Monday, 9/12

Lecture 6

Econ 4905, Fall 2016

Some Financial News

- ZLB
- Stock market drop
- Major US stock market indexes
  - Dow Industrials (3)
  - S&P 500
  - S&P Total Stock Market (5000)
  - NASDAQ
  - Others from US and elsewhere?

Housing, Mortgages, Tax Policy, and the Financial Meltdown

- Misallocation
- Subsidies, regulation
- GSEs
  - Fannie Mae
    - (Federal National Mortgage Association)
  - Freddy Mac
    - (The Federal Home Loan Mortgage Corporation)

Bank runs: Review of DD

- Three periods: *T = 0, 1, 2*
- A single good
- A continuum of agents with measure 1
- Each agent is endowed with 1 unit of the good in period 0.

The Model: Asset Return

$$
\begin{array}{ccc}
T=0 & T=1 & T=2 \\
 & \begin{cases} 0 & R \\ 1 & 0 \end{cases} & \\
-1 & &
\end{array}
$$

The Model: Preferences

- In period 0, all agents are identical.
- In period 1, some agents become “patient” and others become “impatient.” (private information)
- $$\begin{cases} u(c_1) & \text{if impatient} \\ u(c_2) & \text{if patient} \end{cases}$$
- The probability of being impatient is λ for each agent in period 0.
- The proportion (the measure) of impatient consumers in period 1 is also λ.

Autarky

- Autarky:
  - Utility of the impatient in period 1: $u(1)$
  - Utility of the patient in period 2: $u(R)$
  - Expected utility in period 0: $\lambda u(1) + (1 - \lambda)u(R)$

- $1 < R$
  - Insurance against the liquidity shock is desirable.

Banking Economy

- Banks offers demand deposit contract (d_1, d_2)
- Agents
  - make deposits in period 0.
  - withdraw d_1 in period 1.
  - or withdraw d_2 in period 2.
- free-entry banking sector: (d_1, d_2) maximizes the depositor's expected utility.

Optimal Deposit Contract

$$\max_{d_1, d_2} \{\lambda u(d_1) + (1-\lambda) u(d_2)\}$$

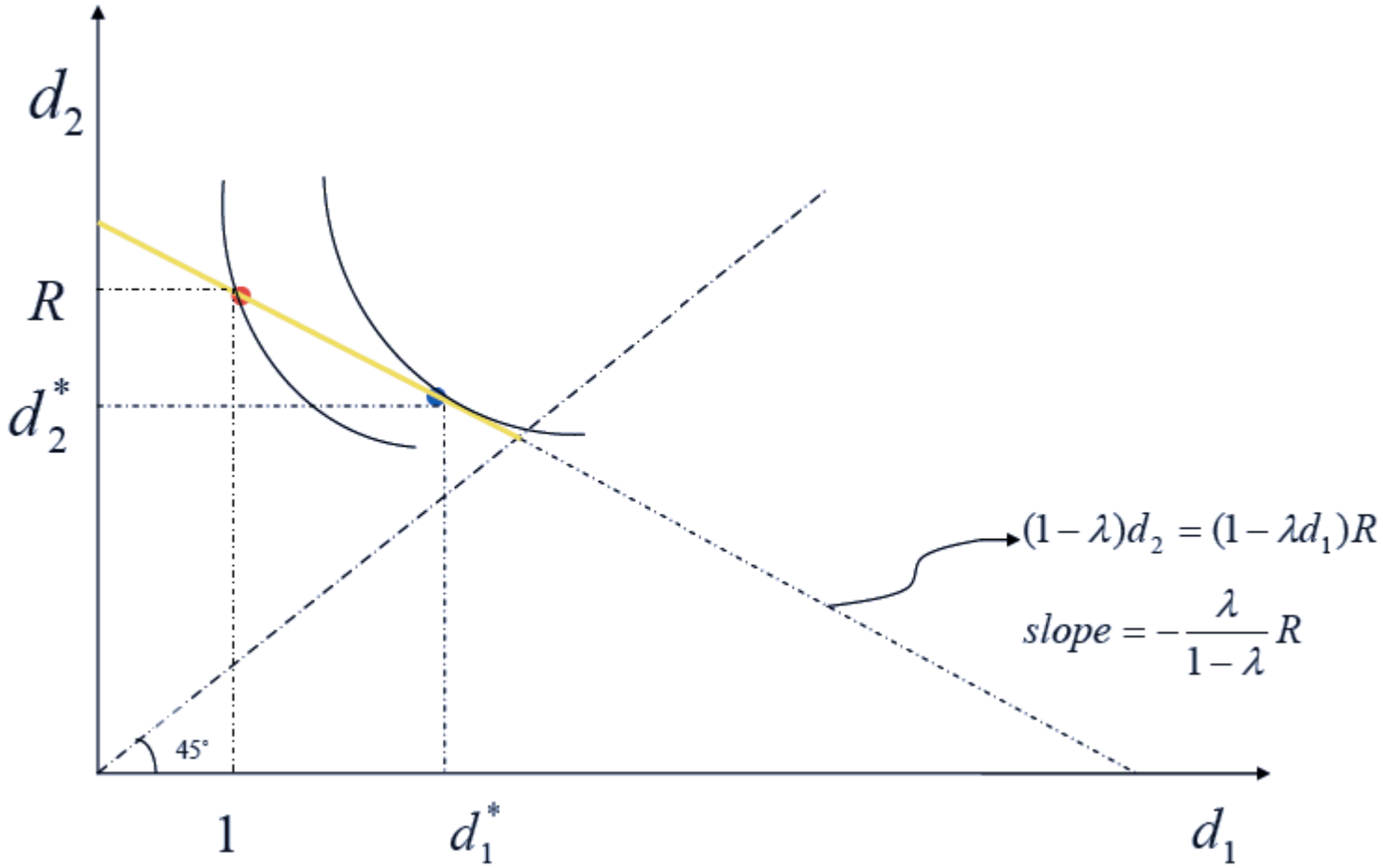
$$\text{such that} \quad \underbrace{(1-\lambda) d_2}_{\text{withdrawals in period 2}} \leq \underbrace{(1-\lambda d_1) R}_{\text{resources in period 2}} \qquad (RC)$$

