What Drives Capital Flows to Emerging Markets? A Survey of the Empirical Literature

Koepke, Robin

Institute of International Finance, University of Wurzburg

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Robin Koepke[1]

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Abstract: This paper reviews the rapidly growing empirical literature on the drivers of capital flows to emerging markets. The empirical evidence is structured based on the recognition that the drivers of capital flows vary over time and across different types of capital flows. The drivers are classified using the traditional "push vs. pull" framework, which is augmented by a distinction between cyclical and structural factors. Push factors are found to matter most for portfolio flows, somewhat less for banking flows, and least for FDI. Pull factors matter for all three components, but most for banking flows. A historical perspective suggests that the recent literature may have overemphasized the importance of cyclical factors at the expense of longer-term structural trends.

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[1] Institute of International Finance and University of Wurzburg. 1333 H St NW, Suite 800E, Washington, DC 20005. Email: rkoepke@iif.com. I am grateful for helpful comments and suggestions by Shaghil Ahmed, Peter Bofinger, Guillermo Calvo, Charles Collyns, Nathan Converse, Glauco De Vita, Eduardo Fernandez-Arias, Marc Hinterschweiger, Felix Huefner, Khine S. Kyaw, Alejandro Lopez-Mejia, Gian-Maria Milesi Ferretti, Mahvash Qureshi, and Christopher Wilson.

1. Introduction

International capital flows play a central role in the global economy. They are closely tied to countries' economic and financial conditions, impact macroeconomic policy-making, and bring a range of benefits and risks to recipient countries. While in absolute terms, most capital flows are between advanced economies, their importance for financial stability is greatest for emerging markets (EMs), which are particularly exposed to swings in the availability of foreign capital (Obstfeld 2012). Understanding the drivers of capital flows to EMs is thus an important policy issue, which is reflected in the significant academic interest they have received over time. The seminal work by Calvo, Leiderman and Reinhart (1993) and Fernandez-Arias (1996) introduced the distinction between country-specific "pull" factors and external "push" factors, providing the theoretical framework for much of the empirical analysis since the early 1990s. The push-pull framework has also proven useful for explaining the behavior of capital flows during and after the global financial crisis, which began in the United States, but quickly saw massive spillovers to emerging markets, reviving the academic debate on the importance of external developments for EM capital inflows. The recent literature interprets the sharp retrenchment in foreign capital flows during the crisis primarily as the result of a huge "push shock" in global risk aversion that prompted global investors to unwind their EM positions (Milesi-Ferretti and Tille 2011). After the crisis, the focus in the literature shifted to another external factor, namely the impact of expansionary monetary policies in mature economies on EM capital flows – the very issue that was at the heart of Calvo, Leiderman and Reinhart's 1993 paper.

This survey takes stock of the empirical evidence on the drivers of capital flows to emerging markets by reviewing the sprawling research produced since the global financial crisis while also considering the extensive findings of the earlier literature. The contribution of the paper is to provide a comprehensive assessment of what we can say with relative confidence about the empirical drivers of EM capital flows. The literature makes use of a wide variety of concepts to measure and analyze capital flows, which means that it is critical to structure the wealth of empirical findings systematically. In this survey, the empirical evidence is organized along three dimensions: the time dimension (reviewing the historical evolution of the literature), the dependent variables (providing a taxonomy for capital flows), and the independent variables (evaluating the prevailing framework for the drivers of capital flows). Building on this structure, a qualitative meta-analysis is conducted for the key push and pull drivers of each of the major capital flows components.

First, the historical overview provides insight on how evolving economic conditions have shaped the focus of the literature. For example, attention has tended to focus on the role of external factors

particularly during the early part of U.S. economic expansions, when interest rates are typically low and concerns about spillovers from Fed tightening are greatest (notably in the early 1990s, the early 2000s, and the extended low-interest period since 2009). By contrast, in the later stage of U.S. expansions, the focus has tended to shift to both EM country-specific factors that attract capital flows and structural forces affecting EM capital flows. A pertinent example is the period of the late 1990s, when secular forces like the rise of institutional investors and innovations in information and communication technology received significant attention (e.g., World Bank 1997; Lopez-Mejia 1999). Since cyclical and structural forces are typically analyzed separately rather than in an integrated framework, there is a risk that the importance of structural forces for capital flows may be understated during periods like the present time, when U.S. interest rates are low and policy concerns are dominated by near-term cyclical developments.

Second, the empirical evidence is structured according to the different concepts and measures of capital flows that are used in the literature. This distinction is important because the drivers of capital flows differ crucially depending on the specific concepts and data that are analyzed. For example, it is important to differentiate between capital inflows to an emerging market by non-residents and outward investment by the residents of an emerging market. For the most part, this survey focuses on non-resident capital flows to emerging markets (see pages 13-15). The drivers of capital flows also vary across components (like portfolio flows, FDI, and banking flows), differ between institutional and retail investors, and depend on the currency denomination and maturity of instruments, among other factors. Moreover, it is important to distinguish between data that directly measure international capital flows as defined in the standard balance of payments (BoP) framework from data that serve as an approximation to BoP capital flows, such as data on flows in and out of investment funds and BIS data on consolidated cross-border bank claims.

Third, this survey discusses the explanatory power of the prevailing "push vs. pull" framework, which distinguishes between external and domestic factors driving capital flows to emerging markets. The push-pull dichotomy provides a simply and intuitive classification of capital flows drivers, but it certainly has its limitations. For example, contagion effects and other forces that are the product of investor behavior are difficult to classify as being either country-specific or external in nature. In addition, some studies have challenged the push-pull framework by asserting that rather than looking at emerging and advanced economy developments separately, the focus should be on differentials between EM and advanced economy variables (such as interest rate differentials and growth differentials; see, for example, Ahmed and Zlate 2013; Herrmann and Mihaljek 2013). A comprehensive review of the literature suggests otherwise, however. Most empirical research concludes that emerging and advanced economy effects on EM capital inflows differ in magnitude

and statistical significance, and sometimes even work in the same direction (as in the case of real GDP growth in mature economies, for which there is some evidence that faster growth tends to support certain types of EM capital inflows). Therefore, it would be misleading to focus on differentials between emerging and advanced economy variables. Overall, this survey concludes that while there are clearly limitations to the push-pull dichotomy, it still offers a very helpful analytical perspective.

Building on this framework, I conduct a qualitative meta-analysis for the evidence on the key cyclical drivers of the major components of capital flows. The results from over 40 empirical studies are summarized in Figure 1, which is a simplified version of Figure 8 on page 24.

Figure 1: Drivers of EM Capital Flows by Major Component

Type	Driver	Portfolio Equity	Portfolio Debt	Banking Flows	FDI
Push	Global risk aversion				
	Mature economy interest rates				
	Mature economy output growth				
Pull	Domestic output growth				
	Asset return indicators				
	Country risk indicators				

Strong evidence for positive relationship
Some evidence for positive relationship
Mixed evidence, no clear relationship
Some evidence for negative relationship
Strong evidence for negative relationship

Notes: The matrix summarizes the available evidence on the role of push and pull factors for the major capital flows components. For example, the red cell in the top left corner of the matrix indicates that there is strong evidence that an increase in global risk aversion leads to a reduction in portfolio equity flows to emerging markets. This figure is a simplified version of Figure 8 on page 22.

Source: author's illustration.

Push factors are found to matter most for portfolio flows, somewhat less for banking flows, and least for FDI. Specifically, there is evidence that increases in global risk aversion have a strong adverse effect on portfolio and banking flows, but not on FDI. In addition, there is strong evidence that lower interest rates in mature economies push portfolio capital to emerging markets, especially into the bond market. There is also some evidence for such an effect for banking flows, while results for FDI

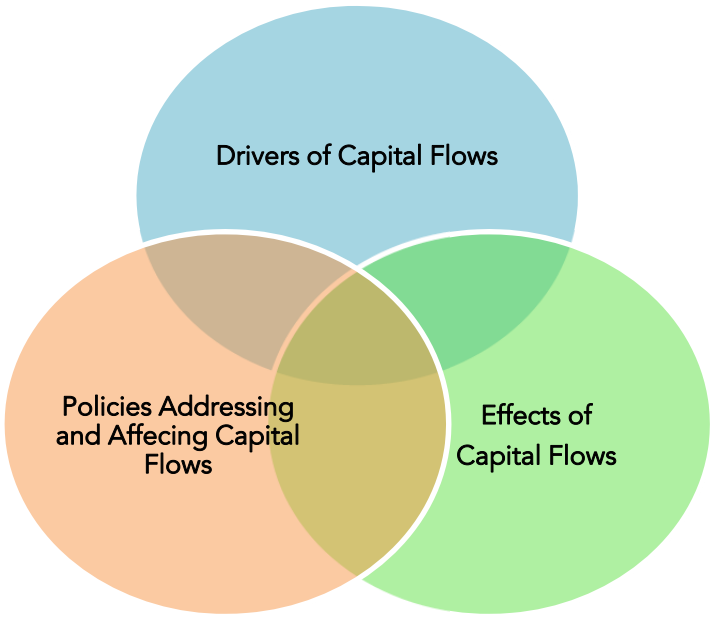
flows are mixed. Pull factors are found to matter for all three components, but most for banking flows. Domestic output growth is the determinant that is most consistently found to show a strong and statistically robust relationship with the four types of capital flows. Greater country risk also appears to reduce all types of capital flows considered, although the evidence is not as robust and there are some exceptions for those country risk measures that indicate increased financing needs, such as a widening current account deficit. Local asset returns seem to attract banking flows the most, followed by portfolio investment, while the evidence is mixed for FDI.

