Fall 2008
International Corporate Finance I

LECTURE 10

Banking Crisis and Regulatory Responses

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Bank as a supplier of liquidity

- Diamond and Dybvig (1983), Journal of Political Economy
- Three periods（t＝0，１，２）
  - t＝0： Firm makes an investment to long (two) term business project.
  - t＝1： If the project is liqudiated, the payoff to unit investment will be 1. So the rate or return is zero.
  - t＝2： If the project continues until t=2, it will payout 2.25.

- There are 100 risk-averse investors. Each investor makes an unit investment. Total amount of initial investment is 100.
  - Early Consumer: $U^E = C^E(1)^{1/2}$
  - Late Consumer: $U^L = 0.6 \cdot \{C^L(1)+C^L(2)\}^{1/2}$
  - t=0: Investor/household does not know his/her type.
  - t=1: With the prob. of 40%, becomes an early consumer.
  - t=2: Remaining 60%, will consume.

Two solutions of the model

- No bank solution of the model
  - A benchmark case.
- Expected utility at t=0, E(U)

= Expected utility if become an early consumer
+ Expected utility if become a late consumer

$= 0.4 \cdot (1)^{1/2} + 0.6 \cdot 0.6 \cdot (2.25)^{1/2}$

$= 0.94$

Introducing a bank as a supplier of liquidity

- Bank sets t=1 payoff to an early consumers to 1.1, instead of 1.0.
- The amount of payoff from projects continued until t=2 must be 100－40･1.1＝56.
- The bank payoff to a late consumer will be: (56･2.25)／60＝2.1
- $E(U)=0.4 \cdot (1.1)^{1/2} + 0.6 \cdot 0.6 \cdot (2.1)^{1/2} = 0.9412$
- Expected utility increased by consumption smoothing

Solution of the model with a bank is Nash equilibrium

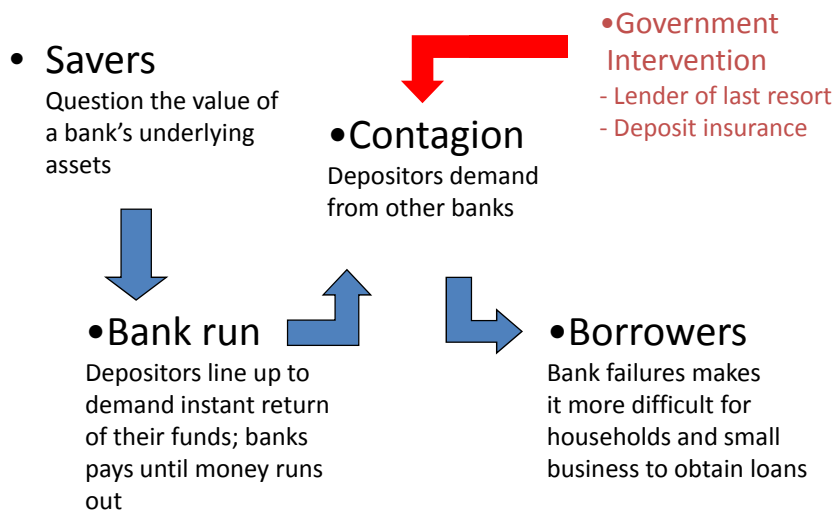
- Definition of Nash equilibrium
  1. Given other players choices, a player's choice is his best possible response.
  2. Condition 1 applies to all players.
- Let's check: It is obvious for E-consumers.
  - L-consumers
  - Choice1 "Wait until t=2": $0.6 \cdot (2.1)^{1/2} = 0.8695$
  - Choice2 "Withdraw at t=1": $0.6 \cdot (1.1)^{1/2} = 0.6293$
  - "Choice1 > Choice 2" as long as all other L-consumers choose Choice1. So it is Nash.

