Bank Capital, Borrower Power, and Loan Rates

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Motivation

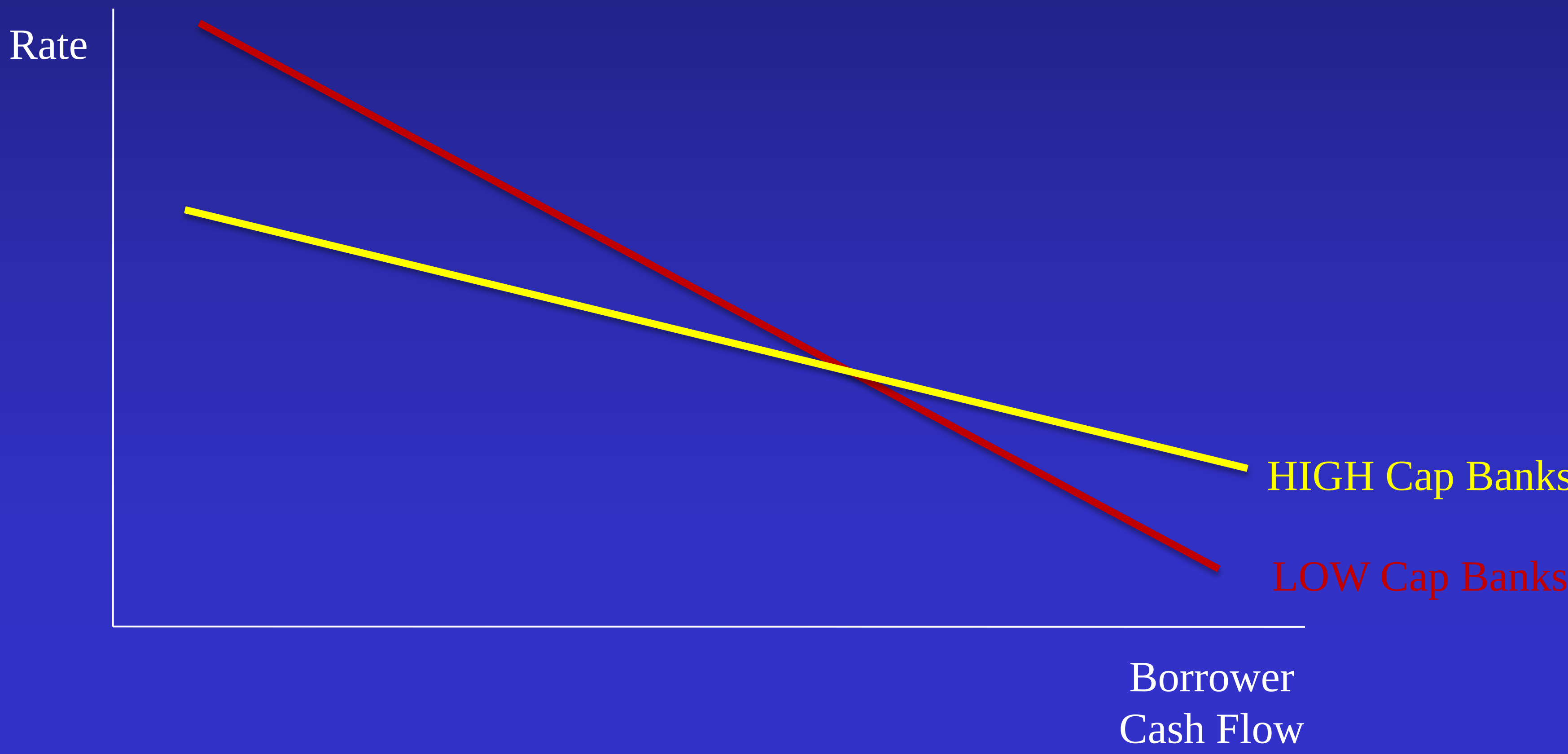
- The link between bank capital and lending is critically important to policy makers who oversee the health of the banking system and its impact on the economy.
- Recent theories by Boot, Greenbaum, and Thakor (1993) and Diamond and Rajan (2000) suggest that banks' capital can affect their lending behavior.
- We test the predictions of these theories on the relationship between bank capital and loan pricing.

Diamond and Rajan (2000): Theory

- Model how loan refinancing rates vary with bank's capital and borrower's cash flow.
- Compared to a bank with adequate capital, banks with low capital:
  - Extract more rents from firms with low cash flow.
  - Extract fewer rents from firms with high cash flow.
- Intuition: bank with low capital is desperate to get cash to improve its position vis-à-vis its debt holders.
  - If borrower’s cash flow weak, bank has credible threat to liquidate borrower to get cash; borrower willing to pay more to avoid liquidation.
  - If borrower’s cash flow strong, bank's bargaining position is weak; borrower can extract weaker lending terms.

Diamond and Rajan: Hypothesis

- **C**ompared to banks with adequate capital, banks with low capital charge weakly higher rates for borrowers with low cash flow and strictly lower rates for borrowers with high cash flow.



Diamond and Rajan: Alternative Hypothesis

- Critique: Any link between how bank capital levels and cash flows affect lending rates may be driven by a variable that affects them independently.
- E.g., business conditions:
  - When conditions are good, bank capital is high and firm cash flow has smaller effect on loan rates;
  - When conditions are bad, bank capital is low and firm cash flow has larger effect on loan rates.
- Controlling for the state of the economy, there is no link between bank capital, borrower cash flow, and loan rates.

Boot, Greenbaum, and Thakor (1993): Theory

- Investigate how a bank's reputation concerns affect its lending incentives.
- Predict that banks with low financial capital may sacrifice reputational capital by reneging on implicit guarantees.
  - One such implicit guarantee is commitment not to exploit informational monopoly power over borrowers (Sharpe, 1990, Rajan, 1992).

