

Strategic Liquidity Mismatch and Financial Sector Stability

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The views expressed are solely my own and should not be attributed to the Board of Governors of the Federal Reserve System or other members of its staff

Motivation

- ▶ **Banks have a unique ability to create liquidity** by financing illiquid assets with liquid liabilities
- ▶ Combination of lending and deposit-taking activities **protects firms and households against liquidity shocks** and helps **promoting economic growth**
- ▶ **Banks are also intrinsically fragile** → excessive liquidity mismatch can lead to bank runs, breakdown of wholesale markets, and distressed asset sales
- ▶ Relationship between excessive liquidity transformation and financial instability *exacerbated* when banks **collectively engage in strategic risk-taking behavior** in the form of common portfolio choices

Motivation

- ▶ WHY WOULD BANKS ENGAGE IN COLLECTIVE RISK-TAKING?
 - 1. **Bailout guarantees** in case of generalized distress: too-many-to-fail
 - 2. **Relative performance evaluation** in bank managers' compensation
 - 3. **Learning motives** i.e., free-riding in information acquisition
 - ▶ *Despite the extensive theoretical literature, collective risk-taking strategies among banks have not yet been empirically tested...*
- ▶ THIS PAPER shows *empirically* that:
 - 1. Commercial banks strategically incorporate their competitors' liquidity mismatch policies when determining their own
 - 2. Collective decisions have a negative impact on financial stability

Motivation

- ▶ WHY IS THIS IMPORTANT?
 1. Commonality in portfolio exposures and unreasonably high liquidity transformation **increases likelihood that banks fail altogether**
 - ▶ Can sow the seeds for costly crises associated with sharp recessions and distributional consequences
 2. **Issue particularly relevant after the crisis** → academics and policymakers questioning the efficacy of recent liquidity regulations

Identification Strategy

Manski's baseline linear-in-means model

$$y_{i,j,t} = \mu_i + \beta \bar{y}_{-i,j,t} + \lambda' \bar{X}_{-i,j,t-1} + \gamma' X_{i,j,t-1} + \delta' Z_{j,t-1} + v_t + \varepsilon_{i,j,t}$$

- ▶ Peer effects captured by coefficient $\beta \rightarrow$ influence of competitors liquidity mismatch positions on those of bank i

Endogeneity problems:

1. Reflection: Peers average liquidity $\bar{y}_{-i,j,t}$ determined simultaneously with outcome variable $y_{i,j,t}$
 - ▶ Cannot disentangle if bank i 's decision is the cause or the effect of its peers' respective choices
2. Correlated effects: banks in the same local network are subject to common but unobserved shocks which lead to similar policies

Identification Strategy

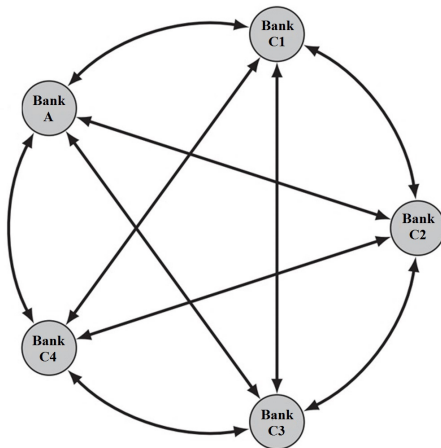
► Solution:

- Explore systematic differences in peer group composition
- Partially overlapping peer groups allows to use liquidity mismatch position of a “peer’s peer” as an instrumental variable (IV)
 - Instrument orthogonal to $\bar{y}_{-i,j,t}$, thus extracting exogenous part of its variation & these indirect peers also generate within-group variation in $\bar{y}_{-i,j,t}$, thus solving the reflection problem

► How?

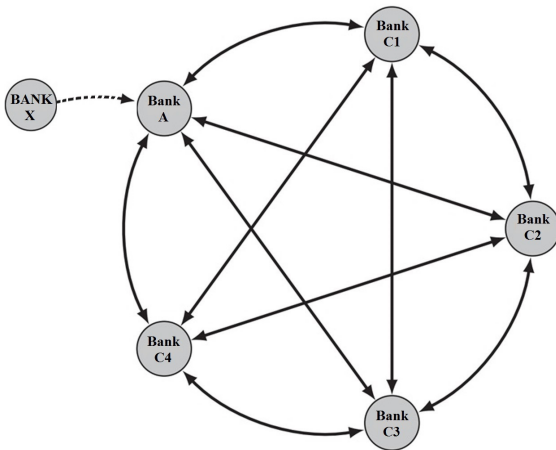
- Large cross-border banking groups manage liquidity on a global scale and coordinate their risk-management policies within the group
- Identifying assumption → in addition to the liquidity choices of its direct competitors, a foreign-owned subsidiary also takes into consideration the overall liquidity transformation policies of its parent bank-holding group when determining its own

