Are Bank Bailouts Welfare Improving?

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Massive Bailouts during GFC

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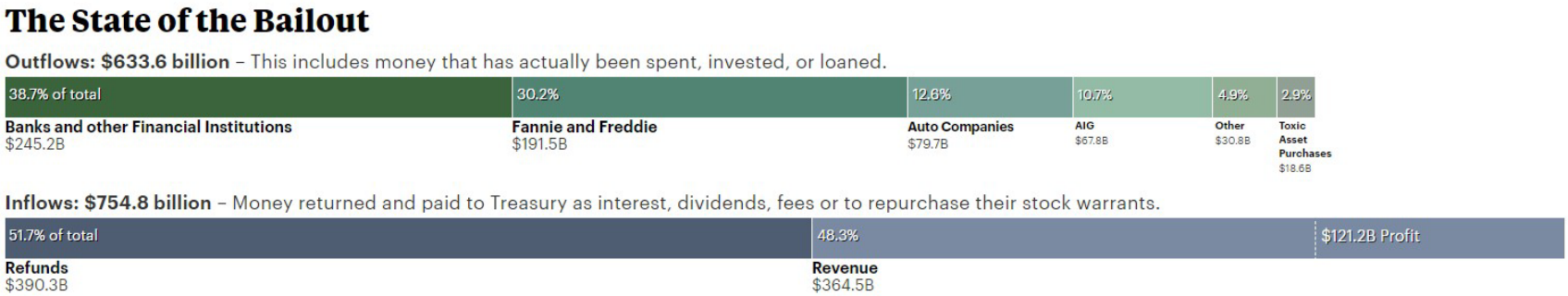
- Turned out not as costly ex post, as initially feared ...



Source: ProPublica Bailout Tracker

Potential long-term costs

$\Rightarrow$ Enhanced expectations of future bailouts

$\Rightarrow$ More reckless financial risk-taking

$\Rightarrow$ More frequent and more severe future financial crises

Question and preview of results

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  - welfare gain equivalent to 1.69 % life-time increase in consumption
  - 3.65 % increase in average wealth

Main Challenges

- Widespread financial crises and bailouts are infrequent
  - hard to establish empirical links among them
  - hard to measure their probabilities
- Expectations of future bailouts are unobservable
  - measurement problems, Hett and Schmitt (2017)
  - identification issues, Dam and Koetter (2012)
- Unclear welfare consequences of changes in risk taking
  - could be welfare beneficial
  - require a structural model

Our analytical framework

- Calibrated quantitative General Equilibrium model in which households value safe, liquid deposits
- Banks are partly funded with **callable** deposits **collaterized** by illiquid assets
- In a financial crisis, early withdrawals trigger **firesale** of asset **claims** from banks to **Patient Investors (PIs)**
- Probability of a financial crisis **depends** on banks' balance sheet positions
- Government **partially** insures returns on firesale assets

Policy Tools

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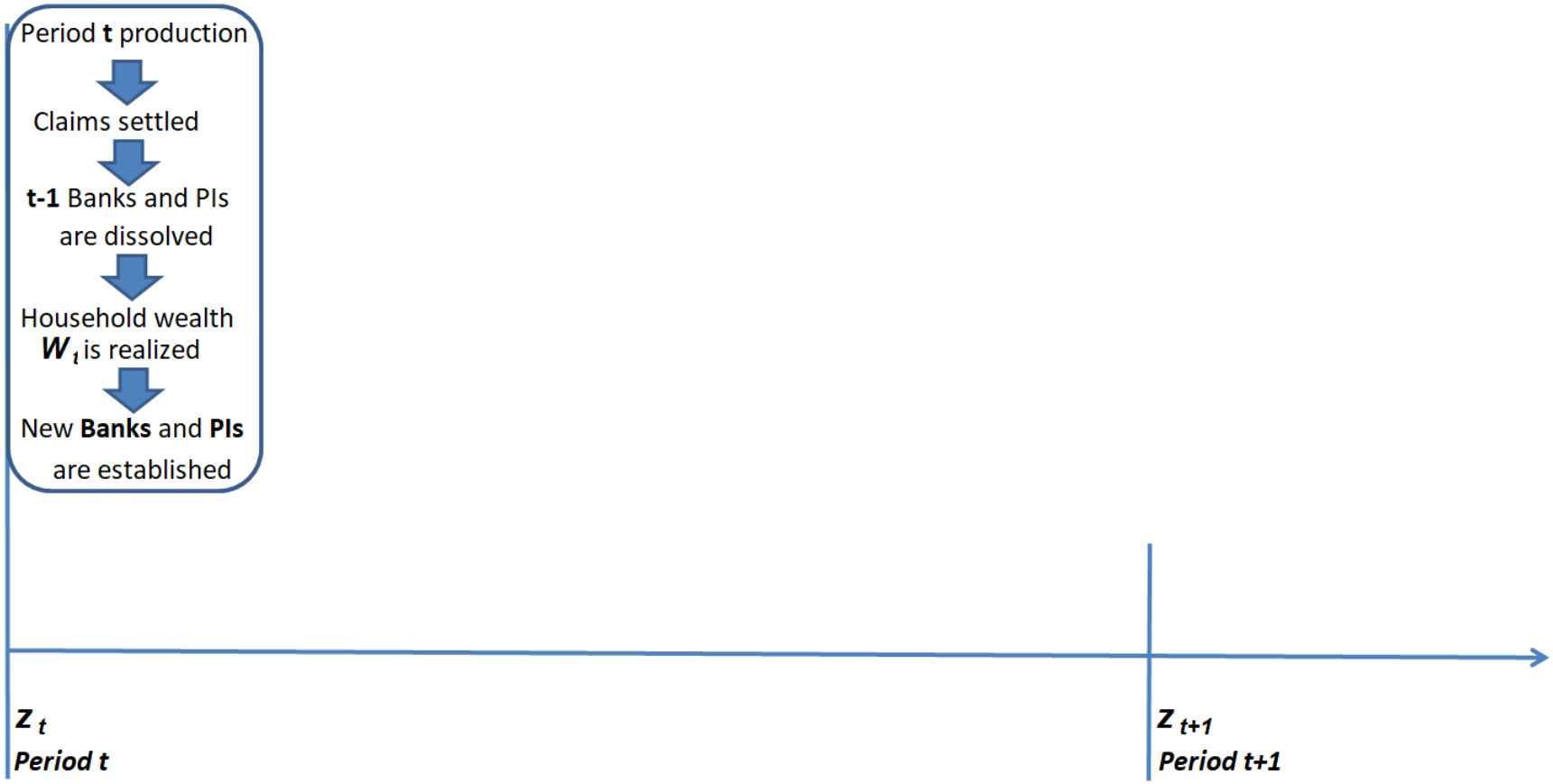
2. Ex ante anticipated bailout insurance policy (financed by lump-sum taxes):

   - eligibility is randomized across banks with probability $\eta \in [0, 1]$
   - fraction $\chi \in [0, 1]$ of a bailout eligible firesale transaction is insured

