The Impact of Nonperforming Loans on Cross-Border Bank Lending: Implications for Emerging Market Economies

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The interconnectedness of the global financial system

- During the global financial crisis, shocks that originated from financial frictions in advanced economies were rapidly transmitted to emerging economies.
    - Banks in advanced countries were hit directly by the deterioration of subprime loans and were forced to search for liquidity.
    - Subsequently, the market for short-term loans dried-up, and some of the troubled banks had to withdraw their funds from emerging economies.
- The interconnectedness of the global financial system renders shocks in one or more financial centers to be transmitted to other economies.
- These negative externalities from advanced countries can be disproportionately high if the troubled banks are larger and more interconnected, i.e. systemically more important.

Cross-border banking activities of non-US banks surpass pre-GFC

US dollar-denominated cross-border bank holdings by non-US banks

(2000 Q1 – 2019 Q3)
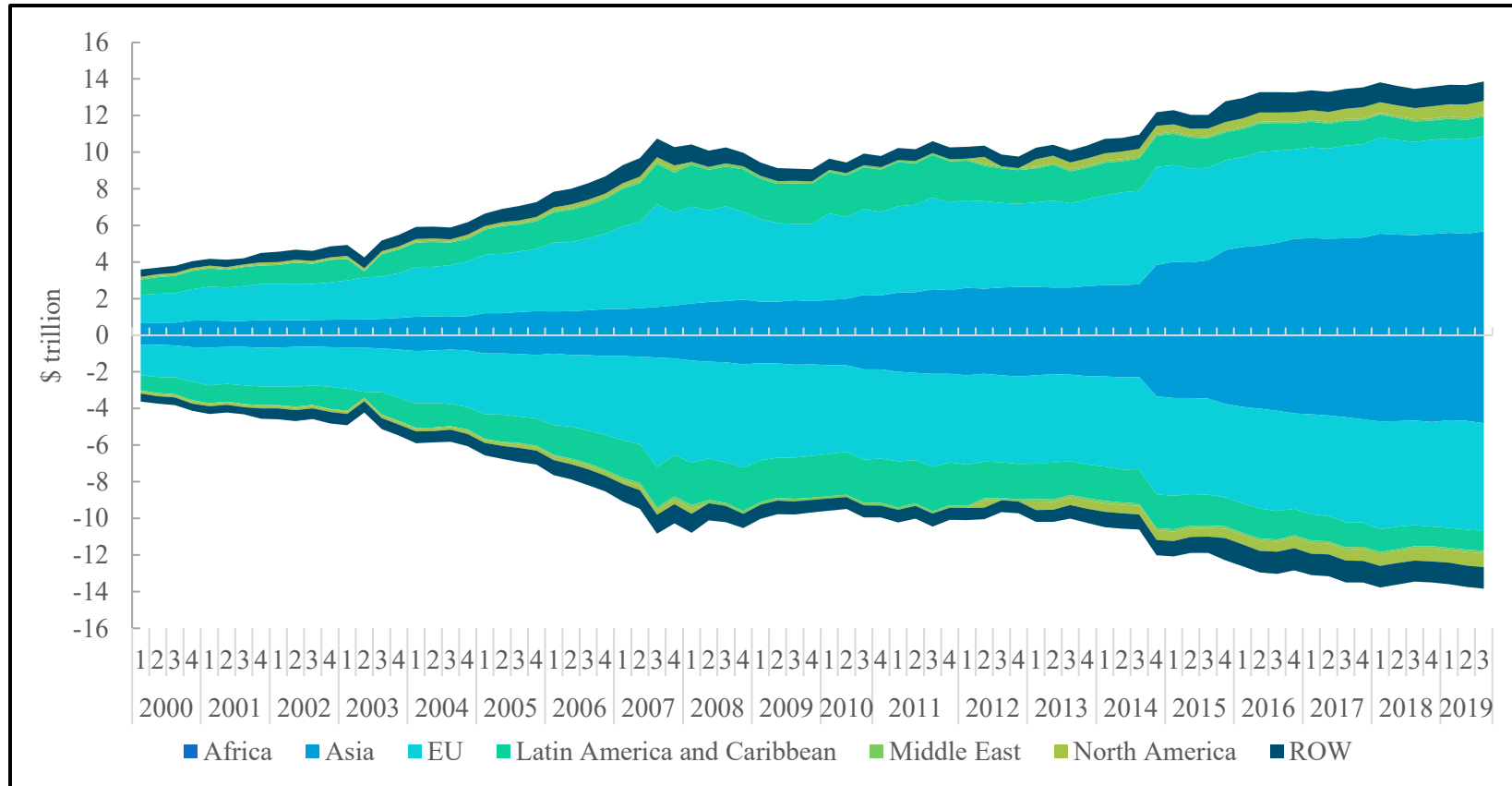
The interconnectedness of the global financial system

- By utilizing bilateral bank claims between countries, Park and Shin (2020) compute direct and indirect exposures of emerging economies to crisis countries, and show that, during the global financial crisis, emerging economies with high exposures suffered from more capital outflows.

