An Economic Analysis of Banking Regulation

In this chapter we use asymmetric information (leading to adverse selection and moral hazard) to study the effects of banking regulations. We study 8 categories of banking regulation.

Government safety net: Deposit insurance

Restrictions on Asset Holding

Bank Capital Requirements

Bank (Prudential) Supervision: Chartering and Examination

Assessment of Risk Management

Information Disclosure Requirements

Restrictions on Competition

Government safety net: Deposit insurance (FDIC and 中央存款保險公司)

I. Theories of Bank Runs (擠兌)

Random Withdrawal Risk: A run can occur based on self-fulfilling beliefs, implying that the banking system is inherently unstable.

Information-based Runs: A run occurs when depositors observe a signal correlated with the value of banking system assets (indicators of recession, decline of net worth of a particular class of bank borrowers). This fragility is intensified by the fear that banks invest in assets which are opaque, illiquid, non-marketable, and containing private information (asymmetric information).

Some Implications on the theory of information-based runs:

1. Since banks operate on a "**sequential service constraint**" (a first-come, first-served basis), those depositors who monitor their bank more closely would get to the bank earlier when a bad signal arrives and recover their funds in full, while the losses suffered by late-coming depositors are the penalty they must pay for neglecting monitoring. Thus, the possibility of bank runs gives incentives for depositors to monitor.

2. When a bank becomes terminally ill, a bank run can drive the bank into default very quickly and take away the control of the management. Otherwise, the managers who no longer have enough incentives to manage its remaining properties, might sell off the assets in a hurry at lower prices ("fire sale"), bet on take an even greater risk bet, or commit fraudulent conducts. Therefore, it would not be undesirable that the "panicky" depositors race each other for demanding redemption, and this is in fact an essential feature of the bank's efficient liquidation. Thus, runs on banks may be viewed as a form of monitoring and an optimal response (Calomiris and Gorton (1994)).

3. Chari and Jagannathan (1988) argue that uninformed agents learn the state of the bank only by observing the line at the bank. If there happens to be a long line at the bank, more depositors will join in to withdraw. Thus, runs on banks as a means of market discipline may be imperfect.

II. Bank Panics

No matter what the cause of bank runs is, it is widely believed that bank runs are contagious, that is, a run on one or a few (may be insolvent) banks can trigger off runs on other (otherwise liquid and solvent) banks. According to this view, bank runs on an

individual or a few banks can spread like infectious diseases or forest fires and shatter confidence in the banking system and ultimately provoke a system-wide run, or a bank panic. Thus, the banking system is susceptible to **systemic risk**.

We say that a **bank panic** occurs when bank debt-holders of many banks suddenly demand that banks convert their debt claims into cash at par to such a extent that banks **suspend convertibility** of their debt into cash. Because it is believed that bank run contagion is a major feature of the historical record, the widespread fear of bank runs makes the public and regulators to consider bank runs an evil to be avoided at any cost.

In the U.S., major bank panics occurred every 20 years or so in 1819, 1837, 1857, 1873, 1884, 1893, 1907, and 1930-33.

The argument for bank run contagion can be divided into two categories:

(1) Pyramiding and web of interbank transactions and payment clearing, leading to a chain of liquidity squeeze between creditor-debtor banks. This may be due to regional economic problems (agricultural disaster or regional recession), or some financial institutions are heavily exposed to credit risk.

(2) Due to asymmetric information, depositors lack information about the quality of their banks' assets. Upon observing a bank failure, a depositor is unable to tell whether his own bank is financially sound. If the two banks are similar in some ways, this may cause depositors at other banks to suspect their own banks' soundness and decide to run on their own bank as well. Since banks operate on a "sequential service constraint," depositors have strong incentives to show up at the bank as early as possible. When many depositors react the same way, this leads to bank runs on both insolvent and solvent banks.

III. Evidence on the Cause of Bank Runs

1. Evidence from the National Banking System (1863-1913) indicates that periods of bank failures were associated with **macroeconomic instability** (Bernanke (1983), Gorton (1988), and Kaufman (1994)).

2. Studies by Saunders and Wilson (1996) covering 1929-1933 and Calomiris and Mason (1997) concentrating on June 1932 Chicago banking panic both find strong contagion effects. Moreover, they also stress the significant role of **economic shocks** and thus they support the information hypothesis of bank runs.

3. Park (1991) argues that a review of bank panics in US history supports the importance of **bank-specific information**. He finds that the government or banks have stopped widespread bank runs mainly by providing information about banks' solvency rather than liquidity.