Timing of events in the model



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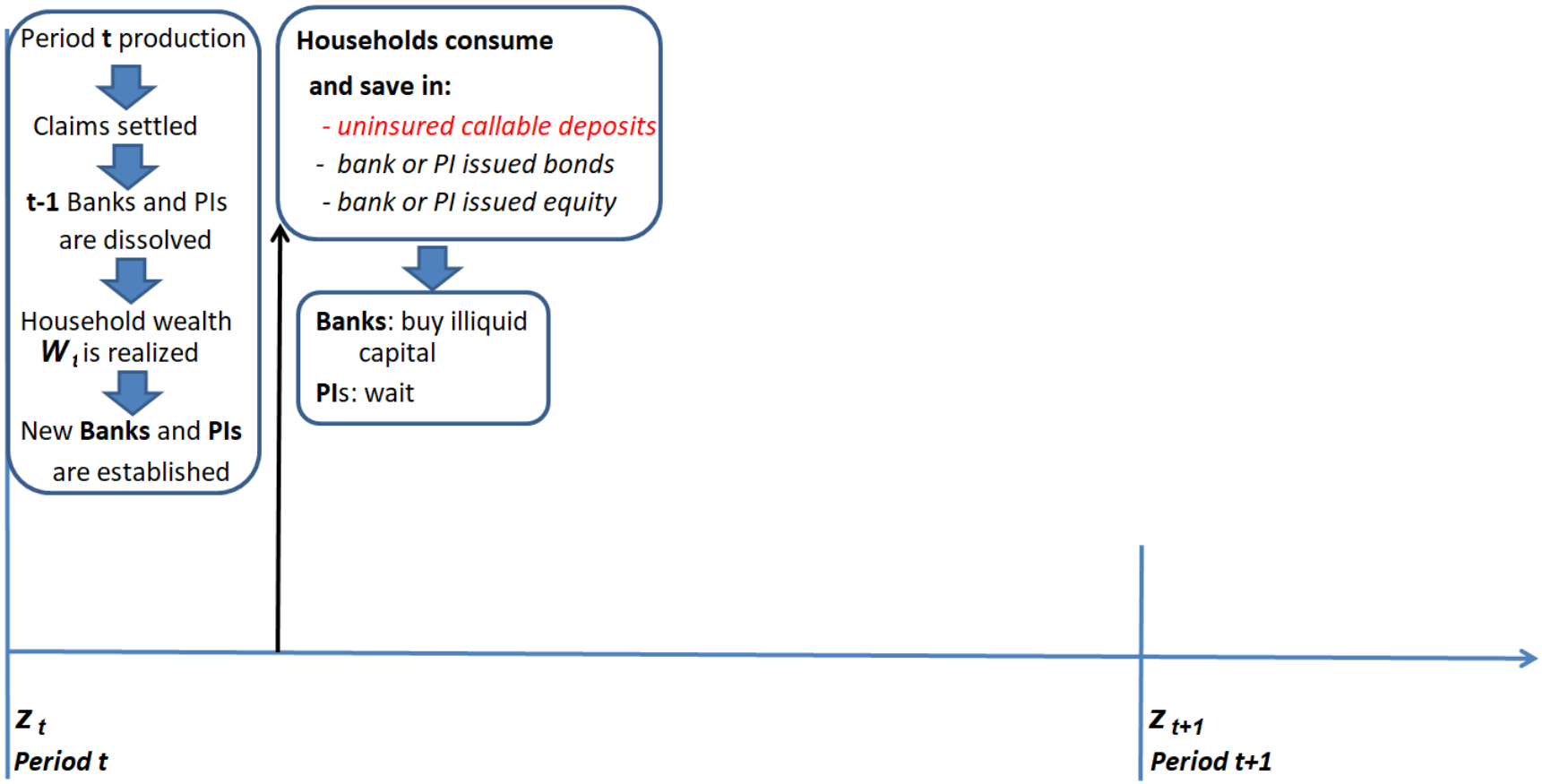

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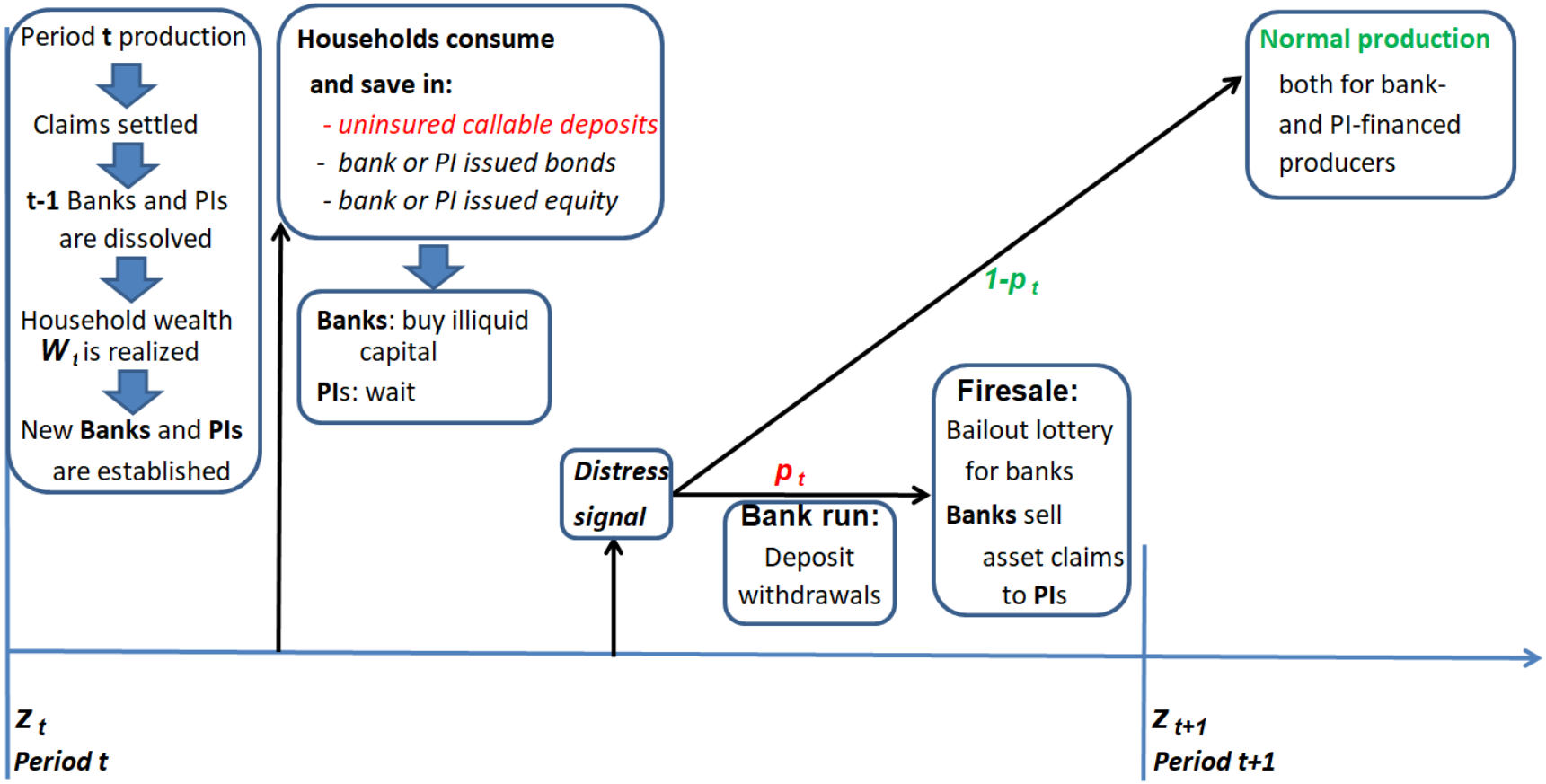

