



Econ 208

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Lecture 14

Monetary Policy in the Short Run

Financial Intermediation



What to read

- DLS, chapter 19
- DLS, chapter 17.4



Where are we?

- **Monetary Economics**
 - Money Supply
 - Money Demand
 - Long-Run effects of Monetary Policy
 - **Short-Run effects of Monetary Policy**
- Financial Intermediation



Monetary Policy and the Phillips Curve

- What are the features of a sound monetary policy?
 - Ability to commit
 - E.g. independent central bankers



Monetary Policy and the Phillips Curve

- Phillips Curve

$$u = u^* + \gamma(\pi^e - \pi) + \varepsilon$$

- How does (should) central bank choose inflation?

- Objective function:

$$V = -u^2 - \pi^2$$

- Fed Objectives: "...maximum employment, stable prices..."



Monetary Policy and the Phillips Curve

Fixed expectations

- Suppose that expectations are exogenously given by π^e
- Fed's problem

$$\max_{\pi} = -[u^* + \gamma(\pi^e - \pi)]^2 - \pi^2$$

- Solution:

$$\pi^*(\pi^e) = \frac{\gamma}{1 + \gamma^2} u^* + \frac{\gamma^2}{1 + \gamma^2} \pi^e$$



Inflationary Expectations

- Two alternatives of how inflation expectations are formed:
 1. Central bank cannot commit to a particular target
 2. Central bank can commit
- Main result:
 - The equilibrium inflation are very different!
 - Equilibrium unemployment is **the same**



Nixon vs Burns (1972)

- I know there's the myth of the autonomous Fed... [short laugh] and when you go up for confirmation some Senator may ask you about your friendship with the President. Appearances are going to be important.....
 - Richard Nixon to Arthur Burns



Nixon vs Burns (1972)

Table 2
Growth Rates for M1, M2, and Real GDP

<i>Year</i>	<i>M1 Growth</i>	<i>M2 Growth</i>	<i>Real GDP growth rate</i>
1970	4.51%	7.36%	2.8%
1971	6.77%	13.38%	3.5%
1972	7.56% ^a	11.65% ^a	7.7%

^aGrowth rate for the first half of the year at an annualized rate.

Sources: Federal Reserve of St. Louis website at <http://research.stlouisfed.org/fred2/> and author's calculations.

Table 3
Consumer Price Index Inflation Rate

<i>Year</i>	<i>Inflation rate</i>
1969	6.2%
1970	5.3%
1971	3.3% (wage and price controls initiated in August 1971)
1972	3.6% (wage and price controls in effect for full year)
1973	9.6% (wage and price controls removed in stages during 1973)
1974	11.8%
1975	6.7%



Inflationary Expectations

Central Bank Cannot Commit

- After inflationary expectations are set, the central bank can pick any inflation
 - No commitment to a pre-specified target
- In equilibrium, $\pi^e = \pi$

$$\pi^* = \gamma u^*$$

$$u = u^*$$

- High Inflation



Inflationary Expectations

Central Bank Can Commit

- The central bank can commit to a pre-specified target
- The central bank chooses

$$\pi^* = 0$$

$$u = u^*$$

- Zero Inflation, the same unemployment!



Inflationary Expectations

- Lessons Learned

- Commitment to low inflation is key in achieving it
 - If not, temptation to increase inflation is expected, and preempted
- More generally, successful disinflations need to set inflation expectations low
 - Successful example: German Hyperinflation
 - Unsuccessful example: USA 1979-1982



Where are we?