The rest of this paper is structured as follows. Section 2 puts the scope of this survey into the broader context of the literature on EM capital flows. Section 3 provides some theoretical background on the rationale for the existence of international capital flows. Section 4 reviews the historical evolution of the literature on the drivers of EM capital flows. Section 5 provides a classification of the different concepts of capital flows that are commonly analyzed, while Section 6 discusses the "push-pull" framework for capital flows drivers. Section 7 looks in detail at the drivers of the major components of capital flows. Section 8 discusses the main conclusions and provides guidance on future research.

2. Relationship between Surveyed Literature and other Literature Strands

The literature on international capital flows is voluminous, reflecting the central role of international capital flows in the global economy. In order to situate the focus of the present survey in the broader context of the existing literature, it is useful to divide the literature into three broad categories (Figure 2): the causes, effects, and policy implications of capital flows. The first area on the causes (or "drivers") of capital flows examines the various factors that affect the volume, composition, and dynamic behavior of capital flows to EM economies. This is the focus of the present survey. The second area of research is primarily concerned with the economic impact of capital flows on recipient countries, including the potential benefits of capital flows (such as higher investment and growth) as well as the potential costs in terms of financial stability and the risks associated with capital flows reversals (surveys on these issues include Prasad et al. 2003 and Henry 2007). The third area considers a wide range of policy issues, including macroeconomic and macroprudential policy responses to capital inflow surges, policy prescriptions for capital account liberalization and for the use of capital controls, optimal reserve policies and the choice of exchange rate regimes (some surveys include Dooley 1995; BIS 2009; Ostry et al. 2010; Alistair 2014).

Figure 2: Stylized Illustration of the Major Literature Strands on EM Capital Flows



Source: author's illustration.

To the extent possible, I will avoid discussions on the latter two areas of research and instead refer to existing surveys. The transition between the three areas is fluid, however, and some aspects pertaining to the capital flows behavior, consequences and policies have an important bearing on the drivers of capital flows. For example, some authors have examined how policy measures such as capital controls affect the subsequent volume and composition of capital inflows (e.g., Montiel and Reinhart 1999; Forbes et al. 2012). Conversely, the literature on the drivers of capital flows has important implications for the other areas of research. For example, the appropriate policy response to a capital inflows surge depends on whether flows are driven by external or domestic factors (Calvo et al. 1993). Similarly, the long-term economic impact of capital flows on the recipient economy is likely to differ depending on whether inflows are primarily cyclical or structural in nature (Prasad et al. 2003).

3. Theoretical Background

Before delving into the empirical determinants of EM capital inflows, it is helpful to review the theoretical rationale for the existence of international capital flows. The specific benefits of capital flows differ between *net* and *gross* capital. Net capital flows are the mirror image of the current account balance (adjusted for changes in reserves, capital transfers, and errors & omissions), i.e. a current account deficit is typically reflected in positive net capital flows. By contrast, gross capital

flows consider resident outward investment and foreign inward investment separately (i.e., the changes in assets and liabilities in the financial account). For the purpose of understanding observed capital flows movements, the theoretical benefits of gross capital flows are most relevant. The main reason is that net flows capture only a small portion of the vast amount of international financial transactions that characterize today's world economy and global financial system. Indeed, the current account and net capital flows by definition reflect trade in real goods and services, whose determinants are quite detached from those of transactions in financial assets (Borio and Disyatat 2011). Instead, international borrowing, lending, and financial intermediation are captured by gross capital flows.

Both net and gross capital flows enable welfare gains on the production side (i.e. a more productive allocation of capital) and on the consumption side (i.e. a superior consumption path for the providers and recipients capital). Figure 3 provides a stylized overview of those benefits.

Figure 3: Stylized Overview of the Theoretical Benefits of Net and Gross Capital Flows

	Production Benefits	Consumption Benefits
Net Flows	More efficient allocation of global capital (higher returns for given amount of risk)	Improved intertemporal consumption path (smoothing known/expected variations in income and returns)
Gross Flows	Riskier, but more productive allocation of global capital (higher return and more risk that is better diversified)	Reduced state-dependent variability of income (smoothing unknown/random variations in income and returns)

Source: author's illustration.

The theoretical benefits of net capital flows can be illustrated in the context of the intertemporal approach to the current account (Obstfeld and Rogoff 1995). In this approach, net capital flows are viewed as an exchange of assets in return for goods and services. Assets entitle their owner to future consumption, while goods and services are used for present consumption. Hence, in this framework, net capital flows are interpreted as intertemporal trade, i.e. present consumption is traded against future consumption. Net capital flows thus allow domestic consumption and saving to be separated from domestic investment. Countries with high returns on capital will receive net capital flows from abroad to finance investment until their rate of return equals the world rate of return. Hence, on the production side, the rationale behind net capital flows is that resources can flow from countries with

low returns on capital to countries with high returns on capital, resulting in a more efficient allocation of global capital.[2]

On the consumption side, the rationale behind net capital flows is to enable countries to achieve an improved intertemporal consumption path by allowing them to smooth consumption in the face of known or anticipated variations in their national income. A classic example is the case of an oil-exporting country that uses present income from oil exports to accumulate external assets that will help finance future consumption when its natural resources are depleted (Sachs 1981).

By contrast, *gross* capital flows refer to trade in assets for other assets (referred to as "intratemporal trade" in the intertemporal approach to the current account). By diversifying their portfolios countries are able to share risks internationally and trade across different states of nature, enabling the providers of capital to protect themselves against concentrated risks (Grubel 1968; Obstfeld 1994). As a result, the residents of a country engaging in intertemporal trade achieve a smoother consumption path. For example, when a country is hit by a natural disaster, household incomes and business profitability will decline. If the country's businesses are predominantly foreign-owned, some of the losses are borne by non-residents, reducing residents' exposure to this particular risk.[3] The consumption benefits of gross capital flows thus arise by diversifying across unknown or random variations in incomes and returns, in contrast to the benefits of net flows that stem from known or expected variations in incomes or returns.[4]

In addition, gross capital flows also provide benefits on the production side. When the risks of a project are shared by a broad pool of investors worldwide, capital can be allocated to projects with higher risks and returns than if all the associated risk had to be borne by a narrower set of investors located within a particular country. This allows a riskier allocation of global capital that is more productive on average (Arrow 1971). The resulting welfare gains benefit both provides of capital (via higher returns) and recipients of capital (via faster growth). For example, Obstfeld (1994) shows in a theoretical model how international risk sharing can produce significant welfare gains through a world portfolio shift towards riskier assets. The production benefits of gross vs. net flows may be

[2] Lucas (1990) discusses why, against the predictions of standard economic theory, net capital has tended to flow "uphill" from emerging to mature economies, a phenomenon dubbed the "Lucas paradox." However, Alfaro et al. (2011) show that sovereign-to-sovereign lending accounts for upstream capital flows, and that net private capital flows are positively correlated with countries' productivity growth. Indeed, emerging markets have generally been net recipients of foreign capital in recent decades if international reserve accumulation is excluded (IIF 2015).

[3] Theory predicts that a country-specific income shock should have only a limited impact on the country's consumption since household income risks are pooled across countries. Therefore, consumption should be more correlated across countries than output. However, Backus, Kehoe, and Kydland (1992) note that against the predictions of theory, consumption has historically been less correlated across countries than output.

[4] "Known" variations in incomes or returns include unexpected events once they have materialized, such as a country borrowing from abroad after experiencing a natural disaster.

contrasted in that net flows result in a higher return for a given amount of risk, while gross capital flows help achieve a higher return while taking on more risk that is better diversified.

4. Historical Evolution of the Empirical Literature on the Drivers of EM Capital Flows

In order to provide a thorough understanding of the current state of the literature it is helpful to review briefly the economic developments from which this literature emerged and the key issues it aimed to address over time.[5] The early literature on the drivers of capital flows emerged in the context of the rebound in flows to Latin America in the early 1990s. The Latin American economies had suffered major dislocations from the debt crises of the 1980s, in part due to a boom-bust cycle in foreign bank lending. In the late 1980s, many of these economies underwent major economic reforms, including inflation stabilization programs, privatization programs, and the liberalization of local equity markets (Calvo et al. 1992; Taylor and Sarno 1997). At the same time, the U.S. economy went into recession in 1990-91, which resulted in record-low interest rates in the U.S. and other mature economies. When capital inflows to Latin America rebounded in the early 1990s, the question was whether these flows reflected improved access to external financing as a reward for improved macroeconomic fundamentals, or if instead flows were driven by favorable external circumstances that were likely to reverse. This question was first raised in the seminal paper by Calvo, Leiderman and Reinhart (1993), who argued that the cyclical downturn in the U.S. had been a major driver behind rebound in capital inflows to Latin American countries. The authors used principal component analysis to assess the degree of co-movement between various U.S. variables (interest rates, equity and real estate returns) and a proxy of capital flows to Latin American economies (monthly data on reserve accumulation and real exchange rate appreciation). Their finding of significant co-movement between U.S. variables and their capital inflow proxy seemed to suggest that external factors were indeed playing a major role in driving capital flows.

Subsequent studies pointed out various limitations in the approach taken by Calvo et al. (1993) and addressed these shortcomings by extending the sample period, introducing domestic control variables, and using data on capital flows as the dependent variable (rather than a mere proxy). These subsequent studies generally found further support for the view that capital inflows were to a large extent driven by external factors (e.g., Fernandez-Arias 1996; Taylor and Sarno 1997).

[5] A more comprehensive survey of the early literature is provided by Lopez-Mejia (1999).

This view was not unanimous, however. For example, Ghosh and Ostry (1993) found for a large group of EM economies that domestic economic fundamentals were the predominant driver of capital flows. Their findings were based on a theoretical model of intertemporal current account determination, whose predictions were largely consistent with observed capital flows. Other authors further attested to the importance of pull factors. For example, Chuhan et al. (1998) looked at the behavior of monthly gross capital inflows from the U.S. to a sample of 18 countries in Latin America and EM Asia. Using a panel approach with country fixed effects, they found that domestic factors are at least as important in driving capital flows as external factors, especially in Emerging Asia.