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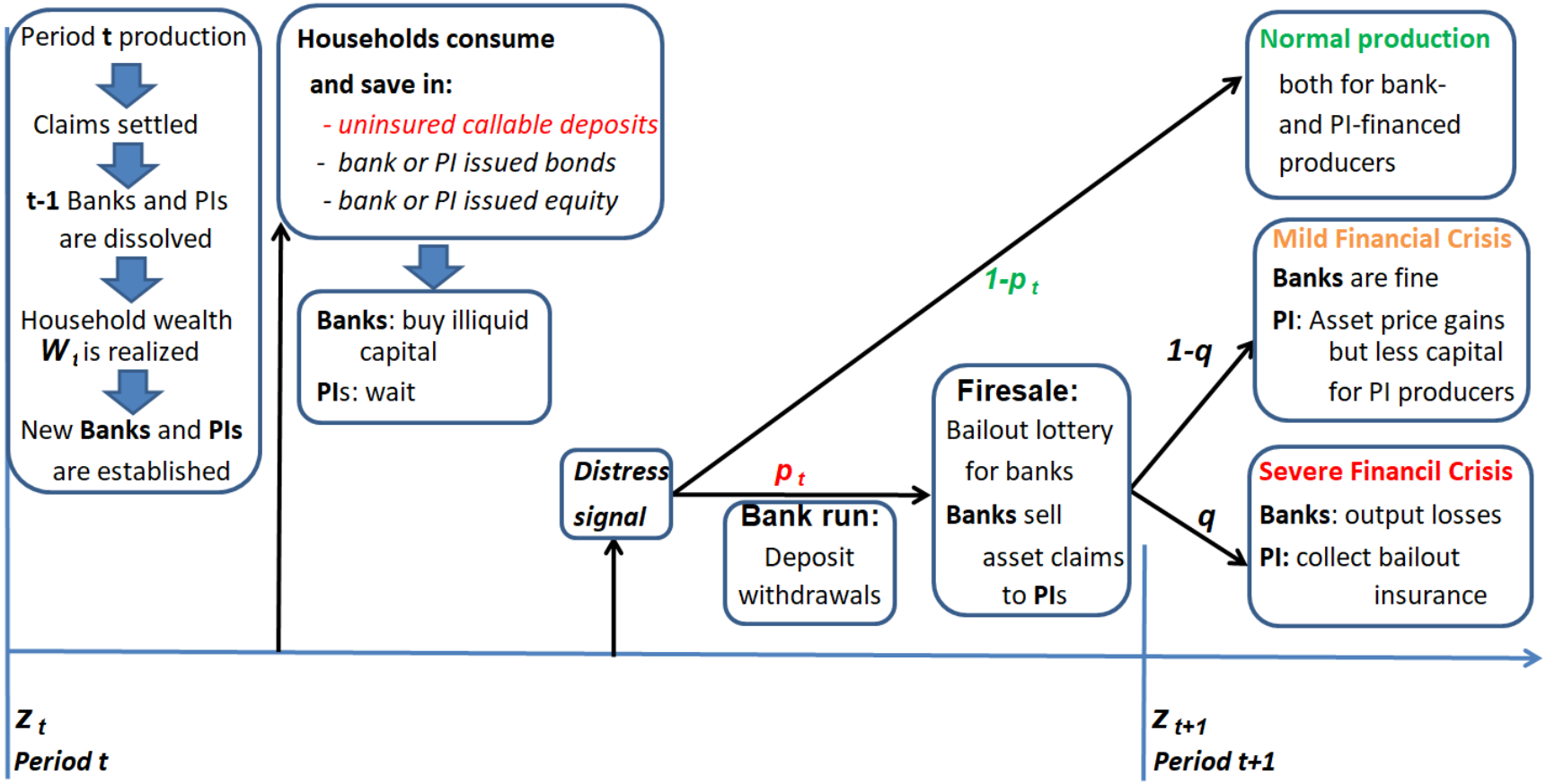


Distress probability is EQUAL to the default probability

$$p_t \equiv \Pr(default|W_t, z_t) = (1-p_t)\Pr\left(default \,|normal\ production\right)$$

$$+ p_t q \Pr\left(default \,|severe\ financial\ crisis\right)$$

$$+ p_t (1-q) \left[\begin{array}{c} \eta \Pr\left(default \mid \left[\begin{array}{c} mild\ crisis \\ bailout\ eligible \end{array} \right]\right) \\ + \\ (1-\eta)\Pr\left(default \mid \left[\begin{array}{c} mild\ crisis \\ ineligible \end{array} \right]\right) \end{array} \right]$$

Individual bank's default risk is always positive due to idiosyncratic revenue shocks

Financial friction: Collateral constraint

- The amount of callable deposits issued by banks is constrained by the expected **firesale** value of their assets
- Individual banks do not take in account their effect on firesale prices. Overborrow short-term
- Pecuniary externality PLUS collateral constraint leave scope for policy improvements

Calibration

Policy parameters

PARAMETER	VALUE
Capital Adequacy Ratio (CAR)	8 %
Ex ante probability of bailout eligibility	$\eta = 0$
Fraction of patient investor losses insured	$\chi = 0$

Calibration moments

Six parameters are estimated to match six moments

MOMENTS IN PER CENT	DATA	MODEL
Average risk spread*	1.50	1.50
Average real return on bonds*	3.94	3.93
Average share of callable funding*	31.54	31.78
RGDP Drop during Great Recession	8.65	8.60
RGDP Drop during Great Depression	34.75	34.98
Average financial crisis probability	1.266	1.266

