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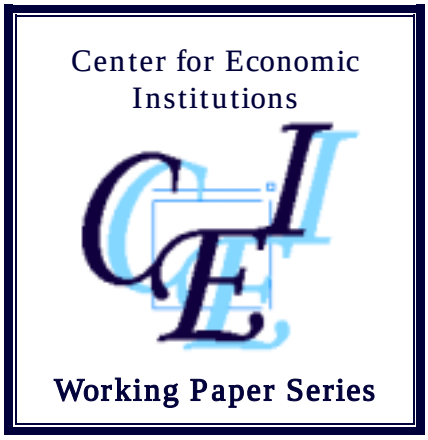

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This paper was presented at the conference on *Designing Financial Systems in East Asia and Japan: Toward a Twenty-First Century Paradigm*. This two-day conference was co-organized by the International Monetary Fund and the CEI. It was held during September 24-25, 2001 at Hitotsubashi Memorial Hall in Tokyo, Japan. A select group of academics, researchers and policy makers from around the world gathered to examine the timely issue of how the financial systems and corporate governance in East Asia and Japan should be redesigned in order to achieve sustainable economic development. The conference included six sessions with 17 papers. All the presented papers were added to the CEI series of working papers. The series, as well as the contents of the conference, can be reached at http://cei.ier.hit-u.ac.jp.

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Financial Deregulations, Weakness of Market Discipline, and Market Development: Japan's Experience and Lessons for Developing Countries

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1. Introduction and summary of the paper

As a result of prolonged weak economy and the declining asset prices in the 1990, Japanese financial sector faced an enormous bad loan problem. When a few financial institutions failed in 1996, Deposit Insurance Law was amended to allow the Deposit Insurance Corporation (DIC) to fully protect all deposits until March 2001. In spite of the full protection of all the deposits beyond the limit of normal coverage, public concern over the soundness of financial system became extremely intense after the successive failures of Sanyo Securities, Hokkaido Takushoku Bank and Yamaichi Securities in late 1997.

Depositors and investors of bank debentures issued by long-term credit banks imposed some market discipline. Deposits flew out of banks with low credit ratings because depositors feared that they would not be able to withdraw deposit quickly if their banks were closed. LTCB and Nippon Credit Bank faced a rapid early redemption of their debentures because debentures are not covered by the deposit insurance system explicitly. Stock prices of weaker banks fell sharply and triggered mild bank runs in some cases.

In view of this sever problem, the government and politicians finally moved. The government put up Yen 30 trillion of public money for the protection of depositors, the injection of capital for weak banks and the resolution of failed financial institutions. Initial capital injection of Yen 1.8 trillion to major banks in the spring of 1988 were too small relative to the size of the problem. In the summer of 1998, the stock price of LTCB fell sharply when Sumitomo Trust and Banking effectively refused the merger with LTCB. In October 1998, just before the LTCB went bankrupt, Financial Revitalization Act and Bank Recapitalization Act were enacted in disorderly atmosphere.

Under Bank Recapitalization Act, Yen 7.5 trillion of capital was injected to 15 major banks at the end of March 1999. Unlike the former attempt, this program was much better designed, succeeding to eliminate persistent Japan premium that started in late 1997. The gradual recovery of the Japanese economy and the announcements of big mergers among major banks have also contributed to calm the public concern over the financial system.

Although banks issued large amount of preferred shares to the government,

diluting the ownership of existing shareholders, there were no public outcry of bank shareholders. In spite of the near collapse of major banks, all the shareholder meetings that approved the issuance of preferred shares to the government were generally calm. No major shareholders objected the deal. This is because the management of major banks are well protected by extensive cross shareholdings with friendly life-insurance companies and industrial companies. While healthy industrial companies sold badly performing bank shares, weaker companies bought bank shares so as to be protected by banks. Corporate governance structure of major Japanese life-insurance companies is weak because they are organized as mutual companies where representative policyholders in policyholders meetings are effectively chosen by the management themselves.

The Japanese banking system still has latent unstable factors. In this paper, we will estimate the probability of bank failures by an application of option pricing theory to evaluate the risk in the net asset position of individual banks. We found that even at the end of March 2000, significant number of Japanese banks have relatively high probability of failures over one-year time horizon. In order to reduce the probability of failures of all money center banks to the equivalent of banks with A1-A2 credit rating by Moody's Investor Service, the banks, in aggregate, have to raise Yen 16 trillion of capital (about US$160 billion at 100 yen/dollar) that is almost as big as their collective core capital. In other words, weaker large Japanese banks have to double their current core capital to recover their true soundness.

Japan still faces a number of problems in its financial system. Firstly, the profit margin is too small to cover the increased default risk after the crush of the bubble. Many firms have not overcome their debt overhang and surviving with the help of their banks. Banks have not succeeded to increase their lending margin under a strong competitive pressure from government-backed financial institutions. They are also facing a strong pressure from FSA to increase lending to small and medium sized firms. This is because banks were obliged to increase such lending as a condition of capital injection by the government in 1999. As a result, banks cannot raise capital by promising a good return to investors. In order to allow the capital market to function as the source of recapitalization of Japanese banking sector, it is necessary to remove market distortions created by the government-backed financial institutions and the FSA requirements on new lending to small and medium sized companies. Without strong market discipline on banks from shareholders, we may not be able to overcome bad-loan problem.

Secondly, banks still have excessive stock investment. Although banks show Yen 35.2 trillion of capital on their balance sheet at the end of March 2000, this figure is inflated with Yen 8.2 trillion of deferred tax asset (present value of future tax shelter) and Yen 7.5 trillion of capital injection by the government. Since banks pledge that they will repay the injected capital, the remaining net capital is only Yen 24 trillion even if we take account of the after-tax unrealized capital gain in their stock portfolio. This permanent capital is small compared with their stock portfolio of Yen 54.5 trillion and Yen 63.4trillion problem loans. It is necessary to unwind crossholding of shares between banks and other companies that had also weakened the market discipline on entrenched management.

Thirdly, we still have to remove the government guarantee of all the banking sector liabilities. The government decided to postpone the removal of full protection of deposits at the end of 1999. This measure has weakened the market discipline on banks. As soon as we can stabilize financial system, we have to introduce risk-adjusted deposit insurance premium so as to strengthen market discipline on banks. Here, we also take account of the existence of huge postal saving system that is fully guaranteed by the government. In order to remove market distortion by the postal saving system, we have to privatize the system to have a level-playing field among deposit taking financial institutions.

Finally, we have to stabilize life insurance sector, exemplified by the recent failure of Chiyoda Life and Kyoei Life. Life insurance companies promised high minimum returns on their long-lasting life insurance and annuity policies in the 1980s and early 1990s. Since they did not match the duration of their assets and liabilities, they faced an enormous negative yield gap when Japan experienced a very low nominal interest rates in the late 1990. Life insurance policies are an important saving instrument in Japan and this sector controls about Yen 180 trillion of asset. Moreover, banks provide subordinated credit and surplus notes to mutual life insurance companies amounting Yen 2.3 trillion at the end of March 2000. On the other hand, life-insurance companies provide Yen 6.7 trillion of subordinated credit to banks and own Yen 7.7 trillion of bank stocks. Given this double gearing between life insurance companies and banks, the systemic risk of Japanese financial system remains high and capital market cannot provide adequate discipline on the management of banks.

2. Real estate bubble and financial crisis

In this section, we briefly review the process of asset price bubble and the developments of financial crisis in the 1990s.

2. 1. The Origin of the problem

In order to examine the origin of the Japanese financial problems, we briefly review the magnitude of Japanese asset price bubble in the 1980. The market value of the Tokyo Stock Exchange 1st section as a ratio to nominal GDP had been staying between 20 to 40 percent range from early 1950s to early 1980s. However, the stock prices started to rise in the mid 1980s and reached 140 percent by the end of 1989. After the crush of the bubble, this ratio fell to about 50-80 percent range. In relation to nominal GDP, the residential land price almost doubled in the second half of 1980s and the commercial land price tripled in the same period. After the bubble, the fall of commercial land price index is extremely sharp, falling to less than 20 percent of the peak level relative to nominal GDP.

Chart 1 and Chart 2

The asset price bubble was created by the following three factors; loose monetary policy, tax distortions, and financial deregulations.[1] In countries where these three factors were in place, asset price inflation was often observed. In this respect, Japanese case was not a singular phenomenon. However, the magnitude of the asset price bubble in Japan was enormous and impact of its collapse was extremely severe.

(1) Easy Monetary Policy

Japanese monetary policy in the late 1980s was clearly too loose. Policy makers put too much weight on stabilizing the appreciating yen and too little weight on stabilizing the asset price inflation and the overheating economy. The Bank of Japan tried to tighten monetary policy in the late 1987 so as to counter overheating economy and rising asset prices. However, the sharp fall in stock prices on Black Monday in the United States in October prevented this move. The Bank did not raise its discount rate until May 1989, and failed to stop the asset price inflation at an early stage. The stock prices defied the intention of the Bank of Japan and it continued to rise until the end 1989. The land prices hit its peak in early 1990. If the Bank had acted in late 1987 or early 1998, it could have alleviated the severity of asset price deflation in the 1990.

[1] See Shigemi [1995] and BIS [1993] on the causes of asset price inflation in major countries.

(2) Tax distortions

Japanese tax system favored debt financed real-estate investment until the end of the bubble. Since tax distortions on real-estate investment are extensive only major factors are illustrated.

(i) Marginal rate of inheritance tax has been very high in Japan. It was 75 percent over 500 million yen until 1988 and it is still 70 percent over 2 billion yen. However, the evaluation of land for taxation used to be about one half of the market value and the debt was evaluated at its face value during the bubble period. As a result, wealthy individuals borrowed money to buy land so as to reduce the inheritance tax.

(ii) Capital gain on land is not taxed until the time of its sales and the interest rate payments can be deducted from taxable income for companies and for those individuals who are investing in condominiums and offices. Moreover, the effective property tax rate on land was very low, about 0.1 percent of the market value, until early 1990s. As a result, a large number of real estate investments were carried out for tax planning purposes.

(3) Financial deregulations.

Financial system in Japan was liberalized very gradually. Driving forces behind this liberalization process were the massive issuance of government bonds in the late 1970s and the increasing internationalization of financial markets. Ceilings on bank deposit interest rates were liberalized gradually from large-denomination to smaller ones from 1985 to 1994. Restrictions on the issuance of corporate bonds were gradually liberalized during 1980s. As a result, large listed companies, which are traditional customers of Japanese banks, gradually shifted their funding from banks to capital market. Banks faced a prospect of profit squeeze due to rising funding cost and declining customer base.

In view of the declining rent from traditional business of retail deposit taking and commercial lending to large firms, banks tried to increase middle-market business. Most banks started to increase real estate lending. In expanding such lending, banks exclusively relied on collateral and paid little attention to cash flow of underlying business. This was because the nominal land price in Japan was on a rising trend since the end of the World War II and the pace of land-price inflation was higher than government bond interest rates on average. This land price performance created a general perception to bankers that they can always avoid loan losses as long as loans are

secured by real estate. This was certainly true until the collapse of the bubble in the 1990s. Many banks solicited loans to customers by providing information on real estate investment opportunities. During the bubble period, even an ordinary salaried worker living in Tokyo could easily borrow up to 100 million yen for any purposes at long-term prime rate if his house can be used as a collateral. Thus, financial liberalization created a perfect environment for asset price bubble where firms and households can easily acquire real estate with borrowed money in the 1980s.

The financial intermediation by banks expanded significantly in the 1980s. The bank lending-GDP ratio rose from 70 percent of GDP in late 1970s to 108 percent by 1990. The composition of loan portfolio of Japanese banks also changed dramatically. The share of manufacturing sector in the loan portfolio declined from 25 percent in 1977 to less than 15 percent by the end of 1980s. On the other hand, the share of loans to real estate and financing companies rose sharply in the same period. Since lending to financing companies such as Jusen (housing loan companies) is often on-lent to real estate investment, the involvement of banks in real estate related lending was very large in the 1980s.

Chart 3

2.2. Slow-moving financial crisis: 1991-96

(1) Increasing problem loans

Reflecting a successive tightening of monetary policy from May 1989 until February 1991, the stock and real estate prices started decline rapidly. The ratio of land price index and nominal GDP index declined twice in the past 30 years (see Chart 2). In the early 70s when this ratio declined, the nominal land price did not decline much and this fall was induced by a sharp inflation of goods and services. However, in the 90s, the fall in this ratio was induced by a fall in nominal land prices. These differences are important in evaluating the fallout from the collapse of the bubble. In the first episode, investors who bought land with borrowed money could repay their debt. On the other hand, in the second episode, the real estate investors could not honor their debt obligations.

At first, bankers and bank supervisors thought that the fall in land prices would be temporary. They expected that by waiting for a recovery of the economy, banks could eventually recover most of their bad loans. However, the wait and see strategy did not work this time and the real estate prices continued to fall. The understatement of bad

loan problems by some banks rapidly became a falsification of financial statements. Since a falsification of financial statements of listed companies carries a stiff criminal penalty, the management of banks with large bad loans faced a difficult choice, covering up the extent of their problem to keep their bank open or face a bank run by disclosing the reality and they chose the first option. Apparently, bank supervisors actively supported this choice of banks until early 1997.

(2) Declining Credit Ratings and Japan Premium

Reflecting the increasing loan losses and declining stock prices, the credit rating of Japanese banks declined rapidly. In mid 1980s, Japanese banks enjoyed highest credit ratings under regulated interest rates and huge unrealized capital gains in their equity portfolio. However, financial deregulations and asset-price deflation completely changed the relative credit worthiness position of Japanese banks. By 1992, Japanese banks have the lowest average credit rating among major countries.

Against this dire picture, both the Ministry of Finance (MOF) and the Bank of Japan (BOJ) denied the severity of bad-loan problem and collaborated to postpone the costly resolution of insolvent financial institutions. There are several reasons for the slow response of policy makers.

