



BANK FOR INTERNATIONAL SETTLEMENTS



## BIS Working Papers No 745

# Financial stress in lender countries and capital outflows from emerging market economies

by Ilhyock Shim and Kwanho Shin

Monetary and Economic Department

September 2018

JEL classification: E44, F15, F21, F34, F38.

Keywords: financial stress, capital outflows, emerging market economies, cross-border claims, local claims.

BIS Working Papers are written by members of the Monetary and Economic Department of the Bank for International Settlements, and from time to time by other economists, and are published by the Bank. The papers are on subjects of topical interest and are technical in character. The views expressed in them are those of their authors and not necessarily the views of the BIS.

This publication is available on the BIS website ([www.bis.org](http://www.bis.org)).

© *Bank for International Settlements 2018. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated.*

ISSN 1020-0959 (print)  
ISSN 1682-7678 (online)

# Financial stress in lender countries and capital outflows from emerging market economies<sup>1</sup>

Ilhyock Shim<sup>2</sup> and Kwanho Shin<sup>3</sup>

## Abstract

We investigate if financial stress in countries where international banks are headquartered is a major driver of banking outflows from emerging market economies (EMEs). We find that when financial stress measured by sovereign or bank CDS spread or corporate bond spread increases, international banks decrease their lending to EMEs, which acts as a major driver of capital outflows from EMEs. In particular, financial stress in lender countries is a more important driver than the local financial conditions and macroeconomic fundamentals of EMEs. Such results generally hold even after the Global Financial Crisis (GFC) period, but to a lesser extent. When we divide the total amount of international lending into subcomponents, cross-border lending to EMEs is more susceptible to financial stress in lender countries than is local lending, and that local lending in foreign currency is more stable than is cross-border lending. Our findings suggest that it is desirable for EME policymakers to promote diversification of lender countries and induce more borrowing from local subsidiaries than cross-border lenders.

JEL classification: E44, F15, F21, F34, F38.

Keywords: capital outflows, cross-border claims, emerging market economies, financial stress, local claims.

<sup>1</sup> We are grateful for comments by Claudio Borio, Stijn Claessens, Georgios Georgiadis, Catherine Koch, Patrick McGuire, Madhusudan Mohanty, Hyun Song Shin, Elod Takáts and other participants in seminars at the Bank for International Settlements (BIS) headquarters in Basel and the Representative Office for Asia and the Pacific in Hong Kong SAR, and the National Graduate Institute for Policy Studies in Tokyo. We thank Dohoon Kim, Ran Li and Jose Maria Vidal Pastor for excellent research assistance, the Bank for International Settlements and the Korea Research Fund for financial support, and Patrick McGuire and Jakub Demski for providing data on break and exchange rate adjusted bilateral foreign claims. The views expressed in this paper are solely those of the authors, and do not necessarily represent the views of the BIS.

<sup>2</sup> Special Adviser on International Financial Stability Policy, Monetary and Economic Department, Bank for International Settlements, Centralbahnplatz 2, 4002 Basel, Switzerland. Email: ilhyock.shim@bis.org.

<sup>3</sup> Professor, Department of Economics, Korea University, 145 Anam-ro Seongbuk-gu, Seoul 02841, Korea. Email: khshin@korea.ac.kr.

# 1 Introduction

During the global financial crisis (GFC), although shocks originated from advanced economies (AEs), they were rapidly transmitted to emerging market economies (EMEs). Banks played a pivotal role in this contagion of the crisis. Banks in AEs were first hit by the subprime-loan deterioration and forced to search for liquidity. As the market for domestic liquidity dried up, and AE banks' capital positions deteriorated, some of the troubled banks withdrew their lending to EMEs. This episode clearly shows that financial stress in lender countries can contribute critically to capital outflows from EMEs.

The above channel of contagion crucially hinges on the liability side of financial institutions, most of which comes from short-term borrowing arrangements. Shin (2009) stresses that the Northern Rock in the United Kingdom had to go bankrupt when lenders, mostly other financial institutions, cut back their exposures in response to the crisis. He notes that a modern-style bank run, from Northern Rock's viewpoint, was initiated as lenders started to deleverage their balance sheets, although this may look prudent from their risk-management perspective. The Northern Rock case illustrates that liabilities held by other financial institutions are fragile and subject to runs. Čihák, Muñoz and Scuzzarella (2011) further emphasize the importance of distinguishing between cross-border interlinkages of the asset and liability sides. They find that the effect of changes in interconnectedness on banking system fragility is more significant when interconnectedness is measured from the liability side than when measured from the asset side. Hahm, Shin and Shin (2013) also find that a subset of liabilities that they call noncore liabilities are particularly fragile against the threat of bank runs. They find that the larger a stock of noncore liabilities of the banking sector in an EME is, which consist mostly of banks' borrowings from foreign countries, the more vulnerable the EME is to a crisis.

More generally, Claessens (2017) reviews the literature on what has driven changes in cross-border banking flows since the GFC, distinguishing supply (lender), demand (borrower) and regulatory factors. About the demand factor, Milesi-Ferretti and Tille (2011) report that during the GFC, there was an unprecedented collapse in international capital flows that was driven by re-assessment of risk by investors. They find that a more significant retrenchment in capital flows was made from countries with large net external liabilities or those whose external portfolio was more exposed to liquidity risk. Laeven and Tressel (2013) also show that a borrowing country's sovereign and bank credit default swap (CDS) spreads explain a large share of the decline in intra-euro area claims between 2010 and 2012. In addition, Cerutti, Claessens and McGuire (2014) show that the relative reliance on foreign versus domestic funding predicts which countries were at risk of banking outflows during the European debt crisis in 2010.

On the supply factor, Cetorelli and Goldberg (2011) find that adverse liquidity shocks on major advanced-economy banking systems during the GFC led to reductions in cross-border lending activity, which worked as substantial lending supply shocks. Cerutti and Claessens (2017) also use bilateral lender-borrower data and control for demand to show that the reduction in banks' international lending after the GFC was driven by their (perceived) capital at risk, that is, markets' prior assessments of banks' vulnerabilities. Park and Shin (2017, 2018) also find that an EME's exposure to crisis countries during the GFC, calculated as the share of liabilities held by crisis-affected foreign countries, is closely related to capital outflows from the

EME.<sup>4</sup> They interpret that deleveraging of the banks in crisis-affected countries triggered a situation like a run on banks and other entities in EMEs, which acted as a main source of capital outflows from the EMEs.

Takáts (2010) points out that although both demand and supply factors contributed to the fall in cross-border bank lending, the supply factors contributed more during the GFC. More recently, Amiti, McGuire and Weinstein (2017) decompose the growth in international bank credit into common shocks, idiosyncratic supply shocks and idiosyncratic demand shocks. They show that during crisis years, bank flows are affected by idiosyncratic supply shocks to a borrower country's creditor banks, but during non-crisis years, they are explained by common shocks and local demand shocks.

In this paper, we investigate whether supply factors play a dominating role in explaining bank capital outflows from EMEs. We contribute to the expanding literature on this issue in the following three important areas. First, we utilise a panel dataset of bilateral banking flows for an extended sample period. Whereas most previous studies focused on the episode of the GFC and hence relied on cross-section regressions, by relying on a panel dataset we can remove unobserved bilateral country fixed effects. Further, by restricting the sample to the post-GFC period, we examine if the findings during the GFC still hold in the post-GFC period. The dataset we construct is a panel form of quarterly frequency ranging from 2001Q1 to 2017Q3.

Second, we compare supply and demand factors on an equal footing. By measuring financial stress in both lender and borrower countries, we investigate which one plays a more important role. We adopt three proxies for financial stress in lender countries: (i) bank CDS spread; (ii) sovereign CDS spread; and (iii) corporate bond spread. We also measure financial stress in EMEs based only on sovereign CDS spread, because the other measures are not available for many EMEs. By using these financial measures as well as economic fundamental variables of EMEs as regressors, we examine which country's financial stress, a lender's or a borrower's, is more responsible for explaining bank capital outflows from EMEs. Finally, we decompose foreign bank claims in various components, such as cross-border claims, local claims in foreign currency and local claims in local currency, and investigate which component is more susceptible to withdrawals during financial stress. Since these three components are not reported separately, we use estimates derived after making some plausible assumptions. We also decompose total claims into bank loans and debt securities and examine any differences in their responses to financial stress in both lender and borrower countries.

We find strong evidence that financial stress in lender countries is a major driver of capital outflows from EMEs. Although financial stress in EMEs also has some explanatory power, once we include the financial stress of both lender countries and EMEs and the economic fundamentals of EMEs, only the financial stress in lender countries survives. This finding holds even after we make adjustments of international claims for occasional breaks in time series and valuation effects caused by exchange

<sup>4</sup> By using bilateral foreign claims of reporting countries obtained from the Bank for International Settlements' consolidated banking statistics and locational banking statistics, Park and Shin (2017, 2018) compute measures of EMEs' direct and indirect exposures to the crisis-affected countries. While their exposure measures are at the country level, Hale, Kapan and Minoiu (2016) develop a similar method for a different purpose to measure direct and indirect exposures of individual banks.

rate movements.<sup>5</sup> Our findings become weaker but generally prevail even after the GFC. We also find that cross-border claims are more susceptible to financial stress in lender countries than local claims in foreign or local currency are. When we divide local claims depending on currency denomination, we find that local claims in foreign currency are more stable than cross-border claims. Finally, we find that the effect of financial stress in lender countries is stronger on bank loans and on debt securities.

The remainder of the paper is organised as follows. In the next section, we explain how we measure financial stress in lender countries and EMEs. Section 3 explains how we define bilateral capital flows between a lender country and an EME. In section 4, we lay out our empirical framework of assessing the effect of financial stress in lender countries on capital outflows from EMEs. In section 5, we report and discuss the main empirical findings. Finally, section 6 concludes.

## 2 Financial stress in lender countries

A key variable in this paper is financial stress in lender countries, where international banks are headquartered. Appendix Table 1 provides the lists of lender countries when we use consolidated banking statistics (CBS) and locational banking statistics (LBS). Most of them are AEs, but seven out of the 27 CBS reporting countries and six out of the 29 LBS reporting countries marked in bold in Appendix Table 1 are also included in the list of 67 borrower countries.<sup>6</sup>

We use the following three measures of financial stress:

(i) *Bank CDS spread*

We calculate the weighted average of the bank CDS spread of the largest banks headquartered in each lender country with long time series, using individual banks' total assets as weights. There is a trade-off between the inclusion of more banks for each country and using longer time-series data for the same country. Markit provides at least one quarter of CDS spread data for 129 distinct banks headquartered in 29 countries. Total asset data were obtained from Capital IQ. Eventually, we use data on 66 banks headquartered in 29 countries.<sup>7</sup> Appendix Table 2 provides the list of banks.

(ii) *Sovereign CDS spread*

Data were obtained from Markit. We use data on senior five-year CDS spread under complete restructuring (CR) for all countries except Australia, for which we use CDS spread under modified restructuring (MR), because the time series under MR is longer than that under CR.

<sup>5</sup> We made adjustments following Amiti, McGuire and Weinstein (2017). See Section 4 for more details of the adjustments.

<sup>6</sup> When we use one of these six or seven economies as a lender country in our regression analysis, bilateral flows are defined between the lender country and the other 66 borrower countries.

<sup>7</sup> Markit provides senior five-year CDS spread data under three different restructuring clauses: Complete Restructuring (CR), Modified Restructuring (MR), and Modified-modified Restructuring (MM). We use CR because it allows us to use longest time-series data for all countries in our sample.

### *(iii) US dollar-denominated corporate bond spread*

This spread is calculated as the difference between the US dollar corporate bond-yield index for each lender country and the US Treasury yield of approximately the same maturity. The bond-yield index data were obtained from Barclays for AEs and from JPMorgan Chase for EMEs.<sup>8</sup> Appendix Table 3 provides the sample period of each indicator for each economy.

Graph 1 shows the time-series pattern of three measures of financial stress in lender countries. In Table 1, we report the time-series correlation coefficients between any two of the three measures of financial stress within each individual lender country. We find relatively high correlation, ranging from 0.07 to 0.98 with mean 0.72 and median 0.76.