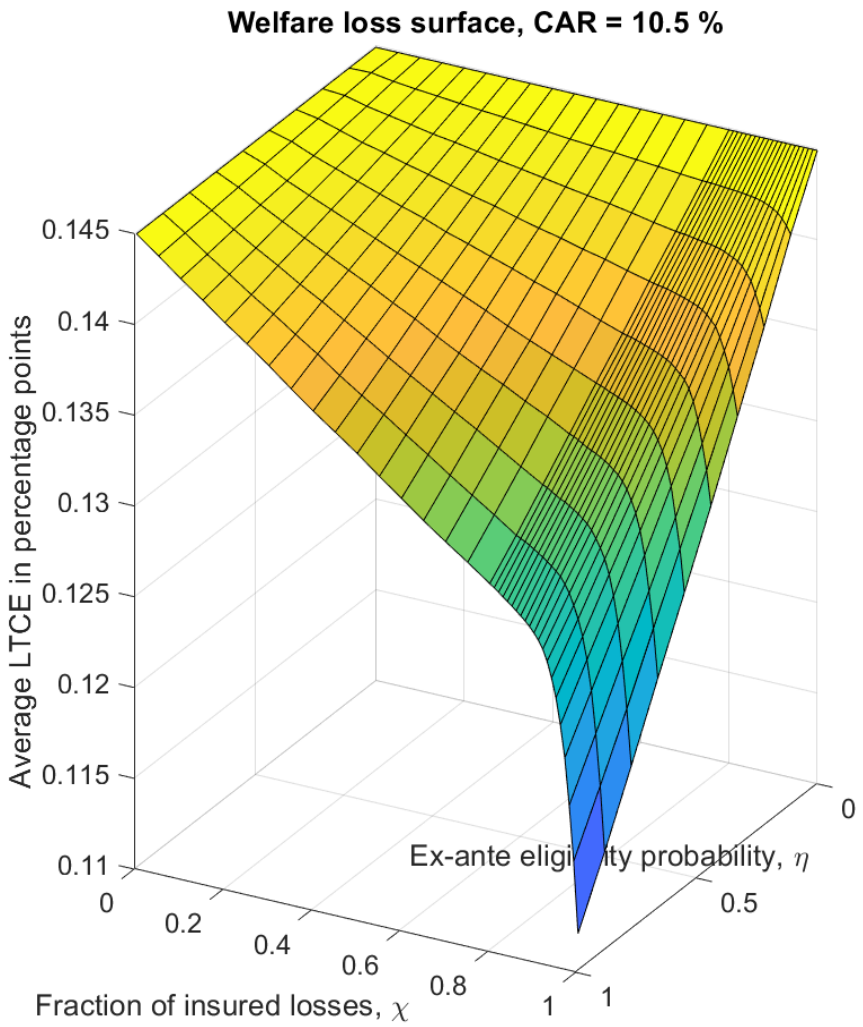
*Period: 1986Q1-2007Q4; Source: U.S. Flow of funds, NIPA data, FRED database

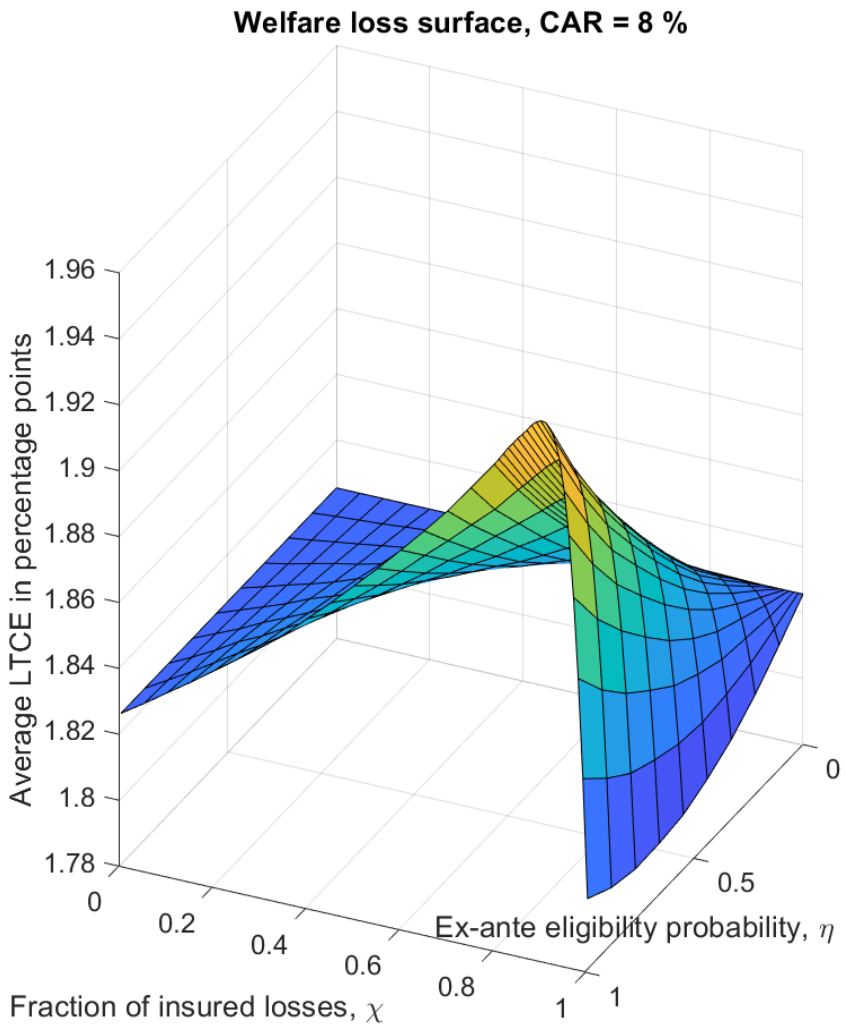
Results

The effects of higher Capital Adequacy Requirement

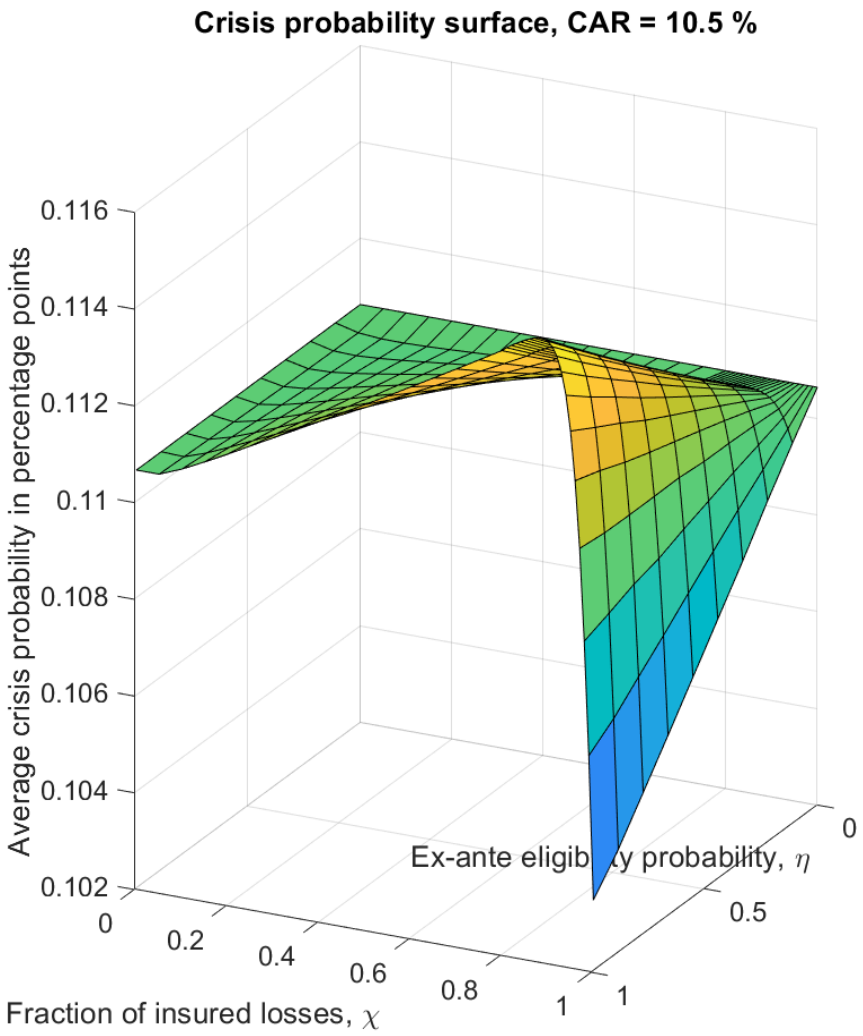
MOMENTS IN PER CENT	CAR=8%	CAR=10.5%
Average financial distress probability	1.33	0.11
Average welfare loss (LTCE)	1.83	0.14
Average wealth relative to "first best"	−2.63	1.02
Average real return on bonds	3.93	4.26

