Discussion:
Capital Regulation with Heterogeneous Banks

Andreas Barth and Christian Seckinger

Discussant: Magdalena Pisa
University of Luxembourg and Maastricht University

SGF Conference 2014
11 April 2014

Contributions

- *Big question*:

  What is the optimal banking regulation (minimum capital requirement) in a world with moral hazard and selection problem?

- Why is it *interesting*:

  1) Effect of regulation on bank risk taking is unclear.
     i. moral hazard problem $\downarrow$ with $\uparrow$ in capital requirement as there is more 'skin in the game'
     ii. selection problem $\uparrow$ with $\uparrow$ in capital requirement as there is excess supply of deposits, so more agents enter banking sector
     iii. $\Rightarrow$ Interest rate $\downarrow$ $\Rightarrow$ moral hazard problem$\uparrow$

  2) More realistic approach to banking regulation which accounts for *heterogeneous banking* sector.

Comments (1/3)

1) Clean *simple* model

- *Focuses* on the regulatory capital without unnecessary complications.

- Agents in the model are *heterogeneous* wrt ability a_i with which their project succeeds. This ability can be inversely related to the monitoring cost.

  The high ability agents can *monitor more efficiently* with the same cost and succeed more often with the same effort.

  Useful model as the heterogeneity can resemble *local vs. international* banks, i.e. the international banks may lack the knowledge of the local market hence lower p.

- Objective of the regulator is to *minimize the risk* in the banking system. In other words to minimize the occurrence a project fails and bank closes. This objective is more intuitive than i.e. maximizing production in the economy (as in Morrison and White, 2005).

  Stability of fin. system (min # bankruptcy) is what Basel is trying to achieve.
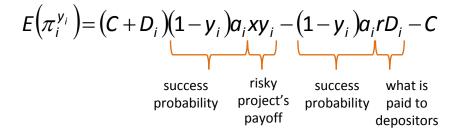
Comments (2/3)

2) Model setup

- Continuum of agents with ability $a_i \sim U(0,1)$

- Capital endowment C might be invested in:

    i. Risky project $y_i \in [0,1]$ with success probability $p(y_i,a_i) = (1 - y_i)a_i$ and a payoff xy_i;

    ii. Deposit D_i at a bank with interest rate r;

    iii. Risk-free asset with $r_f = 1$.

- Regulator chooses minimum capital requirement with a leverage ratio $C/(C+D_i)$. Since C is constant, regulator sets the leverage ratio by choosing D^{max}.

    ➔ If C is constant per bank (and economy), does this mean that regulator *predetermines the maximum size* of a bank to $C+D^{max}$ as the bank cannot grow larger constrained by the regulatory leverage ratio?

    ➔ Are all banks the *same size*?

Comments (3/3)

3) The bank's payoff

$$E\left(\pi_i^{y_i}\right) = (C + D_i)(1 - y_i)a_i x y_i - (1 - y_i)a_i r D_i - C$$

- success probability
- risky project's payoff
- success probability
- what is paid to depositors

➔ For a bank the regulatory capital is equal to its initial endowment *C*. Why is it *invested in the risky project*? Does regulatory capital *absorb* the losses?

➔ Is $D_i > C$? If yes, and bank invests only in one risky project then its failure means that bank defaults and its depositors loose their money. What about the purpose of regulatory capital to serve as a *buffer* that absorbs losses?

➔ If risky project fails and bank defaults, does the bank *distribute* C to the depositors (deposit insurance)?

➔ What about *risk weighting*? Do more risky banks hold more regulatory capital?

Comments & Extension

4) Calibration

- Agents prefer to lend than to buy a risk free asset if:

$$(\text{LEND2}) \qquad C \cdot E(p) \cdot r \geq C \cdot r_f \qquad \rightarrow \qquad E(p) \geq \frac{1}{r} \qquad \rightarrow \qquad E(p) \geq 0.98$$

$r_f = 1$

$r = 1.02$

- At 2% deposit rate the expected probability of bank's success ≥ 0.98. This is very intuitive as low success probability could trigger *bank-runs* in the economy.

- It implies banks are run by high ability agents and invest in low return projects, because $p = (1-y_i)a_i$. But in your model:

$$E(p) = \left(1 - y^*\right)\frac{1}{2}\left(1 + a^*\right) \qquad \text{where} \qquad y^* = \frac{1}{2} + \frac{rD^{\max}}{2\left(C + D^{\max}\right)x} \geq 0.5$$

$\leq 0.5 \qquad < 2$

➔ E(p) < 0.5

6

Conclusions

- Interesting paper with detailed derivation, analysis and validation of regulatory capital model.

- *Message*: increase in the regulatory capital may have unclear effect on riskiness of the baking system.

- Contributions to:
  - *regulatory* framework of minimum capital requirement.
  - a healthy critical look at the *reliability* of Morrison and White (2005) model.

- Policy relevant:
  - easy to implement by regulators.