



Portfolio investments and fragility in emerging economies: detection tools

Over the past decade, emerging economies have experienced repeated withdrawals of capital by non-resident investors (“sudden stop” episodes). This was also the case recently, with the tensions of mid-2018 related to the tightening of monetary policy in the United States. These sudden stops have major consequences for the economic and financial conditions of the affected countries. Rapidly detecting such episodes is thus an essential part of the risk analysis for these countries. To this end, the authors present the data available as well as the advanced estimators constructed at the Banque de France, which also allow a detailed analysis of the determinants of capital flows. Via an empirical application of these higher frequency tools, the authors demonstrate the influence of financial conditions in the United States on recent trends in gross portfolio flows to emerging economies.

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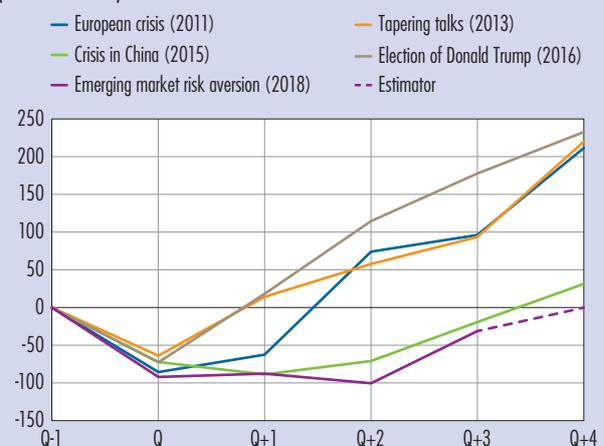
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USD **31** billion
non-resident portfolio outflows
in second-quarter 2018,
after USD 61 billion during the first quarter

4

the number of quarters that would be needed
to compensate for these massive outflows,
including an estimated turnaround of USD 100 billion
in the first and second quarters of 2019

**Episodes of non-resident portfolio investment turnarounds
in emerging economies during the last decade (cumulative flows)**
(USD billions)



Sources: EPFR, national sources and Banque de France calculations.
Note: Portfolio investments during the quarter prior to the crisis (Q-1) are normalised to zero to ensure that the starting points are identical for all crises.



1 High volatility in international capital flows in 2018

This article focuses on net portfolio investments – asset purchases less asset sales that do not fall into the category of direct investments – by non-residents in emerging economies.

Measures taken in the United States and their consequences

The economic policy of the United States in 2017-18 had a significant impact on financial markets, international capital flows and global economic activity. US trade policy, which has led to major tensions with China, has heightened economic uncertainty in a number of sectors. The US tax reform enacted in December 2017 resulted in the repatriation of around USD 500 billion of US multinational profits held abroad.¹ From an accounting point of view, these transfers have caused a sharp decline in non-resident foreign direct investment (FDI) in countries that had previously been beneficiaries of these funds (Switzerland, Ireland and Luxembourg in particular).² The widening budget deficit in the United States has led to a rise in the issuance of US Treasuries providing an additional safe asset support. At the same time, the tightening of monetary policy during 2018 led to a hike in domestic interest rates across maturities. The combination of monetary and fiscal policies has thus resulted in a rebalancing of international portfolios in favour of US sovereign bonds.

Among the emerging economies, Argentina and Turkey were the worst affected by capital outflows in 2018, due to their more fragile economic fundamentals (persistent external and fiscal imbalances, high inflation, short-term foreign currency denominated debt). In both

BOX 1

Direct investments and portfolio investments

Foreign direct investments (FDI) are international investment flows aimed at creating, expanding or maintaining a subsidiary in a foreign country and/or establishing control over the management of a foreign company.

Portfolio investments, the subject of this article, are bond, equity and other security acquisitions made for financial purposes. In contrast to direct investment, portfolio investment in equities is not made with the intention of gaining control over the company: it involves acquiring a stake of less than 10% of a company's capital. FDI and portfolio investments are recorded in the financial account (see Appendix 1).

Other investments (mainly current loans and deposits), derivatives and reserve assets make up the remainder of the financial account.

countries, capital outflows led to economic crises. Argentina requested a loan from the International Monetary Fund (IMF) in order to meet its international commitments. Other emerging economies have also been affected, witnessing capital outflows (see Chart 1) and generally depreciated currencies (see Chart 2), as well as authorities stepping in to either introduce or reinforce macroprudential or capital control measures, or to directly intervene in the markets to smooth out excessive volatility in their currency flows.

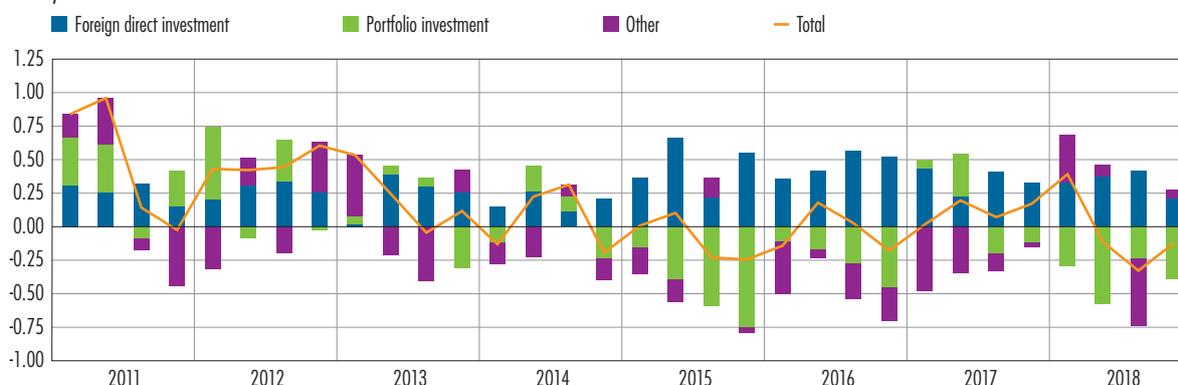
¹ Before being repatriated, a significant proportion of these profits were reinvested in US securities; the repatriation to the United States was therefore inevitably accompanied by a decline in non-resident portfolio investment.

