FEDERAL RESERVE BANK *of* NEW YORK

Gauging procyclicality and financial vulnerability in Asia through the BIS banking and financial statistics

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May 2018 : AMPF meeting, Singapore. Discussion of Avdjiev, Berger and Shin

Gauging procyclicality and financial vulnerability in Asia
by Stefan Avdjiev, Bat-el Berger, and Hyun Song Shin

High-level paper overview

- BIS banking and financial statistics describe international trends/ cycles
  - ✓ Heavy use of international banking statistics (creditor and debtor country/region perspective, sectoral breakdown, currency, maturity)
  - ✓ Introduce BIS global liquidity indicators. From borrowing country and sector perspective, shows relative trends in loans vs international debt securities; onshore versus offshore IDS issuance; role of USD

- Procyclicality and financial vulnerability
  - ✓ Cross-border dimension important as the margin $ of funding
  - ✓ Procyclical risk-taking propensities of financial intermediaries through liability structure
  - ✓ Financial vulnerabilities from Asia perspective, e.g. 1997 crisis, Korea more maturity than currency mismatch; differences across Asia and with other EMEs

Organization of discussion

- Comment on paper contributions
  - ✓ Procyclicality in international flows and financial vulnerabilities
  - ✓ Application to Asia
    - o Description of evolution of funding
    - o Debate about 1997-98 crisis cause
- Historical context on early warning indicators and crises
  - ✓ Currency crises, banking crises, financial crises
  - ✓ Current state of EWIs
- Suggestions for next generation indicators
  - ✓ Idea for further leveraging the data of this paper
  - ✓ Can the next crisis be predicted, instead of the last one?

1. Current paper contributions

Emphasis on procyclicality in international flows and financial vulnerabilities

Approach gives a rich historical perspective from different types and cuts of global liquidity series of the BIS

Chart pack tells the story of evolution of international bank lending

Cross-border and international claims: by lender nationality, or borrower location (stocks and growth rates, and relative to GDP)

Counterparty sector (bank, nonbank), maturity (<1yr, 1-2 yr, >2 yr), currency breakdown

Procyclicality shown visually as the form, composition, and importance of different types of international flows evolve.