Finally, we use EME sovereign CDS spread as a proxy for financial stress in borrower countries. Appendix Table 4 provides the list of 67 borrower countries by region. Graph 2 shows the time-series pattern of EME sovereign CDS spread. We find simultaneous increases in financial stress indicators during the GFC and the European debt crisis as well as an idiosyncratic surge in CDS spreads for several countries during non-crisis periods.

## 3 Bilateral capital flows

This section explains what data we use for bilateral banking flows and how the data are structured. Broadly speaking, the BIS international banking statistics measure international banking activities in consolidated and locational dimensions. In particular, CBS captures international banking activities based on the nationality of the lenders, that is, the country in which a lender bank is headquartered. For example, if an international bank is headquartered in the United States but its subsidiary is located in Hong Kong SAR, then the lending by the subsidiary to an entity in Korea is counted as lending by the US bank to Korea according to CBS. In contrast, LBS focuses on the location of banks, that is, the country in which a lender bank is located. Using the same example, the lending by the US bank's subsidiary in Hong Kong SAR to the entity in Korea is counted as lending by a Hong Kong bank to Korea.

The BIS reports CBS in two ways: an immediate counterparty (IC) basis and an ultimate risk (UR) basis. Broadly speaking, the difference between the two is that the ultimate risk approach considers risk transfer activities through credit risk mitigants, such as collateral, guarantees and credit protection, but the immediate counterparty approach does not.<sup>9</sup>

<sup>8</sup> Among the BIS CBS reporting countries, we were not able to obtain data on Finland, Greece, Ireland, Luxembourg and Portugal. For Denmark, we use data on local currency (Danish krona) corporate bonds. When we calculate the quarterly average bond yield, we use the quarterly average of month-end data from January 2001 to August 2004, and the quarterly average of daily data from September 2004 to September 2017. Finally, when we calculate the average maturity of the US dollar corporate bond yield index for each country, we use average remaining maturity data from Barclays for Australia, Austria, Belgium, Canada, France, Germany, Italy, Japan, Korea, Mexico, the Netherlands, Spain, Sweden, Switzerland, the United Kingdom and the United States. For Brazil, Chile, Hong Kong SAR, India, Panama, Singapore, Chinese Taipei and Turkey, we use data on yield-to-maturity modified duration from JPMorgan Chase as a proxy for the remaining maturity.

<sup>9</sup> See BIS (2016) for the difference between CBS on an IC basis and those on an UR basis.

Correlation between measures of financial stress in lender countries

Table 1

Economy	Correlation between bank CDS spread and sovereign CDS spread	Correlation between bank CDS spread and corporate spread	Correlation between sovereign CDS spread and corporate spread
Australia	0.89	0.74	0.66
Austria	0.85	0.81	0.82
Belgium	0.89	0.77	0.57
Brazil	0.85	0.85	0.57
Canada	0.86	0.55	0.46
Chile	0.28	0.17	0.79
Chinese Taipei	0.18	0.61	0.07
Denmark	0.93	0.94	0.83
Finland*	-	-	-
France	0.97	0.58	0.53
Germany	0.83	0.46	0.54
Greece**	0.61	-	-
Hong Kong SAR	0.96	0.91	0.92
Ireland**	0.98	-	-
Italy	0.97	0.56	0.62
Japan	0.80	0.70	0.77
Korea	0.98	0.94	0.93
Mexico	0.54	0.08	0.70
Netherlands	0.92	0.68	0.65
Panama**	-	-	0.96
Portugal*	-	-	-
Singapore	0.75	0.96	0.73
Spain	0.98	0.70	0.69
Sweden	0.90	0.78	0.78
Switzerland	0.43	0.81	0.75
Turkey	0.97	0.55	0.64
United Kingdom	0.87	0.66	0.71
United States	0.84	0.75	0.57

This table reports the correlation coefficients between any two of three time-series measures of financial stress for each individual lender country. The first measure of financial stress is bank CDS spread that is calculated by the weighted average of bank CDS spreads of as many as possible largest banks in each lender country with long time series, with total assets as weights. We use 66 banks headquartered in 29 lender countries. The second measure of financial stress is sovereign CDS spread. The final measure of financial stress is the US dollar corporate bond spread that is calculated by the US dollar corporate bond yield in each lender country after subtracting the US Treasury yield of approximately the same maturity. Countries with \* have only sovereign CDS spread data. Countries with \*\* have one missing series of financial stress data.

Source: authors' calculations.



---

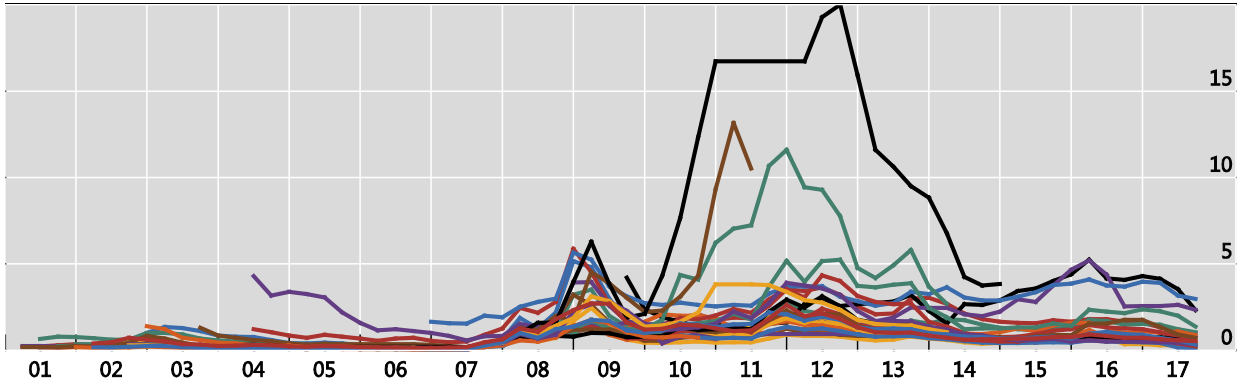
## Financial stress in lender countries

In percentage points

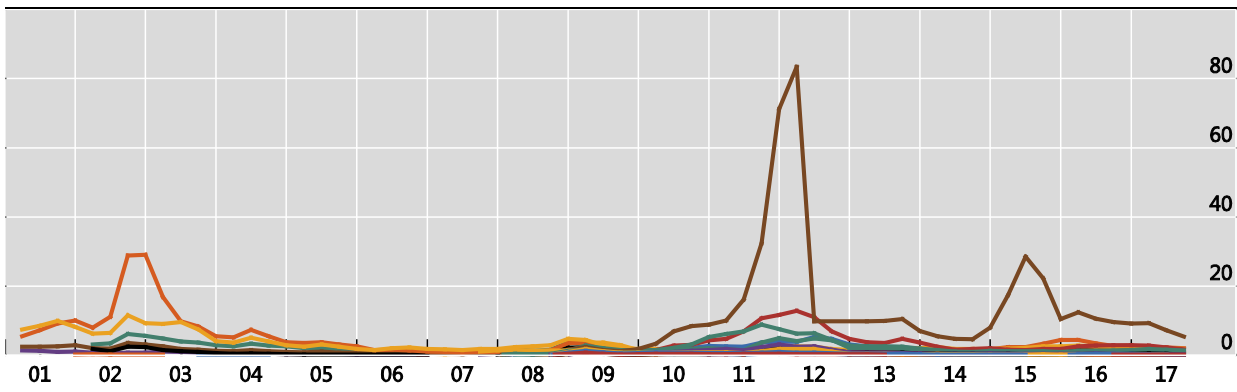
Graph 1

---

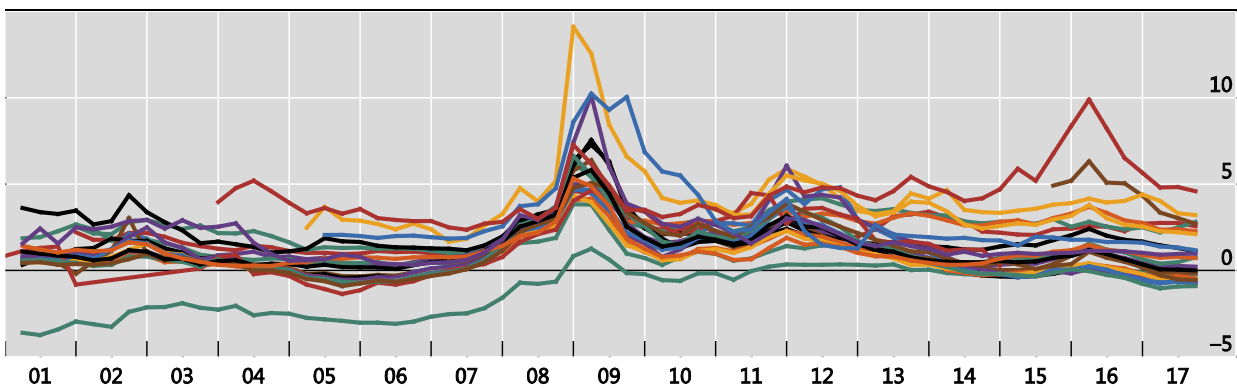
### Bank CDS spread



### Sovereign CDS spread



### Corporate bond spread



This graph presents three proxies for financial stress: bank CDS spread, sovereign CDS spread and corporate bond spread in 27, 29 and 25 lender countries, respectively. The data are quarterly from 2001Q1 to 2017Q3.

Sources: Barclays; Capital IQ; JPMorgan Chase; Markit; authors' calculations.

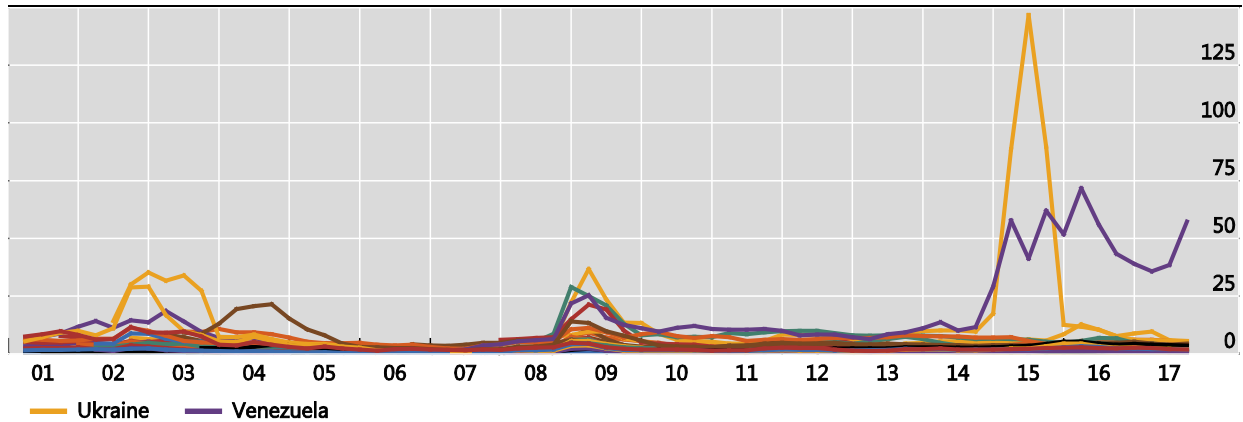
---

---

## Financial stress in EMEs

Sovereign CDS spread, in percentage points

Graph 2



This graph presents sovereign CDS spread in 41 emerging market economies. The data are quarterly from 2001Q1 to 2017Q3.

Source: Markit.

---

In addition to the different calculation methods, the BIS CBS report international banking activity with different classifications of subcomponents. In particular, CBS IC provides data on the following categories:

- CBS total foreign claims on an immediate counterparty basis: (a)
- CBS international claims on an immediate counterparty basis: (b)
- CBS local claims in local currency on an immediate counterparty basis: (c)

Here, international claims are the sum of cross-border claims and local claims in foreign currency. Foreign claims (a) are the sum of international claims (b) and local claims in local currency (c).

In contrast, CBS UR provides data on the following subcategories:

- CBS total foreign claims on an ultimate risk basis: (d)
- CBS cross-border claims on an ultimate risk basis: (e)
- CBS local claims in all currencies on an ultimate risk basis: (f)

Local claims are the sum of local claims in foreign currency and local claims in local currency. Foreign claims (d) is the sum of cross-border claims (e) and local claims (f).

