSAP purchases.
Figure 9: Number of capital control measures introduced in EMEs since 2002

- **Argentina**: Measures introduced each quarter and cumulative measures.
- **Brazil**:
- **Chile**:
- **Colombia**:
- **Czech Republic**:
- **Hungary**:
- **India**:
- **Indonesia**:
- **Israel**: Number of measures
Figure 9 (cont.): Number of capital control measures introduced in EMEs since 2002

Korea

Malaysia

Mexico

Philippines

Poland

Romania

South Africa

Taiwan

Thailand

Turkey
Figure 10: U.S. Relative Weight for EME19 Equities based on All Financial Assets
Table 1: Relative Weight Examples

The table shows a baseline Period 1 allocation across three markets (US, which is the home market; AE; and EME) and four scenarios for Period 2. All scenarios should be compared to the Period 1 baseline. In (a), new US savings are allocated proportionately across all markets, pushing up all prices by 5%; capital flows occur, but portfolio weights and relative weights do not change. Scenario (b) also has US new savings allocated proportionately, but prices increase relatively more in EMEs; portfolio weights change, raw relative weight changes slightly, but normalized relative weight is unchanged. Scenario (c) has active reallocations from US and AE equities to EME equities, which increases EME relative prices; these active flows result in increased portfolio weights and relative weights in EMEs, and decreased weights in AEs. Scenario (d) begins with relative price changes (increase in EME prices) that would increase the weight of EMEs in US portfolios, but active rebalancing (selling EMEs) keeps portfolios weights constant; relative weights adjust from this active rebalancing.
Table 2. Equity Flows to EMEs

Reported are results from OLS regressions of various flow and portfolio measures. Flows are scaled by recipient-country market capitalization; US portfolio share and normalized relative weight are relative to global portfolios. See the Data Appendix for variable definitions. The working sample of 17 countries includes India, Indonesia, Korea, Philippines, Taiwan, and Thailand; Argentina, Brazil, Chile, Colombia, and Mexico; Czech Republic, Hungary, and Poland; and Israel, Turkey, and South Africa. Regressions include country fixed effects and are estimated from 2002:Q1 to 2012:Q4 for the full sample, 2002:Q1 to 2008:Q2 for the pre-GFC sample, and 2009:q3 to 2012:Q4 for the post-GFC sample. Robust standard errors, computed using clustering at the country level, are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively (those at the 1% and 5% levels are also shaded yellow).