² Non-resident portfolio investment in these countries also declined, but less than direct investment.



C1 Net capital flows to emerging economies (excluding China)

(% of GDP)



Sources: National sources and Banque de France calculations.

C2 US dollar exchange rate and J.P. Morgan index for emerging markets

(1 January 2018 = 100)



Sources: J.P. Morgan, national sources and Banque de France calculations.

Note: The JPM emerging markets index represents the aggregation of emerging countries' bilateral exchange rates against the dollar weighted by their relative share in trade.

The need for appropriate tools to monitor emerging economies' flows

In 2018 the combination of external factors and fragile fundamentals led to the largest decline in net flows to emerging economies since 2008 (particularly in the case of portfolio and banking flows). These flows have an extremely strong impact on the financial stability and domestic activity of emerging economies, either directly through financing, exchange rates and inflation, or indirectly through economic policies introduced to mitigate their effects. It is therefore vital to develop appropriate monitoring tools for these flows, especially as balance of payments or Bank for International

Settlements data are generally released on a quarterly basis, with a significant delay.

Institutions commonly use advanced net flow estimators based on principles of accounting balances (see Appendix 1), which provide an excellent approximation of total capital flows (FDI, portfolio investments and other investments, with the latter largely composed of banking flows).

Even though these estimators provide important information in terms of exchange rate pressures and external imbalances, they are modelled on net flows and on total capital flows. This limits our ability to detect



immediate pressures that a country may face in the event that non-residents withdraw their investments. Indeed, net flows make no distinction between the investment behaviour of foreigners and residents. Therefore, a massive sale of domestic securities by non-residents, which is liable to impact financial stability, could be offset in accounting terms by resident flows even though those flows do not necessarily involve repurchases of the securities sold. Furthermore, the perceived risk aversion phenomena will be particularly visible in portfolio flow data and other flows, the most volatile items in the financial account. The lack of “high frequency” data leads to a refocusing on portfolio flows. In particular, if we wish to have an insight into the behaviour of foreign investors, we must look at (net) non-resident portfolio investments. Lastly, in addition to the inadequate frequency (rarely better than quarterly) of the data, the delay for them to become available can sometimes extend to several quarters.

However, other data sources allow a higher frequency monitoring (on a monthly or weekly basis) and are published in a more timely manner.

2 Using EPFR data for a high frequency monitoring of portfolio flows

Emerging Portfolio Fund Research (EPFR) Global data from the US company Informa PLC allow us to monitor flows invested in a large sample of investment funds and the allocation of their assets under management. The EPFR database covers between 80% and 85% of the assets under management of global mutual funds,³ with coverage increasing to 99% for the universe of exchange-traded funds (ETFs).⁴ Including all the fund categories covered by EPFR, at the beginning of 2019 the database was comprised of 32,282 funds with

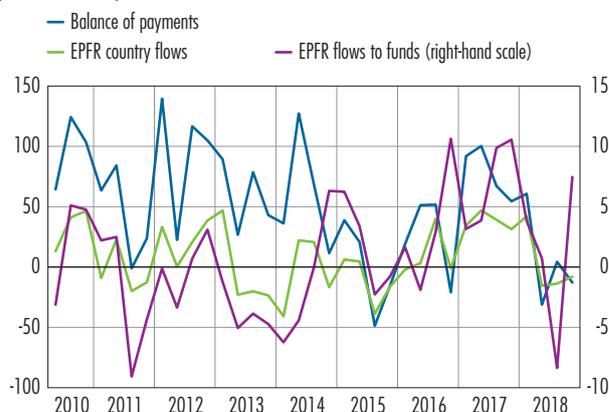
USD 33,900 billion of assets under management.⁵ Emerging economies account for a small proportion of the database, with 5,903 funds with USD 2,120 billion of assets under management, which include specialised fund allocations at the country, regional and global levels. Monthly, weekly and daily data are available, but the use of higher frequency data significantly reduces the scope of the analysis.⁶

Use of the EPFR database must take into account the limited scope of the data

Although the database does not cover the entire global market, the data are illustrative of portfolio investment trends, at least outside of periods of tension (see below). Indeed, there is a significant divergence from the balance of payments data in 2013 (during the taper tantrum⁷ and the Chinese banking liquidity crisis – see Chart 3),

C3 Non-resident portfolio investments: EPFR data versus balance of payments data

(USD billions)



Sources: EPFR, national sources and Banque de France calculations. Note: Balance of payments data refer to non-resident portfolio flows. The EPFR data series are three-month totals. The countries sampled correspond to those of the two other estimators.

3 According to the Securities and Exchange Commission (SEC), a mutual fund is a company that pools money from many investors and invests the money in equities, bonds and other securities. Each investor in the fund holds shares that represent a fraction of the assets held. Global mutual funds can invest in companies located anywhere in the world.

4 Exchange traded funds, a sub-category of mutual funds, allow investors to make an investment that typically tracks a benchmark index, such as the S&P 500 or the MSCI.

