Origination and Sale of Loans, and Bank Capital Regulation

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Motivation

- The prominence of the originate-to-sell model in bank credit creation
- Effect of bank capital regulation on incentives to sell loans
- Basel III:
  - a mix of risk-sensitive and insensitive capital regulation
  - addresses pro-cyclicality
- A model in which we study
  - how risk sensitivity of bank capital regulation affects banks’ incentives to sell and originate loans
- Main results - risk sensitivity matters
  - for existence of pro-cyclicality
  - for riskiness of the banks
Setup

- One period and three dates $t$: 0, 1 and 2.
- A bank:
  - shareholder-managed, with $E = 1$ of initial equity
  - issues and sells loans, holds cash reserves
  - finances with insured deposits and inside equity (no outside equity)
  - maximizes its return at $t = 2$
  - subject to capital requirements on its loans
- Risk neutral investors = buyers of loans
- Passive insured depositors
The loans originated at $t = 0, 1$ and maturing at $t = 2$ can be thought as projects:

\[
\begin{cases} 
R_t \text{ with prob. } p_t \\
0 \text{ with prob. } 1 - p_t
\end{cases}
\text{ and } p_t R_t \geq 1.
\]

- Cash reserves and insured deposits pay 0 net return
- Two kinds of (exogenously given) bank capital regulation
  - risk insensitive and sensitive
Timing

0. Bank raises $D$ of insured deposits, issues loans $L$ and holds cash reserves $B$.

1. A signal about performance of existing loans: Only bank knows whether the loans will pay at $t = 2$
   - New lending opportunities arrive
   - The market for loans opens:
     - The bank sells $S \in [0; L]$ of the existing loans, issues new loans $L_1$, new deposits $D_1$ and cash reserves
     - The investors pay $P$ for the loans sold by the bank.

2. Loans mature and payments are made.
Constraints faced by the bank

\( t = 0 \)

\[ L + B = E + D, \text{ where } E = 1 \]
\[ \alpha_0 E \geq L, \alpha_0 \geq 1 \]

\( t = 1 \)

\[ \beta_1 L_1 + \beta_0 (L - S) \leq E_1, \beta_0, \beta_1 \in [0; 1], \]

where

\[ E_1 = 1 + S(P - 1) = L_1 + (L - S) + B + SP + D_1 - L_1 - (D + D_1) \]
\[ L_1 \leq B + SP + D_1, D_1 \geq -D, S \in [0; L] \]
Risk insensitive capital requirements

\[ \alpha_0 = \frac{1}{\beta_0} = \frac{1}{\beta_1} \]

- We solve the model backwards
- Date \( t = 1 \)
  - only the bank knows its type
  - investors offer screening contracts \((P; S; L_1; D_1)\)
Proposition 1 - \( t=1 \)

There are three cases:

1. High CR and low \( L \): no loans traded and \( L_1 = \alpha_0 - L \).
2. Intermediate CR and high \( L \): separating on the loan market and
   \[ L_1 = \frac{(\alpha_0 - 1)(1 + Lr_0)}{R_0 + r_1(1 + \alpha_0 r_0)} \]
3. Low CR and high \( L \): pooling with \( P = pR_0 L \) and
   \[ L_1 = \alpha_0 (1 + L(pR_0 - 1)) \].
Intuition - Proposition 1:

- Trade is limited or breaks down due to adverse selection
  - the bad bank, if solvent at $t = 1$, mimics the good bank always (for lower $L$)
    - the good bank sells only if gets compensated for the discount
  - when the bad bank is insolvent at $t = 1$, separating may arise for low $S$
- Trade occurs for sufficiently low CR compensating for the discount
- Trade allows to access increase equity and issue new loans
Proposition 2 - t=0

Main result:
- lower CR lead to more risky loans being sold and more creation of new credit
Risk sensitive capital requirements

- A function from each private signal into a CR $\beta_0$
- Adverse selection disappears
  - assumption: truthful implementation is possible
- Increases in CR for existing loans have a different effect than under insensitive approach
  - Reason: different CR for different types of loans
  - Increase of CR for existing loans at $t = 1$ leaves little equity for new lending, making bank more willing to sell
Impact of capital requirements on credit supply

- Channel studied here: *distribution of existing loans*
- If insensitive: their decrease $\rightarrow$ more trade and higher credit supply
- If sensitive: slope of the function matters
  - increase of CR for existing loans $\rightarrow$ more trade and higher capital supply
- Important under uncertainty about the reason for loan trade
  - if insensitive any changes in existing CR are always subject to an error if loans are traded only on private information
  - no such issue under risk sensitive CR
Conclusion

- The effect of risk-sensitivity of capital regulation on incentives to originate and distribute loans
- Implications for the reform addressing the presumed pro-cyclical effect of risk sensitive capital regulation
- Result:
  - in general pro-cyclical effect only under risk-insensitive capital regulation
- More to be done:
  - overall riskiness (endogenizing the capital requirements)