$$d_1 \leq d_2 \qquad (IC)$$

The Unconstrained Optimal Banking Contract

- Assumes (for the moment) that a consumer's type is **public** knowledge in period 1
- So that IC does not bind
- We solve for the **unconstrained optimal deposit contract** (misleadingly referred to by DD as "the optimal contract")

Optimal Deposit Contract



What do Banks Do?

- $u'(d_1^*)/u'(d_2^*) = R$
- $u'' < 0 \quad \Rightarrow \quad d_1^* < d_2^*$
- CRRA: $u(c) = \dfrac{c^{1-\gamma}}{1-\gamma}$
  - $u'(c) = c^{-\gamma} \quad \Rightarrow \quad u'(d_1)/u'(d_2) = (d_2/d_1)^{\gamma}$
  - If $\gamma = 1 \quad \Rightarrow \quad d_1^* = 1,\ d_2^* = R$
  - If $\gamma > 1 \quad \Rightarrow \quad 1 < d_1^* < d_2^* < R$
- The unconstrained optimal contract can be decentralized uniquely if there is public knowledge of types in period 1. The teller will not make payments in period 1 to patient depositors.
  - Impatient receives d_1^* in period 1
  - Patient receives d_2^* in period 2

The Constrained Banking Contract

- Consumer types are private knowledge. IC binds.
- Test the DD “optimal contract” in the private knowledge bank. There are 2 outcomes:
  - The non-run equilibrium as in the public knowledge case
  - The bank run equilibrium

- Criticism: If the run probability *s* is non-zero, then the DD contract in non-optimal. The contract should be more conservative as *s* increases.

Why Do Bank Runs Occur?

- $\gamma > 1 \quad \Rightarrow \quad 1 < d_1^* < d_2^* < R$
- IC: $d_1 \leq d_2$
- Expectation: Only the impatient depositors withdraw in period 1.
- A patient depositor can $\begin{cases} \text{get } d_2^* \text{ if he withdraws in period 2} \\ \text{get } d_1^* \text{ if he withdraws in period 1} \end{cases}$

Why Do Bank Runs Occur? (Continued)

- $\gamma > 1 \quad \Rightarrow \quad 1 < d_1^* < d_2^* < R$
- Expectation: *All* other depositors demand withdrawal in period 1.
- A patient depositor can

$$\begin{cases} \text{get } \textit{nothing} \text{ if he withdraws in period 2} \\ \text{get } d_1^* \text{ with probability } 1/d_1^* \text{ if he withdraws in period 1} \end{cases}$$

Improvements on DD

- Sequential Service Constraint, Neil Wallace
- Partial Suspension of Convertibility, Neil Wallace

- Sunspots, Runs, and the Optimal Banking Contract
  - Jim Peck & Karl Shell
  - Yu Zhang and Karl Shell

Cornell/ Penn State Macroeconomics Workshop

- **All-day Saturday & all-morning Sunday, October 1 & 2**
- **Weill Hall**