Lax Lending Standards and Capital Requirements

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Motivation: two facts

1) One undisputed cause of the crisis:
   - Banks gave "too much" credit to low quality borrowers
   - Banks did not screen "enough"
2) Over the business cycle:
   - Strong negative correlation between quantity and quality of credit

Periods of high credit volume, followed by high losses

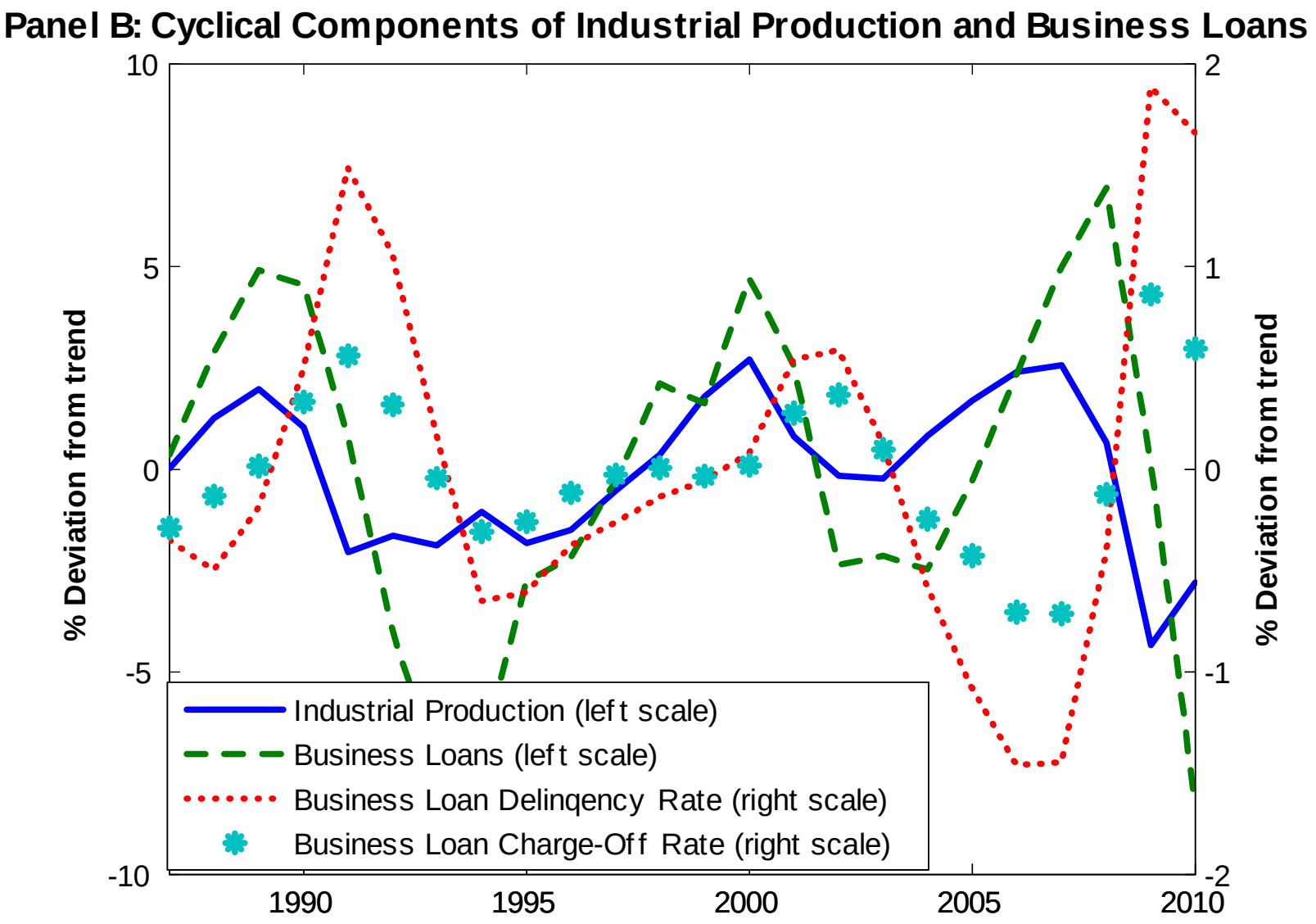


Table 1: Comovement of Quality & Quantity of Credit

	Cross Correlation of Business Loans at time t with		
Variable x	x(t)	x(t+1)	x(t+2)
Quality of Credit:			
Delinquency Rate on Total Loans	0.07	0.7	0.79
Delinquency Rate on Business Loans	0.002	0.66	0.86
Charge-off Rate on Total Loans	0.15	0.75	0.8
Charge-off Rate on Business Loans	0.21	0.8	0.83

Note: Annual data for years 1987-2010. HP filter with smoothing parameter 100.

What can explain the previous facts?

- Securitization?
- Deposit insurance?
- This paper: quantitative study of a different externality

Theoretical support (Hachem 2010)

- Banks try to get rid of bad borrowers, retain good ones
  - When credit volume increases, quality of pool of available borrowers decreases in subsequent periods
- Banks do not internalize that their behavior alters the pool of borrowers faced by other banks
  - Why? small banks, perfect competition

- Market Failure relative to Social Planner:
  - Banks do not screen enough
  - Excessive low quality credit
  - Banks follow a "give credit now, screen later" strategy

In this paper...

- Quantitative study of previous mechanism:
  - it can match well observed quality-quantity correlations
