



# Bailouts, Bail-ins, and Banking Industry Dynamics



April Meehl

University of Wisconsin-Madison

Web: aprilmeehl.com Email: aimeehl@wisc.edu

## A New Policy

- The EU provided big banks with bailouts during the 2008 financial crisis.
- Bailed-out banks received equity injections from the government to repay their creditors and continue operating.
- Since, the EU has passed the Bank Recovery and Resolution Directive (BRRD) to deal with the failure of big banks. Included in the BRRD is the bail-in tool.
- Bail-ins impose the losses of the bank onto the shareholders and creditors, and recapitalize the bank by converting debt claims into equity.

## Resolution in the Benchmark Model

- Banks in resolution are bailed out with probability  $\rho$  and liquidated with probability  $1 - \rho$ , where  $\rho$  depends on the size of the bank's loans ( $l$ ).
- In a bailout, banks receive an equity injection  $\tau$ , that is equal to the amount of equity needed to meet  $\alpha$ . The bailed-out bank continues as a bank with more equity.

$$\tau(z, l, b, j) = b + \delta^j - (1 - \alpha)zl$$

$$V_0(z, l, b, j) = \mathbb{E}_{(j'|j)} \left( V_C(z, l + \frac{\tau(z, l, b, j)}{z}, b, j, j') \right)$$

## This Paper

- Research Question: How do banking industry dynamics differ under bailout and bail-in policies?**
- In this paper, I build a quantitative model of the EU banking industry prior to the financial crisis.
- In the benchmark model, banks have an expectation of bailout if they fail, dependent on their size.
- 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.
- The equilibrium bail-in rate is only 0.02% compared with the bailout rate of 2.62% under the benchmark.
- Aggregate lending decreases by 4.2%.

## Bail-ins lead to less big bank failure

- In a counterfactual exercise, the expectation of bailout is replaced with that of bail-in.
- In a bail-in, all uninsured debt is converted to equity.
- Original shareholders only keep their shares if the value of the new shares exceeds the debt claims.

$$V_I(z, l, b, j) = \max(0, V_C^I(z, l, b, j) - b)$$

$$V_C^I(z, l, b, j) = \mathbb{E}_{(j'|j)} (V_C(z, l, 0, j, j'))$$

- The price of uninsured debt  $q$  will adjust to reflect the change in repayment under bail-in compared with bailout.
- Creditors receive guaranteed full repayment under bailout, but receive shares that may be worth less than  $b$  in a bail-in.
- Banks enter resolution (aka fail) less often because they are less leveraged and fall below the  $\alpha$  threshold less frequently.

## Bank Optimization Problem

- Banks of type  $j$  finance loans ( $l$ ) with insured deposits ( $\delta$ ), uninsured debt ( $b$ ), and equity ( $e$ ) to maximize dividends ( $d$ ).
- Loans earn a stochastic return of  $z$  at the beginning of each period.

$$V_C(z, l, b, j, j') = \max_{d, l, b} d + \beta \mathbb{E}_{(z'|z)} (V(z', l', b', j'))$$

s.t.

