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Extreme capital flow episodes from the Global Financial Crisis to COVID-19: An exploration with monthly data

by

Annamaria De Crescenzio and Etienne Lepers *

The COVID-19 pandemic triggered a sudden funding squeeze manifested in major disruptions in international capital flows, the most dramatic of the wave of extreme capital flow episodes since the global financial crisis (GFC). This paper contributes to efforts to better understand this extreme episode in the context of post-GFC structural financial changes. To do so, it presents a new monthly dataset of gross capital flows for 41 countries, better suited to the identification of sudden shocks than quarterly Balance of Payments data. Leveraging on this dataset, the paper first develops a more precise identification of extreme capital flow episodes since the GFC and revisit their drivers, asking whether COVID-19 episode significantly changed recent findings of the weaker role of global factors. The answer is no. Rather, the role of global factors may have further lost explanatory power in the post-GFC period including COVID. On the other hand, pull factors such as pre-COVID vulnerabilities and country-specific and pandemic-specific factors appear key to explaining the identified cross-country heterogeneity.

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JEL categories: F32, F34, F38

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1 Introduction

The COVID-19 outbreak in March 2020 led to dramatic capital outflows, both from Emerging Market Economies (EMEs) and some Advanced Economies (AEs) and associated large exchange rate depreciation in many countries (Eguren Martin *et al.*, 2020; OECD, 2020). As "history doesn't repeat itself", the COVID-19 global sudden stop was mainly in the form of sales of portfolio assets by foreign investors, unlike the Global Financial Crisis (GFC), which saw a funding squeeze driven by banks. However, "history does rhyme": the large outflows seen in 2020 were driven substantially by non-bank financial institutions, in particular investment funds, whose share of global financial assets has been increasing at an accelerating pace since the GFC. Such funds, often unregulated, have rapidly divested from long-term assets such as governments bonds (Falato, Goldstein and Hortaçsu, 2021; Schrimpf, Shim and Shin, 2021).

The COVID-19 global sudden stop is the latest of a series of capital flow waves and associated extreme episodes that has occurred over the past decades, with the post-GFC period being no exception, with an important surge of capital inflows to EMEs on the back of accommodative monetary policy in advanced economies after 2009, followed by sudden stops during the so-called "taper tantrum", but also the "China scare" in 2015.

A large body of work has highlighted the role of global push factors in driving capital flows (Koepke, 2019) and their extreme movements (Forbes and Warnock, 2012), identifying notably the existence of a global financial cycle which make macroeconomic policy choices substantially more difficult as it transforms the trilemma into a dilemma, where independent monetary policies are possible only if the capital account is managed (Rey, 2013; Miranda-Agrippino and Rey, 2015). In this regard, the GFC appears to have led to a structural break in cross-border capital flow intermediation and its drivers. Recent research has underlined a shift in the drivers of capital flows post-GFC: global risk aversion, typically proxied by the VIX, no longer explains the bulk of capital flow dynamics (Shin, 2016; Avdjiev *et al.*, 2020; Forbes and Warnock, 2020). Instead, global oil prices have played an increasing role (Forbes and Warnock, 2020), as have exchange rates vis a vis the dollar (Shin, 2016; Erik *et al.*, 2020), while US monetary policy was found to have played an especially crucial role as drivers of banking flows around the time of the 2013 taper tantrum before reverting to pre-GFC sensitivities (Avdjiev *et al.*, 2020).

Against this background: has the COVID-19 episode changed that picture? What was the magnitude of the stop and which countries experienced them? How has it been different from previous shocks? What was the role of global factors in driving COVID capital flow dynamics and which country-specific factors have played the largest role in explaining the important heterogeneity across countries? These are the questions this paper seeks to answer.

The first contribution is on the data side. One of the unique specificities of the COVID-19 shock has been its suddenness, with most outflows concentrated in the month of March 2020 alone. This renders traditional Balance of Payment data which are available at quarterly frequency relatively blind to the magnitude of the shock. This paper seeks to fill this gap by providing a newly collected monthly capital flow dataset solely based on publicly available national sources. The final dataset includes a total of 41 economies (22 AEs and 19 EMEs) and covers for most countries the full range of the financial account (FDI, portfolio, other investment assets and liabilities).

Armed with this higher frequency dataset, this paper revisits the measurement of extreme capital flow episodes by adjusting the quarterly methodology developed by Forbes and Warnock (2012). Specifically, it explores whether and when countries in this sample experienced an extreme capital flow episode (surges and stops, for non-resident flows; flights and retrenchments, for resident flows)[1] during the post-GFC period, including the COVID-19 episode.

It then proceeds to analyse the drivers of monthly extreme episodes. Starting by a broader analysis of such drivers in the pre and post-GFC period, it highlights in particular the much less predominant role of global factors as drivers of capital flow episodes than in the pre-GFC period, with the exception of global oil prices which make a striking entry as predictor of extreme episodes post-crisis, consistent with recent findings above-reviewed.

Has the COVID-19 episode significantly changed that picture? That is, has the inclusion of a dramatic "risk-on" period such as COVID-19 with global risk aversion, oil prices, and liquidity spiking to extreme values, led to a comeback of global factors as predictors of extreme episodes? The answer is no. In fact, with the exception of banking flows which become more sensitive to global factors in risk-on period, global factors further lose economic and statistical significance when 2020 data are added to the models. Simple out of sample predictions excluding COVID would have predicted a substantial likelihood of portfolio flow stops in the COVID episode - setting global factors to March 2020 values, a likelihood of portfolio flow stops of above 72% (or 60% in post-GFC models). In comparison, adding 2020 data to the model (in sample) leads to a substantial drop in the predicted likelihood to 41 and 24% respectively.

These results have two implications: 1) the role of global factors may have further lost explanatory power in the post crisis period including COVID, 2) the difference between the predicted and the actual experience of extreme episodes as well as the important cross-country heterogeneity in capital flow dynamics during COVID has to be explained by country specific factors.

The final section thus analyses in detail the origins of the important cross-country heterogeneity testing for a number of country-specific factors. It finds that COVID-related factors such as the number of COVID deaths per capita or the stringency of health-related restrictions, domestic macroeconomic variables such as activity trackers, the extension of swap lines, and pre-COVID financial vulnerabilities are all significant predictors of portfolio flows during these months.

These findings contributes first and foremost to the prolific literature on extreme capital flow episodes (bonanzas and sudden stops) and their drivers, starting from Calvo (1998) and expanded subsequently (Reinhart and Reinhart, 2008; Forbes and Warnock, 2012; Calderón and Kubota, 2013, 2019; Ghosh *et al.*, 2014; Mercado, 2018, 2019) by first providing a more precise identification of extreme episodes thanks to the monthly frequency, being able to capture especially sudden and short lived events such as COVID-19; second, by providing a detailed split by types of flows; third, by extending the analysis to 2020 including COVID-19.

The paper then contributes to the above-mentioned literature on the changing role of global factors in the post-GFC period (Shin, 2016; Goldberg and Krogstrup, 2018; Avdjiev *et al.*, 2020; Forbes and Warnock, 2020) and more generally the literature on capital flow volatility in risk-on/risk-off periods (Chari, Dilts Stedman and Lundblad, 2020) by outlining that the role of global factors may have further lost explanatory power when including the COVID-19.

[1] This paper uses throughout the seminal definition provided by Forbes and Warnock (2012) of “surges” and “stops”: sharp increases and decreases, respectively, of gross inflows (net foreign acquisition of domestic assets), and “flight” and “retrenchment”: sharp increases and decreases, respectively, of gross outflows (net domestic residents' acquisition of foreign assets). The authors’ identification of “surges” and “flights” in this paper is without prejudice to the assessments of extreme episodes under the OECD Capital Movements Code.

It finally contributes to the specific understanding of the COVID-19 macroeconomic implications with regards to capital flows (Eguren Martin *et al.*, 2020; Elfayoumi and Hengge, 2021) by testing a battery of pull factors ranging from COVID-related factors, such as the number of COVID deaths per capita or the stringency of health-related restrictions, domestic macroeconomic variables such as activity trackers, the extension of swap lines, and pre-COVID financial vulnerabilities, in predicting flows.

By making this new dataset of monthly capital flows public [2], it also hoped to contribute to a growing use of higher frequency data in the analysis of capital flows.

The remainder of the paper is structured as follows: Section 2 presents a newly collected dataset of monthly capital flows; Section 3 describes capital flow dynamics and composition in relation to the March-August 2020 episode; Section 4 provides a mapping of extreme episodes in the COVID-19 episode using monthly data; Section 5 investigates which factors have been driving these extreme episodes, and provides a comparison with the GFC period; Section 6 focuses specifically on the COVID-19 episode and seeks to understand country-specific dynamics in the period; Section 7 concludes.

2 A New OECD Dataset of Monthly Capital Flows

The speed with which the COVID-19 crisis and the resulting capital flow shock unfolded has led many researchers to seek and use data on capital flows with higher frequency, rather than the usual quarterly Balance of Payments (BoP) data, typically released with a lag of 2 quarters, which is late to analyse capital flow developments in a timely manner.

Many analysts have thus resorted to private data providers to explore capital flow dynamics, namely Emerging Portfolio Fund Research (EPFR) and Institute of International Finance (IIF). The former tracks equity and debt inflows into dedicated investment funds, covers virtually all countries and is available daily. The latter covers portfolio equity and debt flows to 15 EMEs at a weekly frequency, and 35 EMEs at a monthly frequency. While these data sources have important advantages, they need to be used with important caveats, well described in Koepke and Paetzold (2020): EPFR data covers only mutual fund flows, which represent only a fraction of Balance of Payment portfolio flows (estimated at around a quarter (Puy, 2016)). Perhaps most importantly, their reporting method is conceptually different from BoP data, as it does not rely on the residency principle: outflows from funds can be both by domestic and foreign investors, which may explain important discrepancies with BoP data in the COVID-19 period (Kalemli-Ozcan, 2020). IIF data seek to proxy BoP flows, but

[2] The dataset is available at https://www.oecd.org/daf/inv/investment-policy/OECD-monthly-capital-flow-dataset.xlsx .

the country sample is limited and some country specific proxies do not cover the full range of portfolio flows.

The limitations and costs of private data sources, as well as the fact that a much larger number of countries than previously publish BoP financial account statistics at monthly frequency, have led to recent efforts to collect cross-country datasets on capital flows from public sources, at monthly frequency, consistent with BoP principles. The OECD Economics Department, for example, collected data on portfolio inflows for 12 EMEs (OECD, 2019). The IMF also recently released a dataset covering portfolio inflows for 18 EMEs (Koepke and Paetzold, 2020).

This paper's dataset substantially extends those efforts along several dimensions to provide a more comprehensive and granular dataset on monthly capital flows (Coverage presented in Table 1 while sources for each country are presented in Table A1 in the Annex):

1) The country coverage goes beyond EMEs to cover also AEs, which allows us to have a final sample of 41 countries;

2) The capital flow coverage goes beyond portfolio flows to cover bank flows and FDI, and also go beyond inflows and collect data on outflows to be able to cover the full financial account.

Table 1: Coverage of the OECD Monthly Capital Flow Dataset

Country	Start date	Flows covered	Country	Start date	Flows covered
Belgium	2008M1	All	Lebanon	2002M1	All
Brazil	1995M1	All	Lithuania	2008M1	All
Bulgaria	1998M1	All	Luxembourg	2002M1	All
Chile	2003M1	All	Malaysia	2011M1	Portfolio Debt inflows
Croatia	2013M1	All	Mexico	2009M6	Equity/Gov Debt inflows
Czech Republic	2004M1	All	Mongolia	2009M1	All
Denmark	2005M1	All	Pakistan	2013M6	All
Estonia	2008M1	All	Philippines	2005M1	All
Finland	2013M1	All	Poland	2004M1	All
France	2008M1	All	Portugal	1996M1	All
Germany	1996M1	All	Romania	2005M1	All
Greece	2002M1	All	Slovakia	2008M1	All
Hungary	2008M1	All	Slovenia	1993M1	All
Iceland	2011M1	Portfolio	South Africa	1995M6	Portfolio inflows
India	1995M4	FDI/Portfolio inflows	Spain	1993M1	All
Indonesia	2011M1	Gov Debt inflows	Sri Lanka	2009M1	Portfolio inflows
Italy	2008M1	All	Sweden	2008M1	All
Japan	1996M1	All	Thailand	2005M1	All
Korea	1980M1	All	Turkey	1991M1	All
Latvia	2008M1	All	Ukraine	2010M1	All
			United States	1977M1	Portfolio

3 Capital Flow Dynamics in COVID-19 Times

In this section, the dataset described in the previous section is used to explore at monthly frequency capital flows dynamics in 2020.

3.1. The March 2020 sell-off: an important portfolio drop …

The sharp portfolio drop seen since March 2020 has been unprecedented in magnitude and has affected both AEs and EMEs, as highlighted by the monthly capital flow dataset constructed in this paper (Figure 1 and 2). Around USD 103 billion were drawn from EMEs from March to May 2020 (Figure 2), with equity inflows plummeting first, followed by debt flows. In the country sample considered by this paper, portfolio inflows plummeted by USD 666 billion in March 2020 alone, three times as much as the drop seen in the GFC, which peaked in October 2008. Portfolio flows to EMEs started to rebound substantially In November and December 2020 (Figure 2).

Figure 1. Inflows to advanced economies In 2020 – bn USD

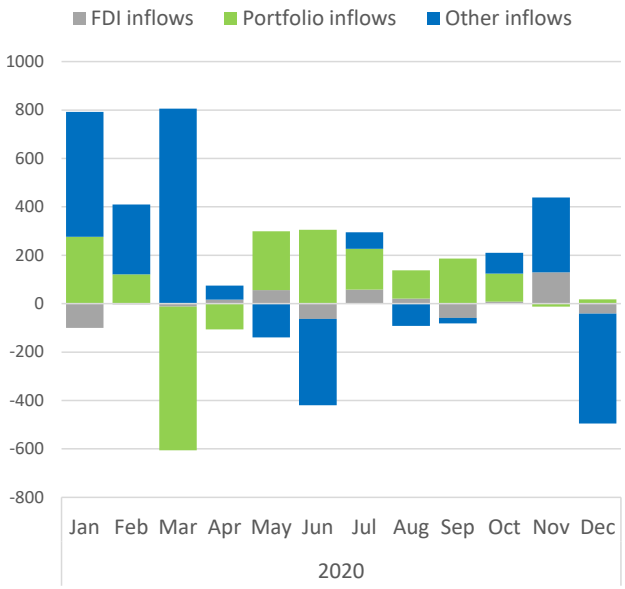
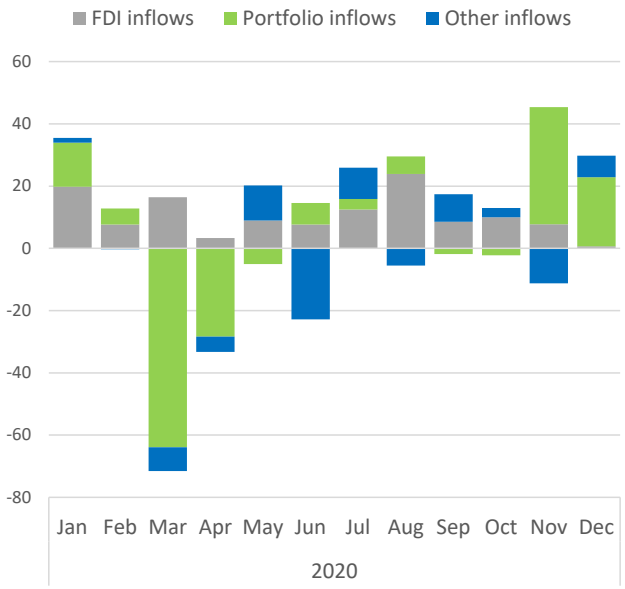


Figure 2. Inflows to emerging economies In 2020 – bn USD



Note: Sample of 22 AEs and 19 EMEs. See Table 1 for capital flow coverage by country.
Source : OECD Monthly Capital Flow Dataset.

From an asset perspective, distinguishing between portfolio and other investment (banking) flows reveals a striking contrast with previous crises episodes. AEs saw massive inflows to banks (Figure 1), which in large part reflected the uptake of the Federal Reserve swap lines. The concentration of the stop in portfolio flows, while at the same time banking flows were booming is of particular contrast compared to the 2008 GFC, during which it was banking flows (listed as other inflows) that contracted the most (Figure 3 and 4).