(i) A number of large financial institutions were either insolvent or severely undercapitalized.
(ii) In order to resolve the crisis, public money is necessary. However, using taxpayers' money is not popular.
(iii) High officials of the Banking Bureau of the MOF rotate in a few years. As a result, there is a strong incentive for them to postpone the resolution of politically difficult problems.

One important factor in this context was the mismanagement of Jusen crisis. Jusen companies are non-bank financial institutions and they were affiliates of groups of banks. Jusen started their business as housing-loan companies but their business was limited by two factors. Japan Housing Loan Corporation, a governmental loan company, provided subsidized loan with prime collateral. Parent banks also started to provide housing loans in the late 1970s. As a result, the Jusen companies are gradually marginalized in housing loan market. In the 1980s, Jusen companies started to shift their business to more risky real-estate loans. Jusen companies often took second-rated collateral to make high-risk loans.

After the collapse of the bubble, Jusen companies quickly became insolvent. This became obvious for related parties by 1992-93 period but parent banks and MOF officials decided to wait for a recovery of real-estate prices. By 1995, it became a serious political problem. Since Jusen companies financed its real estate loans with borrowed money from small agricultural credit unions, the failure of Jusen companies would induce failures of a number of such unions. Since agricultural unions had a strong lobby in the Diet, the national congress of Japan, politicians put strong pressures on the MOF to resolve Jusen crisis without inducing failures of agricultural credit unions. As a result, Yen 680 billion of public money was used to cover a part of the losses of unions without bankruptcy procedures or asking the managers to take responsibility. Seven of the eight Jusen companies were liquidated and most of the losses were borne by parent banks. Against this rather skewed loss-sharing scheme of Jusen resolution by the MOF and politicians, public opinion was extremely critical, making it politically impossible to discuss further use of public money to resolve financial crisis. As a result, a further postponement of resolution was carried out.

Market participants were well aware of Japan's problem. As the asset price deflation continues, the funding cost of Japanese banks started to increase relative to European and American banks due to the rising credit-risk of Japanese bank. Even most sound banks had to pay a risk premium (so-called Japan premium) for their inter-bank borrowings.

Chart 4

2.3. Japanese Financial Crisis since 1997

In November 1997, the failure of Sanyo Securities, Hokkaido Takushoku Bank and Yamaichi Securities sharply increased financial instability. These events generated a severe credit crunch in the Japanese financial market, inducing an extremely serious recession. Then what has caused this enormous problem for Japan? In my opinion, there are two factors behind this financial crisis.

One is the crash of the stock and real estate market bubble in the 1990s. The second is the lost confidence in the accounting and auditing system in Japan. We note that the actual amount of bad loans discovered at failed financial institutions has been far larger than the amount published prior to the failure. The Hokkaido Takushoku

Bank was forced into bankruptcy even though it posted profits and paid dividends for the year to March 1997. Financial statements for that year reported Yen 0.3 trillion in capital; inspections after the failure found a negative equity of Yen 1.2 trillion as of March 31, 1998. This indicates a window-dressing of almost Yen 1.5 trillion.

Likewise, Yamaichi Securities was hiding Yen 260 billion of losses on securities investments--worth more than one-half of its equity capital--which neither Ministry of Finance inspections nor Bank of Japan examinations were reportedly able to uncover.

Depositors and investors of bank debentures issued by long-term credit banks imposed some market discipline. Deposits flew out of banks with low credit ratings because depositors feared that they would not be able to withdraw deposit quickly if their banks were closed. LTCB and Nippon Credit Bank faced a rapid early redemption of their debentures in 1997 because their debentures were not covered deposit insurance system explicitly. Stock prices of weaker banks fell sharply and triggered mild bank runs in some cases.

Chart 5

These financial-institution failures have exacerbated suspicions both at home and abroad regarding the financial statements and regulatory supervision of Japanese financial institutions. It was this mistrust of financial statements that widened the "Japan premium" charged in overseas markets, blocked the domestic call market (which is used for short-term inter-bank loans), and multiplied the number of cash-pressed financial institutions turning to the Bank of Japan for loans. Japanese financial markets clearly experienced a kind of credit crunch because of a rash of failures, declining asset prices, and growing mistrust of financial statements and regulators. This credit crunch in turn cut into corporate investment and hiring, increased bankruptcy rates, and reduced consumption and housing investments because workers feared for losing their jobs. That resulted in a further contraction of credit in what became a vicious cycle. In other words, unreliable financial statements had proved a serious impediment to the functioning of a market economy.

Chart 6

The contraction was somewhat abated by the Emergency Economic Package

announced by the Liberal Democratic Party and Ministry of Finance at the end of 1997. The government prepared Yen 13 trillion for the capital injection to solvent banks and Yen 17 trillion for the protection depositors of failed banks. The Ministry of Finance should have used the fund effectively: by forcing banks to write off all the bad loans, the financial institutions and the financial oversight by the government could have regained the public confidence. However, most of the money was left unused. Only Yen 1.8 trillion of Yen 13 trillion was thinly injected to 21 large banks at the end of March 1998 without any complete examination or comprehensive cleanup of bank balance sheets.

The failure of the capital injection became apparent only a few months later. In the summer of 1998, the stock price of Long-Term Credit Bank of Japan (LTCB) fell sharply when Sumitomo Trust and Banking effectively refused the merger with LTCB. LTCB was a big bank with Yen 26.2 trillion of asset at the end of March 1998. In October 1998, just before the LTCB went bankrupt, Financial Revitalization Act and Bank Recapitalization Act were enacted in disorderly atmosphere. This time, the government prepared Yen 60 trillion, about 12 percent of GDP: Yen 25 trillion for the capital injection into solvent banks under Bank Recapitalization Act, Yen 18 trillion for the resolution of failing banks under Financial Revitalization Act such as the capital injection into rescue banks, bridge banks, and the disposition of bad loans, and Yen 17 trillion for the protection of depositors by DIC.[2]

Under Financial Revitalization Act, LTCB and Nippon Credit Bank were nationalized in October and December 1998. Under Bank Recapitalization Act, Yen 7.5 trillion of capital was injected to 15 major banks at the end of March 1999. Unlike the former attempt, this program was much better designed, succeeding to eliminate persistent Japan premium that started in late 1997. The gradual recovery of the Japanese economy and the announcements of big mergers among major banks have also contributed to calm the public concern over the financial system.

Total net cost of these measures will not be known for years to come because the government may recover some of these costs by the sales of bad loans and stocks of banks. Gross cost of these operations from 1992 until the summer of 2000 is about Yen 27 trillion and can be broken downs as follows:[3]

Cost of Capital Injection: Yen 10 trillion

[2] See Fukao [2000] for the detail of the Bank Recapitalization Act and Financial Revitalization Act.

Cost of Grant to Buyer of Failed Institutions	Yen 13 trillion
Cost of Purchasing Bad Loans	Yen 4 trillion.

2.4. Evolving Japanese Deposit Insurance System

The Deposit Insurance Law established the DIC in 1971. The initial role was to protect depositors of failed financial institutions up to one million yen per person by direct payout of insured deposits. The limit of coverage was gradually increased to Yen 10 million in 1986 and the DIC obtained a new power to assist mergers of failed institution and a sound one to protect depositors. After a few failures of small financial institutions in 1994 and 95, the Law was amended in 1996 to allow the DIC to fully protect depositors beyond the normal Yen 10 million limit as a temporary emergency measure until March 2001. At the same time, the "general" deposit insurance premium was raised from 1.2 BP (basis points) to 4.8 BP, which covers the cost of protection up to the Yen 10 million limit. In addition, "special" deposit insurance premium of 3.6 BP was introduced to cover the cost of deposit protection beyond the Yen 10 million limit. At the end of 1997, the DIC obtained the power to purchase bad loans from failing financial institutions when they collectively create a new bank.[4] The borrowing limit of DIC from the Bank of Japan and private financial institutions was also raised from Yen 1 trillion to Yen 10 trillion.

In spite of the full protection of all the deposits beyond the limit of normal coverage, public concern over the soundness of financial system became extremely intense after the successive failures of Sanyo Securities, Hokkaido Takushoku Bank and Yamaichi Securities in late 1997. Depositors were not sure that the DIC had enough money to honor the commitment of the government to protect all the deposits.

In October 1998, just before the LTCB went bankrupt, Financial Revitalization Act and Bank Recapitalization Act were enacted in disorderly atmosphere. At this time, Deposit Insurance Law was also amended. As a result, a principle of the resolution of failed financial institution was established and a new mechanism for rehabilitating solvent but under-capitalized ones. The DIC obtained the following temporary roles in this process; to act as an administrator of failing institutions, to

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[3] See Horie [2001].

[4] Since this measure is likely to preserve weak financial institutions as a new bank under largely unchanged management structure, this method of assistance was abolished in March 1999 after the assisted merger of Fukutoku Bank and Naniwa Bank was carried out in October 1998.

establish bridge banks to keep failed institutions running, to own stocks of temporarily nationalized institutions and choose directors for them, to purchase bad loans from financial institutions, and to purchase shares of undercapitalized institutions so as to bolster their capital position.

In May 2000, Deposit Insurance Law was amended so as to prepare the permanent resolution scheme for failing banks because Financial Revitalization Act and Bank Recapitalization Act expired at the end of March 2001. In this amendment, bridge bank scheme and a procedure of systemic exception from the minimum cost principle became a permanent feature of the system. The termination of full protection of deposits was postponed for one year from the end of March 2001. However, certain liquid deposits will be fully protected until the end of March 2003. Yen 10 trillion was added to the Yen 17 trillion fund for the protection of depositors.

3. Excess Debt Probability of Banks

We estimated the excess debt probability of Japanese Banks that have been rated by Moody's Investor Service from the stock price data and option pricing theory. Specifically, we estimated the probability of insolvency over one-year time horizon. In order to take account of the tendency of forbearance by bank supervisors, we assumed that a bank would be allowed to operate until its asset becomes less than 97 percent of its liability. Therefore, bank supervisors would tolerate minor insolvency.

We will summarize the estimation procedure of excess debt probability following Moridaira [1997]. A bank raises its funds by deposit taking and issuing shares. The market value of its asset and debt are V and B (Diagram 1). We can calculate E at time t=0 as a value of a call option with an underlying asset, V, and the striking price at ρ Bt where ρ =0.97. The asset, V, is equal to the net present value of its cash inflow. We assume that the asset, V, follows a log-normal distribution and its distribution function, f(V, t), depends on time, t (Diagram 2). Since the excess debt probability at time t=T is equal to the probability of the event, $\{V<B_T\}$, we have following equations to estimate this probability.

$$\text{Excess Debt Probability} = \int_0^{B_T} f(V,T)\,dV = N(x) \tag{1}$$

$$x \equiv \frac{\ln\frac{B_0}{V_0} + \left(\delta + \frac{\sigma_V^{\,2}}{2}\right)T}{\sigma_V\sqrt{T}} \tag{2}$$

Note

V_0: Value of V at T = 0　　B_0: Value of B at T=0

B_T: $B_0 \exp(rT)$　　r: Risk-free interest rate

δ: Dividend on bank's shares　　σ_V: Volatility of asset, V

N( ) : Probability density function of normal distribution

In this paper, we set one-year time horizon for estimation and T is equal to one. The expected return on bank assets is assumed to be equal to risk-free interest rate.

Since we cannot directly observe the market value of asset, V, and its volatility, σ_v, we will estimate them from stock prices and disclosure materials of banks. Specifically, V is estimated from the market capitalization of banks and the book vale of their liabilities at the end of March each year. The volatility was estimated from the daily changes in the market capitalization of banks in the preceding 90 days before the end of March. In order to check the manipulation of stock prices by banks, we looked into the turnover and price movements of bank stocks but we could not find any obvious abnormal movements except for the case of Nippon Credit Bank in 1998. The Bank supported its stock price by buying its own shares through its subsidiaries.

The results of our estimation are shown in Chart 7. We found that the excess debt probability in each year is generally higher for banks with relatively low credit ratings. Some banks with low credit ratings have very high bankruptcy probabilities, in some cases, approaching unity. The probabilities went up from March 1997 to March 1998 and went down in March 1999. We have to note that Hokkaido Takushoku Bank that had a high excess debt probability in March 1997 actually failed in November 1997 and, as a result, the dispersion within Baa3 category declined in March 1998. In March 1999, the excess debt probability generally declined after the capital injection to major banks by the government and the nationalization of LTCB and Nippon Credit Bank in late 1998. However, they went up again in March 2000.

Chart 7

The relationship between the excess debt probability and the credit rating is less clear in March 2000 because of the following reasons:

i) Some low credit local banks have low estimated excess debt probability because they issued large amounts of preferred shares to the government. Moody's apparently regards these preferred shares as unstable capital because banks pledged that they would repay government capital as soon as possible.

ii) Some weak trust banks have relatively high credit ratings because of their new affiliation with major city banks.

Charts 8 shows the number of banks in each 10 percent range of excess debt probability. In March 1997, some banks already showed very high excess debt probability over one-year time horizon. We can note that some long-term credit banks and trust banks showed high probabilities. One year later, in March 1998, the number of banks in high-risk categories increased dramatically, reflecting the much stronger concern by market participants after the successive failures of Sanyo Securities, Hokkaido Takushoku Bank, and Yamaichi Securities. The capital injection of Yen 1.8 trillion yen to major banks in the same month had not reduced the public anxiety over the soundness of Japanese banking system. We can point out the following problems in this capital injection:

Chart 8

i) Disclosure of bad loans in the banking system was not credible to the public.

ii) The amount of capital injection was too small compared with the seriousness of the problem.

iii) At this time, about 80 percent of injected capital was subordinated debts and the market participants regarded them as low quality capital.