Identification Strategy



- ▶ Network of banks operating in same country j in period t under a complete market structure where: (i) *Bank A* is a foreign-owned subsidiary; (ii) *Banks Cs* are its domestic competitors of similar size

Identification Strategy



- ▶ Liquidity mismatch position of a bank-holding group (*Bank X*) based in country f can be used as an instrument for all banks in country j (*Banks Cs*) that belong to peer group of its foreign subsidiary (*Bank A*)

Criteria to Specify Peer Groups

1. *Country:*

- ▶ Within-country banks have higher incentives to mimic their peers since they *share the same LOLR*
- ▶ Firms *select peers narrowly when setting RPE* to filter out common exogenous shocks to performance
- ▶ Learning likely to occur within countries where *information for managers of smaller banks is more accessible*

2. *Business Model:* only commercial banks included in the sample

3. *Bank Size:* each peer group in each country j in each year t has a maximum of 20 commercial banks in the benchmark case

- ▶ Small banks would only be bailed-out if too-many-to-fail
- ▶ Probability of RPE adoption increases with bank size

Liquidity Mismatch Indicators

Berger and Bouwman Liquidity Creation measure:

- ▶ Liquidity-weighted sum of all bank balance sheet items as a share of assets → liquidity weights based on ease, cost and time it takes:
 1. For a bank to dispose of its obligations to meet demand for liquidity
 2. For customers to withdraw liquid funds from the bank
 - ▶ Banks create liquidity by financing illiquid assets (e.g., corporate loans) with liquid liabilities (e.g., demand deposits)
 - ▶ Banks destroy liquidity by financing liquid assets (e.g., cash) with illiquid liabilities (e.g., long-term funding) or equity
- ▶ Results robust to using the Liquidity Mismatch Index (LMI) or a proxy for the Net Stable Funding Ratio (NSFR)

Data

1. Main Sample: 13,954 bank-year observations → 1,584 commercial banks operating in OECD countries from 1999 to 2014
 - ▶ Banks' balance-sheets and income statements → Bankscope
 - ▶ Bank ownership data → manually collected from various sources:
 - ▶ BvD ownership database, banks' annual reports and websites, newspaper articles. Data is further cross-checked with the Claessens and van Horen bank ownership database
 - ▶ Daily stock prices and no. shares outstanding → Datastream
 - ▶ Country-level data → World Bank WDI, IMF IFS, MSCI
2. Alternative Sample: 14,407 bank-quarter observations → 472 US commercial banks from 1999:Q1 to 2014:Q4 (from "Call Reports")

Main Results

1. Commercial banks follow the liquidity mismatch policies of their respective competitors when determining their own

- ▶ 1 SD increase in liquidity created by competitors → up to 28 percent increase in bank i 's liquidity creation
 - ▶ Peer effects concentrated in ex-ante riskier banks with lower capital ratios, profit stability, and distance to default
 - ▶ Collective risk-taking behavior is driven by liquidity created on the asset-side, of which lending is a key component
 - ▶ Small banks follow small banks, while large banks mimic large banks
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- ▶ **EXISTING EVIDENCE:** competitors affect banks' *lending* decisions and *liquid asset* choices; firms' *compensation* and *leverage*...
 - ▶ **CONTRIBUTION:** novel identification strategy to capture strategic interactions exploiting the presence of partially overlapping peer groups

Main Results

2. Strategic complementarity in banks' liquidity mismatch decisions deteriorates the stability of the financial system

- ▶ Response of individual banks to their peers' choices is asymmetric, with mimicking occurring only when competitors are taking more risk
- ▶ Peer effects associated with statistically and economically significant increases in default risk of individual institutions and systemic risk
 - ▶ 1 SD increase in peer effect → up to 7% increase in default risk
 - ▶ 1 SD increase in peer effect → up to 13% increase in systemic risk

- ▶ **EXISTING EVIDENCE:** idiosyncratic bailout guarantees lead to additional bank risk-taking → but moral-hazard not confined to banks choosing to bear excessive exogenous risk

- ▶ **CONTRIBUTION:** first study empirically examining the impact of banks' collective balance-sheet decisions on financial sector stability

Summary

1. Liquidity mismatch *choices* of competitors *do matter* for liquidity mismatch *decisions* of individual banks
2. This effect is concentrated on the asset side of riskier banks and is asymmetric
3. Strategic liquidity risk management decisions increase individual banks' default risk and overall systemic risk

POLICY IMPLICATIONS:

- ▶ Results highlight the importance of regulating systemic liquidity risk from a *macroprudential perspective*
- ▶ Move from *bailouts* to *credible bail-ins* is an important step to mitigate incentives for collective risk-taking behavior