- Show another problem:
  - Bank capital fluctuates too much (too many profits in good times, and losses in bad times)
  - Output is 2% more volatile than it should be

- Study capital requirements as answer to previous market failure:
  - Requirements alter cost for banks of giving credit
  - Encourage banks to screen more
  - Externality is time-varying, capital requirements should be as well
  - Change in capital requirements: from 4% to 4.6% is enough

The Model

Borrowers

- Heterogeneous in idiosyncratic productivity:

$$\omega \sim U[0, 1]$$

- ω is borrower's private information
- Banks need to pay screening cost to discover borrower's type

- 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

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

- All financing takes place before z_t is realized
- To simplify the contract:
  - Banks can observe $y_t(\omega, z_t, L_t)$
  - $\kappa \geq 0$ is an unseizable fraction of output
  - Banks receive remaining portion

Banks

- Make expectation about distribution of quality of borrowers
- Keep profitable borrowers from past period (except exogenous separation shock)

- Banks make 2 decisions:
  - How many resources to allocate to screening?
  - If meet with borrower, to give her credit or not?

- Screening is costly
- Cost modeled as an "opportunity cost":
  - Loan officers checking credit records could be salesman attracting customers
  - Tradeoff between screening and matching

Banks' decision #1

- Choose matching intensity: π
  - π is probability of successfully matching with a borrower
  - $(1 - \pi)$ is probability of successfully discovering a borrower's type