In October 1998, Financial Revitalization Act and Bank Recapitalization Act were enacted. Two major banks were nationalized and Yen 7.5 trillion of capital was injected to most of the remaining major banks in March 1999. Reflecting these strong measures by the government, the excess debt probability declined sharply in March 1999. We can point out the following aspects of the measures as a relative success of this episode:

i) This time, about 80 percent of injected capital is preferred stocks.
ii) Two weak banks were nationalized and disappeared from our sample.
iii) The supervisory authority set relatively strict conditions for the eligibility of capital injection regarding the restructuring efforts and writing-off of bad loans.

However, some trust banks and a long-term credit bank still show relatively high excess debt probability. This is probably because these banks have relatively large exposure to real estate and financial sectors that were involved in speculative real-estate investment (Table 1). Table 2 shows the lists of banks with high excess debt probability each year and their fate in the following year. In many cases, banks with high excess debt probability announced mergers with other, raised new capital, or went bankrupt.

Table 1 and Table 2

4. Required Capital of Banks to Fully Stabilize Japanese Banking Sector

Japanese government carried out re-capitalization of banking sector in March 1998 and March 1999. We will investigate whether the injection of public funds was enough to fully stabilize Japanese banking sector. In this analysis, we will estimate the required amount of capital injection to "money center banks" so as to reduce the excess debt probability of all thee recipient banks to that of Bank of Tokyo-Mitsubishi which has been enjoying the highest credit rating (A1-A2 rating) among major Japanese banks. In our estimation, money center banks include city banks, long-term credit banks, trust banks (excluding Nippon Trust that became a subsidiary of Bank of Tokyo-Mitsubishi), and Yokohama Bank, which is the largest regional bank.

In this estimation, we made following assumptions:

i) Capital injection would be carried out as an issuance of preferred stocks to the government.
ii) New issuance of preferred stocks would not affect the prices of existing common stocks.
iii) The volatility of bank assets would not change after the re-capitalization by the government.

The estimated required additional capital for March 1998 was Yen 45.1 trillion (see Table 3). It means that it was necessary to increase capital of banks by Yen 45.1

trillion in addition to the actual capital injection of Yen 0.3 trillion in preferred stocks. As we have seen in Chart 8, this capital injection was not so effective in reducing the excess debt probability and our estimation shows that the required capital injection was much larger than the actual amount.

Table 3

The estimated required additional capital for March 1999 was Yen 7.4 trillion on top of actual injection of Yen 7.5 trillion. This additional capital was much smaller than one year earlier. This is partly due to the nationalization of LTCB and Nippon Credit Bank. However these factors explain only one quarter of the decline from Yen 45.1 trillion to Yen 7.4 trillion. We think the following factors affected this decline:

i) During the last three months of fiscal 1998 ending March 1999, the stock price volatility of all banks declined by 30-90 percent compared with the volatility one year ago. This reflected the very strong stabilization measure by the government in the fall of 1998. Increased public confidence in the banking sector reduced the estimated volatility of bank assets.

ii) Banks reduced both assets and liabilities in fiscal 1998. At the same time, market estimate of the net asset of banks increased as a result of policy measures.

iii) The excess debt probability of target bank, Bank of Tokyo-Mitsubishi, declined from 3.75 percent to 0.87 percent in fiscal 1998.

While the third factor increased the estimated required capital injection, the first and the second factors that reduced the required capital dominated the result. Especially, the first factor was most important in reducing the required amount of capital injection.

Financial market was strongly affected by self-fulfilling prophecies. When market participants started to question the fundamental soundness of the financial system, this anxiety itself adversely affected the normal functioning of the market. Under certain conditions, this would bring about a financial crisis. On the other hand, when market participants started to regain confidence in the market, the stability of the market would be strengthened. In this respect, the series of stabilization measures played an important role in reducing the level of anxiety in the market.

The estimated required capital increased again to Yen 15.9 trillion for March 2000 indicating the continued under-capitalization of major Japanese banks. This

increase in the required capital was due to the net result of following reasons:

i) The volatility of bank stock prices increased for 12 of the 15 banks at the end of fiscal 1999. This reflects the increased risks in the banking sector.
ii) The excess debt probability of target bank, the Bank of Tokyo-Mitsubishi declined to 0.78 at the end of fiscal 1999, increasing the required additional capital of other banks to reduce their excess debt probability.

Our estimation of required additional capital for March 2000 indicates that the financial fragility of the Japanese economy has not been removed in spite of the strong measures taken by the government. Recent failures of Sogo Department Stores, a number of debt forgiveness for construction companies by banks, and the failures of three life insurance companies including Chiyoda and Kyoei Life all indicate the continued weakness of Japanese financial sector.

5. Estimation of Risk-Adjusted Deposit Insurance Premium

In this section, we estimate the fair risk-adjusted deposit insurance premium from the excess debt probability. Under the existing deposit insurance system and the level of market volatility of bank stock prices, the risk-adjusted deposit insurance premium is approximately equal to the "general" deposit insurance premium that covers the cost of protection up to Yen 10 million limit per person. Since the current general deposit insurance premium is a flat 4.8BP for all banks, we will compare the estimated risk adjusted premium with this rate.

Under the revised Deposit Insurance Law of May 2000, all the deposits of an insured bank will be fully protected by the DIC until March 2002. However, the DIC has protected all the liabilities of failed financial institutions in the past. Therefore, we assume that the DIC grants the amount of negative equity to the buyer bank to protect all the bank creditors including depositors. Therefore, the following equation holds:

$$\text{Grant from the DIC} = \text{Max}\,[B_T - V, 0] \qquad (3)$$

The expected value of the grant from the DIC is equal to the risk-adjusted insurance premium under the current system. Therefore, the fair risk-adjusted deposit insurance premium is equal to the price of European type put option on bank asset V with striking price B_T. Thus, the fair risk adjusted "total" deposit insurance premium, P, is estimated with the following equation:

$$P = e^{-rT}\int_0^{\infty} \max\left[B_T - V, 0\right] f(V,T)\,dV = B_0 N(x) - V_0 e^{-\delta T} N\left(x - \sigma_V \sqrt{T}\right) \qquad (4)$$

Note: See the note of equation 2 for the definitions of variables.

By dividing P with the value of total debt $B_{0,}$ we can estimate the expected rate of excess liability at the time of closure.

The estimated “general” deposit insurance premium is approximately one half of the expected rate of excess liability at the time of closure. Under the Japanese deposit insurance system, there is no provision for depositor preference in the resolution procedure of bank failures. As a result, depositors are at par with ordinary unsecured creditors under the absolute priority rule of bankruptcy procedure. Since the shortage of asset to repay debt is borne by depositors and ordinary creditors on a pro rata basis, the cost of depositor protection by the DIC up to Yen 10 million insurance limit is equal to the product of expected rate of excess liability and the amount of insured deposit. Deposit insurance premium is levied on all the yen deposit including the part that is above Yen 10 million limit. Since the ratio of insured deposit within all the yen deposit is about 50 percent, the fair "general" deposit insurance premium is one half of the expected rate of excess liability at the time of closure.

In the estimation of the expected rate of excess liability, we will use the market value of bank assets and its volatility. In order to estimate these values, we have to set the value of forbearance parameter, ρ. This parameter is the market expectations on the behavior of bank supervisors regarding its bank closure policy. If the bank supervisors are expected to close a bank as soon as the liquidation value of bank’s assets becomes less than its value of liabilities, this parameter is one. Usually, bank supervisors often do not close banks until the liquidation value of bank’s net asset becomes somewhat negative because banks may recover its losses from future profit. We estimated this value based on Oda’s method and set ρ equals 0.97 (see Oda[1998]). It means that the bank supervisors allow banks to operate so long as their excess liability is less than 3 percent of their gross asset.

The estimated expected rate of excess liability is shown in Chart 9. Generally, the expected rate of excess liability of a bank increases as its credit rating falls. The estimated rates of excess liability for March 1998 were much higher than the other three

periods. This was because the sharp fall in stock prices reduced the net asset of banks that hold large amount of stocks in their security portfolio. Moreover, the increased volatility of bank stock prices increased the estimated probability of excess liability. The estimated expected rate of excess liability of some regional and money center banks increased more than ten times over the year earlier. However, the estimated excess rate of liability at March 1999 declined to the pre-crisis period of March 1997. Especially, the large banks that received the capital injection from the government in the same month experienced a fall of this rate below the March 1997 levels. On the other hand, the chart for March 2000 shows a different picture, two banks with A3 credit rating shows high estimated rates. One of the two banks has low net asset position but has a relatively high rating because it has become a subsidiary of a bank with a high credit rating. The other of the two banks experienced a high volatility of its share price.

Chart 9

The fair "general" deposit insurance premium is equal to about one half of the expected rate of excess liability and can be estimated with the following equation:

$$\text{Fair General Deposit Insurance Premium} \cong \alpha \left[N(x) - \frac{V_0 e^{-\delta T}}{B_0} N\left(x - \sigma_V \sqrt{T} \right) \right] \qquad (4)$$

where x is defined by equation (2) and α is the ratio of insured deposit within all the yen deposit. In our estimation, we set α = 0.5.

Table 4 shows the weighted average of fair "general" deposit insurance premium for banks classified on their credit rating categories and their business categories. Similar to the estimated excess debt probabilities, long-term credit banks and trust banks face higher fair "general" deposit insurance premium than city and regional banks. The premium for city banks fell sharply for the end of March 1999 when they had just received capital injection from the government. Moreover, some city and regional banks with low credit ratings faced lower fair insurance premium than some banks with higher ratings because of the large dose of public capital for fragile banks. Regarding the trust banks in March 1998 and 99, the A3 rating faced a higher fair insurance premium than the other trust banks with lower ratings. This is because this A3 category includes a trust bank that became a subsidiary of city bank with a high

rating.

Table 4

We can also observe that the average fair "general" deposit insurance premium has been much higher than the actual premium of 0.048 percent. Even in March 1999 when we had the lowest estimated fair premium, banks with credit rating of less than Baa1 faced significantly higher fair premium than the actual rate.

Chart 10 then look at the fair "total" deposit insurance premium which is the sum of “general” and “special” deposit insurance premium to protect both the insured deposits and the other uninsured bank liabilities. There are a few outliers in this chart. Table 5 shows the breakdown of fair “special” deposit insurance premium based on the credit rating and business categories and we can find that those outliers are long-term credit banks. The reason of the high fair “special” premium for long-term credit banks is that they mainly raise funds with 1-year and 5-year bank debentures that are not normally covered by the deposit insurance system. In order to assess fair amount of “special” premium from long-term credit banks for the full protection of their liabilities, it is necessary to set a high insurance premium on their relatively small deposit base.

Chart 10

The fair “special” deposit insurance premium increased sharply in March 1998 then declined in March 1999 after the capital injection to major banks. In this period, the average fair “special” premium was 0.084 percent that is still higher than the actual rate of 0.036 percent. However, in March 2000, the fair "special" deposit insurance premium increased again to 0.156 percent, indicating a renewed concern over the health of Japanese banking sector.

Total fair deposit insurance premium is shown in Table 6 which is the sum of the fair "general" deposit insurance premium in Table 4, and the fair "special" deposit insurance premium in Table 5. Compared with the current flat deposit insurance premium of 0.084 percent, estimated fair premium remained high even after the capital injection by the government. The estimated average fair premium rose from 0.260 percent in March 1997 to the extremely high 2.039 percent in March 1998. Although it fell to 0.136 in March 1999, it rose to 0.249 in March 2000.

Table 5 and Table 6

6. Weak Japanese banking system

Since the sharp decline of asset prices in 1990, more than a decade has passed. The acute financial crisis in 1998 was abated more than three years ago. However, we are still facing an increasing amount of bad loans and very fragile economy.

We also have to stabilize the weakened life insurance sector, exemplified by the recent failures of Chiyoda, Kyoei, and Tokyo Life Insurance. Life insurance policies are an important saving instrument in Japan and this sector controls more than Yen 200 trillion of asset. Life insurance companies promised high minimum returns on their long-lasting life insurance and annuity policies in the 1980s and early 1990s. Since they did not match the duration of their assets and liabilities, they faced an enormous negative yield gap when Japan experienced a very low nominal interest rates in the late 1990. However, we do not discuss this problem in detail because it would require a book rather than a section of this paper.[5]

6.1 Bad loan situations in Japan

Table 7 shows the historical data of problem loans of Japanese banks. Since the disclosure of the bad loan situation improved gradually, the data are not consistent over the years. For example, the definition of bad loan outstanding has been widened twice and, as a result, the disclosed figures jumped up due to this discontinuity. Until FY 1995, only major banks disclosed loan loss figures. Japanese banks have lost 66 trillion yen due to band loans since March 1992 until March 2000. In spite of this enormous loss amounting 13 percent of GDP in 2000, Japanese banks still have more than 30 trillion yen of disclosed bad loans or about 6 percent of loan portfolio. According to FSA, the total classified loans of banks (not disclosed on a individual basis) amount to 63 trillion yen. The classified loans are more than twice as much as the disclosed bad loan figure.

Table 7

The Chart 11 shows that, while the bad-loan/total loan ratio has stabilized for city banks, the ratio of first tier and second tier regional banks has been increasing rapidly. This is partly due to the application of a tougher classification standard by

[5] See Fukao, Mitsuhiro and Japan Center for Economic Research [2000b].

FSA but also due to the deteriorating loan quality for smaller financial institutions.

Chart 11

The Chart 12 compares the bad loan situations in Japan and the United States. While US bad-loan/total loan ratio has declined from 3% in 1992 to 1% in 1999, the corresponding Japanese ratio has risen from 2% to 6%. Loan-loss reserve/bad loan ratio in the US has been above 160% since 1994, while the similar ratio in Japan has been 40-60% range. We can clearly see that while the US banking sector recovered quickly from bad-loan problem in early 1990s, Japanese situation has been deteriorating even after the capital injection by the government in 1998.