- Monetary Policy
- Financial Intermediation
 - Bank Runs



Financial Intermediation

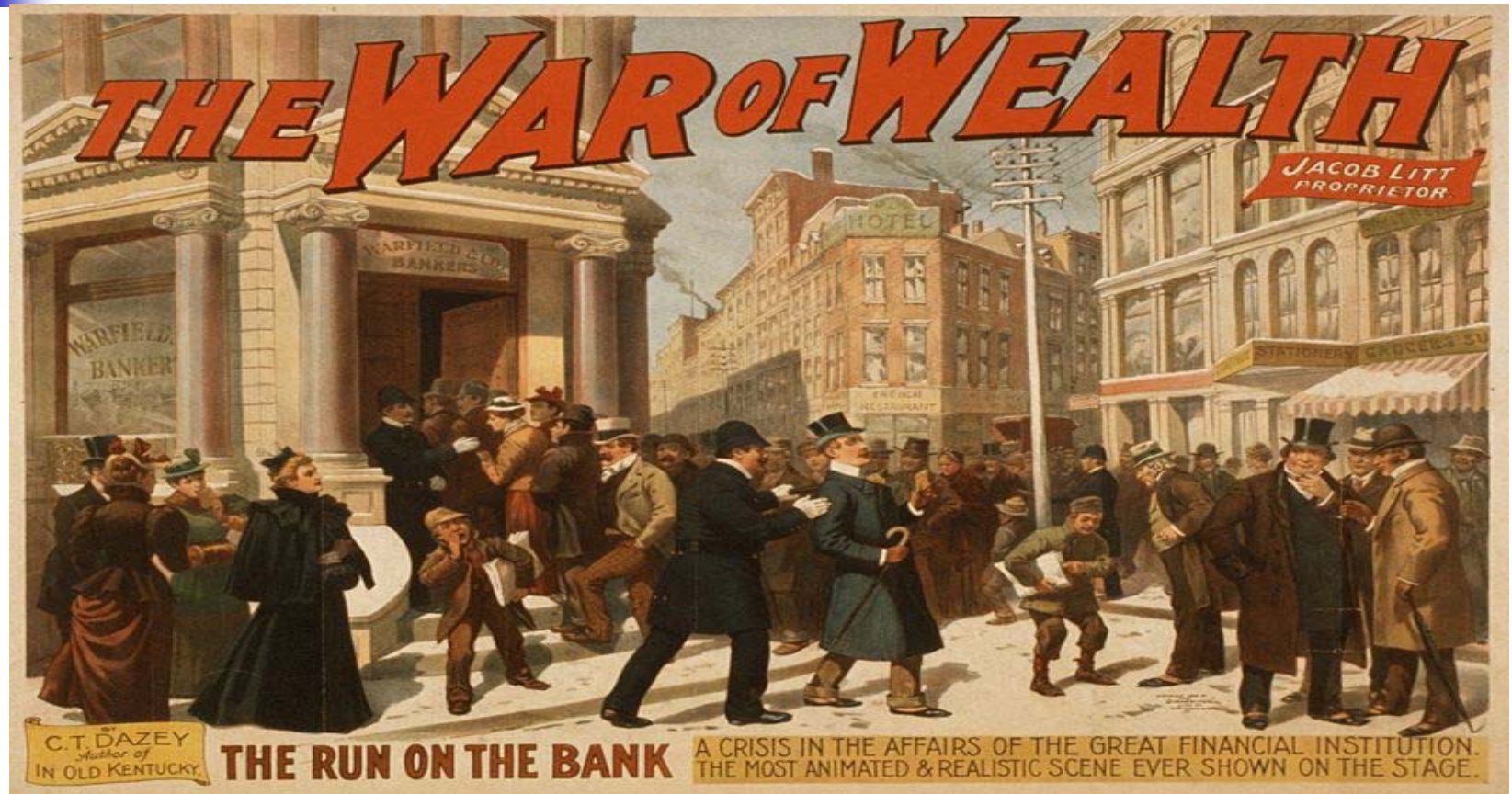
- Financial Intermediation has several roles:
 - Matching borrowers and lenders
 - Monitoring of loans
 - Matching liquid deposits and illiquid loans
- Today, we will focus on the third role