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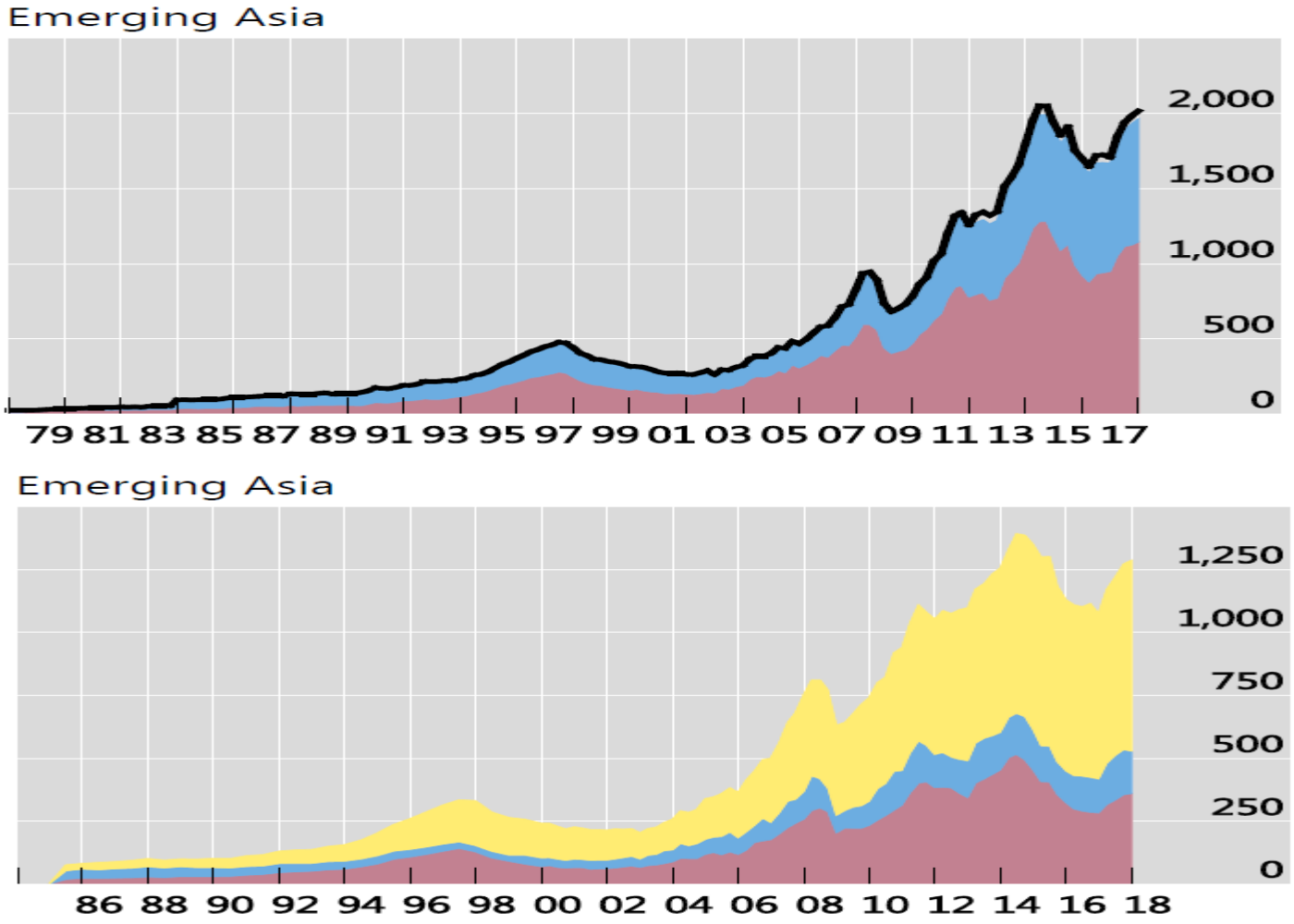
Procyclicality shown visually as the form, composition, and importance of different types of international flows evolve.

Paper does not actually measure the procyclicality, or engage in predictive exercises on financial vulnerabilities. These would be useful analytical additions.

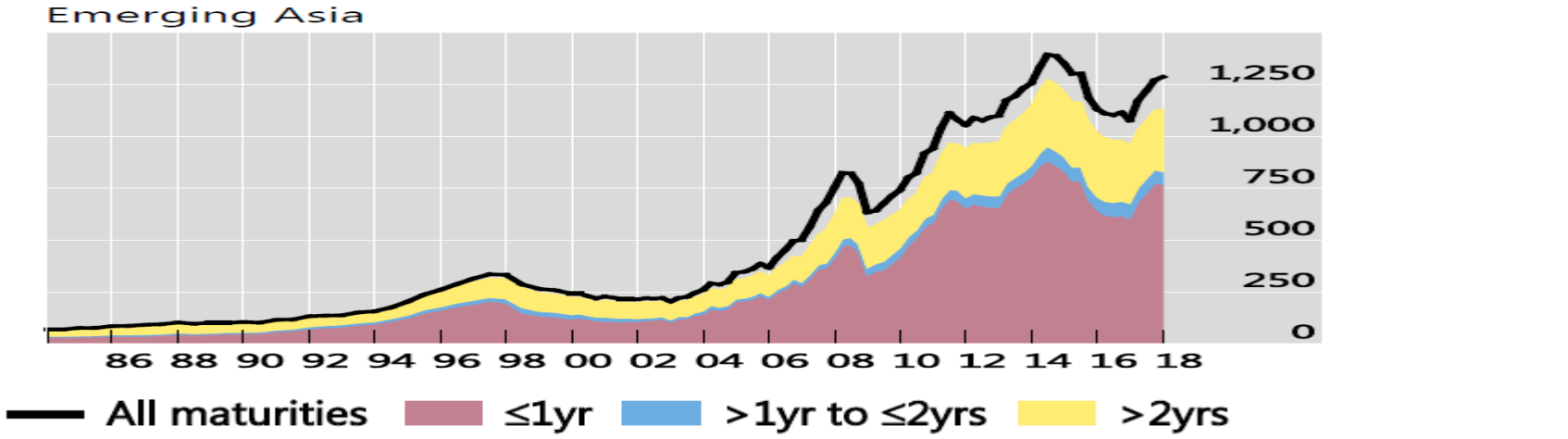
Asia 1997-98: international borrowing was high relative to history but totals inflated in nonconsolidated banking data. Nonbank private and interbank relatively similar pre-crisis, while sovereign share was relatively more important in 1980s.

