Empirical network contagion for U.S. financial institutions
by Duarte & Jones
Discussion by

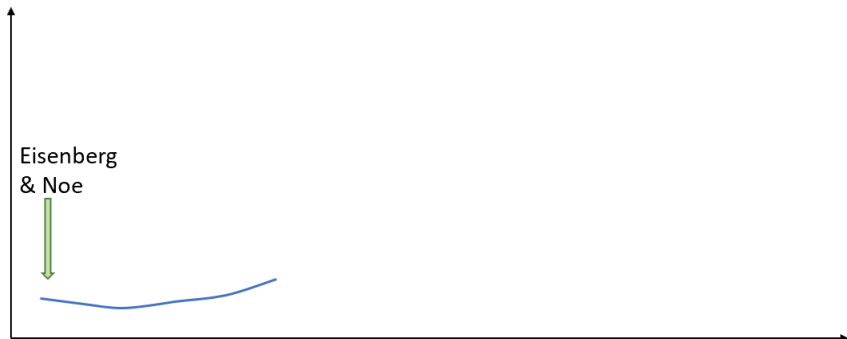Iñaki Aldasoro[1]

[1]Bank for International Settlements

February 6, 2020

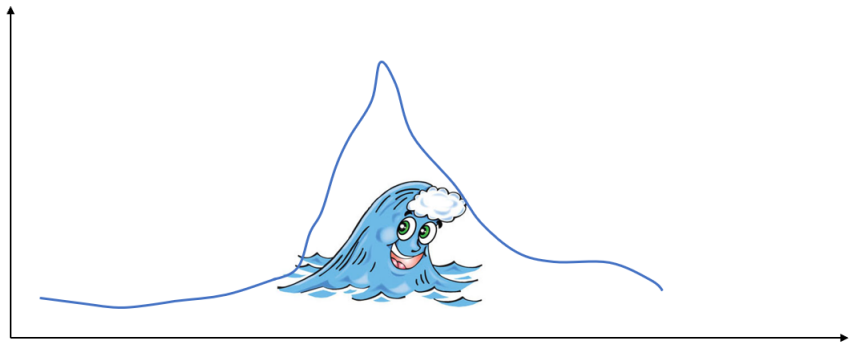ECB Macroprudential Stress-testing Conference, Frankfurt

FAding **S**ocial **H**istoric **I**nterest **O**n **N**etworks (FASHION) index

- ▶ Once a upon a time, there was a clearing algorithm

FAding **S**ocial **H**istoric **I**nterest **O**n **N**etworks (FASHION) index

- Contagion, contagion, contagion!

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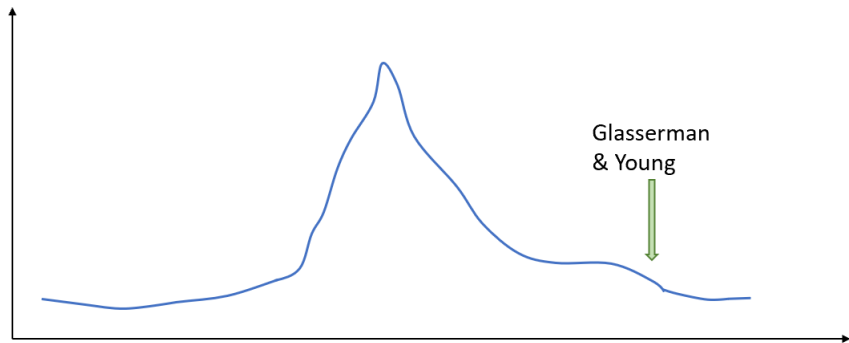
- Contagion is dead

FAding Social Historic Interest On Networks (FASHION) index

Duarte & Jones?
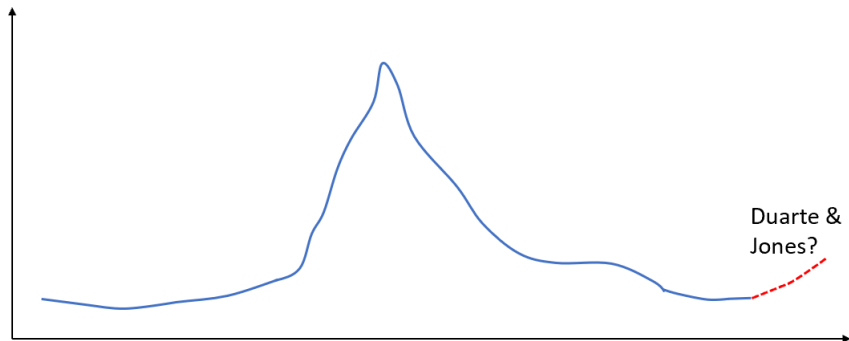
- ▶ Contagion is dead, long live contagion!

Overview

- **Theoretical** grounding
  - Contagion via *direct* links; no fire sales, no info contagion, runs, liquidity risk); defaults cascades (Eisenberg & Noe '01 and offspring)
  - Bounds on network contagion (Glasserman & Young '15)
    - "Network spillovers"

- **Empirical** paper
  - Take result on bound and run with it
  - Very *thorough* empirical application
    - Uniform reasonable methods / rare sharp use
    - In identifying these gaps

A simple key message

Network default spillovers could be large ($\approx 25\%$)

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Systemic risk in financial systems (EN)

- ▶ Originally developed as clearing algorithm to determine payment vector between *banks*

- ▶ Captures *default* contagion

- ▶ Banking network as *mutualisation* scheme

  - ▶ Final equity loss is equal to initial loss to outside assets

  - ▶ "the financial system is conservative, neither creating nor destroying value, the value in a surplus set must be allocated somewhere"

  - ▶ No amplification

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How likely is contagion in financial networks? (GY)

- A network paper ...