Chart 12

The cause of this increasing amount of bad loans without loan-loss reserves is the low profitability of Japanese banking sector. Since banks do not earn enough profit to write-off all the bad loans, they try to postpone the recognition of losses so as to show relatively high capital position. If they write-off bad loans immediately, most banks would not be able to comply with BIS capital requirements and they may even have to show negative equity position.

6.2 Bank profitability

Table 8 shows the profit structure of Japanese banking sector. The gross lending margin (A), which is the difference between interest and dividend income received and the interest paid, has been about Yen 10 trillion in the 90s. Other revenue (B) that includes fees, dealing profit of fixed income securities, and foreign exchange operations, was about Yen 3.5 trillion from 1995 until 1998. However, these figures exaggerate the underlying profitability of these activities because bond prices rose sharply under falling interest rates. We think that the underlying profitability of other revenue is probably about Yen 2.5 trillion.

Table 8

On the other hand, the operating cost has been declining over the past two years because of the cost cutting measures by Japanese banks. Here again, we think that it is rather difficult to continue the recent pace of cost cutting. Certainly, Japanese banks may cut salaries and wages further by reducing employees and cutting average

compensation. On the other hand, the computer system of Japanese banks is outdated. Banks could not invest in the system adequately because they have been preoccupied with bad-loan problem since early 1990s. In retail banking sector, banks cannot compete with national convenience store chains in payment services because banks cannot keep up with the sophisticated POS (point of sales) terminals of convenience shops.[6] Since banks have to invest heavily in information technology in the future, it would be difficult to cut total operating cost further.

Given these profit and cost figures, the gross profit before taking account of loan losses is about Yen 5 trillion. On the other hand, the loan loss has exceeded the gross profit ever since FY 93. Since FY 94, the loan loss has been 6 to 14 trillion yen. Compared with the outstanding loan portfolio of about Yen 500 trillion during this period, the loan loss rate has been 1.2 to 2.8 percent. In other words, the Japanese banking sector has not been able to earn enough profit to cover loan losses. When they reported profit at the bottom line, they realized capital gains on their stocks and real estates with low book values.

6.3 Weak capital position of Japanese banking sector

Corresponding to these flow figures of profits, the capital position of Japanese banks has been deteriorating. Under the Japanese accounting rules on banks and lenient application by the regulators, BIS capital ratios have been manipulated in many ways. Banks often used historical cost book keeping of equity portfolio, under reserving against bad loans, and subordinated debts from friendly life insurance companies so as to raise BIS ratios. As a result, most failed banks could maintain more than 8 percent of BIS capital ratios just before their bankruptcy. Therefore, we tried to estimate simple leverage ratios of major banks and adjusted the simple core capital (tier 1 capital) by taking account of unrealized capital gains and losses.

Table 9 shows the adjusted core capital/total asset ratios for major Japanese banks since 1998. In this estimation, we added unrealized capital gains and loan-loss reserves and subtracted the standardized estimated loan losses from disclosed bad-loan figures. This particular estimate of capital is used because this variable worked well in predicting bank failures over one-year time horizon with a regression model of various

[6] In Zengin electronic fund transfer system, which is the main payment system among customers of banks, user cannot send his name and messages in Chinese characters because the system cannot handle 2-byte codes. Because of the outdated Bank payment system, more and more cash payments are handle by convenience store chains rather than banks.

financial indicators.[7] According to this estimated distribution of core capital/asset ratio of banks, the leverage ratio fell to 0.93 percent in March 1998. According to this estimation, as many as eight banks had negative equity position while only two banks were nationalized. The capital ratio recovered one year later by Yen 7.5 trillion capital injection by the government. The capital ratio recovered further to 3.48 percent by March 2000 as the stock prices recovered. However, it started to fall as banks continued to lose money by bad loans and stock prices started to fall again. By the end of February 2001, the capital ratio fell to 1.86 percent.

Table 9

As we can see from Table 9, the capital position of banks is quite sensitive to stock prices. Table 10 shows the capital structure of all the commercial banks. In this table, the core capital based on the traditional historical cost accounting is adjusted for unrealized capital gain on stocks, deferred tax asset, and public capital injection but not adjusted for under reserving for loan losses. Although banks show Yen 35.2 trillion of capital on their balance sheet, this figure is inflated with Yen 8.2 trillion of deferred tax asset (present value of future tax shelter) and Yen 7.5 trillion of capital injection by the government. Since banks pledge that they will repay the injected capital, the remaining net capital is only Yen 25.6 trillion even if we take account of the after-tax unrealized capital gain in their stock portfolio. This permanent capital is small compared with their stock portfolio of Yen 54.5 trillion and Yen 63.4trillion problem loans (Table 7).

Table 10

Because the market value of stocks held by banks is about two times of their net capital account, about a 10 percent fall in stock price index wipes out 20 percent of their net capital. In the late 1980s and early 1990s, the unrealized capital gain (the difference between column A and B) was very large and they could withstand the fluctuations in stock prices. However, in the 1990s, banks gradually realized the gains so as to show paper profit to cover the huge loan losses. As a result, the unrealized capital gain is depleted when Nikkei index fell below 15000 in late 2000.

6.4. Causes of unprofitable banking sector

[7] See Fukao, Mitsuhiro and Japan Center for Economic Research [2000a].

The profit margin of Japanese banks is too small to cover the increased default risk after the crush of the bubble. Many firms have not overcome their debt overhang and surviving with the help of their banks. Banks have not succeeded to increase their lending margin under a strong competitive pressure from government-backed financial institutions. Moreover, under the terms and condition of government capital injection in March 1999, banks are required to maintain and increase loans to small and medium sized firms. Because of this condition, banks often disregard the internal model-based required lending margin to make new loans to small companies. In the remainder of this section, we will look into the effect of financial deregulations and the presence of government sponsored financial institutions on the profit margin of private banks.

6.4.1. Effects of deregulations

Average lending rate of Japanese banks was 2.1 percent in FY1999. On the other hand, the average funding cost was 0.3 percent and the average intermediation cost was 1.3 percent. As a result, the lending spread was only 50 basis points. Since the average credit rating of borrowers from banks is about BB level, the annual loan loss rate is well over 1 percent per year. Although a part of this negative profit margin is offset by other revenues such as dealing profit and fees from customers banks are making losses from lending business (see Table 8).

One of the reasons of this low lending spread is the overhang of deposit interest rate control until early 1990s. When the government controlled deposit interest rates, banks could easily make money from deposit taking. On average, banks could get 1.5 percent point margin between average funding rate and the short-term money market rate. The average lending rate was almost equal to short-term market rates. This fact probably indicates that banks passed a part of regulatory rent of interest-rate control to borrowers. As the deposit-rate control was phased out in the late 1980s and early 1990, banks tried to keep profit margin by increasing lending rate relative to short-term market rates. Chart 13 shows that average lending rate rose relative to 3-month CD rate at the turn of the decade.

Chart 13

Chart 4 shows the decomposition of lending margin into regulatory rent, which is the spread between the short-term market rate and average funding cost, and the true profit margin, which is the spread between the average lending rate and the market rate. This chart indicates that banks have only replaced the lost regulatory rent with the pure

profit margin and have not succeeded to increase their traditional thin margin under a high growth period with rising asset prices.

Chart 14

While the banks have not raised the profit margin, the borrowers are paying a higher interest rate in relation to the money market rate. Chart 15 shows the past movements of average new lending rate, overnight call rate and the GDP deflator inflation rate. The gap between the interest rates and the inflation rate is the real interest rate. Reflecting loose monetary policy of the Bank of Japan, the real interest rate of call rate has fallen since 1991 until 1998. On the other hand, the real interest rate of new lending rate has not fallen much because of the increasing gap between the new lending rate and the call rate. While the opportunity cost of borrowing for large creditworthy companies is close to the call rate, the cost for small and medium sized companies is close to the new lending rate. Therefore, smaller companies could enjoy less of the expansionary effect of loose monetary policy than larger ones in the 1990s. This fact may have contributed the relatively weak recovery of small business sector in this decade.

Chart 15

6.4.2 Presence of government sponsored financial institutions

In Japanese financial market, the presence of government-sponsored financial institutions (GSFIs) is extremely large. Table 11 shows the market share of private banks and GSFIs at the end of year 2000. GSFIs have about one quarter of the loan market, one third of the deposit market and 40 percent of the life-insurance market.

Table 11

In the loan market, GSFIs make very long-term loans at about 2 percent interest rate. They are especially dominant in housing loan market, holding more than half of the outstanding housing loans. Table 12 shows the central lending rates of GSFIs on February 9, 2001. While their new lending rates are similar to short-term loans of private banks, the average term to maturity of GSFIs is much longer. Since government agencies usually accept prepayments of their loans without penalties, their loans are more attractive to borrowers. While the market share of GSFIs in loan market is smaller than in other markets, they have 30-40 percent share in rural

prefectures. As a result, banks cannot set significantly higher lending rates over those of government agencies. Since government agencies obtain subsidies of about Yen 1 trillion per year as direct subsidy and indirect subsidy of zero-cost capital, they can cover the losses from credit and other risks in making loans. Compared with the outstanding domestic loans of GSFIs, this subsidy amounts to 0.6 percent point of cost advantage relative to private financial institutions.[8]

Table 12

In the deposit market, the Postal Saving System (PSS) is a dominant player. The deposit of the System is fully guaranteed by the government. The deposit interest rates are set competitively against those of private deposit taking institutions. PSS has more than 24000 offices and this branch network is by far the largest as a single financial institution in Japan. Even the largest private banking group, Mizuho, has about only 600 offices. Since, PSS does not charge account-maintenance fee on customers, it is difficult for private banks to charge such fee without alienating a large number of customers. Under the zero-interest rate policy of the Bank of Japan, banks cannot get any profit margin even between zero-interest demand deposit and the market rate.

7. Weak governance of banking sector

While we have investigated the reason of unprofitable banking sector, still an important question remains: Why banks do not stop unprofitable lending activities? In the following, we will introduce a few hypotheses: absence of shareholder control and the skewed incentive structure for the bank management due to negative equity position.

7.1 Absence of control by bank shareholders

Although banks issued large amount of preferred shares to the government in March 1999, diluting the ownership of existing shareholders, there were no public outcry of bank shareholders. In spite of the near collapse of major banks, all the shareholder meetings that approved the issuance of preferred shares to the government were generally calm. No major shareholders objected the deal. This is because the management of major banks are well protected by friendly shareholders such as life-insurance companies and industrial companies. Table 13 shows the list of top five

[8] See Higo [2001] on the role of GSFIs and their institutional details.

shareholders of ten major Japanese banks. Out of 50 listed top shareholders in the list, 25 are life-insurance companies.

Table 13

Since all major life-insurance companies are mutual companies, there is no formal cross holding of shares. However, life-insurance companies often relied on banks to cultivate new corporate customers. Moreover, banks and life insurance companies relied on each other to raise broadly defined capital. As shown in Table 14, banks provide subordinated credit and surplus notes to life-insurance companies amounting Yen 2.3 trillion at the end of March 2000. On the other hand, life-insurance companies provide Yen 6.7 trillion of subordinated credit to banks and own Yen 7.7 trillion of bank stocks. Given this effective double gearing between the two, it is difficult to expect strong governance pressure on banks from life-insurance companies.

Table 14

As mutual companies, the corporate governance structure of Japanese major life-insurance companies is also weak. In Japanese mutual life companies, "representative policyholders meeting" play the role of shareholders meeting in joint stock companies. Each representative policyholder has equal one vote. They are effectively chosen by the management themselves. Sometimes, they become policyholders after being asked to be representative policyholders by the management. In other cases, the managers of a company to which the insurance company lend money are asked to become representative policyholders.

According to a series of interviews of top managers of major banks and large institutional investors by the author conducted in 1997-98, we found the following points:

(1) When banks reported a loss for the first time in decades to the shareholders' meeting there were almost no reactions from even large shareholders.

(2) The bank management generally secures the majority of votes as signed proxy cards before shareholder meetings. In addition, the management makes sure that friendly shareholders send representatives to the meeting with more than two third majority votes of the meeting.

(3) A former senior director of a major life-insurance company stated that his company had never voted against the management in shareholders meetings. However, in some

rare occasions, his company abstained from voting so as to indicate its dissatisfaction with the current management.

(4) Ministry of Finance regulation and surveillance was strong, so there was little incentive for shareholders to monitor bank managements.

(5) The industrial companies that entered into cross shareholding relationships with banks raised their fund primarily through bank borrowings, which made their position as shareholders weak.

7.2 Skewed incentive for bank management

Another possible reason of lack of profit of Japanese banks is the skewed incentive structure for bank managers. In order to set the incentive structure right for corporate management and shareholders, it is necessary to maintain significantly positive capital position. When there is no capital or negative amount of capital, there is a skewed incentive for the management to invest in excessively risky projects. The management would also try to conceal negative equity position to keep control of the company as long as possible.

After the successive failure of Japanese financial institutions, very large gaps between before-failure and after-failure equity values as we have explained in section 2 on Hokkaido Takushoku Bank and Yamaichi Securities. Similarly, LTCB and Nippon Credit Bank were found that each of them had negative equity of more than Yen 3 trillion after their failures.

I suspect that top managements of most major banks know that their banks are either insolvent or very marginally capitalized. Under such circumstances, the only safe exit from their position is to keep their banks running without disclosing the realty; i.e. postponing the recognition of bad loans. They also have to comply with any irrational regulations by the FSA including the requirement of making new loans to small and medium sized companies with very thin spread.

8. Remaining Problems in Japanese Financial System

In this paper, we showed that the stock market still indicates a strong skepticism against the soundness of Japanese banking sector. Banks are regarded to be under-capitalized and the estimated average fair deposit insurance premium is almost three times of the current premium. We believe that this market skepticism reflect the number of remaining problems in Japanese financial system

We can learn a number of lessons from the bitter Japanese experience.

