

WHAT DRIVES CAPITAL FLOWS TO EMERGING MARKETS? A SURVEY OF THE EMPIRICAL LITERATURE

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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 distinction between ‘push’ and ‘pull’ drivers, which continues to serve as a useful framework. Push factors like global risk aversion and external interest rates are found to matter most for portfolio debt and equity flows, but somewhat less for banking flows. Pull factors such as domestic output growth, asset returns and country risk matter for all three capital flows components, but most for banking flows.

Keywords. Bank lending; Determinants of EM capital flows; Portfolio flows; Push and pull

1. Introduction

International capital flows play a central role in the global economy. They are closely tied to countries’ economic and financial conditions, bring a range of benefits and risks to **recipient countries** and raise important policy issues. **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 thus is important for the purpose of macroeconomic policy making, which is reflected in the significant scholarly interest these drivers have attracted over time.

The seminal work by Calvo *et al.* (1993) and Fernández-Arias (1996) introduced the distinction between ‘push’ and ‘pull’ factors, providing the analytical framework for much of the empirical analysis since the early 1990s. In this framework, pull factors relate to domestic conditions in EMs that help attract foreign capital, while push factors are external forces that affect global investors’ decisions to invest in EMs. The push-pull framework has also proven useful for explaining the behaviour of capital flows during and after the global financial crisis, which began in the United States, but quickly saw extensive spillovers to EMs, reviving the academic debate on the importance of external developments for EM capital inflows. The literature interprets the sharp retrenchment in foreign capital flows during the crisis primarily as the result of a powerful ‘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 *et al.*’s (1993) paper.

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This survey takes stock of the empirical evidence on the drivers of capital flows to EMs by reviewing the sprawling research produced since the global financial crisis while also considering the extensive findings of the earlier literature. The contribution of this survey 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 analyse capital flows, which means that it is critical to structure the wealth of empirical findings systematically. In this survey, the empirical evidence is organized first by providing a taxonomy for the different types of capital flows. The paper then evaluates the prevailing framework for the drivers of capital flows and conducts a qualitative meta-analysis for the key push and pull drivers of each of the major capital flows components.

In discussing the empirical evidence the first step is to consider 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 analysed. For example, it is important to differentiate between capital inflows to an EM by non-residents and outward investment by the residents of an EM. For the most part, this survey focuses on non-resident capital flows to EMs. The drivers of capital flows also vary across components (like portfolio flows, foreign direct investment (FDI) and banking flows), differ between institutional and retail investors and depend on the currency denomination and the economic sectors involved in the transactions, 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 (BoPs) framework from data that serve as an approximation to BoP capital flows, such as data on flows into investment funds and BIS data on cross-border bank claims.

Second, this survey discusses the explanatory power of the prevailing ‘push vs. pull’ framework, which distinguishes between external and domestic factors driving capital flows to EMs. The push-pull dichotomy provides a simple and intuitive classification of capital flows drivers, but it certainly has its limitations. For example, contagion effects and other forces related to investor behaviour 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 that the focus on differentials is misguided, 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 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 framework.

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 34 empirical studies are summarized in Figure 1, which is a simplified version of Figure 7.

Push factors are found to matter most for portfolio debt and equity flows, but somewhat less for banking flows. Specifically, there is evidence that increased global risk aversion has a strong adverse effect on portfolio and banking flows. In addition, there is strong evidence that lower interest rates in mature economies push portfolio capital to EMs, especially into bond markets. There is also some evidence for such an effect for banking flows. Pull factors are found to matter for all three components, but most for banking flows. Domestic output growth is the domestic determinant that is most consistently found to show a strong and statistically robust relationship with the three 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 reflect increased financing needs, such as

Type	Driver	Portfolio Equity	Portfolio Debt	Banking Flows
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

Figure 1. Drivers of EM Capital Flows by Major Component. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/joes.12277)]

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.

Source: Author's illustration.

a widening current account deficit. Local asset returns seem to attract banking flows the most, followed by portfolio investment.