- Shim and Shin (2018) also find that financial stress in AEs leads to banking outflows from EMEs.
    - Three proxies for financial stress in AEs:
      (1) USD corporate bond spread;
      (2) Sovereign CDS spread; and
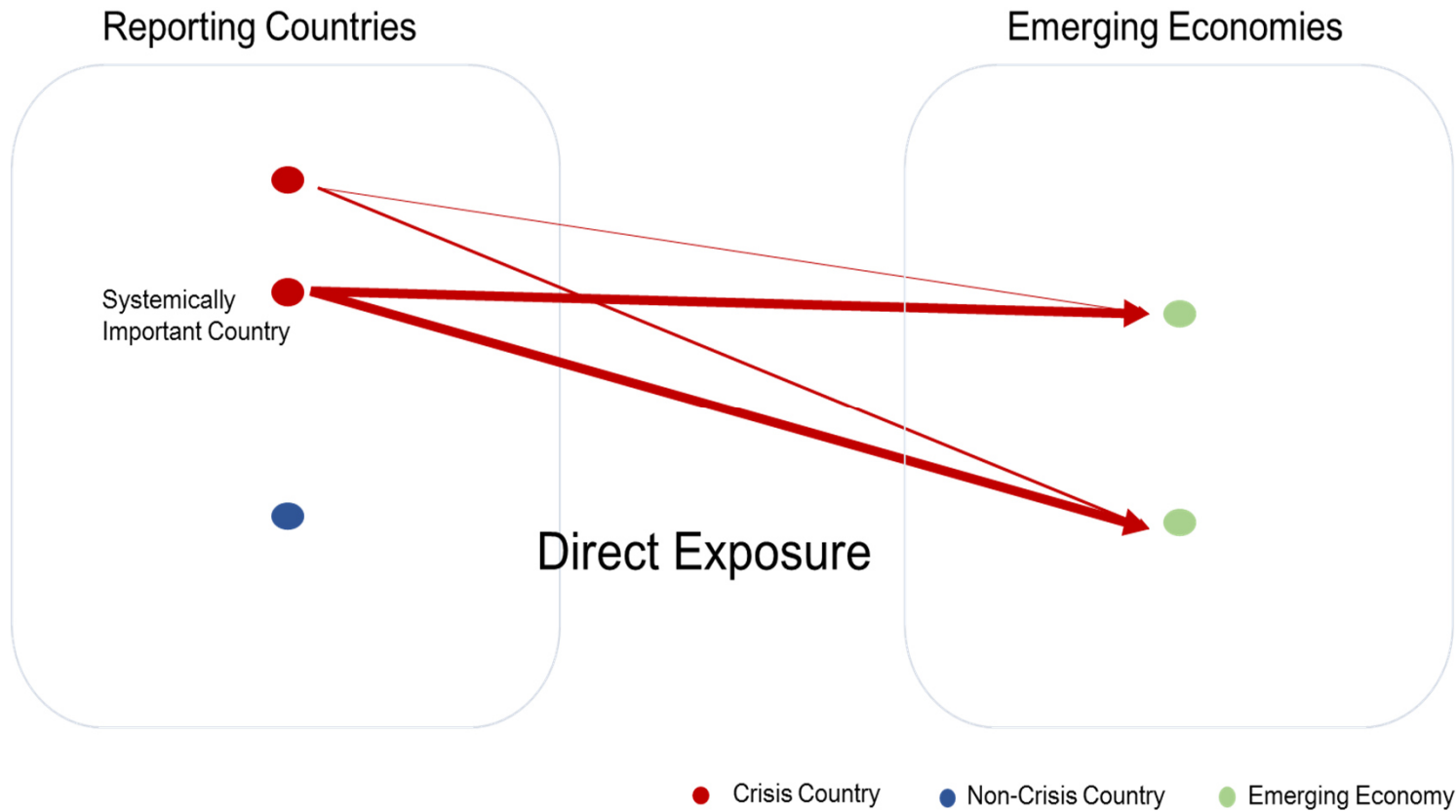   (3) Bank CDS spread.

Direct Exposure

- The direct exposure is defined as the sum of shares of foreign-claims for a counterparty economy i across all reporting economies j's that experience crises.

$$DE_{i,t}^f = \sum_{j \in C_t} share_{ij,t}^f \quad \text{where} \quad share_{ij,t}^f = \frac{fc_{ijt}}{\sum_{k=1}^N fc_{ikt}}$$

