Lax Lending Standards, Capital Requirements and Macroprudential Tools

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May 2012
This paper...

A) Quantitative study of two externalities generating lax lending standards

B) Study three macroprudential tools:
   - Capital requirements
   - Taxes on banks’ borrowings
   - Taxes on banks’ lending
Externality #1: Limited liability

- Banks finance loans with own equity and external financing:

\[ L_t = K_t + B_t \]

- Banks’ maximum loss is their own capital:

\[ \max \{ 0, R_t L_t - (1 + i_b) B_t \} \]
Externality #2: Lack of internalization effects on quality of pool of borrowers (Hachem 2010)

- Banks try to get rid of bad borrowers, retain good ones
- \[ \text{credit volume} \uparrow \Rightarrow \text{quality pool of available borrowers} \downarrow \text{next period} \]
- Banks do not internalize this effect
Summary of results

1) Both externalities $\implies$ banks do not screen enough
   - Quantitatively, limited liability has larger effects

2) Lax lending standards $\implies$ banks overexposed to negative economic shocks
   - Excessive volatility in credit, bank capital and output
3) The three policy tools help achieve right lending standards
   - They alter costs/benefits of screening

4) Externalities are time-varying, macroprudential tools should be as well
The Model
Borrowers

- Borrowers need credit $L_t$ to produce

$$y_t(\omega, z_t, L_t) = z_t \theta \omega^\alpha L_t$$

- $z_t$ is an aggregate productivity shock

$$\log z_t = \rho \log z_{t-1} + \varepsilon_t, \quad \varepsilon_t \sim N \left[0, \sigma^2 \right]$$

- Heterogeneous in idiosyncratic productivity $\omega \sim U \left[0, 1 \right]$
Banks

- Banks need to pay screening cost to discover $\omega$

- Screening cost modeled as an "opportunity cost":

$$\uparrow \text{screening} \rightarrow \downarrow \text{sales}$$

- Loan officers checking credit records could be salesmen attracting customers
Banks make two decisions:

1) How many resources to allocate to screening?

- Choose $\pi$, the probability of successfully matching with a borrower
- $(1 - \pi)$ is probability of successfully discovering a borrower’s type
2) Matched bank (informed or uninformed): to give credit or not

- profitable borrowers kept for two periods
- capital requirements limit loan size

\[ K_t \geq \gamma L_t \]
Bank’s problem at each period $t$
We focus on quantity of credit, not on price of credit:

- Banks can observe $y_t(\omega, z_t, L_t)$
- $\kappa \geq 0$ is an unseizable fraction of output
- Banks receive remaining portion:
  \[ R_tL_t = (1 - \kappa) y_t(\omega, z_t, L_t) \]
Exterality #2: Lack of internalization

- Quality of borrower’s pool depends on aggregate lending intensity ($\Pi_i$)

- Banks’ expectation about aggregate lending intensity

$$\Pi_i = \zeta \pi_i + (1 - \zeta) \Pi_i^g \quad i = 1, 2$$

- If $\zeta < 1$, banks don’t fully internalize
- If $\zeta = 1$, externality internalized

- Symmetric equilibrium: $\Pi_i = \pi_i = \Pi_i^g$
Results
- Both externalities generate lax lending standards
- Externalities are procyclical
- Limited liability is larger distortion
Screening as function of productivity

Limited Liability

Lack of Internalization

<table>
<thead>
<tr>
<th>Screening Intensity</th>
<th>TFP</th>
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<tbody>
<tr>
<td>0.995</td>
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</tr>
<tr>
<td>1</td>
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Externality

No Externality

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Externality

No Externality
Screening as function of banks’ borrowing costs

Limited Liability

Lack of Internalization

Screening Intensity

cost of bank borrowing

Screening Intensity

cost of bank borrowing

Externality
No Externality

Externality
No Externality
Quantitative Properties of Calibrated Model:

- For U.S. banking system, 1987-2010, the model matches:
  - Average return to capital, Capital/asset ratio, Net interest margin, Ratio of losses to total loans
  - Volatilities quality/quantity credit
  - Correlations quality/quantity credit
Tradeoff: volatility vs short term growth

- Lax lending standards $\implies$ more uninformed credit is given $\implies$
  
  a) larger output and bank capital after unexpected **positive** TFP shocks
  
  b) larger losses and less bank capital after unexpected **negative** TFP shocks

- Thus, higher volatility
Volatility induced by each externality

Ratio of standard deviation of model with externality/model without

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<tr>
<td>Output</td>
<td>1.51</td>
<td>1.08</td>
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<tr>
<td>ROE</td>
<td>1.23</td>
<td>1.04</td>
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<tr>
<td>Quantity of Credit</td>
<td>1.5</td>
<td>1.08</td>
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<tr>
<td>Bank Losses</td>
<td>1.16</td>
<td>1.01</td>
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Capital requirements encourage screening
Tax on bank lending

\[(1 - \tau_l)R_tL_t\]
Tax on bank borrowing

\[(1 + \tau_b)(1 + i_b)B_t\]
Conclusions

- Lending standards should be time varying, but if externalities → overlending
- Limited liability → laxer lending standards
- Policy tools should vary with business cycle/cost of bank borrowings
Appendix
"Bank management in Ireland, like many banks elsewhere in the world, had forgotten the very nature of credit. The focus of such a transaction is limiting and mitigating risk rather than expanding sales.

This apparent inability, some might say unwillingness, of Irish banks to remember this basic principle of banking was a major cause of the banking crisis in Ireland.

This problem was further exacerbated as many banks appear to have emphasized and valued loan sales skills above risk and credit analysis skills."