Top Cross-border claims by counterparty sector (in bil USD; Blue – nonbank; red -- banks, locational, unconsolidated;

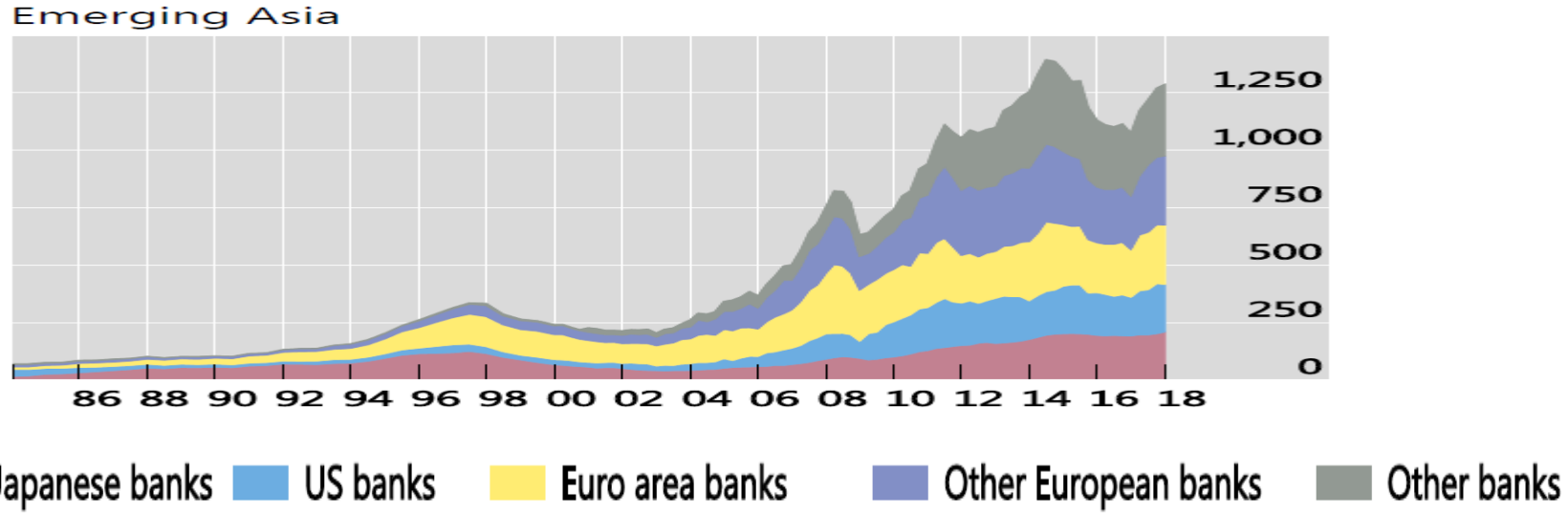
Bottom Consolidated data red-banks, blue official sector, yellow nonbank private



Funding maturities shortened as borrowing rose, a vulnerability in 1997 and the primary point of collapse. Lending banking systems also diversified with a larger euro area role (state of flightiness of respective locations not evident from this data).



Source: BIS consolidated banking statistics on IC basis.



What does this tell us about vulnerabilities and crises in Asia?

Informs importance of monitoring the composition of expansions in international indebtedness (a possible mirror for domestic developments).

1997-98 Asia crisis. Contemporaneous debate had two discrete views of the drivers of the collapse.