<table>
<thead>
<tr>
<th>BOP Equity Inflows</th>
<th>US Equity Inflows</th>
<th>US Portfolio Share Change, Global</th>
<th>Normalized Relative Weight Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Total Portfolio Growth Reallocation</td>
<td>Total Passive Active Weight Change</td>
</tr>
<tr>
<td>Sample:</td>
<td>Full</td>
<td>Full</td>
<td>Full</td>
</tr>
<tr>
<td>GDP diff</td>
<td>-0.0214*</td>
<td>0.0080</td>
<td>0.0019</td>
</tr>
<tr>
<td></td>
<td>(0.0124)</td>
<td>(0.0091)</td>
<td>(0.0014)</td>
</tr>
<tr>
<td>VIX</td>
<td>-0.0328***</td>
<td>0.0032</td>
<td>0.0003</td>
</tr>
<tr>
<td></td>
<td>(0.0046)</td>
<td>(0.0029)</td>
<td>(0.0006)</td>
</tr>
<tr>
<td>10-year Treasury: non-LSAPs</td>
<td>-0.0412</td>
<td>0.0100</td>
<td>-0.0107***</td>
</tr>
<tr>
<td></td>
<td>(0.0445)</td>
<td>(0.0300)</td>
<td>(0.0052)</td>
</tr>
<tr>
<td>Lag equity returns diff</td>
<td>0.2796***</td>
<td>-0.0354</td>
<td>-0.0529***</td>
</tr>
<tr>
<td></td>
<td>(0.0707)</td>
<td>(0.0377)</td>
<td>(0.0083)</td>
</tr>
<tr>
<td>REER dev</td>
<td>0.0008</td>
<td>0.0016</td>
<td>-0.0001</td>
</tr>
<tr>
<td></td>
<td>(0.0030)</td>
<td>(0.0027)</td>
<td>(0.0004)</td>
</tr>
<tr>
<td>Policy diff</td>
<td>0.0032</td>
<td>-0.0007</td>
<td>-0.0003</td>
</tr>
<tr>
<td></td>
<td>(0.0070)</td>
<td>(0.0055)</td>
<td>(0.0008)</td>
</tr>
<tr>
<td>Total CFM</td>
<td>-0.0100</td>
<td>0.0027</td>
<td>0.0010</td>
</tr>
<tr>
<td></td>
<td>(0.0083)</td>
<td>(0.0057)</td>
<td>(0.0009)</td>
</tr>
<tr>
<td>10-year Treasury: LSAPs</td>
<td>-0.2493**</td>
<td>-0.0402</td>
<td>0.1017***</td>
</tr>
<tr>
<td></td>
<td>(0.1139)</td>
<td>(0.0705)</td>
<td>(0.0142)</td>
</tr>
<tr>
<td>N</td>
<td>748</td>
<td>748</td>
<td>748</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.117</td>
<td>0.037</td>
<td>0.581</td>
</tr>
</tbody>
</table>
### Table 2 (cont.). Equity Flows to EMEs

<table>
<thead>
<tr>
<th>Sample:</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP diff</td>
<td>-0.0317</td>
<td>0.0017</td>
<td>-0.0032</td>
<td>0.0034</td>
<td>-0.0006</td>
<td>-0.0003</td>
<td>-0.0002</td>
<td>0.0303</td>
<td>(0.0194)</td>
<td>(0.0151)</td>
<td>(0.0023)</td>
<td>(0.0155)</td>
<td>(0.0005)</td>
<td>(0.0004)</td>
<td>(0.0006)</td>
