Transparency and Bank Runs

Cecilia Parlatore

NYU Stern

May 2015

Introduction

Calls for enhancing transparency in the financial sector

- Basel III, SEC on MMFs, disclosure of stress tests

Advantage:

- Better market discipline

Disadvantages:

- Contagion: Chen and Hasan (2006), Acharya and Yorulmazer (2008)
- Decrease in *ability* to coordinate: Morris and Shin (2002)
- Decrease in *incentives* to share risk: Hirshleifer (1971)

This paper:

- increase in *incentives* to coordinate $\Longrightarrow \uparrow$ **in fragility**
- decrease in *ability* to share risk $\Longrightarrow \downarrow$ **in welfare**

Outline

- Model
- Equilibrium
  - Withdrawal game: incentives to coordinate
  - Bank's choices: ability to share risk
- Fragility and Welfare

The Model

- $t = 0, 1, 2$
- Continuum of ex-ante identical consumers
  - Preferences

$$U(c_1, c_2) = \begin{cases} u(c_1) & \text{w.p. } \lambda \\ c_2 & \text{w.p. } (1-\lambda) \end{cases}$$

    $u(0) = 0$, $u' > 0$ and $u'' < 0$.

  - Endowment: $e = (1, 0, 0)$
- Competitive bank: maximizes expected utility of consumers.
- 2 assets: safe short-term and risky long-term

Assets

	t=0	t=1	t=2
Safe	-1	1	1
Risky	-1	θ_H ($\frac{1}{2}$)	θ_H
		$r\theta_L$ ($\frac{1}{2}$)	θ_L

- $r\theta_L < 1 < \theta_L < \theta_H$
- $\frac{1}{2}\left(r\theta_L + \theta_H\right) < 1 < \mathbb{E}\left(\theta\right)$

Deposit Contract

t=0	t=1	t=2
-1	$min\{c, \frac{W_1(\theta)}{\mu(\theta)}\}$	$\frac{W_2(\theta)}{1-\mu(\theta)}$

- $\mu(\theta)$: fraction of early withdrawers
- $W_t(\theta)$: bank's wealth in period t.

Information Structure

- Consumer's type is private information of the consumer.
- State θ is not observed by consumers.
- Private signal $\widetilde{\theta}_i$ of θ where

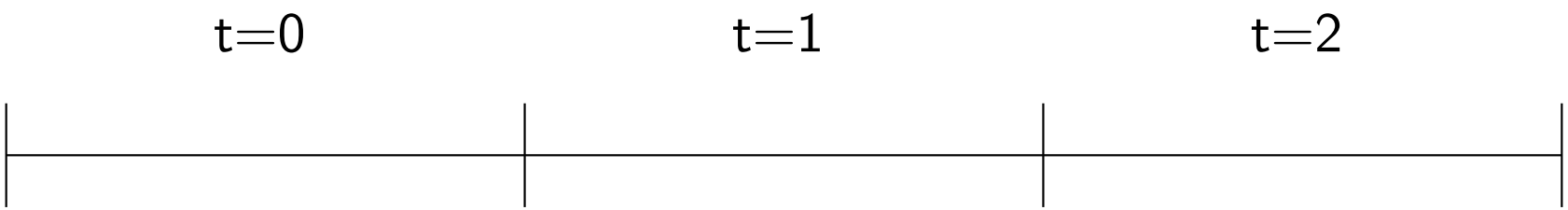
$$\Pr\left(\widetilde{\theta}_i = \theta_j | \theta = \theta_j\right) = p \text{ for all } i \text{ for } j = L, H$$