- Sudden shifts in market expectations and confidence of domestic and international investors key, not deterioration in local fundamentals (Radelet, Sachs 1998).
- Crisis reflected domestic structural, macro and policy distortions, with market overreaction and herding responsible for the sharp price and real responses (Corsetti, Pesenti, Roubini 1999)

Current data provides relatively more insights into the first view of the crisis.

2. Predicting crises: Historical context on early warning indicators

Long literature on describing crises and early warning indicators (1)

1. Currency and balance of payments crises (1980s,90s many studies!)

- Range of monetary and credit conditions, inflation, current account used to predict probability of collapse of a controlled exchange rate or target zone departure (largely 1970s - early 1990s).
- Context: international capital flows have banks funding sovereign borrowers. “Original sin” on public debt. Domestic macro focus in crises.

2. Sovereign debt and banking crises (1990s many studies!)

- Imbalances and mismatches in financial sector [Calvo Mendoza 1996]
- Bank balance sheet composition, including sovereign debt held, and relation to currency crises [Kaminsky Reinhart 1996].
- Broader understanding of current account sustainability/ reversals/ fiscal and banking fragility [Milesi-Ferretti Razin 1996]
- Context: capital account liberalization. Higher volumes of flows, more room for contagion.
- Doom loop. Sovereign stress erodes the value of sovereign assets held by banks, weakening bank solvency and resiliency.

Long literature on describing crises and early warning indicators (2)

3. Financial vulnerabilities/ soundness and banking crises (2000s - …)

- More extensive growth of international interbank funding flows (AEs)
- Banking crises and sudden stops in private funding. EM Macroeconomic turmoil reduced and institutional frameworks, inflation targeting strengthened. USD funding, plus less “original sin”.
- AE policies, risk sentiment, characteristics of market participants, asset prices, sectoral distortions and rigidities in focus.
- Financial Soundness Indicators (FSIs) to measure the health of a country’s financial system
  - Elements include bank capital adequacy, asset quality, earnings, profitability, liquidity sensitivity to market risk; some nonfinancial, household, and real estate metrics also encouraged.
- Parallel development of macro-prudential indicators and frameworks for risk assessment.

3. Mapping from the current paper to next generation indicators

Putting the BIS data to the test

- ✓ What are the features of strong early warning indicators of banking crises?
- ✓ Aldasoro, Borio and Drehmann BIS QR March 2018
- ✓ Vulnerabilities assessed using data for 1980-2017 quarterly, using 42 countries, plus banking crisis dates.
- ✓ Explore evolution of existing EWIs around crises, predictive properties. Introduce new measures.