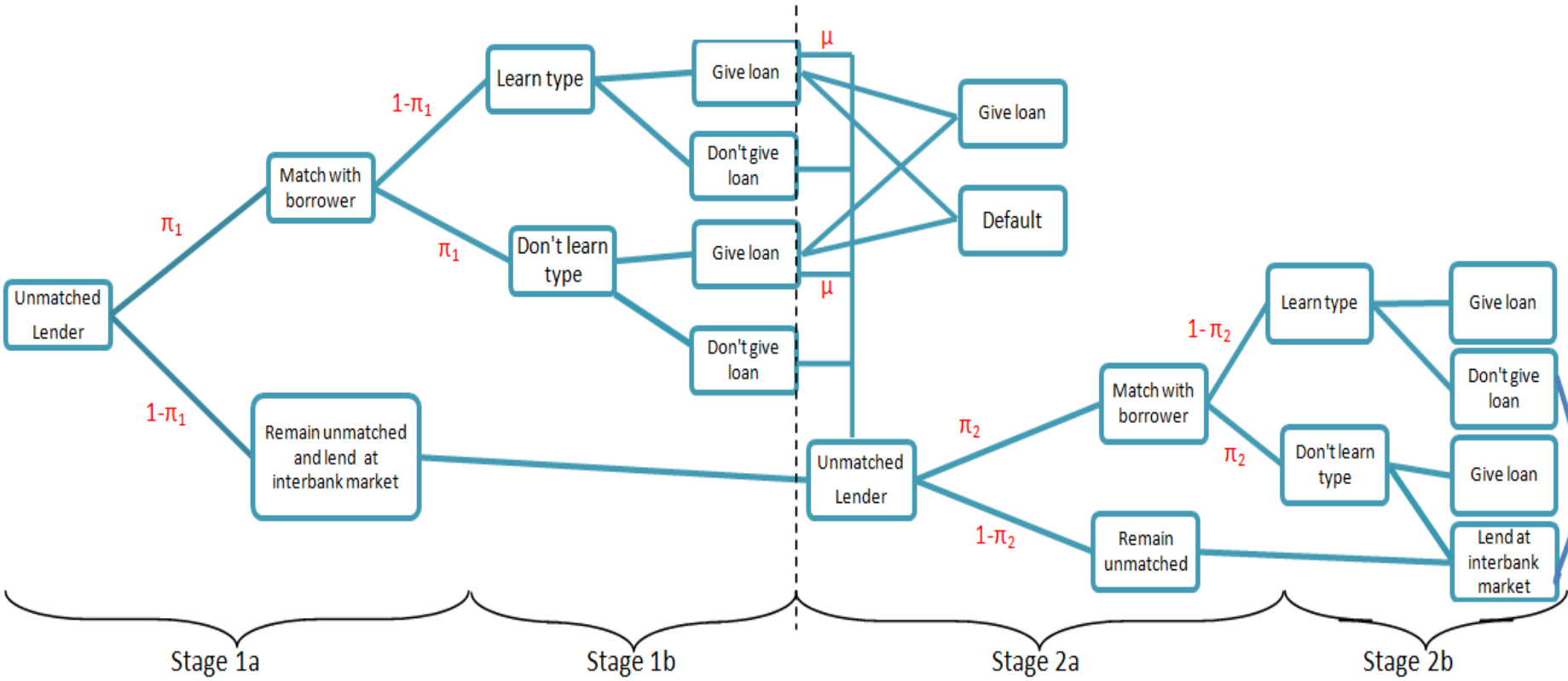
Banks' decision #2

- If Bank is matched: to give credit or not, how much to borrow in interbank markets

$$
\begin{aligned}
L_t &= B_t + K_t \\
K_t &\geq \gamma L_t
\end{aligned}
$$

- γ are the capital requirements
- We assume cost of own capital is higher than cost of external finance

Bank's problem at each period t



Banks fail to internalize effects on borrowers' distribution

- 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 $\zeta < 1$, individual banks don't fully internalize the effect of π on the distribution of available borrowers
- If $\zeta = 1$, externality internalized. We call this the "planner"