$$\Longrightarrow$$

$$\Pr\left(\theta = \theta_j | \widetilde{\theta}_i = \theta_j\right) = p$$

p is the level of **transparency** of the economy

Timing



-Deposit contract

-Portfolio choice

-Cons. type realized

-θ is realized

-Signals on θ

-Early withdrawals

-Late withdrawals

Depositor's withdrawal decision

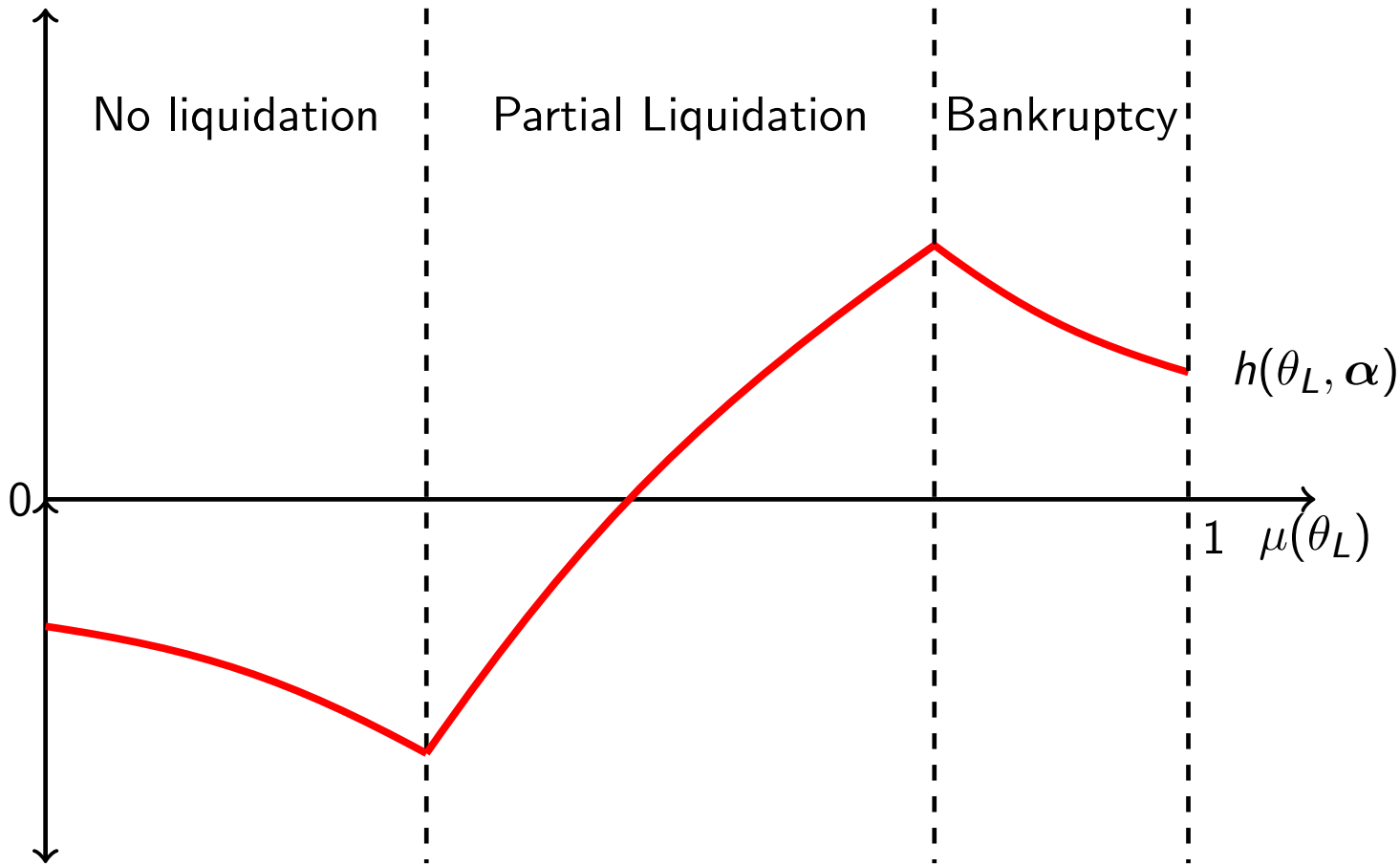
- Strategies: $\boldsymbol{\alpha} = (\alpha_L, \alpha_H)$
- The benefit from withdrawing early is

$$h(\theta_j, \boldsymbol{\alpha}) = c_1(\theta_j, \boldsymbol{\alpha}) - c_2(\theta_j, \boldsymbol{\alpha})$$

- A late consumer with signal θ_j withdraws early if and only if

$$\mathbb{E}_p(h(\theta_j, \boldsymbol{\alpha})) = ph(\theta_i, \alpha) + (1-p)h(\theta_j, \alpha) > 0$$

Benefit of withdrawing early



Liquidation costs $\Longrightarrow$ strategic complementarities in withdrawals

Multiple Equilibria

Proposition There exist pairs (c, L) such that there are multiple equilibria in the withdrawal game at $t = 1$

Equilibria set: $\mathbf{A}(c, L)$

Sunspot equilibria: Probability distribution, $\mathrm{f}_{(c,L)}$, over $\mathbf{A}(c, L)$

Bank's Problem

$$\max_{c,L\in[0,1]} \int_{\mathbf{A}(c,L)} \pi_{(c,L)}(\boldsymbol{\alpha}) \left(EU\left(c, L, \boldsymbol{\alpha}\right)\right) d\boldsymbol{\alpha}$$

- $\pi_{(c,L)}$ are the bank's beliefs
- in equilibrium $\pi_{(c,L)} = f_{(c,L)}$