But, there also exists another bad Nash equilibrium

- Suppose all other L-types will choose Choice 2: "Withdraw at t=1"
  - Choice1 "Wait until t=2": Zero
  - Choice2 "Withdraw at t=1"
    - Sequential withdrawal: Rush to the bank!
    - First 90 people: 1.1 (as promised)
    - 91th: 1.0
    - 92th to 100th: Nothing
- Bad equilibrium with Bank Run

- Bank-run equilibrium is self-fulfilling. To eliminate bad Nash equilibrium in this model, we need further assumption.
- How can we get rid of a bad, Bank-run equilibrium?
  - Set t=1 payoff equal to 1.0.
  - However, then the merit of the bank as a supplier of liquidity disappears.

Bank runs to banking panic



Other ways to eliminate Bank-run Nash equilibrium

- The central bank as a lender of last resort.
- Introduce deposit insurance.
- Possible side effect of such measures
  - Banks' moral hazard: Banks lose incentives to monitor borrower and for risk management.
  - Depositors also lose their incentives to monitor banks.

Safety net vs moral hazard

- Historically, banking panics were very costly for aggregate economic activity. So safe net is very important.
  - Bank run and banking panic
- However, safety net causes moral hazard of banks and depositors.
- Such moral hazard will increase tax payers' costs.

1930s: US economy in the Great Depression

- Backgrounds
  - Slow down of exports
  - Stock market crash in 1929
  - Stagnation of agricultural prices
    - Weak banking sector because of agricultural lending.
- Waves of banking panics hit US financial system in 1930-33
  - No of commercial banks: 25,000 → 15,000
  - GNP: 50% decline. Unemployment rate: 25% in 1932.
- Banking panics finally stopped by Roosevelt's bank holiday

Decision of nonbank public

- Money supply = Currency + Deposit
- C/D = Currency/Deposit ratio
  - Wealth increase: C/D falls
  - Interest rate goes up: C/D falls
  - Riskiness of deposits: C/D falls
  - Annominity value of cash: C/D rises

Bank behavior and the determination of money supply

- Money supply = Currency + Deposit
- R/D = Reserve/Deposit ratio
  - Interest rate goes up: R/D falls
  - Variability of deposit outflows: R/D rises
- Monetary Base (B) = C+R
- Money supply
  = money multiplier x monetary base

$$M = \frac{1+C/D}{C/D + R/D} B$$

Figure 15.1
The currency–deposit ratio and the reserve–deposit ratio in the Great Depression
During the Great Depression people worried about the safety of their money in banks and increased the ratio of currency in circulation to deposits. In anticipation of possible bank runs banks increased the ratio of reserves to deposits.

Source: Milton Friedman and Anna Schwartz, *A Monetary History of the United States, 1867–1960*: Currency—Table A-1, column (1); deposits, total commercial banks (demand and time)—Table A-1, column (4); bank reserves—Table A-2, column (3).

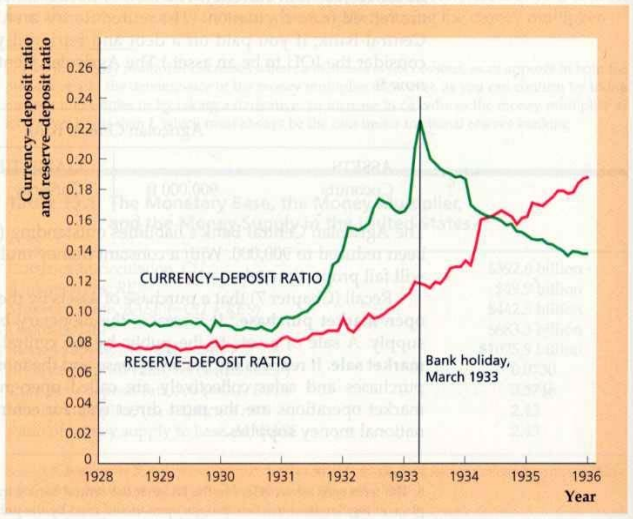
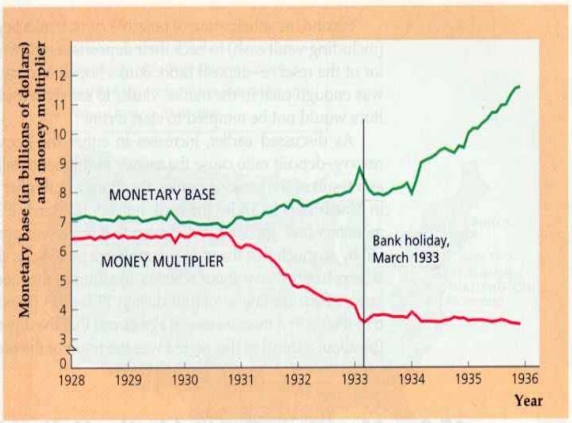