While it seemed plausible in the early 1990s that the cyclical downturn in the U.S. had contributed to the surge in EM capital flows, this notion became more difficult to uphold when capital flows continued during the subsequent acceleration in U.S. real GDP growth and rising policy interest rates. Capital inflows generally continued their upward trend in the mid-1990s, notwithstanding some major setbacks such as the 1994/1995 Mexico crisis. Other factors thus seemed to be at work that would support such a sustained increase in capital inflows. A World Bank (1997) study argued that structural changes were behind this trend. These included the rise of institutional investors in mature economies, the deregulation of financial markets in both emerging and mature economies, as well as the impact of new information and communication technology. Earlier studies on the topic had not considered the impact of these structural changes and arguably may have overemphasized the importance of cyclical factors. In addition, the World Bank study argued that behavioral factors such as learning on the part of international investors had resulted in greater country differentiation, increasing the relative importance of pull factors over time.

In the mid-2000s, the literature increasingly focused on the drivers of flows to individual emerging market regions as well as specific components of capital flows. For example, Baek (2006) used a panel with country fixed effects for 9 emerging economies in two regions, finding that push factors tend to be more important for portfolio flows to Emerging Asia than to Latin America. De Vita and Kyaw (2008a) estimated a structural VAR model for 5 EM economies that suggested that EM productivity growth is more important for FDI flows than portfolio flows, while the domestic money supply is the dominant driver of portfolio inflows. FDI flows received particular attention in this period, reflecting the rapid growth of direct investment in emerging markets from an average of $40 billion per year in the early 1990s to an annual average of $300 billion in the mid-2000s (Institute of International Finance 2015). For example, Albuquerque et al. (2005) investigated the connection between world market integration and FDI flows, finding that global factors had increased in importance, while local factors such as productivity growth, trade openness, and financial depth had become less important.

The global crisis of 2008/2009 sparked a major retrenchment of global capital flows, which soon became the subject of extensive academic inquiry. The crisis shifted the focus of the literature squarely on gross capital flows (i.e. the changes in external assets and liabilities, as distinct from net flows, which are captured by the financial account balance). Gross capital in- and outflows exhibited rapid growth in the period leading up to the crisis and saw sharp movements during the crisis itself. Early work on measuring the gross positions of international claims was done by Lane and Milesi-Ferretti (2001; 2007), documenting the remarkable rise in countries' gross external assets and liabilities. Obstfeld (2012) addresses the rise in flows during the years preceding the crisis, when gross capital flows far outpaced net flows, and concludes that gross external positions and their associated flows are the primary transmission channel of financial instability. Broner et al. (2013) find supporting empirical evidence by analyzing the cyclical behavior of gross capital flows to and from a sample of 103 low-, middle- and high-income countries. They find that gross capital flows have been much more volatile than net flows, especially during economic downturns. In addition, gross capital flows are found to be highly pro-cyclical, with both non-resident inflows and resident outflows of capital rising during economic expansions and declining during recessions.

In the post-crisis period, particular attention has also been devoted to the co-movement of (gross) capital flows across different components and regions. For example, a study by Milesi-Ferretti and Tille (2011) documents how the behavior of various capital flows components varied during the financial crisis, with banking flows contracting the most and FDI flows the least. Forbes and Warnock (2012) present a systematic framework for analyzing extreme episodes of capital flows, which are classified into four categories: surges (of non-resident inflows), stops (of non-resident inflows), flight (of resident outward investment), and retrenchment (of resident outward investment). In this framework, most of the extreme episodes countries experienced between 1980 and 2009 were driven by global factors, notably global risk aversion. This result is confirmed by Ghosh et al. (2014a), who find that the single most important factor behind liability-driven surges is global risk aversion (as measured by the VIX).

During the last several years, significant attention has been devoted to the role of exceptionally loose monetary conditions in driving capital flows to emerging markets, with particular focus on the Federal Reserve's quantitative easing programs. Fratzscher et al. (2012) find a significant impact of central bank asset purchases on EM asset prices and portfolio flows using weekly data on flows to EM-dedicated funds from Emerging Portfolio Fund Research (EPFR) Global. By contrast, in a Federal Reserve discussion paper, Ahmed and Zlate (2013) find that unconventional U.S. monetary policy has left the volume of flows unaffected, but has shifted the composition of capital inflows towards

portfolio investments. A more recent study by the World Bank (2014) concludes that the Fed's three quantitative easing programs have had a significant, but diminishing impact on the volume of EM capital flows over time. A limitation of this study, however, is that the impact of Fed asset purchases is not modeled explicitly and is instead estimated as a residual. Koepke (2014) takes a broader approach on the impact of U.S. monetary policy by focusing on shifts in market expectations for future Fed policy interest rates, which are found to be an important determinant of portfolio flows to EM economies, especially bond flows. This relationship is established for both EPFR fund flows data and BoP-consistent monthly portfolio flows data. In addition, in the post-crisis period, shifts in expectations towards tighter monetary policy are found to have had a much stronger adverse impact on portfolio flows than the boost that comes from shifts towards easier policy. Dahlhaus and Vasishtha (2014) build on this framework and confirm in a cross-country comparative analysis that Fed policy expectations have been an important determinant of equity and especially bond flows in recent years, particularly during the "Taper Tantrum" of 2013.

Overall, the academic focus has shifted substantially over time, reflecting changing economic circumstances, increasing data availability, and the growing role of emerging markets in the global economy. One recurring pattern is that the literature has tended to focus on cyclical push factors during and after U.S. recessions, while the other periods have seen greater focus on pull factors and secular forces shaping the evolution of capital flows. This may be in part because the relative importance of the drivers of capital flows themselves changes over time, for example due to changes in the magnitude of external and domestic shocks. In particular, Fratzscher (2012) finds that push factors were the dominant drivers of portfolio fund flows during the global financial crisis, while in the years after the financial crisis, portfolio flows responded more strongly to pull factors such as macroeconomic fundamentals, institutions and policies of recipient countries. In addition, Lo Duca (2012) specifically investigates the extent to which push and pull factors vary over time using a time varying coefficient model. He finds that pull factors are more important when risk aversion is elevated, although extreme risk aversion generates panics where local developments play only a small role in shaping capital flows.

5. Classification of Capital Flows Analyzed in the Literature

A systematic review of the literature on the drivers of capital flows is complicated by two particular challenges. First, there are a number of different ways to measure international capital flows (and for each measure, there are often a range of datasets available). Second, there are a large number of potential explanatory variables for movements in capital flows, reflecting the central role of capital

flows in the global financial system and the countless forces that may in principle affect international movements of capital. For any empirical analysis, this means that there are many choices for both the dependent and the independent variables, resulting in a very large number of possible combinations. In order to structure the discussion, it is thus helpful to introduce some classifications for both dependent and independent variables, which are discussed in this section and the next, respectively. Figure 4 provides an overview of relevant categories for analyzing capital flows.

Figure 4: Classification of Capital Flows

Basis for Distinction	Main Examples
Residency of investor	EM resident capital flows, non-resident capital flows, net capital flows
Component	FDI, portfolio equity, portfolio debt, bank lending
Type of investor	Retail and institutional investors
Data frequency	Annual, quarterly, monthly, weekly, daily
Official vs. private sector	Private investors vs. offical lending; private sector recipients vs. public sector borrowing
Currency	Local currency, foreign currency
Maturity	Short vs. long term (debt flows), indefinite (equity flows)
Geography	EM Asia, EM Europe, Latin America, Africa/Middle East, individual countries

Source: author's illustration.

It is noteworthy that for each of these measures of capital flows, there are a number of different ways to scale and adjust flows for the purpose of empirical analysis. The most appropriate form to use in an econometric analysis is likely to depend on the specific research objective. A helpful overview of capital flows specifications used in the empirical literature is provided by Ahmed et al. (2015, 2-3), who list and discuss studies using as dependent variable "the dollar amount of flows, flows normalized by average past flows, log changes in portfolio positions, flows as a percent of lagged portfolio size, changes in the portfolio share, flows scaled by local market capitalization, and flows scaled by local GDP."

Residency of Investor

A key distinction is between gross and net capital flows. Gross means that non-resident capital inflows are analyzed separately from resident capital outflows (Borio and Disyatat 2011; Obstfeld 2012). In balance of payments terminology, this distinction corresponds to changes in the liabilities of an emerging market country versus changes in its assets. Net capital flows are obtained by netting changes in liabilities against changes in assets.[6]

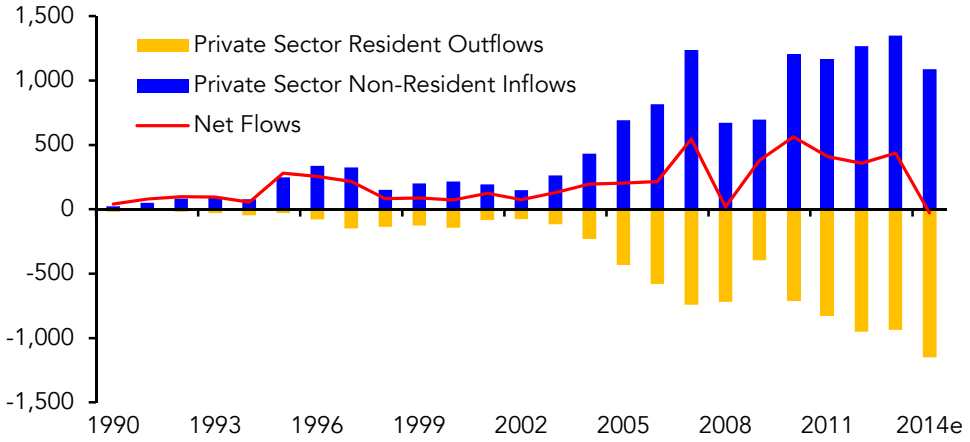
[6] If available, data on gross flows provide more information since actions by resident and non-resident investors can be analyzed separately (United Nations, 2009). In principle, netting can be done in the same asset category (e.g. net FDI flows) or in groups of asset categories (i.e. overall net capital flows).

