Discussion of "Illiquidity and Interest Rate Policy" by Diamond and Rajan

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Model

Period 0:

- Bank has 1 unit of capital
- Financed with short term debt D due in 1

Roll over

Period 1:

- Finance D with:
  - short-term loans at interest rate r, i.e. rollover: L
  - partial liquidation of $\lambda \in [0,1]$ units of capital, yields λX

$$\lambda X + L \leq D$$

Final payoff

Period 2:

Bank's payoff

$$F(1-\lambda)-rL$$

F concave function

substitute:

$$F(1-\lambda)+r\lambda X-rD$$

Optimal liquidation

If

$$\max_{\lambda \in [0,1]} \{F(1-\lambda) + r\lambda X\} \geq rD$$

optimal liquidation

$$\begin{aligned} \text{no liquidation} &: \lambda = 0 \quad \text{if} \quad r < F'(1)/X \\ \text{partial liquidation} &: F'(1-\lambda) = rX \quad \text{if} \quad r \in \left[F'(1)/X, F'(0)/X\right] \\ \text{complete liquidation} &: \lambda = 1 \quad \text{if} \quad r > F'(0)/X \end{aligned}$$

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Bankruptcy

If

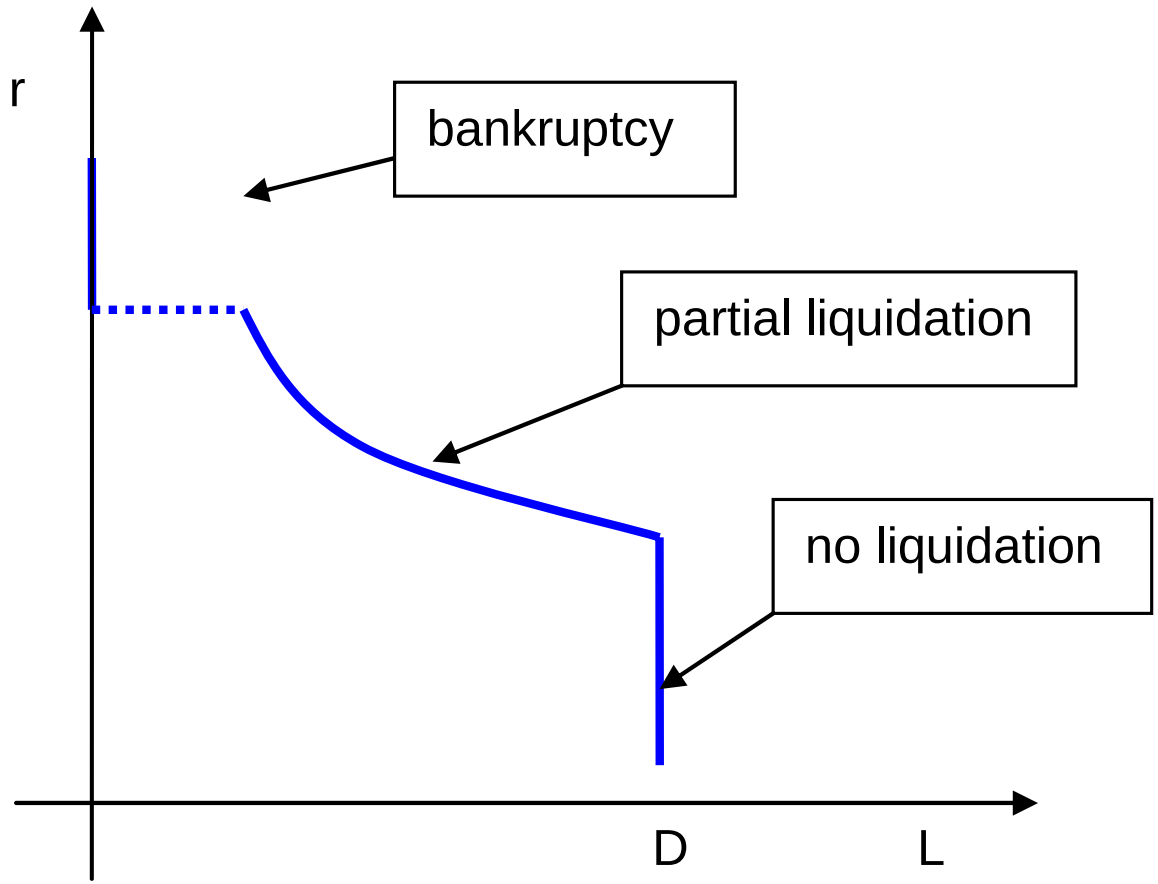
$$\max_{\lambda \in [0,1]} \{F(1-\lambda) + r\lambda X\} < rD$$

