Information Management in Banking Crises

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[1] The views expressed are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of New York or The Federal Reserve System.

"If money isn't loosened up, this sucker could go down."

- Statement by former President George W. Bush, quoted in the New York Times on September 26, 2008

- Uncertainty about whether the regulator will act to stabilize shaky financial institutions was an element of both the subprime crisis and the European sovereign debt crisis.
- Two audiences pay close attention to the regulator:

1. Depositors: may run if they believe the regulator *will not* provide capital
2. Banks: may take excessive risk if they believe the regulator *will* provide capital

- When the regulator's ability to inject capital is private information, the regulator may 'manage' information to balance the expectations of these two audiences.

This Paper

- We show:
  - Regulator may inject excessive capital into bad banks to prevent future runs.
  - Regulator may inefficiently forbear on bad banks to minimize subsequent risk taking by banks.
    - No need to commit to prevent moral hazard.
  - Credible stress tests are more likely to come from well funded regulators. A regulator with poor funding does a credible stress test when beliefs are negative.

The Model

- Three types of risk neutral agents: the regulator, banks, and depositors.
- There are 2 banks, resolved sequentially. 3 stages for each bank:
  1. Regulator resolution choice
  2. Depositor withdrawal choice
  3. State realization
- Depositors: mass one who each deposited 1 unit. Promised return on deposits is $\tilde{R} > 1$ if withdrawn at stage 3, 1 if withdrawn at stage 2.
- Liquidated asset provides a return of 1.

Banks and Depositors

- Stage 3: the return on bank assets revealed: $\bar{R}$ (probability q) or $\underline{R}_\theta$ (probability $1-q$)
- Bank type: $\theta \in \{G, B\}$ with probability α that bank is type G
- If depositors knew a bank was good, they would not run.
- If depositors knew a bank was bad, they would run (no deposit insurance):

$$q\tilde{R} + (1-q)\underline{R}_B < 1$$

- Denote α^* by:

$$q\tilde{R} + (1-q)(\alpha^*\tilde{R} + (1-\alpha^*)\underline{R}_B) = 1$$

The Regulator

- The regulator's objective function is to maximize the sum of the expected surplus of all agents minus the cost of insolvencies and potential capital injections.
- Regulator has three possible actions for a bad bank:

1. **Injecting** an amount of capital X costs $\lambda_i X$, where $\lambda_i > 1$ To prevent insolvency, regulator injects $X_I = \tilde{R} - \underline{R}_B$.
2. **Liquidating** the bank has surplus $1 - C$ (C is the insolvency cost)
3. **Forbearing** leads to expected insolvency cost $(1 - q)C$

Regulator Types

- We make the following informational assumption:

$$1 - C < S_F$$

- A **low cost** regulator (λ_L):

