Comments by Rafael Repullo on

Government Guarantees and Financial Stability

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Purpose of paper

- Analyze effect of government guarantees on bank deposits
- What is the trade-off?
  - → Guarantees may prevent panics
  - → Guarantees may lead to excessive risk-taking
- Question
  - → Do they stabilize or increase fragility of financial system?

Setup

- Starting point: Diamond and Dybvig (1983)

  → Multiple equilibria

  → Possibility of (inefficient) bank runs

- Reference model: Goldstein and Pauzner (2005)

  → Unique equilibria (global games approach)

  → Panic-based and fundamental-based runs

- Introduce a government in Goldstein and Pauzner (2005)

Main results

- Introduction of government guarantees

  → Reduces depositors' incentives to run

  → Induces banks to take more risk

  → Overall effect is ambiguous

- Eliminating runs is not desirable

  → Guarantee has to be set at an inefficiently high level

- Effectiveness of guarantees depends on their credibility

  → If not credible they unambiguously increase fragility

Main comment

- Formal analysis is very complicated

  → It is difficult to see what is driving the results

- In the words of the authors

  "Due to the complexity of the model, we cannot provide a full characterization and we have to focus on a particular scheme, but our analysis sheds light on basic trade-offs and decisions."

What am I going to do?

- Consider a simplified version of the model

  → Focusing on fundamental runs: θ is observable at $t = 1$

  → Dispensing of the global games apparatus

  → Hoping that the intuition will carry over to general case

This discussion

- Compute a simple numerical example

  → Probability of high return at $t = 2$ is $p(\theta) = \theta \sim U(0,1)$

  → Proportion of early consumers is $\lambda = 1/2$

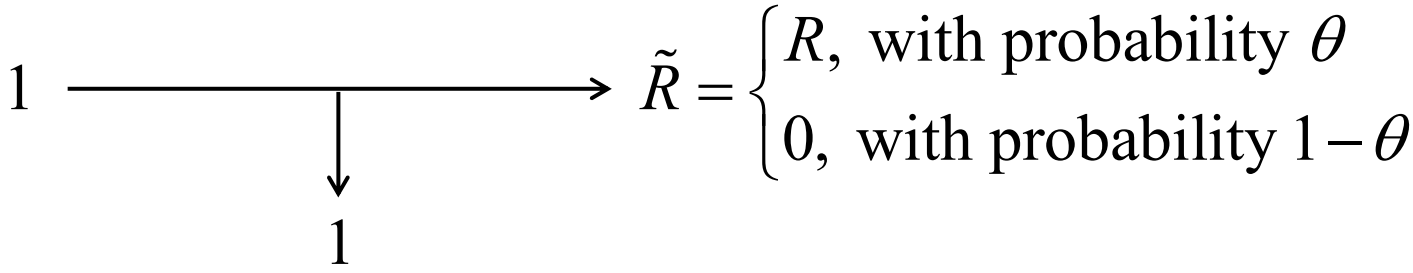
  → Utility function is $u(c) = \begin{cases} c, & \text{if } c \leq 1 \\ 2 - \dfrac{1}{c}, & \text{otherwise} \end{cases}$

  → This function satisfies $u(0) = 0$ and $RRA(c) = 2$ for $c > 1$

  → Utility of public good replaced by social cost of taxation

Model without guarantees

- Investment returns



where $E(\tilde{R}) = \frac{R}{2} > 1$

Optimal contract (i)

- Bank offers a contract with promised payments

$$c_1 \text{ and } c_2 = \begin{cases} \dfrac{(1-\lambda c_1)R}{1-\lambda} = (2-c_1)R, & \text{with prob. } \theta \\ 0, & \text{with prob. } 1-\theta \end{cases}$$

Optimal contract (ii)

$$\max_{(c_1,c_2,\hat{\theta})} \hat{\theta}u(1)+(1-\hat{\theta})\left[\lambda u(c_1)+(1-\lambda)E(\theta\left|\theta\geq\hat{\theta}\right.)u(c_2)\right]$$

$$\text{subject to } u(c_1)=\hat{\theta}u(c_2)$$

- Fundamental runs: when late depositors observe a state $\theta<\hat{\theta}$

  → Payoff if they run: $u(c_1)$

  → Expected payoff if they do not run:

$$\theta u(c_2)<\hat{\theta}u(c_2)=u(c_1)$$

  → All depositors withdraw at $t = 1$ and bank is liquidated

Numerical results

- Optimal contract for $R = 4$

$$\hat{c}_1 = 1.15, \quad \hat{c}_2 = 3.38, \quad \hat{\theta} = 0.67$$

- How do we know whether there is too much liquidation?