$$C_t = \{\text{reporting economies in crisis at } t\}$$

Indirect Exposure
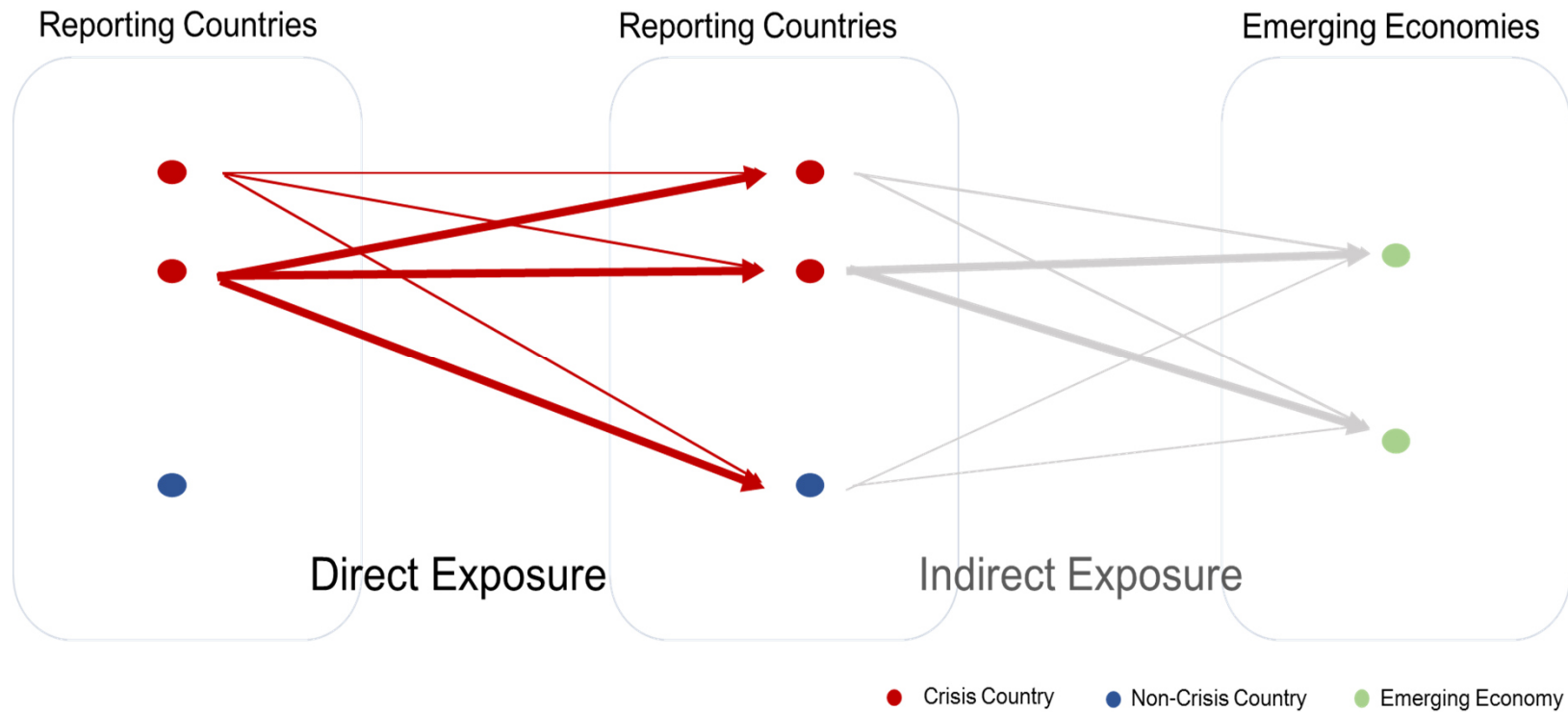
- Even countries that do not experience crises also face some degree of liquidity problems and can affect other countries as well.

- The indirect exposure of foreign claims for country i is the weighted average of direct exposures faced by all reporting economies j's with their shares of claims used as the weights.

$$IDE_{i,t}^{f} = \sum_{j} share_{ij,t}^{f} \cdot DE_{j,t}^{f}$$

After the GFC

- While Park and Shin (2020) focused on the GFC episode, Shim and Shin (2020) considered the period after the GFC as well as during the GFC.

- The findings that financial stress in lender countries is a more important driver than the local financial conditions and macroeconomic fundamentals of EMEs generally hold even after the GFC period, but to a lesser extent.

What we do in the paper

- We estimate the impact of NPLs in both lender and borrower countries on banking outflows from emerging market economies.

- Annual data of 26 BIS reporting lenders and 67 emerging market economies as borrowers are analyzed for the sample period from 2000Q1 to 2017Q4.

- Emerging market economies are grouped into four different regions: Asia, Europe, North and South America, and Africa.

Data

- Bilateral data on cross-border asset positions are collected from the BIS consolidated banking statistics (CBS) and locational banking statistics (LBS).

    - CBS provides consolidated claims of internationally active banks headquartered in 30 BIS reporting economies against 223 counterparty countries.

    - They report the claims at an aggregate level compiled in two ways: (1) by immediate counterparty and (2) by ultimate risk.

    - The immediate counterparty is the entity in the counterparty country with which the bank in the reporting economy counteracts with directly and ultimate risk refers to the counterparty country to which credit exposure transfers through credit risk mitigants.