<td>(0.0308)</td>
</tr>
<tr>
<td>VIX</td>
<td>-0.0336***</td>
<td>-0.0105*</td>
<td>0.0019*</td>
<td>-0.0145**</td>
<td>-0.0002</td>
<td>-0.0001</td>
<td>0.0000</td>
<td>-0.0176</td>
<td>(0.0087)</td>
<td>(0.0055)</td>
<td>(0.0010)</td>
<td>(0.0059)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td>(0.0134)</td>
</tr>
<tr>
<td>10-year Treasury: non-LSAPs</td>
<td>-0.3501***</td>
<td>-0.0066</td>
<td>-0.0621***</td>
<td>0.0321</td>
<td>-0.0024</td>
<td>0.0048*</td>
<td>-0.0072**</td>
<td>-0.6159***</td>
<td>(0.1192)</td>
<td>(0.0699)</td>
<td>(0.0141)</td>
<td>(0.0741)</td>
<td>(0.0026)</td>
<td>(0.0025)</td>
<td>(0.0034)</td>
<td>(0.1908)</td>
</tr>
<tr>
<td>Lag equity returns diff</td>
<td>0.1251</td>
<td>0.0147</td>
<td>-0.0574***</td>
<td>0.0788*</td>
<td>0.0201***</td>
<td>-0.0027</td>
<td>0.0207***</td>
<td>0.2765**</td>
<td>(0.0852)</td>
<td>(0.0428)</td>
<td>(0.0096)</td>
<td>(0.0446)</td>
<td>(0.0018)</td>
<td>(0.0017)</td>
<td>(0.0025)</td>
<td>(0.1379)</td>
</tr>
<tr>
<td>REER dev</td>
<td>0.0060*</td>
<td>-0.0008</td>
<td>-0.0005</td>
<td>-0.0003</td>
<td>0.0004***</td>
<td>0.0000</td>
<td>0.0003*</td>
<td>0.0017</td>
<td>(0.0036)</td>
<td>(0.0028)</td>
<td>(0.0005)</td>
<td>(0.0030)</td>
<td>(0.0001)</td>
<td>(0.0001)</td>
<td>(0.0002)</td>
<td>(0.0068)</td>
</tr>
<tr>
<td>Policy diff</td>
<td>0.0017</td>
<td>-0.0041</td>
<td>-0.0014</td>
<td>-0.0028</td>
<td>-0.0003</td>
<td>-0.0001</td>
<td>-0.0003</td>
<td>-0.0143</td>
<td>(0.0098)</td>
<td>(0.0084)</td>
<td>(0.0010)</td>
<td>(0.0088)</td>
<td>(0.0002)</td>
<td>(0.0002)</td>
<td>(0.0003)</td>
<td>(0.0121)</td>
</tr>
<tr>
<td>Total CFM</td>
<td>-0.0066</td>
<td>-0.0035</td>
<td>-0.0001</td>
<td>-0.0041</td>
<td>-0.0003</td>
<td>-0.0003</td>
<td>-0.0001</td>
<td>0.0078</td>
<td>(0.0173)</td>
<td>(0.0118)</td>
<td>(0.0018)</td>
<td>(0.0121)</td>
<td>(0.0005)</td>
<td>(0.0006)</td>
<td>(0.0007)</td>
<td>(0.0253)</td>
</tr>
<tr>
<td>10-year Treasury: LSAPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| N | 442 | 442 | 442 | 442 | 442 | 442 | 442 | 442 | 442 | 442 | 442 | 442 | 442 | 442 |
| R-sq | 0.122 | 0.055 | 0.639 | 0.081 | 0.325 | 0.062 | 0.171 | 0.087 | 0.122 | 0.055 | 0.639 | 0.081 | 0.325 | 0.062 | 0.171 | 0.087 |