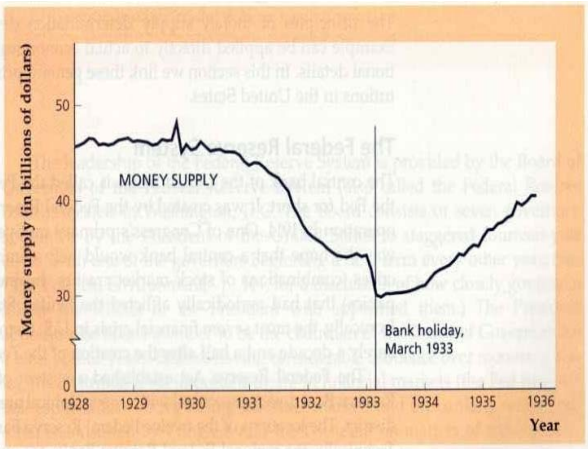
Figure 15.2
Monetary variables in the Great Depression
(a) As a result of the increases in the currency–deposit ratio and the reserve–deposit ratio, the money multiplier fell sharply during the Great Depression. The monetary base rose during the Great Depression.
(b) Although the monetary base rose during the Great Depression, the money multiplier fell so much that the money supply—the product of the money multiplier and the monetary base—declined sharply.

Source: Milton Friedman and



(a) The monetary base and the money multiplier in the Great Depression

Anna Schwartz, *A Monetary History of the United States, 1867–1960*: Currency—Table A-1, column (1); deposits, total commercial banks (demand and time)—Table A-1, column (4); bank reserves—Table A-2, column (3); base = currency + reserves; money multiplier = (currency + deposits) / base; money = currency + deposits.



(b) The money supply in the Great Depression

Costs of safety net

- Origin of deposit insurance in the US
  - Banking panics and the Great Depression in 1930s.
  - Other countries (such as Japan) followed US.
- S&L（or thrifts）example
  - Established in 1930s to promote mortgage lending.
  - Hold long-term, fixed-rate mortgages and financed by short-term deposits.
  - Financial innovations in 1970s: Disintermediation
  - High inflation rate and tight monetary policy (Volker deflation) raised interest rate very sharply.
  - Interest rate control is abolished.

S&L crisis

- Deregulations in 1980s
  - Direct investments to real estates
  - Investments to junk bonds
  - Broader coverage of deposit insurance
- Moral hazard problem got worse. The cost of closing insolvent S&L quickly escalated.
- By 1986, the deposit insurance for S&Ls (FSLIC) were wiped out.