Reporting Economies and Counterparty Emerging Market Economies by Region

Region	Reporting Economies	Emerging Market Economies
Asia and Oceania	Taipei,China; Hong Kong, China, Japan; Macao, China; Republic of Korea, Australia	Bangladesh, India, Indonesia, Malaysia, Mongolia, Pakistan, Philippines, Republic of Korea, Sri Lanka, Thailand
Europe	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Luxembourg, Netherlands, Spain, Switzerland, United Kingdom	Turkey, Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Hungary, Latvia, Lithuania, Macedonia FYR, Moldova, Poland, Romania, Russian Federation, Ukraine
North & South America	Canada, United States Brazil, Chile, Mexico	Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Suriname, Uruguay, Venezuela
Africa	South Africa	Cape Verde, Egypt, Ghana, Kenya, Lesotho, Mauritius, Morocco, Mozambique, Nigeria, Seychelles, South Africa, Tanzania, Tunisia, Uganda

The Empirical Methodology

$$Koutflow_{ijt} = \alpha_1 NPLr_{jt} + \alpha_2 NPLr_{it} + X_{it}\beta + \gamma_t + \varepsilon_{ijt}$$

- $Koutflow_{ij} = \frac{FC_{ij,t} - FC_{ij,t+f}}{FC_{ij,t}}$: the bilateral banking outflows from EME i to lender country j at time t
- $NPLr_{jt}$ and $NPLr_{it}$: the NPL ratio of lender country j and EME i, respectively, in year t
- X_{it} is a vector of economic fundamental variables of EME i in year t.

Table 1a. Impact of Nonperforming Loans on Banking Outflows from Emerging Market Economies (CBS Total Foreign Claims on an Immediate Counterparty Basis)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Nonperforming Loan1	0.672***	0.708***	0.490***	0.655***	0.491***
	[0.064]	[0.082]	[0.084]	[0.085]	[0.087]
Nonperforming Loan2		0.424***	0.358***	0.446***	0.354***
		[0.052]	[0.052]	[0.060]	[0.059]
Increase in CA deficit				0.149	-0.055
				[0.119]	[0.122]
Real exchange rate change				0.427***	0.325***
				[0.091]	[0.113]
Difference Credit				0.149***	0.050
				[0.046]	[0.046]
Reserve/M2				5.123*	5.219*
				[3.100]	[3.087]
GDP growth				-0.244*	-0.373**
				[0.144]	[0.168]
Inflation				-0.018	0.030
				[0.132]	[0.139]
Rule of law				2.261***	1.861**
				[0.837]	[0.837]
Year Fixed effects	No	No	Yes	No	Yes
R-squared	0.008	0.022	0.069	0.040	0.084
Observations	12,296	6,990	6,990	5,034	5,034

Table 1b. Impact of Nonperforming Loans on Banking Outflows from Emerging Market Economies (LBS total cross-border foreign claims)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Nonperforming Loan1	0.851***	0.909***	0.688***	0.875***	0.696***
	[0.088]	[0.114]	[0.118]	[0.119]	[0.121]
Nonperforming Loan2		0.519***	0.481***	0.587***	0.495***
		[0.044]	[0.045]	[0.051]	[0.049]
Increase in CA deficit				0.079	-0.114
				[0.136]	[0.136]
Real exchange rate change				0.382***	-0.008
				[0.093]	[0.115]
Difference Credit				0.045	-0.020
				[0.048]	[0.048]
Reserve/M2				3.909	4.967
				[3.376]	[3.263]
GDP growth				-0.139	-0.631***
				[0.153]	[0.176]
Inflation				-0.329**	-0.103
				[0.133]	[0.141]
Rule of law				0.705	0.770
				[0.883]	[0.871]
Year Fixed effects	No	No	Yes	No	Yes
R-squared	0.008	0.030	0.084	0.049	0.111
Observations	11,113	6,176	6,176	4,428	4,428

Table 2a. Impact of Nonperforming Loans on Banking Outflows from Emerging Market Economies: Internationally Active Lenders (CBS total foreign claims on an immediate counterparty basis)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Non-Performing Loan1	1.307***	1.439***	0.815**	1.489***	0.522
	[0.228]	[0.291]	[0.335]	[0.336]	[0.380]
Non-Performing Loan2		0.259***	0.219***	0.379***	0.279***
		[0.072]	[0.073]	[0.081]	[0.079]
Increase in CA deficit				0.137	-0.124
				[0.160]	[0.163]
Real exchange rate change				0.700***	0.443***
				[0.121]	[0.138]
Difference Credit				0.162***	0.061
				[0.057]	[0.055]
Reserve/M2				0.662	1.156
				[4.097]	[4.037]
GDP growth				-0.106	-0.278
				[0.182]	[0.206]
Inflation				-0.259	-0.113
				[0.176]	[0.182]
Rule of law				1.329	1.166
				[1.098]	[1.055]
Year Fixed effects	No	No	Yes	No	Yes
R-squared	0.006	0.015	0.116	0.049	0.145
Observations	5,662	3,004	3,004	2,202	2,202

Table 2b. Impact of Nonperforming Loans on Banking Outflows from Emerging Market Economies: Internationally Active Lenders (LBS total cross-border foreign claims)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Nonperforming Loan1	0.705**	0.476	-0.052	0.455	-0.214
	[0.311]	[0.409]	[0.487]	[0.461]	[0.544]
Nonperforming Loan2		0.466***	0.414***	0.553***	0.437***
		[0.065]	[0.066]	[0.075]	[0.073]
Increase in CA deficit				0.212	-0.046
				[0.197]	[0.198]
Real exchange rate change				0.417***	0.156
				[0.134]	[0.156]
Difference Credit				0.032	-0.043
				[0.067]	[0.065]
Reserve/M2				-0.474	1.258
				[4.838]	[4.687]
GDP growth				-0.315	-0.893***
				[0.233]	[0.285]
Inflation				-0.420**	-0.250
				[0.213]	[0.224]
Rule of law				0.108	-0.543
				[1.266]	[1.207]
Year Fixed effects	No	No	Yes	No	Yes
R-squared	0.001	0.019	0.110	0.042	0.141
Observations	4,837	2,524	2,524	1,841	1,841