*Significance levels: *p < 0.1, **p < 0.05, ***p < 0.01.
## Table 2 (cont.). Equity Flows to EMEs

<table>
<thead>
<tr>
<th></th>
<th>BOP Equity Inflows</th>
<th>US Equity Inflows</th>
<th>US Portfolio Share Change, Global</th>
<th>Normalized Relative Weight Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Total</td>
<td>Portfolio Growth</td>
<td>Reallocation</td>
</tr>
<tr>
<td><strong>Sample:</strong></td>
<td>Post</td>
<td>Post</td>
<td>Post</td>
<td>Post</td>
</tr>
<tr>
<td><strong>GDP diff</strong></td>
<td>-0.0166</td>
<td>0.0106</td>
<td>0.0014</td>
<td>0.0085</td>
</tr>
<tr>
<td></td>
<td>(0.0124)</td>
<td>(0.0098)</td>
<td>(0.0013)</td>
<td>(0.0102)</td>
</tr>
<tr>
<td><strong>VIX</strong></td>
<td><strong>-0.0328</strong>*</td>
<td>0.018</td>
<td><strong>-0.0072</strong>*</td>
<td>0.0056</td>
</tr>
<tr>
<td></td>
<td>(0.0076)</td>
<td>(0.0081)</td>
<td>(0.0011)</td>
<td>(0.0084)</td>
</tr>
<tr>
<td><strong>10-year Treasury: non-LSAPs</strong></td>
<td>-0.0165</td>
<td>-0.0348</td>
<td>-0.0021</td>
<td>-0.0263</td>
</tr>
<tr>
<td></td>
<td>(0.0518)</td>
<td>(0.0518)</td>
<td>(0.0062)</td>
<td>(0.0525)</td>
</tr>
<tr>
<td><strong>Lag equity returns diff</strong></td>
<td>0.2291**</td>
<td>-0.1376</td>
<td><strong>-0.0644</strong>*</td>
<td>-0.0626</td>
</tr>
<tr>
<td></td>
<td>(0.0991)</td>
<td>(0.0913)</td>
<td>(0.0108)</td>
<td>(0.0936)</td>
</tr>
<tr>
<td><strong>REER dev</strong></td>
<td>0.0050</td>
<td>0.0021</td>
<td>-0.0015</td>
<td>0.0032</td>
</tr>
<tr>
<td></td>
<td>(0.0079)</td>
<td>(0.0101)</td>
<td>(0.0012)</td>
<td>(0.0104)</td>
</tr>
<tr>
<td><strong>Policy diff</strong></td>
<td>0.0079</td>
<td><strong>0.0650</strong>*</td>
<td>0.0045</td>
<td><strong>0.0636</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.0273)</td>
<td>(0.0293)</td>
<td>(0.0033)</td>
<td>(0.0299)</td>
</tr>
<tr>
<td><strong>Total CFM</strong></td>
<td><strong>-0.0634</strong>*</td>
<td>-0.0136</td>
<td><strong>0.0106</strong>*</td>
<td>-0.0237</td>
</tr>
<tr>
<td></td>
<td>(0.0203)</td>
<td>(0.0227)</td>
<td>(0.0028)</td>
<td>(0.0237)</td>
</tr>
<tr>
<td><strong>10-year Treasury: LSAPs</strong></td>
<td>-0.1039</td>
<td>-0.0694</td>
<td><strong>0.1200</strong>*</td>
<td>-0.1745</td>
</tr>
<tr>
<td></td>
<td>(0.1235)</td>
<td>(0.1278)</td>
<td>(0.0179)</td>
<td>(0.1322)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
</tr>
<tr>
<td><strong>R-sq</strong></td>
<td>0.258</td>
<td>0.075</td>
<td>0.847</td>
<td>0.110</td>
</tr>
</tbody>
</table>

*Note: The table shows the coefficients for various economic indicators and their impacts on equity flows to emerging market economies (EMEs)."
Appendix Figure 1. BOP Equity Flows to EMEs Scaled by EME GDP

Note: See the Data Appendix for variable definitions.
Appendix Figure 2. US Equity Flows to EMEs Scaled by EME GDP: Total, Portfolio Growth and Reallocation

Note: See the Data Appendix for variable definitions.
Appendix Figure 3. Changes in the EME Share of US Foreign Equity Portfolios

Note: See the Data Appendix for variable definitions.
Appendix Table 2. Equity Flows to EMEs (scaled by GDP; foreign portfolio share)
Reported are results from OLS regressions of various flow and portfolio measures. Flows are scaled by recipient-country GDP; US portfolio share is relative to US investors’ foreign equity portfolio; and normalized relative weight is (as in the main Table 2) relative to global portfolios. See the Data Appendix for variable definitions. The working sample of 17 countries includes India, Indonesia, Korea, Philippines, Taiwan, and Thailand; Argentina, Brazil, Chile, Colombia, and Mexico; Czech Republic, Hungary, and Poland; and Israel, Turkey, and South Africa. Regressions include country fixed effects and are estimated from 2002:Q1 to 2012:Q4 for the full sample, 2002:Q1 to 2008:Q2 for the pre-GFC sample, and 2009:q3 to 2012:Q4 for the post-GFC sample. Robust standard errors, computed using clustering at the country level, are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively (those at the 1% and 5% levels are also shaded yellow).