bank fails to repay and shuts down

Inefficient bankruptcy if $r < F'(0)/X$ lenders get

$$X < \frac{1}{r} \max_{\lambda \in [0,1]} \{F(1-\lambda) + r\lambda X\}$$

Demand for funds



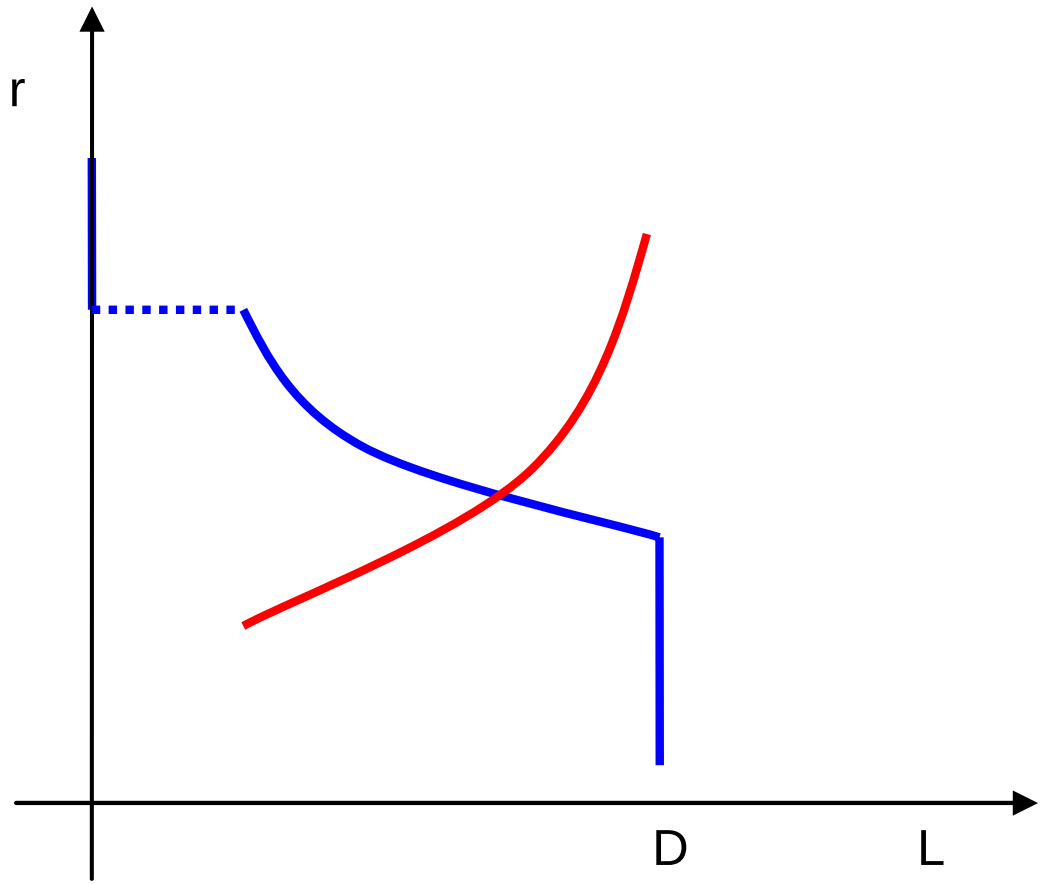
Supply of funds

Supply of funds on the short-term loans market in 1

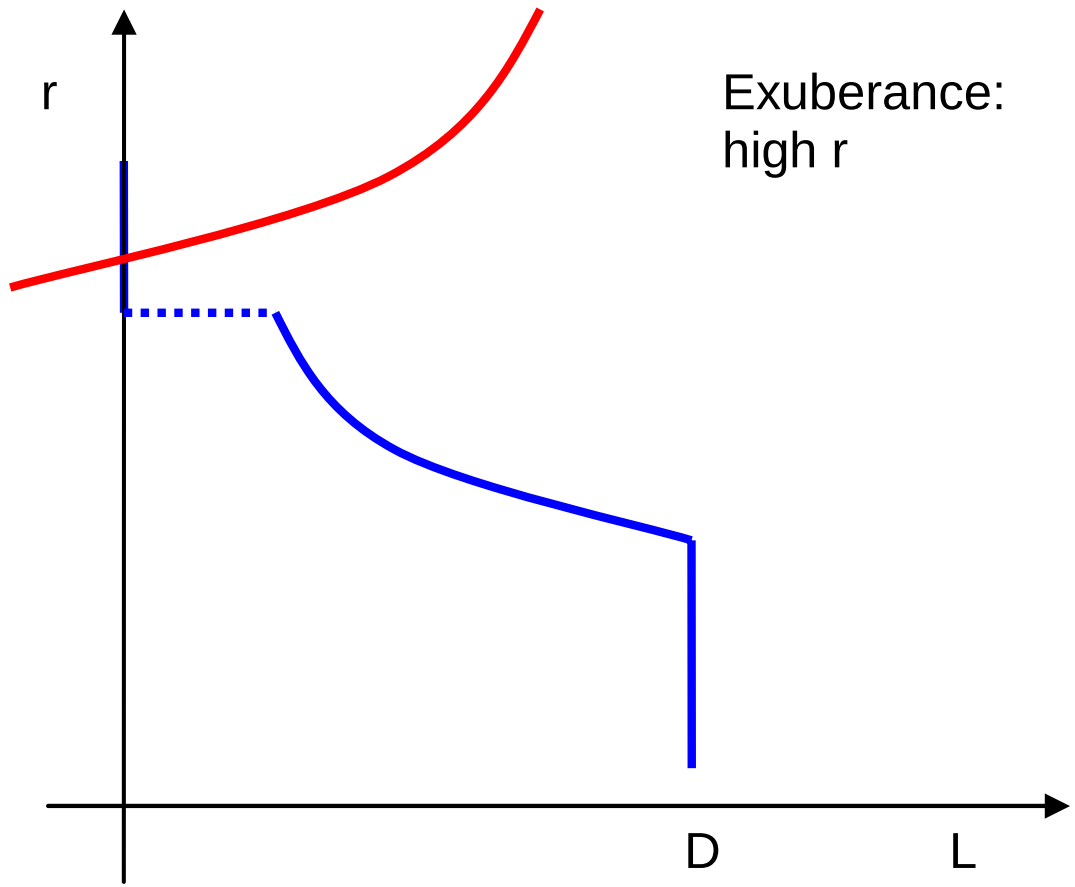
Consumers

$$\max_{L} u(e_1 - L + D) + u(e_2 + rL)$$

Equilibrium



Equilibrium



Ricardian equivalence

Government taxes consumers and lends proceedings in loans market

$$\max_L u(e_1 - L + D - \tau) + u(e_2 + rL + r\tau)$$

The net supply of funds

$$L^S(r,\tau) + \tau = L^S(r,0)$$

is independent of τ

No effect on prices and allocation

Breaking Ricardian equivalence

Introduce a borrowing constraint

$$L \geq 0$$

(interpretation: withdrawals $D - L$ bounded above by D)

Now if initial equilibrium at r^* a positive tax reduces interest rates if

$$\tau > L^S(r^*, 0)$$

as this tax makes the constraint binding

Optimal choice of D

- D not state contingent
- higher D increases probability of inefficient bankruptcy
- but increases payment to consumers in non-bankruptcy states
- equilibrium D maximizes expected payment to consumers

Moral hazard

- Government intervenes ex post to save banks in 'exuberant' state
- D adjusts up endogenously, more fragility
- possible to make everyone worse off
- moral hazard can go through pure market interventions

Monetary policy

- monetary policy: no effect of lower rates on activity (e_1)
- ok because here exuberance driven high rates can happen without recession
- benefits and dangers of interest rate interventions not driven by cyclical conditions (asset price stabilization)
- novel and important emphasis on ex ante effects (moral hazard and reverse moral hazard)