

Discussion on “Network-motivated Lending Decisions”

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RIETI Workshop (03/07/2016)

- Question: Do banks internalize the positive externality of “central” firms by forbearance?
- Model: inter-connected firms through intermediate inputs (production) + a monopolistic bank’s decision to which firms it extends loans (finance)
- Data: Japanese inter-firm transaction network data (for centrality) + firm-level financial data (for interest rates)
- Empirics: OLS on interest rates and centrality
- Results: well-connected (central) firms get lower interest rates

- New theory and empirical results on production networks and corporate finance
- New insight on on the value of firms: centrality
- Related to many important questions:
 - assessment of “zombie lending” during Japan’s lost two decades
 - resource misallocation and aggregate productivity
 - bailout

- A representative household owns a monopolistic bank and consumes goods (endowment economy)
- The bank determines which firms should operate to maximize the aggregate output
- Firms which received loans from the bank can produce using intermediated goods produced by other firms (network)
- CES preferences and technology \rightarrow homotheticity \rightarrow system of linear equations
- Discrete network + extensive margin adjustment \rightarrow multiple equilibria, difficult to solve

- ① Network matrix determines the centrality of firms

$$\mathbf{v}' = \mathbf{1}' (\mathbf{I} - \mathbf{Q})^{-1}$$

- ② Bank's problem

$$\max_{\{e_i\}} \sum_i e_i \left[\underbrace{\pi_i}_{\text{profit}} - \underbrace{(1 + \rho) F_i}_{\text{cost}} \right]$$

- ③ Rational forbearance

$$e_i = 1 \text{ even though } \pi_i - (1 + \rho) F_i < 0$$

because $\sum_{j \neq i} \frac{\partial \pi_j}{\partial e_i} > 0$ (positive externality of firm i). This externality is increasing in v_i , the centrality of firm i

- Japanese inter-firm transaction network data \rightarrow estimate centrality (influence coefficient)
- Regress interest rate on centrality, credit score and other control variables including industry and regional dummies.
- Differential effect of centrality depending on credit-worthiness
- The effect of centrality should be stronger for firms whose main bank is a regional bank

- ① High centrality lowers interest rate
- ② This effect is stronger for less credit-worthy firms (interaction term is positive)
- ③ This effect is stronger for firms whose main bank is a regional bank (more monopolistic power)

- More robust empirical results are desired
- Effect of firm exits, network dynamics
- A dynamic model and endogenous network formation can be a fruitful extension
- Any policy implications for resource misallocation and government bailout?
- Overall, this is a very interesting and well-written paper