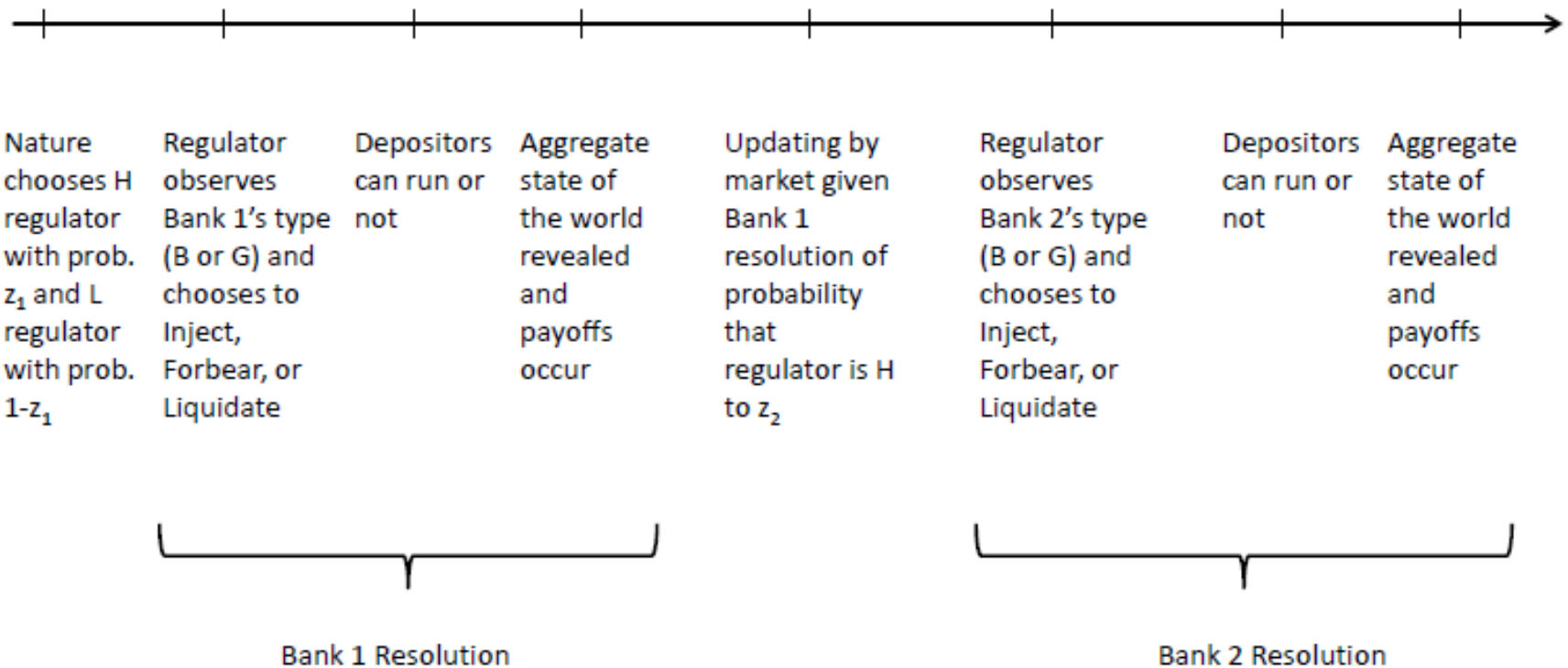
$$S_F < S_L(X_I)$$

- A **high cost** regulator (λ_H):