Figure 3. Inflows to AEs (2007m1 -2020m12) – bn USD

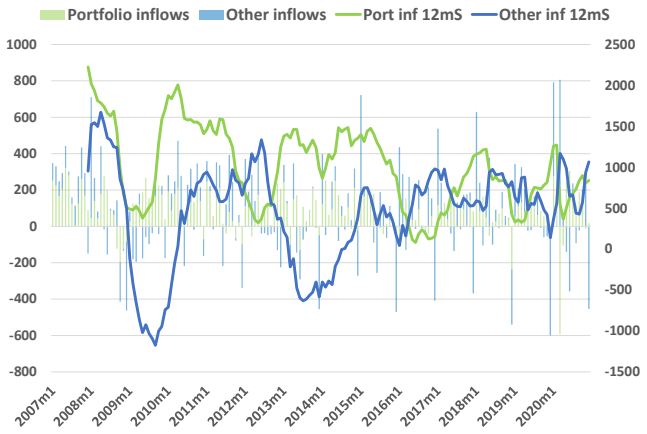
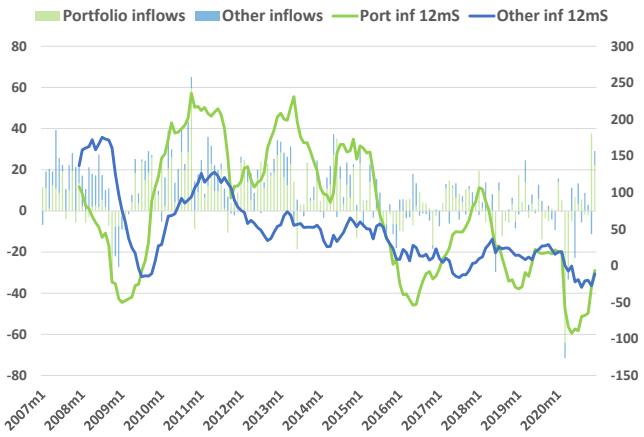


Figure 4. Inflows to EMEs (2007m1 -2020m12) – bn USD



Note: Unbalanced sample of 22 AEs and 19 EMEs. Bars represent monthly flows (left-axis), lines the rolling 12 months sum of capital flows (right-axis).

Source : OECD Monthly Capital Flow Dataset.

This picture is confirmed by traditional quarterly BoP data for a more comprehensive set of countries, provided in the annex for reference (Figures A1-A4 for the asset perspective) and is complemented by the more detailed breakdown by sectors allowed by the BoP (Figures A5 to A8 and Lepers and Mercado (2020) and Avdjiev et al (2018) for a discussion). Indeed, AE banks saw massive inflows of currency and deposits (Figure A1): as explained in Aldasoro et al (2020), drawing on swap lines results in an increase in liabilities of US banks to banks abroad, as well as an increase in reserves at the Fed. Because the swap lines were primarily drawn by other AEs central banks such as the European Central Bank (ECB), the Bank of England (BoE) and the Bank of Japan (BoJ), the mirror image appears from the outflow perspective with corresponding large outflow from AEs banks and central banks (Figure A6).

Banking flows more generally seem to have weathered the episode thanks to the resilience built up in this sector, enabled by regulatory reforms over the last decade (Giese & Haldane, 2020), which helped to prevent the transmission of market stress to the core of the international banking system. In contrast, non-bank financial institutions in AEs entered the crisis with pre-existing financial vulnerabilities, including liquidity mismatches. As the COVID-19 crisis deteriorated, investor appetite shifted abruptly, first from risky to safe and more liquid assets, and then, from mid-March, to cash and near-cash short-dated assets. Asset managers sought to raise cash to meet redemptions, foreign central banks raised dollars in part to stem capital outflows and intervene on foreign exchange markets, and banks needed to raise funding as corporates were drawing on their bank credit lines (Cheng et al., 2020).

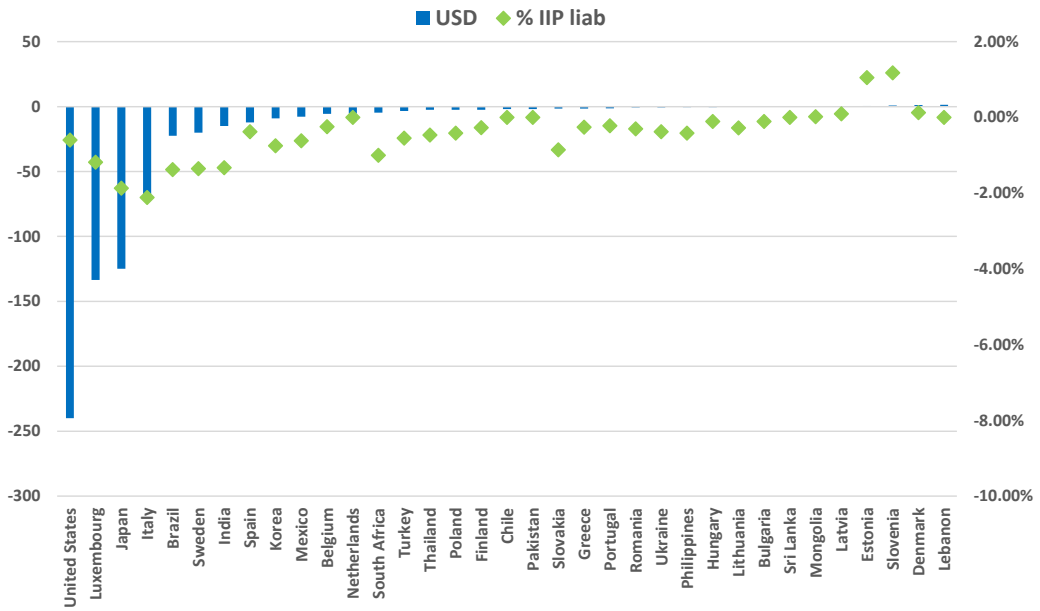
These assets were often treasury bonds which is reflected by the drop in inflows to the general government category, corresponding to foreign residents selling AEs' domestic government bonds (Figure A5). The use of reserves by EMEs during COVID-19 appears as a drop in inflows to the central bank sector (Figure A6).

3.2. … concentrated in key countries

Although the COVID-19 pandemic acted as a global and simultaneous shock to aggregate demand and supply, countries' reactions have differed widely, as have policy responses to capital flows. Again, focussing on monthly data allows for more precise analysis of the episode, as data for the first quarter of 2020 also contain January and February, months that in most countries were not yet affected by the shock.

The March 2020 drop seen in portfolio flows was driven, in absolute terms, by global financial hubs such as the United States, Luxembourg and Japan. When scaled, however, as a percentage of total external liabilities in Q4 2019, capital inflows receded significantly in Italy (over 2%), Japan (almost 2%), Brazil and Sweden (slightly less than 1.5%). Once scaled by total external liabilities, EMEs and other countries enter the picture (Figure 5). The next sections seek to provide insights into the drivers of such heterogeneity in country capital flow patterns.

Figure 5. Portfolio inflows (US billions, % 2019 Q4 total external liabilities) – March 2020



Source: OECD Monthly Capital Flow Dataset, IMF International Financial Statistics, OECD calculations

4 Extreme Capital Flow Episodes from GFC to COVID-19

This section now turns to the identification of extreme capital flow episodes since the GFC using the monthly capital flow dataset presented above.

4.1. Identification of capital flow episodes at monthly frequency

A large literature originating with Calvo (1998) has tried to measure the occurrence of extreme capital flow episodes, either sudden stops or bonanzas. Until Forbes and Warnock (2012), hereafter FW, such literature was using net capital inflows to define extreme events. Throughout this paper, the focus is on gross capital flows, for two core reasons. First, a substantial literature has convincingly argued for the need to study gross capital flows instead of net when the aim is to assess financial imbalances and vulnerabilities (Obstfeld, 2012). Second, another core benefit of using gross flows is that it allows a distinction between the behaviours of residents and non-residents, which have different determinants and different consequences even when they go in the same direction (increase of residents' investment abroad and cut-off of funds by foreign investors) (see FW (2012), Calderon and Kubota (2013), and Broner et al (2013)).

Crystallin et al (2015) provides a survey of the various measures of extreme episodes: it distinguishes between methods based on some deviation from a benchmark, usually standard deviations from historic mean, filtered trend or magnitude (e.g. Forbes and Warnock (2012), Calderon and Kubota (2013)), or methods based on threshold percentile for the entire sample (e.g. Ghosh et al (2014), Reinhart and Reinhart (2008)).

More recently, an alternative approach to the measurement of drivers of large episodes has relied on the capital flow at risk methodology, which enables analyses of the drivers of flows at different part of its distribution using quantile regressions (Gelos *et al.*, 2019; Eguren-Martin *et al.*, 2020). "Capital flows at risk" can for instance be defined as the 5th percentile of the left tail of the distribution.

This paper presents a new methodology for identification of monthly capital flow episodes closely following the methodology that FW (2012, 2020) developed for quarterly data. It thus uses a relative identification measure, i.e. comparing current capital flows to historical trends using gross flows, leveraging on the granularity of our dataset. The FW classification of episodes into four categories is followed – surges and stops for non-resident flows (liabilities), and flights and retrenchments for resident flows (assets).

FW require the data to meet three criteria to classify as "extreme capital flow episode":

- An extreme episode is a period when current year-over-year changes in the annual sum of gross capital flows exceed one standard deviation above or below their historical mean, provided it reaches two standard deviations above or below at some point in the episode.
- The episode ends when gross flows are no longer at least one standard deviation above or below its mean.

- The episode needs to last at least two quarters.

These criteria are translated into a workable methodology for monthly data. The cumulative sum of the last twelve months of gross capital flows is calculated, called C_t and then the annual year-over-year changes in C_t to avoid seasonal fluctuations:

$$C_t = \sum_{i=0}^{11} Kflow_{t-i} \quad ; \quad \Delta C_t = C_t - C_{t-12} \qquad (1)$$

Rolling means and standard deviations of ΔC_t over the past 5 years (60 months) are then calculated.[3] Using rolling instead of historical means, computed using all available data, allows capital flows to enter "new normals" and captures changes in domestic and global financial systems. A robustness check also identifies episodes based on historical means similar to Calvo (2004).

Translating the first two conditions of FW into monthly data is relatively straightforward: an extreme episode is identified starting the first month t that ΔC_t increases more than one standard deviation (SD) above or below its rolling mean, on the condition that for one month during the episode it reaches at least two standard deviations above or below its mean. The episode ends once ΔC_t falls back below within one standard deviation above or below its mean.[4]

The last condition involves more judgment: how many consecutive months should ΔC_t exceed one SD below or above its mean to be classified an extreme episode? In this paper, the decision is to require a minimum of three consecutive months for an episode to be classified as extreme.

4.2. Newly computed data on monthly extreme capital flow episodes

This methodology allows us to identify all extreme episodes for our country and time sample, and take a particular look at episodes during the COVID-19 episode.

Extreme episodes in the post-GFC period

To analyse the prevalence of different extreme episodes in the post-crisis period, the share of countries experiencing that episode is displayed as a percentage of all countries, as the panel is unbalanced.

Starting with sudden stops (when non-resident inflows dry up abruptly), of particular interest in the context of the COVID-19 episode, the Figure shows that in the GFC a higher number of countries experienced such stops compared with the COVID-19 crisis (Figure 6). In terms of dynamics, during the GFC countries experienced first a portfolio equity sudden stop and then and most importantly a sudden stop on other flows, mostly banking. Assuming here that the GFC started in September 2008, the sudden stop in banking flows had already affected ten countries by January 2009. Such a trend has not been identified in COVID. While roughly similar in absolute terms, the share of countries in stops during the GFC appears strikingly higher. As shown in Figure 5, while of large magnitude, the capital flow shock was concentrated in a few key countries. Still, a number of countries experienced stops coinciding with COVID-19.

[3] In FW (2012), the mean is calculated on the previous 20 quarters (or 5 years) and does not include the current quarter. It thus requires 4 years' worth of data to calculate the historical mean.

[4] This compares with Calvo et al (2004) who uses proxies of monthly capital flow data and use similar methodology, albeit comparing to historical and not rolling averages. In addition, Calvo does not require a minimum of consecutive months.

Looking at surges (when non-resident inflows increase abruptly), it is observed that flows dried up sharply as the GFC unfolded between the end of 2008 and mid-2009. Over the period 2010-11, surges peaked again, driven by portfolio flows in the context of accommodative monetary policy in advanced economies (Figure 7).

Moving to retrenchments (when capital outflows decrease sharply) it appears that, as for the stops episodes, during the GFC a higher number of countries experienced retrenchments compared with the COVID-19 crisis, when they affected in particular other (banking) flows (Figure 8).

Finally, flights (when capital outflows increase sharply) have exhibited a volatile pattern. Again, this volatility is mainly driven by portfolio flows. Banking flows experienced flights in 2010 and spiked during COVID, illustrating the banking flow dynamics described in Section 3 (Figure 9).

As robustness checks for the monthly capital flow episode identification, extreme episodes are computed again comparing current capital flow values with historical means rather than 5-year rolling means. This is not the preferred computation method, as it does not take into account regime changes and is especially sensitive to the fact that the time series are unbalanced across countries. Nonetheless, patterns appear very similar (Figures A9-A10). Stops and retrenchments patterns are identical. The same applies to surges, except for displaying a stronger share of countries in other investment flows surges in 2010. Flights calculated with historical means display a lower share of countries experiencing flights in the COVID-19 episode.

Figure 10-13 then provide a split between EMEs and AEs to see whether there are different characteristics in these two groups (For space reasons, only stops and surges are displayed). It appears that a higher percentage of EMEs in the sample have experienced stops, already in the months preceding the COVID-19 episode. The portfolio flow stops are concentrated in EMEs. During COVID, surges In EMEs dropped to 0 while AEs experienced some surges especially in banking flows and consistent with the previous discussion.

Figure 6. Stops

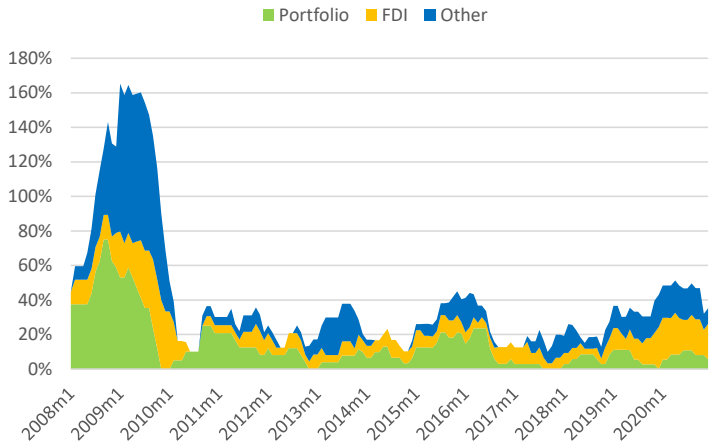


Figure 7. Surges

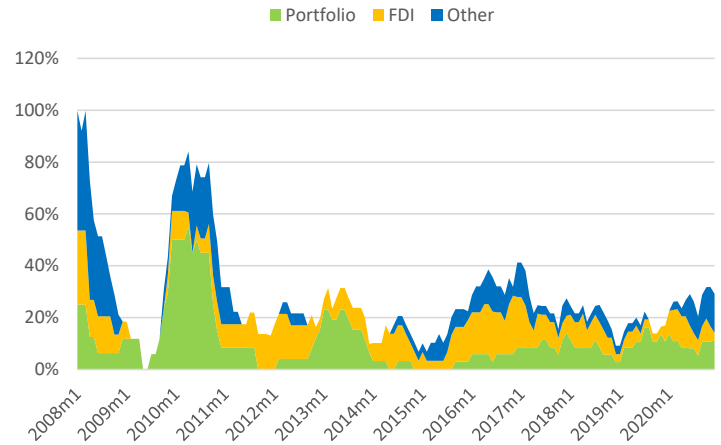


Figure 8. Retrenchments

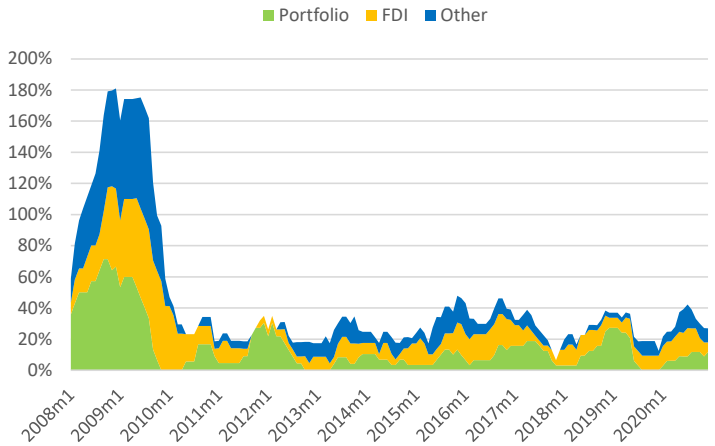
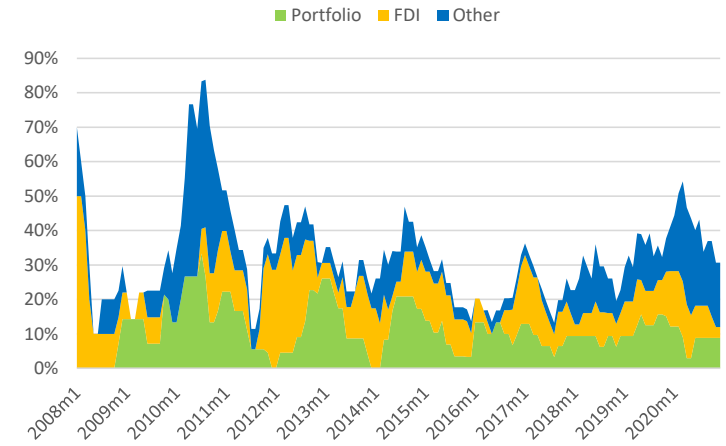


Figure 9. Flights



Note: Share of countries experiencing an extreme episode by flow type. Exceeds 100% if countries face episodes in several capital flow types.