5 This represents almost 40% of total fund assets under management. At end-2016, this total was estimated at USD 80,000 billion, 80% of which were traditional assets (equities and bonds). More precise estimates of the size of the market vary: Willis Watson put it at USD 81,500 billion at end-2016 and the Boston Consulting Group (BCG) put forward the figure of USD 79,200 billion for end-2017.

6 65% of the 5,903 funds publish data on a weekly basis. Even fewer funds disclose data daily.

7 The “taper tantrum” refers to the episode of financial turbulence that affected emerging markets the month after the US Federal Reserve’s announcement in May 2013 that it would be reducing the pace of its purchases of Treasury bonds.



which could be linked to a lower coverage of institutional funds, which are less responsive to risk, particularly during periods of tension.

In addition, and especially for country flows, certain precautions should be taken when using EPFR data to avoid erroneous interpretations. EPFR provides data on flows to funds as well as to countries. Some funds publish the country-by-country allocation of their portfolio on a monthly basis. An extrapolation based on weightings supplied by the fund is applied to separate inflows between the various countries,⁸ as direct information on the positions taken by funds following an inflow is not available. Country flows are therefore derived by weighting and aggregating flows to funds that have positions in the country in question. Ultimately, these data have the following limitations: (i) the EPFR database records flows to and from funds rather than countries; (ii) the calculation only includes funds that publish their country allocations; and (iii) changes in allocations, fund disclosure policies or the inclusion of new funds affect the metric. Country flows are thus a rather imprecise proxy for portfolio flows to countries but are more effective than fund flow data when estimating total flows to emerging economies as they take into account funds that specialise in emerging markets or regions.

Using data on flows into country and region-specific funds may be a better solution.⁹ Although the sample size is less significant (the universe of country-specific funds is smaller), it is a better proxy for capturing the idiosyncratic component of country portfolio flows. These data are particularly relevant for large emerging economies where a considerable number of specialised funds are active (see Appendix 2).

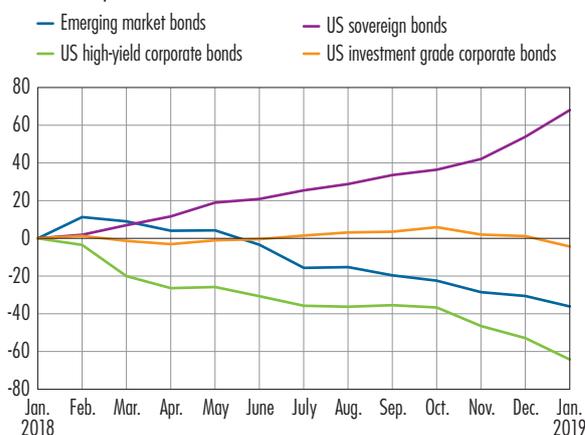
Despite the conceptual differences between country flows in the EPFR database (which do not distinguish

between residents and non-residents) and the balance of payments data, their statistical relevance can be tested. For the countries considered, EPFR data explain on average only 20% of the foreign portfolio investment variance, compared with around 56% for the “emerging economies” aggregate (see Section 3).

Therefore, on aggregate, using EPFR data allows us to make an initial approximation of portfolio flows in real time. This notably made it possible to detect the portfolio investment rotation of 2018, as emerging market portfolios were reallocated in favour of US sovereign bonds (see Chart 4). Indeed, inflows shifted towards sovereign bonds, while significant outflows – of more than USD 60 billion for specialised funds in 2018 – were observed in the corporate bond market, particularly its high yield segment.

C4 Cumulative investment flows to funds, by fund category/specialisation

(USD billions)



Sources: EPFR and Banque de France calculations.
Note: Inflows since early 2018 are aggregated for each investment fund category/specialisation.

⁸ Funds that publish their allocation on a country-by-country basis account for less than 10% of total assets under management in the EPFR database.

⁹ A fund specialising in one country can hold assets from another country, but they must be a minority holding.



3 A reliable advanced estimator of portfolio flows based on a combination of national sources and EPFR data

While EPFR data give an initial approximation of portfolio flow trends, they can also usefully be reworked and enhanced to provide a reliable advanced estimator of portfolio flows to emerging economies at a weekly or monthly frequency (see Box 2, columns 3 and 5 of the table). While some emerging countries provide data on a monthly, weekly or even daily basis, the methodologies and types of securities covered are heterogeneous. Thus, only data that provide a close approximation of portfolio investments recorded in the balance of payments are selected (see Appendix 3). Aggregating the information from the national and EPFR databases makes it possible to construct the estimators.

These estimators are useful in establishing a monthly or weekly monitoring of data series that are normally quarterly and significantly delayed. In particular, they make it possible to clearly identify phases of slowdown, or even withdrawal, of foreign portfolio investment following, for instance, announcements related to tapering in the United States, the financial crisis in China or the tensions of 2018 (see chart below).

They also indicate that, following the withdrawal observed at the end of 2018, portfolio flows to emerging countries started recovering in early 2019. The determinants of these portfolio flow recoveries to emerging economies are set out in Section 4.