He also finds evidence that **clearing house loan certificates** and suspension can convey bank-specific information to depositors and succeed in tranquilizing bank runs and contain contagious effect, while **equalization of reserves**, implemented only once in 1873, fails to stop the run because equalization of reserves is an arrangement to ask sound banks to share problems with problem banks. The public knew that some banks are in trouble. When they learned that all banks shared the problems by pooling reserves, depositors conjectured that the entire banking system would become fragile. This conjecture prompted system-wide bank runs.

4. Countries with banking systems offering the same debt contracts did not experience the same occurrence bank panics. Empirical research has identified the **institutional structure** such as branch banking laws, bank cooperation arrangements, and formal clearing houses, for the probability of panic and the resolution of crisis. Cross-country comparisons lead to the conclusion that bank panics are not inherent in banking contracts, rather, institutional structure matters. Bordo (1985) and Williamson (1989) attribute a large part of US bank failures to the absence of branch banking

(institutional factor). Canada experienced no panic after 1830s. Canada allowed nationwide branch banking (number of banks was in 40s in 19th century and falls to 10 in 1929). Suspension of convertibility did not occur. (During 19th and early 20th centuries the American banking system suspended convertibility 8 times). During crisis, the largest bank in Scotland acted as a leader and the Bank of Montreal in Canada acted as a lender of the last resort. Failure rates and their costs were much lower. In US failure rate during 1870-1909 was 0.36%, while in Canada, was 0.1%.

5. Institutional arrangement that affect the likelihood and severity of panics:

(1) During Scottish free banking era, banks form large networks and enter voluntary coinsurance arrangement.

(2) Starting 1853 **clearing houses associations** (CHA) was originated by banks in New York City. The clearing houses clear liabilities, respond to panics, act as lender of the last resort, issue private money, provide deposit insurance, audit risk-taking activities, set capital requirement and penalize members who violate rules. During panics, it issues **clearing house loan certificates** in small denominations which are a liability of the association. This brand name effect did actually contain some of the bank panics. In 1913, Congress created the **Federal Reserve System**, which is a federal clearing system modeled on the many private clearing houses that had sprung up across US.

6. What are more likely to trigger runs nowadays?

(1) Runs on managed liabilities (large CDs, interbank loans, commercial papers, Repos): Sudden withdrawal of large CDs, fail to roll over commercial papers and Repos, etc.

(2) Losses on derivatives trading.

IV. Deposit Insurance

Given that bank assets are opaque (asymmetric information), when some banks have losses on loans or other investments due to an adverse shock, depositors may not be able to tell whether their own banks are good or bad. Furthermore, since bank operate on a sequential service constraint, depositors realize that they may not be able to get back all their depositors if they are last in line. Thus, depositors have a strong incentive to show up at banks as early as possible. This uncertainty about the health of the banking system in general may lead to runs on banks both good and bad.

The purpose of deposit insurance is to short-circuits bank failures and contagion effect. Banks pay deposit insurance premium to the insurer (FDIC in US and 中央存款保險公司 in Taiwan) and depositors are insured up to a certain limit in case the bank fails. There are two main methods to handle a bank failure:

(1) Payoff method

(2) Purchase and assumption method: This is equivalent to guaranteeing all liabilities and deposits.

V. Other Forms of Safety Net

Besides deposit insurance, some governments often provide liquidity to banks when they face runs (**lender of last resort**) or immediately extend deposit insurance to all deposits (**complete insurance**), or even guarantee **non-deposit liabilities**. For example, in Taiwan all troubled banks are merged to public banks or taken over by the government (中央存款保險公司 or 金融重建基金), thereby guaranteeing all deposits and other bank creditors ("government guarantee").

If the government is unable to pre-commit (Time-inconsistency problem) its pre-announced policy, this creates an "implicit guarantee." Either explicit or implicit **government guarantee**:

(1) leads to "over-lending syndrome" and the weakness of financial institutions,

particularly in economies where lending and borrowing are primarily dependent upon the value of collateralized asset (Higgins and Osler (1997), Corsetti et al. (1999)); and

(2) helps explain the severity of the moral hazard problem in the financial sector and the huge boom-bust cycle of asset prices in East Asian countries (Krugman (1998), Kim and Lee (1998)).

VI. Moral Hazard

1. With deposit insurance (or even "government guarantee"), depositors have no incentives to impose market discipline on their banks by withdrawing deposits when they perceive that the bank is taking too much risk. Therefore, banks with a government safety net have an incentive to take on greater risks. A most likely result is that taxpayers pay off the bill.