<table>
<thead>
<tr>
<th>Sample:</th>
<th>BOP Equity Inflows</th>
<th>US Equity Inflows</th>
<th>US Portfolio Share Change, Foreign</th>
<th>Normalized Relative Weight Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Total</td>
<td>Total</td>
<td>Portfolio Growth</td>
</tr>
<tr>
<td>GDP diff</td>
<td>-0.0414</td>
<td>0.0137</td>
<td>0.0091*</td>
<td>0.0050</td>
</tr>
<tr>
<td></td>
<td>(0.0372)</td>
<td>(0.0194)</td>
<td>(0.0051)</td>
<td>(0.0206)</td>
</tr>
<tr>
<td>VIX</td>
<td>-0.0650***</td>
<td>-0.0108</td>
<td>-0.0059***</td>
<td>-0.0040</td>
</tr>
<tr>
<td></td>
<td>(0.0111)</td>
<td>(0.0067)</td>
<td>(0.0017)</td>
<td>(0.0071)</td>
</tr>
<tr>
<td>10-year Treasury: non-LSAPs</td>
<td>0.0517</td>
<td>-0.0563</td>
<td>-0.0720***</td>
<td>0.0186</td>
</tr>
<tr>
<td></td>
<td>(0.1119)</td>
<td>(0.0695)</td>
<td>(0.0167)</td>
<td>(0.0748)</td>
</tr>
<tr>
<td>Lag equity returns diff</td>
<td>0.5322***</td>
<td>-0.0335</td>
<td>-0.1003***</td>
<td>0.0662</td>
</tr>
<tr>
<td></td>
<td>(0.1249)</td>
<td>(0.0682)</td>
<td>(0.0198)</td>
<td>(0.0714)</td>
</tr>
<tr>
<td>REER dev</td>
<td>0.0011</td>
<td>-0.0014</td>
<td>0.0025*</td>
<td>-0.0039</td>
</tr>
<tr>
<td></td>
<td>(0.0076)</td>
<td>(0.0051)</td>
<td>(0.0014)</td>
<td>(0.0055)</td>
</tr>
<tr>
<td>Policy diff</td>
<td>-0.0084</td>
<td>-0.0029</td>
<td>-0.0054**</td>
<td>0.0022</td>
</tr>
<tr>
<td></td>
<td>(0.0130)</td>
<td>(0.0082)</td>
<td>(0.0021)</td>
<td>(0.0089)</td>
</tr>
<tr>
<td>Total CFM</td>
<td>-0.0385</td>
<td>-0.0026</td>
<td>0.0025</td>
<td>-0.0052</td>
</tr>
<tr>
<td></td>
<td>(0.0236)</td>
<td>(0.0109)</td>
<td>(0.0033)</td>
<td>(0.0123)</td>
</tr>
<tr>
<td>10-year Treasury: LSAPs</td>
<td>-0.7441***</td>
<td>-0.1083</td>
<td>0.1241***</td>
<td>-0.2504</td>
</tr>
<tr>
<td></td>
<td>(0.2754)</td>
<td>(0.1637)</td>
<td>(0.0425)</td>
<td>(0.1742)</td>
</tr>
<tr>
<td>N</td>
<td>748</td>
<td>748</td>
<td>748</td>
<td>748</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.126</td>
<td>0.050</td>
<td>0.537</td>
<td>0.023</td>
</tr>
</tbody>
</table>
## Appendix Table 2 (cont.). Equity Flows to EMEs (scaled by GDP; foreign portfolio share)