BOX 2

Performance of monthly and weekly estimators of gross portfolio flows in emerging economies

Non-resident portfolio investments for 19 countries

Estimation period: Q2 2010-Q2 2018

	Explained variable: the sum of non-resident portfolio investments in emerging economies				
	(1)	(2)	(3)	(4)	(5)
	Estim M			Estim W	
National data for all frequencies	1.67		1.67		
EPFR data		1.59	0.68		0.64
National data excl. monthly data				2.35	2.35
Constant	19.89	41.96	19.89	27.75	27.95
Adjusted R ²	0.81	0.56	0.86	0.77	0.80

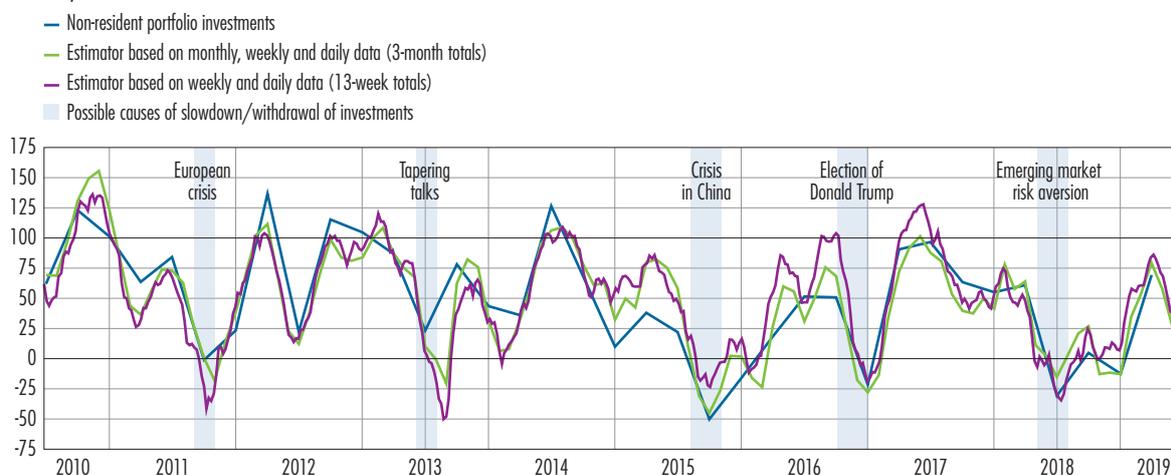
Note: For columns (3) and (5), EPFR data are initially regressed on national data. Three countries for debt security flows (instead of six) and seven countries for equity flows (instead of eight). R² measures the explanatory power of the model, and rises from 0 to 1 with the quality of the adjustment. The adjusted R² can be used to compare models that have differing numbers of explanatory variables and/or observations.

Even though the “national data” aggregate only comprises six countries (out of a total of nineteen) for debt security flows and eight countries for equity flows, it nevertheless explains 81% of the variance in balance of payments data (column 1 of the table). EPFR data alone explain 56% of portfolio investments (column 2) but their contribution is marginal compared with the national data aggregate (column 1). Combining national data with EPFR data allows us to develop a monthly estimator – “Estim M” – that explains 86% of the variance (column 3), which suggests that a significant proportion of the “statistical” information provided by EPFR data is already included in the national sources. Using weekly data (only national data is available at that frequency), the explanatory power of the “Estim W” estimator is slightly reduced, from 86% to 80% of the variance (column 5).



C5 Non-resident portfolio investments and advanced estimators

(USD billions)

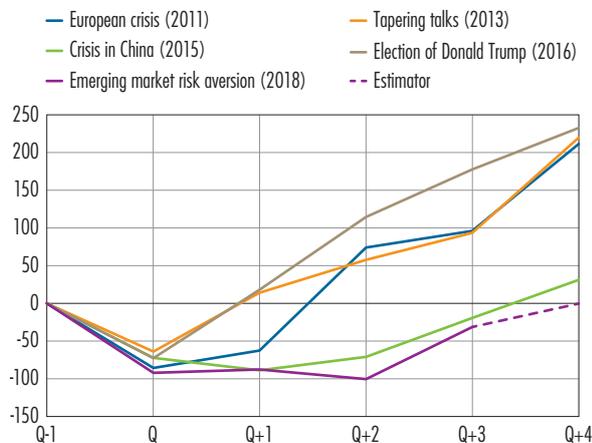


Sources: EPFR, national sources and Banque de France calculations.

Note: Chart updated on 18 July 2019.

C6 Episodes of non-resident portfolio investment turnarounds in emerging economies during the last decade (cumulative flows)

(USD billions)



Sources: EPFR, national sources and Banque de France calculations.

Note: Portfolio investments during the quarter prior to the crisis (Q-1) are normalised to zero to ensure that the starting points are identical for all crises. In the first quarter of 2018 (Q-1 prior to the crisis linked to an increase in emerging market risk aversion), portfolio investment amounted to USD 61 billion. They have been normalised to zero in the chart. In the second quarter of 2018 (Q), the cumulative decline amounted to USD 92 billion: USD 31 billion of negative flows plus USD 61 billion in the first quarter. Adding USD 4 million in the third quarter (Q+1), USD -13 billion in the fourth quarter (Q+2), USD 69 billion in the first quarter of 2019 (Q+3) and an estimated USD 31 billion in the second quarter (Q+4), according to the estimator, in cumulative terms, four quarters would thus be needed to compensate for the crisis in the second quarter of 2018. Chart updated on 18 July 2019.

However, the return of non-resident portfolio flows to emerging economies has been modest, particularly compared with the preceding episode of portfolio flow tensions (see Chart 6). Although the estimators point to a more sustained return of capital flows in the first and second quarters of 2019, the overall 2019 trend is more akin to that observed in 2015, when the crisis in China sparked widespread aversion among non-resident investors to emerging economies. Indeed, the shock observed in 2018 is the most persistent of the past nine years.