Finally, we also consider LBS. In particular, we consider the following classification:

- LBS total cross-border claims on all sectors, all instruments: (g)
- LBS total cross-border claims on all sectors, debt securities: (h)
- LBS total cross-border claims on all sectors, loans and deposits: (i)

Total cross-border claims (g) is the sum of debt securities (h) and loans and deposits (i).

When we measure capital outflows from foreign claims, we calculate one-, two- and three-year bilateral capital outflows from EME  $i$  to lender country  $j$  by differencing quarterly foreign claims by four, eight, and twelve quarters:

$$Koutflow_{ijt} = \frac{FC_{ij,t} - FC_{ij,t+f}}{FC_{ij,t}} \times 100, f = 4, 8, 12 \quad (1)$$

In order to focus on capital outflows, we drop an observation if it takes a value lower than  $-100$ . We also calculate capital outflows of other forms in a similar way.

## 4 Empirical approach

In this section, we report and discuss the main empirical findings. Table 2 presents summary statistics of the variables considered in the estimation. As explained in section 3, capital outflow measures are percentage values between  $-100$  and  $100$ . If any positive foreign claims decrease to zero, the capital outflow measure becomes  $100$ . We truncate values below  $-100$  to focus on capital outflows, not capital inflows.<sup>10</sup> The three measures of financial stress in lender countries, bank CDS spread, sovereign CDS spread and corporate bond spread, and one measure of financial stress in EMEs, EME sovereign CDS spread, are all denoted in percentage points. The lender countries' bank CDS spread is on average higher than the sovereign CDS spread for lender countries, but lower than the corporate bond spread of lender countries and the EME sovereign CDS spread.<sup>11</sup> All remaining variables are related to economic fundamentals of EMEs that will be used as control variables when we explain capital outflows from these countries.

The main empirical specification takes the following form:

$$Koutflow_{ijt} = \alpha_1 fs_{jt} + \alpha_2 fs_{it} + X_{it}\beta + \vartheta_{ij} + \gamma_t + \varepsilon_{ijt} \quad (2)$$

where  $Koutflow_{ijt}$  is capital outflow from EME  $i$  to lender country  $j$  at time  $t$ ;  $fs_{jt}$  and  $fs_{it}$  are measures of financial stress in lender country  $j$  and EME  $i$ , respectively, at time  $t$ ;  $X_{it}$  is a vector of control variables;  $\vartheta_{ij}$  is bilateral fixed effects;  $\gamma_t$  is aggregate time-fixed effects; and  $\varepsilon_{ijt}$  is an error term at time  $t$ . For economic fundamental variables for EMEs, we consider the increase in the ratio of current account deficits to GDP over the past three years, real exchange rate appreciation over the past three years, the increase in the total credit-to-GDP ratio over the past three years, the ratio of reserves to M2, GDP growth and inflation.<sup>12</sup> These data were obtained from the IMF and the BIS. Finally, we consider the Rule of Law index from the World Bank as an additional control variable. Appendix Table 5 provides the definition and data sources of variables used in this paper.

<sup>10</sup> Note that our measure takes positive (negative) values when capital flows out (in), that is, when a borrower country repays loans to (obtains new loans from) a lender country on net during a quarter.

<sup>11</sup> The average value of lender countries' bank CDS spread for the sample countries from 2000 to 2017 is 1.29 percentage points, that of lender countries' sovereign CDS spread is 1.20 percentage points, that of lender countries' corporate bond spread is 1.59 percentage points, and that of EME sovereign CDS spread is 2.98 percentage points.

<sup>12</sup> For the motivation to include these fundamental variables, see Eichengreen and Gupta (2015) and Park, Ramayandi and Shin (2016).

## Summary statistics

Table 2

	Count	Mean	Min	Max
Outflow rate of capital flows based on total foreign claims of CBS on an immediate counterparty basis	60,466	0.87	-100.00	99.83
Outflow rate of capital flows based on CBS claims in foreign currency	58,693	1.30	-100.00	99.83
Outflow rate of capital flows based on CBS claims in local currency	17,195	-6.28	-100.00	100.00
Outflow rate of capital flows based on cross-border claims of LBS	33,081	2.77	-100.00	99.68
Outflow rate of capital flows based on local claims in all currencies of LBS	14,199	-3.40	-100.00	100.00
Outflow rate of capital flows based on cross-border claims of CBS on an immediate counterparty basis (estimates)	10,245	-4.56	-100.00	94.94
Outflow rate of capital flows based on local claims in foreign currency of CBS on an immediate counterparty basis (estimates)	9,002	2.35	-99.99	100
Bank CDS spread	1,471	1.29	0.04	19.99
Sovereign CDS spread	1,724	1.20	0.01	83.41
Corporate bond spread	1,480	1.59	-3.71	14.11
EME sovereign CDS spread	2,564	2.98	0.04	146.82
Increase in CA deficit (in the past three years)	3,716	0.10	-35.69	36.07
Real exchange rate appreciation (in the past three years)	3,277	-1.74	-49.83	24.36
Increase in credit to GDP ratio (in the past three years)	3,770	3.92	-61.38	62.01
Reserves/M2	3,718	0.41	0.03	1.98
GDP growth	3,790	4.43	-14.81	33.74
Inflation	3,741	5.87	-9.77	93.86
Rule of law	3,837	-0.11	-2.18	1.86

Outflow data are calculated as percentage points. Outflow measures below -100 are truncated. Spreads are shown in percentage points.

Source: authors' calculations.

## 5 Empirical findings

Our key question is whether financial stress in lender countries is a main driver of capital outflows from EMEs even after we control for financial stress in EMEs as well as other economic fundamentals in EMEs.

Tables 3–5 present estimation results when we measure capital outflows using total foreign claims of CBS on an immediate counterparty basis.<sup>13</sup> The sample period is from 2001Q1 to 2017Q3. In Table 3, we use bank CDS spread as the measure of financial stress in lender countries. In columns (1)–(5), we report pooling regression results that do not include bilateral fixed effects  $\vartheta_{ij}$  in the regression. In columns (1), (2) and (4), we do not include time dummies  $\gamma_t$ . Column (1) shows that when we use financial stress only in lender countries as a regressor, the estimated coefficient is positive, with statistical significance at the 1 percent level. Whether we include time dummies or not, when we use both measures of financial stress in AEs and EMEs as regressors, both coefficients are positive, with statistical significance at the 1 percent level. However, when we include economic fundamental variables in columns (4) and (5), although the estimated coefficient on financial stress in lender countries is still positive, with statistical significance at the 1 percent level, the statistical significance of financial stress in EMEs disappears. These results reflect that, after economic fundamental variables are included, the financial stress in EMEs does not have any additional explanatory power. It should be noted, however, that there is a potential simultaneity issue here as financial stress in an EME is likely to be correlated with economic fundamental variables of the EME. By contrast, the statistical significance and magnitude of the coefficients on financial stress in lender countries change little even in columns (4) and (5). This suggests that the importance of financial stress in lender countries in explaining capital outflows from EMEs remains intact even after economic fundamentals in EMEs are controlled for.

In columns (6)–(10) of Table 3, which report results from panel regressions with fixed effects, the same pattern emerges<sup>14</sup>: the importance of financial stress in lender countries in explaining capital outflows from EMEs prevails in all five specification, whereas the coefficient on financial stress in EMEs is positive and statistically significant only when the economic fundamental variables are excluded. The magnitude of the coefficient on bank CDS spread is also sizable: according to the estimates in columns (6)–(10), the increase in capital outflows caused by one standard deviation rise in bank CDS spread (1.15 log basis points) ranges from 6.2 percentage points to 7.9 percentage points. The estimated coefficients of economic fundamental variables generally make sense. For example, in both pooling and panel regressions, real exchange rate appreciation over the past three years and inflation are positively, while GDP growth is negatively, associated with capital outflows.<sup>15</sup>

<sup>13</sup> We also used two other measures of total foreign claims: (i) total foreign claims of consolidated banking statistics on an ultimate risk basis; and (ii) total cross-border claims of locational banking statistics. The estimation results are qualitatively the same and can be obtained from the authors upon request.

<sup>14</sup> The only exception is that the coefficient on financial stress in EMEs is negative and statistically significant at the 10 percent level.

<sup>15</sup> Although the coefficients on increases in credit and the reserves-to-M2 ratio are statistically significant with the wrong signs in the pooling regression, they are no longer statistically significant in the panel regression.

## Effect of financial stress in lender countries on capital outflows from EMEs

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 3

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	5.196*** [0.157]	6.468*** [0.184]	6.236*** [0.392]	5.701*** [0.207]	6.124*** [0.430]	5.691*** [0.324]	6.858*** [0.386]	5.835*** [0.949]	6.069*** [0.416]	5.365*** [1.044]
EME sovereign CDS spread		0.283*** [0.039]	0.292*** [0.043]	-0.031 [0.046]	0.053 [0.055]		0.191*** [0.065]	0.193*** [0.072]	-0.099* [0.055]	0.013 [0.066]
Increase in current account deficit				0.052 [0.058]	0.055 [0.059]				-0.106 [0.100]	-0.096 [0.105]
Real exchange rate				0.201*** [0.041]	0.217*** [0.048]				0.222*** [0.068]	0.203** [0.079]
Increase in credit				-0.064*** [0.020]	-0.107*** [0.020]				-0.023 [0.037]	-0.070* [0.037]
Reserves/M2				4.573*** [1.449]	5.917*** [1.434]				-7.634 [5.212]	0.848 [5.059]
GDP growth				-0.730*** [0.075]	-0.947*** [0.085]				-0.466*** [0.119]	-0.757*** [0.156]
Inflation				0.228*** [0.056]	0.035 [0.057]				0.233** [0.116]	-0.042 [0.126]
Rule of law				0.127 [0.360]	-0.295 [0.359]				7.501** [3.695]	5.653 [3.666]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	48,136	33,704	33,704	26,076	26,076	48,136	33,704	33,704	26,076	26,076
R-squared	0.024	0.041	0.068	0.049	0.082	0.026	0.040	0.071	0.048	0.083

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs

Lender country financial stress measured by sovereign CDS spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 4

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country sovereign CDS spread	1.549*** [0.096]	1.901*** [0.121]	1.578*** [0.121]	1.554*** [0.126]	1.353*** [0.129]	1.479*** [0.177]	1.698*** [0.220]	1.028*** [0.227]	1.241*** [0.256]	0.818*** [0.268]
EME sovereign CDS spread		0.314*** [0.038]	0.215*** [0.036]	-0.042 [0.045]	-0.025 [0.045]		0.239*** [0.058]	0.107* [0.055]	-0.086 [0.060]	-0.057 [0.059]
Increase in current account deficit				0.152*** [0.058]	0.021 [0.059]				0.069 [0.103]	-0.084 [0.106]
Real exchange rate				0.294*** [0.041]	0.203*** [0.048]				0.280*** [0.069]	0.210*** [0.080]
Increase in credit				-0.036* [0.020]	-0.078*** [0.020]				0.011 [0.038]	-0.053 [0.038]
Reserves/M2				3.951*** [1.438]	4.552*** [1.413]				-5.897 [5.231]	-0.160 [5.091]
GDP growth				-0.997*** [0.073]	-0.811*** [0.084]				-1.112*** [0.121]	-0.782*** [0.158]
Inflation				0.235*** [0.055]	0.097* [0.056]				0.168 [0.122]	-0.003 [0.124]
Rule of law				-0.387 [0.360]	-0.461 [0.358]				11.184*** [3.941]	5.595 [3.724]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	50,798	35,950	35,950	27,760	27,760	50,798	35,950	35,950	27,760	27,760
R-squared	0.006	0.011	0.054	0.021	0.064	0.004	0.006	0.058	0.019	0.069

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). The proxy for financial stress in lender countries is sovereign CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs

Lender country financial stress measured by corporate bond spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 5

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country corporate bond spread	2.299*** [0.106]	2.761*** [0.125]	2.285*** [0.172]	2.740*** [0.138]	2.437*** [0.191]	2.335*** [0.216]	2.705*** [0.257]	1.699*** [0.436]	2.588*** [0.270]	1.598*** [0.438]
EME sovereign CDS spread		0.387*** [0.039]	0.340*** [0.042]	-0.002 [0.042]	0.053 [0.049]		0.296*** [0.061]	0.228*** [0.068]	-0.063 [0.050]	-0.003 [0.057]
Increase in current account deficit				0.175*** [0.059]	0.109* [0.060]				0.062 [0.101]	-0.006 [0.106]
Real exchange rate				0.456*** [0.042]	0.217*** [0.048]				0.435*** [0.073]	0.205** [0.081]
Increase in credit				-0.078*** [0.021]	-0.116*** [0.021]				-0.002 [0.039]	-0.059 [0.038]
Reserves/M2				5.545*** [1.479]	6.869*** [1.463]				-9.034* [5.355]	-0.153 [5.232]
GDP growth				-0.983*** [0.076]	-0.995*** [0.085]				-0.820*** [0.121]	-0.771*** [0.160]
Inflation				0.090 [0.057]	0.038 [0.057]				0.012 [0.125]	-0.016 [0.129]
Rule of law				-0.594 [0.361]	-0.429 [0.359]				12.224*** [4.169]	6.045 [3.898]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	47,763	32,722	32,722	24,626	24,626	47,763	32,722	32,722	24,626	24,626
R-squared	0.012	0.023	0.069	0.040	0.086	0.008	0.015	0.068	0.030	0.082

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). The proxy for financial stress in lender countries is corporate bond spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.



