Architecture and Stability of the Financial System

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Introduction

Historically, a number of different aspects of financial architectures have been associated with various financial stability issues

1. Exchange rate system – Currency crises and sovereign debt default
2. Financial market structures – Stock market crashes
3. Banking system form – Banking crises
4. Nature of banking networks – Contagion
5. Banks versus non-bank intermediaries – Non-bank runs

Here we will focus on 3-5

Banking System Form

Classic banking literature focusses on single banks rather than the banking system (e.g., Bryant (1980), Diamond and Dybvig (1983)) – but Cone (1983) and Jacklin (1987) pointed out that depositors must have restricted access to financial markets

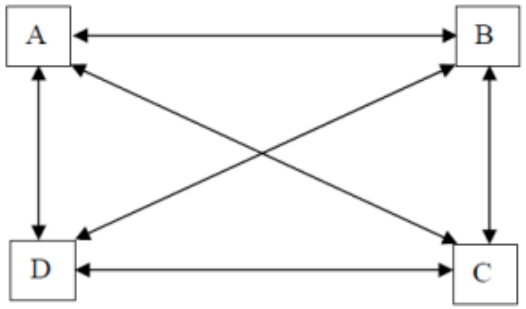
Subsequent papers considered the information structure (e.g., Gorton (1985), Chari and Jaganathan (1988), Jacklin and Bhattacharya (1988), Allen and Gale (1998), Rochet and Vives (2004) and Goldstein and Pauzner (2005))

Contagion of Banking Crises

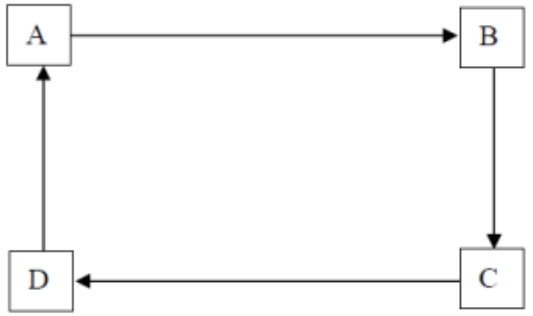
It was in the contagion literature that the architecture of banking networks came to the fore (e.g., Allen and Gale (2000), Freixas, Parigi and Rochet (2000), Dasgupta (2004), Elliott, Golub, and Jackson (2014) and Acemoglu, Ozdaglar, and Tahbaz-Salehi (2015))

Allen and Gale (2000) introduced the idea of complete and incomplete structures and showed that incomplete were more susceptible to contagion:

Complete Networks



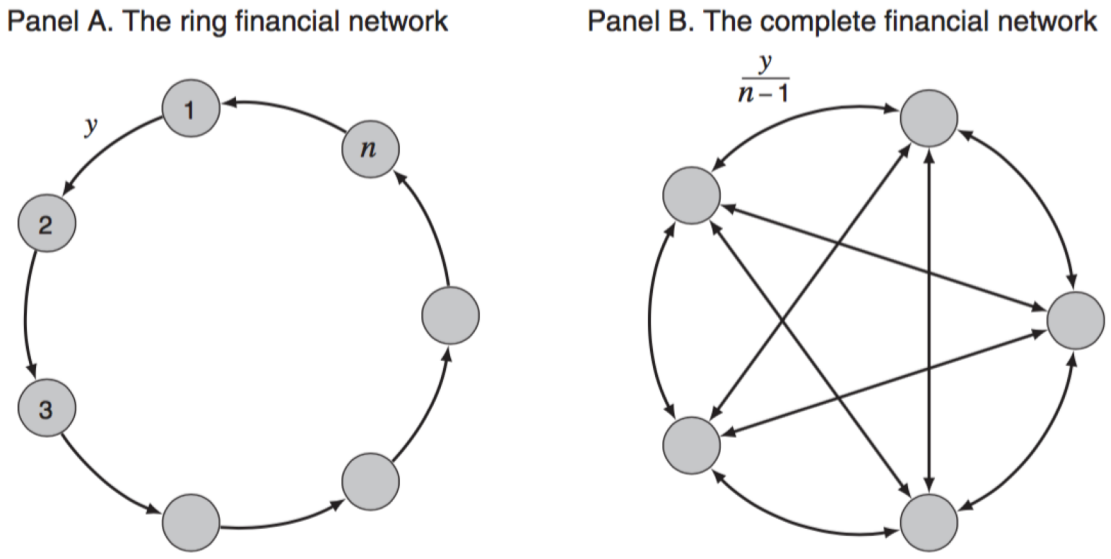
Incomplete network structure



Acemoglu et al. (2015) Results

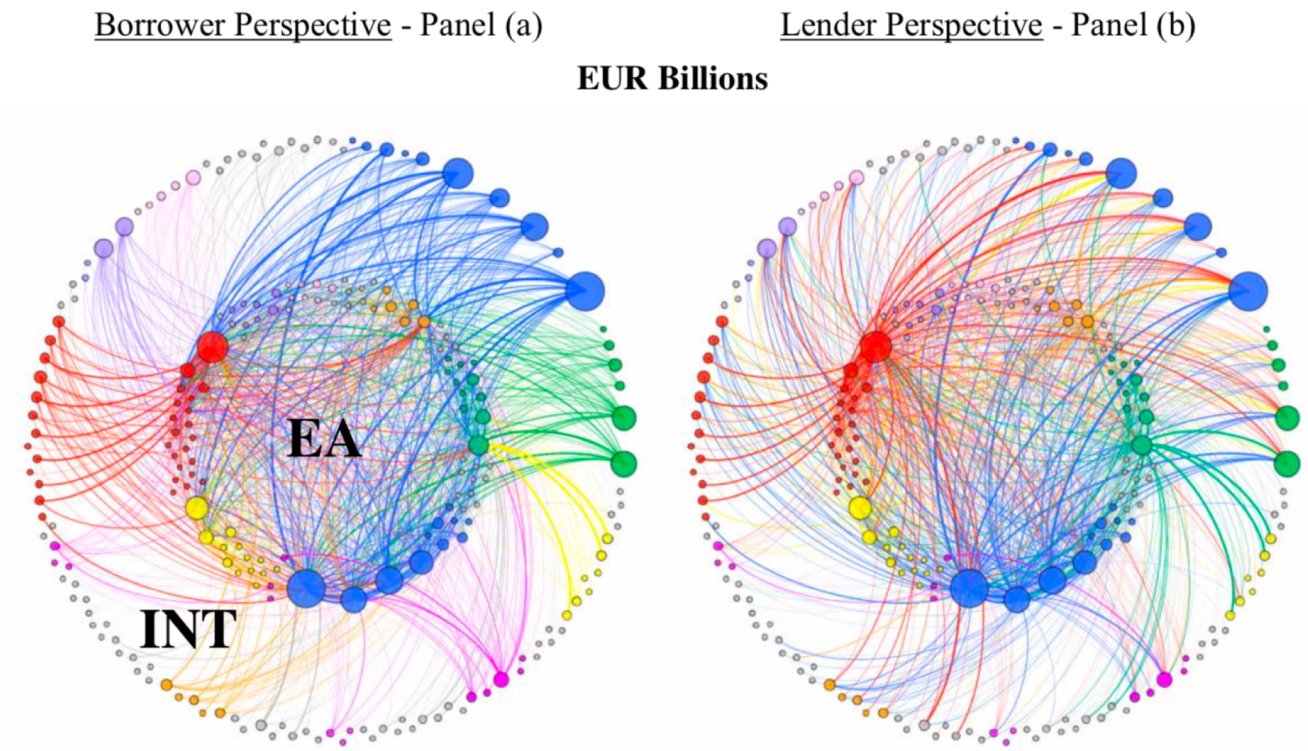
For small losses, the ring network is the least stable, while the complete network is the most stable

For large losses, neither the ring nor the complete network do well; instead, we want “pockets” of banks who are insulated from others