Table 3a. Regional Linkages and the Impact of Nonperforming Loans on Banking Outflows from Emerging Market Economies (CBS total foreign claims on an immediate counterparty basis)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Nonperforming Loan1	0.523***	0.568***	0.317***	0.486***	0.292**
	[0.089]	[0.109]	[0.110]	[0.111]	[0.114]
Nonperforming Loan2		0.329***	0.295***	0.412***	0.341***
		[0.065]	[0.065]	[0.071]	[0.070]
Nonperforming Loan1*region	0.393***	0.326**	0.442***	0.458***	0.544***
	[0.125]	[0.161]	[0.159]	[0.170]	[0.169]
Nonperforming Loan2*region		0.302***	0.197*	0.139	0.066
		[0.111]	[0.110]	[0.121]	[0.119]
Region	-3.985***	-5.650***	-5.443***	-6.761***	-6.339***
	[0.834]	[1.277]	[1.233]	[1.415]	[1.371]
Increase in CA deficit				0.149	-0.055
				[0.119]	[0.122]
Real exchange rate change				0.427***	0.325***
				[0.091]	[0.113]
Difference Credit				0.149***	0.050
				[0.046]	[0.046]
Reserve/M2				5.123*	5.219*
				[3.100]	[3.087]
GDP growth				-0.244*	-0.373**
				[0.144]	[0.168]
Inflation				-0.018	0.030
				[0.132]	[0.139]
Rule of law				2.261***	1.861**
				[0.837]	[0.837]
Year Fixed Effects	No	No	Yes	No	Yes
R-squared	0.008	0.022	0.069	0.040	0.084
Observations	12,296	6,990	6,990	5,034	5,034

Table 3b. Regional Linkages and the Impact of Nonperforming Loans on Banking Outflows from Emerging Market Economies (LBS total cross-border foreign claims)

VARIABLES	(1)	(2)	(3)	(4)	(5)
Nonperforming Loan1	0.489***	0.789***	0.490**	0.824***	0.558**
	[0.150]	[0.186]	[0.196]	[0.211]	[0.221]
Nonperforming Loan2		0.426***	0.424***	0.525***	0.471***
		[0.049]	[0.049]	[0.055]	[0.053]
Nonperforming Loan1*region	0.695***	0.187	0.350	0.102	0.268
	[0.185]	[0.235]	[0.239]	[0.251]	[0.255]
Nonperforming Loan2*region		0.276***	0.163	0.236**	0.112
		[0.103]	[0.102]	[0.112]	[0.111]
Region	-3.704***	-3.050**	-2.879**	-4.155***	-4.081***
	[0.834]	[1.277]	[1.233]	[1.415]	[1.371]
Increase in CA deficit				0.083	-0.105
				[0.136]	[0.136]
Real exchange rate change				0.355***	-0.036
				[0.094]	[0.116]
Difference Credit				0.053	-0.009
				[0.048]	[0.048]
Reserve/M2				4.544	5.699*
				[3.459]	[3.356]
GDP growth				-0.109	-0.636***
				[0.158]	[0.184]
Inflation				-0.342**	-0.090
				[0.136]	[0.143]
Rule of law				0.826	0.983
				[0.899]	[0.886]
Year Fixed Effects	No	No	Yes	No	Yes
R-squared	0.008	0.022	0.069	0.040	0.084
Observations	12,296	6,990	6,990	5,034	5,034

Findings

- International banks withdraw fund from emerging economies in response to the increase in the NPL ratios of either advanced or emerging economies or both.

- The results imply potentially significant and larger effects on banking outflows from emerging market economies if the NPL ratio rises in advanced economies.

- The estimation results using the sample of internationally more active investors show a greater impact of the NPL rise among globally active lenders on capital outflows (CBS only).

  – A 1 percentage point increase in the NPL ratio in advanced and emerging market economies raises banking outflows from emerging market economies by 1.5 percent. (cf. 0.9 percent)

Findings (cont.)

- Banking outflows from (inflows to) emerging market economies driven by the same-region lenders are on average 4%–7% lower (higher).

- The sensitivity of banking outflows to the same-region lenders' NPL ratio is approximately twice as large as that of different regions' lenders.

- This is worrisome given that recent BIS data show that after the global financial crisis, Japan, the People's Republic of China, the Republic of Korea, and Singapore replaced European economies in lending to Asian economies.