In Tables 4 and 5, we replace bank CDS spread with other measures of financial stress, sovereign CDS spread and corporate bond spread, respectively.<sup>16</sup> The results are almost identical except that the magnitude of the coefficients on financial stress differs as the variance of proxies changes. In Table 4, where either pooling or panel regressions are used, and either fundamental variables of EMEs are included or not, only the financial stress in lender countries measured by sovereign CDS spread is consistently statistically significant with a positive sign. According to the estimates in columns (6)–(10), the effect of financial stress is sizable: one standard deviation rise in sovereign CDS spread (3.5 percentage points) increases capital outflows by 3.6 percentage points to 5.9 percentage points. In Table 5, when we use corporate bond spread as a proxy for financial stress in lender countries, the same pattern emerges: only financial stress in lender countries is consistently statistically significant with a positive sign. The estimates in columns (6)–(10) imply that one standard deviation rise in corporate bond spread (1.8 percentage points) increases capital outflows by 2.9 percentage points to 4.9 percentage points.

Although the results in Tables 3–5 are quite strong, there are two limitations to calculating the rate of bilateral capital outflows, denoted in equation (1), by using the raw data, as pointed out by Amiti, McGuire and Weinstein (2017). First, some bilateral claims are relatively small, and sometimes aggregate capital outflows from EMEs are driven by withdrawals by only a few lenders, ie, those holding large bilateral claims. For example, from the borrower’s perspective, a 10 percent withdrawal by a lender with a \$100 billion initial claim position contributes much more to the amount of aggregate capital flows than does a 100 percent withdrawal from, say, a lender with a \$1 billion initial position. However, in estimating the coefficients, the panel regression results in Tables 3–5 use only information in percentage values, 10 per cent and 100 per cent in this example, without taking into account the initial claim positions. This problem can be mitigated by relying on weighted regressions, with the initial bilateral claim positions as weights.<sup>17</sup>

Second, the rate of capital flows calculated in equation (1) does not reflect changes in actual credit provided by each reporting country to each EME, because of (i) valuation effects that arise from exchange rate movements between the US dollar and other currencies; and (ii) “breaks in series” in the underlying data.<sup>18</sup> Following the suggestions by Amiti, McGuire and Weinstein (2017), in order to correct these problems, we have made adjustments to the raw bilateral claims stocks in calculating the rate of capital flows.<sup>19</sup>

<sup>16</sup> In the regression, we take logarithm for bank CDP spread since there are a few large values, but for other financial stress measures, we did not take logarithm. However, the qualitative results do not change if we take logarithm for other measures as well.

<sup>17</sup> Amiti, McGuire and Weinstein (2017) argue that weighted regressions are not enough to resolve the problem in their model and used an estimation technique introduced in Amiti and Weinstein (2018) that exploits a large number of adding-up constraints due to general equilibrium linkages. However, the model they develop is interested in identifying “firm-borrowing channel” and “banking lending channel”, and it is not appropriate to apply the same technique to our context.

<sup>18</sup> Amiti, McGuire and Weinstein (2017) point out a third source of variation that is not directly associated with actual capital flows, ie, valuation effects that arise as firms adjust book values following the mark-to-market accounting principle. However, it is almost impossible to take this problem into consideration.

<sup>19</sup> We thank Patrick McGuire for sharing the adjusted data.

In Tables 6–8, we report the same regression results as in Tables 3–5, except that we use adjusted claims and adopt weighted regressions. In Table 6, when we use bank CDS spread as a proxy for financial stress in AEs, the results are almost identical to those in Table 3, except that the financial stress in EMEs is more statistically significant in pooling regressions (4)–(5) even after economic fundamentals are controlled for. However, it becomes much less statistically significant in panel regressions consistent with Table 3. In Table 7, when we use sovereign CDS spread as a proxy for financial stress in lender countries, the results are again qualitatively the same, except that its coefficient is somewhat imprecisely estimated when we include time dummies in columns (5) and (10). Finally in Table 8, when we use the third measure, corporate bond spread, for the proxy for financial stress in lender countries, the results are quite similar to those in Table 7, except that in columns (3) and (8), where we do not include fundamental variables in EMEs, the coefficient on financial stress in EMEs is more statistically significant than that for lender countries. Hence we still conclude that the financial stress in lender countries is a main driver of capital flows from EMEs even after the method of weighted regressions is used and all the adjustments are made.

Although we find that financial stress in lender countries is a major factor in explaining capital outflows from EMEs, since the sample period includes the GFC, one may question if this finding is mainly driven by the GFC episode, when a number of advanced economy lender countries experienced extreme financial stress and at the same time there were massive capital outflows from EMEs. To verify this, we estimate the same equation using the post-GFC sample from 2010Q1 to 2017Q3. Tables 9–11 is identical to Tables 6–8 except that the sample period is different. In Table 9, where we use bank CDS spread as a proxy for financial stress in lender countries, the pooling regression results in columns (1)–(5) are quite consistent with the previous findings in Table 6: while the coefficient on financial stress in EMEs is positive and statistically significant, once we include fundamental variables, it becomes insignificant, and only the coefficient of financial stress in lender countries is positive and highly statistically significant. However, in the panel regressions, when only fundamental variables are included and time dummies are excluded, the coefficient on financial stress in lender countries is positive and statistically significant at the 10 percent level, and when fundamental variables are not included, it is even negative and statistically significant. In Table 10, where sovereign CDS spread is used in the pooling regression, the results are entirely consistent with the previous results in Table 7, and even panel regression results are generally consistent. In the panel regression results, there is no single case where the coefficient on financial stress is negative and statistically significant, and it is positive and statistically significant at the 5 percent level in column (9). Finally in Table 11, where corporate bond spread is used as a proxy for financial stress in lender countries, panel regressions are generally consistent with the previous results when the fundamental variables are included. The coefficient on financial stress in lender countries is positive in columns (8)–(10) and is statistically significant in columns (8) and (9) at the 1 percent level and at the 5 percent level, respectively. Hence we conclude that, although the evidence is weaker, financial stress in lender countries is a major factor in explaining capital outflows from EMEs even after the GFC.

So far we have measured capital flows by total foreign claims without considering claims in different currency denominations or lenders' different locations. Total foreign claims can be divided into three types: (i) cross-border claims; (ii) local claims in foreign currency; and (iii) local claims in local currency. We expect that the extent to which these are withdrawn from lenders differs across the types. Unfortunately, however, neither CBS nor LBS provides the three types of claims separately.

Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 6

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	3.845*** [0.227]	4.031*** [0.247]	5.092*** [0.499]	3.354*** [0.233]	2.928*** [0.506]	4.392*** [0.651]	4.547*** [0.677]	4.381*** [1.486]	3.925*** [0.461]	2.859** [1.201]
EME sovereign CDS spread		0.655*** [0.082]	0.278*** [0.067]	0.552*** [0.149]	0.180* [0.105]		1.018*** [0.231]	0.454** [0.186]	0.549* [0.285]	0.072 [0.198]
Increase in current account deficit				-0.537*** [0.093]	-0.595*** [0.092]				-0.669*** [0.228]	-0.794*** [0.232]
Real exchange rate				0.425*** [0.044]	0.222*** [0.051]				0.425*** [0.103]	0.223* [0.124]
Increase in credit				-0.137*** [0.028]	-0.125*** [0.025]				-0.104* [0.059]	-0.067 [0.057]
Reserves/M2				-7.995*** [1.738]	-6.318*** [1.666]				-40.139*** [9.411]	-41.544*** [8.734]
GDP growth				-1.375*** [0.099]	-1.125*** [0.103]				-1.497*** [0.232]	-0.724*** [0.248]
Inflation				-0.334** [0.158]	-0.155 [0.146]				-0.247 [0.260]	0.076 [0.264]
Rule of law				1.719*** [0.465]	1.774*** [0.429]				3.649 [4.800]	-1.932 [3.663]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	54,359	37,550	37,550	27,987	27,987	54,359	37,550	37,550	27,987	27,987
R-squared	0.029	0.042	0.169	0.172	0.230	0.101	0.126	0.257	0.256	0.316

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by sovereign CDS spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 7

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country sovereign CDS spread	0.953*** [0.152]	0.916*** [0.157]	0.470*** [0.132]	0.631*** [0.120]	0.098 [0.092]	1.689*** [0.457]	1.652*** [0.468]	0.738* [0.414]	1.554*** [0.479]	0.416 [0.299]
EME sovereign CDS spread		0.699*** [0.086]	0.249*** [0.062]	0.557*** [0.147]	0.119 [0.091]		1.068*** [0.251]	0.347** [0.163]	0.540** [0.266]	-0.003 [0.154]
Increase in current account deficit				-0.364*** [0.100]	-0.615*** [0.093]				-0.418* [0.227]	-0.761*** [0.235]
Real exchange rate				0.486*** [0.045]	0.212*** [0.052]				0.490*** [0.107]	0.219* [0.124]
Increase in credit				-0.141*** [0.029]	-0.137*** [0.026]				-0.112 [0.070]	-0.082 [0.061]
Reserves/M2				-6.530*** [1.773]	-5.184*** [1.680]				-33.096*** [9.410]	-38.373*** [8.489]
GDP growth				-1.581*** [0.098]	-1.175*** [0.104]				-1.815*** [0.233]	-0.746*** [0.241]
Inflation				-0.354** [0.157]	-0.139 [0.146]				-0.265 [0.271]	0.089 [0.276]
Rule of law				1.566*** [0.485]	1.806*** [0.445]				5.433 [5.101]	-1.284 [3.705]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	55,693	39,035	39,035	28,734	28,734	55,693	39,035	39,035	28,734	28,734
R-squared	0.004	0.012	0.159	0.153	0.227	0.088	0.108	0.263	0.249	0.324

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The proxy for financial stress in lender countries is sovereign CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by corporate bond spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 8

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country corporate bond spread	0.567*** [0.148]	0.504*** [0.160]	0.309 [0.236]	1.250*** [0.191]	0.139 [0.266]	0.729** [0.291]	0.561* [0.309]	1.106* [0.578]	1.583*** [0.376]	0.654 [0.608]
EME sovereign CDS spread		0.720*** [0.085]	0.276*** [0.063]	0.485*** [0.139]	0.133 [0.095]		1.059*** [0.236]	0.368** [0.164]	0.455* [0.247]	0.011 [0.161]
Increase in current account deficit				-0.438*** [0.100]	-0.614*** [0.095]				-0.514** [0.233]	-0.795*** [0.240]
Real exchange rate				0.551*** [0.045]	0.226*** [0.051]				0.575*** [0.107]	0.223* [0.122]
Increase in credit				-0.123*** [0.029]	-0.128*** [0.026]				-0.085 [0.073]	-0.062 [0.061]
Reserves/M2				-7.001*** [1.790]	-5.991*** [1.697]				-36.303*** [9.910]	-42.425*** [8.630]
GDP growth				-1.547*** [0.100]	-1.197*** [0.104]				-1.739*** [0.236]	-0.709*** [0.249]
Inflation				-0.396** [0.157]	-0.162 [0.144]				-0.397 [0.280]	0.055 [0.265]
Rule of law				1.255*** [0.475]	1.631*** [0.431]				7.093 [5.797]	-1.879 [3.971]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	54,663	37,111	37,111	26,680	26,680	54,663	37,111	37,111	26,680	26,680
R-squared	0.001	0.010	0.157	0.155	0.225	0.060	0.077	0.241	0.233	0.310