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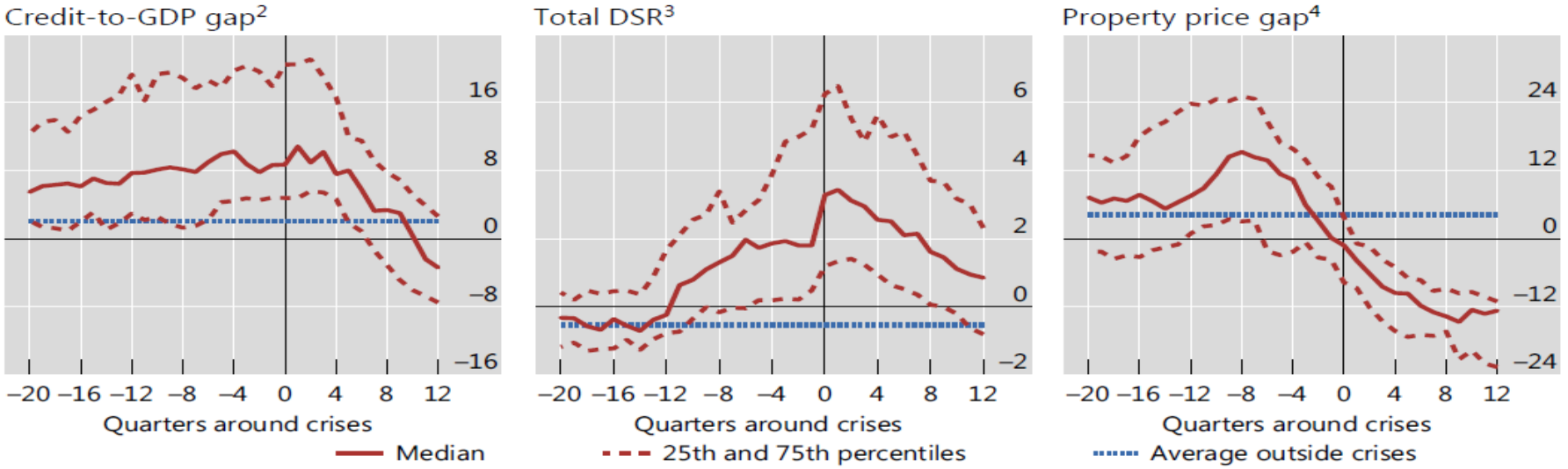
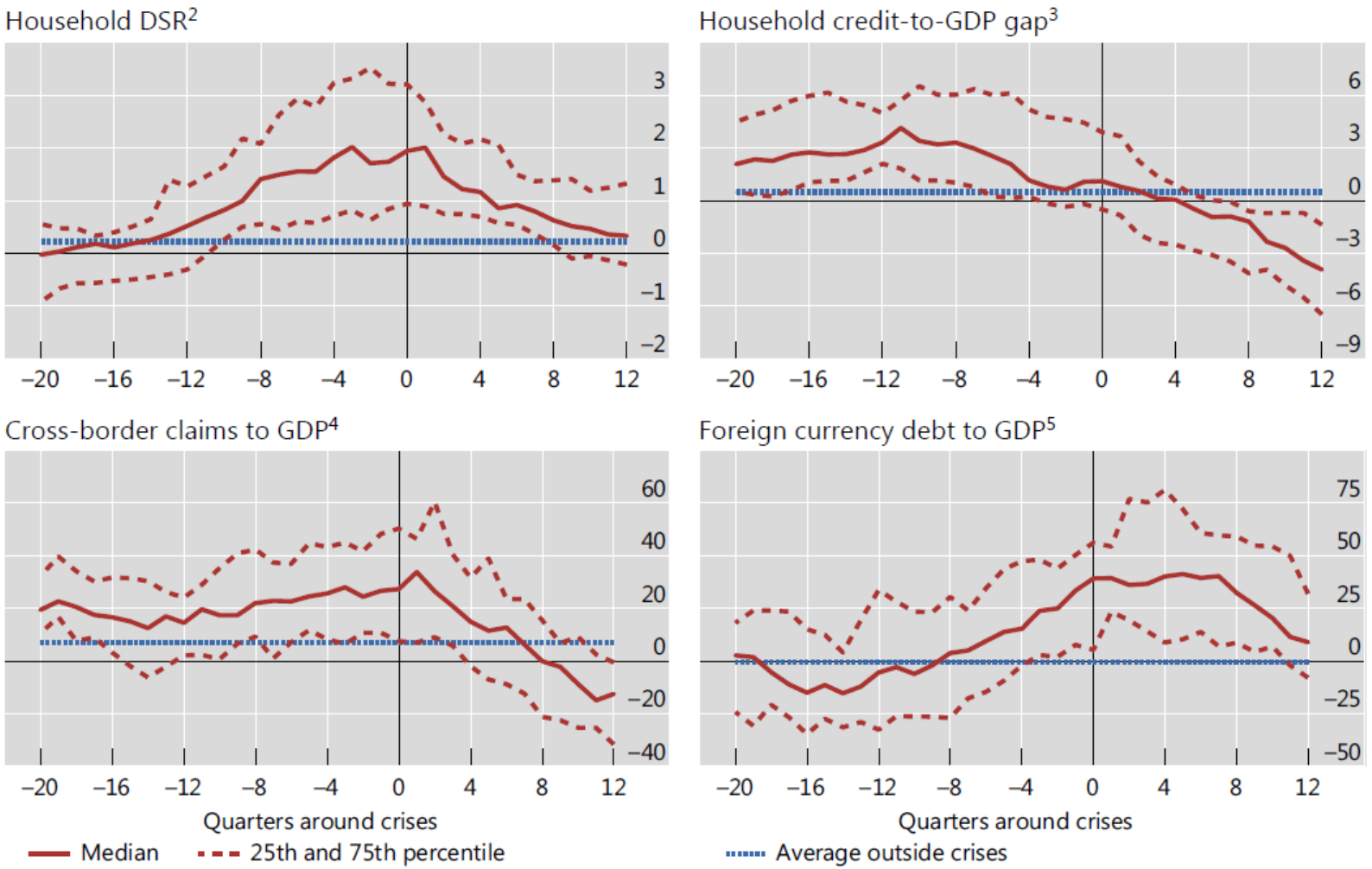
Evolution of existing BIS EWI variables around past banking crises[1] Graph 1