COVID-19 dims corporate revenue and earnings prospects

Corporate earnings estimates continue to decline

index, corporate earnings' expectations over the next 12-months*
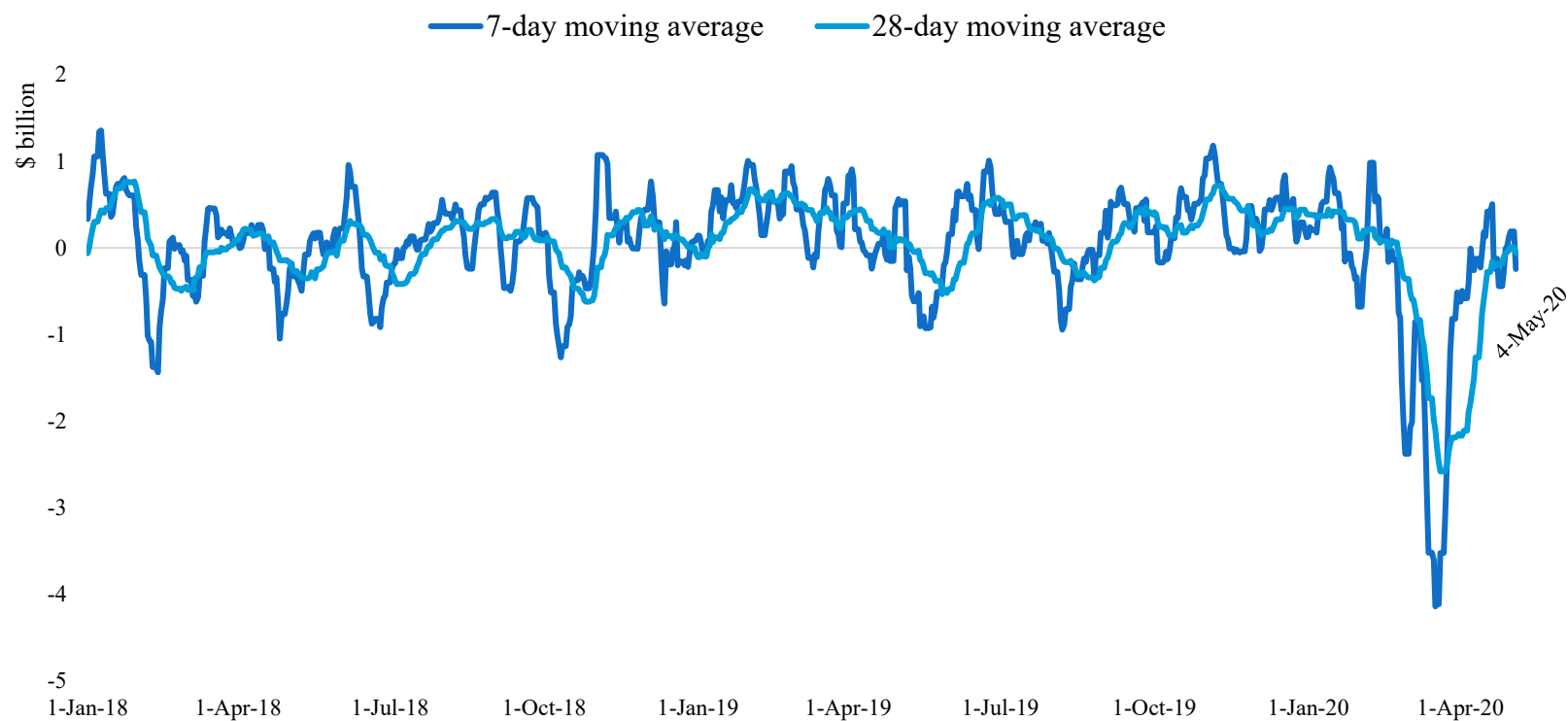

China

EM (ex-China)

