Bank Risk

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Are banks special?

- A bank is an example of a financial intermediary (asset transformer)
  - insurance companies transform illiquid assets into illiquid (state-contingent) liabilities
  - pension funds transform illiquid assets into illiquid (time-contingent) liabilities
  - banks transform illiquid assets into liquid (demandable) liabilities

- So, banks appear to be special only in so far as their liabilities form a part of the money supply
Are banks fragile?

- Just because banks are “special” does not necessarily imply that they need to be regulated differently

- Intervention is usually justified on the grounds that banks are “fragile” and that their failure results in negative externalities
  - e.g., when a bank fails, the money supply (bank liabilities) contracts
  - so, like a negative money supply shock – leads to a contraction in output (via deflation and nominal debt channel)

- “Fragile” refers to the possibility of a bank failing for nonfundamental reasons (like a self-fulfilling prophesy)
Demand deposit liabilities

- When you make a deposit in a bank, or when a bank (creates) and lends you money, you are granted the right to withdraw your money on demand (in the form of cash)

- Demandable liabilities are a very short-term and liquid form of debt

- A bank’s assets are typical long-term and illiquid (e.g., mortgages)
  - this is sometimes called “maturity mismatch”
  - sounds like a bad thing, but is the *raison d’etre* of banking
Bank runs

• Maturity mismatch opens the door for a bank run
  – if all depositors want to withdraw their money, the bank may be forced to borrow and/or sell off its assets very quickly
  – but because assets are illiquid, the bank may have to sell at “firesale” prices (heavily discounted)
  – will quick sales, the bank may not have enough money to meet withdrawal demand, leading to bankruptcy

• The situation is like a coordination game, with two Nash equilibria (explain)
A simple model of demand deposit banking

- A constant population of 3-period-lived individuals (young, middle-aged, and old)

- Young are endowed with $y$ units of output

- Individuals want to consume either in middle-age or when old (young do not wish to consume)
  - hence, early and late consumers
  - assume that “type” is unknown when young, but all know that there is a 50-50 chance of either type occurring
• Moreover, assume that type is private information

• The young can invest in two available assets: storage (or money) and capital

• Storage earns a real gross return of $n$ per period

• Capital earns a real gross return equal to $x^2$ ($x > n$) if it is held for two periods
  
  – if capital is liquidated (sold) before it matures, it returns $x - \theta < n$

  – interpret $\theta$ as a liquidation cost
Efficient risk-sharing...

- If an individual young person invests on his/her own, then it will be prudent to save some of $y$ in the form of storage (money) and some in the form of capital.

- But this is inefficient from a social perspective (liquidation is costly).

- Consider the role of a bank that takes in $N\cdot y$ deposits in exchange for a demandable liability that promises a rate of return equal to $n$ if held short-term, and a return of $x^2$ if held long-term.

- To finance this promise, the bank invests $1/2$ of its deposits in storage, and $1/2$ in capital.
• Early consumers get \( ny \) and late consumers get \( x^2y \) – no liquidation costs incurred

• Note: the liability has to be made demandable because agent type is private information (and must therefore be self-reported)

**Bank run equilibria**

• Suppose you turn out to be a “patient” agent, but hear a rumor that all depositors are going to withdraw early

  – what should you do?
• If the rumor is true, and if you do not withdraw, you will get zero

• Suppose you believe the rumor is true...then it makes sense to withdraw (liquidate)

• Now repeat this logic for all agents
  – it will be individually (but not collectively) rational to run the bank

• This is the sense in which a bank may be “fragile”

• However, maybe banks are not fragile at all – much of what happens during a financial crisis can also be interpreted as a fundamental shock to the value of asset portfolios
Preventing bank runs

1. Interbank lending. It is possible for a troubled bank to borrow from other banks on the interbank market for loans. But if all banks are subject to a run, a “bank panic” ensues. Possible role for the central bank to serve as a lender-of-last resort

2. Identifying unnecessary withdrawals. In such circumstances, banks have sometimes asked for evidence of cash needs (e.g., to meet payroll, or other obligation). Obviously, this is costly and imperfect.

3. Suspension of withdrawals. Banks have frequently suspended withdrawals during a run. Technically, this eliminates the bank run equilibrium. In reality, however, the policy is not without costs (disruption of payments system).
4. Government deposit insurance. Following creation of FDIC in 1933, there have been no retail-level bank runs in the U.S. (recent crisis occurred in the wholesale banking sector – the shadow banking sector). Possible cost: moral hazard.

5. Capital requirements. In our model – force banks to hold a larger fraction of their assets in the form of storage (cash). This may be necessary to combat the motive for excessive risk-taking generated by moral hazard. But cannot go too far – after all, this is the business of banking.