Lax Lending Standards, Capital Requirements and Macroprudential Tools

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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
- $\uparrow$ credit volume $\Longrightarrow$ $\downarrow$quality pool of available borrowers next period
- Banks do not internalize this effect

Summary of results

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

2) Lax lending standards $\Longrightarrow$ 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

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

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

Banks

- Banks need to pay screening cost to discover ω
- Screening cost modeled as an "opportunity cost":

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

  - Loan officers checking credit records could be salesmen attracting customers

Banks make two decisions:

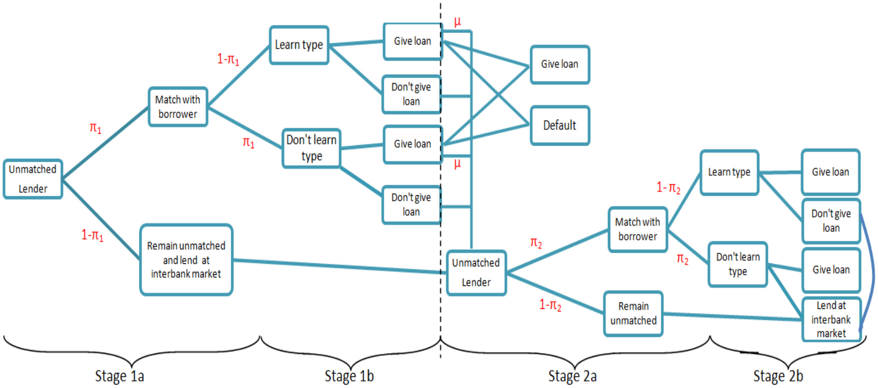
1) How many resources to allocate to screening?
   - Choose π, the probability of successfully matching with a borrower
   - $(1 - \pi)$ is probability of successfully discovering a borrower's type

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:

$$R_t L_t = (1 - \kappa)\, y_t(\omega, z_t, L_t)$$

Externality #2: Lack of internalization

- Quality of borrower's pool depends on aggregate lending intensity (Π_i)

- Banks' expectation about aggregate lending intensity

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

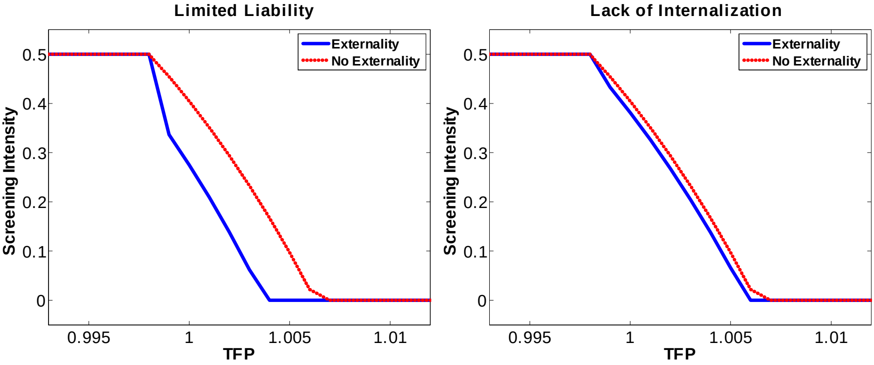
  - If $\zeta < 1$, banks don't fully internalize
  - If $\zeta = 1$, externality internalized

- Symmetric equilibrium: $\Pi_i = \pi_i = \Pi_i^g$

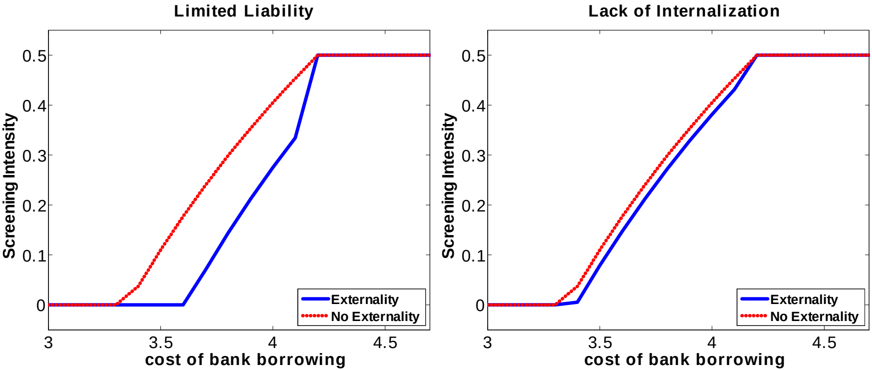
Results

- Both externalities generate lax lending standards
- Externalities are procyclical
- Limited liability is larger distortion