U.S.
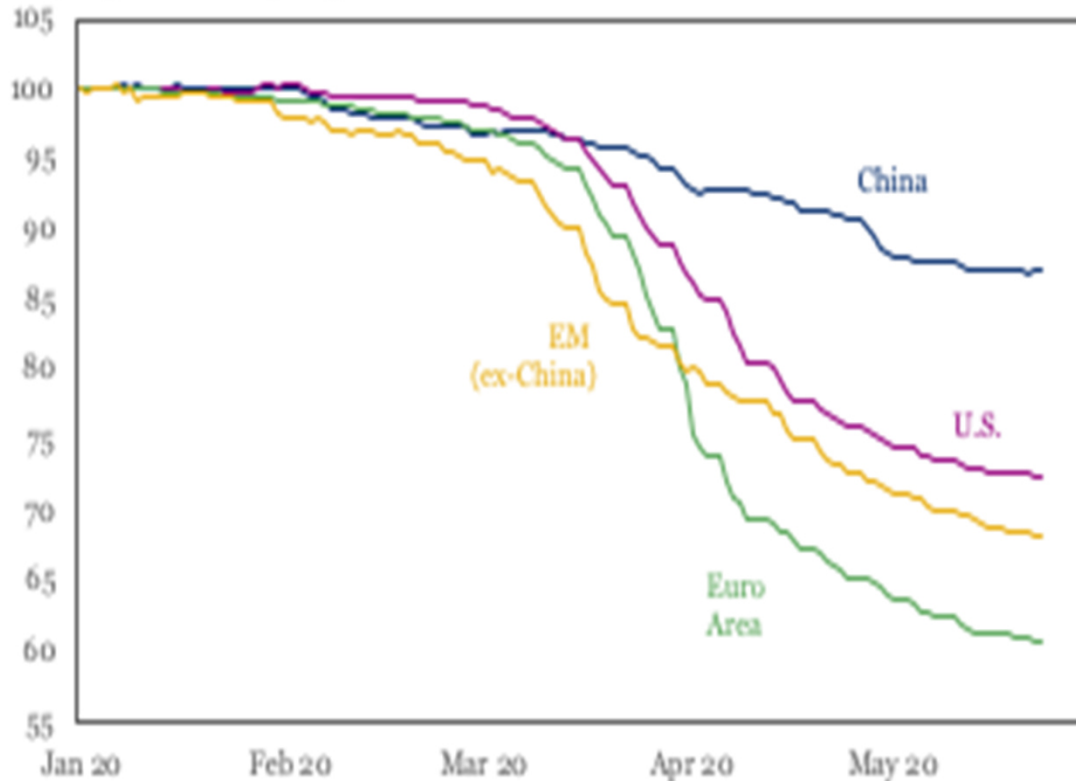
Euro Area

Source: Bloomberg, IIF; *MSCI indices for the U.S., Euro Area, EM (ex-China), and Shanghai composite index for China
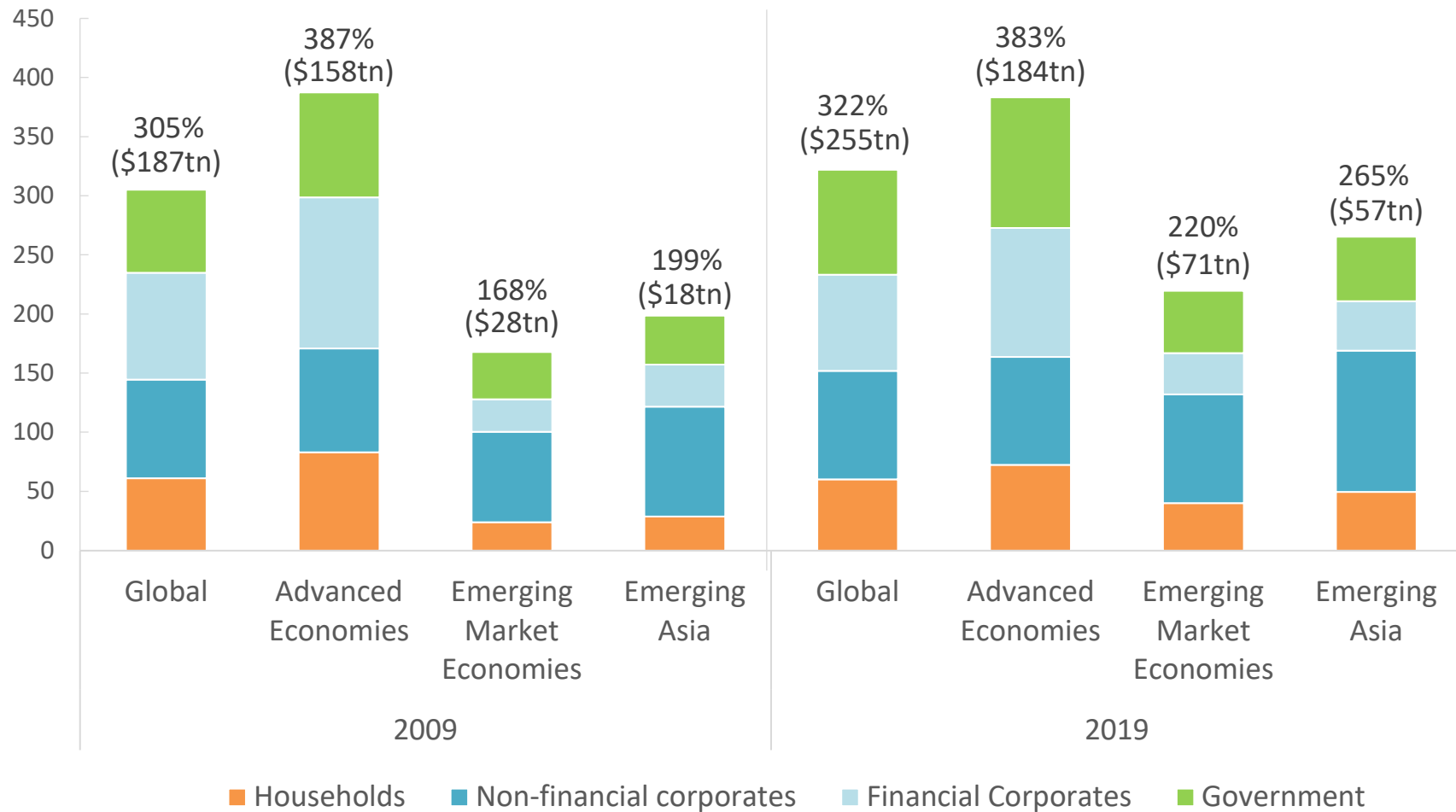
Highly leveraged firms face debt service risks

Corporate defaults are already on the rise

Unwinding of carry trades leads to massive capital flow reversals in emerging Asia