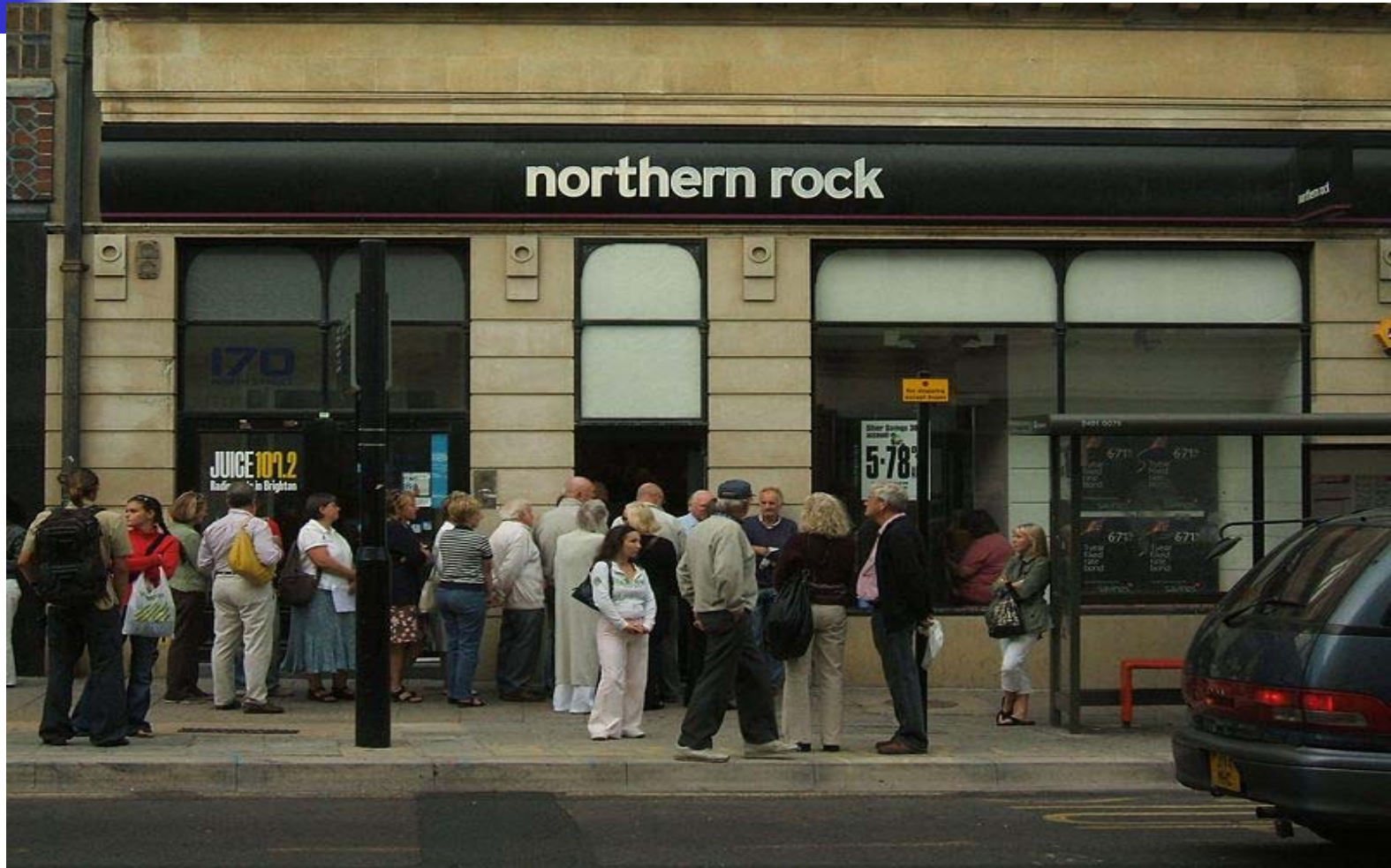
Bank Runs

- Two types of effects
 - Monetary effects: money multiplier decreases
 - Real effects: output decreases
- Why real effects?
 - Banks are forced to liquidate loans prematurely
- Questions about real effects
 - Is the banking system inherently unstable?
 - Are there any tools to prevent banking crises?

Bank Runs



Bank Runs





Bank Runs in the United States (and England)

- Recurrent Banking panics:
 - 1873, 1884, 1890, 1893, 1907
 - 1933: 1/3 of all depository institutions failed
 - 2007-2008:
 - Northern Rock, Bear Stearns
 - Lehman Brothers?



Liquid Deposits vs. Illiquid Loans

- Problems: If everyone wants to withdraw, there is not enough resources (Sequential Service Constraint)
 - If everyone runs, incentives to run
 - If nobody else runs, no incentive to run
 - Bank runs can be self enforcing
- Potential Resolutions
 - Bank Holidays
 - Deposit insurance



The Model

- 3 periods: 0, 1 and 2
- N consumers, N is very large
 - Endowed with 1 unit of good in period 0
- Production technology
 - 1 unit of good invested in period 0 yields
 - a) nothing in period 1 and $1 + r$ units in period 2, or
 - b) 1 unit in period 1 and nothing in period 2 (interrupted production)
- Goods can also be stored from period 1 to period 2
- No consumption in period 0 – invest everything



The Model

- Some people want to consume early (period 1, early consumers), some later (period 2, late consumers)
- Probabilities
 - Early: θ
 - Late: $1 - \theta$
- No utility from consumption in the "wrong" period
- The type revealed only at the beginning of period 1