- Optimal deposit contract $\lambda c^* = 1 - L^*$

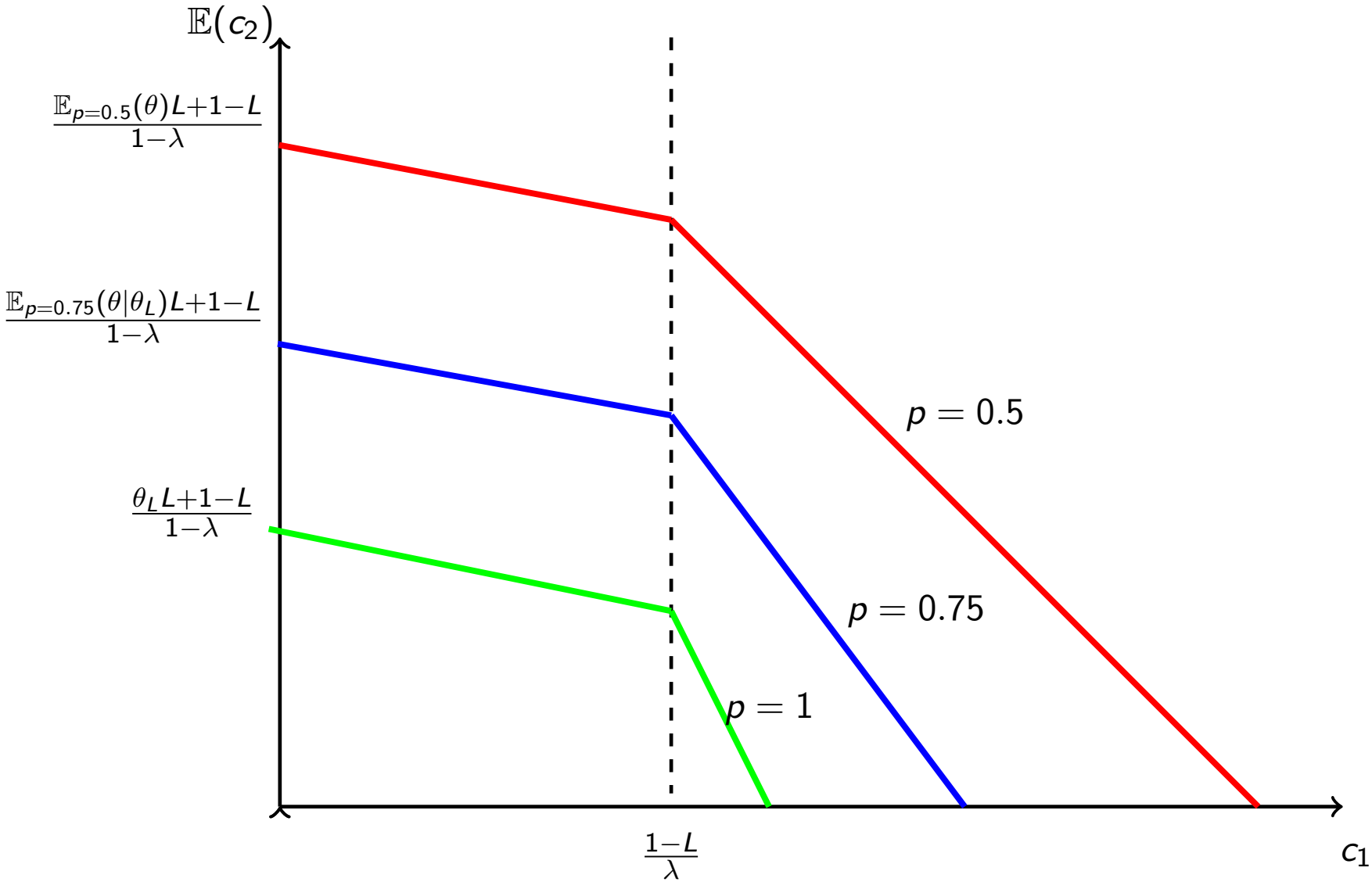
Incentive Compatible Allocation

Definition An allocation $(c_1, c_2(\cdot))$ is incentive compatible if

$$c_1 \leq \mathbb{E}\left(c_2(\theta) | \theta_i\right) \text{ for } i = L, H$$

where $\mathbb{E}\left(c_2(\theta) | \theta_i\right) = pc_2(\theta_i) + (1-p)c_2(\theta_{-i})$.

Incentive Compatible Feasible Set



Constrained Efficiency

Proposition *The constrained efficient allocation is incentive compatible if and only if*

$$p \leq \widehat{p}$$

- (c^{e*}, L^*) attains the constrained efficient allocation if there are no runs.