$$l' - c_0^j(l') = e + q^\delta \delta^{j'} + q(z, l', b', j')b'$$

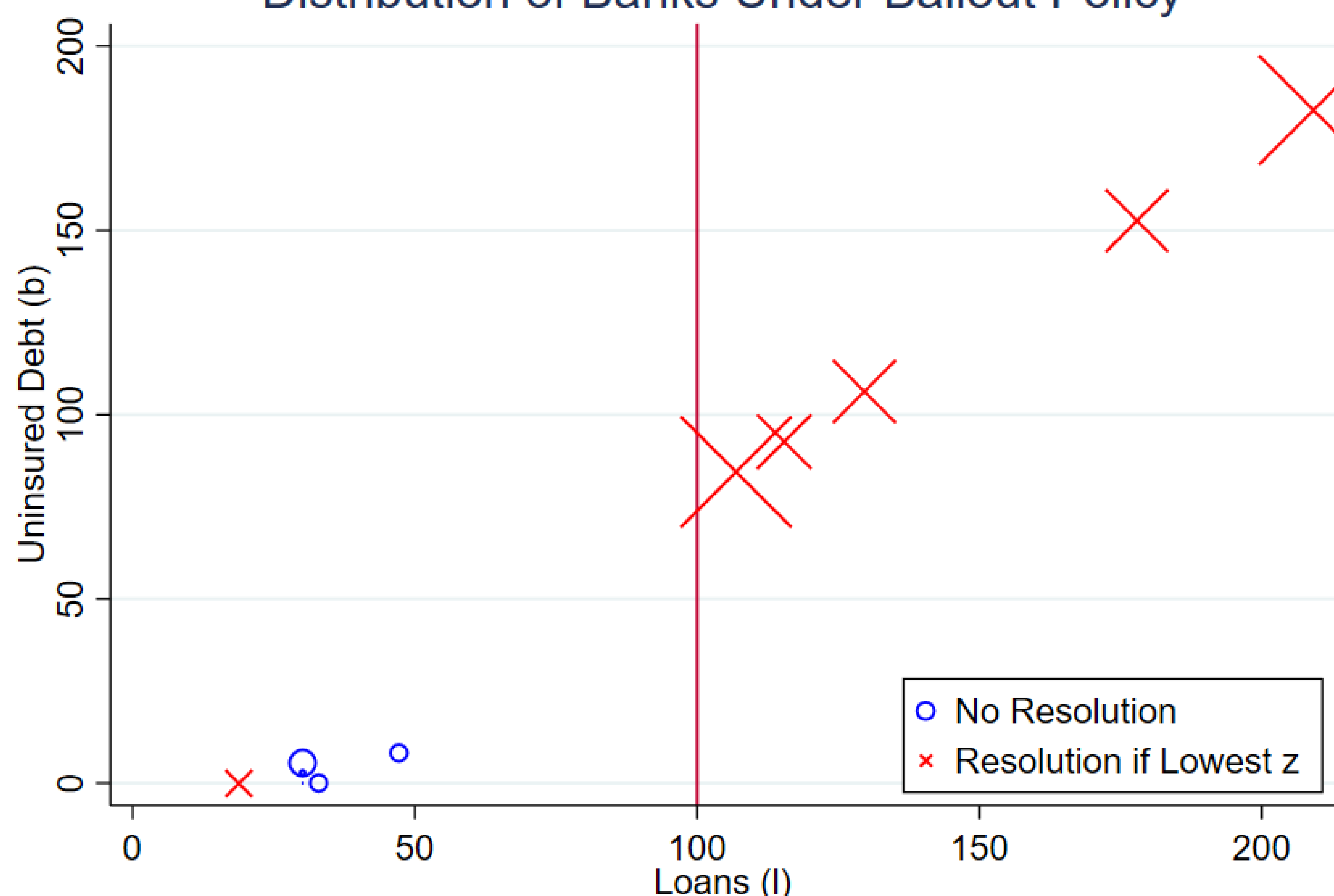
$$e = zl - \delta^j - b - (1 - \lambda_{d < 0}^j)d$$

- 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 repayment in resolution
- At the start of the period, banks realize their equity to assets ratio.
- If this ratio falls below  $\alpha$ , the bank is sent to resolution. Else, the bank chooses between continuing and entering resolution.

## Decomposition of Channels

- Two drivers behind lower bank leverage:
  - Increase in debt prices
  - Lower return to shareholders under bail-in than bailout
- In equilibrium, shareholders lose their entire claims in a bail-in.
- Creditors receive an average haircut of 7% in bail-in, increasing uninsured debt prices  $q$ .
- To decompose the channels, I solve for an "alternative bailout" in which creditors are fully repaid  $b$ , as in a bailout, but shareholders automatically lose their claims, like in the bail-ins.
- The resulting distribution of banks is very similar to the distribution under the bail-in policy.
- Therefore, the main driver behind the decrease in failures under bail-in is the reduced value to shareholders, not the increase in debt prices.

Distribution of Banks Under Bailout Policy



Distribution of Banks Under Bail-in Policy