Flows of FDI are not included in the detailed discussion of capital flows components because the determinants of FDI are quite different from portfolio and banking flows. FDI flows are the least affected by global cyclical developments, and most studies that have examined the impact of push factors (including U.S./external interest rates, global risk aversion and external output growth) on FDI find ambiguous and inconclusive results (e.g., Montiel and Reinhart, 1999; Gupta and Ratha, 2000; Hernandez *et al.*, 2001; Albuquerque *et al.*, 2005; De Vita and Kyaw, 2008; Broner *et al.*, 2013). Instead, FDI flows are closely tied to the strategic decisions of multi-national enterprises (MNEs), a subject that is the focus of a separate, extensive literature (see, for example, Dunning, 1977; Markusen and Maskus, 2002). An exception is FDI to financial sector companies, which tends to be more closely tied to global cyclical developments (Reinhardt and Dell'Erba, 2013). A helpful overview of the literature on the unique determinants of FDI is provided by Blonigen (2005), who considers FDI flows to all countries without differentiating between emerging and mature economies. Some of the unique drivers of FDI flows include the tax regime, trade protection, the strength of bilateral trade relations, exchange rate effects and gravity effects.

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 provides a classification of the different concepts of capital flows that are commonly analysed. Section 5 discusses the 'push-pull' framework for capital flows drivers and looks in detail at the drivers of the major components of capital flows. Section 6 discusses the main conclusions and provides guidance on future research.

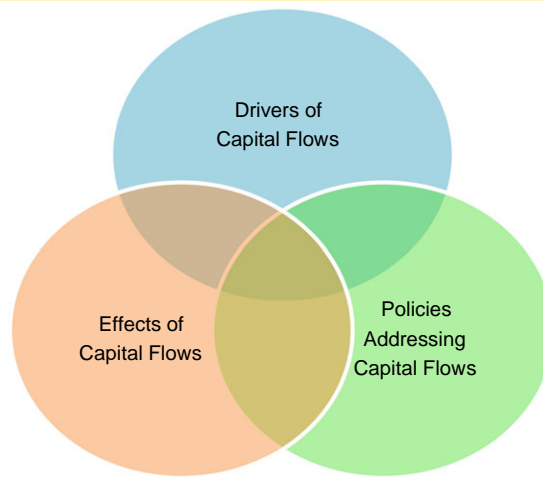


Figure 2. Stylized Illustration of the Major Literature Strands on EM Capital Flows. [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Author's illustration.

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 present survey in the broader context of the capital flows literature, it is useful to divide that 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 behaviour 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 risks associated with capital flows reversals (surveys on the costs and benefits of capital flows include Prasad *et al.*, 2003 and Henry, 2006).

The third area considers a wide range of policy issues, including macroeconomic and macro-prudential 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 1996, BIS 2009 and Milne 2014). The policy implications of capital flows have received growing attention in various international fora in recent years, including the Group of Twenty (see, for example, Group of Twenty, 2011). The importance of the capital flows as a policy issue is also reflected in the IMF's adoption of an 'institutional view' regarding the liberalization and management of capital flows (IMF, 2012, 2016).

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 behaviour, 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.*, 2016). Conversely, the literature on the drivers of capital flows has important implications for the other two areas of research. For example, the appropriate policy response to a capital inflows surge may

	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)	Portfolio diversification reduces state-dependent variability of income (smoothing unknown/random variations in income and returns)

↑
Push/Pull Drivers Affect Portfolio Selection

Figure 3. Stylized Overview of the Theoretical Benefits of Net and Gross Capital Flows. [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/joes.12277)]

Source: Author's illustration.

depend 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 Context

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. For this purpose, it is necessary to distinguish between *net* capital flows and *gross* capital flows. Net capital flows are the mirror image of the current account balance (adjusted for changes in reserves, capital transfers and errors and omissions), that is, a current account deficit is typically reflected in positive net capital flows. By contrast, gross capital flows look at resident outward investment and foreign inward investment separately (i.e. they capture two-way capital flows that reflect the changes in assets and liabilities in the financial account).

The rationales for net and gross capital flows have in common that both types of 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). These benefits are summarized in Figure 3.

The theoretical benefits of net capital flows can be illustrated in the context of the inter-temporal 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 inter-temporal trade, that is, 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. Therefore, 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.¹

On the consumption side, the rationale behind net capital flows is to help countries achieve an improved inter-temporal consumption path by allowing them to smooth consumption in the face of known or expected 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 ‘intra-temporal trade’ in the inter-temporal approach to the current account). On the production side, the benefits of gross capital flows arise because international risk-sharing makes it possible to allocate capital 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 the providers of capital (via higher returns) and the recipients of capital (via faster economic 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 versus net flows may be contrasted in that net flows enable 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.