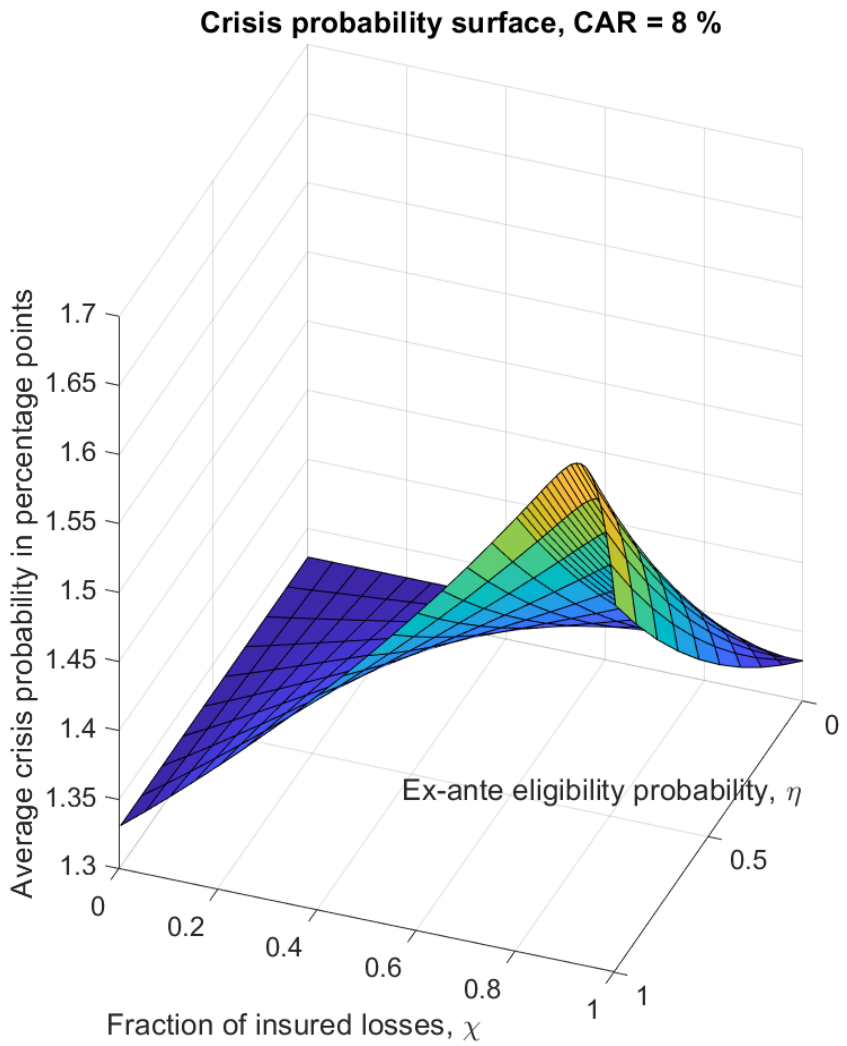
Welfare consequences of Bailout policy



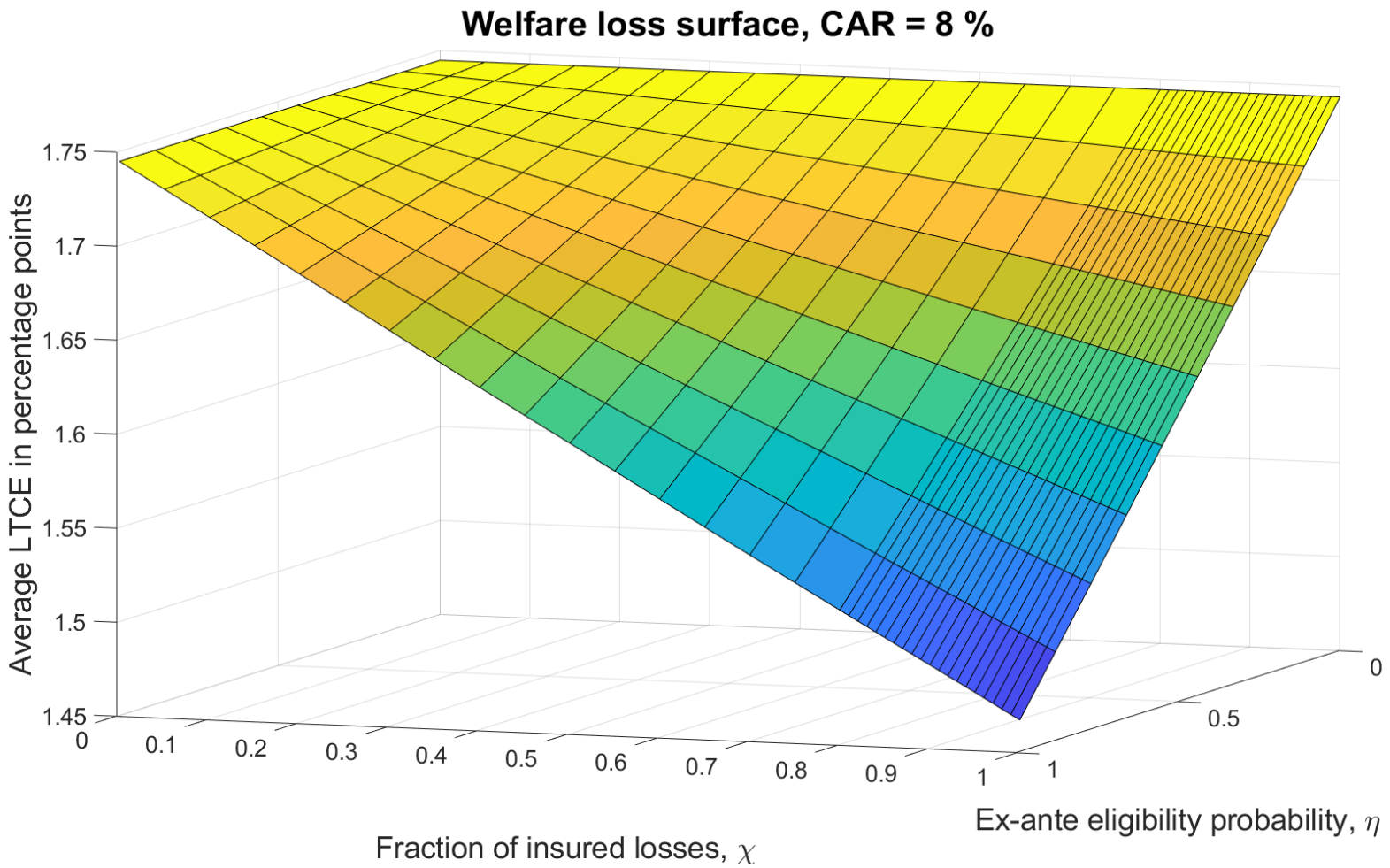


Bailout policy effects on crisis probability

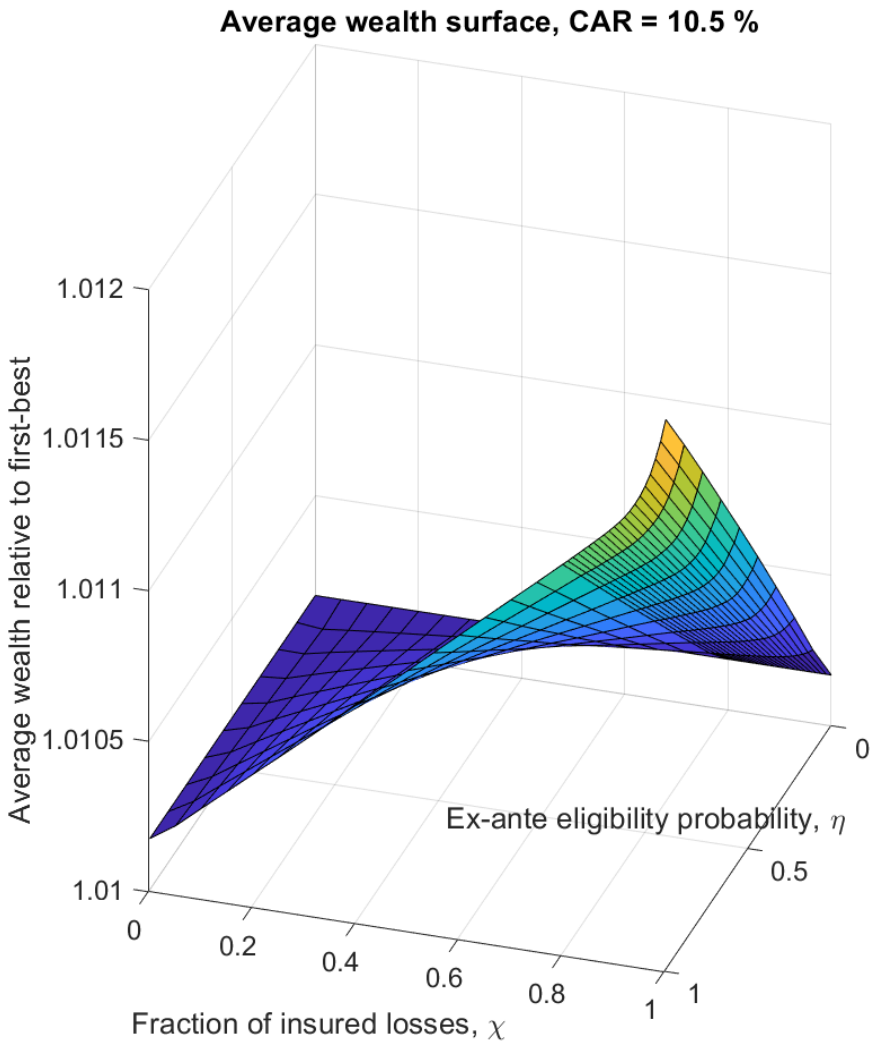


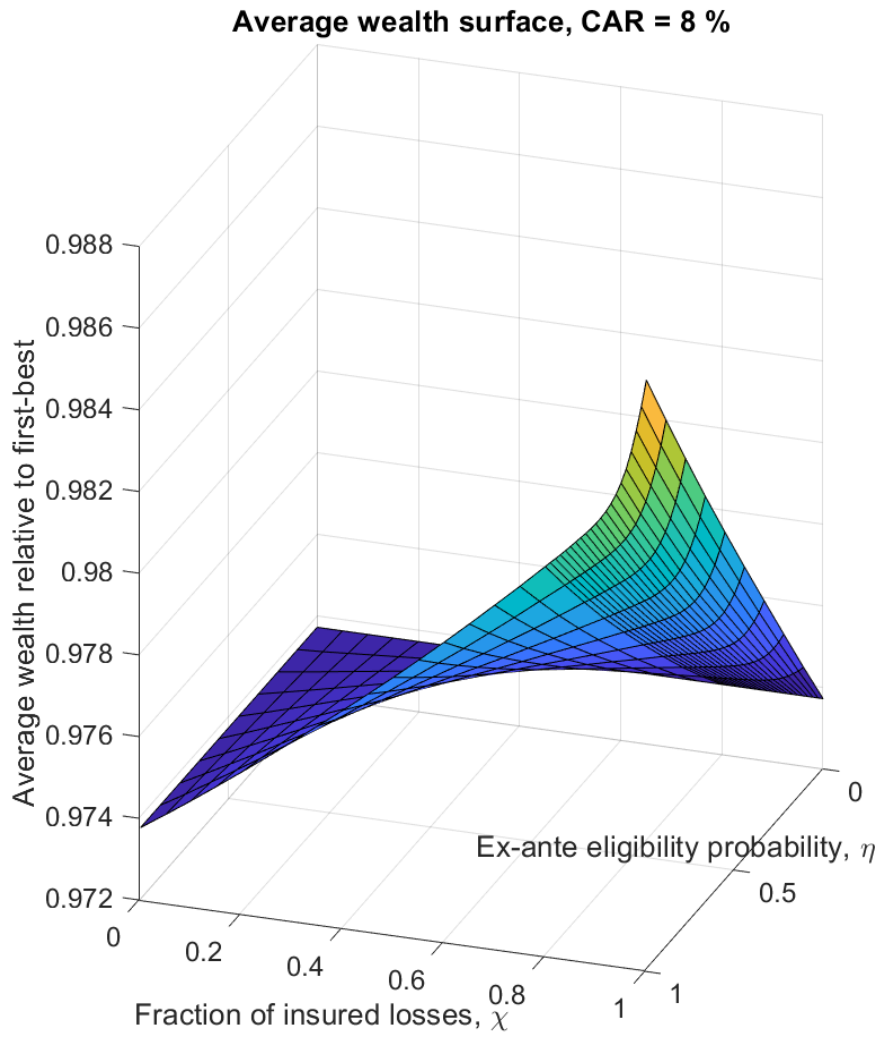


Bailout policy effects on welfare loss: exogenous probability model



Wealth effects of bailout policies





Policy implications

- Basel III enhancements in bank equity buffers are highly beneficial
- Bank bailouts are beneficial if complemented with effective regulation, but detrimental to financial stability and welfare without it
- Policy makers should resist rollbacks of Capital Adequacy Regulations

Thank you!