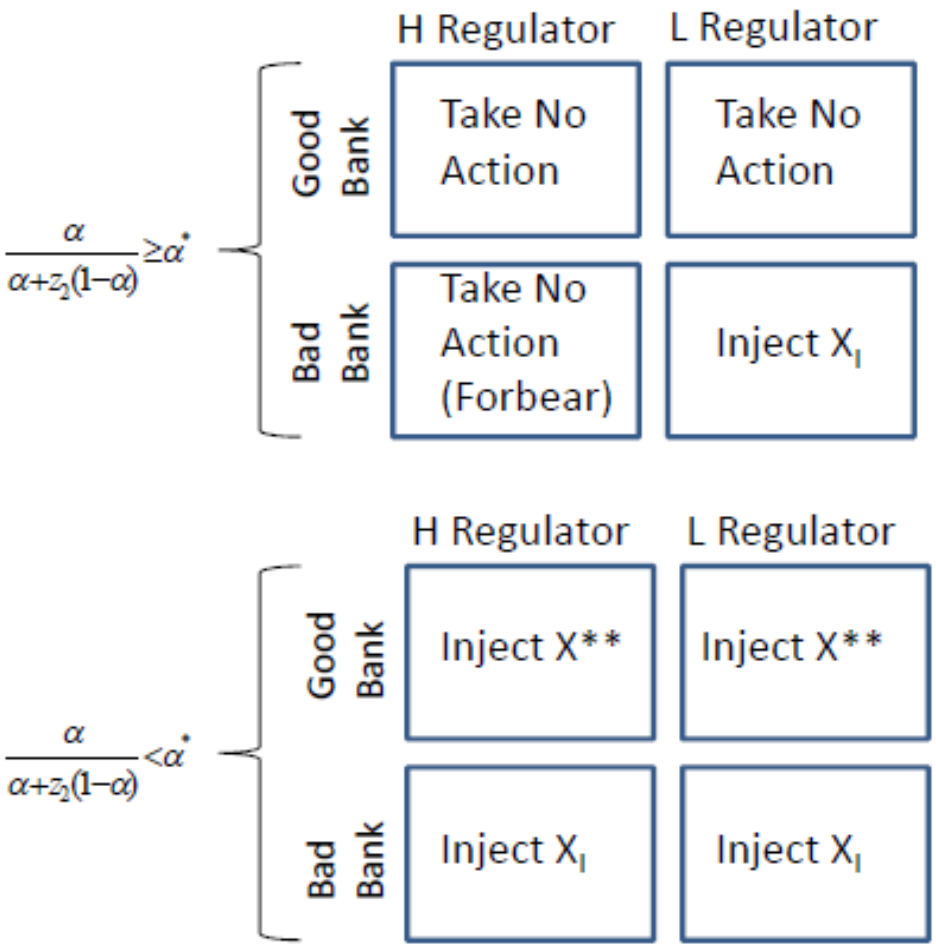
$$1 - C < S_H(X_I) < S_F$$

- The regulator has private info about (i) it's own type and (ii) the type of the bank.
- Depositors' beliefs about regulator: z_t type H for period t, $t \in \{1, 2\}$

Timing


Nature chooses H regulator with prob. z_1 and L regulator with prob. $1-z_1$
Regulator observes Bank 1's type (B or G) and chooses to Inject, Forbear, or Liquidate
Depositors can run or not
Aggregate state of the world revealed and payoffs occur
Updating by market given Bank 1 resolution of probability that regulator is H to z_2
Regulator observes Bank 2's type (B or G) and chooses to Inject, Forbear, or Liquidate
Depositors can run or not
Aggregate state of the world revealed and payoffs occur
Bank 1 Resolution
Bank 2 Resolution

The Second Bank



Reputation and the First Bank

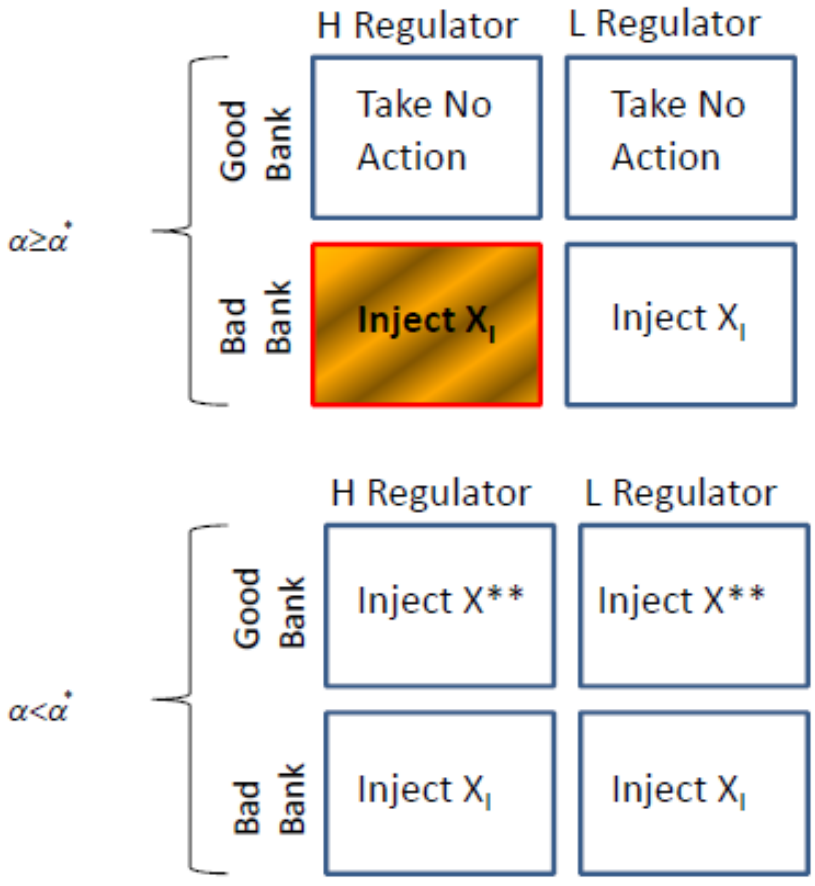
Proposition

The equilibrium regulator behavior for the second bank is an equilibrium for the first bank.

Information Management

- There are other equilibria in this game besides the static one.
- The action of the regulator at the first bank sends a signal to depositors about regulator type & its ability to resolve the second bank.