Boot, Greenbaum, and Thakor: Hypothesis

- Compared to banks with adequate capital, banks with low capital charge higher lending rates on bank-dependent borrowers and similar rates on borrowers with public debt market access.

Boot et al.: Alternative Hypothesis

- Again, any link between how bank capital levels and market access affect lending rates may be driven by a variable that affects both independently.
- E.g., business conditions:
  - When conditions are good, bank capital is high and bank-dependent firms are less risky;
  - When conditions are bad, bank capital is low and bank-dependent firms are more risky.
- Controlling for the state of the economy, there is no link between bank capital, borrower market access, and loan rates.

Testing Diamond and Rajan

$$LOANSPREAD_{f,l,b,t} = c + \zeta \cdot CAPITAL_{b,t} + \delta \cdot CASHFLOW_{f,t}$$
$$+ \eta \cdot CAPITAL_{b,t} \cdot CASHFLOW_{f,t}$$
$$+ \sum_{i=1}^{I} \psi_i X_{i,l,t} + \sum_{j=1}^{J} \nu_j Y_{j,f,t} + \sum_{k=1}^{K} \beta_{k,t} Z_{k,b,t} + \epsilon_{f,t}.$$

Diamond and Rajan predict that :

- ζ can be negative
- η is strictly positive

Testing Boot, Greenbaum, and Thakor

$$
\begin{aligned}
LOANSPREAD_{f,l,b,t} = {} & c + \zeta \cdot CAPITAL_{b,t} + \delta \cdot MKT\ ACCESS_{f,t} \\
& + \eta \cdot CAPITAL_{b,t} \cdot MKT\ ACCESS_{f,t} \\
& + \sum_{i=1}^{I} \psi_i X_{i,l,t} + \sum_{j=1}^{J} \nu_j Y_{j,f,t} + \sum_{k=1}^{K} \beta_{k,t} Z_{k,b,t} + \epsilon_{f,t}.
\end{aligned}
$$

Boot, Greenbaum, and Thakor predict that:

ζ is negative

δ is negative

$\zeta + \eta$ is zero

Testing Diamond and Rajan

VARIABLES	Model 1		
CAPITAL	-6.54***		
LINTCOV	-20.90***		
LINTCOV x CAPITAL	1.85***		
EBITDA/ASSETS			
EBITDA/ASSETS x CAPITAL			
EBITDA/DEBT			
EBITDA/DEBT x CAPITAL			

Testing Diamond and Rajan

VARIABLES	Model 1	Model 2	
CAPITAL	-6.54***	-4.39***	
LINTCOV	-20.90***		
LINTCOV x CAPITAL	1.85***		
EBITDA/ASSETS		-216.30***	
EBITDA/ASSETS x CAPITAL		14.59***	
EBITDA/DEBT			
EBITDA/DEBT x CAPITAL			

Testing Diamond and Rajan

VARIABLES	Model 1	Model 2	Model 3
CAPITAL	-6.54***	-4.39***	-3.14***
LINTCOV	-20.90***		
LINTCOV x CAPITAL	1.85***		
EBITDA/ASSETS		-216.30***	
EBITDA/ASSETS x CAPITAL		14.59***	
EBITDA/DEBT			-1.39
EBITDA/DEBT x CAPITAL			0.28***

Testing Boot, Greenbaum, and Thakor

VARIABLES	Model 1		
CAPITAL	-3.28***		
CPRATING	-43.24***		
CPRATING x CAPITAL	1.88		
CREDITRATING			
CREDITRATING x CAPITAL			
BOND			
BOND x CAPITAL			
P value for H0			
CAP + CAP x MKTACCESS	(0.343)		

Testing Boot, Greenbaum, and Thakor

VARIABLES	Model 1	Model 2	
CAPITAL	-3.28***	-3.28***	
CPRATING	-43.24***		
CPRATING x CAPITAL	1.88		
CREDITRATING		-13.21	
CREDITRATING x CAPITAL		1.30	
BOND			
BOND x CAPITAL			
P value for H0			
CAP + CAP x MKTACCESS	(0.343)	(0.121)	

Testing Boot, Greenbaum, and Thakor

VARIABLES	Model 1	Model 2	Model 3
CAPITAL	-3.28***	-3.28***	-3.55***
CPRATING	-43.24***		
CPRATING x CAPITAL	1.88		
CREDITRATING		-13.21	
CREDITRATING x CAPITAL		1.30	
BOND			-19.47
BOND x CAPITAL			4.41
P value for H0			
CAP + CAP x MKTACCESS	(0.343)	(0.121)	(0.622)

Robustness tests: Selection Effects

- Could be firm-bank selection: banks with low capital are those with riskier borrowers.
- First-cut: compare observable characteristics of firms at banks with < 5%, > 10% capital.
  - Some risk factors higher for borrowers of low-capital banks, others lower.
  - But regress predicted loan spread on bank capital, get *positive* effect.
- Next: include bank fixed effects. Results basically unchanged.
- Could be dynamic changes in individual bank risk. But selection story does not explain Diamond/Rajan result: low-capital banks charge high-cash-flow borrowers *less* than high-capital banks do.

Conclusions

- Results support predictions of Diamond and Rajan (2000): Relative to banks with adequate capital, low-capital banks
  - Charge higher rates for low-cash-flow borrowers,
  - Charge lower rates for high-cash-flow borrowers.

- Predictions of Boot, Greenbaum, and Thakor (1993) weakly hold.
  - Impact of bank capital negative for bank-dependent firms,
  - Firms with public debt market access generally not affected by bank capital, but the net effect sometimes is statistically different from zero.