

ACCOUNTING CHANGES AND ENFORCEMENT OF BANK CAPITAL REQUIREMENTS IN A CRISIS

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MOTIVATION

- Regulators frequently change accounting rules in response to systemic shocks
 - Option to reclassify fair-value securities in October 2008
 - Option to delay implementation of expected credit loss model in the COVID-19 crisis
- These accounting changes reduce the impact of losses on banks' regulatory capital
- A concern is that the accounting changes allow banks to gamble instead of forcing them to raise new capital (e.g., *Skinner, 2008*)
- We show that these accounting changes can increase banks' incentive to raise capital

MECHANISM AT A GLANCE

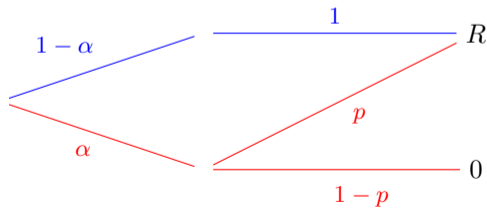
- Undercapitalized banks recapitalize only if capital requirements are enforced (*debt-overhang*)
- Problem in a crisis: enforcement weakens - “too many to fail” (*Acharya&Yorulmazer, 2007*)
- Undercapitalized banks may have no incentive to raise equity under prevailing accounting rules
- Relaxing accounting rules lowers the capital that banks have to raise to comply with capital requirements (*e.g., reducing impairments and introducing prudential filters*)
- Undercapitalized banks may have an incentive to raise the lower amount of equity with new accounting rules

SETTING

- There is a continuum of banks with measure one, shareholders, and a regulator
- Banks act in the interest of current shareholders
- Regulator minimizes expected transfer from tax payers to the deposit insurance fund after a shock
- All parties are risk neutral and the risk-free rate is zero

BANKS' ASSETS AND FINANCING

- At $t = 0$, banks invest I (e.g., loan portfolio, MBS) and finance it with equity E_0 and insured deposits D
- D is constrained by regulatory capital requirements $\gamma \in (0, 1) \rightarrow D \leq (1 - \gamma)I$
- At $t = 1$, the share $\alpha \in [0, 1]$ of banks is hit by a shock, with distribution $G(\alpha)$
- The payoff of assets at $t = 4$ is



Unaffected banks receive R
with certainty

Affected banks receive R
with probability p ,
with $pR < I$

IMPAIRMENTS AND RECAPITALIZATIONS AT $t = 2$

- Affected banks have to write down assets by $x_0 \in [0, I - pR]$
- Affected banks have to raise C_0 to fulfill capital requirements, with

$$C_0 \equiv \max\{0, D - (1 - \gamma)(I - x_0)\}. \quad (1)$$

- At $t = 2$, banks can raise capital E_2 (competitive equity market)
- New shareholders apply a discount factor $\delta_\alpha \in (0, 1]$ to the expected cash flow they receive (“*crisis discount*”)
- δ_α (weakly) decreases in the share of affected banks α

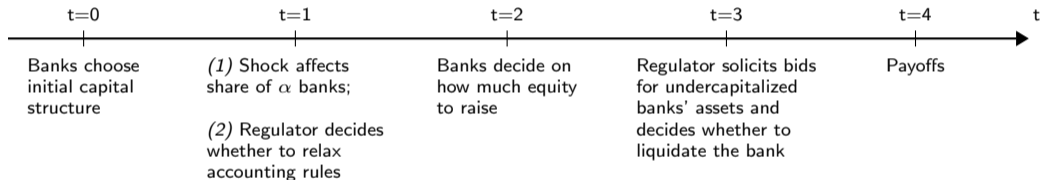
ENFORCEMENT OF REGULATORY CAPITAL REQUIREMENTS AT $t = 3$

- If a bank is undercapitalized, the regulator can search for a buyer for the bank's assets (*unaffected banks or hedge funds*)
- The maximum price that is offered for a specific bank's assets is s , with $s \in [0, pR]$ independently drawn from distribution $F(s|\alpha)$
- Higher α make the realization of low s more likely
- If the regulator liquidates the bank, shareholders get nothing
- Banks that are not liquidated are allowed to continue until payoffs realize