<table>
<thead>
<tr>
<th>Sample:</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
<th>Pre</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP diff</td>
<td>-0.1171**</td>
<td>-0.0018</td>
<td>0.0091</td>
<td>-0.0072</td>
<td>-0.0024</td>
<td>0.0004</td>
<td>-0.0026</td>
<td>0.0028</td>
<td>0.0303</td>
</tr>
<tr>
<td>(GDP diff)</td>
<td>(0.0503)</td>
<td>(0.0322)</td>
<td>(0.0075)</td>
<td>(0.0333)</td>
<td>(0.0022)</td>
<td>(0.0016)</td>
<td>(0.0028)</td>
<td>(0.0308)</td>
<td></td>
</tr>
<tr>
<td>VIX</td>
<td>-0.0881***</td>
<td>-0.0282**</td>
<td>0.0013</td>
<td>-0.0341***</td>
<td>-0.0002</td>
<td>-0.0002</td>
<td>-0.0001</td>
<td>-0.0176</td>
<td></td>
</tr>
<tr>
<td>(VIX)</td>
<td>(0.0208)</td>
<td>(0.0124)</td>
<td>(0.0031)</td>
<td>(0.0129)</td>
<td>(0.0008)</td>
<td>(0.0007)</td>
<td>(0.0011)</td>
<td>(0.0134)</td>
<td></td>
</tr>
<tr>
<td>10-year Treasury: non-LSAPs</td>
<td>-0.4111</td>
<td>-0.0300</td>
<td>-0.0710*</td>
<td>0.0245</td>
<td>-0.0113</td>
<td>0.0046</td>
<td>-0.0155</td>
<td>-0.6159***</td>
<td></td>
</tr>
<tr>
<td>(10-year Treasury: non-LSAPs)</td>
<td>(0.2874)</td>
<td>(0.1593)</td>
<td>(0.0429)</td>
<td>(0.1651)</td>
<td>(0.0119)</td>
<td>(0.0099)</td>
<td>(0.0156)</td>
<td>(0.1908)</td>
<td></td>
</tr>
<tr>
<td>Lag equity returns diff</td>
<td>0.5195***</td>
<td>0.0410</td>
<td>-0.0950***</td>
<td>0.1300</td>
<td>0.1057***</td>
<td>-0.0169**</td>
<td>0.1167***</td>
<td>0.2765***</td>
<td></td>
</tr>
<tr>
<td>(Lag equity returns diff)</td>
<td>(0.1710)</td>
<td>(0.0797)</td>
<td>(0.0245)</td>
<td>(0.0821)</td>
<td>(0.0085)</td>
<td>(0.0069)</td>
<td>(0.0113)</td>
<td>(0.1379)</td>
<td></td>
</tr>
<tr>
<td>REER dev</td>
<td>0.0159*</td>
<td>-0.0021</td>
<td>0.0019</td>
<td>-0.0045</td>
<td>0.0011*</td>
<td>0.0000</td>
<td>0.0010</td>
<td>0.0017</td>
<td></td>
</tr>
<tr>
<td>(REER dev)</td>
<td>(0.0085)</td>
<td>(0.0049)</td>
<td>(0.0016)</td>
<td>(0.0052)</td>
<td>(0.0006)</td>
<td>(0.0004)</td>
<td>(0.0007)</td>
<td>(0.0068)</td>
<td></td>
</tr>
<tr>
<td>Policy diff</td>
<td>-0.0001</td>
<td>-0.0054</td>
<td>-0.0108***</td>
<td>0.0062</td>
<td>-0.0005</td>
<td>-0.0001</td>
<td>-0.0004</td>
<td>-0.0143</td>
<td></td>
</tr>
<tr>
<td>(Policy diff)</td>
<td>(0.0170)</td>
<td>(0.0104)</td>
<td>(0.0026)</td>
<td>(0.0113)</td>
<td>(0.0008)</td>
<td>(0.0007)</td>
<td>(0.0011)</td>
<td>(0.0121)</td>
<td></td>
</tr>
<tr>
<td>Total CFM</td>
<td>-0.0653</td>
<td>-0.0207</td>
<td>-0.0014</td>
<td>-0.0198</td>
<td>-0.0001</td>
<td>-0.0002</td>
<td>0.0000</td>
<td>0.0078</td>
<td></td>
</tr>
<tr>
<td>(Total CFM)</td>
<td>(0.0417)</td>
<td>(0.0204)</td>
<td>(0.0058)</td>
<td>(0.0217)</td>
<td>(0.0020)</td>
<td>(0.0021)</td>
<td>(0.0028)</td>
<td>(0.0253)</td>
<td></td>
</tr>
<tr>
<td>10-year Treasury: LSAPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>442</td>
<td>442</td>
<td>442</td>
<td>442</td>
<td>442</td>
<td>442</td>
<td>442</td>
<td>442</td>
<td></td>
</tr>
<tr>
<td>R-sq</td>
<td>0.223</td>
<td>0.086</td>
<td>0.519</td>
<td>0.057</td>
<td>0.268</td>
<td>0.067</td>
<td>0.176</td>
<td>0.087</td>
<td></td>
</tr>
</tbody>
</table>
### Appendix Table 2 (cont.). Equity Flows to EMEs (scaled by GDP; foreign portfolio share)