  → We need a benchmark

- What would be an appropriate benchmark?

  → Suppose that consumer types were observable

  → In this case late consumers could not claim to be early

Optimal contract with observable types

$$\max_{(c_1,c_2,\theta^*)} \theta^* u(1) + (1-\theta^*)\left[\lambda u(c_1) + (1-\lambda)E(\theta \middle| \theta \geq \theta^*)u(c_2)\right]$$

- Optimal contract for $R = 4$

$$c_1^* = 1.40, \quad c_2^* = 2.39, \quad \theta^* = 0.45$$

- Since

$$\theta^* = 0.45 < 0.67 = \hat{\theta}$$

→ There is indeed too much liquidation in original model

→ But some liquidation is optimal

→ Eliminating runs makes no sense

What happens with government guarantees?

- Bank offers a contract with promised payments

$$c_1 \text{ and } c_2 = \begin{cases} \dfrac{(1-\lambda c_1)R}{1-\lambda} = (2-c_1)R, & \text{with prob. } \theta \\ \overline{c}, & \text{with prob. } 1-\theta \end{cases}$$

where $\overline{c}$ is paid by the government

Optimal contract with guarantees

$$\max_{(c_1,c_2,\hat{\theta})} \hat{\theta}u(1)+(1-\hat{\theta})\Big[\lambda u(c_1)+(1-\lambda)E(\theta\,\Big|\,\theta\geq\hat{\theta})u(c_2)$$

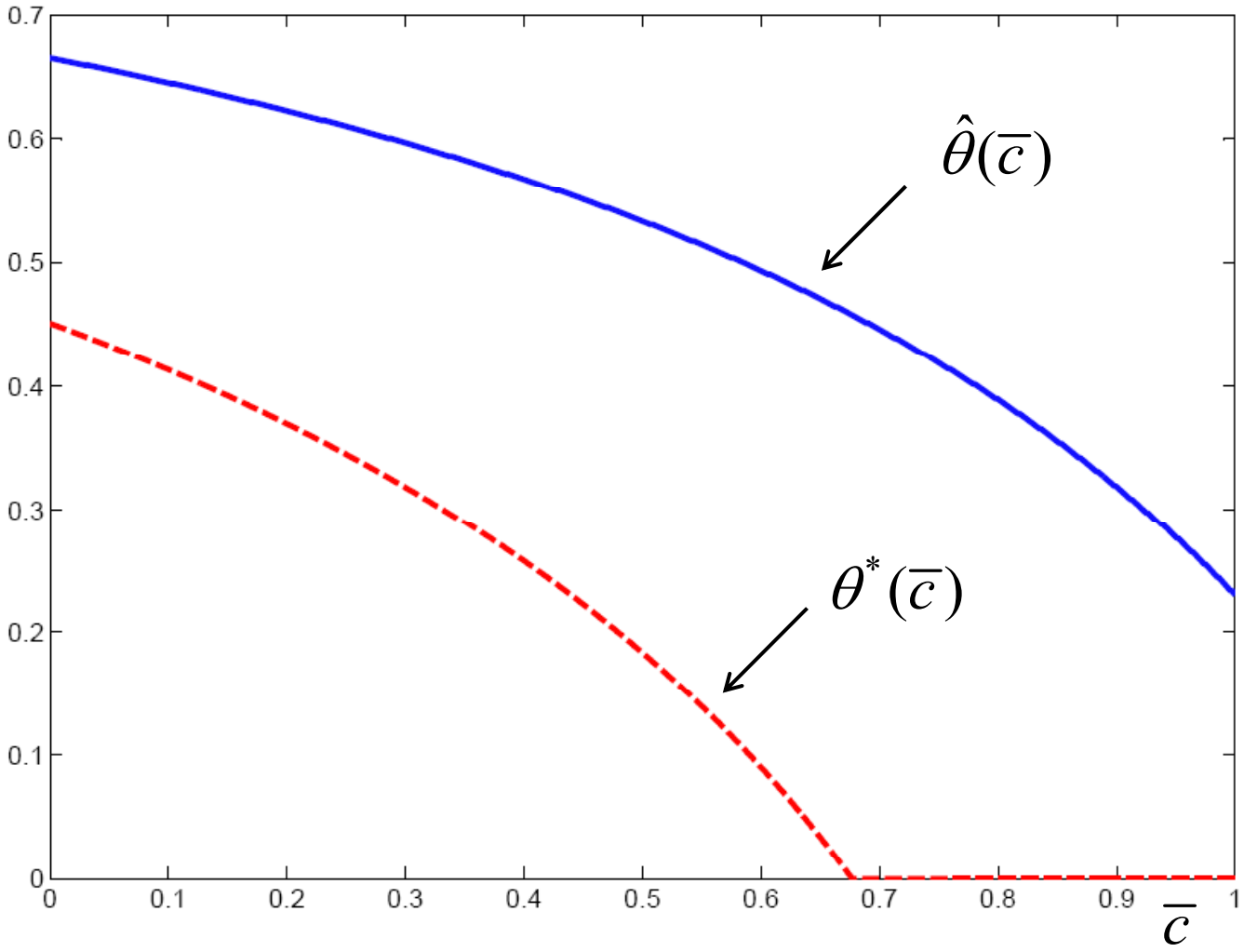
$$+\underbrace{(1-\lambda)E(1-\theta\,\Big|\,\theta\geq\hat{\theta})u(\overline{c})}_{\uparrow\ \text{new term}}\Big]$$