(i) Disclosure and recognition of the depth of the problem is essential. By concealing the true picture, Japan lost a decade of the growth and still struggling to get out from the slowly accelerating rate of deflation.

(ii) Regulators should not allow banks with negative equity to operate under the protection by the government. These zombie banks undercut the lending rate and weaken the healthy banks. Moreover, zombie banks can help firms with negative equity. These bank-supported firms also under price their products and cerate more zombie firms.

(iii) Deflation is very dangerous. Financial system cannot function well under deflation. Even with zero market interest rate in Japan, the real lending rate is too high for small firms to survive under 2 percent deflation.

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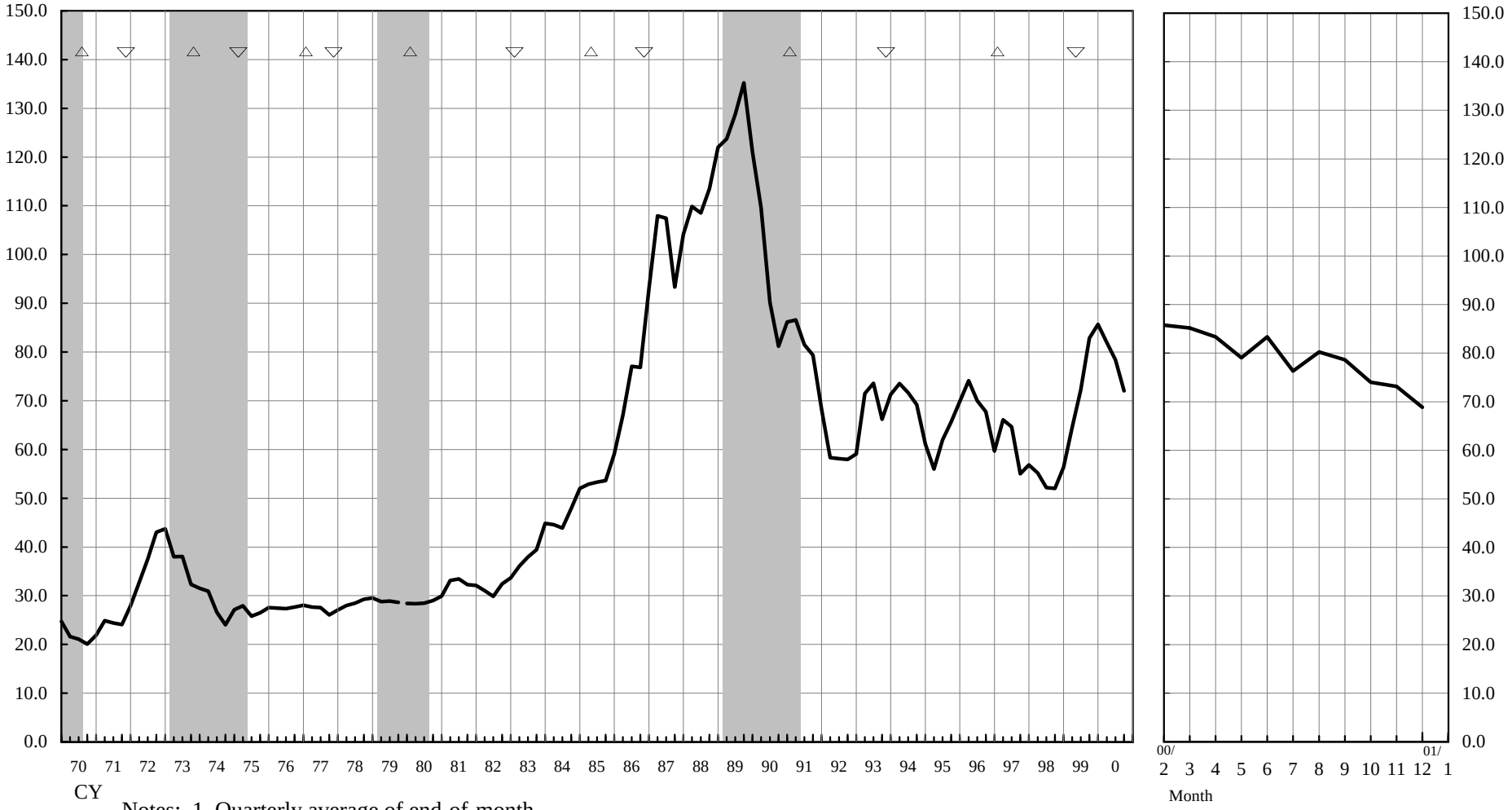
Chart 1 Total Market Value of Stocks on the Tokyo Stock Exchange 1st Section

(Percent of nominal GDP)

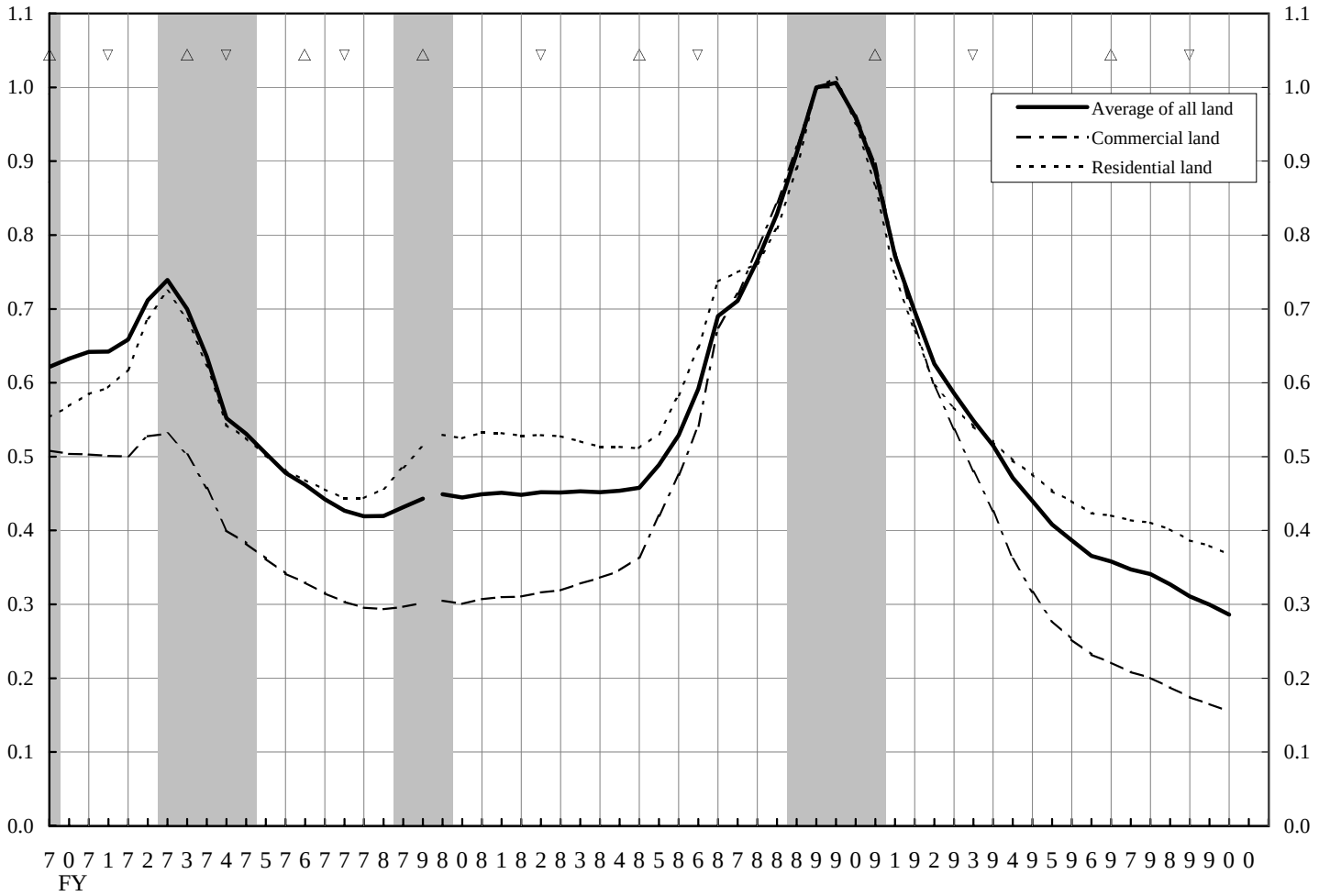


Notes: 1. Quarterly average of end-of-month.
2. Data until 79/4Q = 68SNA basis, data from 80/1Q = 93SNA basis

Source: Bank of Japan CD-ROM, 2000.

Chart 2 Land Price Indexes of Urban Areas

(As a ratio of nominal GDP index; percent; semi-annual)



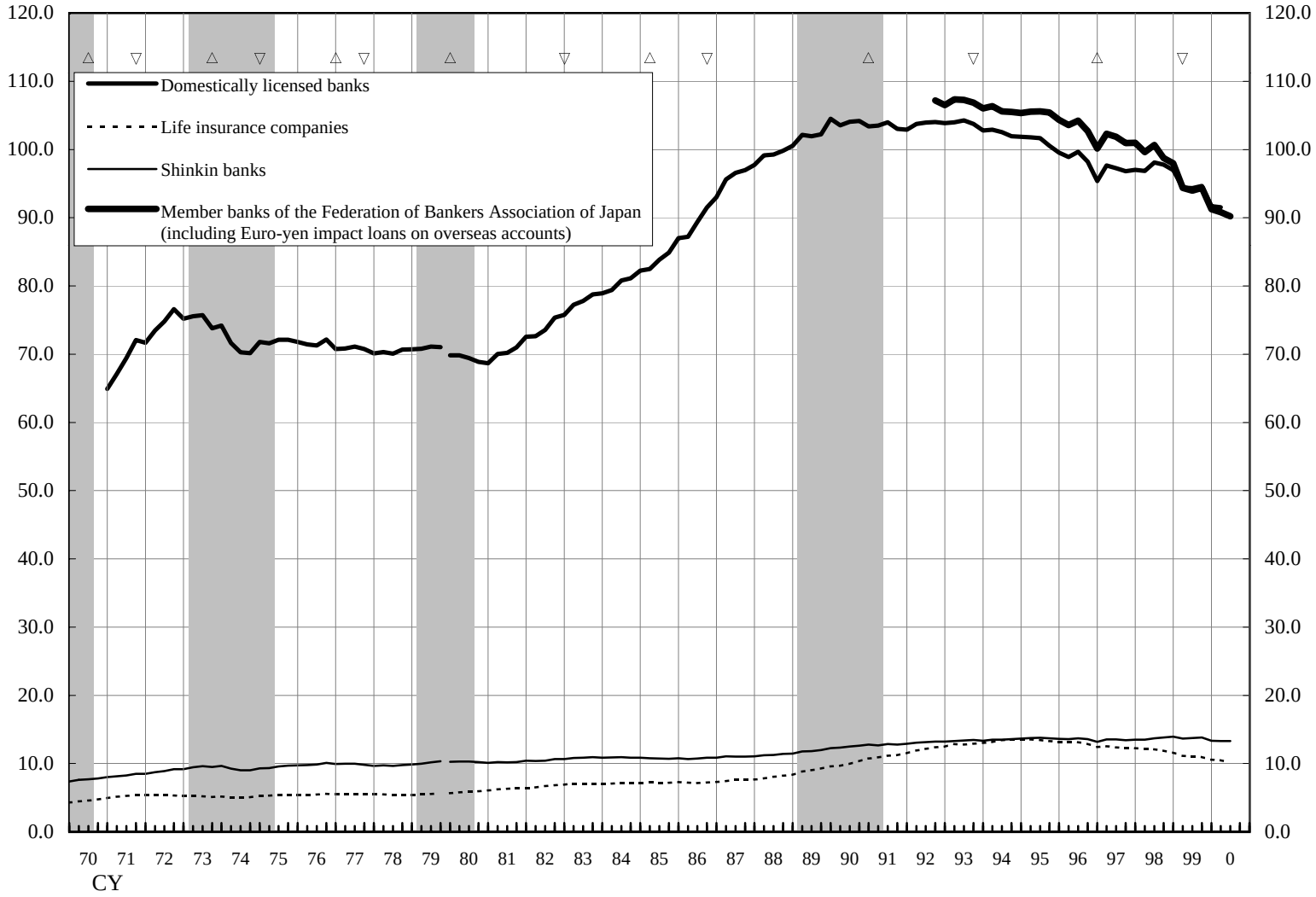
Notes: 1. Land price indexes of urban areas (six large cities, second half of fiscal 1989 <end Mar. 1990>=100) / Nominal GDP index (second half of fiscal 1989=100)

2. Data until second falf of fiscal 1979 = 68SNA basis
Data from first half of fiscal 1980 = 93SNA basis

Source: Bank of Japan CD-ROM, 2000.