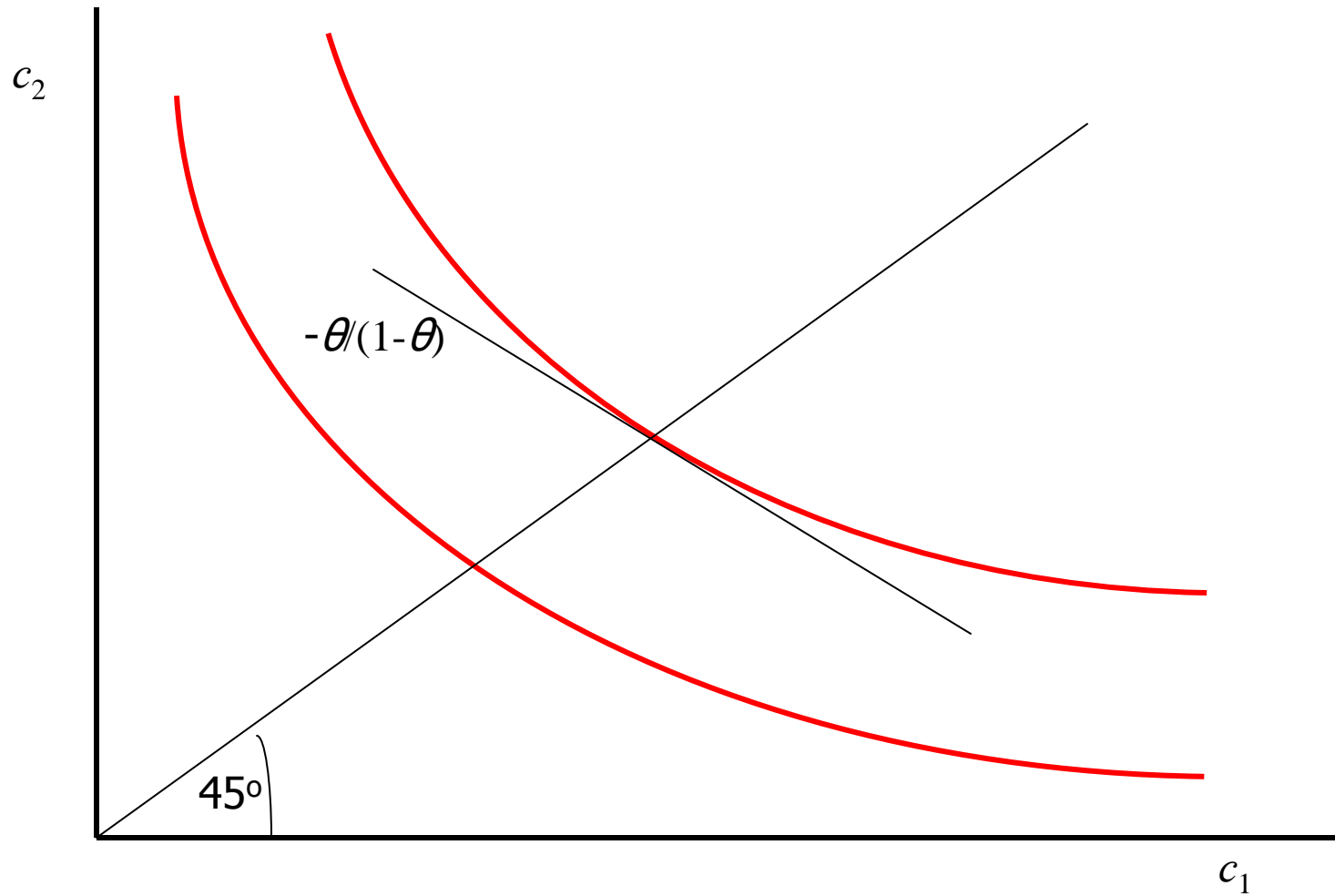
Consumers

- expected utility

$$\theta U(c_1) + (1 - \theta)U(c_2)$$

- c_1 : consumption if in period 1
- c_2 : consumption if in period 2
- Total number of early consumers: $N\theta$
- Total number of late consumers: $N(1-\theta)$

Consumer's Preferences





No Banking

- Each consumer invest on his own
- If he needs to consume early, he interrupts his production
- expected utility

$$\theta U(1) + (1 - \theta)U(1 + r)$$



Banking

- A bank offers a deposit contract:
 - withdraw d_1 units in period 1 or
 - withdraw d_2 units in period 2
- The bank needs to
 - choose the banking contract (d_1, d_2)
 - choose resources X to withdraw in period 1
 - make sure that it is in the interest of late consumers to wait:

$$d_1 \leq d_2$$



Bank's Problem

- Let $x = (X/N)$ be a fraction of investment to be interrupted
- Bank's decision problem

$$\max_{X, d_1, d_2} [\theta U(d_1) + (1 - \theta)U(d_2)]$$

s.t.