Results

Model matches observed quality-quantity correlations

Table 3: Comovements in the Model

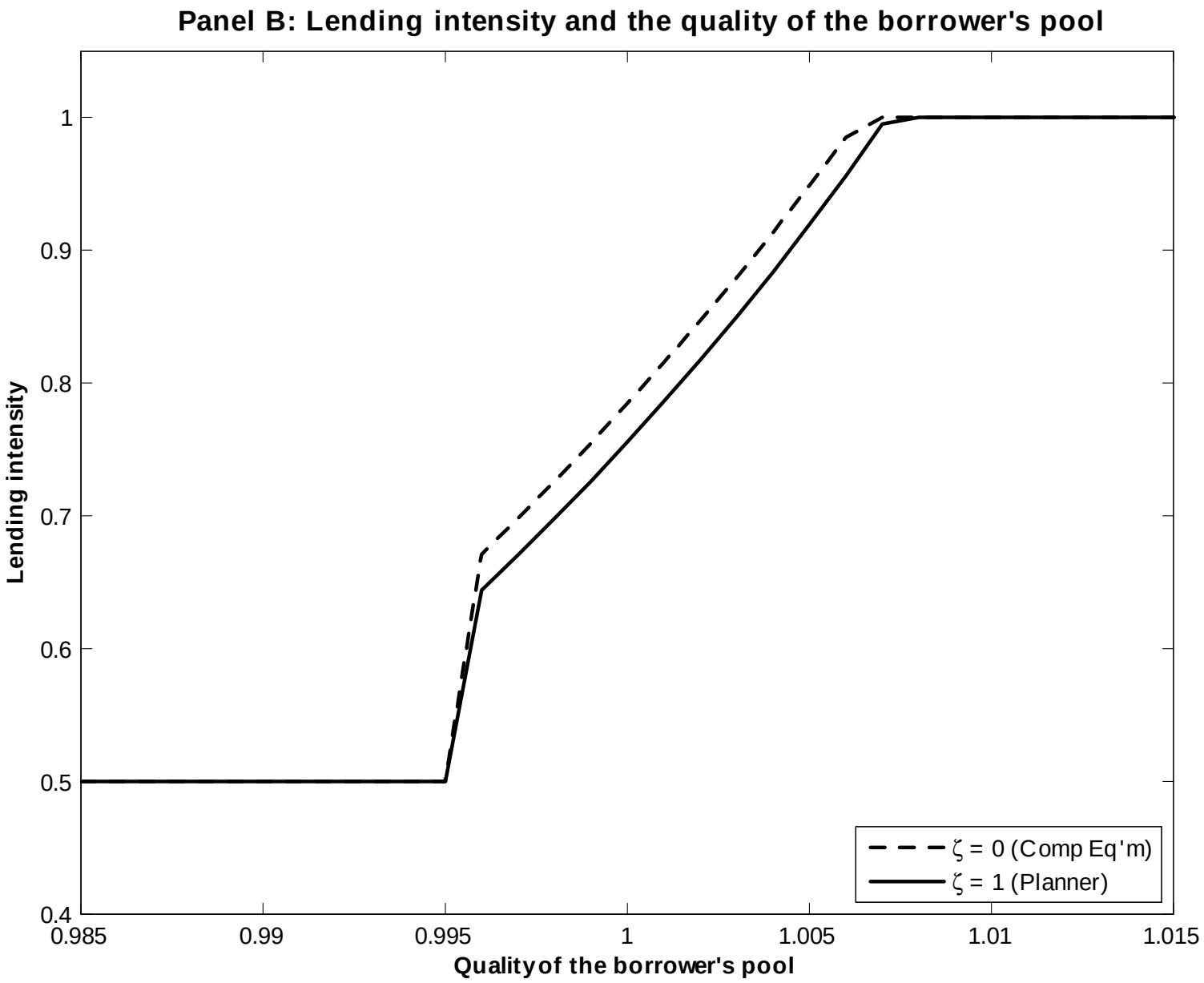
	Cross Correlation of Loans at time t with				
Variable x	x(t-2)	x(t-1)	x(t)	x(t+1)	x(t+2)
Quality of Credit:					
Delinquency Rate	-0.09	-0.12	-0.13	0.84	0.18
Charge-off Rate	-0.06	-0.01	0.11	0.88	0.12

Model matches observed volatilities quality/quantity credit

Table 4: Volatility

	Std. Dev. relative to Industrial Production:	
	In U.S. data	In Model Competitive Eq'm
Quantity of Credit:		
Total Loans	1.06	1.01
Quality of Credit:		
Delinquency Total Loans	0.23	0.14
Charge-off Rate on Total Loans	0.1	0.01