Information Management by the High Cost Regulator

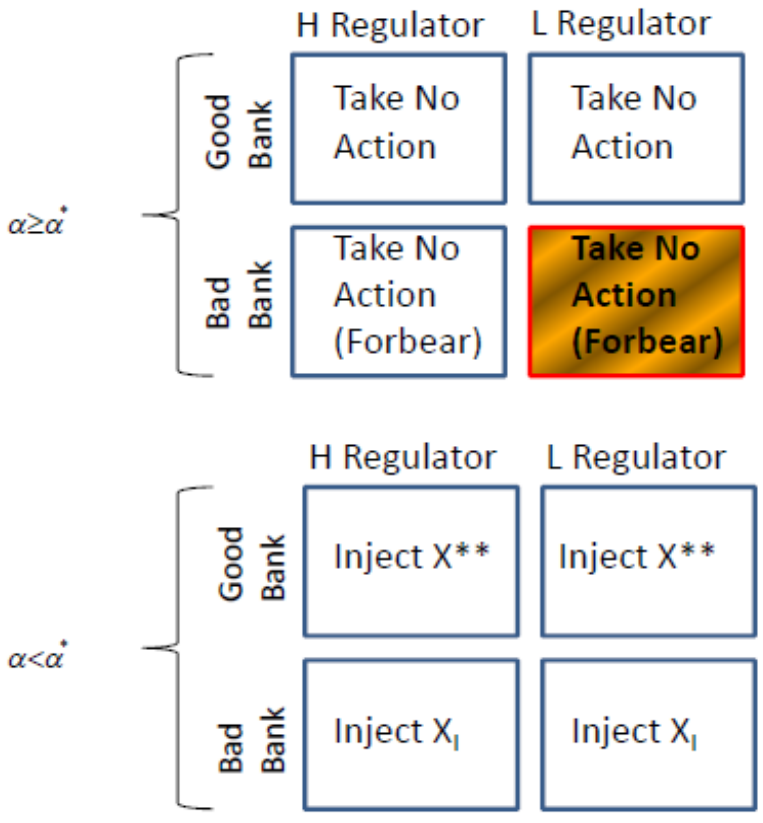


- A high cost regulator may want to pretend to be a low cost regulator in order to prevent future runs.

Moral Hazard

- Add an interim period: Period 1 (Bank 1 resolved), Period 1.5 (Bad Bank 2 can risk shift), Period 2 (Bank 2 resolved)
- Equityholders of a period 2 bad bank can risk shift, increasing $\bar{R}$ to $\bar{R}'$ and reducing $\underline{R}_B$ to $\underline{R}'_B$. This is observable but not contractible.
- $X'_I > X_I$, $\alpha^{'*} > \alpha^*$, and we look at the case where $S_H(X'_I) < 1 - C$.

Information Management by the Low Cost Regulator



- This flips the reputation effect
- The regulator can prevent risk-shifting in a credible way, no need for commitment power.

Stress Tests

- Add an initial stage, where the regulator:
  1. does not know the types of the banks
  2. can commit to do stress tests in both periods
- A stress test is costless and perfectly reveals the type of the bank
- Assume for simplicity: the moral hazard problem is not large

Stress Tests

- The results will then hinge on a tradeoff for the high cost regulator:

$$\text{(C2)} \quad \alpha(\lambda_H - 1)X^{**} > \frac{p_1(1) + p_2(1)}{1 - p_1(1) - p_2(1)}(1-\alpha)(S_F - S_H(X_I))$$

Proposition

When C2 does not hold, only the low cost regulator performs a stress test.

Proposition

When C2 holds, both types of regulator will perform a stress test.

Stress Tests

1. H regulator is less likely to enact stress tests than an L regulator.
2. Some information is revealed no matter what H regulator does.
3. H regulator will do a stress test when priors are unfavorable

Conclusions

- We have a model with uncertainty about bank health and the regulator's ability to conduct bailouts.
- Regulators can take advantage of this uncertainty to prevent runs and moral hazard.
- No need to commit to no bailouts to prevent moral hazard.
- Interesting extensions:
  - More instruments for regulator: force banks to raise outside equity or merge
  - Looking further at the political economy that drives the uncertainty on funding