4 The impact of financial conditions in the United States has been paramount

It may prove challenging to analyse the influence of higher frequency variables on capital inflows using quarterly balance of payments data. Thanks to the availability of higher frequency estimators, the determinants of capital flows can be estimated more accurately. An extensive body of literature has developed over recent years, studying the role of common ("push") and idiosyncratic ("pull") factors in financial flows to emerging economies (see Box 3).



BOX 3

The role of common and idiosyncratic factors in capital flows to emerging economies

The common (“push”) factors are factors that affect all economies: monetary and fiscal policies in advanced economies, risk aversion of international investors and uncertainty associated with the international environment. The idiosyncratic (“pull”) factors are the specific factors affecting the attraction of a given country: the quality of its institutions, political stability and growth or yield differentials. The relative importance of push and pull factors appears to change over time and with the country involved. For example, Fratzscher (2012) shows that push factors primarily explained the portfolio flows to emerging economies during the financial crisis of 2008 and, to a lesser extent, during the preceding period. The most financially integrated emerging economies were the most affected by the withdrawal of numerous investments that shifted into safe US assets. Conversely, Fratzscher goes on to show that during the post-crisis period, pull factors, and particularly the quality of domestic institutions, country risk and the strength of macroeconomic fundamentals, were the determinants of portfolio investments in emerging economies.

It is not always easy to distinguish between the effects of push and pull factors. The literature often looks at the interaction between the two; how local financial market structures, their development and their economic fundamentals could isolate emerging countries from a common shock (often a monetary policy shock) or, on the contrary, amplify the phenomenon. For example, Aizenman et al. (2014) find that countries considered to have more robust fundamentals were more exposed to capital outflows during the taper tantrum episode (whereas the opposite effect would have been expected, with investors discriminating against countries with more fragile fundamentals). The authors attribute this effect to the massive inflows that emerging countries with stronger fundamentals benefited from during the period of US monetary policy easing. These countries therefore mechanically recorded more significant outflows during the tapering episode. As for Cerutti et al. (2015), they showed that countries more sensitive to push factors were those that borrowed most on international markets or from global banks, and that these types of debt, more so than institutional fundamentals in particular, played a dominant role in sensitivity to push factors. However, the majority of academic studies agree on the particular importance of US monetary policy on capital flows to emerging economies. Dedola et al. (2017) and Fratzscher et al. (2018) for example, stress the importance of monetary and financial developments in the United States and their spillover effects on other countries.

We use the weekly estimator presented in Section 3 to analyse the impact of financial conditions in the United States on portfolio investments in emerging economies. To this end, a vector autoregressive model comprising the Chicago Federal Reserve’s US National Financial Conditions Index, the MSCI Emerging Markets

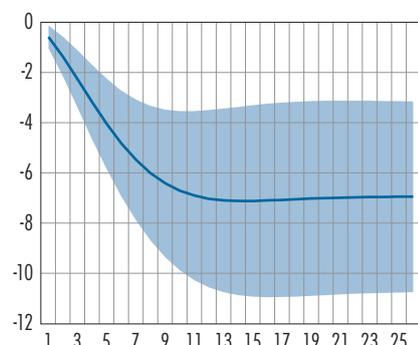
Index and the VIX emerging markets volatility index was constructed. The latter two variables represent (i) the domestic factors in emerging markets that attract capital flows (Koepke, 2015) and (ii) a measure of the risk perception associated with emerging economies, respectively.



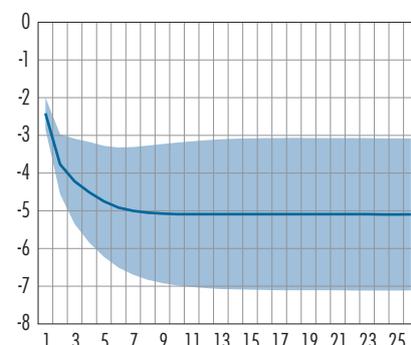
C7 Cumulative response function of the portfolio flow estimator

(x-axis: USD billions; y-axis: number of weeks)

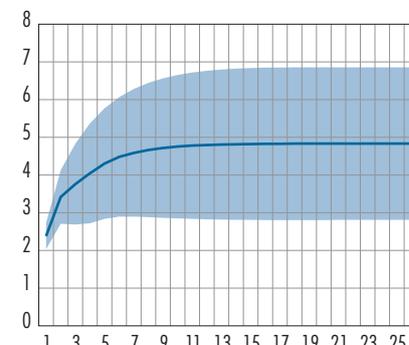
a) US National Financial Conditions Index



b) VIX emerging markets index



c) MSCI emerging markets index



Sources: Datastream and Banque de France calculations.

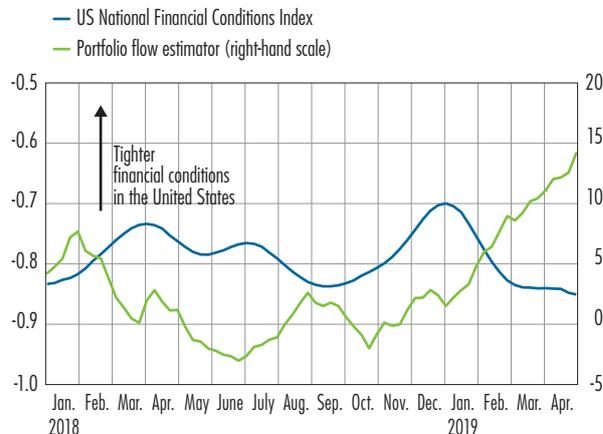
Note: Cumulative response function of the portfolio flow estimator at a weekly frequency to a positive standard deviation shock to each of the three variables considered. The model is estimated on a weekly basis, from April 2011 to April 2019. The blue zone shows the confidence interval of ± 2 standard deviations. The four model variables are ordered according to their degree of exogeneity; the shocks are orthogonalised using a Cholesky decomposition. The three shocks considered are a tightening of US financial conditions, an increase in the risk perception associated with emerging economies and an improvement in emerging countries' domestic conditions.