In addition, gross capital flows also enable benefits on the consumption side. Portfolio diversification allows investors 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, 1994a). As a result, the residents of a country engaging in intra-temporal 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.² 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.³ Figure 3 provides a stylized overview of the consumption and production benefits of gross and net capital flows.⁴

It is worth noting that the consumption benefits of gross capital flows from portfolio diversification accrue to the individual investor, while the other three types of benefits are more widely shared among the residents of countries participating in the international exchange of assets. As a result, it is this fourth category of benefits that is most consequential for guiding investor behaviour and hence most relevant for the push-pull literature on the drivers of capital flows. Consistent with this, the survey focuses on the dynamics of gross capital flows. More broadly speaking, the focus on gross capital flows is warranted because it is the two-way flows of international investment, lending and financial intermediation that characterize a country’s integration into global financial markets (Borio and Disyatat, 2011).

The ‘push-pull’ framework for the drivers of capital flows emerged from the empirical literature without an explicit motivation by economic theory. Nonetheless, there is a compelling link between the empirical push and pull drivers of capital flows and the theoretical framework provided above. The role of external versus domestic drivers can be understood in the context of modern portfolio theory, which provides the theoretical foundation for portfolio diversification and thus for the consumption benefits of gross capital flows illustrated in the bottom right quadrant of Figure 3. The foundations of modern portfolio theory were laid by Markovitz’s (1952) seminal work on portfolio selection and later expanded to the international context by Grubel (1968). Markovitz motivates portfolio diversification by postulating that rational investors should care about two main factors, expected returns and risk (or variance). Thus, the portfolio share of a particular asset will depend on its expected return and risk relative to other investable assets.

Against the backdrop of modern portfolio theory, pull factors can be thought of as factors that affect the expected return and/or risk of EM assets (Chuhan *et al.*, 1998), while push factors can be thought of as affecting primarily the characteristics of other investable assets to which EM assets are being compared

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. official lending; private sector recipients vs. public sector borrowing
Currency	Local currency, foreign currency

Figure 4. Classification of Capital Flows.

Source: Author's illustration.

by investors. For example, on the pull side stronger domestic output growth raises expected returns on equities; more favourable country risk indicators may reduce the variance of asset prices; and more favourable return indicators may point to stronger performance in the future.

On the push side, higher external interest rates make it more attractive to invest in non-EM assets, such as U.S. Treasuries. A similar argument could be made for external output growth, although there are a number of confounding effects that obscure the relationship between external growth and capital flows to EMs (discussed in Section 5). Moreover, **push drivers of capital flows may be factors that shift investors' risk-return preference, represented by a shift along the efficient frontier in the framework of modern portfolio theory (Merton 1972). Since EM assets are generally viewed as high-risk assets, a shift in investor preferences towards a lower expected return at a lower risk would tend to reduce investor demand for EM assets.** Consistent with this notion, the empirical literature highlights investor risk appetite as a key external factor affecting capital flows to EMs.

It is worth noting that the framework of modern portfolio theory is most relevant for explaining portfolio equity and debt flows, and to a lesser extent may also help explain changes in banks' international loan portfolios.

4. Classification of Capital Flows Analysed 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 analysing capital flows.**

It is worth noting 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, pp. 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 per cent of lagged portfolio size, changes in the portfolio share, flows scaled by local market capitalization and flows scaled by local GDP'. Useful**

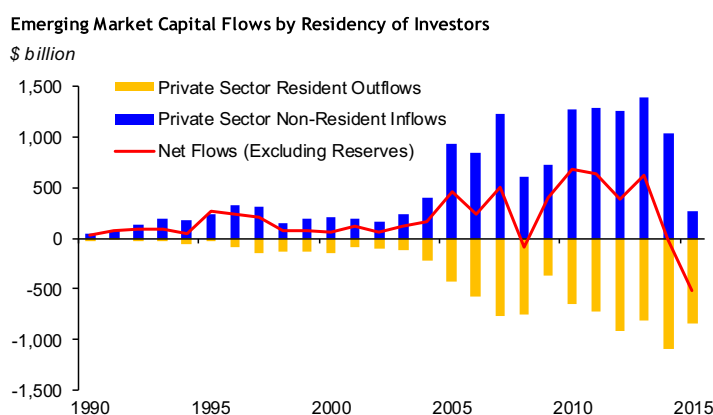


Figure 5. Emerging Market Capital Flows by Residency of Investors. [Colour figure can be viewed at wileyonlinelibrary.com]

stylized facts of the dynamic behaviour of capital flows and relationship with various cyclical variables are provided by Broner *et al.* (2013), Cerutti *et al.* (2017) and Avdjiev *et al.* (2017).