Screening as function of productivity



Screening as function of banks' borrowing costs



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

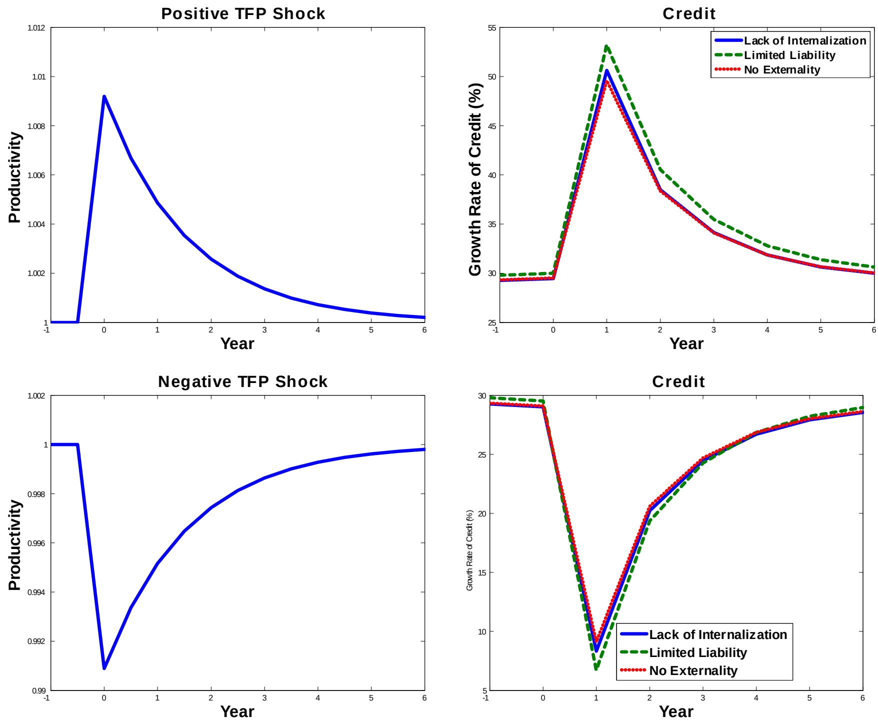
Tradeoff: volatility vs short term growth

- Lax lending standards $\Longrightarrow$ more uninformed credit is given $\Longrightarrow$

  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

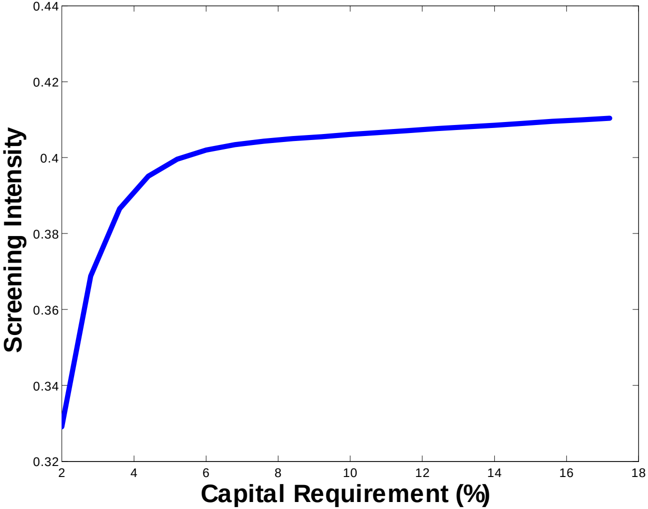

Positive TFP Shock
Productivity
Year
Credit
Growth Rate of Credit (%)
Lack of Internalization
Limited Liability
No Externality
Negative TFP Shock
Productivity
Year
Credit
Growth Rate of Credit (%)
Lack of Internalization
Limited Liability
No Externality

Volatility induced by each externality

Ratio of standard deviation of model with externality/model without

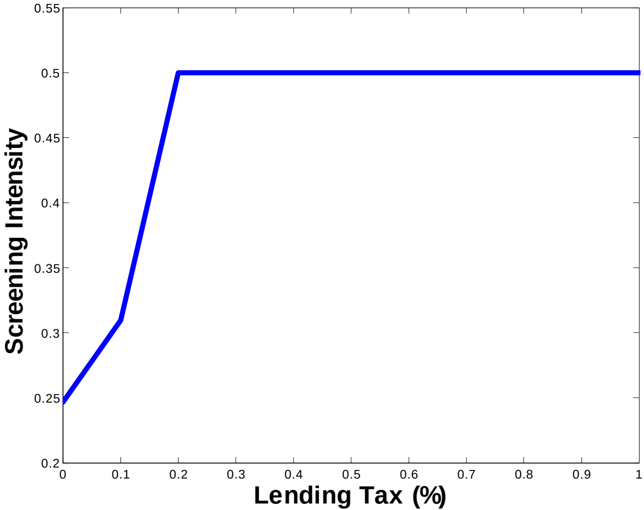
	Limited liability	Lack of Internalization
Output	1.51	1.08
ROE	1.23	1.04
Quantity of Credit	1.5	1.08
Bank Losses	1.16	1.01

Capital requirements encourage screening



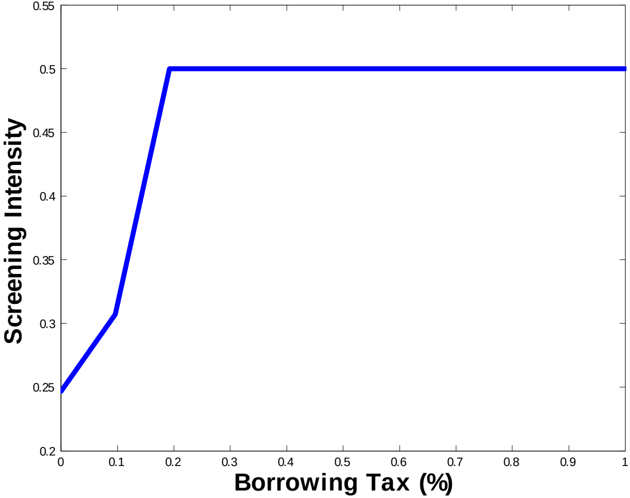
Tax on bank lending

$$(1-\tau_l)R_tL_t$$



Tax on bank borrowing

$$(1+\tau_b)(1+i_b)B_t$$



Conclusions

- Lending standards should be time varying, but if externalities$\Longrightarrow$overlending
- Limited liability$\Longrightarrow$laxer lending standards
- Policy tools should vary with business cycle/cost of bank borrowings

Appendix

Ireland: Commission of Investigation into the Banking Sector

- "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**."