Bailouts, Bail-ins, and Banking Industry Dynamics

April Meehl
University of Wisconsin-Madison
Web: aprilmeehl.com Email: aimeehl@wisc.edu

A New Policy

- Since the financial crisis, governments have spent considerable time crafting new resolution policies for big banks.
- These new policies, called bail-ins, are designed with the goals of maintaining financial stability and promoting market discipline.
- Bail-ins impose the losses of the bank onto the shareholders and creditors and recapitalizes the bank by converting debt claims into equity.

Research Question

- **How do banking industry dynamics differ under bailout and bail-in policies?**
- In this paper, I build a quantitative model of the US banking industry prior to the financial crisis.
- In the benchmark model, big banks have an expectation of bailout if they fail.
- In a counterfactual exercise, I replace the expectation of bailout with one of bail-in.
- I compare the two steady state equilibria and the change in bank exit, lending, and borrowing decisions under each policy.

Bank Optimization Problem

- Banks finance loans (l) with insured deposits (δ), uninsured debt (b), and equity (e) to maximize dividends (d).
- Loans earn a stochastic return of z.

$$V_C(z,l,b) = \max_{d,l',b'} \; d + \quad \mathbb{E}_{z'|z}\left(V(z',l',b')\right)$$

s.t.

$$l' + c_O(l') = e + q^{\delta}\delta + q(z,l',b')b'$$
$$e = zl - \delta - b - (1-\lambda_{d<0})d$$

- The price of uninsured debt q is calculated using a zero-profit condition for the creditor and is a function of the probability of the bank entering resolution and the expected payment in resolution.

Entering Resolution

- If the bank's realized equity to asset ratio falls below , the bank is sent into resolution.
- With probability $1-\rho(l)$, banks in resolution are liquidated. Liquidation involves selling the loans at a discount and using the proceeds to repay the creditors and then shareholders.
- Creditors expect to receive a haircut under liquidation and increase the price of the debt (lower q).
- In the benchmark model, the remaining $\rho(l)$ banks in resolution will be bailed out. In the counterfactual, they will be bailed in.

Bailout Model

- Banks receive an equity injection of τ equal to the amount of equity needed to meet .

$$\tau(z,l,b) = \delta + b - (1- \quad)zl$$

- Creditors are fully repaid b.
- Because creditors receive b, q increases with the probability of bailout.
- Shareholders receive the value of a less leveraged bank.

$$V_O(z,l,b) = V_C(z, l + \frac{\tau(z,l,b)}{z}, b)$$

Bail-in Model

- All uninsured debt is converted to equity.
- The bank is valued as a new "all-equity" bank.
- Creditors receive the value of the new shares.

$$\min\{b, V_C(z,l,0)\}$$

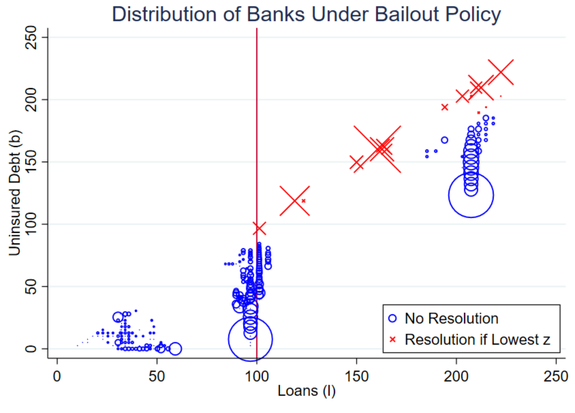
- Because creditors may receive less than b, q does not increase as much as under bailout.
- Shareholders receive any excess value of the new shares.

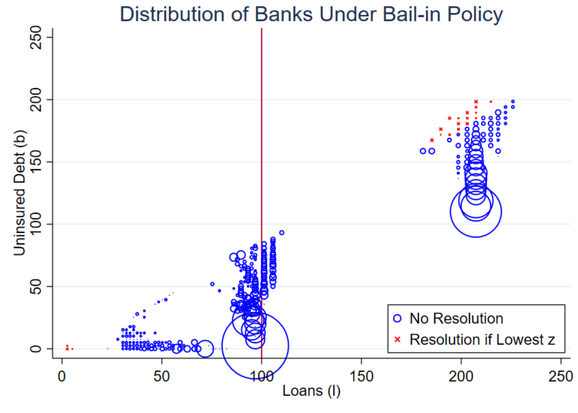
$$V_I(z,l,b) = \max\{0, V_C(z,l,0) - b\}$$

Mechanism

Bail-ins correct the mismatch between the price of uninsured debt and the marginal cost of borrowing to the bank, causing banks to choose less uninsured debt in equilibrium.

Steady State Distributions





Bail-ins lead to less big bank failure.

- In each equilibrium, banks enter resolution when they are highly leveraged and receive a low realization of z.
- Banks choose significantly lower leverage under the bail-in model than under the bailout.
- Because banks are less leveraged, they are bailed in at a fraction of the bailout rate under the benchmark.

	Benchmark	Counterfactual
Average Leverage	62.3%	37.7%
Bailout/in Rate	0.72%	0.01%

Why do banks borrow less?

- Choosing b'^*: banks weigh marginal benefit today ($\partial qb' \backslash \partial b'$) versus marginal increase in mandatory repayment tomorrow
- Bailout: bank must repay b', but receives τ
- q incorporates repayment of b', but the bank does not
  $\Rightarrow b'^* \uparrow$
- Bail-in: if $V(z',l',0) > b'$, shareholders must repay b'
  $\Rightarrow b'^* \downarrow$
- Under bail-in, the cost to the bank from b' is more closely aligned to the price $q(z,l',b')$.

Conclusion

- Under bail-in policies, banks borrow significantly less due to a realignment between the price of uninsured debt and the marginal cost of borrowing for the bank.
- Due to having less leverage, banks enter resolution at a fraction of the rate as under the benchmark.
- Bail-ins achieve their goals of maintaining financial stability and promoting market discipline.