2. Flat deposit insurance premia allow riskier banks to take advantage of the protection of deposit insurance. The structure of differential deposit insurance premia must be able to effectively differentiate the risk born by banks.

VII. Adverse Selection

Risk-lovers will find banking industry an attractive business. Problem banks tend to raise deposit interest rate to attract more deposits, increasing the costs of good banks. Since depositors are insured (or even guaranteed), they will deposit at banks that offer the highest deposit rate. Good banks will suffer deposit outflows.

Even worse, outright crooks will also find banking attractive because insured depositors have no incentive to monitor their banks, and it is easy for them to get away with fraud and embezzlement.

VIII. Too Big to Fail

The failure of a very large financial institution makes it more likely to trigger a major financial disruption, and thus financial regulators tend to be reluctant to allow a big institution to fail. For example, FDIC guarantees all deposits and bond debts when Continental Illinois became insolvent in 1984, and Bear Stern was sold to JPMorgan Chase with a bailout by the Federal Reserve in 2008 .

If the government (central bank) provides guarantees of repayment to large depositors and uninsured creditors (bondholders) of large banks, depositors and creditors of big financial institutions know that these big institutions are guaranteed, and thus they have no incentive to monitor. This increases moral hazard incentives for big financial institutions. The consequence of too-big-to-fail is that big financial institutions take on even greater risks, thereby making bank failures more likely.

Moreover, **financial consolidation** creates more mega size financial institutions. These larger and more complex financial organizations challenge financial regulation;
(1) Increased “too big to fail” problem
(2) Extends safety net to new activities, increasing incentives for risk taking in these areas.

IX. Forbearance Policy and Forbearance Lending in Japan

Forbearance policy or buy-time policy by government in Japan during 1990-1997

(1) Reflect a false hope that the economy would soon recover and buoy up the banks (Nishimura (1999)).

(2) Introduce **Prompt Corrective Action** in 1998, but at the same time injecting public money, declaring full deposit and bank debenture guarantee, and relaxing accounting rules for capital requirement.

(3) Government promotes credit–guarantee scheme. Banks are allowed to attach a zero-risk weight to government guarantee loans.

By the way, “Hot Air Balloon” Policy and “Extend Loans on Raining Days” Policy in Taiwan

(1) Subsidized housing loan program for first-time home buyer

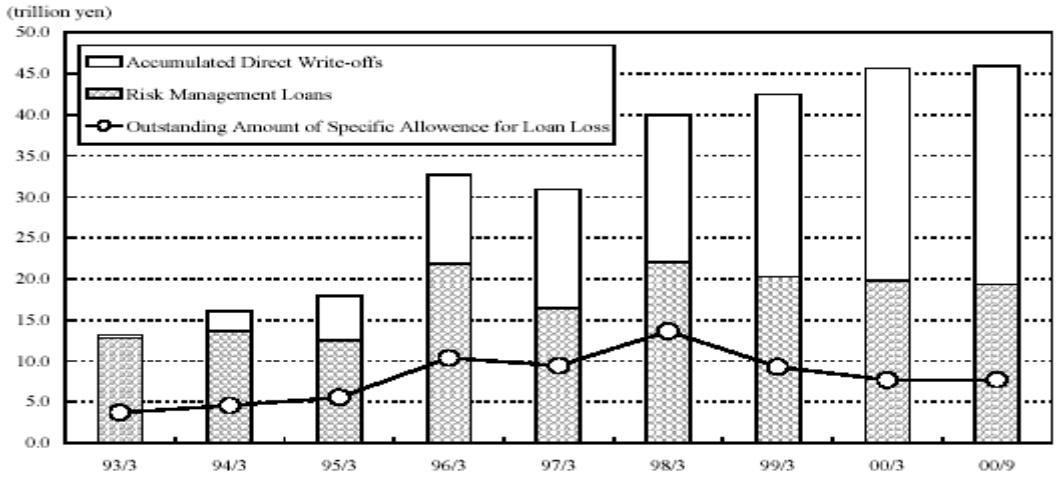
(2) Jawboning: ask banks to continue to extend loans.

Tokyo Kyowa Credit Cooperative and Anzen Credit Cooperative were found insolvent in spring of 1993, but were not closed until the end of 1994. During March 1992 and Nov. 1994, the deposits and lending of both cooperatives nearly doubled. Most of the new loans became non-performing (Cargill et al. (1997)).

The forbearance policy by Japanese government implicitly encouraged **forbearance lending** by Japanese financial institutions.