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The proxy for financial stress in lender countries is corporate bond spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

Effect of financial stress in lender countries on capital outflows from EMEs, post-GFC sample, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis

Table 9

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	0.259 [0.432]	0.439 [0.469]	5.509*** [0.573]	1.503*** [0.543]	2.459*** [0.595]	-4.012*** [1.220]	-3.691*** [1.326]	2.951 [2.421]	2.445* [1.427]	-0.513 [2.422]
EME sovereign CDS spread		0.486*** [0.097]	0.302*** [0.086]	0.072 [0.108]	-0.016 [0.096]		0.537** [0.273]	0.211 [0.246]	-0.126 [0.204]	-0.266 [0.177]
Increase in current account deficit				-0.808*** [0.113]	-0.786*** [0.109]				-0.865*** [0.307]	-0.879*** [0.337]
Real exchange rate				0.249*** [0.071]	0.081 [0.082]				0.335** [0.140]	0.116 [0.156]
Increase in credit				-0.103*** [0.037]	-0.086*** [0.033]				0.011 [0.079]	0.160* [0.090]
Reserves/M2				-7.000*** [2.238]	-3.841* [2.085]				-76.855*** [21.556]	-67.958*** [19.249]
GDP growth				-1.303*** [0.135]	-1.183*** [0.140]				-1.526*** [0.232]	-0.800** [0.317]
Inflation				-0.159 [0.209]	-0.066 [0.190]				-0.084 [0.476]	0.170 [0.442]
Rule of law				1.774*** [0.573]	1.605*** [0.543]				4.578 [5.148]	3.913 [5.654]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	27,909	19,910	19,910	14,469	14,469	27,909	19,910	19,910	14,469	14,469
R-squared	0.000	0.004	0.116	0.130	0.191	0.160	0.175	0.294	0.294	0.366

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The sample period is post-GFC, which is 2010Q1-2017Q3. The proxy for financial stress in lender countries is Bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

Effect of financial stress in lender countries on capital outflows from EMEs, post-GFC sample, weighted regressions after adjustments

Lender country financial stress measured by sovereign CDS spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 10

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country sovereign CDS spread	0.143*** [0.044]	0.127*** [0.045]	0.230*** [0.058]	0.104*** [0.032]	0.064** [0.032]	-0.038 [0.077]	-0.036 [0.076]	0.105 [0.064]	0.166** [0.069]	0.060 [0.061]
EME sovereign CDS spread		0.431*** [0.083]	0.317*** [0.077]	0.036 [0.097]	-0.047 [0.083]		0.413* [0.218]	0.172 [0.199]	-0.158 [0.189]	-0.282* [0.159]
Increase in current account deficit				-0.732*** [0.119]	-0.785*** [0.108]				-0.684** [0.329]	-0.763** [0.327]
Real exchange rate				0.232*** [0.067]	0.109 [0.083]				0.305** [0.127]	0.142 [0.160]
Increase in credit				-0.134*** [0.038]	-0.107*** [0.034]				-0.015 [0.076]	0.130 [0.087]
Reserves/M2				-4.218* [2.242]	-1.894 [2.060]				-65.394*** [20.582]	-59.795*** [17.964]
GDP growth				-1.309*** [0.135]	-1.210*** [0.138]				-1.329*** [0.218]	-0.688** [0.309]
Inflation				-0.122 [0.204]	-0.044 [0.187]				-0.011 [0.439]	0.210 [0.437]
Rule of law				2.018*** [0.585]	1.860*** [0.553]				3.083 [4.097]	3.519 [5.486]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	31,132	22,331	22,331	15,818	15,818	31,132	22,331	22,331	15,818	15,818
R-squared	0.000	0.004	0.100	0.130	0.187	0.181	0.198	0.304	0.306	0.374

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The sample period is post-GFC, which is 2010Q1-2017Q3. The proxy for financial stress in lender countries is sovereign CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

Effect of financial stress in lender countries on capital outflows from EMEs, post-GFC sample, weighted regressions after adjustments

Lender country financial stress measured by corporate bond spread; capital outflows measured by CBS total foreign claims on an immediate counterparty basis Table 11

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country corporate bond spread	-0.773*** [0.253]	-0.838*** [0.270]	0.580* [0.341]	0.367 [0.300]	0.054 [0.388]	-1.156** [0.509]	-1.085** [0.521]	2.922*** [0.608]	1.119** [0.542]	1.132 [0.748]
EME sovereign CDS spread		0.451*** [0.088]	0.330*** [0.081]	0.044 [0.098]	-0.045 [0.085]		0.438* [0.231]	0.168 [0.215]	-0.164 [0.190]	-0.276* [0.162]
Increase in current account deficit				-0.825*** [0.122]	-0.830*** [0.114]				-0.908*** [0.338]	-0.839** [0.350]
Real exchange rate				0.254*** [0.072]	0.104 [0.083]				0.359*** [0.132]	0.081 [0.154]
Increase in credit				-0.109*** [0.038]	-0.089*** [0.034]				0.019 [0.084]	0.169* [0.092]
Reserves/M2				-6.122*** [2.287]	-3.730* [2.111]				-75.191*** [20.461]	-65.831*** [17.969]
GDP growth				-1.330*** [0.135]	-1.260*** [0.140]				-1.481*** [0.229]	-0.772** [0.319]
Inflation				-0.171 [0.205]	-0.084 [0.186]				-0.173 [0.472]	0.126 [0.445]
Rule of law				1.707*** [0.572]	1.496*** [0.544]				5.425 [5.410]	3.416 [6.243]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	28,775	20,535	20,535	14,537	14,537	28,775	20,535	20,535	14,537	14,537
R-squared	0.002	0.006	0.106	0.128	0.188	0.135	0.147	0.280	0.283	0.359

The dependent variable is bilateral capital outflows, based on total foreign claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The sample period is post-GFC, which is 2010Q1-2017Q3. The proxy for financial stress in lender countries is corporate bond spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.



## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS claims in foreign currency

Table 12

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	5.238*** [0.277]	5.622*** [0.299]	8.609*** [0.588]	4.359*** [0.314]	6.571*** [0.653]	5.771*** [0.670]	6.181*** [0.688]	7.803*** [1.836]	4.416*** [0.637]	6.471*** [1.721]
EME sovereign CDS spread		1.123*** [0.111]	0.529*** [0.074]	0.806*** [0.180]	0.183** [0.091]		1.195*** [0.265]	0.332** [0.167]	0.905*** [0.327]	0.048 [0.130]
Increase in current account deficit				-0.567*** [0.100]	-0.462*** [0.095]				-0.606*** [0.228]	-0.529** [0.218]
Real exchange rate				0.568*** [0.060]	0.352*** [0.067]				0.578*** [0.119]	0.400*** [0.126]
Increase in credit				-0.205*** [0.041]	-0.234*** [0.034]				-0.220*** [0.069]	-0.225*** [0.056]
Reserves/M2				-7.590*** [2.233]	-3.663* [2.087]				-30.507*** [9.189]	-23.978*** [8.793]
GDP growth				-1.694*** [0.115]	-1.204*** [0.123]				-2.104*** [0.206]	-1.151*** [0.239]
Inflation				-0.345*** [0.119]	-0.055 [0.114]				-0.513*** [0.175]	-0.119 [0.196]
Rule of law				-0.533 [0.593]	0.236 [0.496]				5.265 [7.106]	0.764 [5.919]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	54,059	37,358	37,358	27,710	27,710	54,059	37,358	37,358	27,710	27,710
R-squared	0.029	0.052	0.198	0.163	0.250	0.084	0.105	0.257	0.230	0.311

The dependent variable is bilateral capital outflows, based on foreign claims in foreign currency of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS claims in local currency

Table 13

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	1.751*** [0.229]	2.072*** [0.247]	0.735 [0.549]	1.912*** [0.249]	-1.196** [0.526]	2.365*** [0.644]	2.468*** [0.658]	-0.286 [1.534]	2.769*** [0.433]	-1.557 [1.480]
EME sovereign CDS spread		-0.128 [0.103]	-0.251** [0.111]	-0.003 [0.109]	-0.085 [0.103]		0.658** [0.314]	0.515 [0.333]	-0.143 [0.215]	-0.195 [0.232]
Increase in current account deficit				-0.273*** [0.092]	-0.471*** [0.097]				-0.421** [0.177]	-0.676*** [0.186]
Real exchange rate				0.222*** [0.046]	0.138** [0.054]				0.244*** [0.093]	0.083 [0.102]
Increase in credit				-0.084*** [0.025]	-0.060** [0.025]				-0.044 [0.060]	-0.011 [0.050]
Reserves/M2				-10.836*** [2.100]	-10.991*** [2.019]				-34.639*** [10.090]	-46.049*** [8.181]
GDP growth				-0.829*** [0.128]	-0.855*** [0.108]				-0.679* [0.350]	-0.180 [0.317]
Inflation				-0.632*** [0.140]	-0.549*** [0.136]				-0.101 [0.264]	0.244 [0.231]
Rule of law				2.085*** [0.428]	1.897*** [0.423]				-1.937 [5.813]	-9.649** [4.824]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	17,962	13,990	13,990	10,696	10,696	17,962	13,990	13,990	10,696	10,696
R-squared	0.009	0.013	0.067	0.094	0.123	0.118	0.132	0.190	0.194	0.240

The dependent variable is bilateral capital outflows, based on foreign claims in local currency of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). Since outstanding claims are reported in US dollars, following Amiti, McGuire and Weinstein (2017), we take into consideration of valuation effects that arise from exchange rate movements. The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

Tables 12 and 13 present regression results when we divide CBS total claims into those in foreign and in local currencies. We report the regression results for capital outflows calculated using claims in foreign currency in Table 12, and for those calculated by using claims in local currency in Table 13. We report only the results when the proxy for financial stress in lender countries is bank CDS spread, adjustments for claims are made for time-series breaks, and valuations changes and weighted regressions are adopted.<sup>20</sup> When we compare Table 12 with Table 13, we find that claims in local currency are more resilient than claims in foreign currency against financial stresses in both lender countries and EMEs. The results in Table 12 for claims in foreign currency are similar to those found in Tables 3–8, in the sense that the financial stress in lender countries is a major factor in explaining capital outflows from EMEs. The only difference is that financial stress in EMEs is also more statistically significant. In the pooling regressions (1)–(5), the coefficient on financial stress in EMEs as well as that in lender countries is statistically significant. Only in the panel regressions when time dummies are included, the significance of financial stress in EMEs disappears. In Table 13 for claims in local currency, even financial stress in lender countries is less statistically significant, particularly when time dummies are included in columns (3), (5), (8) and (10), and its estimated coefficient is generally much smaller. Financial stress in EMEs is mostly insignificant and often of the wrong sign. Hence we conclude that claims in local currency are much less subject to capital outflows facing financial stresses in borrower and even lender countries.

In Tables 14 and 15, we consider another partition of claims based on CBS on an UR basis: cross-border versus local claims in all currencies. We report the results for cross-border claims in Table 14, and those for local claims in all currencies in Table 15, by adopting the method of weighted regressions. Again we report only the results when bank CDS spread is used for financial stress in lender countries.<sup>21</sup> Similar to those in Tables 12 and 13, results in Tables 14 and 15 also suggest that cross-border claims are more vulnerable to financial stress in both lender and borrower countries. When comparing the results in Table 14 to those in Table 15, we find that generally the coefficients on financial stress in both lender and borrower countries are larger and more statistically significant for cross-border claims than for local claims.

To sum up the results in Tables 12–15, we find that claims in foreign currency and cross-border claims are more vulnerable to financial stress, particularly in lender countries. Since cross-border claims are also mostly denominated in foreign currency and hence included in claims in foreign currency, it is not clear from the results in Tables 12–15 which factor, cross-border or foreign currency, makes claims more fragile. To find this out, we need to compare cross-border claims with local claims in foreign currency, because when both are in foreign currency, the only difference is whether they are cross-border or not. If the results are the same across these two cases, we could conclude that currency denomination matters more; otherwise, we could conclude that cross-border matters more. Unfortunately, however, the BIS only recently started to report the breakdown of local claims into those in foreign currency and those in local currency. Table 16 shows the currently available data on the breakdown. Given that available time series for the breakdown are very short, we

<sup>20</sup> The results for other proxies for financial stress in AEs, unweighted regressions, and unadjusted claims are qualitatively the same and not reported, but will be available upon request.