In the early literature, the distinction between gross and net capital flows was of little importance because up to the early 1990s, EM resident capital outflows were typically quite small (Figure 5). Therefore, net capital flows essentially reflected purchases and sales of assets by non-residents. Over time, however, EM resident outflows rose to sizeable volumes, meaning that the behavior of non-resident flows could no longer be approximated by net capital flows. To the extent that non-resident flows do not coincide with net capital flows, the literature on the drivers of capital flows (and this survey) generally focus on non-resident capital flows (although there are notable exceptions, such as Reinhart and Reinhart 2008; and Ghosh et al. 2014a). The main reason why the focus is on non-resident capital flows is that EM economies are typically most affected by the actions of foreign investors (Ostry et al. 2010; Broner et al. 2013). Non-resident flows are generally the more volatile component, especially during crisis periods, making them an important driver of exchange rates, domestic interest rates, and other financial variables. By contrast, EM resident capital outflows are more geographically concentrated in a limited number of countries that are large exporters of oil and other commodities. Meanwhile, net capital flows provide a narrower picture of external financing that is more closely linked to transactions in real goods and services. In addition, net capital flows are jointly determined with the current account balance and the official settlements balance, each of which is subject to its own unique driving factors (see, for example, Debelle and Faruqee 1996; Chinn and Prasad 2003).

Figure 5

Emerging Market Capital Flows by Residency of Investors

$ billion



Source: IIF.

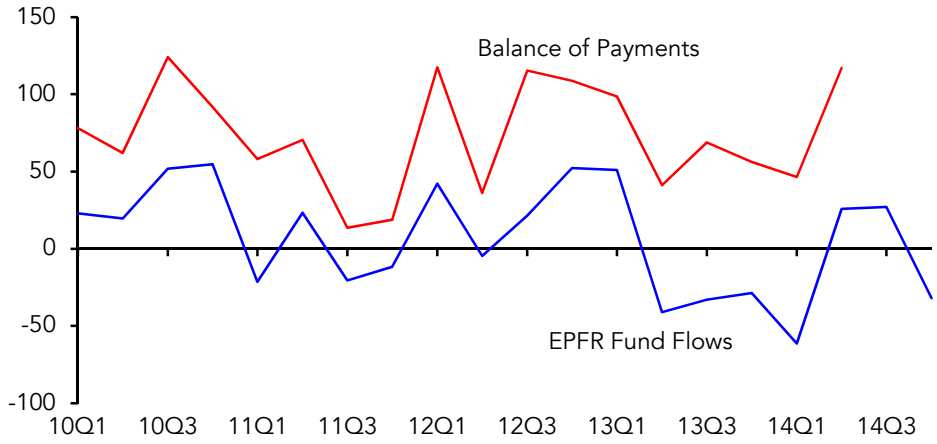
Most data sources on international capital flows clearly fit into one category within the residence-based framework, but there are exceptions. One example is BIS data on consolidated cross-border banking statistics, which include international banks' local claims, i.e. loans by their subsidiaries.

Hence, the consolidated data are not consistent with balance of payments data, which only include transactions between residents and non-residents (see also Takats 2010; BIS 2012; by contrast, BIS locational banking statistics are also compiled using a residence-based approach). Another example is EPFR Global's data on flows in and out of funds that invest in emerging markets. While these flows are often used as a proxy for BoP portfolio flows (Miao and Pant 2012), the discrepancy between the two measures is quite large (Figure 6). Fund flows are also quite different conceptually as they measure net flows into an investment vehicle rather than transactions between the residents of different countries (for a more detailed discussion, see Koepke and Mohammed 2014a). While fund flows are certainly of significant scholarly interest on their own merits, there are justified questions about the degree to which empirical findings based on fund flows also apply to international capital flows.

Figure 6

Portfolio Equity and Debt Flows to Emerging Economies

$ billion; non-resident flows; BoP data based on IIF group of 30 emerging economies



Source: IIF, EPFR.

Capital Flows Components

Following the standard balance of payments presentation by the IMF, capital flows can be broken down into four main components: foreign direct investment (FDI), portfolio equity investment, portfolio debt investment, and "other" investment, which includes bank lending (International Monetary Fund 2010). Capital flows differ greatly in scale and scope across these components, and so do their drivers. Because it so important to distinguish among the major components of capital flows, Section 7 of this survey is devoted to analyzing the drivers of each of the major components of capital flows.

FDI involves transactions where the investor owns a substantial portion of a firm's shares and typically exercises a degree of managerial control. In addition, FDI transactions often involve the

ownership of physical plants and equipment. Therefore, direct investment flows are driven largely by long-term considerations about the real economy and less subject to short-term financial fluctuations (see, for example, Addison and Heshmati 2003; Biglaiser and DeRouen 2006). In most countries, FDI flows are the largest source of external financing, with total gross FDI inflows typically averaging around 40-60 percent of aggregate capital flows to emerging markets since the mid-1990s (Institute of International Finance 2015). Blonigen (2005) provides a survey specifically on the determinants of FDI flows, covering flows to both emerging and mature economies.

By contrast, portfolio equity and debt flows involve transactions that can, in principle, be executed very quickly. Some investors may adjust the composition of their portfolios in response to economic news and short-term fluctuations on financial markets. This is reflected in empirical evidence showing that a range of financial variables are important drivers of portfolio flows, including asset returns, exchange rate volatility, and external financial volatility indicators that indicate the degree of investor risk aversion (see, for example, Montiel and Reinhart 1999; Baek 2006; Broner et al. 2013).

Finally, banking flows are often analyzed as another separate category, reflecting the special status of the banking system as a financial intermediary (Buch 2002). There are various approaches to analyzing banking flows. Most studies that focus specifically on banking flows make use of BIS data on cross border bank claims, which include both bank lending as well as banks' holdings of debt and equity securities and other assets. Note that this concept differs from the standard balance of payments classification, where bank loans are included in a category "other investment," while all transactions in debt and equity securities (including those by banks) are included in the portfolio debt and equity investment categories, respectively (International Monetary Fund 2010).

Type of Investor

Institutional investors are likely to have different investment objectives from retail investors, and hence are likely to respond differently to changes in the economic and financial environment. For example, institutions like sovereign wealth funds, insurance companies and pension funds generally have long-term mandates that allow them to ride out short-run fluctuations on financial markets (BIS 2007). An exception are hedge funds, which tend to place much greater emphasis on short term tactical asset allocation and adjust positions frequently (Tsatsaronis 2000). By contrast, mutual funds are predominantly owned by retail investors who may withdraw their capital during times of financial stress (IMF 2014). Mutual fund investments are an area of research where fund flows data can provide quite detailed insights into investor behavior. For example, Raddatz and Schmukler (2012) find evidence of a destabilizing effect of mutual funds by analyzing the interplay between actions of ultimate investors (i.e. the owners of fund shares) and fund managers. They conclude that mutual

funds tend to exacerbate the pro-cyclicality of capital flows to emerging markets. Gelos (2011) provides a survey on the behavior of international mutual funds and the implications for capital flows.

Data Frequency

Capital flows data exist at frequencies ranging from daily to annual data and are published with various time lags. The lower the frequency, the more complete the dataset tends to be, but the more difficult it is to capture the impact of short term developments and rapid shifts in investor behavior. In recent years, the literature has increasingly focused on high-frequency data sources serving as proxies for EM capital flows, such as fund flows data (see, for example, Fratzscher et al. 2012; Lo Duca 2012; Feroli et al. 2014). A comparison of empirical results across different studies suggests that the relative importance of capital flows drivers differs across data frequencies. For portfolio flows, the evidence suggests that external factors (especially risk aversion) are the dominant driver of short run movements, while pull factors (especially macroeconomic conditions) seem to be less important at high frequencies and matter more for long-term trends. For example, Fratzscher (2012) and Koepke (2014) find only a limited role for domestic macroeconomic variables at the weekly and monthly frequencies, respectively, while Baek (2006) and De Vita and Kyaw (2008a) find strong evidence for the role of domestic output growth at the quarterly frequency. These results are consistent with Ananchotikul and Zhang (2014), who find based on weekly fund flows data that the contributions from external factors are much more volatile, while those of pull factors are small at high frequencies but more persistent. A promising avenue for future research would be to compare push and pull drivers systematically using a common methodological approach across different frequencies for the various capital flows components.

Official vs. Private Sector Flows

Another useful distinction is by the economic sector that provides the capital as well as the sector using the capital. While capital provided by the private sector can be expected to be driven by risk-return considerations, this may not be the case for official lending provided by international financial institutions like the World Bank and IMF or by bilateral official creditors (Gupta and Ratha 2000). Alfaro et al. (2011) address this question by separating flows from private sector sources and official flows such as official aid and reserve accumulation. The authors find evidence that private flows are indeed driven more by economic factors such as productivity growth, consistent with theory, while official flows are not determined by these fundamental factors. Most of the literature (and this survey) focuses on the determinants of private sector sources of capital.

On the recipient side, creditworthiness and risk-return profiles are likely to differ between securities issued by the public and the private sector, meaning that investors may take into account different factors when making investment decisions. In addition, equity flows are almost always directed to the private sector (except when the target company is partially state-owned), while bonds may be issued by either government entities or companies. The literature (and this survey) addresses capital flows to both public and private sector recipients, although most studies do not differentiate between the two.

