

Accounting for Banks, Capital Regulation and Risk-Taking

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Research Question

- Which accounting regime is more effective in controlling excessive risk-taking by banks?
 - Historical cost accounting (HC)
 - Lower of cost or market accounting (LCM)
 - Fair value accounting (FV)
- Which regime is more desirable from the regulator's perspective?
 - Costly capital regulation
 - Ex-ante effort incentive of the bank

Main Results

- Given exogenous minimum capital requirement, LCM and FV induce less risk-taking by banks and more excess capital issuance than HC.
- Under FV, banks are more risk-taking than under LCM due to the short term interest of the bank's manager.
- The regulator always prefer LCM over other two regimes when the capital regulation bears social cost
- However, considering the ex-ante effort of discovering risky project, the regulator may prefer either HC or FV, given extremely short-term oriented banks.

Literature Review

- Recent papers focus on the criticisms of fair value accounting: (ex-post perspective)
 - Allen and Carletti (2007) (liquidity pricing)
 - Plantin, Sapra, and Shin (2008) (fire sale)
- Ryan (2008b): the subprime crisis is caused by bad decisions, not by accounting procedures.
 - *Can different accounting regimes affect the bank's ex-ante decision making?*
- Strausz and Burkhart (2006): FV intensifies the risk-shifting problem in banks.
- This study: risk-taking incentive with capital regulation

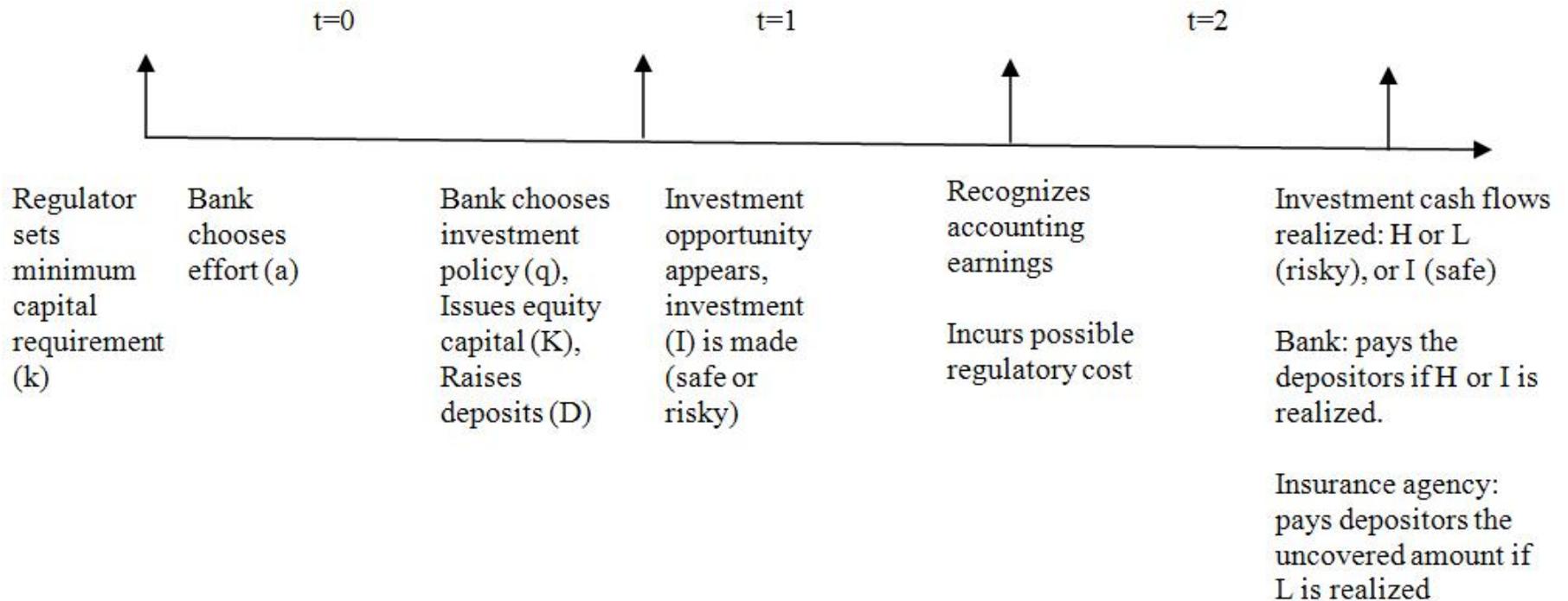
Banks' Risk-taking Incentives

- Banks' high incentives in risk-taking:
 - Deposits financing
 - Highly levered (liquidity provision)
- Banks subject to prudential regulation: (Dewatripont and Tirole, 1994).
 - Depositors of banks:
 - * Dispersed and uninformed small investors
 - * Insured by government agencies (FDIC)
 - * Lack of capability and incentives

Capital Regulation

- Minimum capital regulation:
 - Basel Accords 1988;
 - Basel II
- Capital requirement can reduce risk-taking (Keeley and Furlong (1989))
- Depends on the accurate and informative measure of capital
 - Tier I capital
 - Tier II capital
- Role of accounting information

