

“LIQUIDITY REGULATION AND CREDIT
BOOMS: THEORY AND EVIDENCE FROM
CHINA”

BY KINDA HACHEM AND ZHENG MICHAEL SONG

Hui Chen

MIT and NBER

6th Annual JRCPPF Conference

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.

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

⇒ regulatory arbitrage

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

$$\xi_j = \frac{\alpha\mu_j}{2(1 - \bar{\theta})}$$

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.

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

⇒ regulatory arbitrage

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

$$\xi_j = \frac{\alpha\mu_j}{2(1 - \bar{\theta})}$$

- No risks. So why don't all savings go to DLPs?

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.

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

⇒ regulatory arbitrage

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

$$\xi_j = \frac{\alpha\mu_j}{2(1 - \bar{\theta})}$$

- No risks. So why don't all savings go to DLPs? (convex transaction costs ω)

KEY ELEMENTS

- Big bank has market power in interbank lending market.
 - Lower propensity to invest its funds than small banks.

KEY ELEMENTS

- Big bank has market power in interbank lending market.
 - Lower propensity to invest its funds than small banks.
- Incentives to raise interbank rate:
 - Direct motive: return on excess reserves
 - Reallocation motive: external liquidity + small bank reserves
 - Funding share motive: small banks' RA incentive

KEY ELEMENTS

- Big bank has market power in interbank lending market.
 - Lower propensity to invest its funds than small banks.
- Incentives to raise interbank rate:
 - Direct motive: return on excess reserves
 - Reallocation motive: external liquidity + small bank reserves
 - Funding share motive: small banks' RA incentive
- $\alpha \uparrow$. What follows?
 - Small banks expand on DLP by raising rates:

$\xi_j \uparrow \rightarrow$ DLP, funding share $\uparrow \rightarrow$ small bank lending \uparrow

- Big bank reacts through direct competition on DLP + withdrawal of interbank liquidity

$\xi_k \uparrow, i_L \uparrow \rightarrow$ 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?

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 ω represent?
 - Interpretation matters for how we think about regulation (α) changes.
 - Example: Households diversify between deposit and DLP due to potential risks \Rightarrow Is the regulator raising α because of rising risks? $\Rightarrow cov(\alpha, \omega)$

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 ω represent?
 - Interpretation matters for how we think about regulation (α) changes.
 - Example: Households diversify between deposit and DLP due to potential risks \Rightarrow Is the regulator raising α 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.

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)?
 - How much ex ante market power?

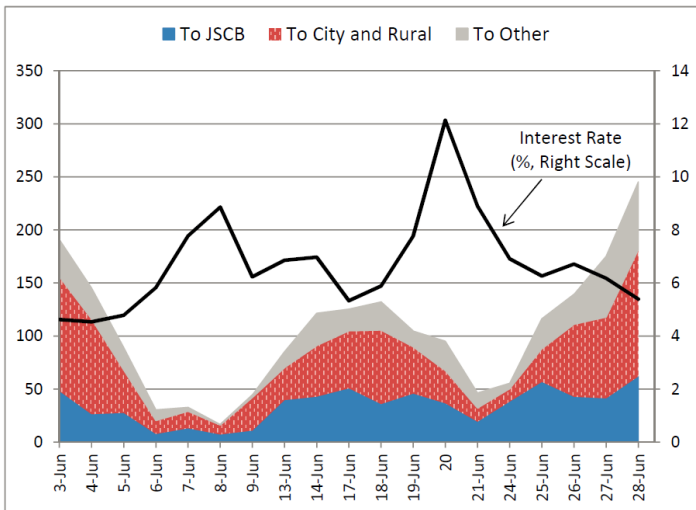
A WISH LIST FOR EMPIRICS

- 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)?
 - How much ex ante market power?
- 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

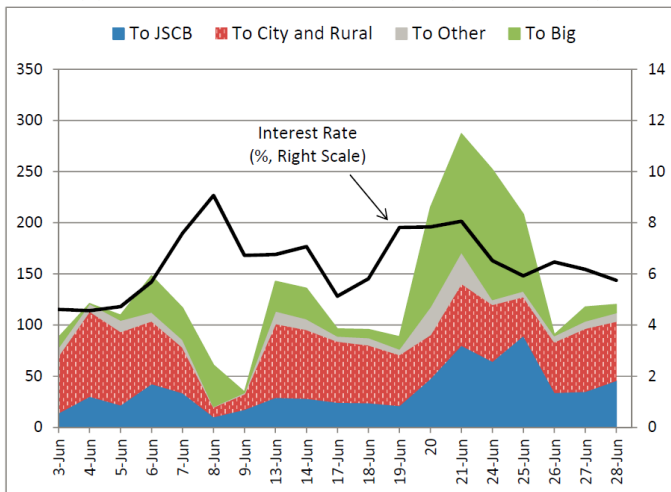
Figure 5

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



BANK LIQUIDITY CRISIS OF 06/2013

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



Note: Interest rate is the weighted average lending rate charged by policy banks.

BANK LIQUIDITY CRISIS OF 06/2013

- 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.
 - ψ 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.