The estimates reveal a significant and negative portfolio investment reaction to a restrictive shock on US financial conditions (see Chart 7). The easing of financial conditions in the United States at the beginning of 2019 thus favoured capital inflows to emerging economies (see Chart 8). Factors related to attraction and risk perception also had a major influence. Lastly, the reaction of portfolio investment to the different shocks that were studied seems to occur quickly, within one to ten weeks.

This empirical application thus highlights the advantages of using higher frequency databases and estimators to improve the analysis of risk in emerging economies.

C8 Financial conditions in the United States and portfolio flows to emerging economies

(USD billions)



Sources: Chicago Federal Reserve and Banque de France calculations.

Note: The National Financial Conditions Index for the United States is published by the Chicago Federal Reserve (decreases and increases correspond to an easing and a tightening of conditions, respectively). The portfolio flow estimator is the one used in Chart 6 at a weekly frequency (average over 8 weeks).



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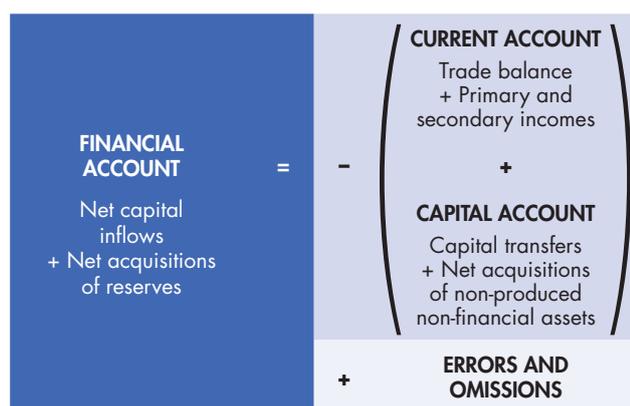
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Appendix 1

Advanced estimator of net capital inflows in emerging economies

Monthly trade balance and exchange reserve data can be used to obtain an advanced estimator of net capital inflows. These data are available within one to two months in most of the countries considered, compared to at least a three to six months delay for complete financial account data, and therefore facilitate a more advanced monitoring of net capital inflows. This estimator relies on a simplification of balance of payments accounting equations used, for example, by Calvo et al. (2008) and Berthaud et al. (2010):



Several assumptions can then be applied to simplify this balancing equation.

- The current account balance is proxied by the trade balance, which is the main sub-component in emerging economies (this is no longer necessarily the case in some advanced economies, see Berthou et al., 2018).
- The capital account balance is assumed to be negligible. It records acquisitions and disposals of non-produced non-financial assets and capital transfers.

- Errors and omissions are assumed to be zero. However, this assumption does not apply to certain countries where the amounts on this item are substantial. This is particularly the case in China, probably due to efforts to circumvent the capital control measures implemented by the authorities (Hatzvi et al., 2015). Consequently, China is not included in our country sample.
- Net acquisitions of reserves are calculated by adjusting the monthly change in foreign exchange reserves with an estimate of the revaluation effects caused by exchange rate fluctuations.

Net capital inflows are thus estimated using the following formula:

$$\text{Net capital inflows} = - (\text{trade balance} - \Delta \text{foreign reserves})$$

The estimator is then calibrated to observed capital flow data in order to limit its systematic biases. The calibration relationship is estimated by a simple regression between the interest variable at a quarterly frequency and the monthly estimator adjusted to a quarterly frequency.¹ The estimator using reserve and trade balance data² over the entire quarter can explain 63% of changes in net capital inflows between 2006 and 2018. Preliminary estimates obtained with data available in the first or second month of the quarter can explain 47% and 51% of the changes, respectively.

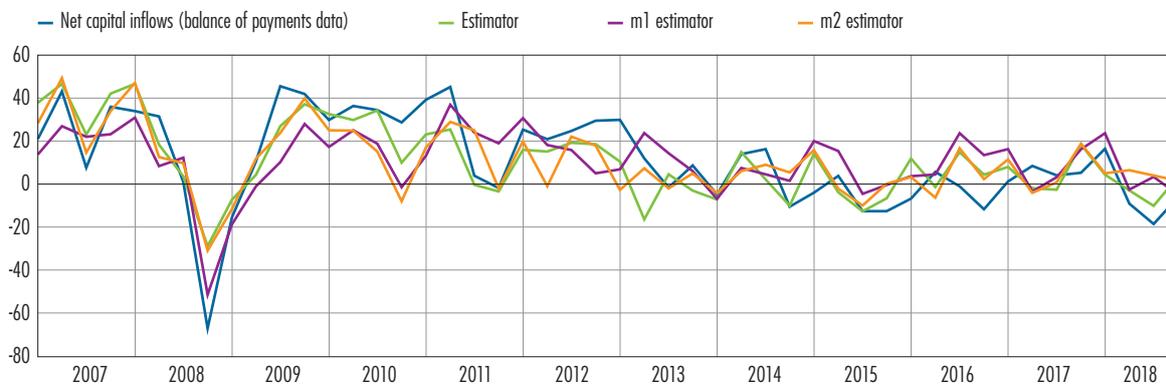
¹ This is the method commonly used in preparing the national accounts. See: https://www.insee.fr/fr/statistiques/fichier/2571301/imet126_c_chapitre_2_principe_d_elaboration.pdf

² Countries selected in the sample: Argentina, Brazil, Chile, Colombia, Hong Kong, Hungary, India, Indonesia, Mexico, Malaysia, Philippines, Poland, Russia, Singapore, South Africa, South Korea, Taiwan, Thailand and Turkey.