Basic Model (John, et al (1990))



Basic Model (con't)

- Bank exerts effort a to discover a risky investment opportunity.
 - $a \in [0, 1]$
 - Cost of effort $g(a) = \frac{1}{m}a^2$
 - Probability of discovering a risky project is a .
- Investment opportunity:
 - Safe investment (always available): zero NPV, generate cash flows of I
 - Risky investment (depends on a): \tilde{q} indicates the probability of H , ex-ante $\tilde{q} \sim U[0, 1]$, unknown to outsiders
- Bank's decisions at the beginning of $t=1$
 - Equity issuance(K)
 - Investment policy (q):
 - * The bank will invest in the risky asset for $\tilde{q} \geq q$ and in the riskless asset for $\tilde{q} < q$.

The Bank's Problem with Risk-Investment Opportunity

- Bank's manager short term oriented: interested in both short term earnings and long term value
- Objective function:

$$\max_{q, K} \Pi_j(q, K) = \gamma E[e_j] + (1 - \gamma)\pi(q, K) - E[C(u_j(k))], \quad j \in \{h, l, f\}$$

st.

$$D + K = I$$

$$K \geq K_0(k), \quad K_0(k) = \frac{k}{k + 1}I$$

$$u_j(k) = \text{Max}\{0, kD - K - e_j\}$$

$$C' > 0, \text{ and } C'' > 0$$

- Accounting plays dual roles:
 - Short term interest
 - Ex-post cost of capital violation

Accounting Regimes

- **Historical cost accounting: HC**

- No earnings recognized: $E[e_h] = 0$
- No cost of capital violation: $E[C(u_h)] = 0$

- **Lower-of-cost-or-market accounting: LCM**

- Expected earnings to be recognized: $E[e_l] = P(B)e^B$
- Expected regulatory cost: $E[C] = P(B)C(u)$

- **Fair value accounting: FV**

- No biased in earnings:

$$E[e_f] = \frac{1 - \tilde{q}^2}{2}(H - I) + \frac{(1 - \tilde{q})^2}{2}(L - I)$$

- Expected regulatory cost remains the same as LCM: only for bad news

Risk-Taking: Exogenous Capital Requirement

- Ignoring effort incentive ($g' \rightarrow 0$); risky project always available
- Key Results:
 - The bank's investment policy is most risky under HC, and least risky under LCM ($q_h^* < q_f^* < q_l^*$).
 - The bank's capital issue is the highest under LCM and the lowest under HC. Under HC, the bank only issues minimum capital required. ($K_l^* > K_f^* > K_h^* = K_0(k)$)
- LCM is the most effective regime in controlling bank's risk-taking incentive.

The Ex-ante Effort Incentive: Exogenous k

- Bank's problem at the beginning of $t=0$:

$$\begin{aligned} & \max_a a \cdot \Pi_j(q_j^*(k), K_j^*(k), k) - g(a) \\ \text{s.t.} \quad & q_j^*(k), K_j^*(k) \in \arg \max_{q, K} P_j^{t1}(q, K|k) \end{aligned} \quad (1)$$

Where $g(a) = \frac{1}{m}a^2$.

- $P_j^{t1}(q, K)$ denotes bank's problem at $t=1$.
- $a_j^*(k) = \frac{m}{2}\Pi_j(q_j^*(k), K_j^*(k))$: depends on the payoff from the risky project.
- LCM discourages the bank's ex-ante effort incentive most strongly.

The Regulator's Problem

- The regulator adjusts the capital requirement k under each regime.
- Capital requirement is costly: reduce the liquidity provision of the banking sector.
- Tradeoff: induce effort-incentive and avoid social costly capital requirement
- The regulator's problem:

$$\begin{aligned} \max_k \quad & W_j(k) = a_j^*(k)V(q_j^*(k)) - g(a_j^*(k)) + L(k) \\ \text{s.t.} \quad & a_j^*(k) \in \arg \max_a a \Pi_j(q_j^*(k), K_j^*(k), k) - g(a) \\ & q_j^*(k), K_j^*(k) \in \arg \max_{q, K} \Pi_j(q, K | k) \end{aligned} \quad (2)$$

The Regulator's Problem

- If capital regulation and effort are both costless, the regulator can choose freely an optimal capital requirement under each regime, to achieve the same maximized social welfare.
- When cost of effort is negligible (only consider social cost of capital regulation), the regulator prefers $LCM > FV > HC$.
- When the cost of capital regulation is negligible, then other regimes can be preferred when $\gamma \rightarrow 1$ (extremely short-term oriented):
 - If bank's cost of violating capital regulation is very high, HC is preferred
 - Otherwise, FV is preferred.

Conclusion

- LCM is most effective in controlling risk-taking incentive given exogenous capital requirement, but it discourages the manager's effort incentive.
- When the regulator can adjust the capital requirement, LCM is the most desirable regime when the manager's effort is unimportant in project selection and the capital regulation is costly.
- However, if the bank manager is very short term oriented, it might be optimal to adopt either historical cost accounting or fair value accounting when the manager's effort in discovering a risky project is important ex-ante.