[1] The vertical line indicates time = 0. The historical dispersion (median, 25th and 75th percentiles) of the relevant variable is taken at the specific quarter across all crisis episodes available for the respective indicator. [2] Difference of the credit-to-GDP ratio from its long-run trend computed with a one-sided HP filter. [3] Difference of the total DSR from country-specific 20-year rolling averages. [4] Deviation of real property prices from their long-run trend computed with a one-sided HP filter.

BIS approach added new EWI, including international claims

Evolution of new EWI variables around past banking crises[1] Graph 2



[1] The vertical line indicates time = 0. The historical dispersion (median, 25th and 75th percentiles) of the relevant variable is taken at the specific quarter across all crisis episodes available for the respective indicator. [2] Difference of the household DSR from country-specific 20-year rolling averages. [3] Difference of the household credit-to-GDP ratio from its long-run trend computed with a one-sided HP filter. [4] Twelve-quarter growth rate in the cross-border claims-to-GDP ratio. [5] Twelve-quarter growth rate in the foreign currency debt-to-GDP ratio.

Assessing EWIs (Aldasoro, Borio and Drehmann 2018)

- Missed crisis calls (type I errors); False alarms (type II errors).
- Evaluate current data of series relative to their estimated optimum threshold values.
- Compute Noise To Signal (NTS) s.t. correctly predicting 2/3 (eg.) of banking crises, with threshold(s) breached within a three year horizon before crisis in interval spanned by available x 42 country data

	#crises	NTS (solo)	NTS (joint w residential property prices)
Household DSR	19	18.7	12.1
Total DSR	28	22.4	20.9
Credit-to-GDP Gap	30	25.7	11.8
Cross-Border Claims to GDP	29	27.3	19.0

Suggestion: Extend EWIs for financial vulnerability using international data, plus insights from recent research

- Current approaches to EWI only use one country data
- BIS data has borrower country perspective on bank and nonbank global liquidity, details of lender banking systems.
- Which flows are more vulnerable to retrenchment/ cycles and why?
- How important are these flows in country external financing?
- Construct metrics to combine these features and go beyond single country reporter perspective

Lessons from recent research on lending banking system features

Global liquidity driver effects depend on composition and balance sheet condition of lenders (capitalization, funding structure, internal capital markets).

- Differentiated. By country types, banking system characteristics, and across **core versus periphery locations** from perspective of global banks.

- Evolving. Shift in composition of lending banking systems, toward **better capitalized** and with **more stable funding**, reduces risk sensitivity.

  Avdjiev, Gambacorta, Goldberg, Schiaffi NBER 2017.

  Goldberg and Krogstrup NBER 2018. Cetorelli and Goldberg JIE 2012.

- Borrowing bank characteristics also matter. In US MP spillovers, International Banking Research Network (IBRN) finds **bank-specific cross-border gross and net liability** positions matter most, **Internal capital markets**

  Buch, Bussiere, Goldberg and Hills NBER 2018

5. Closing remarks

Nice and really informative paper

Provides a set of rich insights on the evolution of international financial stocks and flows, with a special emphasis on Asia

Could introduce more explicit treatment of procyclicality.

Could introduce more explicit role as EWI, leveraging rich compositional dimensionality of data

Suggestion to modify the existing approach to instead look across series, and also capture the features of the lending banking systems in monitoring borrower financial vulnerabilities

Well-poised to consider market-based finance features and evolution in international banking. Can the next crisis be predicted?

Thank you.