RELAXING ACCOUNTING RULES AT $t = 1$

- The regulator can relax the accounting rules to reduce the impact of the shock on regulatory capital
 - before the reporting date
 - after observing α
- The level of new impairment is $x \leq x_0$
- C is the new capital shortfall that affected banks have to raise to fulfill regulatory capital requirements, with $C < C_0$ if $x < x_0$

TIMELINE



LIQUIDATION OF UNDERCAPITALIZED BANKS

- The regulator is allowed to liquidate *undercapitalized* banks
- The regulator liquidates the bank if the transfer to depositors in case of liquidation is lower than the expected transfer if the bank is allowed to continue

$$D - s \leq (1 - p)D$$

- There exists a threshold \hat{s} such that the regulator accepts the offer if $s \geq \hat{s}$ and rejects it otherwise
- The probability of liquidation, $q = 1 - F(\hat{s}|\alpha)$, decreases in α

RECAPITALIZATION DECISION

- An affected bank optimally chooses $E_2 \in \{0, C\}$
- $E_2 = C$ if shareholders' loss from (expected) liquidation exceeds the cost of raising equity

$$\left(\frac{1}{\delta_\alpha} - p\right)C \leq qp(R - D) \quad (2)$$

- (2) is binding for the maximum amount a bank is willing to raise to prevent liquidation, \bar{C}
- The maximum amount \bar{C} decreases in α

RELAXING ACCOUNTING RULES

- The regulator relaxes accounting rules to implement $C = \bar{C}$ if:
 1. Banks do not raise capital under prevailing accounting rules ($\bar{C} < C_0$)
 2. The maximum amount that banks are willing to raise is sufficiently high ($\bar{C} \geq \hat{C}$)
- If banks raise \hat{C} (*under the relaxed accounting rules*), the regulator is indifferent between
 - relaxing the accounting rules
 - initial accounting rules (*banks raise no equity and the regulator intervenes*)

ILLUSTRATION FOR $s \sim \mathcal{U}(pR(1 - \alpha), pR)$

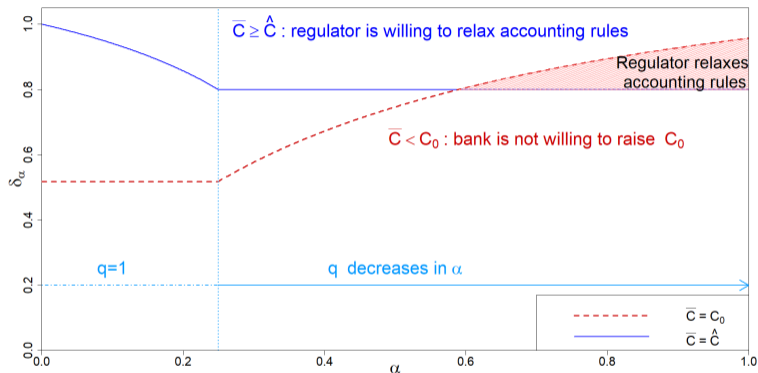


Figure 1: (δ_α, α) -combinations for which the regulator relaxes the regulatory accounting rules for $I = 1, R = 1.1, p = 0.75, D = 0.825, \gamma = 0.175$.

EX-ANTE LEVERAGE CHOICE

- When choosing the initial capital structure, banks trade off
 - *benefits of debt*: deposit insurance, lower equity stake in case of liquidation, lower probability of liquidation
 - *cost of debt*: cost of raising capital in a crisis, risk of liquidation
- Banks choose maximum leverage if
 - $\delta_\alpha = 1$ for all α (*no crisis discount*) **OR** $q = 0$ for all α (*no enforcement*)
- Banks hold a capital buffer if
 - it is sufficiently likely that banks will raise C_0 **AND** $\delta_\alpha < 1$ for some α (*crisis discount*)

CONCLUSION & IMPLICATIONS

Relaxing regulatory accounting rules in a crisis

- is a response to a weaker regulatory enforcement in a systemic crisis
- can increase banks' incentives to raise equity in a systemic crisis
- is not optimal after idiosyncratic shocks when enforcement is strong
- only affects those banks that are hit by the shock in contrast to a general reduction in regulatory capital requirements

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- [2] Skinner, D. J. 2008. The rise of deferred tax assets in Japan: The role of deferred tax accounting in the Japanese banking crisis. *Journal of Accounting and Economics* 46(2-3): 218-239.