Figure 10. Stops - EMEs

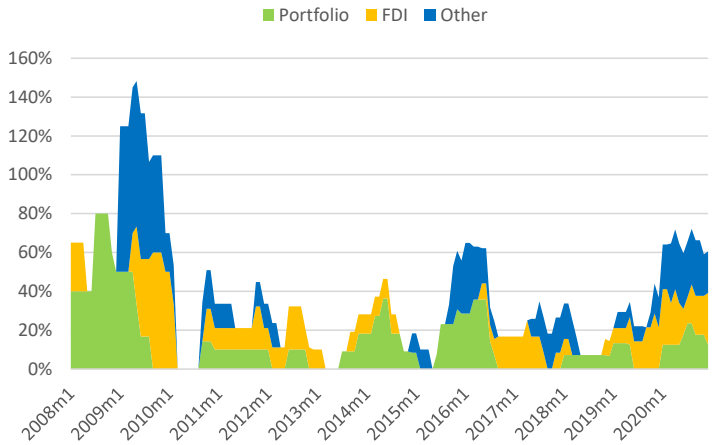


Figure 11. Surges - EMEs

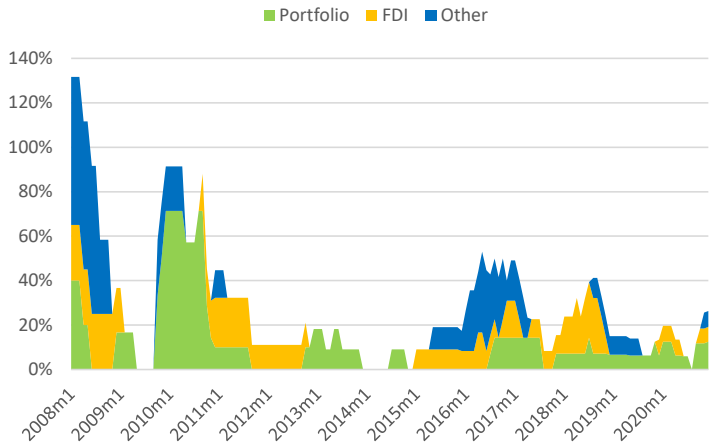


Figure 12. Stops - AEs

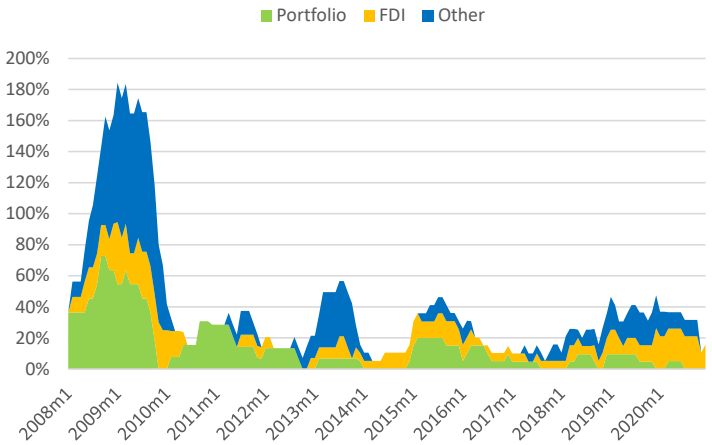
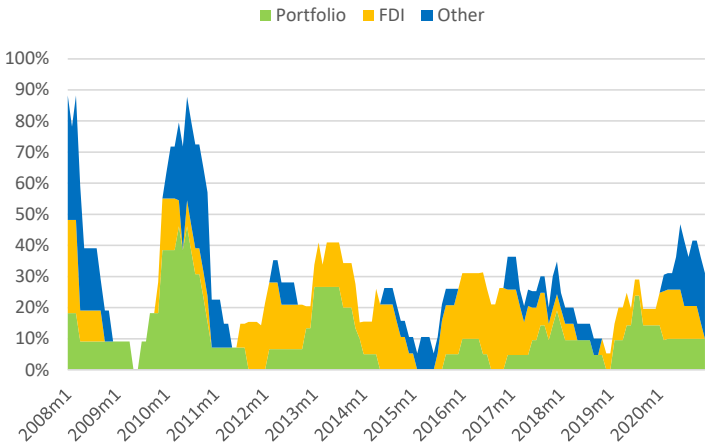


Figure 13. Surges - AEs



Note: Share of countries experiencing an extreme episode by flow type. Exceeds 100% if countries face episodes in several capital flow types.

Country-specific analysis of extreme episodes in COVID-19

Turning now to a more detailed country specific analysis of extreme episodes during COVID-19, Table 2 presents the country by country occurrence of the four types of episodes in the COVID period. Annex B presents a summary of the episodes recorded for each country.

Regarding surges, most of the surges captured are actually part of a rising longer-term trend that each of these countries were experiencing already before the COVID-19 outbreak, and since March 2020 the trend has abated.

Flights and retrenchment episodes happened in a number of countries, emphasizing the need to look at both non-resident and resident flows, to get a full picture of capital flow patterns in crises.

Table 2: Summary of the identification of extreme episodes

Country	*Stop*	*Surge*	*Flight*	*Retrench*
Belgium		X	XX	
Brazil	X		X	
Bulgaria			X	X
Chile	X	X	XX	
Croatia				
Czech Republic				X
Denmark		XX	XXX	
Estonia		X	XX	X
Finland	X		X	
France	XX			XX
Germany	X	X	X	X
Greece	X		X	
Hungary				
Iceland				
India				
Italy	X	X		X
Japan	X	X	X	
Korea			X	XX
Latvia		X	XX	
Lebanon	X		XX	

Country	*Stop*	*Surge*	*Flight*	*Retrench*
Lithuania	X	X	X	X
Luxemb.	X		X	
Mexico				
Mongolia	X		X	
Netherlands				
Pakistan				
Philippines	XXXX		X	X
Poland	X			X
Portugal				
Romania	X	XX		X
Slovakia				
Slovenia	X	X		
South Africa				
Spain	X			
Sri Lanka				
Sweden			X	
Thailand			XX	
Turkey				X
Ukraine	X		X	
US	X	X		

Source: Authors' calculations based on OECD Monthly Capital Flow Dataset.
Note: The presence of more than one "X" indicates that the country has experienced an extreme episode in more than one category (debt, equity, FDIs, banking). For example, France has recorded a sudden stop in both FDIs and banking flows and this is represented with two "X". For the purpose of this table the focus is on the initial COVID-19 shock (first 2 quarters of 2020).

5 Drivers of Extreme Capital Flow Episodes

This section now uses the monthly extreme capital flow episodes computed in the previous section and revisits their determinants 1) at monthly frequency, 2) with and without the COVID period.

5.1. The shifting drivers of extreme capital flow episodes post-GFC

The large literature cited above, which quantified extreme events, provided important evidence on the determinants of different extreme capital flow episodes.

Regarding surges, domestic factors appear to play a larger role in explaining surges into EMEs than AEs, with overvalued currencies, regional contagion and strong growth and natural resource abundance increasing the likelihood of surges (Ghosh *et al.*, 2014; Calderón and Kubota, 2019). On the push side, low interest rates in advanced economies, decreased economic uncertainty, low global risk aversion, and sustained global growth predict the incidence of surges (Forbes and Warnock, 2012; Ghosh *et al.*, 2014).

Sudden stops and retrenchments are more likely when the growth of the domestic economy is below performance, when risk aversion spikes, and when global growth slows (Forbes and Warnock, 2012).

Flights are more likely when there are high external savings, especially in natural resource abundant countries. Rising financial openness increases the likelihood of both stops and flights, while rising risk aversion reduces the risk of flights (Calderón and Kubota, 2013).

Additional papers have noted that the likelihood of transitioning from surges to stops is not high, with more than half of all surges ending in normal episodes (Mercado, 2018), and provided evidence that economies with more volatile output growth, and more financially developed economies tend to have higher likelihood of moving from surge to stops (Mercado, 2019).

More recently, FW reran their model on an extended sample, including the post-crisis quarters, and highlighted striking changes in the post-crisis sample, with most variables becoming insignificant drivers of extreme episodes (Forbes and Warnock, 2020).

This section closely replicates their analysis using the above described classification of extreme episodes, moving from a quarterly to a monthly frequency. Specifically, the following model is run:

$$Prob(e_{cm} = 1) = F(\varphi_{m-1}^{Global}\beta_G) \qquad (2)$$

where e_{cm} is an episode dummy variable that takes the value of 1 if country *c* is experiencing an extreme capital flow episode (surge, stop, flight, or retrenchment) in month m; $\varphi_{m-1}^{Global}\beta_G$ is a vector of global factors lagged by one month.

As mentioned above, the debate surrounding the drivers of extreme episodes in the post crisis period focuses on the role of global factors and the global financial cycle. Domestic factors are thus left aside in this section to focus on global factors. Monthly data on domestic developments are also less frequently available with longer time series so the focus on global factors maximizes the number of observations. Domestic determinants are explored at length in the next empirical exercise on the COVID-19 episode specifically.

Most of the global factors used in the quarterly extreme episode literature are available at monthly frequency. Notably, all five global factors in FW (2020) can be available or proxied: advanced economies monetary policy, global GDP growth, global money supply, global risk aversion, and global oil prices. Global risk aversion is proxied with the VIX. Global liquidity is proxied with the average of the US, JP, EA M2 stock and of the UK M4 stock. For monetary policy, this paper follows FW (2020) by using the shadow Interest rates data collected by Krippner (2013), which captures unconventional monetary policy at the zero lower bound and averages the shadow rates for US, JP, EA, and UK. Using data for all key advanced economies is in line with recent work that points to the usefulness of going beyond US-only data to account for global factors (Mcquade and Schmitz, 2019; Scheubel, Stracca and Tille, 2019). Oil price growth is the year on year change In WTI oil prices.

Proxying global GDP growth at monthly frequency is more difficult, a recent body of literature discusses the forecasting power of a range of proxies at monthly frequency. Among the best performing indicators are the Kilian Index of global real economic activity available monthly and constructed from ocean bulk dry cargo freight rates (Kilian and Zhou, 2018), the global economic conditions index (Baumeister, Korobilis and Lee, 2021) which summarizes 16 monthly economic and financial indicators, and an Index of Industrial production for OECD and 6 major non-member economies (Brazil, China, India, Indonesia, the Russian Federation, and South Africa) (Baumeister and Hamilton, 2019). The latter is used as the first correlates more than 50% with oil prices which is separately included in the regressions, and as the second correlates more than 50% with the VIX. The data on global Industrial production is from the OECD Main Indicators Database, extended by Baumeister and Hamilton (2019).

All the data sources and descriptions can be found in Table A2. All variables are lagged by one period.

Because episodes occur irregularly, the distribution of the cumulative distribution function $F(\cdot)$ is asymmetric. Again, the approach by FW (2020) using the complementary logarithmic (or cloglog) framework is followed, being suitable for extreme value distribution, and in using a seemingly unrelated estimation technique that allows for cross-episode correlation in the error terms[5]. Standard errors are also clustered by country.

The results predicting each of the extreme capital flow episodes can be found in Tables A3, A4, A5 and A6 for stops, surges, retrenchments and flights respectively, for the full country sample of 41 economies. For each type of episode, separate regressions are provided for each type of flows (portfolio, debt, equity, FDI and other), and split between the full unbalanced panel covering pre and post GFC, a pre-GFC sample, a post-GFC sample excluding 2020 and COVID-19, and a post-GFC sample including 2020 [6]. Such sample splits allow us to assess the shifting drivers of extreme episodes in the pre and post GFC but also see whether COVID changed the picture.

[5] As noted in FW (2012), this captures the fact that the covariance matrix across episodes is not zero, without having a model of interactions between episodes.

[6] 2009m1 is used as break month to split the panel between pre and post-GFC following Avdjiev et al (2020) who found 2009q1 to be the structural break in the drivers of banking flows.

In the full sample (1995-2020), results are broadly consistent with existing literature using total flows and a lower frequency, confirming the crucial role of most global factors, albeit with interesting heterogeneity across types of flows which has been overlooked by past literature:

Starting with **surges**: lower risk aversion leads to higher likelihood of portfolio and equity surges; Increased global liquidity drives surges in portfolio and other investment Inflows; global monetary policy is insignificant; increasing global oil prices lead to more likely surges of portfolio Inflows; and higher Industrial production leads to higher chances of FDI and banking surges and counterintuitively to less portfolio Inflow surge.

Moving to **stops**: results confirm the role of increasing global risk aversion in driving the likelihood of portfolio inflow stops (both debt and equity); easier global monetary policy lead to higher likelihood of stops across the board for all types of flows; decreasing global activity leads unsurprisingly to stops in FDI and banking flows, while global liquidity and oil prices are found Insignificant.

Turning to **flights**: global risk aversion Is associated with less portfolio (debt) flights, but more FDI and other Investment flights; global liquidity leads to more equity and banking flights, while Industrial production leads to FDI flights and oil prices Is Insignificant.

Finally regarding **retrenchments**, a spiking VIX is a strong predictor of retrenchments across the board with cuts in outward investment and home bias in periods of uncertainty. Easier global monetary policy also lead to retrenchments for all flows, while lower global economic activity leads to FDI and banking retrenchments.

The next results explore in more details the shifting drivers of extreme episodes from pre-GFC to the post-GFC to the recent COVID episodes.

Comparing the **pre-GFC and the post-GFC excluding the COVID period**, two striking patterns appear: on the one hand, a structurally lower explanatory power of global factors in explaining extreme episodes; and on the other, a much more prominent role of global oil prices, which were generally insignificant in the pre-GFC sample, in driving episodes.

Specifically, global risk aversion has no explanatory power for surges for all types of flows, and loses significance for banking stops, banking flights and banking retrenchments. Advanced economy monetary policy loses its significance for stops, flights, and retrenchments. And global money supply has no impact anymore on sudden stops.

In contrast, oil prices are now a significant driver of portfolio (debt and equity) surges, of portfolio and banking stops (when prices drop), and of flights (FDI and banking) and retrenchments (portfolio and banking, when prices drop).

The exercise is also repeated for stops and surges splitting the sample along EMEs and AEs in Tables A7 and A8 which provides yet further insights. First, surges are very poorly explained by global factors even in the pre-GFC period for advanced economies, while they do explain EME surges. Second, the drop of explanatory power of monetary policy post-GFC is specific to EMEs and is in contrast to the widely held conclusion that advanced economies monetary policy led to the taper tantrum sudden stops in EM, and more in line with recent reconsideration of the role played by US monetary policy during the taper tantrum (Clark *et al.*, 2020). Third, the new role of oil prices in explaining stops is specific to EMEs, which thus be more sensitive to oil and commodity cycles. Finally, drops in global economic activity lead to stops in AE but not in EMEs where region or country-specific business cycles may be more relevant.

Overall, the lower power of the VIX in driving banking flows extreme episodes specifically is in line with Avdjiev et al (2020) study of banking flows, which explains this lower sensitivity by the increase in the lending share of better capitalized banking system. Regarding monetary policy which they highlight as a stronger post crisis driver, the results show that its relevance decreases in the longer

run, as 5 additional years of data are added in this paper. The relatively weaker role of global factors in the post crisis period is consistent with recent papers at quarterly frequency by Forbes and Warnock (2020)[7], which provided evidence of the less important role of global factors such as risk and global growth in driving extreme episodes, and Goldberg and Krogstrup (2018) found that risk measures have played a less prominent role in driving flows over the last decade.

5.2. Global factors and extreme episodes in COVID-19: does the addition of a new "risk-on" period paint a different picture?

Has the COVID-19 episode changed this picture? Can an additional 12 months of data paint a different story for the post-GFC period?

This section now turns to the COVID-19 period specifically, which featured exceptional developments in most of the variables tested in the previous section. In March 2020, the VIX spiked to exceptional levels, global oil prices plummeted (Figure 14 and 15), and the money supply by central banks expanded dramatically in a second stage.

Comparison between the post-GFC regressions excluding and including COVID is provided in the last 8 columns of Tables A3 to A6.

While other investment (banking) episodes were poorly explained by global factors before COVID-19, extending the sample to 2020 leads to the comeback of their explanatory power, especially for resident flows: a spiking VIX and a drop in global activity leads to higher banking flows flight - as can be seen by 2020 advanced economies banking outflows. Monetary policy also becomes relevant in risk-on periods for banking flows episodes, with easier policy being associated with more stops and more retrenchments.

Beyond banking flows, there is no general "come back" of global factors in explaining extreme episodes when adding COVID-19. In fact, coefficients appear generally of smaller magnitude and less significant than in the pre-COVID post-GFC period.