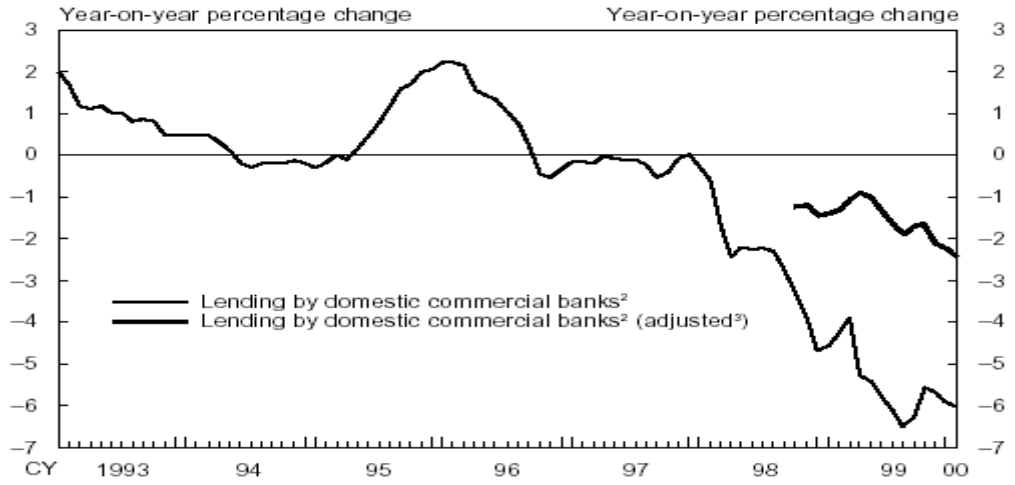
Okina and Shiratsuka (2001) and Mori et al. (2001): Even though the amount of Japanese banks non-performing loans rose significantly after the stock and real estate prices crashed in the early 1990s, financial institutions continued to lend to unprofitable firms in order to prevent loan losses from materializing.

Fig. 1　Non-Performing Loans in Japan



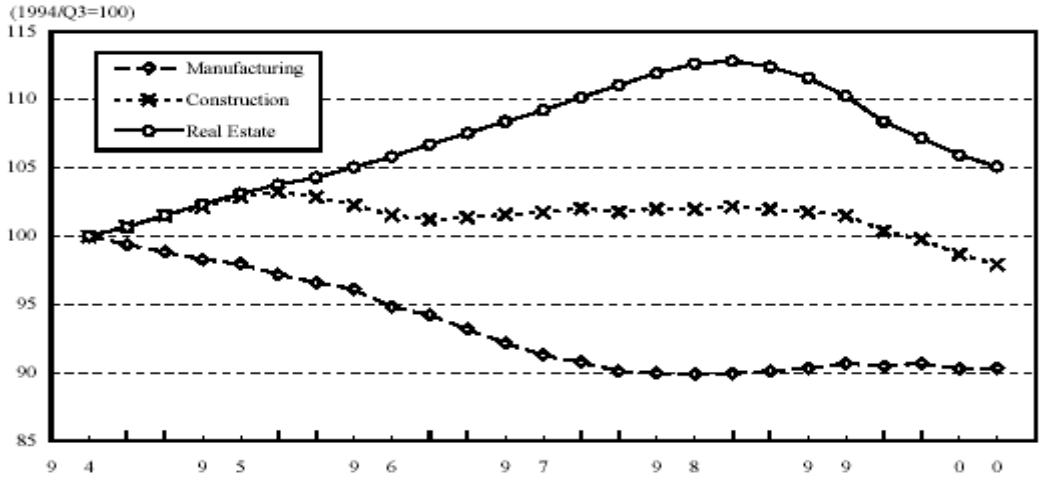
Source: Okina and Shiratsuka (2001): According to the new standards in 1997, Risk Management Loans comprise of Past Due Loans in arrears by 3 months or more, and Restructured Loans with changes in terms and conditions, as well as loans to borrowers in legal bankruptcy. According to the previous standards, Past Due Loans and Restructured Loans comprise only those loans in arrears by 6 months or more or those whose interest rate has been reduced below the official discount rate..

Fig. 2　Lending by Domestic Commercial Banks in Japan



Source: Mori et al. (2001).

Fig. 3　Bank Lending to Real-Estate Related Industries in Japan



Source: Okina et al.(2001).

Restrictions on Asset Holding

Even without government safety net, banks have incentives to take on too much risk. Since most small depositors are incapable of monitoring their banks, this provides a rationale for government regulation on reducing banks' risk-taking.