How likely is contagion in financial networks? (GY)

- A network paper ... without a network

To be or not to be (contagious)

- ▶ Answer: put bounds on target measure, $R = \frac{E(L_{actual})}{E(L_{disc})}$
  - ▶ Network spillovers: difference between actual and hypothetical (connections disappear but balance sheets remain the same)

- ▶ R has upper bound B
  - ▶ Combine (outside) asset-weighted PD and *maximum* inter-financial liability share
  - ▶ Express it as Network Vulnerability Index ($NVI = B - 1$)

- ▶ How meaningful is the counterfactual $E(L_{disc})$? Need to defend this!

- ▶ Most variability driven by PD, so time series pattern of NVI $\approx$ PD
  - ▶ Why not just use PDs?
  - ▶ It has to be because the level of NVI matters (more later)

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Empirics

▶ Locational or consolidated? (eg banks *in* the US vs *US* banks)

▶ What role for foreign banks and their US operations?

  ▶ Large literature documenting how important they can be in
    granting credit, intermediating derivatives and repos, etc

▶ BHCs: with or without BD subsidiaries? (some double
  counting?)

  ▶ FR Y-9C: can distinguish between CBs, UBs with and without
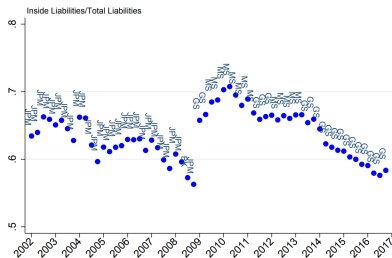   BD subsidiaries (*rssd*9346, *bhckc*252)

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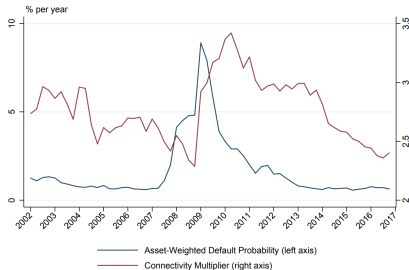 - ▶ FR Y-9C can distinguish between CBs, UBs with and without BD subsidiaries (*rssd*9346, *bhckc*252)
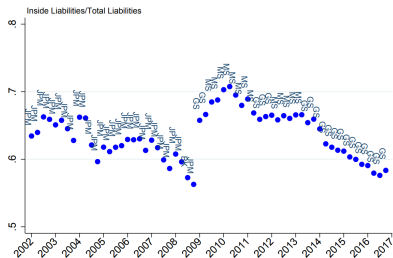
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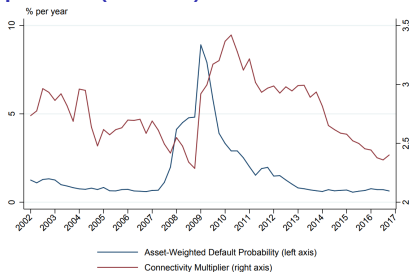
Empirics (cont.)

% per year

Asset-Weighted Default Probability (left axis)
Connectivity Multiplier (right axis)

Inside Liabilities/Total Liabilities

- ▶ PDs on the driving seat

- ▷ Strange patterns for connectivity

  - ▸ Reclassification of IBs as BHCs

- ▷ More broadly: mixing a lot of different entities and coming up
  with a single β^+ (maximum intrafinancial liability share)

  - ▸ Apples and oranges? Need to discuss contagion mechanisms!

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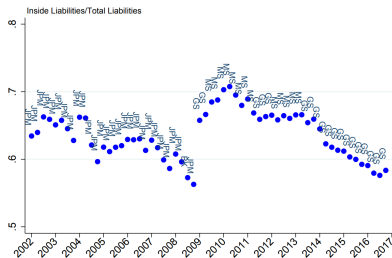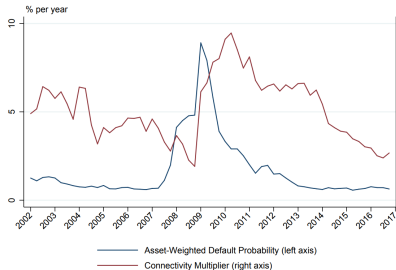
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Passing judgment

- I really liked the paper, you should read it!
- Powerful (and straightforward) message
- Nicely done, very thorough empirical application
- More robustness than I could think of

The "**E**nigma of **C**onditionality in **B**lockchain" (ECB)

"I was a hope. And a hope without proportions is always superior to a measurable reality" (Roberto Arlt)

- ▶ Blockchain *could/may* fix cross-border payments, digital IDs, remittances, poverty, water supply, <*insert random stuff*>

    - ▶ But again, it *could/may not*

- ▶ Network spillovers *could* be large

    - ▶ But again, they *could not*

    - ▶ Meaningfulness of bound is a decreasing function of its size

- ▶ "In theory, there is no difference between theory and practice. In practice, there is."

    - ▶ Bounds are a useful theoretical result

    - ▶ Implications for policy? For stress-testing?

    - ▶ Can we pin down more accurately the extent of contagion?

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THANK YOU FOR YOUR ATTENTION!

✉ inaki.aldasoro@bis.org