Transparency and Fragility

Proposition

There exists $p^* \in [0.5, \widehat{p}]$ *such that if*

$$p < p^*$$

the bank chooses the (c^{e*}, L^*) *and the economy is not fragile, i.e., there are no runs in the unique equilibrium.*

Moreover, p^* *is decreasing in* r*.*

Transparency and Welfare

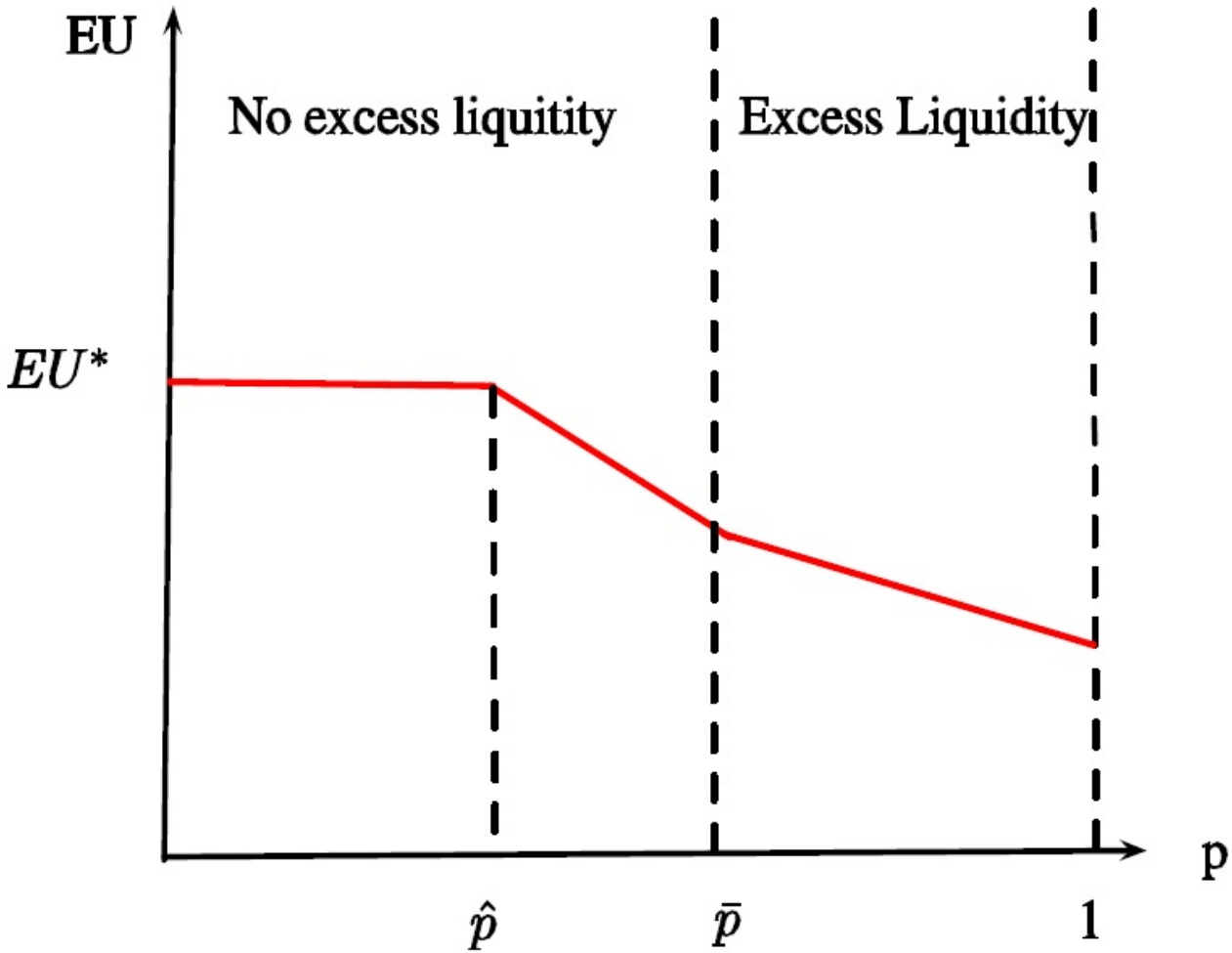


Figure: Upper bound on expected utility

Conclusion

- Transparency can be costly
  - increases fragility
  - decreases welfare
- This cost is particular to settings in which strategic complementarities are a concern
  - Not only banks! Money market funds and mutual funds, too.
- The strongest the liquidation costs involved in meeting redemptions of short term liabilities, the more relevant this channel becomes.