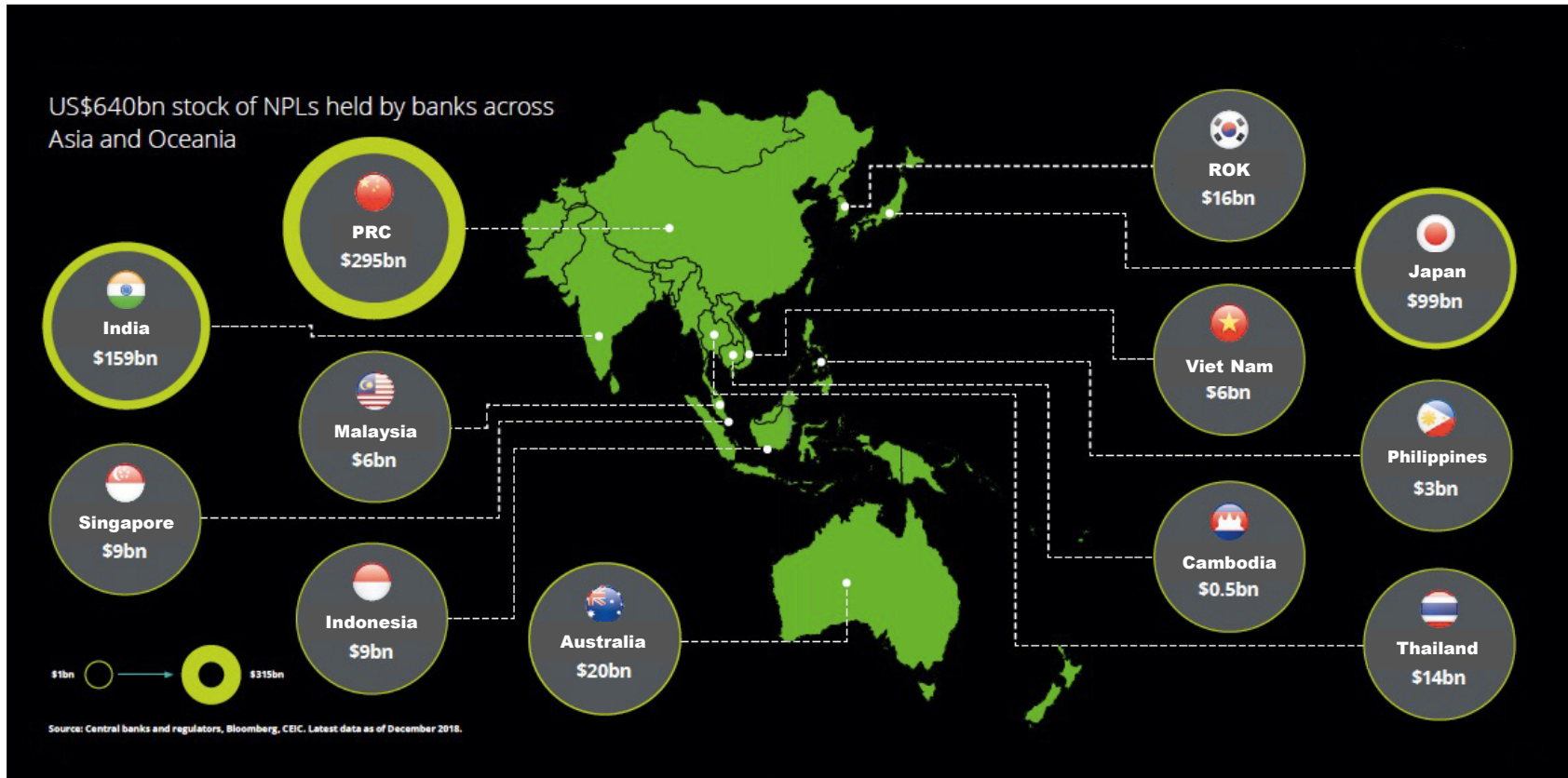### Emerging Asia Portfolio Flows
1 January 2018 — 4 May 2020

High debt exposes EME vulnerability

NPL stock held by banks across the region reaches $640 billion

US$640bn stock of NPLs held by banks across Asia and Oceania

- PRC $295bn
- India $159bn
- ROK $16bn
- Japan $99bn
- Malaysia $6bn
- Singapore $9bn
- Viet Nam $6bn
- Philippines $3bn
- Indonesia $9bn
- Australia $20bn
- Cambodia $0.5bn
- Thailand $14bn

$1bn → $315bn

Source: Central banks and regulators, Bloomberg, CEIC. Latest data as of December 2018.

PRC = People's Republic of China, ROK = Republic of Korea.
Source: Deloitte (2019).

Policy Options

- **Macroeconomic stimulus policies**: A swift economic recovery will improve the quality of debts and therefore help avoid a rise in NPLs.

- **Early action should be taken to preempt corporate defaults**

- **Special Purpose Vehicles** can be established to assist debt restructuring and resolution of the corporate sector

- **Developing distressed asset markets** allows banks and financial institutions to dispose of NPLs more easily

- **Stronger regional financial cooperation** is crucial to avoiding a financial crisis and safeguarding financial stability.

Elements for successful NPL resolution