4.1 Residency of Investor

A key distinction is between gross and net capital flows. In BoPs terminology, this distinction corresponds to changes in the liabilities of an EM country versus changes in its assets (IMF, 2010). Net capital flows are obtained by netting changes in liabilities against changes in assets.⁵

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 EM assets by non-residents. Over time, however, EM resident outflows rose to sizeable amounts, meaning that the behaviour 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 (Obstfeld, 2012; Broner *et al.*, 2013). Non-resident flows are generally the more unstable component, especially in the context of sudden stops (Korinek and Mendoza, 2014; Cavallo *et al.*, 2015).⁶ In fact, during periods of stress EM residents tend to dispose of overseas assets if the country's reserve buffers are high, offsetting some of the selling pressure by non-residents (Alberola *et al.*, 2016). As a result, non-resident flows in general and portfolio flows in particular are of predominant importance from a financial stability perspective. Moreover, EM resident capital outflows are more geographically more concentrated in 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 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, Debelles and Faruquee, 1996; Chinn and Prasad, 2003).

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

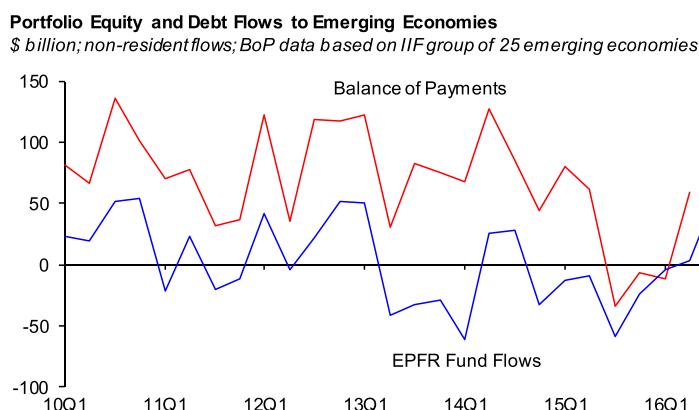


Figure 6. Portfolio Equity and Debt Flows to Emerging Economies. [Colour figure can be viewed at wileyonlinelibrary.com]

statistics, which include international banks' local claims, that is, loans by their subsidiaries. Hence, the consolidated data are not consistent with BoPs data, which only include transactions between residents and non-residents (see also Takáts, 2010 and 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 EMs. 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 there are questions about the degree to which empirical findings based on fund flows also apply to international capital flows, fund flows are certainly of significant scholarly interest on their own merits. For example, they help shed light on the growing importance of flows arising from passive investment vehicles such as exchange-traded funds. Moreover, **fund flows data are particularly useful for capturing shocks that play out over a short period of time, such as risk aversion shocks** (see section below on data frequency).

4.2 Capital Flows Components

Following the IMF's standard BoPs presentation, the main components of capital flows comprise FDI, portfolio equity investment, portfolio debt investment and 'other' investment, which includes bank lending (IMF, 2010).⁷ 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 5 of this survey is devoted to analysing the drivers of each of the major components of capital flows, focusing on portfolio equity and debt flows as well as banking flows.

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).**

Banking flows are often analysed as another separate category, reflecting the special status of the banking system as a financial intermediary (Buch, 2002). There are various common measures that are used to analyse 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 BoPs classification, where bank loans are included in the 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 (IMF, 2010).⁸

4.3 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). Hedge funds are an exception as they 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 behaviour. For example, Raddatz and Schmukler (2012) find evidence of a destabilizing effect of mutual funds by analysing 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 EMs. Gelos (2011) provides a survey on the behaviour of international mutual funds and the implications for capital flows.

In recent years, the growing role of investment funds has prompted a particular focus on the implications of benchmark-driven investing for EM capital flows. Raddatz *et al.* (2017) provide an overview of the issues that arise from changes in the composition of benchmark indices. For example, countries that are downgraded from advanced economy status to EM status may, counterintuitively, see *increased* capital inflows due to the large amount of capital tracking the EMs benchmark. Miyajima and Shim (2014) show that even active mutual funds that invest in EMs tend to follow relevant benchmark indices quite closely. Arslanalp and Tsuda (2015) provide estimates for the size of benchmark-driven investors in the EM local currency bond market and argue that benchmark-driven investors have made portfolio flows more sensitive to external factors. Converse *et al.* (2018) show that EM flows via exchange-traded funds in particular are highly sensitive to external factors, amplifying the role of the global financial cycle in EMs.