Comparison between the estimator and balance of payments data for the sample of countries considered

(USD billions)



Sources: National sources and Banque de France calculations.

Note: The m1 estimator is constructed with data available in the first month of the quarter while the m2 estimator is constructed with data available in the second month of the quarter.



Appendix 2

Correlation between EPFR country flows and flows to funds

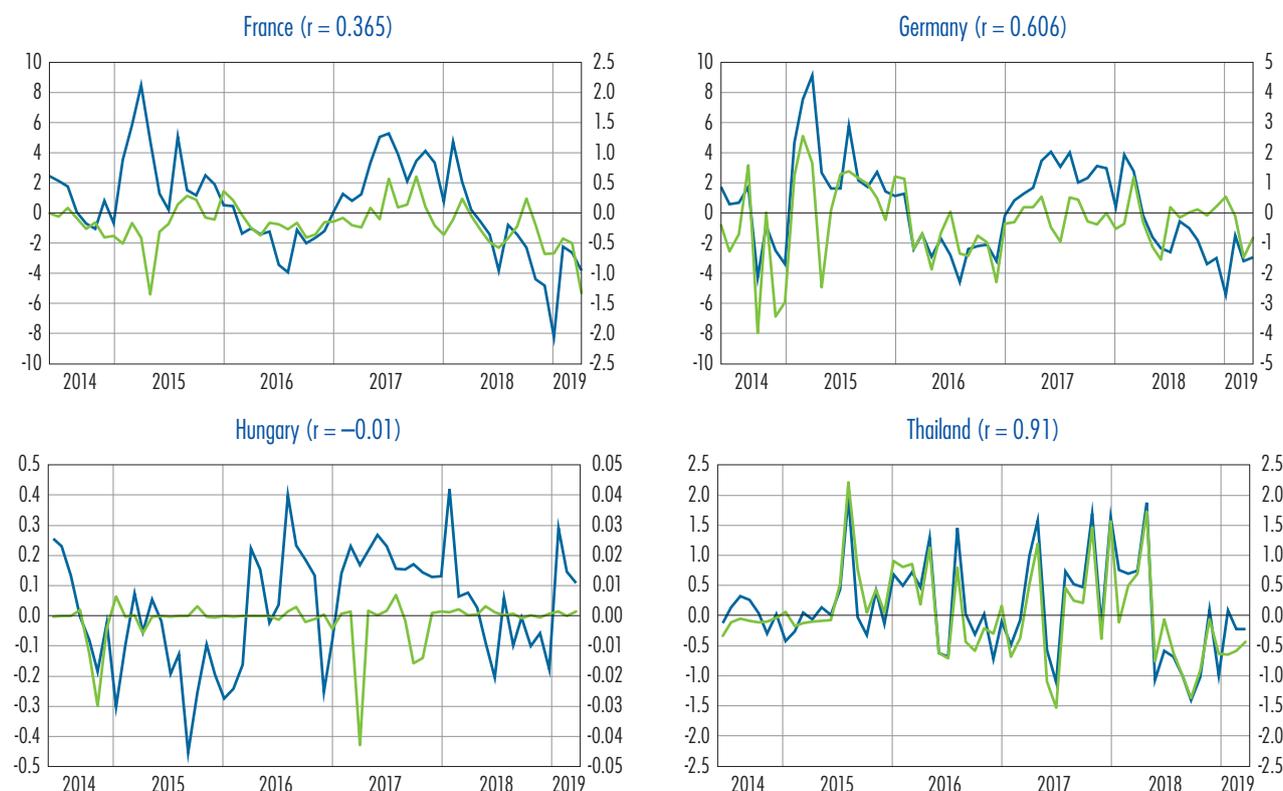
Generally, country flows and flows to funds are closely correlated, particularly for Asian countries. Exceptions may arise due to the country's presence in, or absence from, the funds' portfolios (regional, emerging or global) or due to the small number of funds specialising in the country in question (therefore resulting in a small number of fund flows to the country, as is, for instance, the case with Hungary). A country's inclusion in a large number of regional or global indices can reduce the correlation

between the two metrics due to non-idiosyncratic factors having a stronger influence on flows. This is particularly the case for major euro area countries. A range of factors can influence flows to funds. In the case of emerging economies, many funds are benchmarked, which reduces the depth of the market as transactions concentrate on the assets tracking the benchmark. The prices of assets included in the indices also tend to be more volatile and inter-correlated.

Ca Comparison between country flows and flows to funds

(USD billions)

— Country flows — Flows to funds (right-hand scale)



Source: EPFR and Banque de France calculations.

Note: Monthly data. r is the correlation coefficient between the two data series; the closer r is to 1, the more the series are correlated.