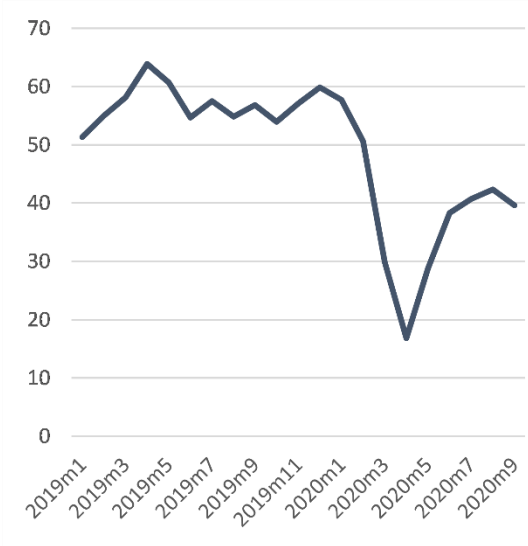
Focusing specifically on portfolio inflow stops, which have been the most striking and debated consequence of the COVID-19 shock, an increasing VIX is associated with more portfolio stops, but the coefficients are 4 times smaller than in the 2009-2019 period. Only oil prices display coefficients of same magnitude and significance. Monetary policy, global liquidity, and global economic activity are insignificant predictors of portfolio stops in the 2009-2020 period.

[7] A detailed comparison between these results and Forbes and Warnock (2020) quarterly results is not possible due to different country sample. Nonetheless, the present results using a more precise identification at monthly frequency, as well as the resulting much larger number of observations in the post crisis period, broadly confirm their findings.

Figure 14. VIX

Source: FRED

Figure 15. Oil prices



Note: Western Texas Intermediate, USD per barrel
Source: FRED

For the sake of illustration, the rest of this section provides simple in and out of sample predictions of the likelihood of stops in the COVID-19 period, fitting the COVID-19 data to 4 models:

- The full sample model (pre and post crisis) – in sample
- The post-GFC model – in sample
- The full sample model (pre and post crisis) rerun excluding the COVID period by ending the time series in 2020m1 – out of sample
- The post-GFC model rerun excluding the COVID period by ending the time series in 2020m1 – out of sample

That is: what would the models have predicted in terms of likelihood of stops with the shock experienced during the COVID-19 period (The in-sample models obviously benefitting from the COVID-19 extreme episode to fit the model)? Results are summarized in Table 3.

Table 3: Predicted likelihood of portfolio inflow stop based on March 2020 values

	In sample (up to 2020m12)		Out of sample (up to 2020m1)	
	Full sample	Post GFC	Full sample	Post GFC
Portfolio stop	0.41 ***	0.24 ***	0.72 ***	0.60 ***
Equity stop	0.40 ***	0.23 ***	0.72 ***	0.58 ***
Debt stop	0.39 ***	0.30 ***	0.54 ***	0.48 ***

Note: Margins of cloglog regressions, setting all predictors (the lagged change in the global money supply, the change in the VIX, the change in AE long term government bond yield and the growth of oil prices) at March 2020 values. In sample predictions based on all observations. Out of sample predictions based on observations until 2020m1. * p<0.10,** p<0.05,*** p<0.01

The full model until 2020m1 would thus have predicted a likelihood of stops above 72%. If we are to believe financial systems have undergone important structural transformations post-GFC which

importantly change the determinants of cross border capital flows, the predicted likelihood is lower but still above 60%.

Taking into account the COVID-19 observations ex-post to better fit the models, likelihood drops to around 40% in the full sample and 24% in the post crisis model.

These results have two implications: 1) the role of global factors may have further lost explanatory power in the post crisis period including COVID, 2) the difference between the predicted and the actual experience of extreme episodes as well as the important cross-country heterogeneity in capital flow dynamics during COVID has to be explained by country specific factors, which is what the next section is about.

6 The role of country-specific factors as key drivers of COVID-19 capital flow heterogeneity

This section turns to the role of country-specific drivers of COVID-19 capital flow dynamics, that may explain the heterogeneity highlighted in Section 3.2.

For this exercise, the dependent variable is changed back to flows rather than the likelihood of extreme episodes for several reasons: 1) the focus on a specific crisis limits the number of extreme episodes entering the regressions, thus weakening the robustness of the analysis; 2) the methodology for identifying capital flow episodes by definition comes with a lag, so new countries may be flagged as having experienced an extreme episode in the beginning of 2020 when new data will become available; 3) in this section, the analysis is narrowed to portfolio flows which have been hit the hardest more vulnerabilities in COVID-19; directly analysing portfolio flows thus allows us to capture in the same regressions different types of episodes.

A number of preliminary attempts to analyse the drivers of capital movements during COVID-19 have been produced in recent months. El Fayoumi and Hengge (2020) use weekly data on mutual funds from EPFR during COVID-19, which allow for a substantial number of observations and better identification. They find 1) that domestic infections were initially having a negative impact on flows, which then became positive reflecting, according to them, increased demand for financing by affected economies, 2) that both lockdown and fiscal measures supported flows, and 3) that easier monetary policy in advanced economies led to cumulative declines in flows. In similar work using EPFR data, IMF analysis highlights that outflows were largely driven by spiking global risk aversion, which explained as much as 45% of the variance of EPFR flows. It also found that deteriorating terms of trade, a higher share of tourism in exports, no access to Federal Reserve swap lines, and higher weekly change in COVID-19 cases led to more outflows.

As outlined in Section 2, EPFR data captures less than a quarter of BoP portfolio flows, so the present data captures the drivers of all portfolio flows at the detriment of lower frequency. Monthly

rather than weekly frequency also allows us to test more potential drivers of flows. BoP flows tend to be significantly less sensitive to the VIX than EPFR flows, as also highlighted in the previous section, so the extent to which global factors drove flows in the COVID-19 crisis is an open question. On the other hand, it considerably diminishes the number of observations.

The new model becomes:

$$Y_{cm} = \alpha + \beta_G X_m^{Global} + \beta_D X_{cm}^{Domestic} + \beta_{pC}(X_c^{PreCOVID} * X_m^{Global}) + \delta_c \quad (3)$$

where Y_{cm} represents alternatively portfolio, debt, and equity inflows, scaled by GDP for each country *c* in month m; X_m^{Global} represent global factors (here the Vix); $X_{cm}^{Domestic}$ is a vector of domestic variables, including country-specific COVID-19 developments; $X_c^{PreCOVID} * X_m^{Global}$ is an interaction term between global factors and pre-COVID-19 macroeconomic vulnerabilities (the latter of which is set at the latest available data point before January 2020 and held constant in the panel). Country fixed effects δ_c are included to control for unobservable country-specific characteristics, which have been constant over the period studied. Robust standard errors, clustered by country, are used.

Equation (3) is estimated over the specific period of interest, namely from January 2020 to the end of the summer (August) to capture the first wave of COVID-19 and exclude the recovery in flows.

As inherent to any of such exercises focusing on short specific episodes with aggregate panel data, the small number of observations in the regressions may make the results especially sensitive to changes in sample or model parameters. The covariates are selected with the aim to ensure a relatively balanced sample and restrict ourselves to parsimonious models. While recognizing the caveats, the below regressions still provide interesting suggestive evidence on the drivers of flows in this episode.

The data sources and description of all variables are displayed in Table A2. The results from the various regressions are summarised in Table 4 along three key categories:

1) domestic macroeconomic developments during the COVID-19 crisis;

2) country-specific COVID-19 situation and policies;

3) pre-pandemic vulnerabilities

for each type of flows and split between regressions ran on an Advanced Economies (AE) sample and regressions ran on emerging markets (EME) sample.

As the VIX provides the single best global predictor of capital flows in the COVID-19 period (1st line of Table 4), it is included in every regression to proxy global factors. As detailed in Equation (3), pre-pandemic vulnerabilities enter as interaction terms with the VIX. The present estimates would thus provide information on which pre-crisis vulnerabilities amplify or mitigate the impact of global risk aversion on capital flows.

Table 4. Summary of coefficients for key variables of interest

		AE			EME		
		Portfolio	Debt	Equity	Portfolio	Debt	Equity
	Vix (log)	-1.123**	-0.818*	-0.305**	-0.619**	-0.371	-0.262**
Domestic	Terms trade yoy (t-1)	0.013	0.012	0.002*	0.004	0.005	-0.001
	Stock prices yoy (t-1)	-0.004	-0.004	0.000	-0.001	-0.001	-0.000
	GDP tracker (t-1)	-0.008	-0.022	0.014**	0.026**	0.014	0.017**
	Fed swap (t-1)	0.371	0.340	0.031	0.056	-0.012	0.066*
	Policy rate (t-1)	-0.213	-0.202	-0.011	0.001	0.003	0.005
COVID	COVID deaths (log)	-0.113*	-0.060	-0.053***	-0.089**	-0.058	-0.035
	COVID deaths per cap	-644.063	-236.292	-407.771	-925.133	-720.268	-233.553
	COVID cases per cap	-115.932	-53.227	-62.705*	-16.189	-12.526	-4.569
	Stringency index (t-1)	-0.010	-0.005	-0.005**	-0.003	0.000	-0.003**
	Containment/Health index (t-1)	-0.009	-0.004	-0.005**	-0.001	0.001	-0.002**
	Economic support index (t-1)	0.006	0.009	-0.003	0.002	0.001	0.001
Pre-COVID vulnerabilities	Vix * 2019 Current account/GDP	-0.151	-0.075	-0.075	0.132*	0.108	0.026
	Vix * 2019 Reserves/GDP	7.531***	7.042***	0.489	1.816	1.995	-0.059
	Vix * 2019 Reserves/Imports	0.067	0.066	0.001	-0.019	-0.024	-0.000
	Vix * 2019 Reserves/ST Debt				0.318	0.243	0.073
	Vix * 2019Q4 Policy rate diff.	0.312	0.255	0.056	0.017*	0.012	0.006
	Vix * 2019 Gov Debt/GDP	-0.012	-0.011	-0.000	0.008	0.005	0.003

Note: This table summarizes the coefficients from the separate regressions in Tables A9, A10 and A11. All regressions include the VIX in addition to the variable of interest or the interaction term between the variable of interest and the VIX in the case of pre-COVID-19 vulnerabilities. * p<0.10,** p<0.05,*** p<0.01

6.1. COVID-19 capital flows and domestic macroeconomic developments

The first set of regressions studies the impact of a few country-specific macroeconomic developments for which data is available at a monthly frequency, namely: the year-on-year change in the terms of trade, the year-on-year change in stock prices, whether the country has been eligible for swap lines with the US Federal Reserve (lagged by a month), and the domestic central bank policy rate (lagged too).

The recent innovative weekly activity tracker developed by the OECD using Google Trends (Woloszko, 2020) is also used, aggregated at the monthly frequency (period average) to proxy GDP growth in the period. As explained in Woloszko (2020), the OECD Weekly Tracker can be interpreted as an estimate of the year-on-year growth rate of "weekly GDP". The tracker covers virtually all countries in the capital flow country sample and is available from 2017.

Other factors such as the introduction of an IMF program during the period would be important but this is not a relevant feature for this specific sample of countries.

Results are presented in Tables A9 and can be summarized as follows:

- Higher GDP/activity growth as proxied by the tracker overall is strongly associated with higher equity flows to both AEs and EMEs;
- An improvement in the terms of trade was associated with higher portfolio flows to AEs.
- Stock price growth was an insignificant predictor over the period.

- The presence of a bilateral Fed swap line with a specific country is also associated with higher equity inflows to that country. [8]
- Central bank policy rates are not found to have a significant effect.

6.2. COVID-19 capital flows and pandemic-related developments

To capture the impact of pandemic-related developments on capital flows, both health and policy aspects are included: namely the absolute number of COVID-19 deaths (logged), the number of COVID-19 deaths and cases per capita, as well as lockdown stringency; containment and health; and economic support indices taken from the University of Oxford COVID-19 government response tracker.

Results are presented in Table A10 and show that COVID-19 related variables have had impact on portfolio flows to both AE and EMEs:

- An increase in COVID-19 deaths have had a negative impact on portfolio flows in both AEs and EMEs generally, and a strong negative impact on equity inflows to AEs.
- The stringency of lockdowns and of health and containment policies have also had a negative impact on flows, possibly due to their negative impact on domestic economies.
- There are no significant coefficients for the economic support index in either increasing or decreasing portfolio flows.

6.3. COVID-19 capital flows and pre-pandemic vulnerabilities

To analyse which pre-crisis vulnerabilities amplify or mitigate the impact of global risk aversion on capital flows, regressions test the impact of the pre-crisis level of government debt (% GDP), the pre-crisis policy rate differential with the US to proxy for monetary policy space, the pre-crisis level of current account (% GDP), and the pre-crisis level of international reserves (% GDP, % imports, % short term debt).

Results are presented in Tables A11. Pre-crisis vulnerabilities play a role for some of the variables:

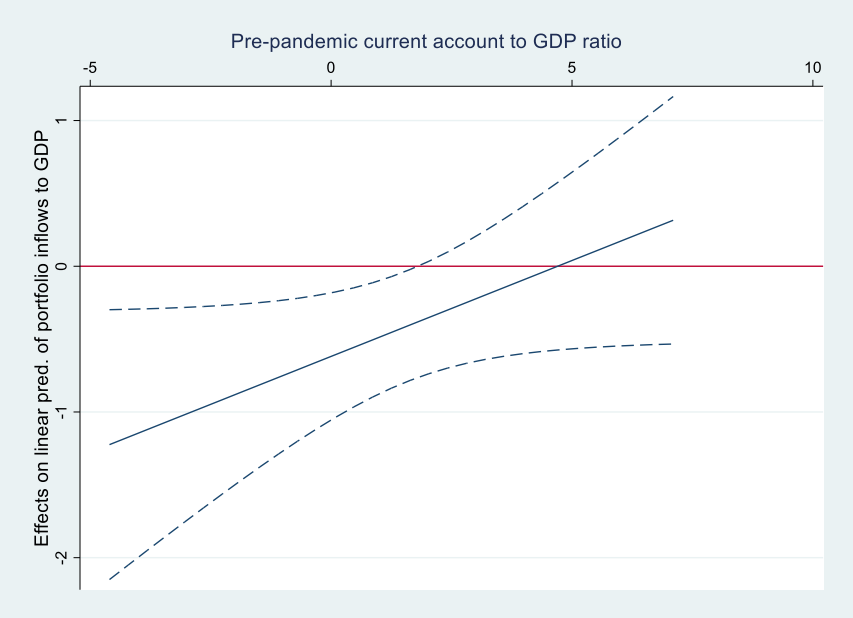
- The level of international reserves, albeit with positive coefficient, is surprisingly not associated significantly with portfolio flows to EMEs. It may be that the model is not suited for picking up this role or that what matters is the actual use of these reserves during the crisis rather than their level in the previous year. The level of reserves-to-GDP is significantly associated with a lower impact of the VIX on portfolio flows to AEs, specifically debt flows.
- A higher current account surplus (or lower deficit) pre-crisis is mitigating the risk to portfolio flows from spikes in global risk aversion in EMEs.
- A higher interest rate differential pre-crisis, which proxies the monetary policy space pre-crisis mitigated in EMEs the risk to portfolio flows too.[9]

These interactions effects for EMEs are represented in Figure 16 and 17.

[8] The Fed extended swap lines to the central banks of Canada, Japan, Brazil, Mexico, Sweden, Korea and the ECB. When including swap lines extended by the ECB (to Bulgaria, Denmark, and Croatia), the coefficient turns insignificant. Repo facilities by the Fed and the ECB are not considered.

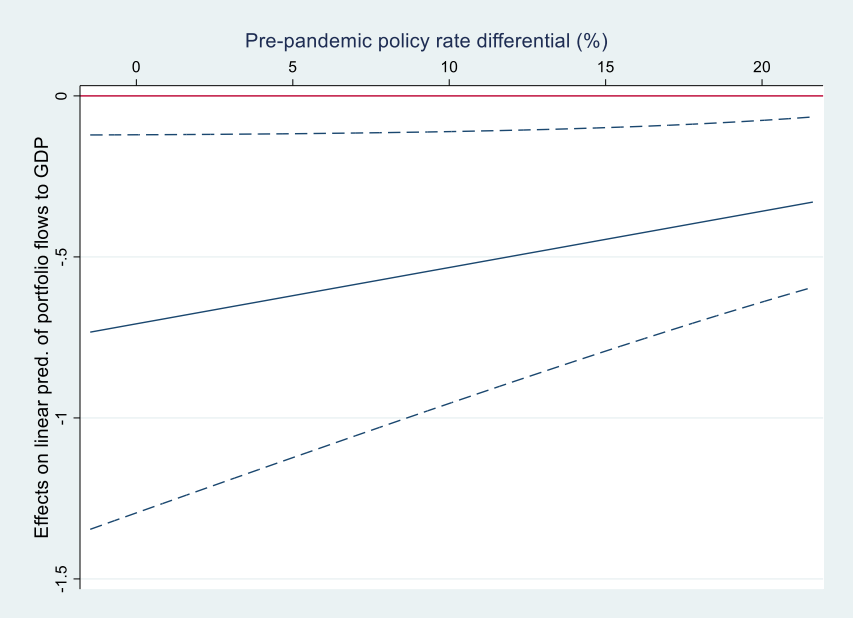
[9] And EMEs did cut monetary policy substantially this time around (Gelos, Rawat and Ye, 2020).

Figure 16. Impact of pre-pandemic current account deficit on sensitivity of portfolio flows to global risk aversion



Note: Conditional marginal effects from interaction term between the log of the VIX and the 2019 current account to GDP ratio, with 95% confidence interval. EME sample.