Currency

Up to the early 2000s, emerging markets typically borrowed in "hard" currency, notably in U.S. dollars (Burger et al. 2012). Since then, there has been rapid growth in local currency bond markets, against the "original sin" hypothesis, according to which emerging markets would not be able to borrow in their own currencies in large scale (e.g., Eichengreen and Hausmann 1999; 2005). Depending on the currency denomination of the securities issued, different factors are likely to matter for attracting foreign investors and lenders. For example, hard currency investors should be concerned about EM exchange depreciation primarily to the extent that the borrower's ability to service debt and repay principal is affected. By contrast, for local currency debt, exchange rate depreciation directly affects foreign investors' returns. Hence, the domestic inflation performance and central bank credibility should matter much more for local currency debt than foreign currency debt. Consistent with this, Burger and Warnock (2007) find that countries with a better inflation track record and creditor friendly policies have been able to issue more debt in local currency. In addition, Burger et al. (2012) find that flows into securities in local currency are particularly driven by investor-friendly institutions, regulations and policies (e.g., fewer capital controls), market liquidity, and creditor rights.

Maturity

For debt flows, the determinants are likely to vary depending on the maturity of credit, given the differences in risk-return characteristics and rollover risks. Notably, the price of a long-dated bond is more sensitive to changes in interest rates compared to a bond with a short remaining maturity. Consistent with this, there is evidence that flows into short-term bonds tend to be less sensitive to changes in mature economy interest rates compared to bonds with longer remaining maturities (Koepke 2014). On the other hand, short-term borrowing involves greater rollover risks for the issuer, which can lead to funding pressures during periods of emerging market stress. Indeed, Rodrik and Velasco (1999) find that greater short term borrowing increases the probability and severity of financial crises in emerging markets.

Regional and Country Differences

Studies frequently distinguish between various emerging market regions and contrast the behavior across these different groupings (e.g. Taylor and Sarno 1997; Baek 2006, and Förster et al. 2014). It is plausible that the determinants of capital flows differ systematically across countries, for example due to structural factors, such as whether a country is a major exporter of a particular commodity. In addition, empirical results may differ across studies because different country samples are used. In some cases, this may be due to different definitions of which countries are classified as emerging markets. EM country groupings differ between various international organizations like the International Monetary Fund, the World Bank, and private sector organizations such as Morgan Stanley Capital International (which provides benchmark equity indices like the MSCI Emerging Market index).

6. Classification and Discussion of Capital Flows Drivers

Push-Pull Framework

The distinction between push and pull factors for capital flows has been the dominant intellectual framework for classifying drivers since the focus of academic inquiry shifted to the role of external factors in the early 1990s. A strength of this framework is that it is simple and intuitive, and yet is able to capture most of the key drivers of capital flows. From the perspective of an emerging market country, most of the relevant macroeconomic and financial developments affecting capital flows can be classified as being either domestic or external in nature. For example, domestic economic performance, asset return indicators, and country risk indicators stand out as important variables in emerging market economies that are found to have a significant bearing on capital flows. Similarly, mature economy interest rates and global risk aversion are unambiguously external in nature and have significant explanatory power for capital flows movements.

However, there are also several important caveats regarding the push-pull framework. Some factors do not seem to fit into either the external or the domestic category, such as the behavioral responses of international investors to local market developments. For example, contagion effects may arise through the interaction of country-specific developments (such as the deterioration in vulnerability indicators) and a flight-to-safety response by global investors (Calvo and Reinhart 1996). Such contagion effects are the subject of a separate, voluminous literature (for an overview, see Forbes and Rigobon 2001). Recent focus has been on contagion stemming from investment funds and their ultimate investors, which is surveyed in Gelos (2011). Other aspects of investor behavior are also closely linked to country-level developments, such as the degree to which investors

rebalance their portfolios away from assets whose prices have previously increased or allocate additional funds to those assets ("rebalancing vs. return chasing," Bohn and Tesar 1996; Curcuru et al. 2011). Similarly, the effects of information asymmetries and transaction costs cannot be fully captured by the push-pull framework (Portes and Rey 2005).

In addition, there may be important interactions between external conditions and country fundamentals that are difficult to capture with the push-pull framework. For example, domestic asset return indicators are found to be an important determinant of portfolio and banking flows, but in an interconnected world of global finance it is difficult to disentangle whether observed asset price movements are driven by domestic or external developments. Similarly, interactions between external and domestic variables also obscure the picture for real economy variables and country risk indicators. A classic example explored by Fernandez-Arias (1996) is the positive effect of low U.S. interest rates on the creditworthiness of EM borrowers, which in turn encourages foreign capital inflows. He finds that the improvement in the creditworthiness of emerging markets in the early 1990s was primarily attributable to the decline in international interest rates and argues that the resulting increase in foreign inflows should not be interpreted as having been driven by domestic factors. Another example for such endogeneity issues is domestic real GDP growth, since capital flows are not only attracted by faster growth but also support such growth (for a recent discussion, see, for example, Kyaw and MacDonald 2009). These endogeneities make it notoriously difficult to establish true causal relationships for the drivers of capital flows.

Another argument raised against the push-pull framework is that for certain variables, both sets of factors may essentially be viewed as two sides of the same coin. If an increase in EM growth has the same impact on capital flows as a decline in mature economy growth of the same magnitude, then it is the growth *differential* that determines capital flows (Ahmed and Zlate 2013). While this is a valid theoretical point, a critical reading of the empirical literature does not support this view. There is substantial evidence that the EM and advanced economy effects on capital flows are quite different. While there is robust evidence that stronger EM real GDP growth tends to boost EM capital inflows, the impact of slower mature economy growth is much more ambiguous (see, for example, Gupta and Ratha 2000; Ferucci et al. 2004). Indeed, there is some evidence that slower mature economy growth tends to reduce certain types of capital flows (Jeanneau and Micu 2002; Baek 2006; De Vita and Kyaw 2008a).

Similarly, a decline in U.S. interest rates may in principle have the same impact on capital flows as an increase in EM interest rates, in which case capital flows be driven by interest rate differentials. Indeed, interest rate differentials are often seen as an important driver of portfolio flows in the

context of the carry trade investment strategy (see, for example, Galati et al. 2007). However, analysis of aggregate capital flows movements finds little support for the notion that flows are driven by interest rate differentials. While mature economy interest rates are found to be an important determinant of various types of EM capital inflows, the evidence is much more mixed for EM interest rates (e.g., Ahmed and Zlate 2013). A complication with estimates of how much local interest rates attract foreign capital flows is again endogeneity. Since greater foreign capital flows would tend to reduce local interest rates, estimations that do not address endogeneity would tend to obtain coefficients with a downward bias, i.e. the impact of domestic interest rates may be understated. On the other, the literature on global interest rate transmission finds that EM interest rates themselves are to a significant degree driven by mature economy interest rates (Frankel et al. 2004; Edwards 2012). Hence, a large negative impulse from an increase in mature economy interest rates may lead to a sharp reduction in EM capital flows, but may only result in a small increase in the interest rate differential. Therefore, it would not be appropriate to attempt to explain such a reduction in flows with the change in the interest rate differential.

Overall, the push-pull framework certainly has its limitations, but it continues to be a useful analytical perspective for structuring the discussion on the determinants of EM capital flows.

Cyclical vs. Structural Drivers of Capital Flows

One complementary dimension that sometimes receives insufficient attention in the discussion of country-specific and global factors is the distinction between cyclical and structural forces that shape the evolution of capital flows. Cyclical factors are more short-term in nature and often vary across different phases of the business cycle, such as real GDP growth and interest rates. By contrast, structural factors are more long-term in nature, and relate to the fundamental structure of an economy, its institutions, and its policy and regulatory frameworks. While structural factors typically shape longer-term trends in capital flows, abrupt changes in these factors may also have important short-term effects. A prime example would be an emerging market country that undertakes steps towards liberalizing its capital account to make it easier for foreigners to invest in its economy. The impact of capital account liberalization on foreign investment is among the topics that have received significant interest in the literature (e.g., Bartolini and Drazen 1997; Kim and Singal 2000; Bekaert et al. 2002). In addition, the longer-term effects of structural forces received particular attention in late 1990s and early 2000s literature, which saw some important contributions with respect to the rise of institutional investors and information and communication technology (including World Bank 1997; Lopez-Mejia 1999; Addison and Heshmati 2003). When it comes to explaining aggregate capital flows movements, however, there has been much more focus on the cyclical forces shaping capital

flows to emerging markets. This is especially true for the most recent period since the global financial crisis of 2008/09, which shifted the focus squarely on the cyclical drivers of capital flows.

Arguably, the distinction between structural and cyclical factors is complementary to that between push and pull factors. Pull factors can be structural or cyclical in nature, as can be push factors. Figure 7 illustrates this complementarity and provides frequently cited examples of capital flows drivers. For example, the rise of institutional investors in mature economies is an important structural push driver, while the quality of institutions in emerging markets can be regarded as a structural pull driver.

Figure 7: Classification of the Main Drivers of Capital Flows

	Push	**Pull**
Cyclical	Global risk aversion	Domestic output growth
	Mature economy interest rates	Asset return indicators
	Mature economy output growth	Country risk indicators
Structural	Rise of institutional investors	Quality of institutions
	Portfolio diversification	Capital account openness
	Information & communication technology	Role of government in the economy

Source: author's illustration.

While structural drivers are clearly of great importance for a more complete understanding of international capital flows dynamics, the subsequent discussion will focus on cyclical push and pull drivers, both due to space constraints and because they have received the greatest attention in the literature on the drivers of capital flows to emerging markets.