Time varying lending intensity & Overlending

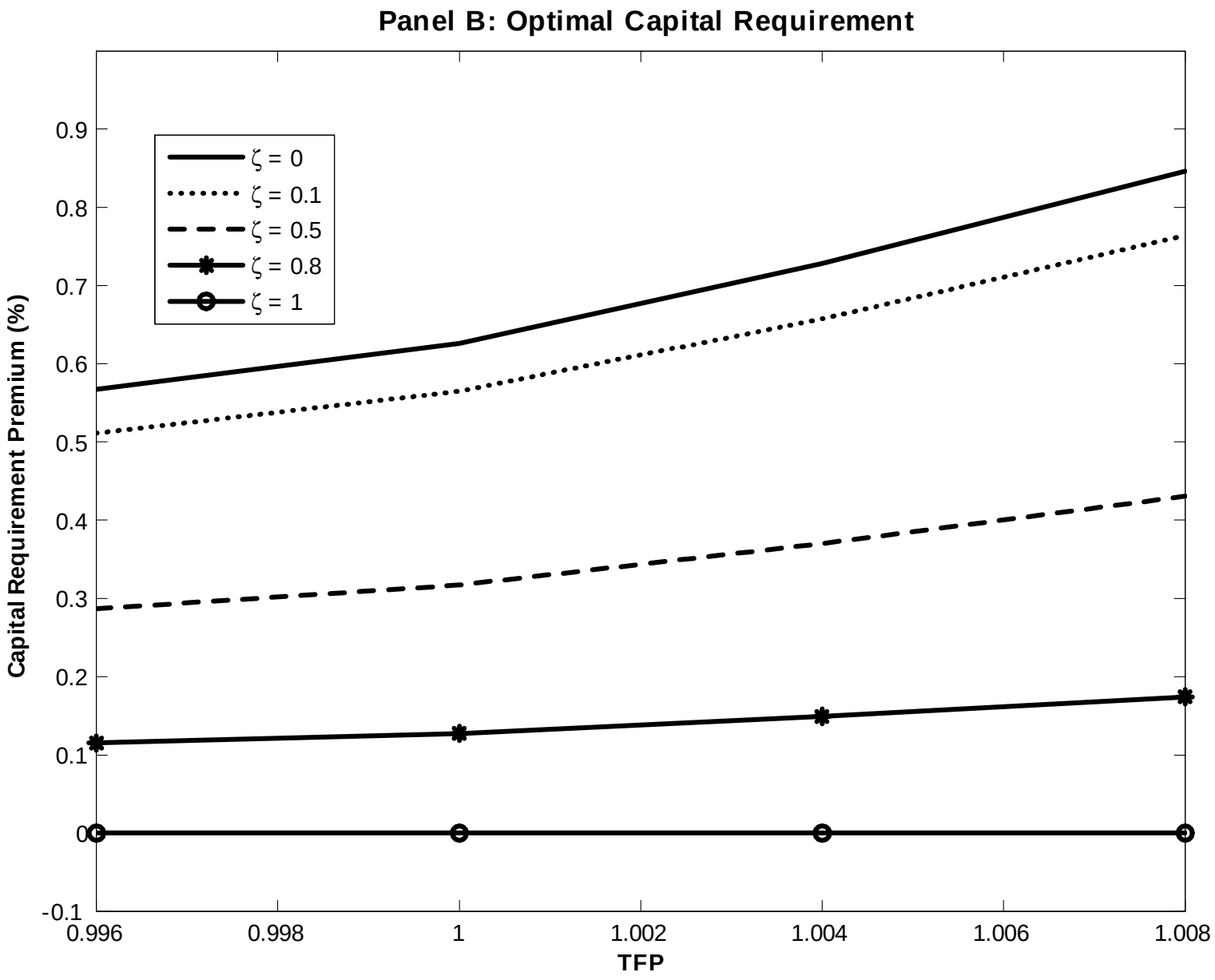


Competitive Banking System is too volatile (too much uninformed credit)

Table 5: Excessive Volatility over the Business Cycle

	Std. Dev.		
	Competitive Eq'm	Planner	Ratio Comp. Eq'm
Output	0.503	0.494	0.983
Bank Profitability			
Return on Equity	0.193	0.191	0.992
Quantity of Credit			
Total Loans	0.510	0.501	0.982
Quality of Credit			
Delinquency Rate	0.071	0.070	0.986
Charge-off Rate	0.005	0.005	0.983

Capital Requirements to get optimal lending intensity



Conclusions

- Quantitative study of externality that produces too lax lending standards
- Lending standards should be time varying, but Competitive Eq'm overlends
- Capital requirements should vary with business cycle

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**."