<table>
<thead>
<tr>
<th>Sample:</th>
<th>Post</th>
<th>Post</th>
<th>Post</th>
<th>Post</th>
<th>Post</th>
<th>Post</th>
<th>Post</th>
<th>Post</th>
<th>Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP diff</td>
<td>-0.0122</td>
<td>0.0237</td>
<td>-0.0007</td>
<td>0.0201</td>
<td>-0.0014</td>
<td>-0.0000</td>
<td>-0.0003</td>
<td>0.0270*</td>
<td>0.0149</td>
</tr>
<tr>
<td>VIX</td>
<td>-0.0787***</td>
<td>0.0012</td>
<td>-0.0217***</td>
<td>0.0156</td>
<td>-0.0010</td>
<td>0.0003</td>
<td>-0.0026</td>
<td>0.0247**</td>
<td>0.0119</td>
</tr>
<tr>
<td>10-year Treasury: non-LSAPs</td>
<td>0.1802</td>
<td>-0.1146</td>
<td>0.0081</td>
<td>-0.1113</td>
<td>-0.0154*</td>
<td>0.0168**</td>
<td>-0.0268**</td>
<td>-0.2269***</td>
<td>0.0814</td>
</tr>
<tr>
<td>Lag equity returns diff</td>
<td>0.5084**</td>
<td>-0.2056</td>
<td>-0.1026***</td>
<td>-0.0941</td>
<td>0.0817***</td>
<td>-0.0214**</td>
<td>0.1052***</td>
<td>0.2585**</td>
<td>0.1317</td>
</tr>
<tr>
<td>REER dev</td>
<td>-0.0158</td>
<td>-0.0051</td>
<td>0.0046</td>
<td>-0.0090</td>
<td>0.0035</td>
<td>-0.0004</td>
<td>0.0054</td>
<td>0.0111</td>
<td>0.0147</td>
</tr>
<tr>
<td>Policy diff</td>
<td>0.0410</td>
<td>0.1597**</td>
<td>0.0153</td>
<td>0.1486*</td>
<td>-0.0100</td>
<td>-0.0000</td>
<td>-0.0125</td>
<td>0.1079**</td>
<td>0.0435</td>
</tr>
<tr>
<td>Total CFM</td>
<td>-0.1519**</td>
<td>-0.0036</td>
<td>0.0284***</td>
<td>-0.0328</td>
<td>-0.0206***</td>
<td>-0.0016</td>
<td>-0.0225**</td>
<td>0.0029</td>
<td>0.0330</td>
</tr>
<tr>
<td>10-year Treasury: LSAPs</td>
<td>-0.2261</td>
<td>-0.1273</td>
<td>0.2910***</td>
<td>-0.3937</td>
<td>-0.0263</td>
<td>0.0436**</td>
<td>-0.0705**</td>
<td>-0.2246</td>
<td>0.1892</td>
</tr>
<tr>
<td>N</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
<td>238</td>
</tr>
<tr>
<td>R-sq</td>
<td>0.165</td>
<td>0.059</td>
<td>0.869</td>
<td>0.075</td>
<td>0.248</td>
<td>0.083</td>
<td>0.219</td>
<td>0.104</td>
<td>0.104</td>
</tr>
</tbody>
</table>