Figure 17. Impact of pre-pandemic interest rate differential on sensitivity of portfolio flows to global risk aversion



Note: Conditional marginal effects from interaction term between the log of the VIX and the 2019Q4 policy rate differential with the US, with 95% confidence interval. EME sample.

7 Conclusions

The COVID-19 pandemic triggered a sudden global funding squeeze, of large magnitude, highlighted in major disruptions in international capital flows. Although the shock was of a global scale, countries have been hit in different ways.

This paper contributes to the efforts to better understand this shock and important cross-country heterogeneity by constructing a new granular dataset of gross capital flows for 41 countries at monthly frequency, better suited to identify sudden shocks than traditional quarterly BoP data.

Leveraging on such dataset, this paper provides a more granular identification of all extreme capital flow episodes since the GFC. It contributes to the existing literature by adapting the methodology originally conceived for quarterly data to monthly data. Therefore, this paper provided a detailed monthly mapping of the extreme episodes that have occurred in a sample of 41 countries, with a breakdown by instrument.

Under these most precisely identified episodes, the findings point to a much less predominant role of global factors as drivers of capital flow episodes than in the pre-GFC period, with the exception of global oil prices which make a striking entry as predictor of extreme episodes post-crisis.

Has the COVID-19 episode significantly changed that picture? It appears that the answer is no. In fact, with the exception of banking flows which become more sensitive to global factors in risk-on period, global factors further lose economic and statistical significance when 2020 data are added to the models. These results have two implications: 1) the role of global factors may have further lost explanatory power in the post crisis period including COVID, 2) the difference between the predicted and the actual experience of extreme episodes as well as the important cross-country heterogeneity in capital flow dynamics during COVID has to be explained by country specific factors. COVID-related factors such as the number of COVID deaths or the stringency of health-related restrictions, domestic macroeconomic variables such as activity trackers, the extension of swap lines, and pre-COVID financial vulnerabilities all appear significant predictors of portfolio flows during these months.

Avenues for further research include continuing to investigate the policies that can help countries build up financial resilience, which could help them weather both current and future crises, and policies to use in crisis times. During COVID-19, countries responded first and foremost by intervening in the FX market to support depreciating currencies. Several central banks established or expanded bilateral swap lines. Few countries resorted to capital controls on outflows, with EMEs' policy responses in the capital flows area being focused instead on relaxing rules on inflows to ease liquidity and increase access to foreign funding (OECD, 2020). A number of EME central banks implemented quantitative easing programmes for the first time by purchasing long-term, local currency government bonds (Arslan, Drehmann and Hofmann, 2020). Further research can detail which policies prove effective in risk-on/off periods.

Another aspect that should be better analysed is the role that various actors have played in triggering different types of extreme episodes, compared to previous crises, and in particular of non-bank financial institutions, which as highlighted in the present paper, have played an important role in the COVID-19 episode. The weaker relevance of global factors in driving extreme episodes may indeed be related to the different behaviour of these institutions, which provides a promising research agenda.

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Annex A. Supplementary material

Table A1 – Sources for OECD capital flow dataset

Country	Source	Flow covered
Belgium	National Bank of Belgium	All
Brazil	Banco Central do Brasil	All
Bulgaria	Bulgarian National Bank	All
Chile	Central Bank of Chile	All
Croatia	European Central Bank	All
Czech Republic	Czech National Bank	All
Denmark	Danmarks Nationalbank	All
Estonia	Bank of Estonia	All
Finland	Statistics Finland	All
France	INSEE - National Institute for Statistics and Economic Studies	All
Germany	European Central Bank	All
Greece	Bank of Greece	All
Hungary	National Bank of Hungary	All
Iceland	Central Bank of Iceland	Portfolio
India	Reserve Bank of India	FDI/Portfolio
Indonesia	Ministry of Finance	Portfolio debt inflows
Italy	Bank of Italy	All
Japan	Bank of Japan/Ministry of Finance	All
Korea	Bank of Korea	All
Latvia	Bank of Latvia	All
Lebanon	Banque du Liban	All
Lithuania	Bank of Lithuania	All
Luxembourg	European Central Bank	All
Malaysia	Bank Negara Malaysia	Portfolio debt inflows
Mexico	Banco de Mexico	Portfolio inflows
Mongolia	Bank of Mongolia	All
Netherlands	European Central Bank	All
Pakistan	State Bank of Pakistan	All
Philippines	Bangko Sentral ng Pilipinas	All
Poland	National Bank of Poland	All
Portugal	Banco do Portugal	All
Romania	National Bank of Romania	All
Slovakia	European Central Bank	All
Slovenia	Bank of Slovenia	All
Spain	Banco de Espana	All
South Africa	South African Reserve Bank	Portfolio inflows
Sri Lanka	Central Bank of Sri Lanka	Portfolio inflows
Sweden	European Central Bank	All
Thailand	Bank of Thailand	All
Turkey	Central Bank of the Republic of Turkey	All
Ukraine	National Bank of Ukraine	All
United States	US Treasury	Portfolio

Table A2 – Other variables sources and definitions

Variable Sources		
Indicators	**Description**	**Data source**
Capital flows	Monthly gross capital inflows and outflows, split by instrument (FDI, portfolio equity, portfolio debt, other)	OECD Monthly Capital Flow Dataset based on national sources
VIX	Monthly Implied quarterly volatility	FRED
Global monetary policy	Average of monthly average shadow interest rates for the US, the UK, JP and the EA	Krippner (2021) explained In Krippner (2013)
Global liquidity	Average of monthly M2 money stock for the United States, Japan, and the Euro Area and monthly M4 money stock of the United Kingdom	FRED
Policy Rate	Monthly policy rate	BIS
Global industrial production	Monthly index of industrial production weighted for OECD + 6 major non-OECD (Brazil, China, India, Indonesia, the Russian Federation, South Africa). We follow Hamilton (2018) in extracting the cyclical component of the series by simply using the difference between the natural logarithm at t and the one at t-24 (2 years earlier)	OECD MEI, updated by Baumeister and Hamilton (2019)
Global oil prices	Monthly Crude oil prices, Western Texas Intermediate, dollars per barrel	FRED
Domestic stock prices	Monthly Share prices, index	OECD MEI
Domestic GDP growth	Weekly OECD GDP tracker, aggregated monthly, end of period	Woloszko (2020)
COVID-19 deaths and cases	Monthly COVID-19 deaths and cases, logged or scaled by population	Hu et al (2020), IMF WEO
Stringency Index, Containment and Health Index, Economic Support Index	Weekly Indices ranging from 1 to 100 Stringency Index: records the strictness of 'lockdown style' policies that primarily restrict people's behaviour Containment and Health Index: combines 'lockdown' restrictions and closures with measures such as testing policy and contact tracing, short term investment in healthcare, as well investments in vaccine Economic Support Index: records measures such as income support and debt relief	University of Oxford COVID Government Response Tracker
Terms of trade	Monthly IMF Commodity Net Export Price Index: individual commodities weighted by ratio of net exports to GDP, rolling weights. June 2012=100. Methodology based on Gruss and Kebhaj (2019)	IMF Commodity Terms of Trade
Fed swaps	Dummy that takes the value of 1 if the country has entered in a bilateral swap agreement with the US Federal Reserve	Authors' calculations
International reserves to short term debt	Annual data, reserves to short term debt	IMF ARA dataset
Current account-to-GDP	Annual data	IMF WEO
Policy rate differential	Domestic central bank policy rate – US policy rate	BIS
Government debt-to-GDP	Annual data, General government debt-to-GDP	IMF WEO

Table A3: Drivers of Stops - Full Sample

	Stop - Full sample					Stop - Pre GFC					Stop - post GFC without COVID					Stop - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	-0.01	-0.01	-0.01	0.02	-0.00	-0.00	-0.03	-0.02	-0.00	0.01	0.01	0.01	0.01	0.02	0.03*	-0.02	0.00	-0.02	0.02	-0.01
	(0.010)	(0.011)	(0.012)	(0.013)	(0.010)	(0.020)	(0.023)	(0.023)	(0.031)	(0.018)	(0.023)	(0.021)	(0.023)	(0.018)	(0.020)	(0.016)	(0.013)	(0.016)	(0.019)	(0.016)
Vix yoy (t-1)	0.04***	0.03***	0.04***	0.00	0.01	0.05***	0.06***	0.04***	-0.02	0.03**	0.04***	0.02**	0.04**	-0.00	0.02	0.01**	0.01*	0.01	0.00	0.00
	(0.006)	(0.007)	(0.008)	(0.011)	(0.010)	(0.012)	(0.012)	(0.012)	(0.017)	(0.013)	(0.012)	(0.010)	(0.016)	(0.013)	(0.015)	(0.007)	(0.008)	(0.011)	(0.011)	(0.010)
Global monetary policy (t-1)	-0.37***	-0.28***	-0.25**	-0.30**	-0.42**	-0.65**	-0.45	-0.76***	-0.40	-0.43	-0.15	-0.19	0.08	-0.16	-0.09	-0.20	-0.21	0.02	-0.20	-0.34**
	(0.111)	(0.096)	(0.119)	(0.138)	(0.166)	(0.259)	(0.305)	(0.195)	(0.293)	(0.300)	(0.128)	(0.143)	(0.121)	(0.188)	(0.187)	(0.133)	(0.136)	(0.130)	(0.165)	(0.167)
Global Oil prices yoy (t-1)	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.01	0.01	0.00	-0.01	-0.01*	-0.01**	-0.01	-0.00	-0.01**	-0.01*	-0.01**	-0.01	-0.00	-0.01
	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.008)	(0.007)	(0.009)	(0.006)	(0.010)	(0.007)	(0.006)	(0.007)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)	(0.004)	(0.004)
Global industrial prod. yoy (t-1)	4.65*	3.01	1.03	-4.51*	-6.67***	13.33**	10.38	13.24**	-10.67*	-4.11	-0.31	2.00	-7.28**	-6.71	-15.53***	1.99	2.59	-3.97	-5.87*	-8.70***
	(2.448)	(2.451)	(2.345)	(2.416)	(1.496)	(6.430)	(9.417)	(6.174)	(6.031)	(5.321)	(3.723)	(4.388)	(2.939)	(4.708)	(3.718)	(3.222)	(3.427)	(2.562)	(3.390)	(2.159)
Observations	5,444	4,819	4,717	4,880	4,618	1,207	1,000	1,000	1,035	916	3,834	3,444	3,364	3,475	3,343	4,237	3,819	3,717	3,845	3,702

Note: Dependent variable is a dummy that equals 1 if the country is in a stop in the given month. Complementary logarithmic (cloglog) regressions. To account for covariance across episodes, the set of four episodes is estimated using seemingly unrelated regressions with robust standard errors clustered by country. Highlighted cells In the post GFC without COVID period highlight the differences in drivers compared to the pre-GFC period, and highlighted cells In the post-GFC with COVID period highlight differences with the post-GFC without COVID. * p<0.10,** p<0.05,*** p<0.01

Table A4: Drivers of Surges - Full Sample

	Surge - Full sample					Surge - Pre GFC					Surge - post GFC without COVID					Surge - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	0.02*	0.01	0.02	0.01	0.03*	0.04**	0.06**	-0.02	-0.01	-0.01	0.00	-0.01	0.03	0.02	-0.01	0.00	-0.00	0.02	0.01	0.02
	(0.012)	(0.014)	(0.013)	(0.015)	(0.015)	(0.021)	(0.028)	(0.020)	(0.028)	(0.021)	(0.024)	(0.020)	(0.022)	(0.021)	(0.033)	(0.019)	(0.016)	(0.019)	(0.015)	(0.025)
Vix yoy (t-1)	-0.02**	-0.00	-0.02**	0.00	0.01	-0.02	0.03	-0.06*	0.01	0.01	-0.01	0.00	0.00	-0.00	-0.01	-0.01	0.00	-0.01	-0.00	0.00
	(0.010)	(0.010)	(0.011)	(0.011)	(0.010)	(0.031)	(0.020)	(0.032)	(0.015)	(0.016)	(0.010)	(0.012)	(0.012)	(0.010)	(0.016)	(0.009)	(0.010)	(0.011)	(0.012)	(0.014)
Global monetary policy (t-1)	-0.06	-0.06	0.07	-0.01	-0.02	0.13	0.25	0.07	-0.02	0.11	-0.19	-0.15	-0.01	-0.03	-0.08	-0.21*	-0.16	-0.05	-0.03	-0.07
	(0.101)	(0.110)	(0.133)	(0.114)	(0.122)	(0.190)	(0.238)	(0.333)	(0.201)	(0.267)	(0.131)	(0.144)	(0.191)	(0.159)	(0.193)	(0.121)	(0.142)	(0.183)	(0.160)	(0.177)
Global Oil prices yoy (t-1)	0.01***	0.01***	0.01*	-0.00	0.01	-0.00	-0.00	-0.00	-0.01**	0.00	0.01***	0.01***	0.01***	-0.00	0.01	0.01***	0.01***	0.01***	0.00	0.01
	(0.002)	(0.002)	(0.003)	(0.003)	(0.006)	(0.008)	(0.006)	(0.009)	(0.004)	(0.007)	(0.002)	(0.003)	(0.004)	(0.005)	(0.008)	(0.002)	(0.003)	(0.003)	(0.005)	(0.008)
Global industrial prod. yoy (t-1)	-3.89**	-2.18	-3.14	6.38**	4.85*	13.25*	8.66	15.99*	14.06	13.89	-8.26**	-4.30	-12.01**	2.91	-3.84	-7.51***	-3.90	-8.87***	2.48	-5.30**
	(1.867)	(2.494)	(2.630)	(2.997)	(2.543)	(7.673)	(10.799)	(8.400)	(10.377)	(9.267)	(3.773)	(3.436)	(4.900)	(3.524)	(3.537)	(2.657)	(2.934)	(3.349)	(2.788)	(2.485)
Observations	5,444	4,819	4,717	4,880	4,618	1,207	1,000	1,000	1,035	916	3,834	3,444	3,364	3,475	3,343	4,237	3,819	3,717	3,845	3,702

Note: Dependent variable is a dummy that equals 1 if the country is in a surge in the given month. Complementary logarithmic (cloglog) regressions. To account for covariance across episodes, the set of four episodes is estimated using seemingly unrelated regressions with robust standard errors clustered by country. Highlighted cells In the post GFC without COVID period highlight the differences in drivers compared to the pre-GFC period, and highlighted cells In the post-GFC with COVID period highlight differences with the post-GFC without COVID. * p<0.10,** p<0.05,*** p<0.01

Table A5: Drivers of Flights - Full Sample

	Flight - Full sample					Flight - Pre GFC					Flight - post GFC without COVID					Flight - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	0.01	0.02	0.04**	-0.01	0.05***	0.01	0.00	0.00	0.01	0.09***	-0.01	-0.01	0.04*	-0.07***	0.00	-0.01	0.00	0.04*	-0.05***	0.02
	(0.012)	(0.016)	(0.017)	(0.015)	(0.013)	(0.018)	(0.026)	(0.033)	(0.026)	(0.021)	(0.018)	(0.019)	(0.021)	(0.023)	(0.023)	(0.016)	(0.018)	(0.021)	(0.018)	(0.015)
Vix yoy (t-1)	-0.03***	-0.02*	-0.01	0.01*	0.01*	-0.06*	-0.07***	-0.01	0.01	0.03*	-0.02*	-0.01	-0.01	0.01	0.01	-0.02**	-0.00	-0.01	0.02*	0.03***
	(0.008)	(0.011)	(0.011)	(0.008)	(0.008)	(0.033)	(0.021)	(0.029)	(0.019)	(0.015)	(0.011)	(0.014)	(0.009)	(0.014)	(0.014)	(0.009)	(0.012)	(0.011)	(0.011)	(0.009)
Global monetary policy (t-1)	0.03	0.01	0.16*	-0.04	0.12	0.45***	0.51**	0.71***	0.08	0.82***	-0.13	-0.16	0.17	-0.20	-0.10	-0.14	-0.16	0.13	-0.20	-0.08
	(0.100)	(0.120)	(0.091)	(0.103)	(0.120)	(0.147)	(0.220)	(0.201)	(0.194)	(0.270)	(0.110)	(0.149)	(0.150)	(0.156)	(0.212)	(0.110)	(0.145)	(0.134)	(0.145)	(0.194)
Global Oil prices yoy (t-1)	-0.00	-0.00	0.00	-0.00	0.00	-0.01	0.01	0.00	-0.01*	-0.01	0.00	0.00	-0.00	0.01*	0.01**	0.00	0.00	0.00	0.01	0.01**
	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.006)	(0.008)	(0.006)	(0.007)	(0.006)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)
Global industrial prod. yoy (t-1)	2.84	4.06	-7.23***	9.78***	-3.85	3.66	1.30	-16.57***	19.18**	-3.13	-0.97	2.78	-12.52***	8.06**	-3.75	-0.63	1.52	-9.97***	5.20*	-7.12*
	(2.060)	(2.858)	(2.707)	(2.198)	(3.366)	(5.824)	(6.776)	(5.618)	(8.979)	(8.258)	(3.740)	(4.731)	(4.335)	(3.267)	(4.792)	(2.640)	(3.587)	(3.029)	(2.766)	(3.749)
Observations	5,444	4,819	4,717	4,880	4,618	1,207	1,000	1,000	1,035	916	3,834	3,444	3,364	3,475	3,343	4,237	3,819	3,717	3,845	3,702