4.4 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 behaviour. 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, Lo Duca, 2012; Feroli *et al.*, 2014; Fratzscher *et al.*, 2018). 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 drivers 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 (2008) find strong evidence for the role of domestic output growth at the quarterly frequency. These results are consistent with Ananchotikul and Zhang (2014), who use weekly fund flows data and find 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.

4.5 Official versus 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 the International Monetary Fund or by bilateral official creditors (Gupta and Ratha, 2000; Bayoumi *et al.*, 2015). Alfaro *et al.* (2014) 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 predominantly by economic factors such as productivity growth, consistent with theory, while official flows are not determined by these 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 characteristics 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. Moreover, 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) generally does not differentiate between the public and private sector recipients of capital flows.

4.6 Currency

Up to the early 2000s, EMs 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 EMs 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.

5. Discussion of Capital Flows Drivers

5.1 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. At the time, a recovery in capital flows against the backdrop of a cyclical downturn and expansionary monetary policy in the U.S. prompted a focus on the role of external conditions.⁹ Since then, there has been a general pattern in the literature to focus on external factors 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. economic expansions, the focus has tended to shift to 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 analysed 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 when U.S. interest rates are low and policy concerns are dominated by near-term cyclical developments.

The push-pull framework remains compelling in 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 EM 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 EM 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 behavioural 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; Cerutti *et al.*, 2015). Such contagion effects are the subject of a separate, voluminous literature (for an overview, see Forbes and Rigobon, 2001).

Another argument raised against the push-pull framework is that for certain variables, both sets of factors may potentially 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). However, a critical reading of the empirical literature does not support this view as 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; Ferrucci *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, 2008).

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 can be thought of as being 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 role of 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, that is, the impact of domestic interest rates may be understated. Moreover, 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 be seem more appropriate to explain such a reduction in flows with the large increase in mature economy rates rather than a modest rise 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.

5.2 Drivers of Capital Flows by Component

The key findings of the push-pull literature can be summarized by evaluating the available evidence on the main cyclical push and pull drivers for the major capital flows components. For this purpose, I consider the three main components of capital flows addressed in the push-pull literature, namely portfolio equity flows, portfolio debt flows and banking flows. 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 7 provides a condensed summary of the results obtained by 34 empirical studies. For the most part, the studies considered in this summary table focus specifically on individual components of EM 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.

5.3 Global Risk Aversion

There is very robust evidence that banking flows and both types of portfolio flows are strongly affected by global risk aversion, which has received particular attention since the global financial crisis of 2008–2009. Empirical studies almost universally find a strong and statistically significant impact of increases in global risk aversion on these capital flows components (including Milesi-Ferretti and Tille, 2011; Fratzscher, 2012; Broner *et al.*, 2013; Rey, 2013; Ananchotikul and Zhang, 2014; Koepke, 2014; Bruno and Shin, 2015).

The most common proxies for investor risk aversion used in the literature are U.S. implied equity volatility (as measured by the VIX index or its precursor, the VXO index) and the U.S. BBB-rated corporate bond spread over U.S. Treasury securities. The VIX has received particular focus in recent years, given its close association with the global financial cycle (Rey, 2013). Both the VIX and the BBB spread are found to have a strong contemporaneous impact on portfolio flows. One caveat is that the VIX index is derived from the (U.S.) equity market and thus may be more closely correlated with portfolio equity flows, while the BBB spread is derived from the (U.S.) bond market and thus may be more closely correlated with credit flows. Irrespective of the choice of variable for risk appetite, there is little evidence in the papers surveyed in this study that would suggest that one type of portfolio flow (debt or equity) is affected more than the other by changes in risk appetite.

Baek (2006) uses an alternative measure of risk appetite and finds mixed evidence for the role of risk aversion as a push factor. In her framework, the market's risk attitude is captured by the Spearman's correlation coefficient between the rank of a country's excess equity return and the rank of its historic volatility. The intuition behind her measure is that during periods of growing risk appetite, riskier equity markets (i.e. those with higher historic volatility) should outperform (i.e. generate greater excess returns). Using data for the 1989–2002 period, Baek finds that portfolio flows to Asia were driven to a significant degree by risk appetite, while flows to Latin America were driven by other external and domestic factors.