$$\text{subject to}\quad u(c_1)=\hat{\theta}u(c_2)+\underbrace{(1-\hat{\theta})u(\overline{c})}_{\uparrow\ \text{new term}}$$

Numerical results

- Compute $\hat{\theta}$ and θ^* for $\overline{c} \in [0,1]$ (and $R = 4$)
- Will guarantees correct excessive liquidation?

Liquidation thresholds



What is going on?

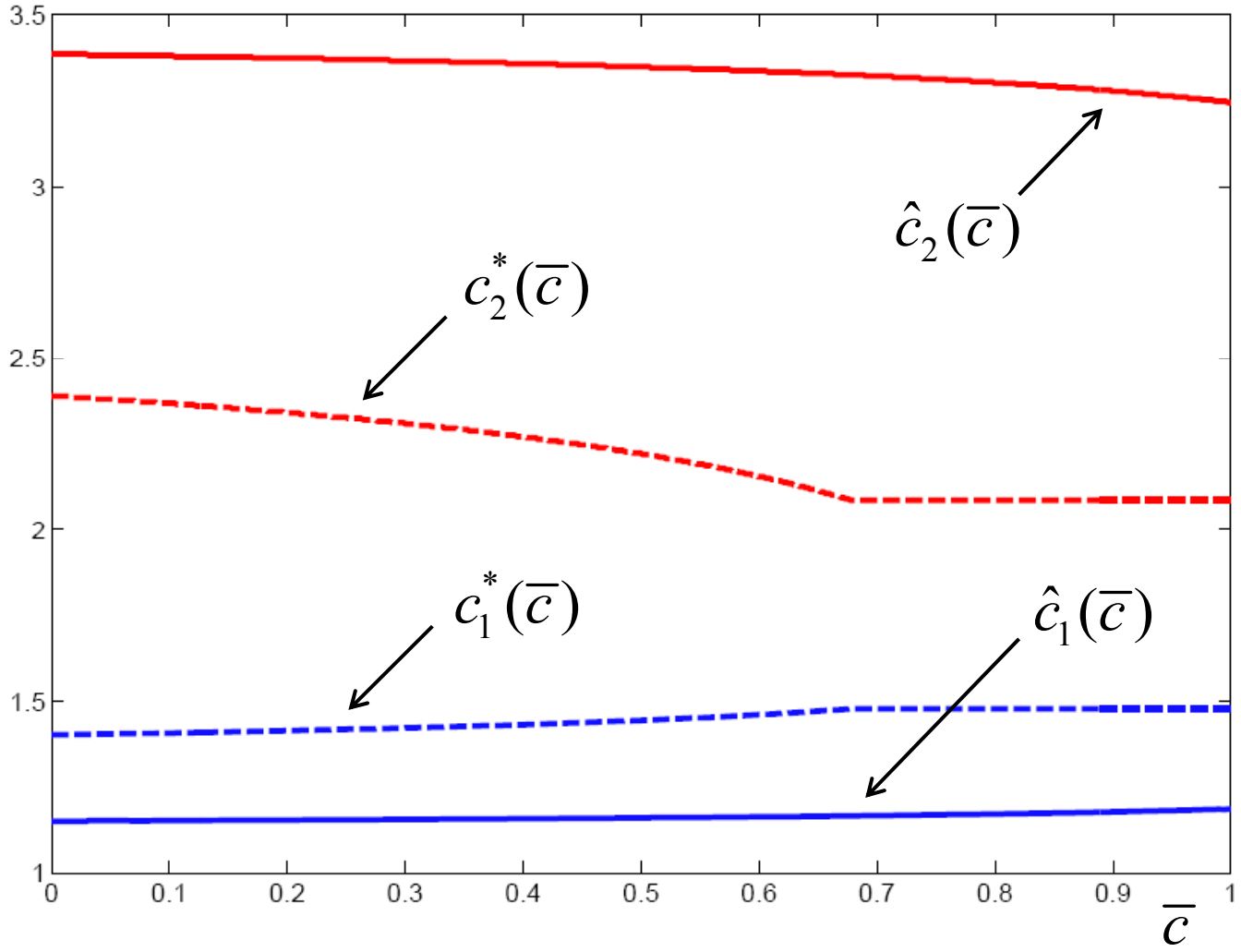
- Government guarantees also affect benchmark contract

  → They introduce new insurance possibilities

  → Continuation is optimal for lower values of the state θ

- In fact, for high values $\overline{c}$ of you never want to liquidate!

Optimal contracts



Discussion

- In what sense can this be optimal?

  → Only if you ignore cost of the taxes required for insurance

  → What happens if you introduce social cost of taxation?

Introducing social cost of taxation

- Suppose that cost of paying $x = (1-\lambda)\overline{c}$ to the late consumers is