Note: Dependent variable is a dummy that equals 1 if the country is in a flight in the given month. Complementary logarithmic (cloglog) regressions. To account for covariance across episodes, the set of four episodes is estimated using seemingly unrelated regressions with robust standard errors clustered by country. Highlighted cells In the post GFC without COVID period highlight the differences in drivers compared to the pre-GFC period, and highlighted cells In the post-GFC with COVID period highlight differences with the post-GFC without COVID. * p<0.10,** p<0.05,*** p<0.01

Table A6: Drivers of Retrenchments - Full Sample

	Retrench. - Full sample					Retrench. - Pre GFC					Retrench. - post GFC without COVID					Retrench. - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	-0.01	0.00	-0.00	-0.01	-0.01	-0.00	0.05***	-0.01	-0.07**	-0.02	-0.01	0.00	0.03*	0.03*	-0.01	-0.03	-0.02	0.00	0.00	-0.04*
	(0.014)	(0.015)	(0.014)	(0.012)	(0.013)	(0.021)	(0.014)	(0.042)	(0.029)	(0.022)	(0.019)	(0.020)	(0.017)	(0.020)	(0.024)	(0.018)	(0.019)	(0.015)	(0.018)	(0.021)
Vix yoy (t-1)	0.05***	0.04***	0.04***	0.01	0.02***	0.05***	0.07***	0.03	0.01	0.04***	0.07***	0.05***	0.06***	0.01	-0.01	0.04***	0.03***	0.03***	-0.01	-0.02*
	(0.007)	(0.010)	(0.013)	(0.007)	(0.008)	(0.014)	(0.007)	(0.021)	(0.015)	(0.009)	(0.012)	(0.015)	(0.013)	(0.010)	(0.013)	(0.008)	(0.009)	(0.008)	(0.009)	(0.010)
Global monetary policy (t-1)	-0.27**	-0.18	-0.38***	-0.43***	-0.42***	-0.23	0.16	-1.06***	-1.09***	-0.47	-0.21*	-0.16	-0.21	-0.07	-0.01	-0.23*	-0.18	-0.19	-0.18*	-0.22*
	(0.136)	(0.139)	(0.131)	(0.129)	(0.104)	(0.395)	(0.326)	(0.230)	(0.421)	(0.298)	(0.123)	(0.130)	(0.127)	(0.105)	(0.167)	(0.123)	(0.138)	(0.136)	(0.104)	(0.131)
Global Oil prices yoy (t-1)	0.01**	0.00	0.01***	0.00	0.00	0.01	-0.00	0.01	0.01	0.01***	0.01*	0.00	0.01**	-0.00	-0.01**	0.01	0.00	0.01***	0.00	-0.01*
	(0.004)	(0.005)	(0.002)	(0.003)	(0.004)	(0.006)	(0.006)	(0.013)	(0.010)	(0.006)	(0.005)	(0.006)	(0.004)	(0.004)	(0.006)	(0.004)	(0.005)	(0.004)	(0.004)	(0.006)
Global industrial prod. yoy (t-1)	2.71	2.86	3.36	-6.01***	-4.41**	6.65	5.02	8.62	-3.07	-0.73	-2.55	-1.71	-1.54	-12.96***	-15.69***	0.34	0.81	3.07	-8.59***	-9.73***
	(2.909)	(3.974)	(2.630)	(1.862)	(1.966)	(4.266)	(5.282)	(5.992)	(8.767)	(5.247)	(3.708)	(5.448)	(3.795)	(3.583)	(5.201)	(3.113)	(4.559)	(3.175)	(2.545)	(3.231)
Observations	5,444	4,819	4,717	4,880	4,618	1,207	1,000	1,000	1,035	916	3,834	3,444	3,364	3,475	3,343	4,237	3,819	3,717	3,845	3,702

Note: Dependent variable is a dummy that equals 1 if the country is in a retrenchment in the given month. Complementary logarithmic (cloglog) regressions. To account for covariance across episodes, the set of four episodes is estimated using seemingly unrelated regressions with robust standard errors clustered by country. Highlighted cells In the post GFC without COVID period highlight the differences in drivers compared to the pre-GFC period, and highlighted cells In the post-GFC with COVID period highlight differences with the post-GFC without COVID. * p<0.10,** p<0.05,*** p<0.01

Table A7: Drivers of Stops - EME vs AE Sample

AE sample	Stop - Full					Stop - Pre GFC					Stop - post GFC without COVID					Stop - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	-0.02	-0.02	-0.01	0.01	-0.02*	0.01	-0.02	-0.05*	-0.01	0.01	-0.02	-0.00	0.03	0.01	0.01	-0.05**	-0.02	-0.01	0.00	-0.05**
	(0.014)	(0.016)	(0.015)	(0.018)	(0.012)	(0.020)	(0.035)	(0.026)	(0.036)	(0.026)	(0.033)	(0.029)	(0.030)	(0.027)	(0.026)	(0.023)	(0.019)	(0.020)	(0.025)	(0.022)
Vix yoy (t-1)	0.04***	0.03***	0.04***	0.01	0.02	0.05***	0.06***	0.03***	-0.01	0.04***	0.04**	0.02	0.04	-0.00	0.02	0.02*	0.01	0.01	0.00	-0.00
	(0.007)	(0.011)	(0.011)	(0.015)	(0.013)	(0.015)	(0.011)	(0.013)	(0.020)	(0.012)	(0.015)	(0.015)	(0.023)	(0.022)	(0.022)	(0.009)	(0.011)	(0.017)	(0.016)	(0.014)
Global monetary policy (t-1)	-0.58***	-0.44***	-0.38***	-0.18	-0.54***	-0.58*	-0.10	-1.01***	-0.36	-0.35	-0.45***	-0.49***	0.03	0.11	-0.20	-0.54***	-0.51***	-0.05	0.03	-0.45**
	(0.116)	(0.104)	(0.130)	(0.173)	(0.195)	(0.334)	(0.277)	(0.208)	(0.374)	(0.347)	(0.121)	(0.140)	(0.094)	(0.217)	(0.201)	(0.126)	(0.135)	(0.130)	(0.197)	(0.186)
Global Oil prices yoy (t-1)	0.00	-0.01	0.01	-0.00	0.00	-0.00	0.00	0.01	0.00	-0.00	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00	-0.00
	(0.005)	(0.006)	(0.007)	(0.005)	(0.005)	(0.009)	(0.009)	(0.011)	(0.009)	(0.010)	(0.010)	(0.009)	(0.011)	(0.007)	(0.005)	(0.009)	(0.008)	(0.009)	(0.006)	(0.004)
Global industrial prod. yoy (t-1)	6.86**	3.94	2.37	-4.88**	-7.05***	12.58	6.11	14.98	-9.08	-6.47	2.01	3.57	-6.47*	-11.30**	-16.33***	4.39	3.81	-2.55	-8.85**	-10.19***
	(3.399)	(3.945)	(2.753)	(2.489)	(1.780)	(8.076)	(12.572)	(9.911)	(8.133)	(5.266)	(4.518)	(5.859)	(3.489)	(5.582)	(3.757)	(4.144)	(5.166)	(3.287)	(3.764)	(2.696)
Observations	5,444	4,819	4,717	4,880	4,618	802	690	690	728	704	2,312	1,974	1,974	2,142	2,142	2,533	2,162	2,162	2,351	2,351

EM sample	Stop - Full					Stop - Pre GFC					Stop - post GFC without COVID					Stop - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	0.02	0.01	-0.01	0.03**	0.04*	-0.04	-0.06*	0.04**	0.04	-0.01	0.05**	0.03	-0.03	0.04**	0.09***	0.03*	0.02	-0.03	0.04	0.04*
	(0.014)	(0.014)	(0.022)	(0.017)	(0.019)	(0.044)	(0.033)	(0.019)	(0.075)	(0.012)	(0.026)	(0.028)	(0.035)	(0.017)	(0.029)	(0.017)	(0.016)	(0.026)	(0.026)	(0.021)
Vix yoy (t-1)	0.04***	0.03***	0.04***	-0.01	-0.00	0.06***	0.05**	0.07***	-0.05	-0.04***	0.03	0.02*	0.04**	-0.00	0.01	0.01	0.01	0.02**	0.01	0.00
	(0.013)	(0.011)	(0.010)	(0.016)	(0.014)	(0.020)	(0.026)	(0.018)	(0.041)	(0.013)	(0.022)	(0.013)	(0.020)	(0.009)	(0.020)	(0.013)	(0.013)	(0.009)	(0.017)	(0.016)
Global monetary policy (t-1)	-0.04	-0.09	-0.02	-0.53**	-0.18	-0.86*	-1.05*	-0.21	-0.73**	0.09	0.33	0.14	0.14	-0.55	0.12	0.28	0.13	0.10	-0.56**	-0.12
	(0.179)	(0.153)	(0.233)	(0.222)	(0.342)	(0.464)	(0.541)	(0.284)	(0.283)	(0.177)	(0.217)	(0.227)	(0.289)	(0.338)	(0.414)	(0.192)	(0.219)	(0.258)	(0.286)	(0.362)
Global Oil prices yoy (t-1)	-0.00	-0.00	-0.00	0.00	-0.02***	0.01	0.02***	-0.01	0.00	-0.08***	-0.02**	-0.02**	-0.00	0.01	-0.03**	-0.02**	-0.02**	-0.01	0.01*	-0.02*
	(0.008)	(0.007)	(0.006)	(0.004)	(0.007)	(0.013)	(0.009)	(0.011)	(0.006)	(0.005)	(0.010)	(0.009)	(0.006)	(0.005)	(0.014)	(0.007)	(0.006)	(0.005)	(0.004)	(0.010)
Global industrial prod. yoy (t-1)	1.47	2.32	-1.13	-3.90	-3.97	14.64	14.17	11.72*	-16.38***	6.26	-4.17	0.99	-8.70	-2.42	-11.79	-0.89	1.65	-5.96	-2.81	-5.08
	(3.492)	(2.840)	(4.227)	(4.840)	(2.829)	(10.446)	(16.140)	(6.033)	(3.064)	(5.830)	(7.558)	(6.135)	(6.025)	(7.349)	(9.310)	(5.283)	(4.238)	(3.883)	(5.548)	(4.196)
Observations	5,444	4,819	4,717	4,880	4,618	405	310	310	307	212	1,522	1,470	1,390	1,333	1,201	1,704	1,657	1,555	1,494	1,351

Table A8: Drivers of Surges - EME vs AE Sample

AE sample	Surge - Full					Surge - Pre GFC					Surge - post GFC without COVID					Surge - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	0.02	0.02	0.04***	0.01	0.03	0.03	0.06	-0.01	-0.00	0.00	-0.00	0.01	0.06**	0.01	-0.08	-0.00	0.01	0.04	0.01	0.01
	(0.016)	(0.018)	(0.014)	(0.020)	(0.019)	(0.021)	(0.036)	(0.037)	(0.044)	(0.025)	(0.032)	(0.026)	(0.027)	(0.021)	(0.052)	(0.027)	(0.021)	(0.025)	(0.017)	(0.039)
Vix yoy (t-1)	-0.02	0.00	-0.02	-0.00	0.02	-0.03	0.01	-0.06*	0.00	0.01	-0.01	0.01	0.02	-0.02*	0.00	-0.01	0.01	0.01	-0.01	0.02*
	(0.014)	(0.012)	(0.016)	(0.014)	(0.013)	(0.043)	(0.027)	(0.033)	(0.022)	(0.022)	(0.012)	(0.015)	(0.017)	(0.008)	(0.020)	(0.012)	(0.013)	(0.016)	(0.015)	(0.014)
Global monetary policy (t-1)	-0.01	-0.02	0.21	-0.06	0.10	0.25	0.23	0.20	-0.22	0.32	-0.13	-0.11	0.21	-0.03	-0.07	-0.14	-0.11	0.10	-0.03	-0.03
	(0.138)	(0.156)	(0.142)	(0.152)	(0.147)	(0.247)	(0.289)	(0.567)	(0.290)	(0.288)	(0.179)	(0.195)	(0.179)	(0.203)	(0.326)	(0.166)	(0.193)	(0.186)	(0.196)	(0.259)
Global Oil prices yoy (t-1)	0.01***	0.01***	0.00	-0.00	0.01	0.00	0.00	-0.02***	-0.01	0.00	0.01***	0.01***	0.01*	-0.00	0.02***	0.01***	0.01***	0.01***	-0.00	0.01
	(0.002)	(0.002)	(0.003)	(0.004)	(0.006)	(0.009)	(0.007)	(0.006)	(0.008)	(0.005)	(0.003)	(0.003)	(0.005)	(0.005)	(0.007)	(0.003)	(0.003)	(0.004)	(0.005)	(0.009)
Global industrial prod. yoy (t-1)	-2.98	-2.41	-7.29**	1.84	3.70	7.83	3.28	8.49	13.91	9.02	-7.51	-3.35	-18.25***	-0.30	-0.73	-6.94*	-3.51	-13.29***	-1.13	-7.73**
	(2.623)	(3.245)	(2.983)	(3.222)	(3.134)	(8.660)	(11.822)	(13.859)	(17.395)	(11.428)	(5.076)	(4.554)	(4.344)	(3.745)	(5.657)	(3.846)	(3.904)	(2.242)	(3.097)	(3.237)
Observations	5,444	4,819	4,717	4,880	4,618	802	690	690	728	704	2,312	1,974	1,974	2,142	2,142	2,533	2,162	2,162	2,351	2,351

EM sample	Surge - Full					Surge - Pre GFC					Surge - post GFC without COVID					Surge - post GFC with COVID				
VARIABLES	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other	port	debt	eq	fdi	other
Global money supply yoy (t-1)	0.03	-0.01	-0.02	0.01	0.02	0.06	0.06*	-0.06***	-0.02	-0.03	0.01	-0.03	0.01	0.02	0.06**	0.01	-0.03	-0.01	0.02	0.03
	(0.022)	(0.019)	(0.023)	(0.025)	(0.022)	(0.055)	(0.031)	(0.020)	(0.043)	(0.025)	(0.037)	(0.026)	(0.038)	(0.053)	(0.024)	(0.024)	(0.022)	(0.031)	(0.030)	(0.020)
Vix yoy (t-1)	-0.03*	-0.02	-0.03**	0.03**	0.00	-0.01	0.06**	-0.13**	0.03	0.02	-0.01	-0.01	-0.01	0.02	-0.02	-0.01	-0.01	-0.03**	0.02	-0.04**
	(0.015)	(0.016)	(0.013)	(0.014)	(0.017)	(0.048)	(0.026)	(0.064)	(0.023)	(0.022)	(0.017)	(0.022)	(0.016)	(0.023)	(0.023)	(0.014)	(0.016)	(0.014)	(0.016)	(0.022)
Global monetary policy (t-1)	-0.16	-0.11	-0.11	0.19	-0.27*	-0.13	0.04	0.19	0.36**	-0.44	-0.32*	-0.23	-0.25	0.08	-0.06	-0.35**	-0.25	-0.26	0.08	-0.11
	(0.142)	(0.122)	(0.265)	(0.179)	(0.160)	(0.316)	(0.570)	(0.281)	(0.164)	(0.366)	(0.181)	(0.183)	(0.318)	(0.309)	(0.217)	(0.156)	(0.183)	(0.333)	(0.321)	(0.200)
Global Oil prices yoy (t-1)	0.01***	0.01**	0.02***	0.00	0.01	-0.01	-0.04***	0.04***	-0.01***	-0.00	0.02***	0.02***	0.01**	0.00	-0.01	0.02***	0.02***	0.01**	0.00	-0.01
	(0.004)	(0.005)	(0.005)	(0.007)	(0.015)	(0.019)	(0.011)	(0.004)	(0.003)	(0.030)	(0.003)	(0.004)	(0.006)	(0.013)	(0.017)	(0.004)	(0.005)	(0.006)	(0.014)	(0.016)
Global industrial prod. yoy (t-1)	-5.52**	-2.68	4.08	15.69***	6.91	25.93*	41.36	60.87***	14.81**	29.03***	-9.36	-6.12	-5.37	10.96	-5.97	-8.37**	-4.70	-2.21	10.84**	-1.10
	(2.558)	(3.960)	(3.407)	(4.235)	(4.889)	(14.200)	(25.345)	(15.938)	(7.258)	(9.891)	(5.880)	(4.543)	(7.585)	(7.443)	(4.432)	(3.588)	(4.142)	(6.035)	(5.019)	(4.348)
Observations	5,444	4,819	4,717	4,880	4,618	405	310	310	307	212	1,522	1,470	1,390	1,333	1,201	1,704	1,657	1,555	1,494	1,351