<sup>21</sup> When other proxies are used for financial stress in lender countries, the results are qualitatively similar and hence not reported here, but are available upon request.

## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS cross-border claims

Table 14

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	5.933*** [0.457]	5.671*** [0.500]	8.214*** [1.189]	5.205*** [0.549]	6.911*** [1.309]	6.358*** [0.855]	6.273*** [0.932]	3.903 [2.813]	5.668*** [1.020]	3.071 [3.199]
EME sovereign CDS spread		0.736*** [0.110]	1.034*** [0.135]	0.212 [0.138]	0.769*** [0.188]		0.383** [0.175]	0.640*** [0.241]	-0.244 [0.216]	0.498 [0.304]
Increase in current account deficit				-0.819*** [0.147]	-0.310** [0.126]				-1.175*** [0.329]	-0.598*** [0.223]
Real exchange rate				0.331*** [0.075]	-0.013 [0.091]				0.373** [0.165]	0.008 [0.152]
Increase in credit				0.132*** [0.044]	-0.019 [0.036]				0.232** [0.097]	0.062 [0.072]
Reserves/M2				6.130** [2.962]	10.339*** [2.669]				-34.512*** [11.638]	-9.764 [11.433]
GDP growth				-0.344** [0.149]	-0.849*** [0.168]				-0.175 [0.260]	-0.808** [0.336]
Inflation				0.217 [0.149]	-0.056 [0.133]				0.375 [0.282]	0.094 [0.241]
Rule of law				-0.907 [0.711]	-0.230 [0.616]				12.183 [8.994]	6.385 [7.806]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	30,612	22,481	22,481	17,465	17,465	30,612	22,481	22,481	17,465	17,465
R-squared	0.028	0.032	0.175	0.050	0.197	0.126	0.123	0.274	0.176	0.307

The dependent variable is bilateral capital outflows, based on cross-border claims of consolidated banking statistics on an ultimate risk basis, from emerging market economies (EMEs). The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS local claims in all currencies

Table 15

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	4.545*** [0.346]	4.439*** [0.380]	4.798*** [1.018]	3.945*** [0.416]	2.040* [1.071]	5.293*** [1.076]	5.418*** [1.221]	3.866 [3.236]	5.020*** [1.065]	1.906 [3.120]
EME sovereign CDS spread		0.397** [0.157]	0.753*** [0.214]	-0.318*** [0.121]	0.107 [0.108]		0.000 [0.302]	0.368 [0.352]	-0.668** [0.324]	-0.108 [0.175]
Increase in current account deficit				-0.456*** [0.110]	-0.304*** [0.116]				-0.525** [0.238]	-0.509* [0.271]
Real exchange rate				0.355*** [0.132]	0.019 [0.127]				0.428** [0.190]	0.087 [0.198]
Increase in credit				-0.023 [0.031]	-0.066** [0.030]				0.077 [0.063]	0.058 [0.059]
Reserves/M2				-8.035*** [3.022]	-6.022** [2.610]				-50.102*** [13.409]	-36.119*** [12.790]
GDP growth				-0.336** [0.152]	-0.843*** [0.173]				0.052 [0.232]	-0.035 [0.459]
Inflation				0.230* [0.139]	0.062 [0.131]				0.107 [0.278]	0.002 [0.286]
Rule of law				-0.223 [0.611]	-0.498 [0.616]				25.005*** [6.400]	8.812 [7.248]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	13,739	10,860	10,860	8,878	8,878	13,739	10,860	10,860	8,878	8,878
R-squared	0.037	0.039	0.177	0.057	0.206	0.134	0.137	0.291	0.179	0.318

The dependent variable is bilateral capital outflows, based on local claims in all currencies of consolidated banking statistics on an ultimate risk basis, from emerging market economies (EMEs). The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

Data availability of cross-border claims and local claims in foreign currency (as of 2017Q3)

Table 16

Consolidated banking statistics reporting country	First quarter data on cross-border claims and local claims in foreign currency were reported	Number of quarters with data available
Australia	-	-
Austria	2017Q2	2
Belgium	2013Q4	16
Canada	2011Q1	27
Chile	2014Q1	15
Chinese Taipei	2011Q1	27
Denmark	2013Q3	17
Finland	2014Q1	15
France	2012Q1	23
Germany	2011Q1	27
Greece	2011Q2	26
Hong Kong SAR	2014Q4	12
India	2010Q4	28
Ireland	2013Q4	16
Italy	2013Q4	16
Japan	2014Q4	12
Korea	2011Q4	24
Netherlands	2013Q4	16
Norway	2011Q1	27
Portugal	2016Q4	4
Singapore	2011Q3	25
Spain	2011Q1	27
Sweden	2012Q2	22
Switzerland	2013Q4	16
Turkey	2011Q1	27
United Kingdom	2005Q4	48
United States	2013Q2	18
Average		19.3

Source: authors' compilation based on the BIS consolidated banking statistics on an immediate counterparty basis.

construct an estimated value of the two claims. In particular, we divide CBS international claims on an IC basis into estimates of cross-border claims ( $XBC_{IC}$ ) and

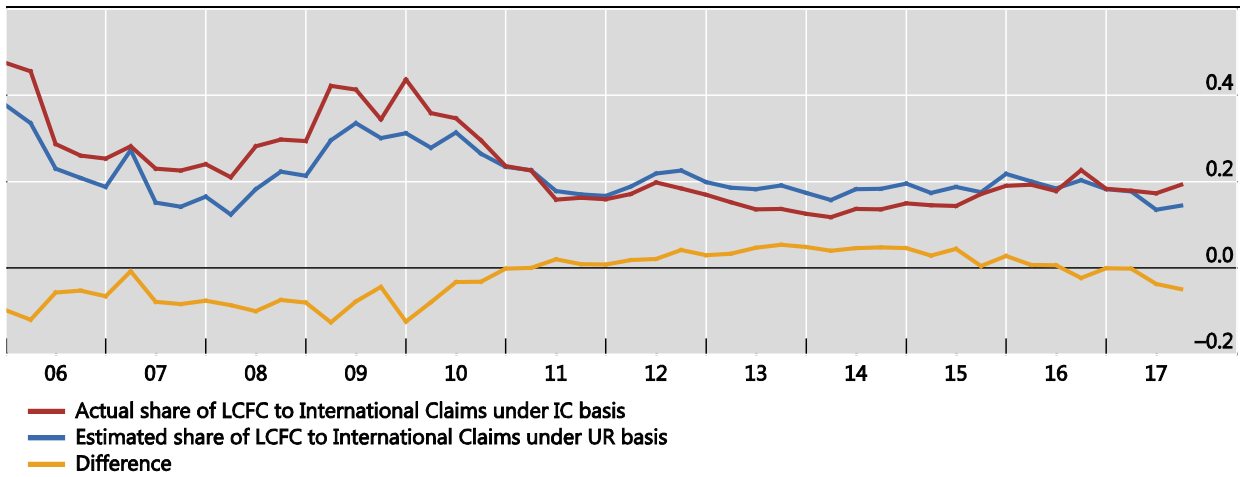
local claims in foreign currency (LCFC<sub>IC</sub>). Since CBS local claims in local currency on an UR basis (LCLC<sub>UR</sub>) is available, by assuming  $LCLC_{IC} = LCLC_{UR}$  we obtain estimates of LCFC<sub>UR</sub>. Then, by equating (estimated LCFC<sub>UR</sub>)/XBC<sub>UR</sub> to LCFC<sub>IC</sub>/XBC<sub>IC</sub>, we obtain the share of LCFC<sub>IC</sub> to XBC<sub>IC</sub>. To confirm the validity of our assumption, Graph 3 compares the estimates of LCFC<sub>IC</sub>/XBC<sub>IC</sub> to the actual data for selected countries for the period during which the actual data are reported. We find that they exhibit very similar time variations.<sup>22</sup>

### Comparison of the estimated and actual share of local claims in foreign currency to international claims

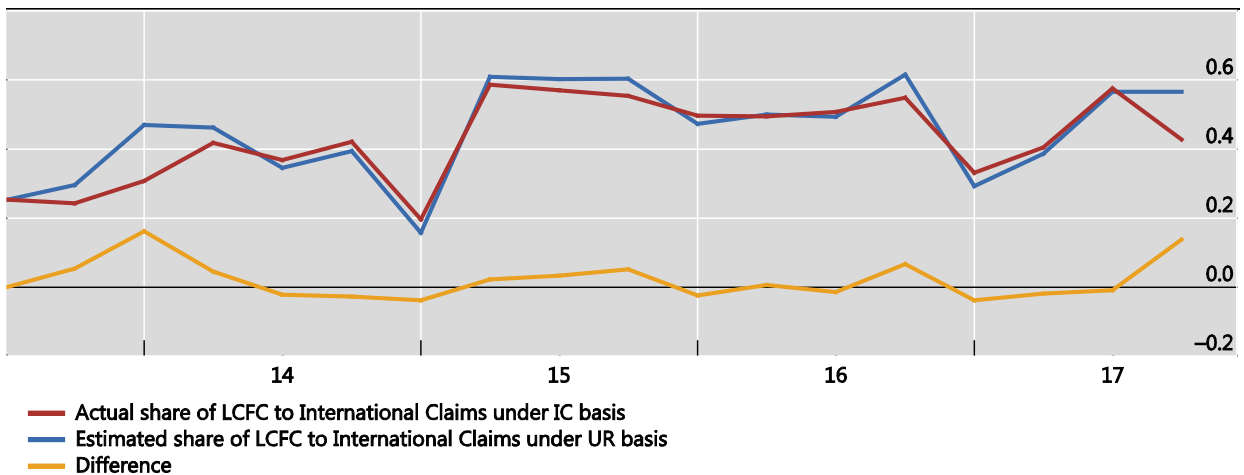
In per cent

Graph 3

#### UK banks' lending to China



#### US banks' lending to Brazil



We compare the estimated and actual shares of local claims in foreign currency to international claims under a CBS ultimate risk basis and present the difference for the UK banks' lending to China and the US banks' lending to Brazil.

Source: authors' calculations.

<sup>22</sup> The United Kingdom is selected because it reports the longest series of actual data.

Tables 17 and 18 present the weighted regression results for estimated cross-border claims (Table 17) and those for local claims in foreign currency (Table 18). Again we use bank CDS spread as a proxy for financial stress in lender countries and adopt the method of weighted regressions.<sup>23</sup> Although the results in Table 17 should be the same in principle as those in Table 14, they are not identical, for two reasons. First, whereas the results in Table 14 are based on CBS on an UR basis, those in Table 17 are based on CBS on an IC basis. Second, whereas the results in Table 14 use actual BIS claims data, those in Table 17 are based on estimated claims. When we compare Table 17 with Table 14, the regression results are quite similar, in the sense that both suggest that the financial stress in lender countries is a major driver of capital flows from EMEs, except that its coefficient is somewhat imprecisely estimated in columns (8) and (10) of Table 17. When comparing Table 17 with Table 18, we find that local claims in foreign currency are much more stable than cross-border claims. In particular, in Table 18 the panel regression results show that the coefficients on financial stresses in both lender and borrower countries are not statistically significant. Although the coefficients are expected to be imprecisely estimated in Tables 17 and 18 because they use the estimated claims subject to errors as regressors, the fact that the results in Tables 14 and 17 are similar suggests that the insignificance of the coefficients on financial stresses in Table 18 are not entirely due to the errors-in-variables bias. Hence we conclude that cross-border rather than currency denomination plays a more important role in making claims vulnerable to withdrawals due to financial stress in lender countries.

Finally, Tables 19 and 20 report regression results to examine the extent to which different instruments respond differently to financial stress in lender countries. Only LBS reports claims in different instruments. We focus on debt securities and bank loans, and report weighted regression results in Tables 19 and 20, respectively. When comparing the pooling regressions across Tables 19 and 20, we find strong evidence that bank-loan flows are much more susceptible than debt-security flows to financial stresses in both lender and borrower countries. Although this difference disappears in panel regressions, and both flows are quite responsive to financial stress in lender countries, in columns (8) and (10), where the time dummy is included, the coefficient on financial stress in lender countries is much more statistically significant for bank loans than for debt securities. Overall, our evidence indicates that bank loans are more vulnerable than debt securities to financial stress in lender countries.