1. Promote diversification (貸款關係人限制)

2. Restrict holdings of risky asset (common stocks)

Bank Capital Requirements

1. Minimum leverage ratio

2. Basel Accord: risk-based capital requirements

Bank (Prudential) Supervision: Chartering and Examination

1. Chartering (screening of proposals to open new banks) to prevent adverse selection.

2. Examinations (scheduled and unscheduled) to monitor capital requirements and restrictions on asset holding to prevent moral hazard

CAMELS ratings (Capital adequacy, Asset quality, Management, Earnings, Liquidity, Sensitivity to market risk). The scale is from 1 to 5 with 1 being strongest and 5 being weakest.

目前我國金融監理之金融預警系統採用CARSEL指標，主要包含：「資本適足性（ capital adequacy）」、「資產品質（ asset quality ）」、「守法性（ regulations' compliance ）」、「經營策略與穩定性(strategies and stability)」、「盈利性(earnings)」與「流動性（liquidity）」

Assessment of Risk Management

1. Changes in financial environment for banking lead the bank examiners to place

more emphasis on evaluating soundness of **management processes** for controlling risk.

2. Promote sound corporate governance.

Information Disclosure Requirements

Requirements to adhere to standard accounting principles and to disclose wide range of information.

Restrictions on Competition

1. Regulation Q (Interest Rate Ceilings)
2. Branching restrictions (eliminated in 1994)
3. Glass-Steagall Act (repeated in 1999)

1980s S&L (Savings & Loans) and Banking Crisis

I. Early Stage

(1) Financial innovation, deregulations, increased competition, and disintermediation forced banks to step into potentially riskier business and new financial instruments.

(2) Deregulation: Depository Institutions Deregulation and Monetary Control Act of 1980 and Depository Institutions Act of 1982

(3) S&Ls expand lending rapidly to commercial real estates business

(4) Increased deposit insurance led to increased moral hazard

(5) The regulator of S&Ls (FHLB (Federal Home Loan Board) did not efficiently monitor.

(6) Rapid rises in interest rates in late 1970s increased the cost of funds for S&LS (since long-term mortgages rates were fixed when interest rates were far lower). Recession in 1981-82 and collapse in oil price hit some states hard (such as Taxes). Loan losses for S&Ls rapidly accumulated. More than half of S&Ls were insolvent by the end of 1982.

II. Later Stages

(1) Regulatory forbearance by FHLB by adopting irregular regulatory accounting principals that in effect lowered capital requirement. Because FSLIC (Federal Savings and Loan Insurance Corporation) had insufficient funds to close insolvent S&Ls and did not want to admit agency was in trouble

(2) Zombie S&Ls (according to Edward Kane), without anything more to lose, had strong incentives to take on high risk projects.

(3) Zombie S&Ls attracted deposits from healthy S&Ls by offering high interest rates, and competed for making loans by offering lower interest rates.

(3) Competitive Equality in Banking Act of 1987 failed to deal with the problem of

regulatory forbearance. Losses in S&Ls approached $20 billion in 1989.

III. Political Economy of S&Ls

(1) Agents for voters-taxpayers: Principal-Agent Problem for Regulators and Politicians

(2) Regulators wish to escape blame; Shortage of funds and staff

(3) Politicians lobbied by S&L interests

The Financial Institutions Reform, Recovery, and Enforcement Act of 1989

(1) Regulatory apparatus restructured: Federal Home Loan Bank Board (FHLB) relegated to the OTS (Office of Thrift Supervision); FSLIC given to the FDIC.

(2) RTC (Resolution Trust Corporation) established to manage and resolve insolvent thrifts (abolished in 1995).

(3) The cost of bailout was around $150 billion.

Federal Deposit Insurance Corporation Improvement Act of 1991

(1) Recapitalize the Bank Insurance Fund under FDIC by increase the ability to borrow from the Treasury and raising deposit insurance premiums.

(2) Reform the deposit insurance and regulatory system to minimize taxpayer losses (reduce adverse selection and moral hazard problem)

___Too-big-to-fail policy substantially limited

___Prompt corrective action provisions: banks are classified into 5 groups based on bank capital adequacy ratio.

___Risk-based insurance premiums

Consolidation of Supervisory Agency

1. Proposals and actions have been made to promote the consolidation of financial regulatory agencies

(1) Take advantage of the “economy of scope” of monitoring, because the role of financial institutions is considered broadly to be information production and risk pooling.

(2) Multiple-regulator system may lead to lax supervision and inefficient resolution of insolvent financial institutions. Multiple regulators are often poor coordinated and inert in reacting to examination results which show early signs of insolvency.

2. Kane (1984, 1997) and Marimort (1999): Competition among regulators may even improve efficiency.