Liquidity and Crises in Financial Markets

Funding Risk III

U of Basel, HS 2012

Resale Market for Assets

When banks fail, there could be a market solution.

Other surviving banks can use current returns and liquid assets to purchase the assets of the failed bank.

- Sufficient funds: banks purchase asset from failed banks at fair prices
- Insufficient funds: banks will buy assets at firesale assets and – possibly – outside investors also in the market.

Outside investment inefficient, when banks have advantage to run bank intermediated assets.

Question: How should one intervene in the market to avoid a misallocation of bank assets due to firesale prices?

Possibilities for Intervention

There are three options:

- disintermediate the bank assets
- bailing out failed banks
- provide liquidity support to surviving banks

All options are costly:

- either involve transfers to the banking sectors – surviving or failed banks
- or assets are misallocated to outsiders

Main Idea: Bailouts are dominated by liquidity provisions from an *ex-ante* perspective.

Why?

Surviving banks profit from purchasing distressed banking assets and have less incentives to correlate their investment.

Archaya and Yorulmazer (2008)

n banks to run one long-run project each

Project:

- investment at $t = 0, 1$
- return is given by $R_t > 0$ with prob. α
- 0 otherwise

Lenders:

- provide 1 unit to fund project
- short-term debt at fixed interest rate $r_t > 0$

Hence: if return is 0, bank cannot refinance and defaults.

Resale of Bank Assets

At $t = 1$: "market" for selling failed banks' assets

State: k failed banks

Surviving Banks:

- use $R_0 - r_0$ profits to buy assets
- expected excess return is $\alpha[R_1 - r_1] \equiv \bar{p}$

Outsiders:

- have enowment w
- exogenous cost of r_1
- expected excess return is $\alpha[R_t - \Delta - r_1] = \bar{p} - \alpha\Delta \equiv \underline{p}$

Suppose k banks fail. Hence there is a supply of k assets.

"Exogenous" aggregate demand curve:

- For $p = \bar{p}$, surviving banks are indifferent.
- For $p \in (\underline{p}, \bar{p}]$:

$$\sum_{i=1}^{n-k} y_i(p) = (n-k)\frac{\alpha[R_1 - r_1]}{p}$$

- For $p = \underline{p}$, outsiders are indifferent.
- For $p < \underline{p}$:

$$\sum_{i=1}^{n-k} y_i(p) + \frac{w}{p} = \frac{(n-k)\alpha[R_1 - r_1] + w}{p}$$

Firesale Pricing in Equilibrium

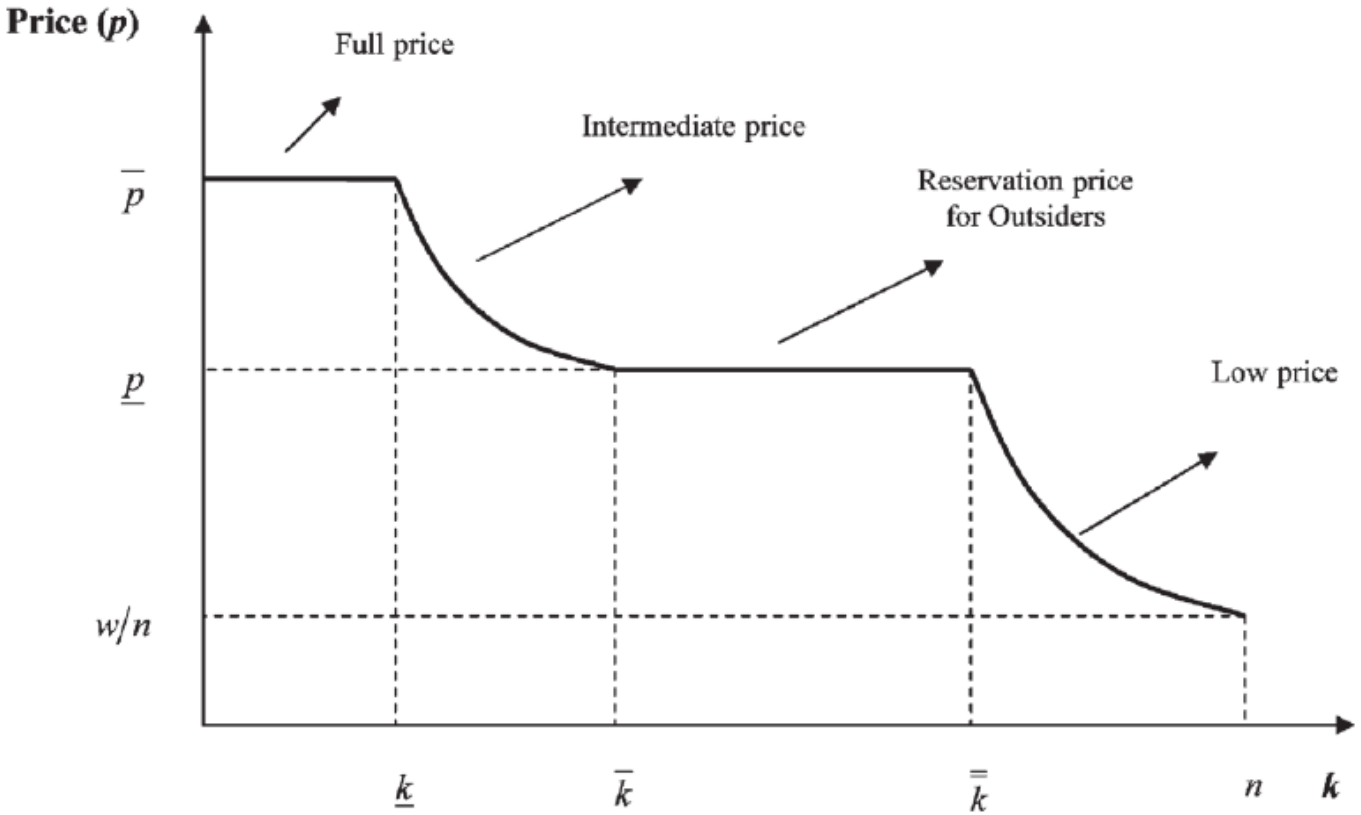

Figure 2
Price without bailouts and liquidity provision.

Social Cost Function

Social cost:

- spend c (net) resources to support banks
- deadweight cost $f(c)$
- f increasing and convex

Gov't – wants to keep all bank assets running:

- pay-off depositors of failed banks, kr_0
- bailout bank: chance for return in $t = 2$
- don't bailout bank: sell it at p

Deadweight costs thus given by

$$f(kr_0 - p(k - b))$$

so that sales to surviving banks/outsiders reduce deadweight costs.

Bailouts

If k is small:

- no intervention
- Why? All assets remain still with banks.

If k is intermediate:

- the gov't uses outside liquidity and in eql. $\underline{p}$
- possible trade-off between misallocation and deadweight costs
- increase # of bailouts up to where MC's are equal

If k is large:

- again announces floor $\underline{p}$
- all funds are already in the market
- bail-out banks until not all are funds are in (maybe more)
- no increase in deadweight cost, but more assets bank funded