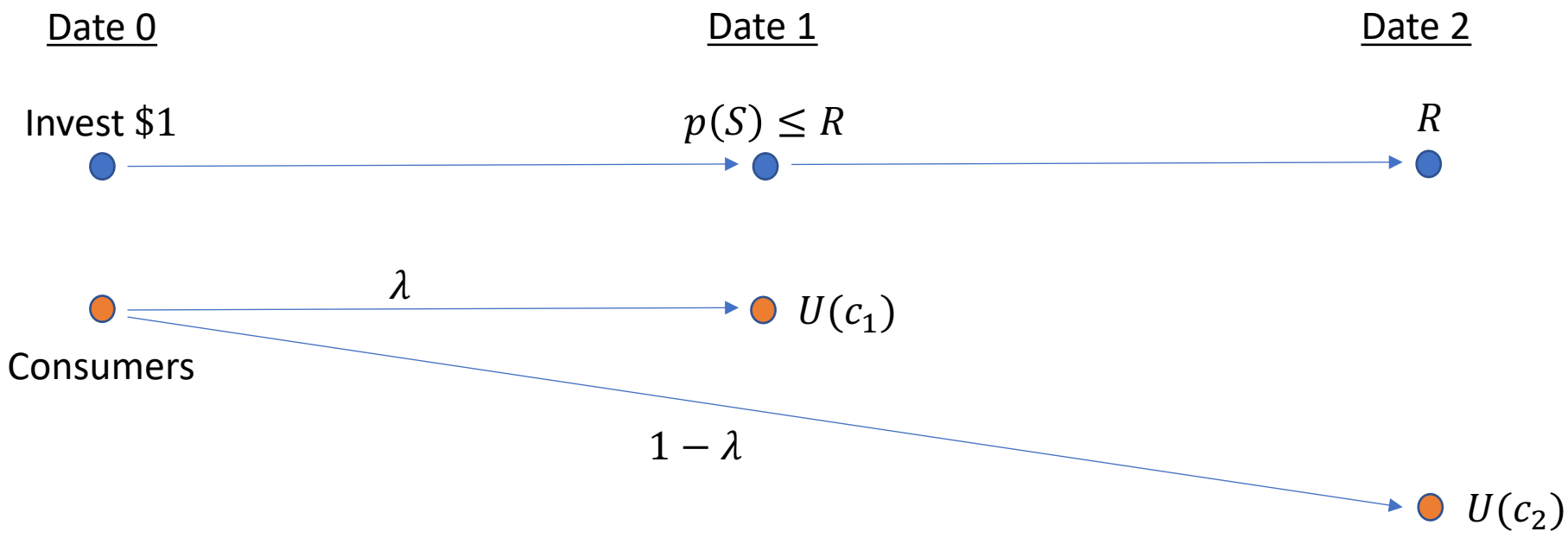
Empirical Work on Banking Networks

There are now many empirical papers on networks (e.g., Afonso, Kovner and Schoar (2011), Billio, Getmansky, Lo and Pelizzon (2012), Craig and von Peter (2014), Gofman (2016), Covi, Gorpe and Kok (2018))



Non-Bank Runs

We focus on non-bank intermediaries with demandable claims (e.g., MMF, open-ended mutual funds) in a canonical model where the intermediary faces a general form of (market) illiquidity



Non-Bank Architecture and Stability

As in Diamond-Dybvig, an intermediary implements the efficient trade-off between returns and liquidity in one particular equilibrium

Do deviations from this equilibrium generate runs?

- Architecture specifies $(c_1(n), c_2(n))$ for all possible scenarios where a fraction n of investors withdraw early
- We study stability properties of some real-world architectures

The "ideal" floating-NAV fund sells just enough to cover outflows for every n and then accurately re-values its shares before honoring redemptions

A Simple Test for Stable Architectures

Definition. An architecture $(c_1(n), c_2(n))$ is run-proof if $c_1(n) \leq c_2(n)$ for all n

Proposition. An architecture is run-proof if and only if its demandable claim $c_1(n)$ is bounded above by the demandable claim of the ideal floating-NAV fund.

Implications for Mutual Funds

Floating NAV is run-proof but it is a knife-edge case, where small deviations in architecture can generate mutual fund runs (e.g., Chen, Goldstein and Jiang (2012), Zeng (2017))

- Investors believe that the NAV is fixed with probability $\epsilon > 0$
- Early liquidations reduce the date 2 return by ϵ per unit

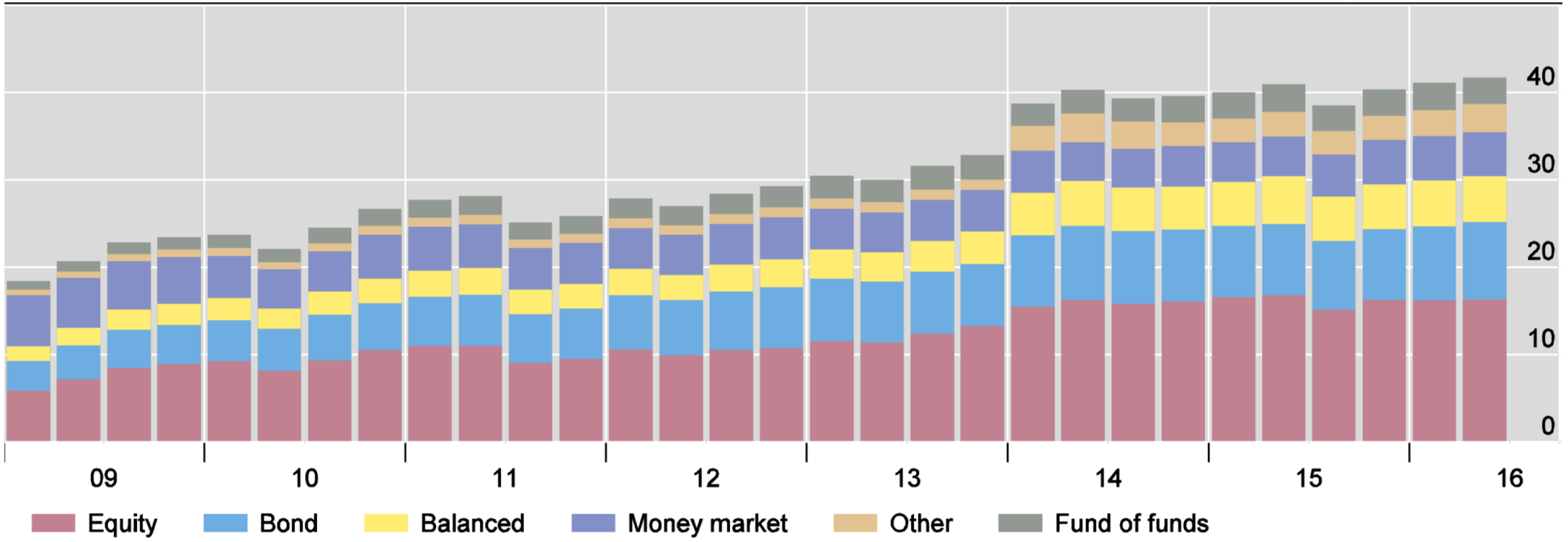
Cash Smoothing versus Cash Hoarding (e.g., Morris, Shin and Shim (2017), Chernenko and Sunderam (2016)) is key for run incentives