Estimated parameter values

PARAMETERS		VALUE
Household discount factor	β	0.96
Liquidity preference weight	γ	0.006
Relative TFP of the banks-financed sector	$\frac{z^B}{z^P}$	1.57
St.Dev of idiosyncratic bank productivity shocks	σ^i	0.025
Probability of a severe crisis after a bank run, %	q	57
Fraction of bank revenue lost in a severe crisis, %	$1-\lambda$	40

Period utility function: $\frac{C^{1-\sigma}}{1-\sigma}+\gamma\frac{D^{1-\sigma}}{1-\sigma}$

Production function: $z^J K^{\theta}\left(A\times 1\right)^{1-\theta}$ with $J=B,P$

Idiosyncratic bank shocks: $\zeta^i\left[\left(1-\delta\right)K+z^B K^{\theta}\left(A\times 1\right)^{1-\theta}\right]$

$$\ln\left(\zeta^i\right)\sim N\left(0,\left(\sigma^i\right)^2\right)$$

Related literature on bank bailouts

- Theoretical models on policy options regarding bank runs
  - Mostly *two or three-period* models as in Diamond and Dybvig (1983)
  - Keister (2014), Gorton and Huang (2004), Farhi and Tirole (2012), Diamond and Rajan (2002, 2012)
  - **Stein (2012)**
- Infinite-horizon macro models
  - Chari and Kehoe (2016): no intertemporal links
  - Bianchi (2016): no banks
  - Gertler, Kiyotaki, and Queralto (2012): no bank defaults
  - Angeloni and Faia (2013): exogenous cost of bank defaults, no asset-firesales
  - Collard, Dellas, Diba, Loisel (2012): zero risk taking is optimal
  - **Elenev, Landvoight, Van Nieuwerburgh (2021)**: no firesales

Basic macroeconomic parameters

Few parameters calibrated based on standard RBC values

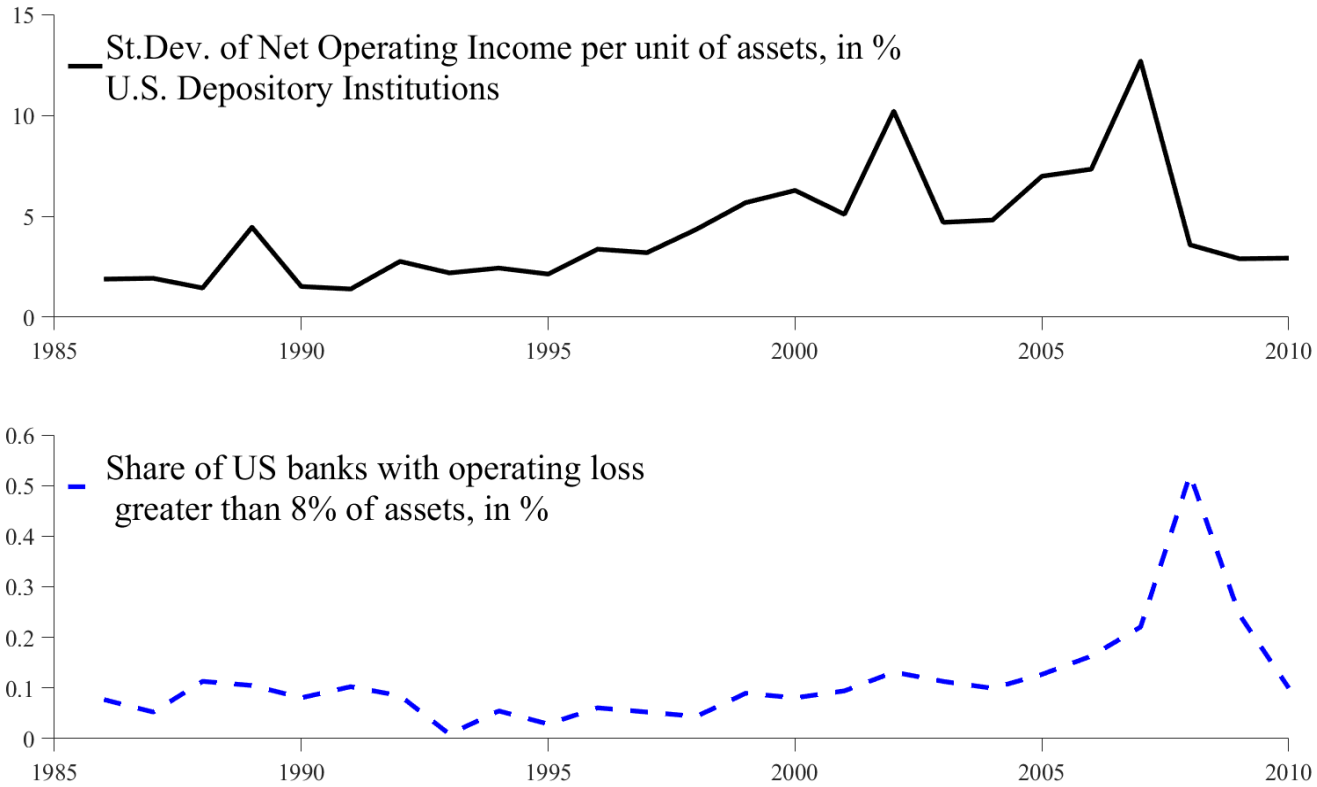
PARAMETER	VALUE
Capital income share	$\theta = 0.33$
Depreciation rate	$\delta = 0.1$
Relative Risk Aversion	$\sigma = 2$