$$s(x) = x + x^2$$

→ Toulouse lambda = $s'(x) = 1 + 2x$

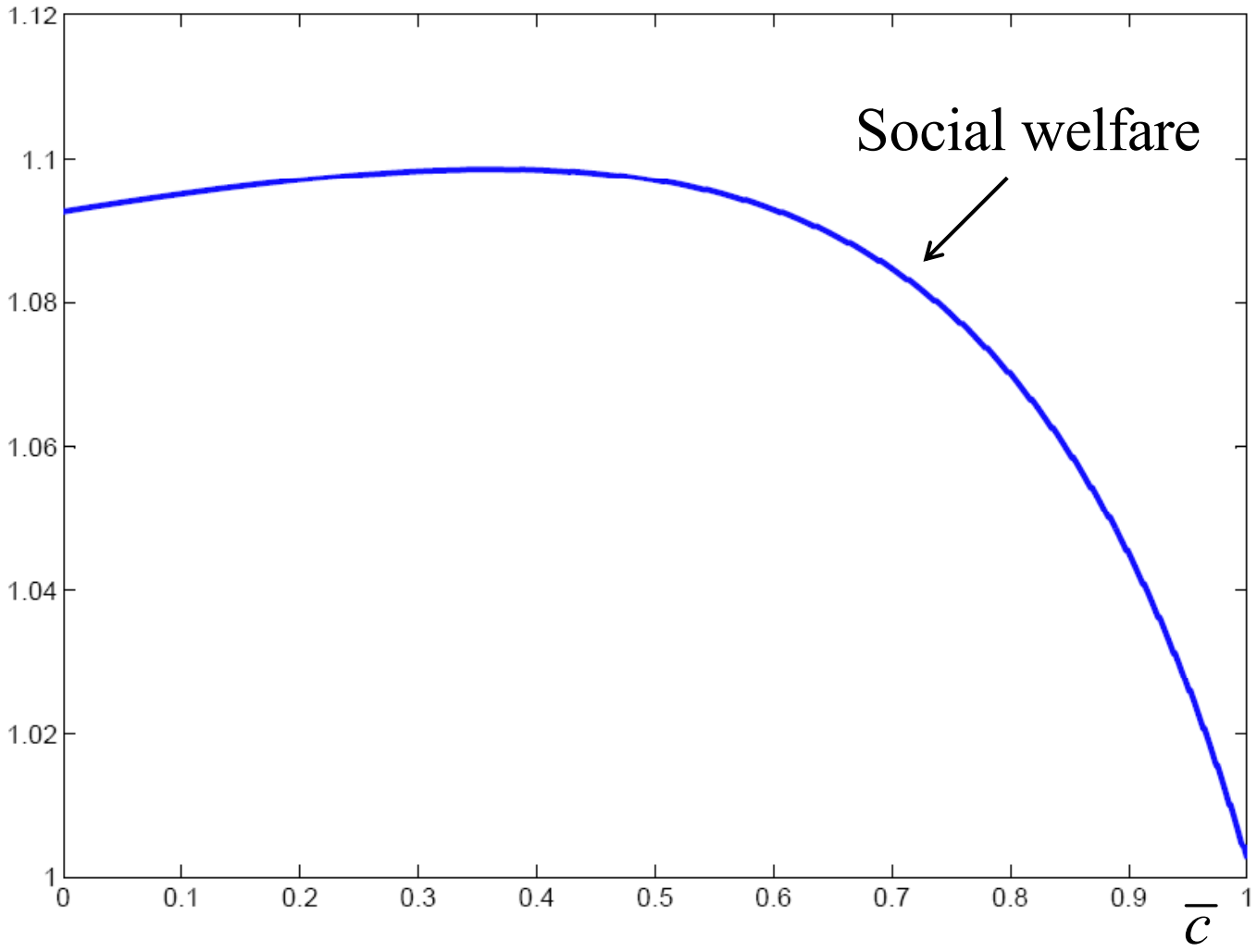
- This is paid with probability

$$\int_{\hat{\theta}}^{1} (1-\theta)\, d\theta = \frac{(1-\hat{\theta})^2}{2}$$

- Once this is taken into account

→ What is the optimal government guarantee?

Optimal government guarantee



Summing up

- Introducing guarantees increases social welfare

  → Even when social cost of taxation is taken into account

- Effect on financial stability

  → Increase payment to early consumers leads to higher $\hat{\theta}$

  → Increase payment in low return state leads to lower $\hat{\theta}$

  → Overall effect is to reduce liquidation threshold $\hat{\theta}$

  → More stable financial system

Questions

- Do these results hold outside the simple numerical example?
- Do these results hold when we consider panic-based runs?
- Should we consider other policy instruments?

  → Complementing or even replacing deposit insurance

Other comments on the model

- Do we need such peculiar utility function?

  → Driven by requirements $u(0) = 0$ and $RRA(c) > 1$

  → Why not simply assume that failure return is positive?

- Liquidation value at $t = 1$ is peculiar

  → Not related to expected continuation value

  → Model of firm with real assets that could be redeployed

  → Not really a model of firm with financial assets

Final comment

- Paper shares common (negative) view of deposit insurance

  → Starting with literature review…

- Does deposit insurance always lead to more risk-taking?

  → It depends on the model

- Deposit insurance reduces banks' funding costs

  → Higher charter values and lower incentives for risk-taking

  → See Repullo (2005)