Global Growth of Asset Management

Total net assets of regulated open-ended funds

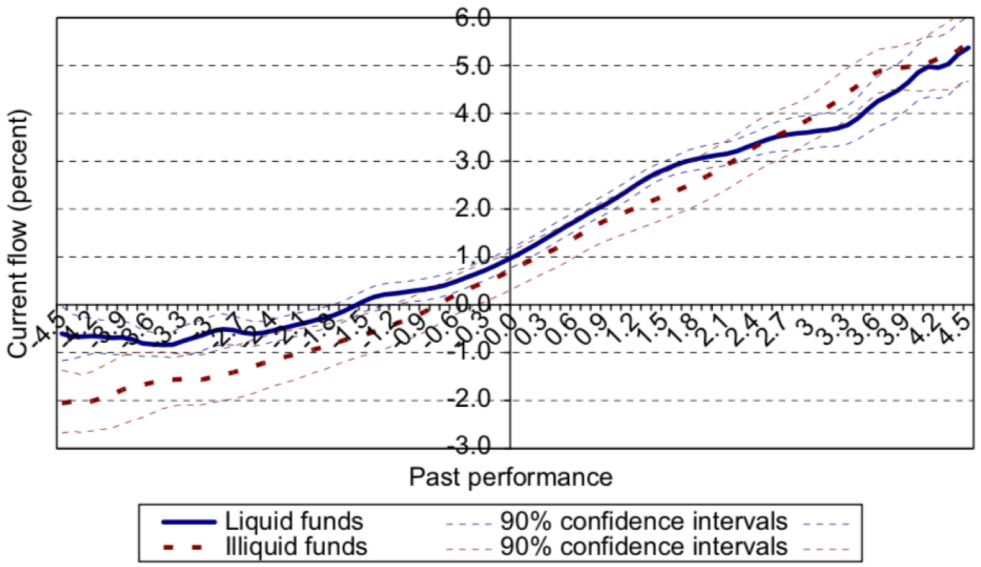
In trillions of US dollars

Chart 1



Source: BIS

Evidence on Non-Bank runs



Source: Chen, Goldstein and Jiang (2012)

Mutual funds flow patterns are consistent with runs in a global game (e.g., Chen, Goldstein, Jiang (2010), Goldstein, Jiang and Ng (2017))

Funds face significant illiquidity (e.g., Gompers and Metrick (2001), Coval and Stafford (2007))

Fixed-NAV funds experienced runs in 2008, including MMF and roll-over based structures such as ABCP conduits and Repo (e.g., Schmidt, Timmermann and Wermers (2016), Kacperczyk and Schnabl (2013), Gorton and Metrick (2012), Covitz, Liang and Suarez (2013), Krishnamurthy, Nagel and Orlov (2014))

Further Topics

- Asymmetric information is key for the design of financial architecture
  e.g., Dang, Gorton, Holmstrom (2015), Dang, Holmstrom, Ordonez (2017)
- Architecture influences asset prices
  e.g., He and Krishnamurthy (2012), Adrian and Shin (2014), Haddad and Muir (2018)
- Stock market runs, broker-dealers and liquidity spirals
  e.g., Bernardo and Welch (2004), Diamond and Rajan (2005), Brunnermeier and Pedersen (2009), Adrian and Shin (2010), Di Maggio, Kermani and Song (2017)
- Concentration and competition matter for systemic stability
  e.g., Egan, Hortascu, Matvos (2015), Corbae and d'Erasmo (2014), Davila and Walther (2018)
- Is FinTech (e.g. P2P) a threat or an opportunity?
  e.g., Braggion, Manconi and Zhu (2018)