Japan in late 1990s to 2000s

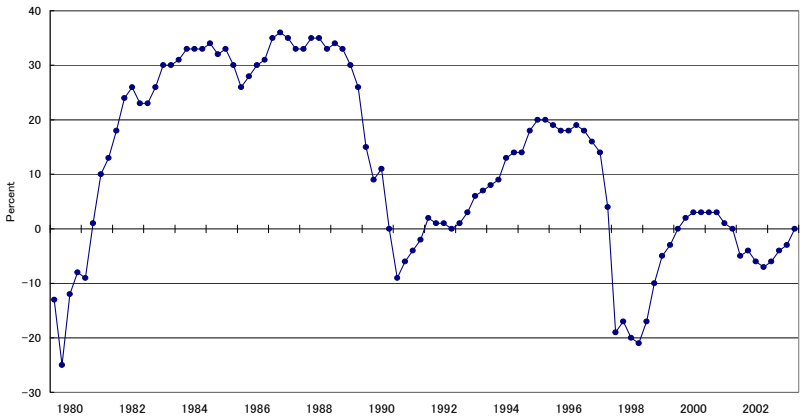
Japanese economy: 1997-1999

- 1997
  - April: Increase of consumption tax: from 3% to 5%
  - Summer: Asian currency crisis started
  - November-December: Banking panics
    - Hokkaido-Takusyoku Bank (Among the biggest regional banks)
    - Yamaichi Securities Co. (Among the big four)
- 1998 and 1999
  - Credit crunch
  - Slow down of the real economy and deflation
  - Zero-interest rate policy by BoJ
  - Two of long-term credit banks disappeared
  - Mergeres of major banks started

Was there credit crunch?

- In general, NO. Exception is late 1997 and 1998
- Before 1997: “Evergreening Loans”
  - Additional lending to effectively insolvent firms.
  - Manipulation to avoid losses on the bank’s balance sheet.
  - The funds that should had been spent to more productive investments were used to let Zombie firms to survive.
  - Evergreening loans = Zombie lending

BoJ's business survey on the bank's attitude toward lendings: "Easy" – "Tough"



Increase of bank borrowing (%)

	Construction	Real Estates	Other sectors
• 1991-1997	3.73	5.68	1.66
• 1998-2002	-4.23	-7.81	-3.95
• 1991-2002	0.41	0.06	-0.68

Restructuring of Japanese firms in 1990s and 2000s

- Compared with 1960s and 70s
  - Best borrowers have swithed to capiatl market: bank's portfolio is concentrated to small and/or troubled firms.
  - No of non-performing loans were much more.
  - In some sense, banks themselves are insiders of non-performing problem
  - Bank's balance sheet was already suffering from substantuial damage
- Banks could not be an arbitrager or a judge.
  - Cf. Mazda's case in 1970s

Shinsei bank's case (1): Initial stage

- Long-term Credit bank (LTCB) was already insolvent.
- Incentive of the government (ruling party LDP): Protecting existing borrower firms = Keep lending to those firms.
- LTCB went bankrupt and nationalized. Then, auctioned.
  - Many non-performing loans were left untouched even after nationalization.
  - Enough time and information for due diligence were not provided.
  - Many potential buyers dropped out from the bidding of LTCB (JP Morgan, Sumitomo Trust among others)

Shinsei bank's case (2): Lipplewood

- Lipplewood: Then unkown American private equity (restructuring fund).
- MoF added a put option that if more than 20% loss was realized, the government buybacks the non-performing loan.
- Lipplewood considered this as a satisfactory complement to buy LTCB.

Shinsei bank's case (3): Collision of business customs

- Japanese government and businesses were expecting new bank (Shinsei bank) to act along Japanese conventional business custom
  - Roll over existing loans to existing borrowers
  - Do not exercise put option on no-performing loans.
- However, Shinsei bank soon exercised put option in Sogo department store case.

Shinsei bank's case (4): Restructuring Sogo department store

- Main bank was Industrial Bank of Japan (IBJ).
- IBJ's strategy: Avoid radical resturcturing.
- Other Japanese banks were in similar situations in their borrower firms cases. So agreed with IBJ to avoid retaliations.
- Shinsei bank did not have such constraints.