Chart 3 Loans and Discounts Outstanding by Type of Financial Institutions

(Percent of nominal GDP)

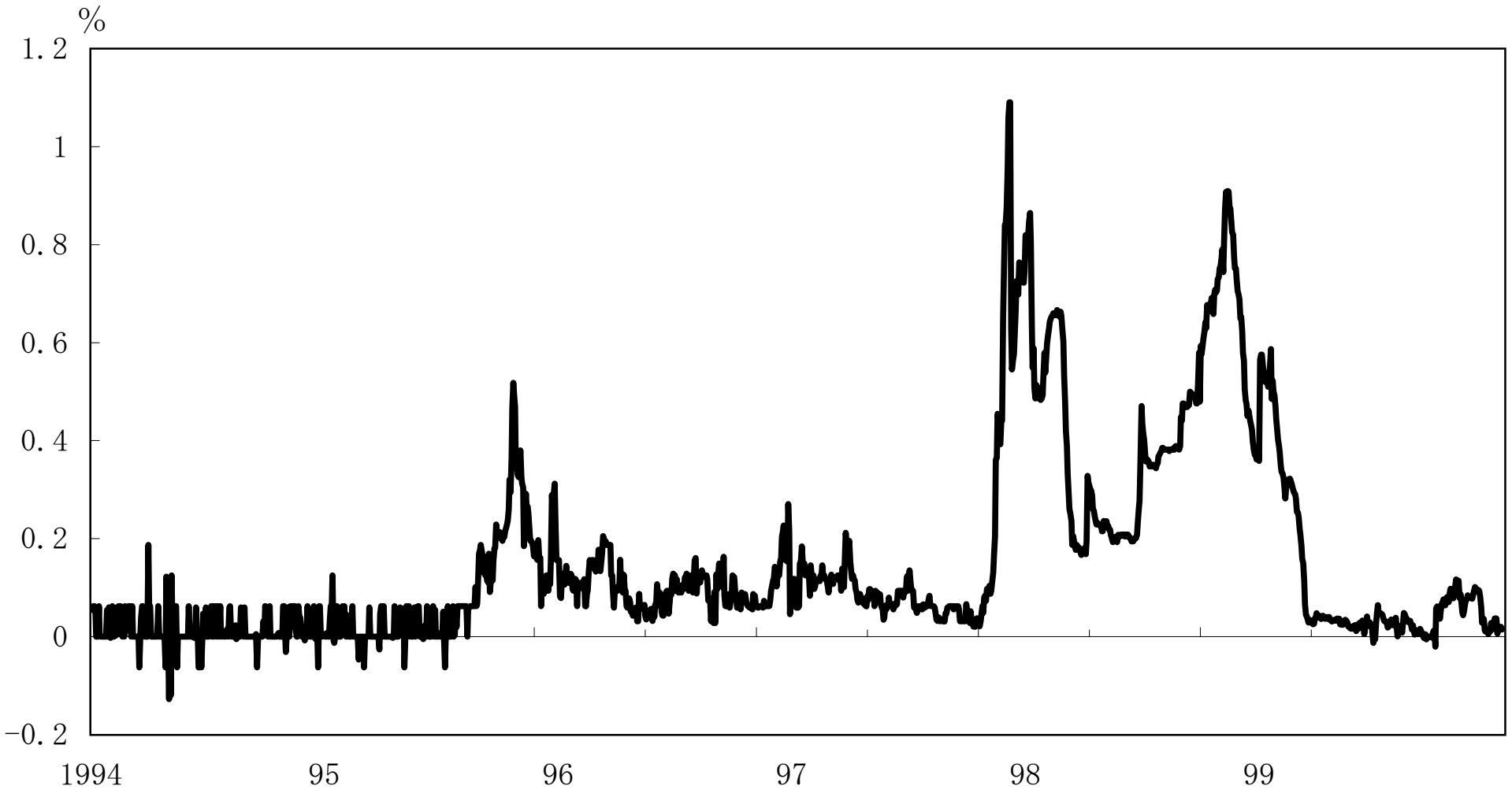


Notes:1. Domestically licensed banks: banking accounts of domestically licensed banks + trust accounts of domestically licensed banks
Prior to 77/1Q, banking accounts of member banks of the Federation of Bankers Association of Japan are banking accounts of former member banks of the Federation of Bankers Association of Japan + accounts of *sougo* banks
Prior to 93/3Q, banking accounts of member banks of the Federation of Bankers Association of Japan (domestic accounts) + trust accounts of member banks of the Federation of Bankers Association of Japan

2. Prior to 91/4Q, 27 companies basis; from 92/1Q, all insurance companies basis; Source: Total Life Insurance Association of Japan.

Source: Bank of Japan CD-ROM, 2000.

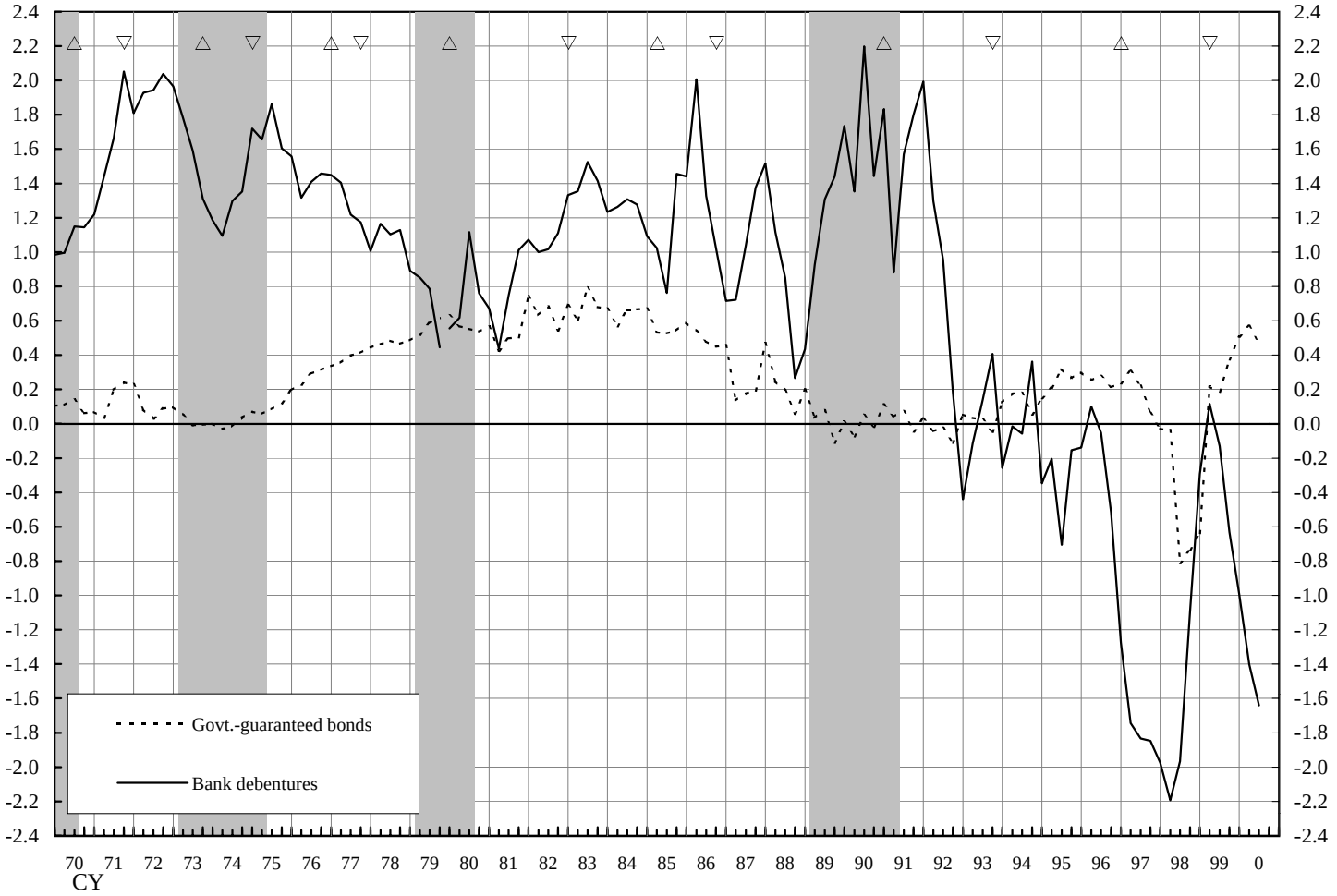
Chart 4 Japan Premium (3-month Tibor - Libor)



Source：ＱＵＩＣＫ

Chart 5 Net Amount of Bonds Issues

(Percent of nominal GDP, 3-qtr MA)

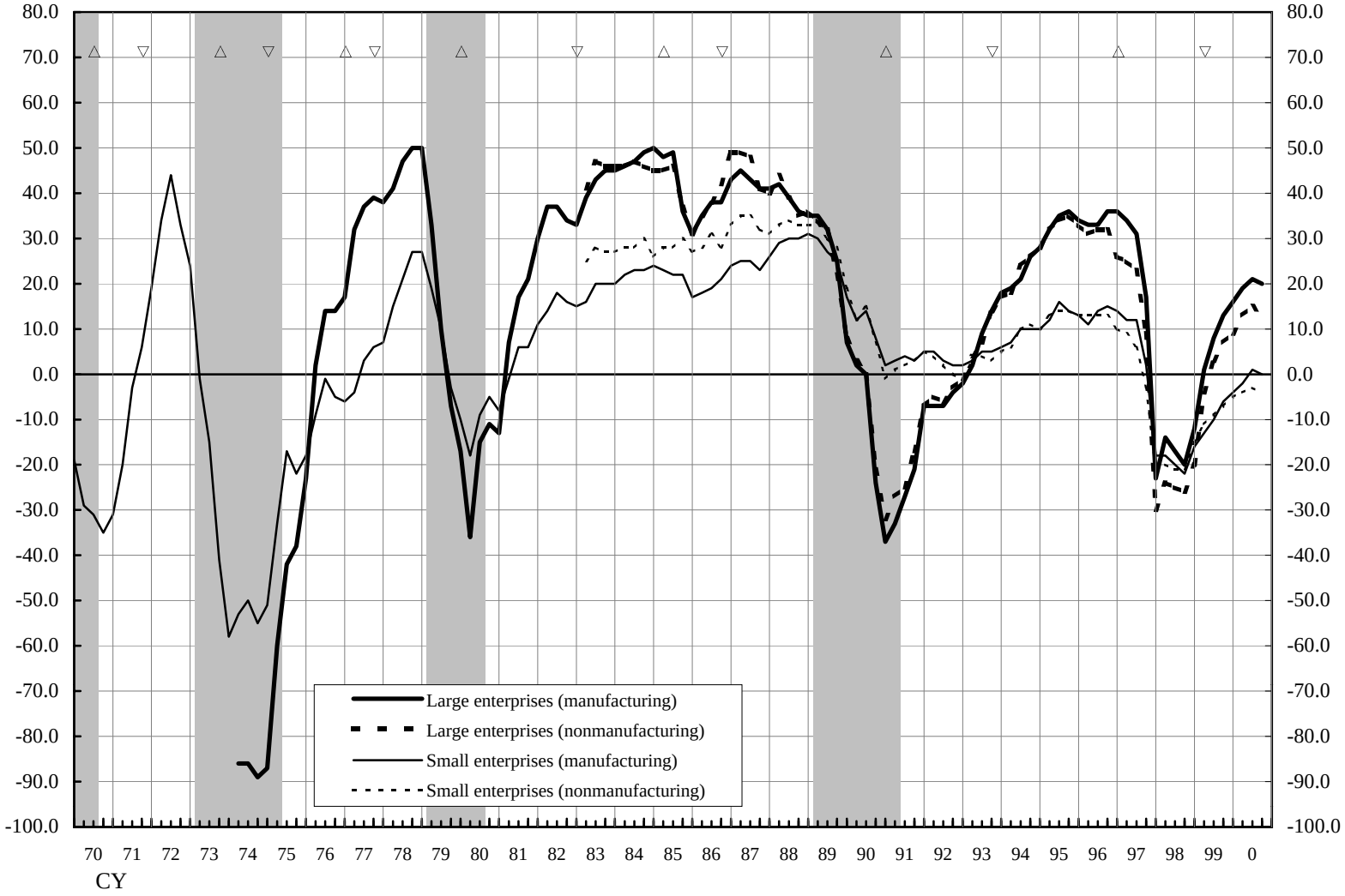


Notes: 1.Data for the Issuance of "Local government bonds," Issuance and Redemption of "Government-guaranteed bonds," and "Yen-denominated foreign bonds" are not seasonally adjusted.

2. Local govt. bonds, Govt.-guaranteed bonds and Bank debentures : data until 79/4Q = 68SNA basis, data from 80/1Q = 93SNA basis

Source: Bank of Japan CD-ROM, 2000.

(Based on *the Short-term Economic Survey of All Enterprises in Japan* < 'Easy' - 'Tight' >; % points)



Source: Bank of Japan CD-ROM, 2000.