Type	Driver	Portfolio Equity	Portfolio Debt	Banking Flows
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 2013, H&M 2013, B&S 2015]
	Mature economy interest rates	Strong evidence for negative relationship [negative: F 1996, T&S 1997, W 1997, CCM 1998, M&R 1999, B 2006, D&V 2014, FKSS 2014, K 2014, FLS 2016; 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: QOS 2014, B&S 2015; positive/negative: G 2002, CCR 2014; positive: J&M 2002]
	Mature economy output growth	Some evidence for positive relationship [positive/insignificant: B 2006, D&K 2008a, F&W 2012; insignificant: A&Z 2013; negative/insignificant: CCM (1998)]	Some evidence for positive relationship [positive/insignificant: B 2006, D&K 2008a, F&W 2012; insignificant: A&Z 2013; negative/insignificant: CCM (1998)]	Mixed evidence, no clear relationship [insignificant: FHST 2004; positive/negative: G 2002; positive: J&M 2002]
Pull	Domestic output growth	Some evidence for positive relationship [positive: D&K 2008a; positive/insignificant: B 2006, D&K 2008b, A&Z 2013, K 2014; insignificant: F 2012]	Some 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 2013]
	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 2013, H&M 2013]
	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 2013]

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

Figure 7. Overview of the Cyclical Drivers of Non-Resident Capital Flows by Major Component. [Colour figure can be viewed at wileyonlinelibrary.com]

Source: Author's illustration.

Notes on Figure 7:

- **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 34 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 the 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 agree on 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 5).

List of studies referenced in Figure 7, in chronological order of publication:

F 1996	Fernandez-Arias (1996)	F&W 2012	Forbes & Warnock (2012)
T&S 1997	Taylor & Sarno (1997)	L 2012	Lo Duca (2012)
W 1997	World Bank (1997)	A&Z 2013	Ahmed & Zlate (2013)
CCM 1998	Chuhan, Claessens & Mamingi (1998)	BDES 2013	Broner, Didier, Erce & Schmukler (2013)
M&R 1999	Montiel & Reinhart (1999)	B&S 2013	Bruno & Shin (2013)
FOS 2001	Froot, O'Connell & Seasholes (2001)	H&M 2013	Herrmann & Mihaljek (2013)
HMV 2001	Hernandez, Mellado & Valdes (2001)	R 2013	Rey (2013)
G 2002	Goldberg (2002)	A&Z 2014	Ananchotikul & Zhang (2014)
J&M 2002	Jeanneau & Micu (2002)	CCR 2014	Cerutti, Claessens & Ratnovski 2014
FHST 2004	Ferrucci, Herzberg, Sousa & Taylor (2004)	GQS 2014	Ghosh, Qureshi & Sugawara (2014)
B 2006	Baek (2006)	K 2014	Koepke (2014)
H&K 2007	Hooper & Kim (2007)	FKS 2014	Feroli, Kashyap, Schoenholtz & Shin (2014)
D&K 2008a	De Vita & Kyaw (2008a)	D&V 2014	Dahlhaus & Vasishtha (2014)
D&K 2008b	De Vita & Kyaw (2008b)	B&S 2015	Bruno & Shin (2015)
K&W 2008	Kim & Wu (2008)	FLS 2016	Fratzscher, Lo Duca & Straub (2016)
T 2010	Takats (2010)		
M&T 2011	Milesi-Ferretti & Tille (2011)		
D&F 2012	Daude & Fratzscher (2012)		
F 2012	Fratzscher (2012)		

Figure 7. Continued.

One caveat against her measure, however, is that it is subject to the influence of confounding variables. For example, if a jump in risk appetite occurs against the backdrop of higher commodity prices, the stock markets of commodity-exporting EMs would tend to outperform irrespective of their historic volatility. This may explain why Baek's study finds less consistent evidence for the role of risk aversion.

5.4 External Interest Rates

Numerous studies published during the last 25 years have analysed 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. Notable studies include Fernández-Arias (1996), Montiel and Reinhart (1999), Baek (2006) and Fratzscher *et al.* (2018), among others (see Figure 7 and related notes for a full listing of references). Many studies focus particularly on the role of U.S. monetary policy, motivated by concerns about spillovers from policy decisions in advanced economies.¹⁰ By contrast, the evidence is much more mixed for banking flows. Overall, the evidence seems to suggest that there is some negative impact of higher 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.