7. Drivers of Capital Flows by Major Component

Prior sections have established the importance of differentiating between various types of capital flows and the continued analytical value of the push-pull framework. This section brings these two perspectives together by analyzing the available evidence on the main cyclical push and pull drivers for the major capital flows components. For this purpose, I consider the four main components of capital flows, namely portfolio equity and debt flows, banking flows, and foreign direct investment. In terms of drivers, the discussion addresses three push factors (global risk aversion, mature economy interest rates, and mature economy output growth) and three pull factors (domestic output growth, asset return indicators, and country risk indicators). Figure 8 provides a condensed summary

of the results obtained by over 40 empirical studies. For the most part, the studies considered in this summary table focus specifically on individual components of emerging market capital flows. Some additional insights can be gained from studies that have a broader country focus and/or consider multiple components of capital flows at once (such as Milesi-Ferretti and Tille 2011, who do not differentiate between flows to emerging and mature economies). To the extent that inferences are possible from these studies, they are included in the table and the discussion below.

Portfolio Equity and Debt Inflows

There is very robust evidence that both types of portfolio flows are strongly affected by global risk aversion, which has received particular attention since the global financial crisis of 2008/09. Empirical studies almost universally find a strong and statistically significant impact of increases in global risk aversion on portfolio flows to emerging markets (e.g., Milesi-Ferretti and Tille 2011; Broner et al. 2013; see Figure 8 and related notes for a full listing of references). The most common proxies for investor risk aversion used in the literature are U.S. implied equity volatility (as measured by the VIX or the VXO) and the U.S. BBB-rated corporate bond spread over U.S. Treasury securities, which are both found to have a strong contemporaneous impact portfolio flows. There does not seem to be conclusive evidence that one type of portfolio flow (debt or equity) is affected more than the other by changes in risk appetite.

Numerous studies published during the last 25 years have analyzed the relation of portfolio flows with world interest rates (often proxied by U.S. rates) and have overwhelmingly concluded that an increase in the external interest rate environment tends to exert a negative impact on portfolio flows and vice versa. Not all studies distinguish between equity and debt flows when analyzing portfolio flows movements, but to the extent that they do, most studies considered in this survey find that bond flows are more sensitive to mature economy interest rates than equity flows (including Taylor and Sarno 1997; Koepke 2014, and Dahlhaus and Vasishtha 2014; an exception is Chuhan et al. 1998).

Studies that do not find a significant relationship between global interest rates and EM portfolio flows include Hernandez et al. (2001) and Ahmed and Zlate (2013). Hernandez et al. attribute the result of no significant relationship to the use of low-frequency data (namely annual data for the real ex-post international interest rate, measured by U.S. dollar 3-month Libor minus U.S. CPI inflation and used in a various relatively short sample periods between 1987 and 1997). The results in Ahmed and Zlate (2013) are based on the U.S. policy interest rate in the pre-crisis period (2002Q1-2008Q2). Their results may be due to the limitations of using current policy rates as opposed to more forward-looking measures of interest rates that capture investor expectations about future interest rates, be it

Figure 8: Overview of the Cyclical Drivers of Non-Resident Capital Flows by Major Component

Type	Driver	Portfolio Equity	Portfolio Debt	Banking Flows	FDI
Push	Global risk aversion	**strong evidence for negative relationship** [negative: M&T 2011, F 2012, BDES 2013, R 2013, A&Z 2013, A&Z 2014, K 2014; negative/insignificant: B 2006]	**strong evidence for negative relationship** [negative: M&T 2011, F 2012, BDES 2013, R 2013, A&Z 2013, A&Z 2014, K 2014; negative/insignificant: B 2006]	**strong evidence for negative relationship** [negative: J&M 2002, FHST 2004, T 2010, M&T 2011, R 2013, B&S 2013a, B&S 2013b, H&M 2013]	**Mixed evidence, no clear relationship** [insignificant: ALS 2005; positive/negative: BDES 2013; negative: M&T 2011, positive: R 2013]
	Mature economy interest rates	**strong evidence for negative relationship** [negative: F 1996, W 1997, M&R 1999, T&S 1997, CCM 1998, B 2006, FLS 2012, D&V 2014, FKSS 2014, K 2014; negative/insignificant: D&K 2008a; insignificant: HMV 2001; A&Z 2013]	**strong evidence for negative relationship** [negative: F 1996, W 1997, T&S 1997, M&R 1999, B 2006, D&V 2014, FKSS 2014, K 2014; negative/insignificant: D&K 2008a; insignificant: HMV 2001, A&Z 2013; greater impact than for equity: T&S 1997, K 2014, D&V 2014; smaller impact than for equity: CCM 1998]	**Some evidence for negative relationship** [negative: B&S 2013a, GQS 2014; positive/negative: G 2002, CCR 2014; positive: J&M 2002]	**Mixed evidence, no clear relationship** [insignificant: W 1997, M&R 1999, HMV 2001, D&K 2008a; negative: ALS 2005; positive: G&R 2000]
	Mature economy output growth	**Some evidence for positive relationship** [positive/insignificant: B 2006, D&K 2008a, F&W 2012; insignificant: A&Z 2013]	**Some evidence for positive relationship** [positive/insignificant: B 2006, D&K 2008a, F&W 2012; insignificant: A&Z 2013]	**Mixed evidence, no clear relationship** [insignificant: FHST 2004; positive/negative: G 2002; positive: J&M 2002]	**Mixed evidence, no clear relationship** [insignificant: G&R 2000; positive/negative: D&K 2008a, ALS 2005]
Pull	Domestic output growth	**Strong evidence for positive relationship** [positive: D&K 2008a; positive/insignificant: B 2006, D&K 2008b, A&Z 2013, K 2014; insignificant: F 2012]	**Strong evidence for positive relationship** [positive: D&K 2008a; positive/insignificant: B 2006, D&K 2008b, A&Z 2013, F 2012; K 2014]	**Strong evidence for positive relationship** [positive: J&M 2002, FHST 2004, T 2010, H&M 2013, B&S 2013b]	**Strong evidence for positive relationship** [positive: GNP 1998, HMV 2001, A&H 2003, D&K 2008a, D&K 2008b; positive/insignificant: GR 2000]
	Asset return indicators	**Some evidence for positive relationship** [positive: FOS 2001, F 2012, L 2012, K 2014; positive/insignificant: CCM 1998, A&Z 2013]	**Some evidence for positive relationship** [positive: FOS 2001, F 2012, K 2014; positive/insignificant: CCM 1998]	**Strong evidence for positive relationship** [positive: FHST 2004, B&S 2013b, H&M 2013]	**Mixed evidence, no clear relationship** [insignificant: W 1997; negative: R&R 2003]
	Country risk indicators	**Some evidence for negative relationship** [negative: W 1997, K&W 2008, D&F 2012; negative/positive: H&K 2007]	**Some evidence for negative relationship** [negative: W 1997, K&W 2008, D&F 2012; negative/positive: H&K 2007]	**Strong evidence for negative relationship** [negative: W 1997, FHST 2004, H&K 2007, K&W 2008; negative/insignificant: J&M 2002; B&S 2013b]	**Some evidence for negative relationship** [negative: R&R 2003, B&D 2006; negative/insignificant: ALS 2005; negative/positive: K&W 2008; smaller impact than for other components: F&H 2001, D&F 2012]

Strong evidence for positive relationship
Some evidence for positive relationship
Mixed evidence, no clear relationship
Some evidence for negative relationship
Strong evidence for negative relationship

Source: author's illustration.

Notes on Figure 8:

- The matrix summarizes the empirical evidence on the main drivers of EM capital flows for each of the major capital flows components. Findings are based on an in-depth review of over 40 studies. For each cell, the relevant studies and their main results are reported in parentheses. For example, "positive/insignificant" indicates that each of the studies listed found some evidence for a statistically significant positive relationship as well as evidence for a statistically insignificant relationship. Due to space constraints, the studies are listed using abbreviated references. The series of letters indicate the initial of the last name for each author, followed by the publication year. For example, "T&S 1997" refers to a paper by Taylor and Sarno (1997). A full listing of references is provided below.
- A color code is used to denote the direction of empirical relationships (see legend below table). "Positive relationship" means that an increase in the independent variable leads to an increase in the capital flows component in question. The opposite holds for "negative relationship." The color code also indicates the strength of the empirical evidence for these relationships. "Strong evidence" indicates that the majority of studies find unambiguous evidence for a statistically significant relationship between the driver and the capital flows component in question (while there may be other studies that do not find a statistically robust relationship). "Some evidence" indicates that most studies are unanimous about the direction of the relationship, but the results are sometimes statistically significant and sometimes not. "Mixed evidence" indicates that evidence regarding the direction of the relationship is ambiguous and/or most studies have not found a statistically significant relationship.
- Inevitably, an attempt to summarize the vast body of empirical evidence in a single table requires simplification. For example, no differentiation is made between contemporaneous and lagged relationships. In addition, the studies considered make use of widely different empirical approaches, including econometric models, datasets, and data frequencies, among others (see Section 4).