Diagram 1
Balance Sheet of Bank

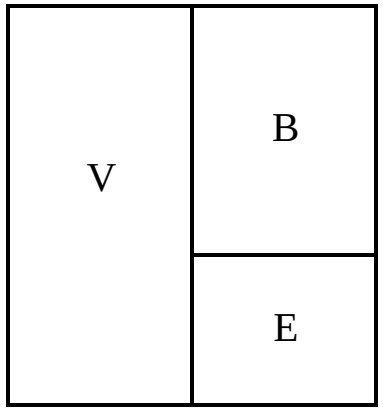


Diagram 2
Distribution Function of V: f(V,T)

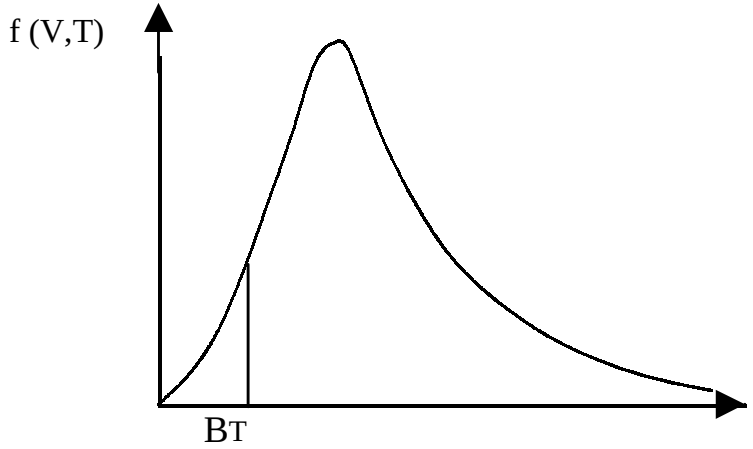
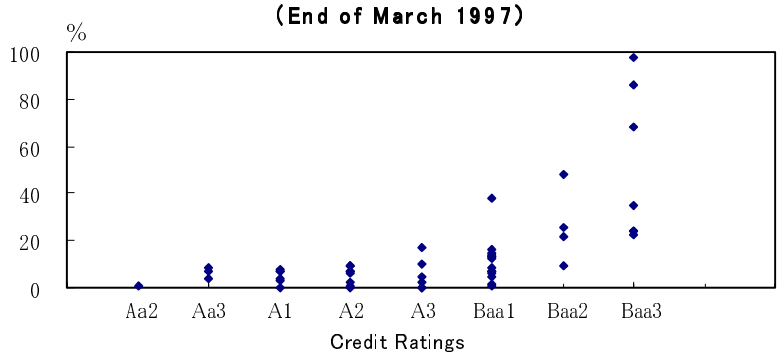
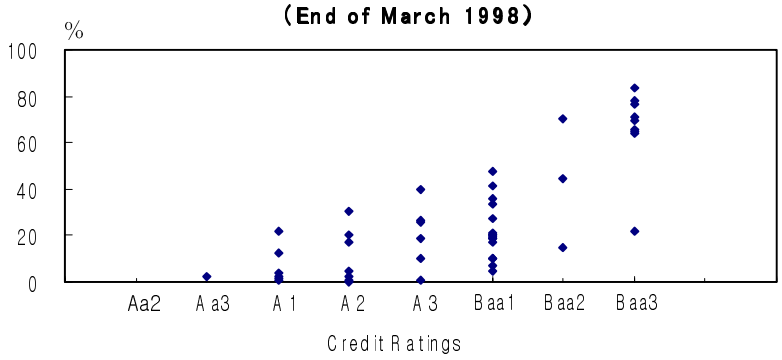


Chart 7 **Excess Debt Probability**

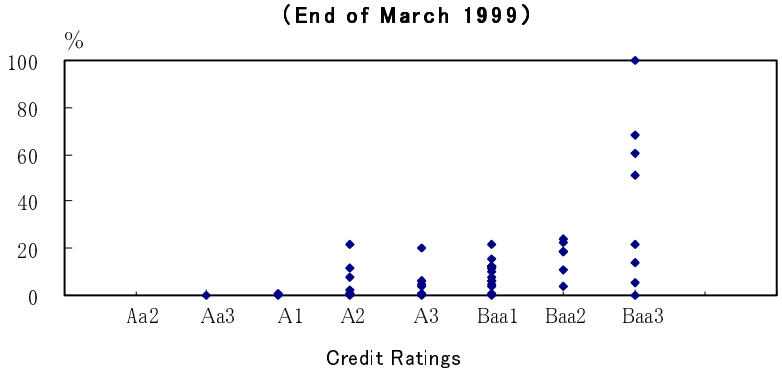
(End of March 1997)



(End of March 1998)



(End of March 1999)



(End of March 2000)

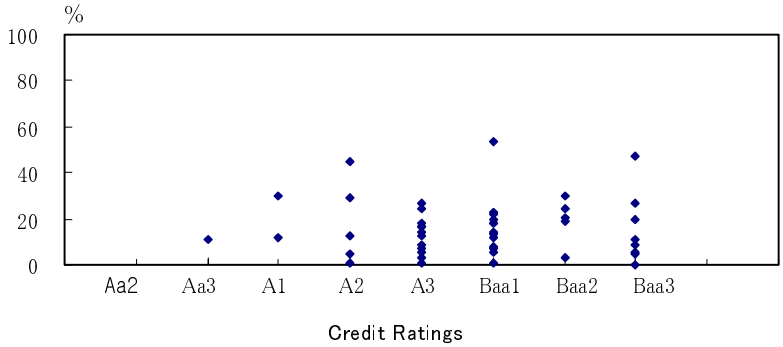
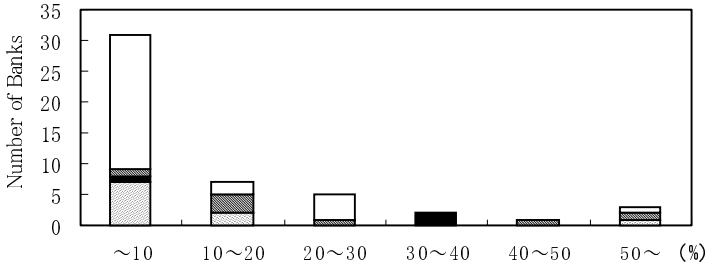
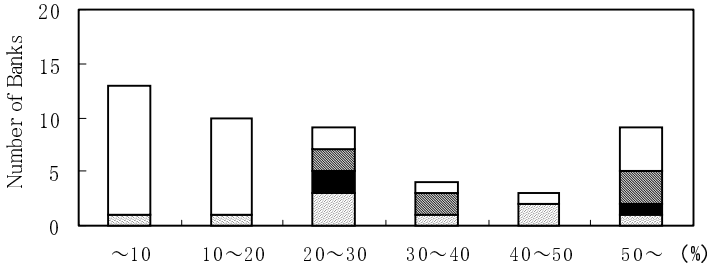


Chart 8 Excess Debt Probability

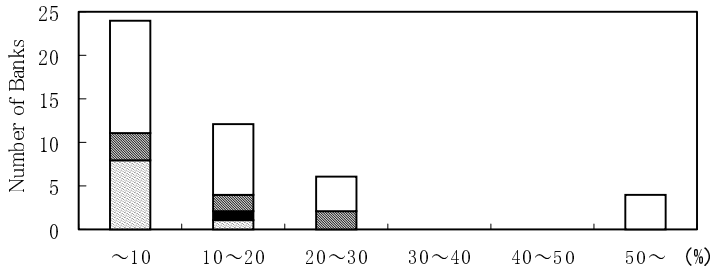
(End of March 1997)



(End of March 1998)



(End of March 1999)



(End of March 2000)

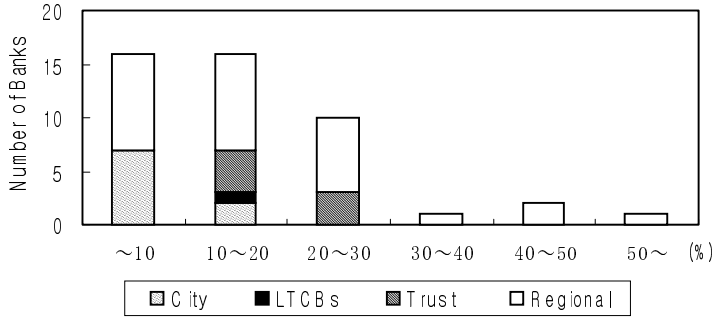


Table 1　Compositon of Loan Portfolio （End of 1998）

（%）

	Banking Account of All Banks					Trust Accounts
	City	Regional	Regional II	Trust	LTCBs	Major Banks
Manufacturing	14.1	17	11.3	12.5	12.7	8.8
Construction	5.4	8.6	9.8	3.5	3.1	3.3
Public Utilities	0.6	0.7	0.2	1.2	5.3	7.9
Transportation and Telecommunications	3.4	3.2	2.8	4.4	6.5	8.7
Wholesale, Retail and Restaurants	16.1	18.2	16	10.3	8	6.4
Finance and Insurance	9.2	4.8	5.3	20.5	22.6	15.4
Real Estate	13.4	9.5	11.5	18.9	18.9	16.9
Services	14	14.4	15.8	18.2	17.4	9.6
Local Government	0.9	4.3	1.9	0.1	0.4	0.7
Individuals	22.8	19.4	25.3	10.4	5.1	22.4
Outstanding（billion yen）	218,676	140,073	54,202	30,022	41,147	18,811

Source: Bank of Japan, *"Financial and Economic Statistics Monthly"*

Table 2
Banks with High Excess Debt Probability and Events in the Consecutive Year

End of March 1997

Banks	EDP	Event in the Consecutive Year
City 2	97.6%	Announced Merger → Bankrupt
Regional 10	85.8%	Announced Merger → Merger Withdrawn
Trust 7	67.9%	Capital Injection
Trust 4	48.4%	Capital Injection
LTCBs 2	38.0%	Capital Injection
LTCBs 3	34.7%	Capital Injection / Capital Increase
Regional 17	25.8%	
Regional 21	24.1%	
Regional 13	23.7%	Capital Injection
Regional 8	22.5%	Capital Injection

End of March 1998

Banks	EDP	Event in the Consecutive Year
Regional 10	83.5%	
Trust 4	78.5%	Affiliated with City 5
Regional 8	76.9%	
City 7	71.5%	Capital Injection
Trust 1	70.2%	Capital Injection / Announced Merger
Regional 13	69.8%	
LTCBs 2	65.7%	Failure
Trust 7	65.1%	Capital Injection / Announced Merger
Regional 21	64.1%	
City 3	47.9%	Capital Injection

Table 2 (continued)
Banks with High Excess Debt Probability and Events in the Consecutive Year

End of March 1999

Banks	EDP	Event in the Consecutive Year
Regional 10	99.9%	Capital Injection / Capital Increase
Regional 8	67.9%	Capital Injection
Regional 13	60.5%	Capital Injection
Regional 21	51.0%	
Trust 3	23.8%	
Regional 17	22.4%	
Regional 28	21.9%	
Regional 24	21.7%	
Trust 4	21.4%	Became Subsidiary of City 5
Regional 19	20.2%	

End of March 2000

Banks	EDP	Event in the Consecutive Year (by October 2000)
Regional 24	53.9%	
Regional 10	47.2%	
Regional 23	44.6%	
Regional 25	30.3%	
Regional 17	29.6%	
Regional 28	29.4%	
Trust 1	26.9%	Merged with Trust 7 (April 2000)
Regional 19	26.6%	
Regional 14	24.4%	
Trust 3	24.0%	

Note: Blank column shows nothing had been observed in .

EDP: Excess Debt Probability

Estimated at ρ =0.97

Table 3 Estimated Required Capital for Full Stabilization

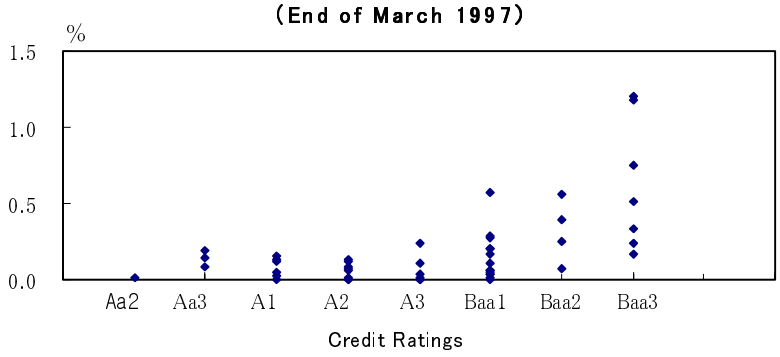
	Mar-98		Mar-99		Mar-00	
	Number of Banks	Required Capital Trillion Yen	Number of Banks	Required Capital Trillion Yen	Number of Banks	Required Capital Trillion Yen
City Banks	9	26.1	8	3.6	8	9.7
LTCB's	3(1)	5.5（2.0）	1	1.4	1	2.3
Trust Banks	6(5)	13.0（6.4）	5	2.2	5	4.2
Regional Banks	1	0.6	1	0.2	1	0.4
Total	19（16）	45.1（35.0）	15	7.4	15	15.9

Note: Figures in ( ) are excluding two failed banks and a trust bank which affiliated with a city bank.

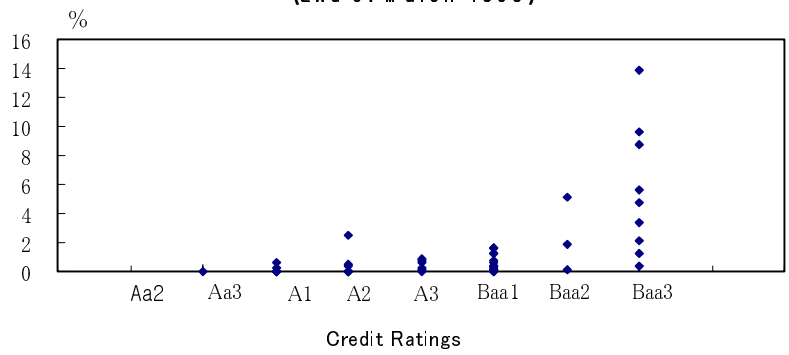
Estimated at ρ =0.97

Chart 9 **Expected Rate of Excess Liability**

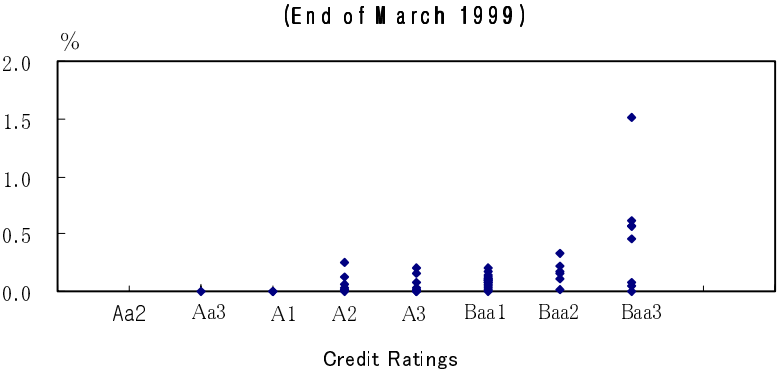
(End of March 1997)



(End of March 1998)



(End of March 1999)



(End of March 2000)