<sup>23</sup> The results are again qualitatively similar for other proxies of financial stress in lender countries.



## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS cross-border claims on an immediate counterparty basis (estimates) Table 17

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	4.234*** [0.565]	4.072*** [0.625]	3.414** [1.633]	4.263*** [0.708]	4.371** [1.767]	4.437*** [0.975]	4.408*** [1.050]	1.648 [4.115]	4.212*** [1.238]	1.637 [4.585]
EME sovereign CDS spread		0.617*** [0.179]	0.933*** [0.239]	-0.025 [0.184]	0.397* [0.222]		0.111 [0.221]	0.496* [0.300]	-0.629** [0.278]	0.019 [0.232]
Increase in current account deficit				-0.952*** [0.199]	-0.262 [0.166]				-1.170*** [0.428]	-0.381 [0.329]
Real exchange rate				0.349*** [0.098]	0.092 [0.113]				0.347* [0.192]	0.109 [0.195]
Increase in credit				0.193*** [0.058]	0.010 [0.049]				0.297** [0.139]	0.090 [0.118]
Reserves/M2				1.112 [4.251]	4.307 [3.600]				-45.624*** [14.972]	-20.053 [13.103]
GDP growth				-0.111 [0.190]	-0.570*** [0.203]				-0.090 [0.315]	-0.876** [0.410]
Inflation				0.402** [0.195]	0.082 [0.168]				0.713** [0.349]	0.346 [0.282]
Rule of law				-0.229 [0.867]	0.198 [0.758]				26.998** [10.638]	12.522 [10.586]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	9,924	7,827	7,827	6,269	6,269	9,924	7,827	7,827	6,269	6,269
R-squared	0.013	0.015	0.192	0.031	0.209	0.084	0.078	0.265	0.134	0.296

The dependent variable is bilateral capital outflows, based on estimated cross-border claims of consolidated banking statistics on an immediate counterparty basis, from emerging market economies (EMEs). The proxy for financial stress in lender countries is bank CDS spread for which we take logarithm. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by CBS local claims in foreign currency on an IC basis (estimates)

Table 18

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	1.839*** [0.647]	1.171 [0.733]	0.577 [1.391]	0.119 [0.792]	-1.426 [1.594]	2.957* [1.557]	2.992 [1.891]	2.887 [4.416]	1.782 [1.579]	0.964 [4.448]
EME sovereign CDS spread		0.669*** [0.217]	0.629*** [0.235]	0.093 [0.154]	0.026 [0.129]		0.364 [0.259]	0.125 [0.225]	0.062 [0.284]	-0.068 [0.204]
Increase in current account deficit				-0.674*** [0.188]	-0.648*** [0.196]				-0.711* [0.415]	-0.715** [0.362]
Real exchange rate				0.559*** [0.127]	0.188 [0.153]				0.672** [0.270]	0.427 [0.317]
Increase in credit				-0.152** [0.064]	-0.159** [0.064]				-0.201 [0.179]	-0.147 [0.183]
Reserves/M2				-5.987 [3.847]	0.360 [3.590]				-28.900 [23.778]	14.200 [19.887]
GDP growth				-0.101 [0.255]	-0.145 [0.253]				0.138 [0.638]	0.094 [0.632]
Inflation				0.588*** [0.199]	0.521*** [0.189]				0.359 [0.398]	0.214 [0.343]
Rule of law				2.187** [1.002]	0.798 [0.970]				30.814** [14.001]	6.895 [14.020]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	8,766	6,896	6,896	5,372	5,372	8,766	6,896	6,896	5,372	5,372
R-squared	0.002	0.005	0.091	0.038	0.108	0.113	0.120	0.223	0.204	0.264

The dependent variable is bilateral capital outflows, based on estimated local claims in foreign currency of consolidated banking statistics on an immediate counterparty (IC) basis, from emerging market economies (EMEs). The proxy for financial stress in lender countries is bank CDS spread for which we take logarithm. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by LBS total cross-border claims in debt securities

Table 19

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	1.270 [0.945]	1.257 [1.002]	-0.794 [1.781]	2.949*** [0.915]	-1.058 [1.891]	6.032*** [1.463]	6.505*** [1.676]	17.766* [9.210]	8.621*** [2.068]	12.800* [7.520]
EME sovereign CDS spread		1.301*** [0.331]	2.268*** [0.331]	-1.569* [0.810]	1.976*** [0.667]		-0.594 [0.722]	0.692 [0.722]	-3.606*** [1.352]	1.980** [0.990]
Increase in current account deficit				-0.809** [0.400]	-0.515* [0.310]				-2.008 [1.319]	-0.943** [0.448]
Real exchange rate				-0.021 [0.202]	-0.055 [0.212]				0.105 [0.397]	-0.078 [0.289]
Increase in credit				0.146 [0.120]	-0.085 [0.078]				0.472 [0.355]	0.123 [0.157]
Reserves/M2				26.605*** [8.074]	27.530*** [6.249]				-25.446 [32.001]	3.030 [22.162]
GDP growth				-0.776** [0.354]	-1.550*** [0.369]				0.821 [0.599]	0.233 [0.634]
Inflation				2.162*** [0.374]	1.039*** [0.320]				1.373*** [0.412]	0.484 [0.473]
Rule of law				1.199 [2.212]	1.562 [1.775]				-19.086 [21.544]	-13.476 [14.450]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	14,903	12,367	12,367	8,804	8,804	14,903	12,367	12,367	8,804	8,804
R-squared	0.001	0.006	0.159	0.069	0.244	0.163	0.174	0.334	0.221	0.375

The dependent variable is bilateral capital outflows, based on cross-border claims of debt securities in locational banking statistics, from emerging market economies (EMEs). The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## Effect of financial stress in lender countries on capital outflows from EMEs, weighted regressions after adjustments

Lender country financial stress measured by bank CDS spread; capital outflows measured by LBS total cross-border claims in bank loans

Table 20

	Pooling regressions					Panel regressions with fixed effects				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lender country bank CDS spread	4.501*** [0.558]	4.862*** [0.643]	8.004*** [1.322]	4.940*** [0.668]	9.100*** [1.411]	5.430*** [0.780]	5.751*** [0.907]	11.431*** [2.854]	5.216*** [0.823]	11.034*** [3.302]
EME sovereign CDS spread		0.734*** [0.100]	0.747*** [0.091]	0.476*** [0.176]	0.789*** [0.197]		0.625*** [0.187]	0.522** [0.211]	0.353 [0.268]	0.685** [0.326]
Increase in current account deficit				-1.305*** [0.244]	-0.599*** [0.147]				-1.564*** [0.498]	-0.792*** [0.255]
Real exchange rate				0.155 [0.104]	0.120 [0.106]				0.215 [0.202]	0.189 [0.156]
Increase in credit				0.150** [0.073]	-0.028 [0.047]				0.222 [0.180]	0.036 [0.081]
Reserves/M2				4.072 [4.209]	12.817*** [3.103]				-34.144*** [10.838]	-0.314 [10.428]
GDP growth				-0.399** [0.195]	-0.902*** [0.201]				-0.370 [0.287]	-1.036*** [0.372]
Inflation				0.300* [0.175]	0.001 [0.123]				0.597 [0.445]	0.053 [0.284]
Rule of law				0.466 [1.135]	1.264 [0.770]				19.427 [13.567]	3.414 [7.220]
Time Dummies	No	No	Yes	No	Yes	No	No	Yes	No	Yes
Observations	37,812	26,262	26,262	19,978	19,978	37,812	26,262	26,262	19,978	19,978
R-squared	0.019	0.028	0.189	0.061	0.234	0.092	0.104	0.281	0.171	0.328

The dependent variable is bilateral capital outflows, based on cross-border claims of bank loans in locational banking statistics, from emerging market economies (EMEs). The proxy for financial stress in lender countries is bank CDS spread. We control for financial stress in EMEs proxied by sovereign CDS spread as well as other EMEs' fundamental variables. The weights in the weighted regressions are the initial outstanding claims. Numbers in brackets are robust standard errors. \*\*\*, \*\* and \* denote the significance levels of 1%, 5% and 10%, respectively.

## 6 Conclusion

In this paper, we find evidence that financial stress in lender countries, which are mostly AEs, is a major driver of banking outflows from EMEs. This conclusion is quite robust, in the sense that the results prevail for both CBS and LBS total claims, for both weighted and unweighted regressions, and for both adjusted and unadjusted claims for occasional breaks in underlying series and valuation effects due to exchange rate movements. Although the evidence is somewhat weaker, we also find that our results generally hold in the post-GFC period, suggesting that the importance of lender countries' financial stress is not restricted to the GFC episode. We further divide total claims into various partitions and find that cross-border claims are more susceptible to financial stress in lender countries than are the other types of claims. We find that local claims in foreign currency are more stable than cross-border claims. Finally, we find some evidence that bank loans are more vulnerable than debt securities to financial stress in lender countries.

Our findings provide various policy implications. First, it would be desirable to avoid risks of simultaneous withdrawals, by diversifying lender countries. If claims are heavily held by a few lender countries suffering heightened financial stress, the borrower country is more likely to experience severe capital outflows, because most claims are subject to withdrawals. This intensified capital outflow can be mitigated by diversifying lender countries, so that at least some lender countries are not exposed to financial stress.

Second, to avoid sudden massive capital outflows, it may not be enough for a country to maintain sound economic fundamentals. Our findings imply that an EME borrower country, even one with strong economic fundamentals, may well experience capital outflows if banks in lender countries are in trouble. Hence it becomes crucial for policymakers to act pre-emptively. For example, macroprudential policies to manage bank capital inflows would be useful. In particular, policymakers could try to moderate strong capital inflows to mitigate strong capital outflows in the future.

Finally, it would be safer to increase borrowing from local subsidiaries rather than cross-border borrowing, other things being equal. Our findings suggest that local borrowing from foreign subsidiaries, even in foreign currency, are less susceptible to funding withdrawals than are cross-border borrowings. Hence, instead of borrowing directly from headquarters located abroad, it may be beneficial to borrow from their subsidiaries located domestically.

## References

- Amiti, M, P McGuire and D E Weinstein (2017): "Supply- and demand side factors in global banking", *BIS Working Papers*, no 639.
- Amiti, M and D E Weinstein (2018): "How much do idiosyncratic bank shocks affect investment? Evidence from matched bank-firm data", *Journal of Political Economy*, vol 126, no 2, pp 525–587.
- Bank for International Settlements (2016): *BIS Statistical Bulletin*. Basel.
- Cerutti, E and S Claessens (2017): "The great cross-border bank deleveraging: supply constraints and intra-group frictions", *Review of Finance*, vol 21, no 1, pp 201–236.
- Cerutti, E, S Claessens and P McGuire (2014): "Systemic risks in global banking: what available data can tell us and what more data are needed?" in: M K Brunnermeier and A Krishnamurthy (eds.), *Systemic Risk and Macro Modelling*, NBER and University of Chicago Press, Chicago, pp 235–260.
- Cetorelli, N and L S Goldberg (2011): "Global banks and international shock transmission: evidence from the crisis", *IMF Economic Review*, vol 59, pp 41–76.
- Čihák, M, S Muñoz and R Scuzzarella (2011): "The bright and the dark side of cross-border banking linkages", *IMF Working Paper*, no 11/186.
- Claessens, S (2017): "Global banking: recent developments and insights from research", *Review of Finance*, vol 21, no 4, pp 1513–1555.
- Eichengreen, B and P Gupta (2015): "Tapering talk: the effect of expectations of reduced Federal Reserve security purchases on emerging markets", *Emerging Markets Review*, vol 25, December, pp 1–15.
- Hahm, J-H, H S Shin and K Shin (2013): "Non-core bank liabilities and financial vulnerability", *Journal of Money, Credit and Banking*, vol 45, no s1, pp 3–36.
- Hale, G, T Kapan and C Minoiu (2016): "Crisis transmission in the global banking network", *IMF Working Paper*, no 16/91.
- Laeven, L and T Tressel (2013): *Financial Integration and Fragmentation in the European Union, Technical Note*, publication of Financial Sector Assessment Program, March.
- Milesi-Ferretti, G-M and C Tille (2011): "The great retrenchment: international capital flows during the global financial crisis", *Economic Policy*, vol 26, no 66, pp 289–346.
- Park, D, A Ramayandi and K Shin (2016): "Capital flows during quantitative easing and aftermath: experiences of Asian countries", *Emerging Markets Finance and Trade*, vol 52, no 4, pp 886–903.
- Park, C-Y and K Shin (2017): "A contagion through exposure to foreign banks during the global financial crisis", *ADB Economic Working Paper Series*, no 516.
- (2018): "Global banking network and regional financial contagion", *ADB Economic Working Paper Series*, no 546.
- Shin, H S (2009): "Reflections on Northern Rock: the bank run that heralded the global financial crisis", *Journal of Economic Perspectives*, vol 23, no 1, pp 101–119.
- Takáts, E (2010): "Was it credit supply? Cross-border bank lending to emerging market economies during the financial crisis." *BIS Quarterly Review*, June, pp 49–56.