List of studies referenced in Figure 8, in chronological order:

F 1996	Fernandez-Arias (1996)
T&S 1997	Taylor & Sarno (1997)
W 1997	World Bank (1997)
CCM 1998	Chuhan, Claessens & Mamingi (1998)
GNP 1998	Gastanaga, Nugent & Pashamova (1998)
M&R 1999	Montiel & Reinhard (1999)
D&R 2000	Gupta & Ratha (2000)
F&H 2001	Fernandez-Arias and Hausmann (2001)
FOS 2001	Froot, O'Connel & Seasholes (2001)
HMV 2001	Hernandez, Mellado & Valdes (2001)
G 2002	Goldberg (2002)
J&M 2002	Jeanneau & Micu (2002)
A&H 2003	Addison & Heshmati (2003)
R&R 2003	Reinhart & Rogoff (2003)
FHST 2004	Ferucci, Herzberg, Soussa & Taylor (2004)
ALS 2005	Albuquerque, Loayza & Serven (2005)
B 2006	Baek (2006)
B&D 2006	Biglaiser & DeRouen (2006)
H&K 2007	Hooper & Kim (2007)
D&K 2008a	De Vita & Kyaw (2008a)
D&K 2008b	De Vita & Kyaw (2008b)
K&W 2008	Kim & Wu (2008)
T 2010	Takats (2010)
M&T 2011	Milesi-Ferretti & Tille (2011)
D&F 2012	Daude and Fratzscher (2012)
F 2012	Fratzscher (2012)
FLS 2012	Fratzscher, Lo Duca & Straub (2012)
F&W 2012	Forbes & Warnock (2012)
L 2012	Lo Duca (2012)
A&Z 2013	Ahmed & Zlate (2013)
BDES 2013	Broner, Didier, Erce & Schmukler (2013)
B&S 2013a	Bruno & Shin (2013a)
B&S 2013b	Bruno & Shin (2013b)
H&M 2013	Herrmann & Mihaljek (2013)
R 2013	Rey (2013)
A&Z 2014	Ananchotikul & Zhang (2014)
CCR 2014	Cerutti, Claessens & Ratnovski 2014
GQS 2014	Ghosh, Qureshi & Sugawara (2014)
K 2014	Koepke (2014)
FKSS 2014	Feroli, Kashyap, Schoenholtz, Shin (2014)
D&V 2014	Dahlhaus & Vasishtha (2014)

explicitly as in Koepke (2014) and Dahlhaus and Vasishtha (2014) or implicitly by using market-based measures of interest rates.

In terms of mature economy output growth, there is limited support for the notion that external growth encourages EM portfolio flows. For example, De Vita and Kyaw (2008a) find a statistically significant positive relationship in some specifications using a structural VAR model, but in alternative specifications the estimated coefficient on the mature economy growth variable turns negative (but insignificant). Baek (2006) finds a statistically significant positive relationship for portfolio flows to EM Asia, but not to Latin America (where the estimated coefficient is negative and insignificant). In addition, Ahmed and Zlate (2013) do not find a significant impact of mature economy growth on EM portfolio flows in a panel of 12 emerging market economies.[7] Some further insights are provided by Forbes and Warnock (2012), who find that stronger global growth is associated with an increased probability of a surge in foreign capital inflows to EMs and a reduced probability of a retrenchment episode. While their analysis is focused on total non-resident capital flows, portfolio flows and banking flows have generally been the most volatile components of capital flows and thus are likely to account for the majority of surge and retrenchment episodes (see also Bluedorn et al. 2013).

On the pull side, almost all studies find evidence that domestic economic performance is an important driver of portfolio flows, though in many studies, the evidence is not statistically robust (particularly for high-frequency data). Studies focusing specifically on the relationship between domestic growth and EM portfolio flows include Baek (2006), De Vita and Kyaw (2008a), and Ahmed and Zlate (2013), who all find supporting evidence for the role of domestic output growth. A caveat is provided by studies using high-frequency proxies for portfolio flows, notably fund flows data, which generally find that the importance of domestic output growth is smaller at the weekly and monthly data frequencies (e.g., Ananchotikul and Zhang 2014; Koepke 2014). This may be partly explained by the fact that comprehensive measures of output growth are typically only available on a quarterly basis (as for GDP growth), while higher-frequency data such as purchasing manager indices, economic surprise indices and growth forecasts may be less reliable and hence less important in informing investor decisions.

There is also some evidence that local asset returns serve as a pull factor for portfolio flows. The strongest evidence is available for local stock market returns, which a number of studies find to be associated with increased portfolio equity and bond inflows. Among the early literature, a notable

[7] Results reported in Section 7 for Ahmed and Zlate (2013) refer to the appendix of their study, where EM and mature economy variables are analyzed separately.

study is Chuhan et al. (1998), which finds some evidence that portfolio flows are driven by local stock market returns. Another early study on the relation between flows and prices is Froot et al. (2001), which uses custodial data from State Street, one of the world's largest custodian banks, and finds that flows are indeed influenced by past returns. Much of the supporting empirical evidence gathered in recent years is based on data on flows to EM-dedicated mutual funds and ETFs, including Fratzscher (2012) and Lo Duca (2012). Koepke (2014) is an exception in that it provides supporting evidence using data on both fund flows and BoP-consistent portfolio flows. The evidence is less conclusive for other asset return indicators, such as domestic policy interest rates (e.g., Ahmed and Zlate 2013). There is evidence, however, that return volatility dampens foreign portfolio inflows, especially real exchange rate volatility (e.g., World Bank 1997; Baek 2006).

There is some evidence that country vulnerability indicators impact portfolio flows, with greater country risk reducing inflows. For example, the World Bank (1997) finds that a higher external debt to GDP ratio tends to dampen flows. In addition, Kim and Wu (2008) find that lower sovereign credit ratings on foreign currency debt tend to reduce flows, particularly for long-term debt. An important caveat applies to vulnerability indicators that are closely tied to external financing needs, like the current account deficit or the government budget deficit. Here, studies generally find that the effect of reduced financing needs outweighs the opposing effect of improved creditworthiness, meaning that deficit reduction tends to reduce foreign portfolio inflows and vice versa (Hernandez et al. 2001; Baek 2006). This same result is also obtained for banking flows (Takats 2010; Herrmann and Mihaljek 2013) and FDI flows (Gupta and Ratha 2000).

Banking Flows

There is robust evidence that banking flows respond negatively to an increase in global risk aversion (and vice versa). This result is obtained by all 7 studies included in this survey that look at specifically at banking flows, spanning a variety of sample periods, country samples, and methodologies (see list of references in Figure 8).

By contrast, the evidence is much more mixed for the other cyclical push variables. Overall, the evidence seems to suggest that there is some negative impact of mature economy interest rates on banking flows, but this effect may at times be more than offset by the stronger economic and financial environment in which higher interest rates tend to prevail (and vice versa). Another reason why the evidence may be more mixed for banking flows than for portfolio flows is likely to be the lack of high-frequency data on cross-border banking flows. In terms of individual studies, Bruno and Shin (2013a) find the expected negative relationship for the 1995-2007 period, using BIS locational banking statistics (which are broadly consistent with capital flows as measured in the balance of

payments; see Takats 2010; BIS 2012). The authors focus on the role of the banking sector in transmitting U.S. monetary policy internationally. They argue that banks' financing costs are closely tied to central bank policy rates, and hence affect banks' willingness to lend internationally, including to local banks in emerging economies. This effect is amplified by a risk-taking channel, in which measured risks decline during periods of low interest rates as borrowers' creditworthiness improves. In addition, Ghosh et al. (2014b) find a negative impact of U.S. real interest rates on cross-border banking flows to a sample of 76 countries, both emerging and mature (also based on BIS locational banking statistics).

However, an earlier BIS study by Jeanneau and Micu (2002) finds a positive relationship between higher global interest rates and banking flows to emerging markets. The authors focus on the 1985-2000 period and use semi-annual data from the BIS consolidated banking statistics database. Note that these data are not consistent with balance of payments data as they include international banks' local claims, i.e. loans by their subsidiaries (Takats 2010; BIS 2012). The explanation offered by the authors is that higher interest rates in mature economies reflect stronger economic conditions that result in improved confidence of international lenders, which may encourage cross-border bank lending. Another study by Goldberg (2002) uses micro-level U.S. banking data from banks' regulatory filings for the 1984-2000 period. She obtains mixed results on this relationship, with the sign of the coefficient depending on the model specification and with different results for U.S. lending to Latin America compared to EM Asia (for which there is more consistent evidence that higher interest rates lead to higher bank lending). Cerutti et al. (2014) provide mixed evidence for a sample of 77 countries (mature and emerging), finding that U.S. real interest rates are positively associated with cross-border bank flows, while the term premium shows the expected negative relationship.

Evidence for the role of mature economy output growth in driving banking flows is also mixed across various studies. Bruno and Shin (2013a) find a negative impact of external growth on banking inflows, while Jeanneau and Micu (2002) find a positive impact. Ferucci et al. (2004) find no statistically significant relationship, while Goldberg (2002) finds mixed evidence.

Regarding pull drivers, there is strong evidence for the roles of domestic output growth, domestic return indicators and country risk indicators in driving banking flows. Studies focusing on domestic output growth include Ferucci et al. (2004), Bruno and Shin (2013b) and Herrmann and Mihaljek (2013). These same studies also consider a variety of local asset returns and find evidence for a significant role of stock market returns, local currency appreciation, and especially banking sector equity performance in attracting foreign bank inflows. A caveat is that most of these studies are

based on BIS data on cross-border bank claims, rather than data taken directly from the balance of payments (which are often not available for banking flows exclusively).

There is also robust evidence for the role of country risk indicators in driving banking flows. Jeanneau and Micu (2002) and Ferucci et al. (2004) find some evidence that a higher external debt ratio tends to reduce banking inflows. Hooper and Kim (2007) find that a higher institutional investor credit rating tends to boost banking flows. In addition, there is evidence that lower sovereign ratings by credit rating agencies tend to reduce banking inflows (Kim and Wu 2008). In a recent study, Bruno and Shin (2013b) look at the government debt to GDP ratio and find some evidence that greater indebtedness deters banking inflows, although this result is statistically insignificant in alternative specifications.

Looking beyond the selected variables considered in Figure 8, the literature on the drivers of banking flows identifies several other important determinants. For example, various studies emphasize the importance of the quality of institutions for banking flows, such as low corruption and a high-quality legal system (e.g., Papaioannou 2009) as well as a lower opacity index (Hooper and Kim 2007). "Gravity" effects are also found to be an important determinant of banking flows (i.e., geographic proximity tends to encourage inflows; see, for example, Buch 2005; Herrmann and Mihaljek 2013). In addition, bank health in lender countries is found to be an important push factor behind EM banking inflows (McGuire and Tarashev 2008; Herrmann and Mihaljek 2013).

