“Liquidity Regulation and Credit Booms: Theory and Evidence from China”

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Overview

Tightening of reserve requirements $\Rightarrow$ credit boom.

- Regulatory arbitrage + bank competition through the interbank lending market.

- Evidence: Big banks’ withdrawal of liquidity led to spikes in interbank rates.

- Calibrated model shows a third of the credit boom in China is accounted for by this channel.
**Model**

- Off-balance sheet DLPs not subject to reserve requirement.

\[ R \geq \alpha(X_j - W_j) \]

- Shadow cost of reserves: Bank lending to non-financials offers higher returns.

\[ \mu_j = (1 + i_A)^2 - (1 + \bar{i}_L) > 0 \]

\( \Rightarrow \) regulatory arbitrage

- Banks shift funding source by offering higher rates on DLPs:

\[ \xi_j = \frac{\alpha \mu_j}{2(1 - \theta)} \]
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**Key Elements**

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  - Direct motive: return on excess reserves
  - Reallocation motive: external liquidity + small bank reserves
  - Funding share motive: small banks’ RA incentive
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- $\alpha \uparrow$. What follows?
  - Small banks expand on DLP by raising rates:
    $$\xi_j \uparrow \rightarrow \text{DLP, funding share} \uparrow \rightarrow \text{small bank lending} \uparrow$$

  - Big bank reacts through direct competition on DLP + withdrawal of interbank liquidity
    $$\xi_k \uparrow, i_L \uparrow \rightarrow \text{big bank lending} \uparrow$$
Comments on the model

- Regulatory arbitrage: shifting off balance sheet vs. growing market share.
  - Could we overstate the effects by tying the two together?

What does DLP transaction cost $\omega$ represent?

Interpretation matters for how we think about regulation ($\alpha$) changes.

Example: Households diversify between deposit and DLP due to potential risks $\Rightarrow$ Is the regulator raising $\alpha$ because of rising risks $\Rightarrow$ cov($\alpha, \omega$)

Equilibrium response of credit boom $i_A$ is fixed in the model.

Credit boom $\rightarrow$ "cheap credit" $\rightarrow$ partially offsetting effects.
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A WISH LIST FOR EMPIRICS

- Evidence of large elasticity of small bank DLP rates & funding share to interbank rates?
  - High interbank rates on average vs. sudden spikes of interbank rates?
  - Did small banks increase reserve holdings after the 06/2013 shock? (a small vs. big bank diff-in-diff)

- Evidence of big bank market power (and collusion)?
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- Differences from the U.S. interbank market (Afonso, Kovner, Schoar 2010, 2014)
  - Small banks are net lenders.
  - Stable borrowing relationships as a hedge.
Bank Liquidity Crisis of 06/2013

Figure 5
(a) Repo Lending by Big Banks (RMB Billions)

Note: Interest rate is the weighted average lending rate charged by big banks. Excludes loans between big banks.

(b) Repo Lending by Policy Banks (RMB Billions)

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Figure 5

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- Should the policy banks have been as restrictive as the Big Four if the government wants to discipline the market?
- If the Big Four were liquidity constrained, why were they still lending to small banks at all?
- Why were Big Four borrowing overnight but lending at longer maturities?
- Did the pricing of Big Four become more uniform than usual?
Regulator

- Government might be using interbank market to discipline off-balance sheet activities.
  - $\psi$ shock
  - How sensitive are the results of the quantitative analysis to this consideration?

- With RA + interbank channel in mind, how should regulator respond with a richer set of policy tools? $\alpha, \alpha_{DLP}, \psi$
Conclusion

- “Unintended” consequences of banking regulation through a novel channel, the interbank market.
- Collaboration with the empirical evidence will further strengthen the argument.