Discussion of

"Interbank Network Disruptions and the Real Economy"

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*The views and conclusions presented do not necessarily reflect the position of the Central Bank of Chile or its Board members.

Summary and general remarks

- An interesting paper that makes an important contribution: Incorporate interbank network with bank-specific trading opportunities into a dynamic macroeconomic model
  - Building upon Bianchi and Bigio (2014) framework (heterogenous banks with idiosyncratic liquidity risk), but allowing for incomplete network of bank relationships
- The author's analysis focuses on two key issues:
  - Effects of interbank network disruptions on interest rates and lending to the real economy
  - Role of monetary policy in the transmission of such shocks
- Main results:
  - A shock that destroys bank relationships affects lending to the real economy
  - The impact may be negative or positive, depending on the size of the shock and the initial structure of the interbank network (distribution of bank relationships)
  - Narrowing the policy rate corridor (between DWR and ERR) can dampen the effects

Key equation: banks' lending rates

- Equilibrium condition for loan rate of bank i (with $\xi = 0.5$):

$$r_{it}^{b} = r_t^{DW} - (r_t^{DW} - r_t^{ER}) \left[F\left(\frac{L_{it} - \rho_t}{1 - \rho_t}\right)(1 - 0.5 p_{it}^{LB}) + \left(1 - F\left(\frac{L_{it} - \rho_t}{1 - \rho_t}\right)\right) 0.5 p_{it}^{BL} \right]$$

- Ceteris paribus:
  - r_{it}^{b} increases with p_{it}^{LB} (probability that lending bank finds a borrower)
  - r_{it}^{b} decreases with p_{it}^{BL} (probability that borrowing bank finds a lender)
  - r_{it}^{b} usually falls with L_{it} (cash-to-deposits ratio)
  - r_{it}^{b} is bounded above and below by r_t^{DW} and r_t^{ER}, respectively
  - Reducing $r_t^{DW} - r_t^{ER}$ shrinks liquidity and network effects on r_{it}^{b}

Effects of a network disruption shock: an intuition

Consider the case of a 100% destruction (from complete to empty network):

- Banks then cannot trade with each other (i.e., $p_{it}^{LB} = p_{it}^{BL} = 0$), so lending rates depend only on liquidity ratios, reserve requirements, and CB interest rates:

$$r_{it}^{b,empty} = r_t^{DW} - (r_t^{DW} - r_t^{ER})F\left(\frac{L_{it} - \rho_t}{1 - \rho_t}\right) >=< r_{it}^{b,complete}$$

- Which case occurs depends on the total mass of borrowing orders relative to the total mass of lending orders (Ψ): Fig. 6
  - If a cash deficit is expected ($\Psi > 1$), then $r_{it}^{b,empty} > r_{it}^{b,complete}$
  - If a cash surplus is expected ($\Psi < 1$), then $r_{it}^{b,empty} < r_{it}^{b,complete}$
  - If neither deficit nor surplus are expected ($\Psi = 1$), then $r_{it}^{b,empty} = r_{it}^{b,complete}$

Comments

Main comment:

1. Role of default risk

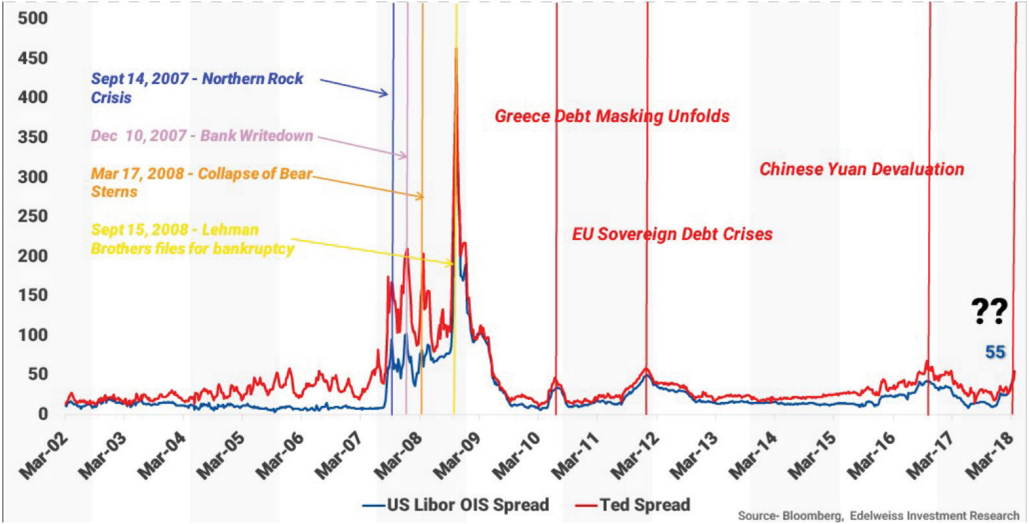
Other comments:

2. Model calibration and interpretation of the results
3. Generality of the modelling strategy

Comment #1: Role of default risk

- The model incorporates liquidity risk, but not counterparty risk (regulatory capital requirement is always met). Implications:
  - Spread between DWR and ERR limits the rise of the interbank rate in a network disruption
  - Therefore, the CB can completely offset any network disruption
- Compare interbank market problems during subprime crisis:
  - Large rise in interbank rate, only partially offset by monetary policy
  - Mainly explained by counterparty risk, especially after Lehman Brothers bankruptcy

Comment #1: Role of default risk



Comment #1: Role of default risk

- Hence, default risk has been a critical element in observed interbank market disruptions
- In fact, it seems critical to explain why such disruptions occur in the first place
- This issue could be analyzed in an extension of the model:
  - Might deliver endogenous network changes (defaulting banks)
  - May have different implications for real lending and CB policy

Comment #2: Model calibration

- In Bianchi and Bigio's (2014) calibrated model, interbank market disruptions generate a decline in loan supply and an increase in the aggregate lending rate
- In this model, loan supply may increase and the loan rate may decrease
- Only a theoretical possibility, with little relevance in practice?
  - Attempt to take a more serious quantitative approach
  - In particular, calibrate interbank market structure based on data
  - Reassess the dynamics. Can the model replicate features of the data?

Comment #3: Modelling strategy

- An agent-based general equilibrium approach:
  - Finite number of banks interacting in GE
- In exchange, strong simplifying assumptions are made:
  - Perfect foresight solution (no expectations about future variables in system of equilibrium conditions from Appendix E)
  - Risk-neutral households with zero time preference ($\beta = 1$)
- Thus, the model may be difficult to implement in a more general framework. Is it?

Final remarks

- A nice paper that can become an important reference in the nexus of macro-finance and network literature
- Adding counterparty risk would be an interesting extension

Appendix

Loan rate as a function of Ψ

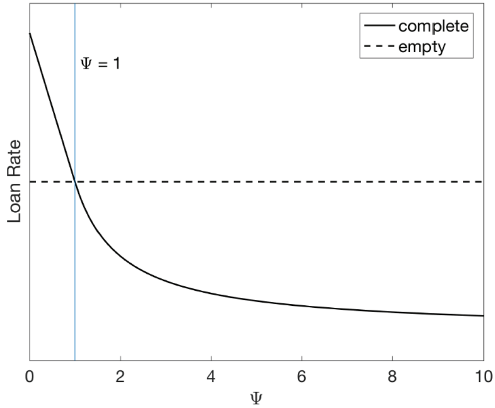


Figure 6. Loan Rate as a Function of Ψ

Back