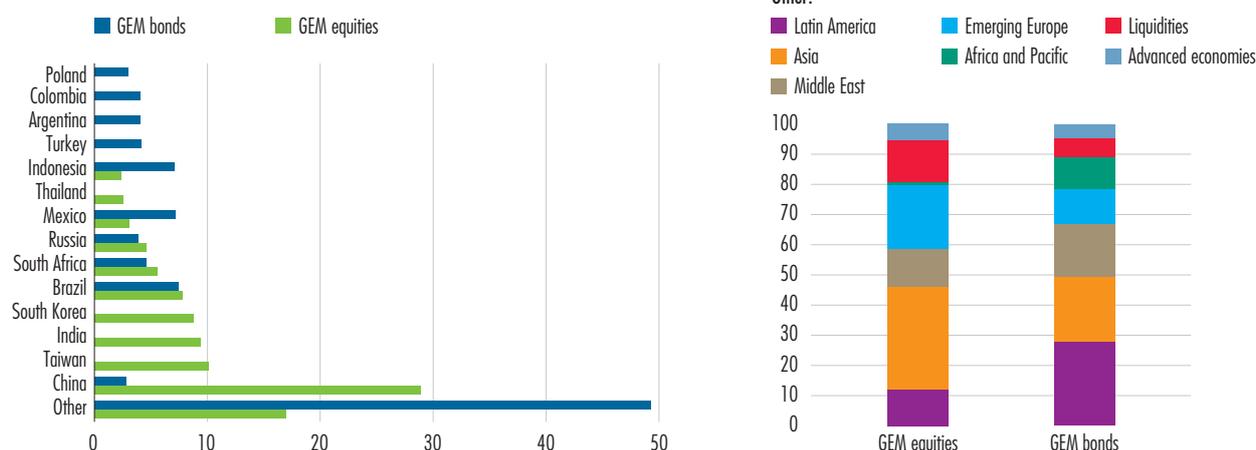
Country weights may differ significantly depending on the asset type. Bond funds, which are on average more geared towards Latin American issuers, have a more concentrated portfolio than equity funds (which are also more oriented towards Asian issuers). In a sample of the ten largest emerging market funds in a range of categories,¹ the majority of assets were Asian, accounting for between 58% and 78% of the total. On average, Chinese assets account for more than 31% of exchange

traded fund (ETF) allocations, reflecting the significant weight of Asian corporations in emerging market indices.²

A distinction is often drawn between institutional investors and retail investors on the basis of an assumed difference in their behaviour.³ While EPFR coverage of institutional investors is limited, its data can reflect certain institutional investor trends.⁴ Even though institutional investors often manage their own funds, they also invest in mutual funds.⁵

Cb Top ten allocations by country of global emerging market (GEM) funds

(%)



Source: EPFR.

Note: Global emerging market (GEM) funds invest the majority of their assets in emerging economies, without targeting one country in particular.

1 Only funds with an exposure to emerging economies of more than 50% fell within the scope. Reference is made to the ten largest emerging market funds for each category that are exclusively oriented towards emerging economies (an allocation of more than 99%). Country shares are calculated by deducting cash.

2 Several bond and equity indices have triggered or announced an increase in short and medium-term exposures to China. See: <https://blocnotesdeleco.banque-france.fr/en/blog-entry/china-rebalancing-benchmark-indices-what-implications>

3 Generally speaking, institutional investors are more sophisticated, invest over longer time periods and are less swayed by short-term disturbances. In a context of emerging economies, they appear to be less sensitive to the VIX. However, their withdrawals from an asset class are usually made on a far greater scale (IMF, 2014).

4 At the beginning of 2019, institutional investors accounted for 62% of total net fund assets in the EPFR database (with a similar proportion for bonds and equities). Within emerging market funds, they accounted for 55% of all bond funds and 68% of all equity funds.

5 Distinguishing between institutional and retail investors is often difficult. Individual positions in mutual funds may be aggregated to reach the institutional investor threshold necessary to reduce management expenses.



Appendix 3

High frequency national portfolio flow data

Balance of payments data are most commonly published quarterly and with significant time delays. Data on cross-border foreign investments are available for some countries – Brazil, South Korea and Turkey (for bond flows) – on a monthly and even weekly basis, according to a model similar to that of quarterly balance of payments

data. Other national authorities provide cross-border data that partly cover the quarterly data. For the purposes of this study, only data series explaining at least 60% of the variance in quarterly balance of payments data (i.e. an R^2 of at least 0.60 – see table) are considered.^{1,2}

National sources of portfolio flow data

Country	Equity flows			Bond flows		
	Frequency	Type	R^2	Frequency	Type	R^2
Brazil	Monthly	Portfolio investments, net liabilities	1.00	Monthly	Portfolio investments, net liabilities	1.00
South Korea	Daily	Net investments by non-resident institutional investors	0.99	Monthly	Portfolio investments, net liabilities	0.95
India	Daily	Net foreign investment	0.83	Daily	Net foreign investment in Indian debt	0.87
Indonesia	Daily	Net foreign investment on the Jakarta Stock Exchange	0.88	Daily	Net foreign investment in sovereign bonds	0.88
Malaysia	Daily	Net portfolio investments	0.62	Monthly	Securities held by non-residents	0.62
Philippines	Daily	Net foreign investment on the Philippine Stock Exchange				0.74
Taiwan	Daily	Foreign investments				0.78
Turkey	Weekly	Net foreign investment	0.69	Weekly	Net non-resident transactions in government debt	0.99

¹ The data series for South Africa (debt and equity flows), Mexico (debt security flows) and Thailand (equity flows) are not included. Other countries excluded from the sample provide data on a monthly, weekly or daily basis.

² R^2 measures the explanatory power of the model, and rises from 0 to 1 with the quality of the adjustment. The adjusted R^2 can be used to compare models that have differing numbers of explanatory variables and/or observations.



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