



Econ 208

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Lecture 16

Financial Intermediation



What to read

- DLS, chapter 17.3



Where are we?

- Monetary Policy
- Financial Intermediation
 - Bank Runs
 - Credit Rationing



The Equilibrium

A Good Equilibrium

- We have $d_1 < d_2$ in equilibrium
 - late consumers strictly prefer to wait
 - only early consumers prefer to withdraw in period 1



The Equilibrium

A Bad Equilibrium (Banking Panics)

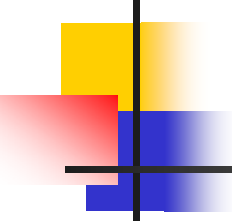
- Suppose that a late consumer believes that all other **late** consumers withdraw in period 1
- Because $d_1 > 1$, even liquidating all assets will not be enough
- Sequential Service Constraint:
 - late consumer prefers to withdraw in period 1
 - Beliefs are correct \rightarrow it is an equilibrium!



Solution#1: Suspension of convertibility

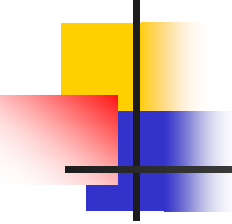
- Suppose that the bank can refuse to pay deposits in period 1 if X is exhausted
- Then waiting guarantees d_2
- Thus, no late consumers decide to run

Solution #2: Deposit Insurance

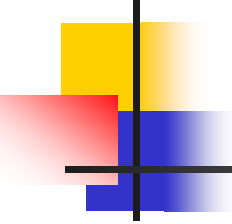


- Suppose the government guarantees that each depositor will receive d_2
 - Tax all consumers in period 1 to finance this in case bank run happens
 - Then no late consumer will withdraw in period 1 even if he believes that everyone else withdraws in period 1
 - Bank run will not occur

Solution #2: Deposit Insurance



- 1934: Federal deposit Insurance Corporation (FDIC) established
 - deposits up to \$250000 insured
 - Raised from \$100000 in 2008
 - No large banking runs on commercial banks since the Great Depression



Solution #2: Deposit Insurance

- Problems with Deposit Insurance:
 - Moral Hazard
 - Bank may take too much risk
 - If successful, profits
 - If unsuccessful, insured
 - Bear Stearns, Lehman Brothers



Where are we?

- Financial Intermediation
 - Bank Runs
 - Credit Rationing



Financial Intermediation

- One of the roles banks have:
 - Matching lenders and borrowers
 - Questions:
 - Who gets bank loans?
 - How should a bank structure a loan?
 - Why are some agents prevented from borrowing? (credit rationing)



Why is financial intermediation special?

- Moral hazard: borrowers have incentives to misbehave
 - Don't put in enough effort
 - Misrepresent the quality of a project
 - Hide revenues
- Banking contracts need to deal with the moral hazard problem
 - Leads to debt contracts and credit rationing



A model with moral hazard

- Investment projects: need 1 unit of capital to succeed
 - If successful, yields $q > 1$ units of output
 - If fails, yields zero
 - The probability of success is equal to the labor effort l .
- Moral hazard: the labor effort can only be observed by the entrepreneur



A model with moral hazard

- Preferences over consumption and labor effort

$$c - \frac{q l^2}{\alpha 2}$$

- Agents differ in their wealth a
 - Some ("poor agents") will demand a loan, some ("rich agents") will not
- Agents can also save at rate r



Rich agents

- $a > 1$
- Invest 1 unit in the project, save the rest
- Choose labor effort l to maximize

$$[lq + (1 - q) * 0 + (1 + r)(a - 1)] - \frac{q}{\alpha} \frac{l^2}{2}$$

- Solution:

$$l^* = \alpha$$



Poor Agents

- $a < 1$
- Invest a in the project, **borrow $1-a$**
- A **Debt Contract**: Charge X if the project succeeds, 0 if it fails
 - Moral hazard: cannot condition on the labor effort



Poor agents

- Given X , poor agents choose labor effort to maximize

$$[l(q - X) + (1 - q) * 0] - \frac{q}{\alpha} \frac{l^2}{2}$$

- Solution:

$$l^*(X) = \alpha \left(1 - \frac{X}{q}\right)$$

- Decreasing in X !



Financial Intermediaries

- Zero expected profits

$$l^*(X)X + (1 - l^*(X)) * 0 - (1 + r)(1 - a) = 0$$

$$\alpha X \left(1 - \frac{X}{q}\right) - (1 + r)(1 - a) = 0$$

- Solution for X:

$$X(a) = \frac{q - \sqrt{q^2 - 4 \frac{q}{\alpha} (1 - a)}}{2}$$



Financial Intermediaries

- Let $a^*(r)$ be

$$a^*(r) = 1 - \frac{\alpha q}{4(1+r)}$$

- If $a < a^*(r)$ then the agent will never get a loan
 - Credit rationing!



Financial Intermediaries

- In equilibrium, three classes of agents
 - $a < a^*(r)$: forced savers, credit rationed
 - $a^*(r) < a < 1$: borrowers
 - $a > 1$ savers, self finance a project