Table A9: COVID-19 capital flows and domestic developments

	AEs														
VARIABLES	Portfolio inflows					Debt inflows					Equity inflows				
Vix (log)	-1.826	-1.090*	-1.041*	-1.044*	-1.036*	-1.010	-0.790	-0.717	-0.746	-0.717	-0.817***	-0.301*	-0.324*	-0.298*	-0.319*
	1.17	0.52	0.55	0.53	0.55	1.14	0.48	0.51	0.49	0.50	0.28	0.15	0.16	0.15	0.15
GDP tracker (t-1)	-0.008					-0.022					0.014**				
	0.03					0.03					0.01				
Terms trade yoy (t-1)		0.013					0.012					0.002*			
		0.01					0.01					0.00			
Stock prices yoy (t-1)			-0.004					-0.004					0.000		
			0.01					0.01					0.00		
Fed swap (t-1)				0.371					0.340					0.031	
				0.26					0.26					0.04	
Policy rate (t-1)					-0.213					-0.202					-0.011
					0.14					0.17					0.04
Constant	6.903	4.094**	4.098**	3.934*	4.067**	3.935	3.105*	3.011	2.947	2.995*	2.968**	0.988*	1.088*	0.987*	1.072*
	4.39	1.84	1.92	1.90	1.89	4.26	1.70	1.76	1.75	1.72	1.05	0.51	0.54	0.52	0.53
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	96	116	110	116	110	96	116	110	116	110	96	116	110	116	110
R-squared	0.098	0.065	0.054	0.067	0.051	0.069	0.040	0.030	0.043	0.028	0.210	0.110	0.112	0.108	0.110
Number of ifs_code	20	20	19	20	19	20	20	19	20	19	20	20	19	20	19

	EMEs														
VARIABLES	Portfolio inflows					Debt inflows					Equity inflows				
Vix (log)	-1.654***	-0.606**	-0.676	-0.615**	-0.650**	-0.957**	-0.356	-0.540	-0.372	-0.393	-0.784**	-0.264**	-0.167*	-0.258**	-0.277*
	0.38	0.26	0.37	0.26	0.28	0.39	0.26	0.39	0.26	0.28	0.34	0.11	0.07	0.11	0.12
GDP tracker (t-1)	0.026**					0.014					0.017**				
	0.01					0.01					0.01				
Terms trade yoy (t-1)		0.004					0.005					-0.001			
		0.00					0.00					0.00			
Stock prices yoy (t-1)			-0.001					-0.001					-0.000		
			0.01					0.01					0.00		
Fed swap (t-1)				0.056					-0.012					0.066*	
				0.09					0.06					0.03	
Policy rate (t-1)					0.001					0.003					0.005
					0.05					0.05					0.01
Constant	6.027***	2.046**	2.279	2.111**	2.234**	3.474**	1.202	1.873	1.301	1.367	2.886*	0.897**	0.514*	0.863*	0.916*
	1.43	0.93	1.30	0.89	0.89	1.48	0.93	1.38	0.90	0.92	1.28	0.39	0.26	0.40	0.41
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	55	78	54	78	72	50	72	48	72	66	50	72	48	72	66
R-squared	0.305	0.170	0.159	0.162	0.165	0.152	0.084	0.103	0.070	0.072	0.230	0.171	0.282	0.177	0.175
Number of ifs_code	11	13	9	13	12	10	12	8	12	11	10	12	8	12	11

Note: OLS regressions with country fixed effects. Dependent variable is the respective capital flow type scaled by GDP. Clustered standard errors by country. Top panel shows regressions run on the AE sample, while bottom panel regressions are run on the EME sample. * p<0.10,** p<0.05,*** p<0.01

Table A10: COVID-19 capital flows and COVID related developments

	AEs																	
VARIABLES	Portfolio inflows						Debt inflows						Equity inflows					
Vix (log)	-0.985*	-1.407***	-1.373**	-3.145**	-2.901**	-1.349	-0.865*	-1.086**	-1.069**	-2.141	-1.975	-0.528	-0.120	-0.321*	-0.304*	-1.004***	-0.927***	-0.821**
	0.49	0.48	0.50	1.36	1.23	1.34	0.43	0.43	0.44	1.34	1.23	1.22	0.10	0.16	0.16	0.33	0.31	0.34
COVID deaths (log)	-0.113*						-0.060						-0.053**					
	0.06						0.07						0.02					
COVID deaths per cap		-644.063						-236.292						-407.771				
		2,260.20						2,137.59						254.80				
COVID cases per cap			-115.932						-53.227						-62.705*			
			279.26						273.53						32.89			
Stringency index (t-1)				-0.010						-0.005						-0.005**		
				0.01						0.01						0.00		
Containment/Health index (t-1)					-0.009						-0.004						-0.005**	
					0.01						0.01						0.00	
Economic support index (t-1)						0.006						0.009						-0.003
						0.01						0.01						0.00
Constant	4.022**	5.414***	5.315***	12.075**	11.143**	5.053	3.579**	4.331**	4.281**	8.337	7.694	2.061	0.443	1.084*	1.034*	3.738***	3.449***	2.992**
	1.66	1.67	1.72	5.25	4.75	5.10	1.47	1.50	1.51	5.15	4.77	4.63	0.37	0.55	0.55	1.24	1.19	1.28
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	110	104	104	96	96	96	110	104	104	96	96	96	110	104	104	96	96	96
R-squared	0.104	0.089	0.090	0.108	0.105	0.101	0.064	0.057	0.057	0.066	0.065	0.074	0.180	0.124	0.125	0.230	0.220	0.185
Number of ifs_code	19	18	18	20	20	20	19	18	18	20	20	20	19	18	18	20	20	20

	EMEs																	
VARIABLES	Portfolio inflows						Debt inflows						Equity inflows					
Vix (log)	-0.380	-0.627**	-0.623**	-1.155***	-0.984***	-0.681**	-0.216	-0.378	-0.374	-0.518**	-0.399**	-0.463*	-0.167**	-0.265**	-0.264**	-0.627**	-0.568**	-0.208**
	0.27	0.27	0.26	0.27	0.25	0.23	0.29	0.27	0.27	0.21	0.18	0.22	0.06	0.12	0.11	0.24	0.23	0.09
COVID deaths (log)	-0.089**						-0.058						-0.035					
	0.04						0.04						0.02					
COVID deaths per cap		-925.133						-720.268						-233.553				
		1,624.94						1,378.53						405.52				
COVID cases per cap			-16.189						-12.526						-4.569			
			39.66						32.96						10.97			
Stringency index (t-1)				-0.003						0.000						-0.003**		
				0.00						0.00						0.00		
Containment/Health index (t-1)					-0.001						0.001						-0.002**	
					0.00						0.00						0.00	
Economic support index (t-1)						0.002						0.001						0.001
						0.00						0.00						0.00
Constant	1.412	2.173**	2.151**	4.178***	3.508***	2.328**	0.828	1.332	1.314	1.827**	1.360*	1.619*	0.598**	0.898**	0.893**	2.308**	2.081**	0.670*
	0.94	0.95	0.93	1.01	0.94	0.86	0.99	0.95	0.93	0.79	0.67	0.81	0.22	0.40	0.40	0.88	0.84	0.32
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	78	78	78	65	65	65	72	72	72	60	60	60	72	72	72	60	60	60
R-squared	0.202	0.165	0.162	0.251	0.241	0.247	0.091	0.073	0.071	0.135	0.139	0.139	0.209	0.172	0.171	0.186	0.172	0.141
Number of ifs_code	13	13	13	13	13	13	12	12	12	12	12	12	12	12	12	12	12	12

Note: OLS regressions with country fixed effects. Dependent variable is the respective capital flow type scaled by GDP. Clustered standard errors by country. Top panel shows regressions run on the AE sample, while bottom panel regressions are run on the EME sample. * p<0.10,** p<0.05,*** p<0.01

Table A11: COVID-19 capital flows and pre-crisis vulnerabilities – AEs

	AEs														
VARIABLES	Portfolio inflows					Debt inflows					Equity inflows				
Vix (log)	-0.794	-2.023***	-1.318**	-0.282	-0.180	-0.654	-1.660***	-1.011*	-0.101	0.088	-0.140	-0.363*	-0.307	-0.181	-0.268
	0.57	0.51	0.59	1.08	0.96	0.55	0.45	0.50	1.02	0.89	0.09	0.20	0.22	0.16	0.26
Vix * 2019 Current account/GDP	-0.151					-0.075					-0.075				
	0.14					0.11					0.06				
Vix * 2019 Reserves/GDP		7.531***					7.042***					0.489			
		2.54					2.28					0.55			
Vix * 2019 Reserves/Imports			0.067					0.066					0.001		
			0.20					0.18					0.03		
Vix * 2019Q4 Policy rate diff.				0.312					0.255					0.056	
				0.32					0.32					0.04	
Vix * 2019 Gov Debt/GDP					-0.012					-0.011					-0.000
					0.01					0.01					0.00
Vix * 2019 Reserves/ST Debt															
Constant	4.339**	4.423**	4.363**	3.592*	4.367**	3.324*	3.396**	3.341*	2.608	3.344**	1.015**	1.027*	1.023*	0.984*	1.023*
	1.73	1.55	1.78	2.03	1.71	1.63	1.41	1.63	1.86	1.56	0.45	0.51	0.51	0.52	0.50
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	116	116	116	110	116	116	116	116	110	116	116	116	116	110	116
R-squared	0.069	0.107	0.059	0.070	0.076	0.036	0.081	0.035	0.041	0.052	0.191	0.111	0.106	0.126	0.106
Number of ifs_code	20	20	20	19	20	20	20	20	19	20	20	20	20	19	20

	EMEs															
VARIABLES	Portfolio inflows						Debt inflows						Equity inflows					
Vix (log)	-0.619**	-1.163*	-0.990	-0.496	-0.708**	-0.999	-0.379	-0.783	-0.788	-0.221	-0.431	-0.602	-0.264**	-0.386	-0.250	-0.260	-0.296**	-0.401
	0.22	0.63	0.56	0.76	0.30	0.83	0.24	0.62	0.57	0.67	0.31	0.82	0.11	0.28	0.21	0.31	0.13	0.26
Vix * 2019 Current account/GDP	0.132*						0.108						0.026					
	0.07						0.07						0.04					
Vix * 2019 Reserves/GDP			1.816						1.995						-0.059			
			1.59						1.61						0.57			
Vix * 2019 Reserves/Imports				-0.019						-0.024						-0.000		
				0.08						0.07						0.03		
Vix * 2019Q4 Policy rate diff.					0.017*						0.012						0.006	
					0.01						0.01						0.00	
Vix * 2019 Gov Debt/GDP						0.008						0.005						0.003
						0.01						0.01						0.00
Vix * 2019 Reserves/ST Debt		0.318						0.243						0.073				
		0.24						0.23						0.11				
Constant	2.130**	2.130**	2.140**	2.130**	2.255**	2.130**	1.297	1.297	1.307	1.297	1.389	1.297	0.887**	0.887**	0.886**	0.887**	0.938*	0.887**
	0.77	0.84	0.87	0.88	0.95	0.87	0.81	0.86	0.87	0.89	0.98	0.89	0.38	0.39	0.40	0.39	0.42	0.39
Country FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	78	78	78	78	72	78	72	72	72	72	66	72	72	72	72	72	66	72
R-squared	0.237	0.196	0.177	0.162	0.179	0.171	0.135	0.096	0.094	0.072	0.080	0.074	0.190	0.182	0.171	0.171	0.185	0.178
Number of ifs_code	13	13	13	13	12	13	12	12	12	12	11	12	12	12	12	12	11	12

Note: OLS regressions with country fixed effects. Dependent variable is the respective capital flow type scaled by GDP. Clustered standard errors by country. Top panel shows regressions run on the AE sample, while bottom panel regressions are run on the EME sample. * p<0.10,** p<0.05,*** p<0.01

Figure A1. Inflows to advanced economies (2007Q1 – 2020Q1) - USD

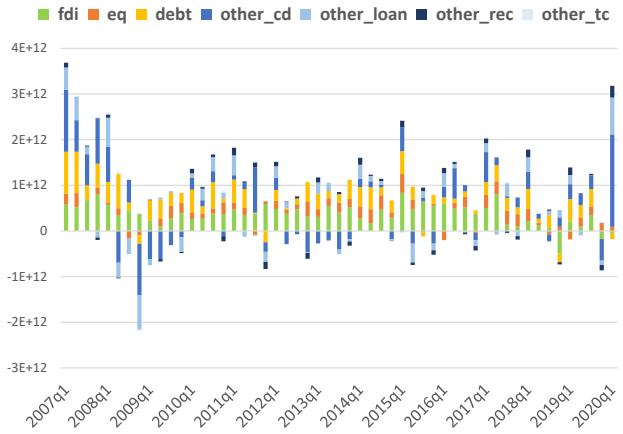


Figure A2. Inflows to emerging economies (2007Q1 – 2020Q1) - USD

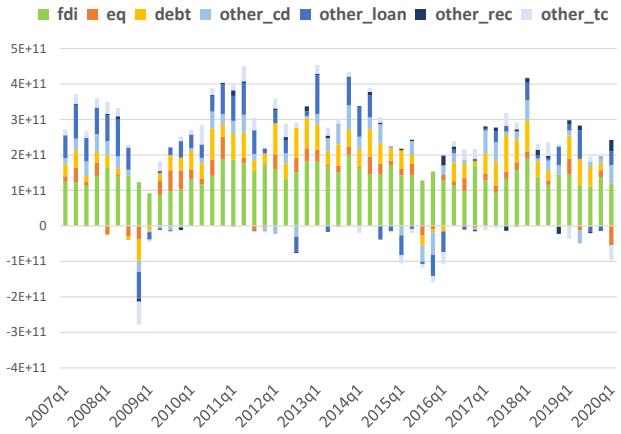


Figure A3. Outflows from advanced economies (2007Q1 – 2020Q1) - USD

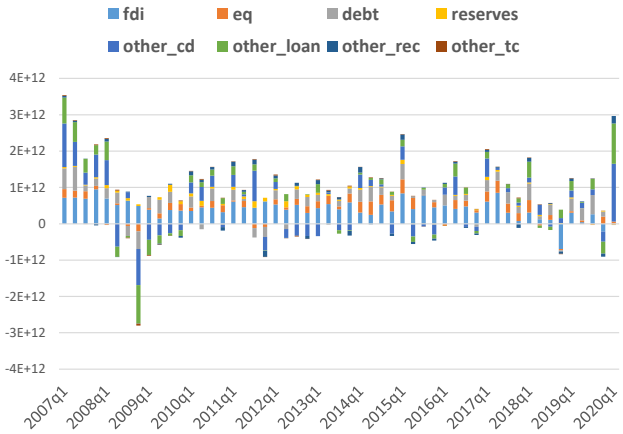
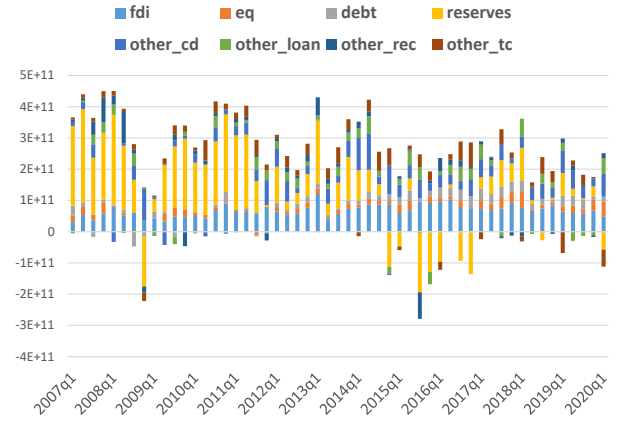


Figure A4. Outflows from emerging economies (2007Q1 – 2020Q1) - USD



Notes: FDI: Foreign Direct Investment, eq: portfolio equity, other_cd: currency and deposits, other_loan: loan flows, other_rec: receivables, other_tc: trade credit. Source: IMF BoP