Equilibrium with Intervention

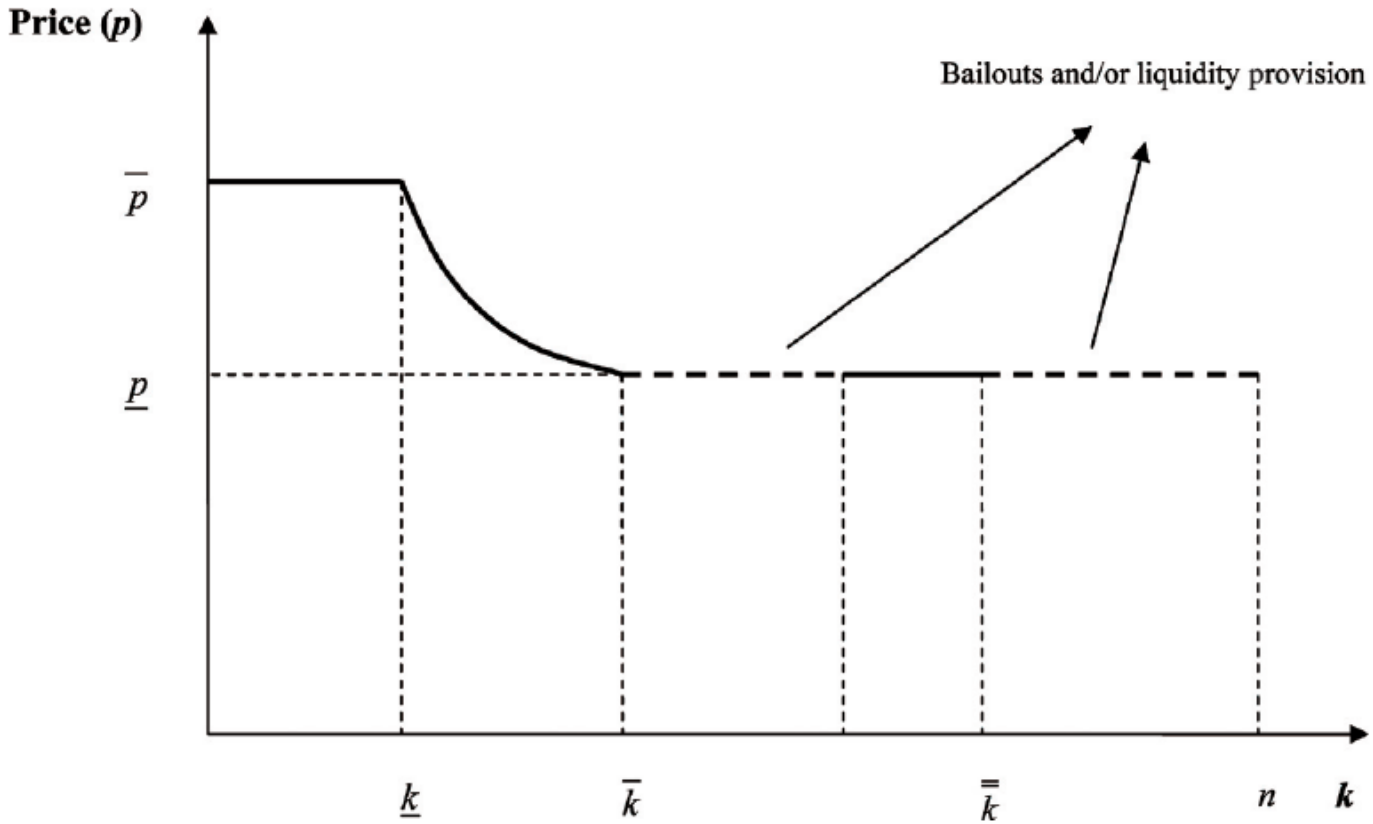

Figure 3
Price with bailouts and/or liquidity provision.

Liquidity Support Is Equivalent

Gov't:

- give free transfer to surviving banks
- no direct bailout

Hence: can avoid misallocation costs as well.

The policy s equivalent to bailouts:

- for large k, can always ensure floor $\underline{p}$
- bailing out a bank increases costs by $\underline{p}$
- grant $\underline{p}$ funds as liquidity to surviving banks
- only which bank runs the asset is different
- deadweight costs unchanged

Ex-ante Collective Moral Hazard

Initial choice of n banks:

- common investment
- all fail (or none) with prob. α $(1-\alpha)$
- specialized investment
- binomially distributed # of failures

Banks anticipate gov't policy in $t = 1$.

Assumptions:

- With bailout, gov't seizes fraction β of future $(t = 2)$ returns (equity stake).
- Specialized investment at $t = 1$ yields higher expected total output. This is equivalent to assume that overall prob. of some bailout is larger with common investment.

Bailout Subsidy

Let $b^*(k)$ be the optimal bailout policy.

The Expected bailout subsidy with special investment given k is

$$\phi(k) = \left(\frac{b^*(k)}{k}\right)(1-\beta)\alpha(R_1 - r_1)$$

With common investment the expected bailout subsidy is

$$(1-\alpha)\left(\frac{b^*(n)}{n}\right)(1-\beta)\alpha(R_1 - r_1)$$

Result: Specific investment is preferred by banks if and only if β_{BS} is sufficiently large.

Liquidity Subsidy

There is now a subsidy for surviving banks beyond the subsidy for failing banks.

- acquire $b^*(k)$ banks at price $\underline{p}$
- if k banks fail, the remaining $n-k$ banks receive this subsidy
- given state k, we have then

$$\gamma(k) = \left(\frac{b^*(k)}{n-k}\right)\alpha[R_1 - r_1]$$

Since no banks are bailed out, there is only a bailout subsidy when there is common investment and all banks fails as before.

Result: Specific investment is preferred by banks if and only if β_{LS} is sufficiently large.

Comparison

Suppose

$$R_0 - r_0 \geq \alpha(R_1 - r_1) - \alpha\Delta$$

Then, one can show that $\gamma(k) > \phi(k)$ for all k such that there is some intervention.

Hence, liquidity support can sustain specialized investment for a larger range of β.

Acharya, Shin and Yorulmazer (2010) extend this model to allow for endogenous liquidity choices by banks to show robustness.

Conclusion:

Allowing assets of failed banks to be resold introduces strategic substitutability into the framework and, thus, weakens collective moral hazard.