## Appendix

### List of lender countries

Appendix Table 1

Consolidated banking statistics reporting country (27)	Locational banking statistics reporting country (29)
Australia	Australia
Austria	Austria
Belgium	Belgium
Canada	<b>Brazil</b>
<b>Chile</b>	Canada
<b>Chinese Taipei</b>	<b>Chile</b>
Denmark	<b>Chinese Taipei</b>
Finland	Denmark
France	Finland
Germany	France
Greece	Germany
<b>Hong Kong SAR</b>	Greece
<b>India</b>	Guernsey
Ireland	<b>Hong Kong SAR</b>
Italy	Ireland
Japan	Isle of Man
<b>Korea</b>	Japan
Netherlands	Jersey
Norway	<b>Korea</b>
Portugal	Luxembourg
<b>Singapore</b>	Macau SAR
Spain	<b>Mexico</b>
Sweden	Netherlands
Switzerland	Norway
<b>Turkey</b>	Spain
United Kingdom	Sweden
United States	Switzerland
	United Kingdom
	United States

The economies in **bold** are also included in the list of 67 borrower countries. When we use an economy in bold as a lender country in our regression analysis, bilateral flows are defined between the lender country and the other 66 borrower countries. Source: authors' compilation based on the BIS's consolidated banking statistics and locational banking statistics.

## List of banks used for the calculation of country-level bank CDS spread

Appendix Table 2

Country of banks' headquarters (total: 29)	Number of banks (total: 66)	Bank name
Australia	4	Westpac Banking Corporation National Australia Bank Limited Australia and New Zealand Banking Group Commonwealth Bank of Australia
Austria	1	Erste Group Bank AG
Belgium	1	KBC Bank NV
Brazil	2	Itau Unibanco SA Banco Bradesco SA
Canada	1	Bank of Nova Scotia (The) - SCOTIABANK
Chile	1	BANCO DE CHILE
China	4	Bank of China Limited Agricultural Bank of China Limited Industrial & Commercial Bank of China (The) - ICBC China Construction Bank Corporation
Denmark	1	Danske Bank A/S
France	3	BNP Paribas Société Générale Crédit Agricole S.A.
Germany	2	Commerzbank AG Deutsche Bank AG
Greece	1	Alpha Bank AE
Hong Kong SAR	1	Bank of East Asia Ltd
India	2	State Bank of India ICICI Bank Limited
Ireland	2	Allied Irish Banks plc Bank of Ireland-Governor and Company of the Bank of Ireland
Italy	3	Banca Monte dei Paschi di Siena SpA-Gruppo Monte dei Paschi di Siena Mediobanca SpA UniCredit SpA
Japan	5	Resona Holdings, Inc Mizuho Bank Ltd Bank of Yokohama, Ltd (The) Bank of Tokyo - Mitsubishi UFJ Ltd (The)-Kabushiki Kaisha Mitsubishi Tokyo UFJ Ginko Sumitomo Mitsui Banking Corporation
Mexico	1	Banco Mercantil del Norte S.A. – BANORTE
Netherlands	1	ING Bank NV
Portugal	1	Banco Espirito Santo SA
Korea	4	Woori Finance Holdings Co. Ltd-Woori Financial Group KB Kookmin Bank Industrial Bank of Korea Shinhan Bank
Singapore	3	Oversea-Chinese Banking Corporation Limited OCBC United Overseas Bank Limited UOB DBS Bank Ltd



List of banks used for the calculation of country-level bank CDS spread  
(continued)

Appendix Table 2

Country of banks' headquarters	Number of banks	Bank name
South Africa	1	Standard Bank of South Africa Ltd.
Spain	2	Banco Bilbao Vizcaya Argentaria SA Banco Santander SA
Sweden	2	Svenska Handelsbanken Skandinaviska Enskilda Banken AB
Switzerland	2	Credit Suisse AG UBS AG
Chinese Taipei	1	CTBC Financial Holding Co Ltd
Turkey	2	Turkiye is Bankasi A.S. - ISBANK Akbank T.A.S.
United Kingdom	5	Barclays Bank Plc HSBC Bank plc Royal Bank of Scotland Plc (The) Standard Chartered Plc Lloyds Bank Plc
United States	7	Bank of America, National Association Goldman Sachs Group, Inc Morgan Stanley JP Morgan Chase & Co. Citigroup Inc Capital One Financial Corporation Wells Fargo & Company

## Sample period for financial stress indicators of lender countries

Appendix Table 3

Economy	Corporate bond spread		Bank CDS spread		Sovereign CDS spread	
	Start	End	Start	End	Start	End
Australia	2001q1	2017q3	2001q3	2017q3	2003q2	2017q3
Austria	2001q1	2017q3	2002q3	2014q1	2001q2	2017q3
Belgium	2001q1	2017q3	2002q3	2017q3	2001q1	2017q3
Brazil	2003q4	2017q3	2004q2	2017q3	2001q1	2017q3
Canada	2001q1	2017q3	2001q1	2015q3	2003q3	2017q3
Chile	2009q3	2017q3	2009q2	2017q3	2002q1	2017q3
Denmark	2000q3	2014q4	2001q4	2010q3	2002q4	2017q3
Finland	-	-	-	-	2002q3	2017q3
France	2001q1	2017q3	2002q3	2017q2	2002q2	2017q3
Germany	2001q1	2017q3	2001q1	2017q3	2002q3	2017q3
Greece	-	-	2004q1	2014q4	2001q1	2017q3
Hong Kong SAR	2001q4	2017q3	2001q2	2017q3	2003q3	2017q3
India	2005q1	2017q3	2004q2	2017q3	2003q3	2017q3
Ireland	-	-	2002q3	2011q2	2003q1	2017q3
Italy	2001q1	2017q3	2001q3	2017q3	2001q1	2017q3
Japan	2001q1	2017q3	2002q4	2017q3	2001q1	2017q3
Mexico	2001q1	2017q3	2009q3	2017q3	2001q1	2017q3
Netherlands	2001q1	2017q3	2001q2	2017q3	2003q3	2017q3
Panama	2015q3	2017q3	-	-	2002q1	2017q3
Portugal	-	-	2001q4	2014q1	2002q1	2017q3
Singapore	2001q4	2017q3	2003q4	2017q3	2003q3	2012q1
Korea	2001q1	2017q3	2002q4	2017q3	2001q1	2017q3
Spain	2001q1	2017q3	2001q1	2017q3	2001q1	2017q3
Sweden	2001q1	2017q3	2002q3	2017q3	2001q2	2017q3
Switzerland	2001q1	2017q3	2001q3	2017q3	2007q3	2017q3
Chinese Taipei	2005q2	2017q3	2003q3	2014q1	2006q3	2014q2
Turkey	2010q3	2017q3	2006q4	2017q3	2001q1	2017q3
United Kingdom	2001q1	2017q3	2002q1	2017q3	2006q1	2017q3
United States	2001q1	2017q3	2002q1	2017q3	2003q4	2017q3

## List of 67 emerging market economies as borrower countries

## Appendix Table 4

Asia-Pacific (16)	Central and eastern Europe (17)	Latin America (16)	Middle East (4)	Africa (14)
Bangladesh	Albania	Argentina	Israel	Cape Verde
China	Armenia	Brazil	Jordan	Egypt
Hong Kong SAR	Bosnia and Herzegovina	Chile	Lebanon	Ghana
India	Bulgaria	Colombia	Saudi Arabia	Kenya
Indonesia	Czech Republic	Costa Rica		Lesotho
Kazakhstan	Croatia	Dominican Republic		Mauritius
Korea	Georgia	Guatemala		Morocco
Kyrgyz Republic	Hungary	Honduras		Mozambique
Malaysia	Latvia	Jamaica		Nigeria
Mongolia	Lithuania	Mexico		Seychelles
Pakistan	Macedonia, Former Yugoslav Republic	Nicaragua		South Africa
Philippines	Moldova	Paraguay		Tanzania
Singapore	Poland	Peru		Tunisia
Sri Lanka	Romania	Suriname		Uganda
Thailand	Russia	Uruguay		
Chinese Taipei	Turkey	Venezuela		
	Ukraine			

---

Definition of variables and data sources

Appendix Table 5

---

Variable	Description and construction	Data source
Outflow of claims	$100 * [(claims\ at\ t - claims\ at\ t+4) / (claims\ at\ t)]$	Bank for International Settlements
Outflow of claims (estimates)	$100 * [(estimated\ claims\ at\ t - estimated\ claims\ at\ t+4) / (estimated\ claims\ at\ t)]$	Authors' calculation
Bank CDS spread		Markit
Sovereign CDS spread		Markit
Corporate bond spread		Markit
EM sovereign CDS spread		Markit
Increase in CA deficit	Increase in current account deficits in the past three years	World Bank <i>World Development Indicators</i>
Real exchange rate	Nominal exchange rates $*(US\_CPI / CPI)$	IMF-IFS database
Increase in credits	Increase in domestic credit to private sector (% of GDP) in the past three years	World Bank <i>World Development Indicators</i>
Reserves/M2	Broad money to total reserves ratio	World Bank <i>World Development Indicators</i>
GDP growth	Aggregate GDP, year-on-year growth rate	World Bank <i>World Development Indicators</i>
Inflation (CPI)	Inflation, consumer prices (% annual)	IMF-IFS database
Rule of law	Perceptions of the extent to which agents have confidence in and abide by the rules of society	World Bank <i>Worldwide Governance Indicators</i>

---

## Previous volumes in this series

744 September	Why you should use the Hodrick-Prescott filter - at least to generate credit gaps	Mathias Drehmann and James Yetman
743 September	An intermediation-based model of exchange rates	Semyon Malamud and Andreas Schrimpf
742 August 2018	Quantitative or qualitative forward guidance: Does it matter?	Gunda-Alexandra Detmers, Özer Karagedikli and Richhild Moessner
741 August 2018	Reserve requirements and capital flows in Latin America	Michael Brei and Ramon Moreno
740 August 2018	The macroeconomic effects of macroprudential policy	Björn Richter, Moritz Schularick and Ilhyock Shim
739 August 2018	The economics of revoking NAFTA	Raphael Auer, Barthélémy Bonadio and Andrei A. Levchenko
738 August 2018	Bank solvency risk and funding cost interactions in a small open economy: Evidence from Korea	Iñaki Aldasoro and Kyoungsoon Park
737 August 2018	Transmission of monetary policy through global banks: whose policy matters?	Stefan Avdjiev, Cathérine Koch, Patrick McGuire and Goetz von Peter
736 July 2018	The role of household debt heterogeneity on consumption: Evidence from Japanese household data	Jouchi Nakajima
735 July 2018	Gauging procyclicality and financial vulnerability in Asia through the BIS banking and financial statistics	Stefan Avdjiev, Bat-el Berger and Hyun Song Shin
734 July 2018	Payments, credit and asset prices	Monika Piazzesi and Martin Schneider
733 July 2018	A risk-centric model of demand recessions and macroprudential policy	Ricardo J Caballero and Alp Simsek
732 July 2018	The global factor in neutral policy rates: some implications for exchange rates, monetary policy, and policy coordination	Richard Clarida
731 June 2018	The likelihood of effective lower bound events	Michal Franta
730 June 2018	U.S. monetary policy and fluctuations of international bank lending	Stefan Avdjiev and Galina Hale

All volumes are available on our website [www.bis.org](http://www.bis.org).