Not all studies distinguish between equity and debt flows when analysing 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, 1977; Koepke, 2014; Dahlhaus and Vasishtha, 2014). An exception is Chohan *et al.* (1998), who find that equity flows were more responsive to changes in U.S. interest rates than debt flows, although their results relate to a limited sample period from 1988 to 1992 and are based on elasticities rather than the relative magnitude of estimated coefficients. The authors use a panel model framework for 18 EMs in Latin America and Asia, with monthly portfolio flows for the period from the Treasury International Capital (TIC) database as the dependent variable (thus focusing on U.S. investors only). A study by Taylor and Sarno (1977) addresses their findings and obtains different results using the same flows dataset, time period and country sample. Taylor and Sarno use an error-correction framework and find evidence that bond flows are more sensitive to external interest rates than equity flows.

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.* (2001) use a panel model with annual data in various relatively short sample periods between 1977 and 1997. The low data frequency and the limited number of observations in the various sample periods are likely to be the reasons why their estimation results do not point to a statistically significant role of U.S. interest rates (which in their study are measured by U.S. dollar 3-month Libor minus U.S. CPI inflation).

Ahmed and Zlate (2013) use a panel model for two distinct time periods, a pre-crisis period (2002Q1–2008Q2) and a post-crisis period (2009Q3–2012Q2). The authors mainly focus on interest rate differentials, but also report estimation results using the U.S. policy interest rate as an independent variable. Estimation results for this specification are only provided for the pre-crisis period, where the federal funds rate is not found to be a significant determinant of portfolio flows. A major caveat, however, is that the policy interest rate does not capture the forward-looking nature of financial markets. Indeed, most studies make use of forward-looking measures of interest rates that capture investor expectations about future interest rates, be it explicitly as in Koepke (2014) and Dahlhaus and Vasishtha (2014) or implicitly by using market-based measures of interest rates. Another reason why the policy interest rate would seem to be an inappropriate choice is that U.S. policy interest rates were unchanged from end-2008 to 2015, reflected in the fact that Ahmed and Zlate (2013) do not report estimation results for the post-crisis period for regressions with U.S. policy interest rates as the dependent variable.

In terms of banking flows, Bruno and Shin (2015) 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 BoPs; see Takáts, 2010, and 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 the central bank's policy rate, and hence affect banks' willingness to take risks and lend internationally, including to local banks in emerging economies. In a structural VAR analysis, Bruno and Shin find that a decline in the federal funds rate increases bank leverage, which in turn leads to an increase in cross-border bank flows. 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 EMs. 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 BoPs data as they include international banks' local claims, that is, loans by their subsidiaries (Takáts, 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 increased 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 U.S. term premium shows the expected negative relationship.

5.5 External Output Growth

In terms of mature economy output growth, there is limited support for the notion that external growth encourages EM portfolio flows, but there is no clear evidence for banking flows. Regarding portfolio flows, De Vita and Kyaw (2008) 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 EM economies.¹¹ 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). In one of the early studies, Chuhan *et al.* (1998) report a negative but statistically insignificant relationship between U.S. industrial production and EM portfolio flows for the 1988–1992 period. The authors note a high degree of correlation between U.S. industrial production and interest rates during their sample period, suggesting that their result may be driven by the impact of falling interest rates in the context of the 1990–1991 U.S. recession.

Regarding banking flows, Jeanneau and Micu (2002) find that cross-border bank lending to EMs has been pro-cyclical in the period from 1985 to 2000, with stronger external growth leading to increased lending activity. The authors estimate a panel model with semi-annual data, using BIS cross-border bank

claims as dependent variable and de-trended real GDP of all lending countries in dollar terms as the explanatory variable. Subsequent studies that used lower-frequency quarterly data did not confirm this result, however. For example, Ferrucci *et al.* (2004) find no statistically significant relationship with mature market growth, in a panel model estimated with BIS data for the period from 1986 to 2003. Goldberg (2002) focuses on U.S. bank lending activity in the 1984–2000 period using data from bank filings. She finds that stronger U.S. growth boosts lending to Latin America, but tends to reduce lending to EM Asia.