Aggregate labour productivity process estimated from PWT9.0

$$\exp(z_t) = \exp(z_{t-1})^{0.88} \exp(\varepsilon_t)$$

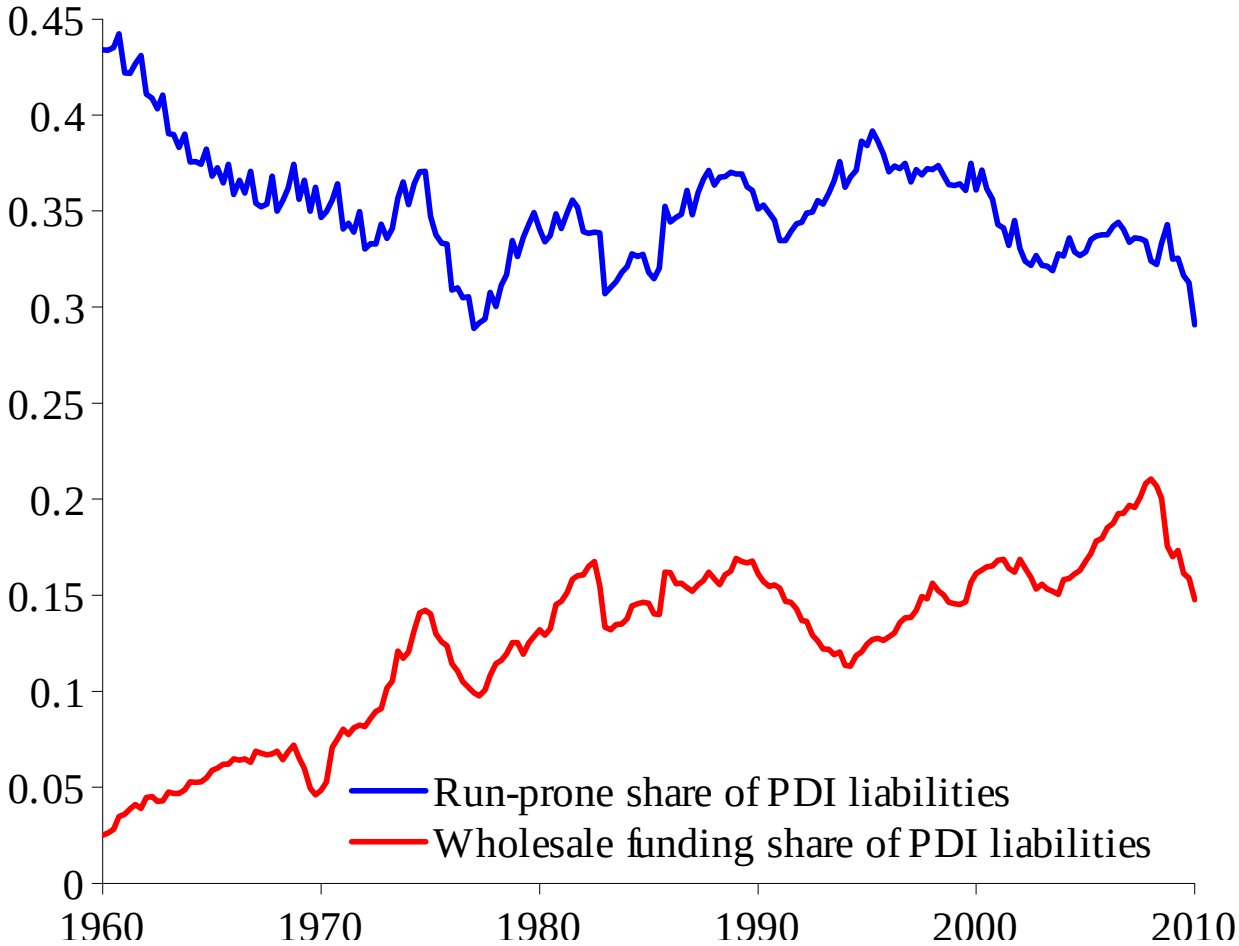
$$\varepsilon_t \sim N\left(0,\ 0.029^2\right)$$

GFC revealed substantial amount of risk in the U.S. financial system



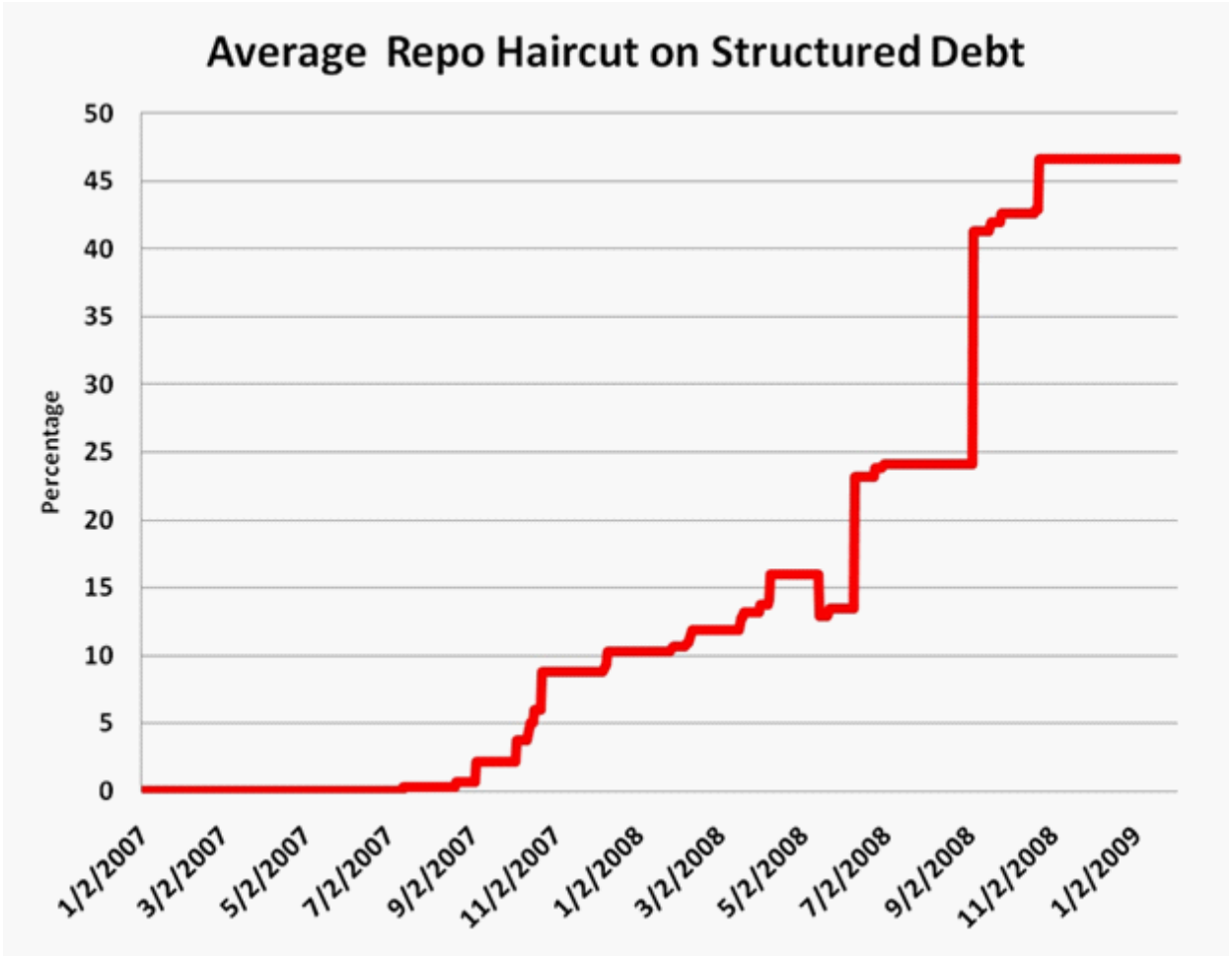
Source: WRDS Bank Regulatory database

Composition of run-prone liabilities shifted toward wholesale funding



Data source: U.S. Flow of Funds Accounts

Bank runs on wholesale funding can be costly



Source: Gorton and Metrick (2010).

An example of partial insurance

In March 16 2008, JPMorgan Chase bought *Bear Stearns* for $2 per share (stock swap), which is less than 7% the stock value 2 days before.

New company funded by loans from

- Federal Reserve Bank of New York: $29 billion
- JPMorgan Chase (junior loan): $ 1 billion

with no further recourse to JP Morgan Chase assets.

Distributions of distress probabilities