

# Network Risk and Key Players: A Structural Analysis of Interbank Liquidity

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# This is a great paper!

## **This paper studies liquidity in interbank markets using a structural model**

- This type of paper is rare
- The financial networks literature has mostly been either empirical and theoretical, absent a few exceptions
- it is important discipline theories with facts and at the same time to impose structure on bilateral data

Otherwise, it would have been impossible to answer important questions that involve the structure of the underlying network ...

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**Which banks contribute the most to systemic risk in interbank liquidity?**

- Why haven't there been more structural papers?
- Because it is difficult to do
- This paper strikes a great balance between having a tractable model and capturing the important complexities of the interbank market/data

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There is not really a lot left to do...so I will only offer three suggestions on:

- 1 Meaning of the network
- 2 Cost versus benefit of liquidity reserves + policy implications
- 3 Scope of risk captured

# Meaning of the network

In the baseline, the network  $g$  affects:

- 1 Accessible stock of liquidity for any given bank
  - “*what can be borrowed from other banks in the network*” (page 9)
- 2 Information spillover about the common value of liquidity
  - “*Neighbors’ liquidity holdings can be informative about the common value of reserves*” (page 9)

$$u_i(z_{i,t}, \{z_{j,t} : j \neq i\} | \mathbf{G}_t) = \underbrace{\tilde{\mu}_{i,t}}_{\text{Unit Value}} \underbrace{\left( z_{i,t} + \psi \sum_{j \neq i} g_{ij,t} z_{j,t} \right)}_{\text{Accessible Liquidity}} - \frac{1}{2} \gamma \left( z_{i,t} + \psi \sum_{j \neq i} g_{ij,t} z_{j,t} \right)^2, \quad (2)$$

where the unit value of liquidity is:

$$\tilde{\mu}_{i,t} := \hat{\mu}_{i,t} + \delta \sum_{j \neq i} g_{ij,t} z_{j,t},$$

- **Implies that interbank lending relationships exist and “matter”**
  - If banks can freely adjust, then the existing network would not matter because the network can just readjust costlessly in response to shocks
  - How costly or quickly adjusting the network is thereby has a big effect on results

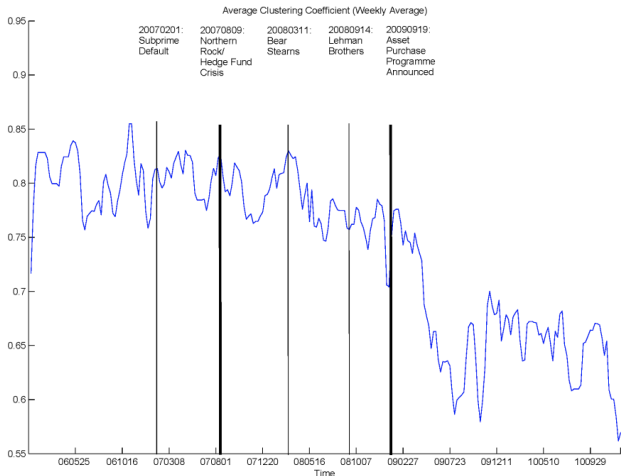


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- **The theory assumes at every time  $t$ , the network is predetermined because it could bias the contribution of network structure to liquidity risk**
  - First best solution: endogenizing network is unlikely to be feasible
  - Second best solution: Allow for the network to interact with bank characteristics, even if reduced form
    - Not allowed for baseline and for main results but general model in the Appendix allows for some interaction
    - Suggest to use general model for main implications

- **Empirically, the network is determined by the overnight loans between bank pairs over the previous month whereas the estimation is at the daily frequency**
  - Why is the one month threshold chosen? It directly decides the stickiness of the network.
  - Suggest to repeat the analysis by changing how the network switching is defined and compare how results differ

# Meaning of the network

No direct data but weekly fluctuation in network clustering seems quite high...



# Costs and Benefits of Liquidity

- The current formulation reflects the *net* benefit of liquidity holdings. However:
  - In the theory, the main channels and results in the theory are speaking towards the **demand** for holding liquidity e.g. strategic complement versus strategic substitutability
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- **Why not explicitly split the demand and supply factors from the onset?**

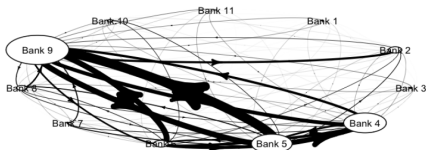
## **Suggest to explicitly split the demand and supply factors from the onset**

This would bring a number of benefits:

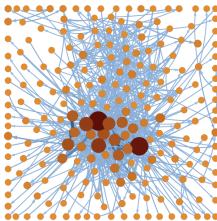
- They are already there!
- Separating/separately mentioning them reduces confusion and improves the economic interpretation
- Sharpens the policy interpretation - monetary policy and QE can be interpreted to influence the supply curve of liquidity
  - These variables are too important to be called controls

# Scope of Risk

This is a network of 11 large banks that are quite densely connected:



I am very sympathetic to the data constraints but the effect of the core on the periphery cannot be simply ignored.



Bech and Atalay - Fed funds



Potential solutions:

- Supplement data with newer sample that includes more banks + simplifying assumptions on how smaller banks behave
- Impose some assumptions on how the remaining network looks like from observable balance sheet variables
- Generate sets of results conditional on the remaining network

Probably no perfect solution but important to get some sense, especially for understanding contributions to systemic liquidity risk.

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- Overall an important contribution to structural estimation of financial networks with careful execution!
- Three main suggestions:
  - 1 Generalize economic formulation and improve empirical measurement of what constitutes a “new network”
  - 2 Differentiate between the demand and supply of reserves from the onset
  - 3 Extend the results to and/or discuss the effects of the remaining network outside of the current sample