Foreign Direct Investment

Out of the major capital flows components, FDI inflows to emerging markets are the least affected by global cyclical developments. Regarding the impact of changes in risk aversion, the empirical results are ambiguous and inconclusive: some studies find a positive relationship (e.g., Rey 2013, who looks at correlations between the VIX and FDI inflows to various EM regions), some studies find a negative relationship (e.g., Milesi-Ferretti and Tille 2011, who emphasize that the impact of risk shocks on FDI flows is smaller than for other components, looking at flows to both mature and emerging markets), and some studies find no relationship (e.g., Albuquerque et al. 2005).

There is more consensus in the literature about the impact of global interest rates on FDI flows, with the majority of empirical analyses finding no statistically significant relationship between the two. There are some exceptions, however. For example, Albuquerque et al. (2005) find that a measure of the average G3 interest rate negatively impacts FDI inflows to a country sample that includes emerging and mature economies. On the other hand, Gupta and Ratha (2000) find a strong positive relationship between FDI flows and international real interest rates.

When it comes to mature economy output growth, the literature again does not find a consistent relationship with FDI flows. Several studies obtain mixed results depending on the model specification (e.g., De Vita and Kyaw 2008a), while others find no statistically significant relationship (Gupta and Ratha 2000). Albuquerque et al. (2005) find evidence for a negative impact of global growth on FDI flows to developing countries, but in an earlier version of their analysis (2002) provide a case study suggesting a positive relationship between global output growth and vertical FDI flows (i.e. production that is part of an integrated international supply chain and that satisfies demand outside the host country). Indeed, from a theoretical standpoint it seems plausible that the role of global growth differs for horizontal FDI (which replicates the same stage of production in various countries to satisfy demand in the local market) and vertical FDI. It seems plausible that vertical FDI would be more closely related to fluctuations in external demand, while the impetus for horizontal FDI is likely to depend to a greater extent on the performance of the host country's economy (Aizenmann and Marion 2004). This would seem to be a promising area for future research.

On the pull side, domestic output growth stands out as the most important driver of FDI inflows. Most studies find unambiguous results supporting this relationship (e.g., Gastanaga et al. 1998; Hernandez et al. 2001; De Vita and Kyaw 2008a), with few exceptions (e.g., Gupta and Ratha 2000).

By contrast, most asset return indicators are unlikely to have a close relationship with FDI flows, given the longer-term nature of these investments, and there are few empirical studies that focus specifically on the relation between asset returns and FDI. There is some evidence, however, that return volatility deters FDI, including World Bank (1997) and Reinhart and Rogoff (2003). Other studies that focus mainly on mature economy FDI inflows suggest that such inflows are encouraged by local exchange rate depreciation, including Froot and Stein (1991) and Klein and Rosengren (1994). In addition, Abbott et al. (2012) find that emerging markets with fixed exchange rates or intermediate regimes tend to attract more FDI inflows than countries with flexible exchange rates.

Country characteristics that make economies vulnerable to crisis tend to deter foreign direct investment. While there is generally less evidence for a negative effect from external vulnerability indicators (such as foreign indebtedness), many studies find that domestic governance matters significantly. For example, a smaller size of government in the economy (measured as government consumption relative to GDP) tends to encourage FDI (Albuquerque et al. 2005), as do reduced expropriation risk and privatization efforts (Biglaiser and DeRouen 2006). There is evidence, however, that country vulnerabilities affect FDI less than the other components of capital flows. This important caveat was first advanced by Fernandez-Arias and Hausmann (2001), who find that more

vulnerable emerging markets generally receive less foreign capital, but FDI accounts for a greater share of those inflows. In a more recent study, Daude and Fratzscher (2008) find that FDI flows are less sensitive to information frictions and the quality of institutions than other types of capital flows, particularly portfolio equity and debt flows.

Besides the literature on the drivers of EM capital flows at large, a separate literature addresses the unique determinants of FDI flows. A helpful overview of this literature is provided by Blonigen (2005), who considers FDI flows to all countries without differentiating between emerging and mature economies. Some of the unique factors include taxes (with lower taxes leading to greater inward FDI), trade protection (with some evidence that greater protection increases inward FDI to circumvent trade barriers), the strength of bilateral trade relations (since some FDI can serve as a substitute for exports), exchange rate effects (with currency depreciation leading to increased inward FDI), and gravity effects. In addition, strong institutions, good governance and low corruption are also important factors in attracting FDI flows (e.g., Gastanaga et al 1998: Biglaiser and DeRouen 2006).

8. Conclusion

This survey has provided an overview of the empirical findings on the drivers of capital flows to emerging markets. The time-tested push-pull framework remains a very useful albeit imperfect way to structure the wealth of empirical evidence gathered since the financial crisis and in the earlier literature. While most of the empirical work focuses on the cyclical drivers of capital flows, a more complete understanding can be achieved by considering secular forces such as the rise of institutional investors, trends in global portfolio diversification, and changes in the institutional framework in EM economies.

Within the push-pull framework, the literature has firmly established that both external and domestic factors matter for capital flows. A comprehensive review of the available evidence provides quite detailed guidance on the relative importance of these two sets of factors for different types of capital flows, with cyclical push factors like global risk aversion and mature economy interest rates generally being most important for portfolio equity and debt flows. Evidence for banking flows suggests a significant role for both external factors (risk aversion and to a lesser extent foreign interest rates) and a range of country-specific factors (including domestic growth, country vulnerability indicators, and domestic asset returns, particularly in the banking sector). By contrast, evidence for the role of external factors is very mixed when it comes to foreign direct investment. Instead, FDI is found to be

driven by country-specific factors like real GDP growth, as well as a number of factors that are specific to FDI flows, such as the tax treatment in the home and host country, the degree of trade protection, and the strength of bilateral trade relations.

In addition, there is robust evidence that the relative importance of push and pull factors varies over time, which is in part due to the fact that the relative magnitude of external and domestic shocks varies over time. Two contrasting periods are the mid-2000s global expansion, where push factors appear to have been relatively less important, versus the global financial crisis of 2008/09, which saw a sharp push shock for EM capital flows in the form of a surge in global risk aversion (Milesi-Ferretti and Tille 2011; Lo Duca 2012). Overall, the answer to the popular question of whether push or pull factors are more important in driving capital flows thus depends not only on the types of capital flows considered, but also on the time period, among other factors. A further caveat is that push and pull factors are interrelated. This complication receives substantial attention in the literature, beginning with the seminal work of Fernandez-Arias (1996), who analyzed the boost to EM borrowers' creditworthiness provided by a decline in U.S. interest rates. This theme is also picked up in the more recent literature, such as Bruno and Shin's (2013a) paper on the risk-taking channel of monetary policy.

These findings have important policy implications. Policy challenges typically arise when a country experiences either large inflows or abrupt outflows of foreign capital. The appropriate policy response to surges and reversals of capital flows depends on the extent to which these are driven by domestic versus external factors (Calvo et al 1993). For example, if unduly large inflows are attracted predominantly by a strong domestic economy, a combination of fiscal tightening and exchange rate appreciation may be warranted. If, on the other hand, flows are primarily driven by a temporary decline in foreign interest rates, this may warrant additional reserve accumulation as a buffer for when favorable external conditions reverse. This survey has shown that the drivers of capital flows depend crucially on the specific flows considered, namely in terms of instruments, investor types, recipient sector, currency denomination, and other factors. Therefore, policymakers need to consider the specific composition of observed capital flows in order to assess how vulnerable its sources of external financing are to a deterioration in factors that are beyond its control. For example, the central bank of a country that has previously received large inflows in the form of portfolio debt should be more concerned about an abrupt increase in foreign interest rates than if the inflows had been in the form of FDI or bank lending.

Several promising avenues for further research emerge from this survey. The first is a more systematic effort to disentangle cyclical and structural factors driving capital flows to emerging

markets. This would be particularly valuable given that a number of structural changes in the international financial system are likely to play an important role in driving capital flows going forward. Examples include the increasing role of emerging markets as source countries for capital inflows to other EM economies ("south-south flows"), as well as the growing popularity of passive investment vehicles like exchange-traded funds, with global assets under management of exchange-traded funds growing from around $97 billion in 2000 to about $2.7 trillion in 2014 (McKinsey 2011; State Street Global Advisors 2015). A better understanding of the interplay of these forces with cyclical effects would enable a more holistic understanding of the drivers of capital flows.

Other promising areas of research include those potential driving forces whose role has not been ascertained conclusively by the extant empirical literature, such as the impact of various external factors for FDI flows (see pages 22-31). One specific example would be the relationship between mature economy growth and FDI inflows to emerging markets, where the theoretical case for external growth boosting vertical FDI seems compelling, but empirical evidence is scarce. Recent improvements in data availability may facilitate such research. For example, since 2009 the IMF has provided bilateral data on the total stock of direct investment from one country to another (Mink et al. 2012) as part of its annual coordinated direct investment surveys (CDIS). Such data may allow more nuanced insights about the role of output growth in source countries in determining FDI inflows to emerging markets. Similar advances may be possible for portfolio flows, where recent efforts have focused on developing high-frequency measures of portfolio flows that track balance of payments data. Examples include the databases on monthly and daily portfolio flows data compiled by the Institute of International Finance, which are broadly consistent with BoP principles (Koepke and Mohammed 2014b). Such high-frequency data may be particularly useful for assessing the role of volatile asset returns and would also make it possible to conduct event studies related to the announcement of unconventional monetary policy measures (which thus far have relied on proxies for capital flows, such as fund flows data).

A final area of research would be a more systematic assessment of how drivers differ between flows to emerging and mature economies, and the extent to which emerging markets are treated as a homogenous group. Emerging markets are generally perceived to be a riskier asset class, which is reflected in the volatility of capital flows (Bluedorn et al. 2013). Nonetheless, emerging economies are quite heterogeneous in their economic structures and level of development. A deeper understanding of how these more fundamental factors affect the importance of various capital flows drivers would be valuable.

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