Figure A5. Inflows to advanced economies (2007Q1 – 2020Q1) - USD

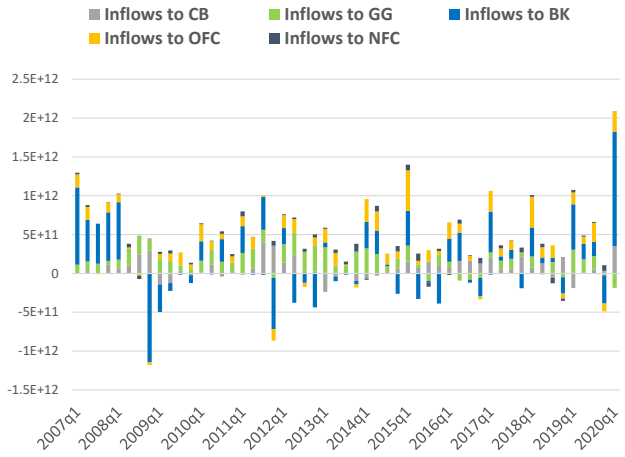


Figure A6. Inflows to emerging economies (2007Q1 – 2020Q1) - USD

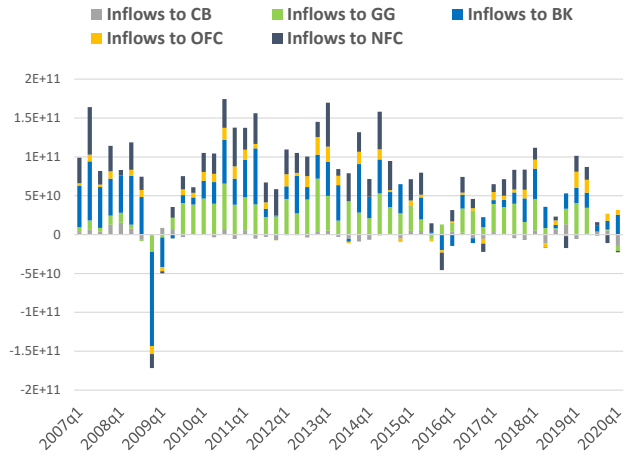


Figure A7. Outflows from advanced economies (2007Q1 – 2020Q1) - USD

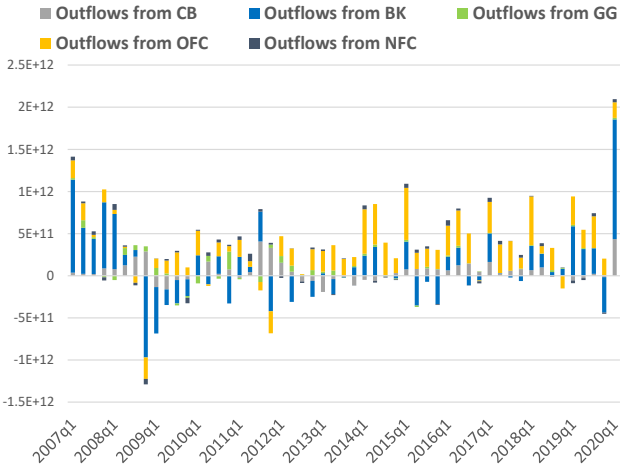
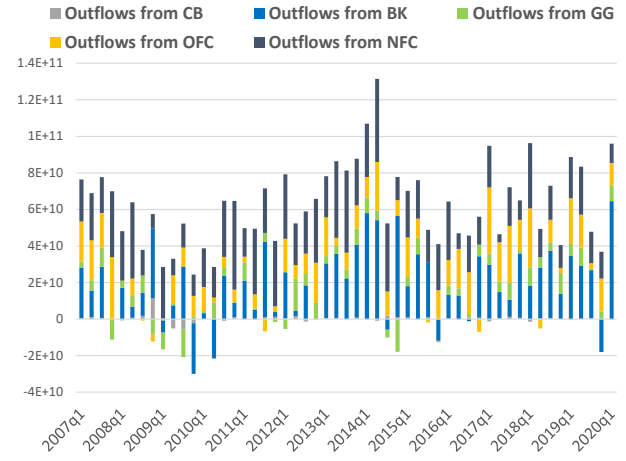


Figure A8. Outflows from emerging economies (2007Q1 – 2020Q1) - USD



Notes: CB: Central Banks, BK: Banks, GG: General Government, OFC: Other Financial Corporates, NFC: Non-Financial Corporates.
Source: IMF BoP

Figure A9. Stops

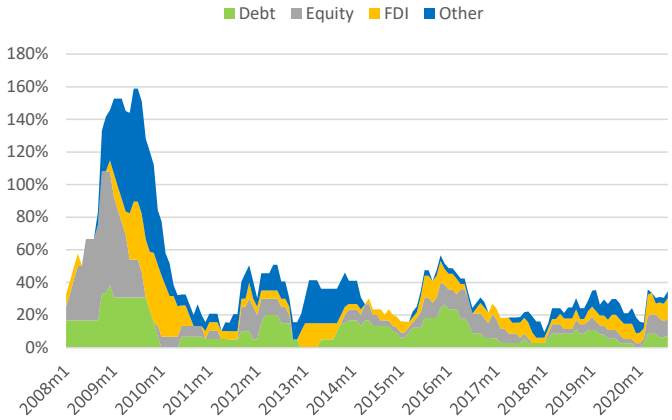


Figure A10. Surges

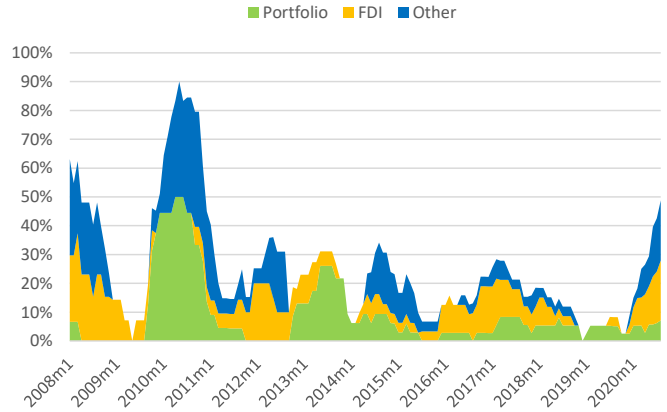


Figure A11. Retrenchments

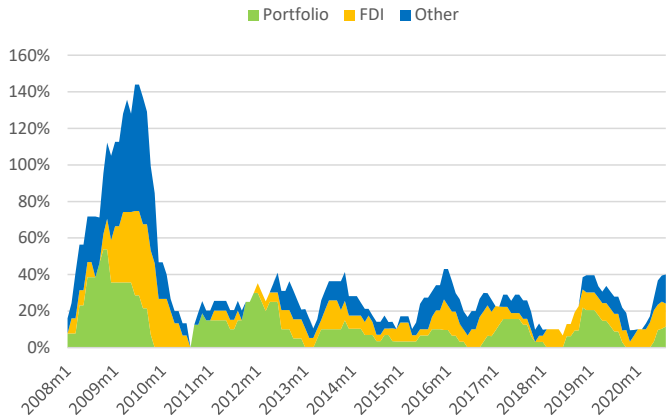
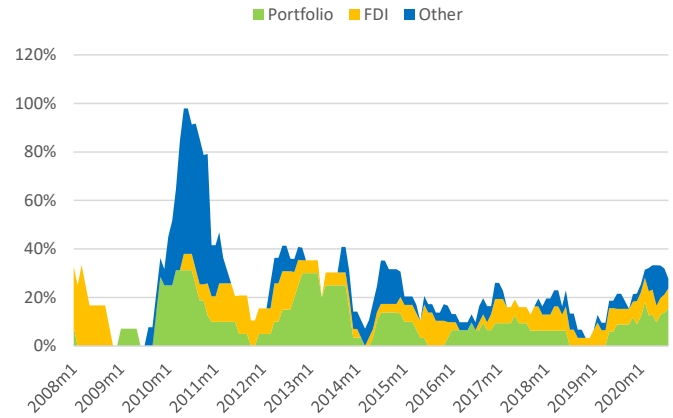


Figure A12. Flights



Note: Share of countries experiencing a specific extreme episode type by flow type. Values can exceed 100% as countries may experience episodes in several capital flow types.

Annex B. Detailed description of the extreme episodes identified

Sudden stops: when non-resident inflows dry up abruptly

A number of countries experienced sudden stops coinciding with the start of the COVID-19 crisis:

Countries that experienced a sudden stop in debt:

- United States (March to August 2020), Japan (March to June 2020), Finland (March to August 2020), Greece (March to August 2020), Philippines (March to June 2020), and Mongolia (March to June 2020). In the cases of Japan and Finland, the stop episode already started in February 2020, in the case of the Philippines and Mongolia in January 2020.
- Countries that experienced a sudden stop in equity:
- Brazil (March to July 2020), Philippines (March to June 2020), Slovenia (March to August 2020). In the cases of Brazil and the Philippines, the stop started in March 2020, while in Slovenia it had already begun in November 2019.

Countries that experienced a sudden stop in FDI:

- France (March to August 2020), Germany (March to August 2020), Italy (March to August 2020), Spain (March to April 2020), Philippines (March to April 2020), Ukraine (April to August 2020), Lithuania (May to August 2020), Poland (March to May 2020), Romania (March to August 2020).
- Countries which have experienced a sudden stop in other inflows (banking flows):
- France (April to August 2020), Luxembourg (March to August 2020), Chile (June to August 2020), Lebanon (March 2020), and Philippines (March to June 2020).

Surges: when non-residents inflows rise rapidly

For this category, most of the surges captured are part of a rising longer-term trend that each of these countries were experiencing already before the COVID-19 outbreak, and that since March 2020 the trend has abated.

Countries that experienced a surge in debt:

- Italy (March to April 2020), Estonia (March to August 2020), Slovenia (March to August 2020). Italy's surge in debt had started in June 2019 and declined by the end of April 2020, the one in Estonia in July 2019, and the one in Slovenia in February 2020.
- Countries that experienced a surge in equity:
- United States (March to August 2020), Denmark (March to April 2020), Germany (March to August 2020), Romania (March to August 2020). The United States' surge in equity had started in December 2019, the one in Denmark in May 2019, in Germany in December 2019, and in Romania in April 2019.

Countries that experienced a surge in FDI:

- Belgium (March to August 2020), Denmark (March to August 2020), Chile (March to June 2020). Belgium's surge had started in January 2020, the one in Denmark in January 2020, in Chile in December 2019 and then abated by mid-2020.

Countries that experienced a surge in other inflows (banking flows):

- Japan (March to July 2020), Latvia (June to August 2020), Lithuania (June to August 2020), and Romania (March 2020). In the case of Japan, the surge started in February 2020, while for Romania in July 2019 and then abated.

Flights: when capital outflows increase sharply

Countries that experienced a flight in debt:

- Finland (March to June 2020), Greece (March to June 2020), Lebanon (March 2020), Estonia (June to August 2020), Latvia (June to August 2020) and Mongolia (March to May 2020). The flight in Greece had started since September 2019, that in Lebanon from August 2019, and in Mongolia from October 2019.

Countries that experienced a flight in equity:

- Belgium (March to August 2020), Denmark (April to August 2020), Germany (May to August 2020), Brazil (March to July 2020), Bulgaria (May to August 2020), Estonia (March to August 2020). The flight in both Belgium and Brazil had already started in November 2019, and in Estonia in February 2020. In Germany, the flight started in December 2019, normalised in March and April 2020 and then turned again into a flight in May 2020.

Countries that experienced a flight in FDI:

- Belgium (March to August 2020), Denmark (March to August 2020), Chile (March to May 2020), Thailand (March 2020), Ukraine (March to August 2020), Latvia (March to April 2020). The flight in Denmark had started in January 2020, the one in Chile in June 2019 and abated by May 2020, the one in Thailand had begun in April 2019 and ended in March 2020, the one in Ukraine in December 2019, in Latvia in November 2019 and ended by April 2020.

Countries that experienced a flight in other inflows (banking flows):

- Denmark (March to April 2020), Luxembourg (March to May 2020), Sweden (March to July 2020), Japan (March to July 2020), Chile (March to August 2020), Lebanon (March 2020), Korea (March to May 2020), Philippines (March 2020), Thailand (March to July 2020), and Lithuania (May to August 2020). The flight in Denmark had already started in December 2019, the one in Japan in February 2020, in Chile in January 2020, in Lebanon in November 2019, in Korea in February 2020, and in the Philippines in June 2019.

Retrenchments: when capital outflows decrease sharply

Countries that experienced a retrenchment in debt:

- Korea (March to August 2020), the Philippines (March to April 2020), Poland (March to May 2020), Romania (April to August 2020). The retrenchment in Korea had started in September 2019, and in the Philippines and in Poland in December 2019.

Countries that experienced a retrenchment in equity:

- Lithuania (May to August 2020).
- Countries that experienced a retrenchment in FDIs:

- France (March 2020 to August 2020), Germany (March to May 2020), Italy (March to August 2020), Korea (March to July 2020). The retrenchment in France had started in September 2019, the one in Germany in May 2019 and abated by May 2020, and the one in Italy in January 2020.

Countries that experienced a retrenchment in other inflows (banking flows):

- France (April to August 2020), Turkey (March to August 2020), Bulgaria (June to August 2020), Czech Republic (May to August 2020), Estonia (June to August 2020). Turkey's episode had started in September 2019, had abated by January 2020, and started again in February 2020.

Annex C. OECD Working Papers on International Investment

www.oecd.org/investment/working-papers.htm

2021

2021/4 – Analysing sectoral capital flows - covariates, co-movements and controls

2021/3 - The future of investment treaties – possible directions

2021/2 - Business responsibilities and investment treaties

2021/1 - Assessing the effectiveness of currency-differentiated tools: The case of reserve requirements

2020

2020/1 - The most favoured nation and non-discrimination provisions in international trade law and the OECD codes of liberalisation

2019

2019/3 - Drivers of divestment decisions of multinational enterprises - A cross-country firm-level perspective

2019/2 - The Broad Policy Toolkit for Financial Stability: Foundations, Fences and Fire Doors

2019/1 - The Determinants of Foreign Direct Investment - Do Statutory Restrictions Matter?

2018

2018/1 Societal benefits and costs of International Investment Agreements: A critical review of aspects and available empirical evidence

2017

2017/5 Adjudicator Compensation Systems and Investor-State Dispute Settlement

2017/4 Have currency-based capital flow management measures curbed international banking flows?

2017/3 Addressing the balance of interests in investment treaties: The limitation of fair and equitable treatment provisions to the minimum standard of treatment under customary international law

2017/2 The balance between investor protection and the right to regulate in investment treaties: A scoping paper

2017/1 Foreign direct investment, corruption and the OECD Anti-Bribery Convention

2016

2016/3 State-to-State dispute settlement and the interpretation of investment treaties

2016/2 Investment policies related to national security

2016/1 The legal framework applicable to joint interpretive agreements of investment treaties

2015

2015/3 Currency-based measures targeting banks - Balancing national regulation of risk and financial openness

2015/2 Investment Treaties over Time - Treaty Practice and Interpretation in a Changing World

2015/1 The Policy Landscape for International Investment by Government-controlled Investors: A Fact Finding Survey

2014

2014/3 Investment Treaties and Shareholder Claims: Analysis of Treaty Practice

2014/2 Investment Treaties and Shareholder Claims for Reflective Loss: Insights from Advanced Systems of Corporate Law

2014/1 Investment Treaty Law, Sustainable Development and Responsible Business Conduct: A Fact Finding Survey

2013

2013/4 Temporal validity of international investment agreements: a large sample survey of treaty provisions

2013/3 Investment treaties as corporate law: Shareholder claims and issues of consistency

2013/2 Lessons from Investment Policy Reform in Korea

2013/1 China Investment Policy: an Update

2012

2012/3 Investor-state dispute settlement: A scoping paper for the investment policy community

2012/2 Dispute settlement provisions in international investment agreements: A large sample survey

2012/1 Corporate greenhouse gas emission reporting: A stocktaking of government schemes

2011

2011/2 Defining and measuring green FDI: An exploratory review of existing work and evidence

2011/1 Environmental concerns in international investment agreements: a survey

2010

2010/3 OECD's FDI Restrictiveness Index: 2010 Update

2010/2 Foreign state immunity and foreign government controlled investors

2010/1 Intellectual property rights in international investment agreements

2006

2006/4 OECD's FDI regulatory restrictiveness index: Revision and extension to more economies

2006/3 Interpretation of the Umbrella Clause in Investment Agreements

2006/2 Investor-State Dispute Settlement in Infrastructure Projects

2006/1 Improving the System of Investor-State Dispute Settlement: An Overview

2005

2005/3 Corporate Responsibility Practices of Emerging Market Companies - A Fact-Finding Study

2005/2 Multilateral Influences on the OECD Guidelines for Multinational Enterprises

2005/1 Transparency and Third Party Participation in Investor-State Dispute Settlement Procedures

2004

2004/6 Mobilising Investment for Development: Role of ODA - The 1993-2003 Experience in Vietnam

2004/5 ODA and Investment for Development: What Guidance can be drawn from Investment Climate Scoreboards?

2004/4 Indirect Expropriation and the Right to Regulate in International Investment Law

2004/3 Fair and Equitable Treatment Standard in International Investment Law

2004/2 Most-Favoured-Nation Treatment in International Investment Law

2004/1 Relationships between International Investment Agreements

2003

2003/2 Business Approaches to Combating Corrupt Practices

2003/1 Incentives-based Competition for Foreign Direct Investment: The Case of Brazil

2002

2002/2 Managing Working Conditions in the Supply Chain: A Fact-Finding Study of Corporate Practices

2002/1 Multinational Enterprises in Situations of Violent Conflict and Widespread Human Rights Abuses

2001

2001/6 Codes of Corporate Conduct: Expanded review of their contents

2001/5 The OECD Guidelines for Multinational Enterprises and other corporate responsibility instruments

2001/4 Public policy and voluntary initiatives: What roles have governments played?

2001/3 Making codes of corporate conduct work: Management control systems and corporate responsibility

2001/2 Corporate Responsibility: Results of a fact-finding mission on private initiatives

2001/1 Private Initiatives for Corporate Responsibility: An Analysis

2000

2000/5 Recent trends, policies and challenges in South East European countries

2000/4 Main determinants and impacts of FDI on China's economy

2000/3 Lithuania: Foreign Direct Investment Impact and Policy Analysis

2000/2 Investment Patterns in a Longer-Term Perspective

2000/1 Bribery and the business sector: Managing the relationship

1999

1999/3 Rules for the Global Economy: Synergies between Voluntary and Binding Approaches

1999/2 Deciphering Codes of Corporate Conduct: A Review of their Contents

1999/1 Southeast Asia: the Role of FDI Policies in Development

1998

1998/1 Survey of OECD work on international investment