5.6 Domestic Output Growth

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). For banking flows, evidence for the role of domestic output growth is even stronger. Studies focusing on the impact of domestic output growth on banking flows include Ferrucci *et al.* (2004), Bruno and Shin (2013) and Herrmann and Mihaljek (2013). 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 BoPs (which are often not available for banking flows exclusively).

Studies focusing specifically on the relationship between domestic growth and EM portfolio flows include Baek (2006), De Vita and Kyaw (2008) 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.

5.7 Domestic Asset Returns

There is also strong evidence that local asset returns serve as a pull factor for banking flows, but the evidence is less robust for portfolio flows. For banking flows, studies 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 (e.g. Ferrucci *et al.*, 2004; Bruno and Shin, 2013; Herrmann and Mihaljek, 2013).

Regarding 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 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). 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).

5.8 Country Risk Indicators

There is robust evidence for the role of country risk indicators in driving banking flows, while the evidence is less robust for portfolio flows. Regarding banking flows, Jeanneau and Micu (2002) and Ferrucci *et al.*

(2004) find 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 (2013) 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.

For portfolio flows, 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 (Takáts, 2010; Herrmann and Mihaljek, 2013).

Looking beyond the selected variables considered in Figure 7, 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).

6. Conclusion

This survey has provided an overview of the empirical findings on the drivers of capital flows to EMs. The **time-tested** push-pull framework remains a very useful albeit imperfect way to structure the wealth of empirical evidence gathered in the literature.

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. **Cyclical** push factors like global risk aversion and mature economy interest rates are found to be 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).

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 2008–2009, 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 Fernández-Arias (1996), who analysed 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 the study by Bruno and Shin (2015) 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 favourable external conditions reverse. This survey has shown that the drivers of capital flows depend crucially on the specific flows considered, particularly in terms of instruments, investor types, recipient sector, currency denomination and other factors. Therefore, policymakers need to take into account the composition of observed capital flows in order to assess how vulnerable a country's 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 bank lending (or FDI).

Promising areas for future research include those potential driving forces whose role has not been ascertained conclusively by the extant empirical literature. Recent improvements in data availability may facilitate such research. For example, significant advances have been made in the development of high-frequency measures of portfolio flows that track BoPs 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 generally relied on proxies for capital flows, such as fund flows data).

Another 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 EMs are treated as a homogenous group. EMs 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 such fundamental country characteristics affect the importance of various capital flows drivers would be valuable.

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Notes

1. 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.* (2014) show that sovereign-to-sovereign lending can explain upstream capital flows, and that net private capital flows are positively correlated with countries' productivity growth. Moreover, emerging markets have generally been net recipients of foreign capital in recent decades if international reserve accumulation is excluded (IIF, 2015).
2. 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 *et al.* (1992) note that against the predictions of theory, consumption has historically been less correlated across

- countries than output, a phenomenon dubbed the ‘international consumption correlations puzzle’ (Obstfeld and Rogoff, 2000).
3. ‘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.
 4. The magnitudes of these theoretical benefits are subject to an on-going debate. See, for example, Coeurdacier *et al.* (2015) for a recent critical discussion.
 5. If available, data on gross flows provide more information since actions by resident and non-resident investors can be analysed 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).
 6. Even in advanced economies, non-resident capital inflows generally decline after rises in global risk aversion (Habib and Stracca, 2015).
 7. The Sixth Edition of the IMF’s Balance of Payments and International Investment Position Manual introduced an additional component referred to as ‘financial derivatives (other than reserves) and employee stock options’ (IMF, 2010). This component is not individually discussed in this survey given that it has not received much attention in the literature.
 8. ‘Other investment’ includes a number of additional sub-components, such as currency and deposits, trade finance and equity that is not in the form of securities (and is not direct investment) (IMF, 2010). These sub-components are not individually discussed in this survey given that they do not receive much attention in the literature.
 9. An excellent overview of the [early literature on the drivers of capital flows is provided by Lopez Mejia \(1999\)](#).
 10. Blanchard (2017) argues that just because some components of capital flows demonstrably respond to U.S. monetary policy, this does not mean that overall gross capital inflows show the same behaviour. The author does not offer theoretical or empirical support for why other components of capital flows, such as FDI, would exhibit the opposite relationship as portfolio flows with respect to U.S. monetary policy actions.
 11. Results reported in Section 5 for Ahmed and Zlate (2013) refer to the appendix of their study, where EM and mature economy variables are analysed separately.

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