Incentives and restructuring scheme of Japanese banks

- Fundamental strategy: Do nothing radical.
  - Wait and pray, spring might come.
- This strategy is sustainable only if all banks are facing similar situations so that have similar incentives.
- If some major player did not participate, the scheme will collapse.
- This scheme makes banks balance sheet eroding gradually.

Public financial institutions: IRCJ

- Industrial Revitalization Corporation Japan
- Establishment of IRCJ was a really successful promotion of restructuring business in Japan.
- The intervention of IRCJ has been limited
- Its assessment is very close to the one in market-based restructuring.
- IRCJ will not be a problem
  - Its tenure is predetermined. Will be gone by 2008.
  - IRCJ people do not have incentives to be soft on zombies.

Public financial institutions: DBJ

- DBJ is more heavily involved in restructuring than IRCJ, in terms of the amount of money they have provided and the number of cases they have dealt.
- But, DBJ has been involved mostly as one of the participants in the scheme.
  - The DBJ has been a major supplier of funds to newly established distressed funds and consortiums in Japan.
- DBJ might be potentially more important, but potentially more problematic
  - Survival of its own organization
  - More vulnerable to political pressure

Role of public financial institutions: Restructuring of Kanebo (1)

- Kanebo: One of largest spinning companies before WWIII
- In high growth era, Kanebo sold real estates and entered into new businesses.
- Oil crisis in 70s: President Junji Ito took very labor-friendly stance and avoided layoffs.
- By late 1990s: typical too-diversified firm.

Case of Kanebo (2): Kao's buyout attempt

- Kao wanted to buy Kanebo's cosmetic division only.
- After all, this was the only solution for Kanebo.
- However, Kanebo declined the offer blaming for strong opposition from labor union.
- Finally, Kanebo decided to go IRCJ.

Case of Kanebo (3): IRCJ's assessment

- IRCJ's assesment was far less favorable to Kanebo than they had been expected.
  - It is not very different from Kao's proposal.
  - Kanebo's management had to resign.
  - IRCJ split the firm to new cosmetic company and remaining.

Lessons from case studies (1)

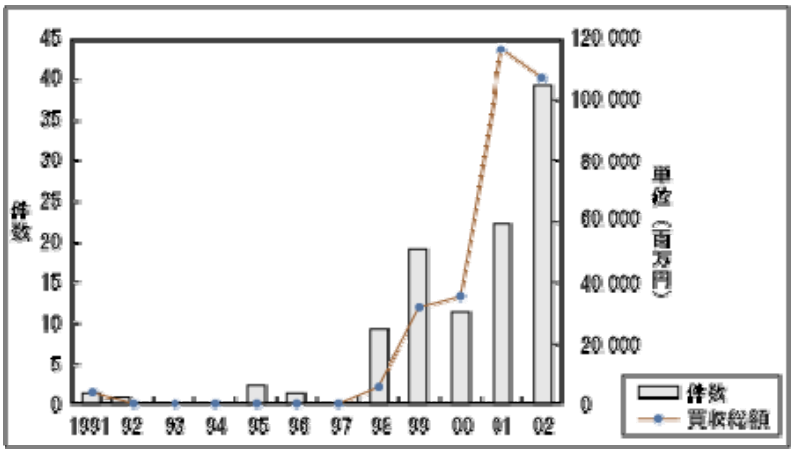
- Need a third party who has not been involved in tangled long-term relationships.
  - Ripplewood for LTCB/Shinsei
  - IRCJ for Kanebo
  - Renault for Nissan
- It requires a third party for the breach of trust among insiders (Shleifer and Summers, 1988).

Lessons from case studies (2)

- Generous bail out scheme by public financial institutions will be in the expense of:
  - tax payers
  - healthy competitors
- We need government interventions only when there is obvious market failure

Increasing buyouts in Japan

left scale (bar graph): Numbers
right scale (line graph): Amount in million yen



Policy suggestions

- Restructuring business in Japan is rapidly increasing. So don't worry.
- Limit the government intervention. Because it might crowd out private restructuring activity.