The effect of regulatory capture on financial stability (Preliminary work)

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Introduction

• Banking regulation has received much criticism in the recent financial crisis.

• There is a need to better understand the effect of current regulation e.g. Capital requirements and reserve requirements, and to develop new regulations within the context of a financial system.
Research questions

• How do reserve and equity requirements protect banks?

• How does regulatory capture effect the vulnerability and efficiency of the financial system?

• How can systemic risk be mitigated?
Model

• Discrete time simulation of the interaction of banks within an economy

• Individual banks maintain balance sheets comprising:
  – Deposits
  – Loans to non-banks
  – Bank Borrowing / Lending
  – Reserves
  – Equity
Model

• Bank pay interest on deposits at their specified interest rate.
• Bank receive interest on reserves at the base rate.
• Banks receive interest on loans at the market rate.
• Banks receive/pay interest on interbank lending at the market rate.
Model

• Bank Lending and Lending to non-banks occur through markets
• Price is initially 0 and adjust based on the balance of supply and demand.
  \[ P_{t+1} = P_t + \Delta e \]
• Where e is the excess demand and \( \Delta \) is the speed of adjustment
• Demand for non-bank loans is exogenous
Model

- Deposits are allocated each time step proportional to interest rate.
- The quantity of new deposits:
  - Loans - deposits + initial economy equity
- Inflation occurs at the end of each time step such that the equity in the economy remains constant.
- A bank with negative equity is bankrupt
Model

- Banks take investment decisions each time step - allocating money from equity and deposits to reserves and lending
- Capital and Reserve regulations constrain investment behaviour
- Each bank has 4 variables specifying its behaviour:
  - Preferred Reserve Ratio
  - Preferred Equity Ratio
  - Preference for lending to banks versus lending to non-banks
  - Interest rate paid to depositors
Simulations

- Simulations are run for 2,500,000 time steps
- Data are averages over the last 500,000
- 200 Banks
- Each starts with Equity=1 (Reserves=1) and all other accounts 0
- Base interest rate = 2.5%
Loans

Reserve Ratio

Equity Ratio
Interest Rates

**Reserve Ratio**

- Money Market Price
- Bank Market Price

**Equity Ratio**

- Money Market Price
- Bank Market Price
Bank Loans

Reserve Ratio

Equity Ratio
Bankruptcies

Reserve Ratio

Equity Ratio
Regulatory Capture

• Two additional experiments were performed in which the reserve and equity ratio’s were set to be weighted averages of banks preferred ratios
• Preferred Equity ratio: 4.5%
• Preferred Reserve ratio: 7%
• In both cases there were higher levels of bankruptcy and lower levels of loans than the equivalent static case
Conclusions

• Loss reserves protect from bankruptcy whilst reducing the economic benefit from banks

• Bank Lending is non-linear in Reserve requirements reflecting trade-offs between risk, return and availability of capital

• The effect of capital requirements is non-linear

• Regulatory capture has a negative effect on economic stability beyond selection of suboptimal regulations
Questions?