$$\theta d_1 = x$$

$$(1 - \theta)d_2 = (1 - x)(1 + r)$$

$$d_1 \leq d_2$$

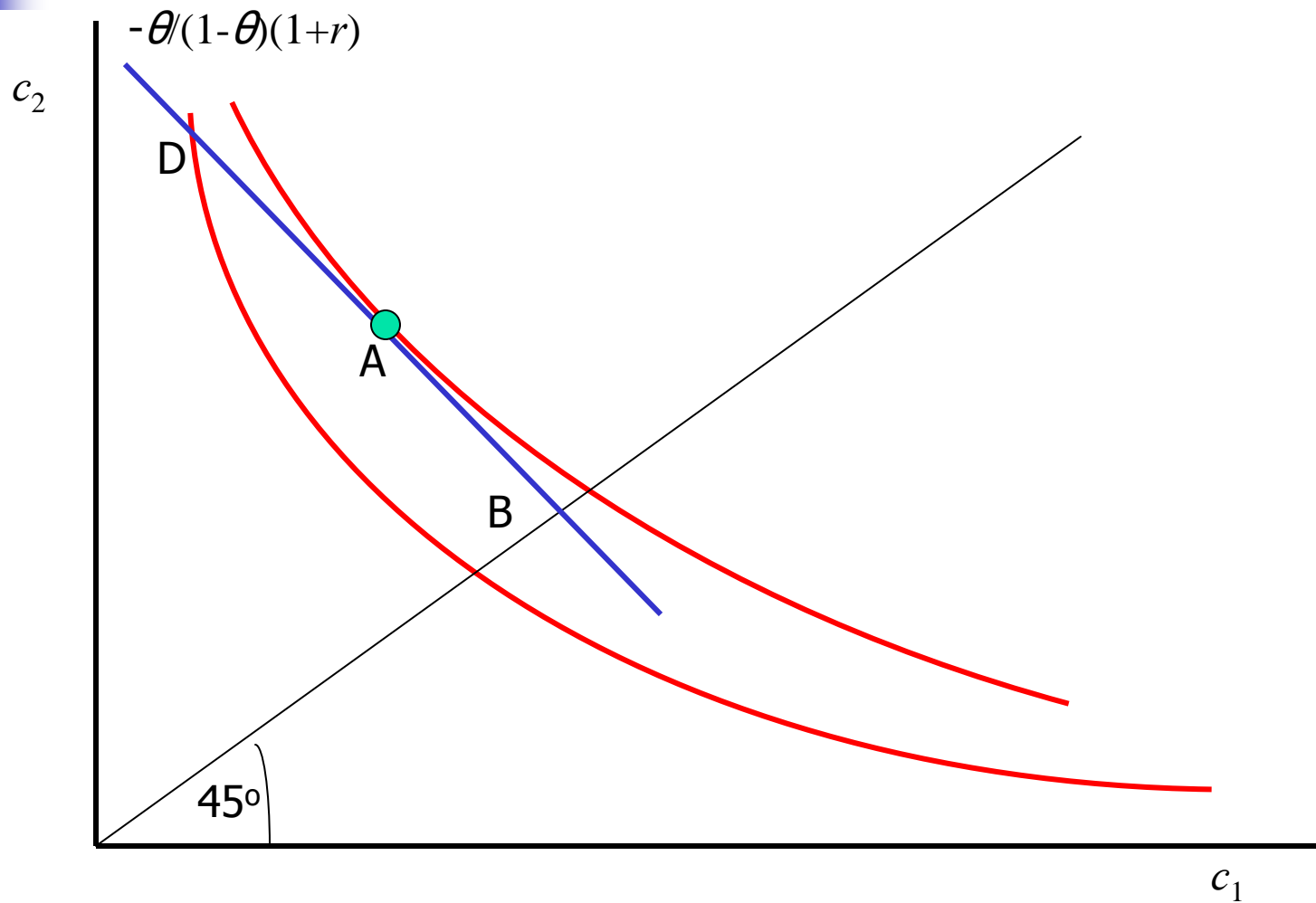


Bank's Problem

- Eliminate x to get bank's budget constraint

$$d_2 = -\frac{\theta}{1-\theta}(1+r)d_1 + \frac{1+r}{1-\theta}$$

Optimal Contract





Optimal Contract

- First Order Condition:

$$U'(d_1) = (1+r)U'\left(\frac{1+r}{1-\theta} - \frac{\theta}{1-\theta}(1+r)d_1\right)$$

- If $-cU''(c)/U'(c) > 1$ then
 - One can show that $d_1 > 1$ and $d_2 < 1+r$
 - Bank provides insurance against the shock



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 → 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 a rate of return $1+r$
- 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 if bank run happens to finance this
 - 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



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

Solution #2: Deposit Insurance



- 1934: Federal deposit Insurance Corporation (FDIC) established
 - deposits up to \$100000 (currently) insured
 - no large banking panics since then....