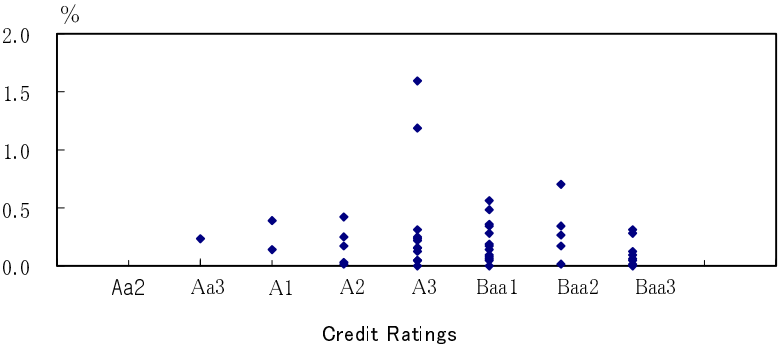


Table 4

Fair Risk-adjusted General Deposit Insurance Premium
（Weighted Average in Credit Rating and Type of Banks）

End of March 1997

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	0.004%	0.073%	0.067%	0.061%	0.118%	0.055%	-	0.600%	0.078%
LTCBs	-	-	-	0.043%	-	0.288%	-	0.259%	0.161%
Trust Banks	-	0.093%	-	-	-	0.128%	0.232%	0.373%	0.178%
Regional Banks	-	0.039%	0.013%	0.017%	0.023%	0.036%	0.072%	0.210%	0.055%
Weighted Average in Credit Rating	0.004%	0.068%	0.060%	0.046%	0.078%	0.100%	0.191%	0.333%	0.090%

End of March 1998

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	0.154%	0.228%	0.358%	0.670%	-	4.399%	0.600%
LTCBs	-	-	-	-	0.314%	-	-	1.234%	0.758%
Trust Banks	-	-	-	1.225%	-	0.399%	2.592%	4.857%	1.693%
Regional Banks	-	0.021%	0.039%	0.055%	0.227%	0.088%	0.568%	2.882%	0.499%
Weighted Average in Credit Rating	-	0.021%	0.130%	0.187%	0.308%	0.511%	1.781%	3.610%	0.742%

Table 4 (continued)

Fair Risk-adjusted General Deposit Insurance Premium
（Weighted Average in Credit Rating and Type of Banks）

End of March 1999

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	-	0.011%	0.002%	0.031%	-	0.000%	0.020%
LTCBs	-	-	-	-	-	0.085%	-	-	0.085%
Trust Banks	-	-	-	-	0.105%	0.061%	0.111%	0.146%	0.106%
Regional Banks	-	0.001%	0.001%	0.040%	0.027%	0.049%	0.063%	0.340%	0.085%
Weighted Average in Credit Rating	-	0.001%	0.001%	0.019%	0.015%	0.038%	0.095%	0.192%	0.053%

End of March 2000

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	-	0.005%	0.058%	0.079%	-	0.030%	0.053%
LTCBs	-	-	-	-	0.154%	-	-	-	0.154%
Trust Banks	-	-	-	-	0.593%	0.224%	0.282%	0.109%	0.220%
Regional Banks	-	0.116%	0.133%	0.105%	0.150%	0.093%	0.084%	0.042%	0.103%
Weighted Average in Credit Rating	-	0.116%	0.133%	0.034%	0.081%	0.109%	0.197%	0.062%	0.093%

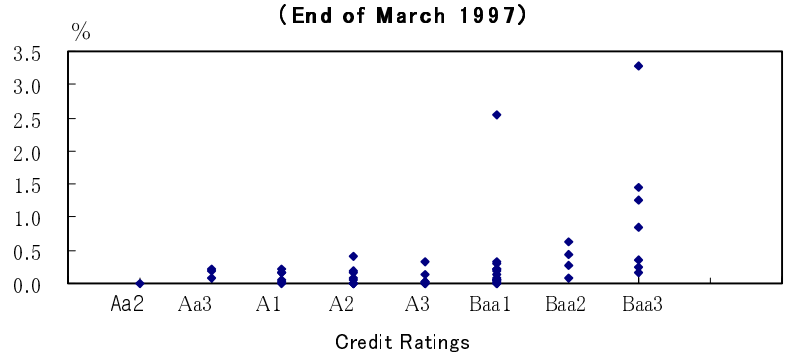
Note: "-" means no corresponding banks exist.

Estimated at ρ =0.97

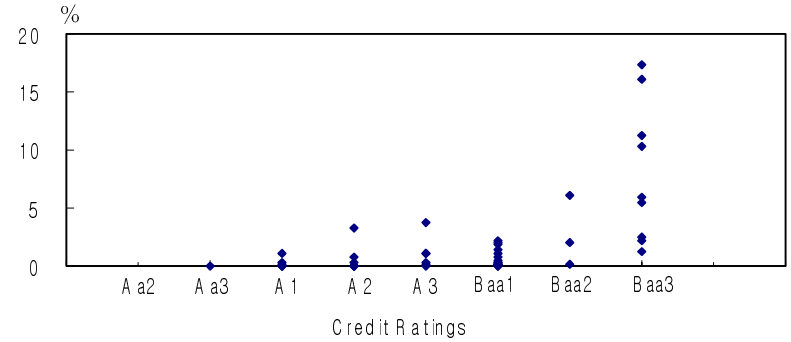
Averaged with insured deposits.

Chart 10 **Fair Risk-Adjusted Deposit Insurance Premium**

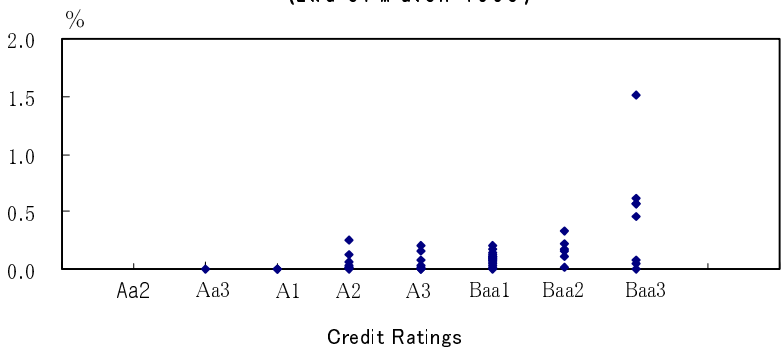
(End of March 1997)



(End of March 1998)



(End of March 1999)



(End of March 2000)

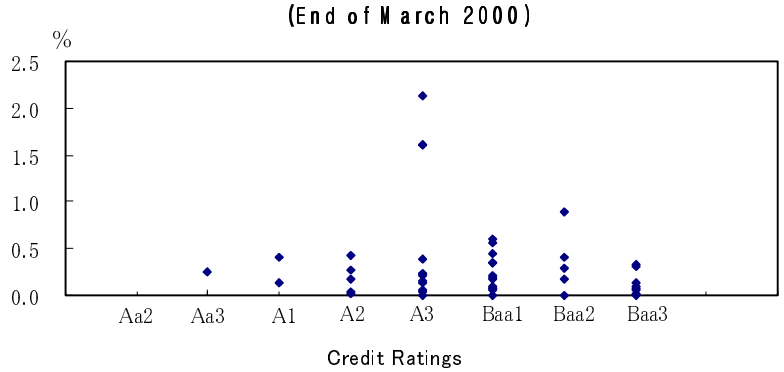


Table 5

Fair Risk-Adjusted Special Deposit Insurance Premium
（Weighted Average in Credit Rating and Type of Banks）

End of March 1997

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	0.008%	0.135%	0.119%	0.104%	0.203%	0.078%	-	0.849%	0.130%
LTCBs	-	-	-	0.363%	-	2.251%	-	3.035%	1.404%
Trust Banks	-	0.105%	-	-	-	0.155%	0.286%	0.475%	0.219%
Regional Banks	-	0.048%	0.015%	0.020%	0.030%	0.041%	0.080%	0.240%	0.063%
Weighted Average in Credit Rating	0.008%	0.120%	0.106%	0.109%	0.131%	0.247%	0.233%	0.604%	0.170%

End of March 1998

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	0.329%	0.494%	0.668%	1.181%	-	6.923%	1.052%
LTCBs	-	-	-	-	3.448%	-	-	#######	7.458%
Trust Banks	-	-	-	1.994%	-	0.544%	3.520%	6.407%	2.269%
Regional Banks	-	0.025%	0.046%	0.066%	0.296%	0.106%	0.668%	3.377%	0.591%
Weighted Average in Credit Rating	-	0.025%	0.271%	0.368%	0.855%	0.855%	2.377%	6.237%	1.297%

Table 5 (continued)

Fair Risk-Adjusted Special Deposit Insurance Premium
（Weighted Average in Credit Rating and Type of Banks）

End of March 1999

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	-	0.022%	0.005%	0.056%	-	0.000%	0.037%
LTCBs	-	-	-	-	-	1.027%	-	-	1.027%
Trust Banks	-	-	-	-	0.223%	0.085%	0.151%	0.190%	0.145%
Regional Banks	-	0.001%	0.001%	0.044%	0.029%	0.056%	0.078%	0.386%	0.097%
Weighted Average in Credit Rating	-	0.001%	0.001%	0.028%	0.020%	0.091%	0.127%	0.225%	0.084%

End of March 2000

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	-	0.009%	0.116%	0.130%	-	0.045%	0.099%
LTCBs	-	-	-	-	1.975%	-	-	-	1.975%
Trust Banks	-	-	-	-	1.012%	0.303%	0.420%	0.132%	0.310%
Regional Banks	-	0.137%	0.142%	0.111%	0.161%	0.102%	0.102%	0.046%	0.113%
Weighted Average in Credit Rating	-	0.137%	0.142%	0.039%	0.194%	0.155%	0.283%	0.075%	0.156%

Note: "-" means no corresponding banks exist.

Estimated at ρ =0.97

Averaged with insured deposits.

Table 6

Fair Risk-Adjusted Deposit Insurance Premium
（Weighted Average in Credit Rating and Type of Banks）

End of March 1997

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	0.012%	0.208%	0.186%	0.165%	0.321%	0.133%	-	1.448%	0.208%
LTCBs	-	-	-	0.406%	-	2.539%	-	3.294%	1.566%
Trust Banks	-	0.198%	-	-	-	0.283%	0.518%	0.848%	0.397%
Regional Banks	-	0.087%	0.027%	0.037%	0.053%	0.077%	0.152%	0.451%	0.118%
Weighted Average in Credit Rating	0.012%	0.188%	0.166%	0.154%	0.209%	0.347%	0.424%	0.937%	0.260%

End of March 1998

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	0.483%	0.722%	1.025%	1.851%	-	11.322%	1.652%
LTCBs	-	-	-	-	3.763%	-	-	13.005%	8.216%
Trust Banks	-	-	-	3.219%	-	0.943%	6.112%	11.264%	3.962%
Regional Banks	-	0.046%	0.085%	0.121%	0.523%	0.193%	1.236%	6.259%	1.091%
Weighted Average in Credit Rating	-	0.046%	0.401%	0.555%	1.163%	1.366%	4.158%	9.846%	2.039%

Table 6 (continued)

Fair Risk-Adjusted Deposit Insurance Premium
（Weighted Average in Credit Rating and Type of Banks）

End of March 1999

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	-	0.033%	0.008%	0.087%	-	0.000%	0.058%
LTCBs	-	-	-	-	-	1.112%	-	-	1.112%
Trust Banks	-	-	-	-	0.328%	0.145%	0.263%	0.336%	0.251%
Regional Banks	-	0.001%	0.002%	0.085%	0.056%	0.105%	0.140%	0.726%	0.182%
Weighted Average in Credit Rating	-	0.001%	0.002%	0.047%	0.035%	0.129%	0.222%	0.417%	0.136%

End of March 2000

	Aa2	Aa3	A1	A2	A3	Baa1	Baa2	Baa3	Weighted Average in Type of Banks
City Banks	-	-	-	0.014%	0.174%	0.209%	-	0.075%	0.152%
LTCBs	-	-	-	-	2.128%	-	-	-	2.128%
Trust Banks	-	-	-	-	1.605%	0.527%	0.702%	0.241%	0.530%
Regional Banks	-	0.253%	0.275%	0.216%	0.311%	0.195%	0.186%	0.088%	0.215%
Weighted Average in Credit Rating	-	0.253%	0.275%	0.074%	0.275%	0.264%	0.481%	0.138%	0.249%

Note: "-" means no corresponding banks exist.

Estimated at ρ =0.97

Averaged with insured deposits.

Table 7

Problem Loan of Japanese Banks (All Commercial Banks)

100 million yen

Financial year		Mar-93	Mar-94	Mar-95	Mar-96	Mar-97	Mar-98	Mar-99	Mar-00
		<---Only for major banks----->							
Loss from bad loans	(A)	16,398	38,722	52,322	133,692	77,634	132,583	136,309	69,441
specific reserves		9,449	11,461	14,021	70,873	34,473	84,025	81,181	25,313
write-off and loan sales losses		4,235	20,900	28,085	59,802	43,158	39,927	47,093	38,646
Cummulative amout of (A)		16,398	55,120	107,442	241,134	318,768	451,351	587,660	657,101
Bad loans outstanding	(B)	127,746	135,759	125,462	285,043	217,890	297,580	296,270	303,660
Definition of B		<----------> defaulted loans and loans with arrears			<----------> defaulted loans, loans with arrears for more than 6 monts and loans with concessional interest rates below ODR.		<---------->	defaulted loans, loans with arrears for more than 90 days and loans with concessional terms (simillar to SEC rule)	
Classified loans						767,000	717,000	642,580	633,860
Substandard						653,000	655,000	610,240	605,390
Doubtful						87,000	61,000	31,600	28,350
Estimated Loss						27,000	1,000	740	120
Total loan loss resreves outstanding		36,983	45,468	55,364	132,940	123,340	178,150	147,970	122,300
Total loan outstanding (all domestic banks)					4,827,009	4,823,121	4,779,785	5,066,620	4,961,730

Source: Financial Supervisory Agency and the Bank of Japan

Chart 11 Bad Loan-Total Loan Ratios

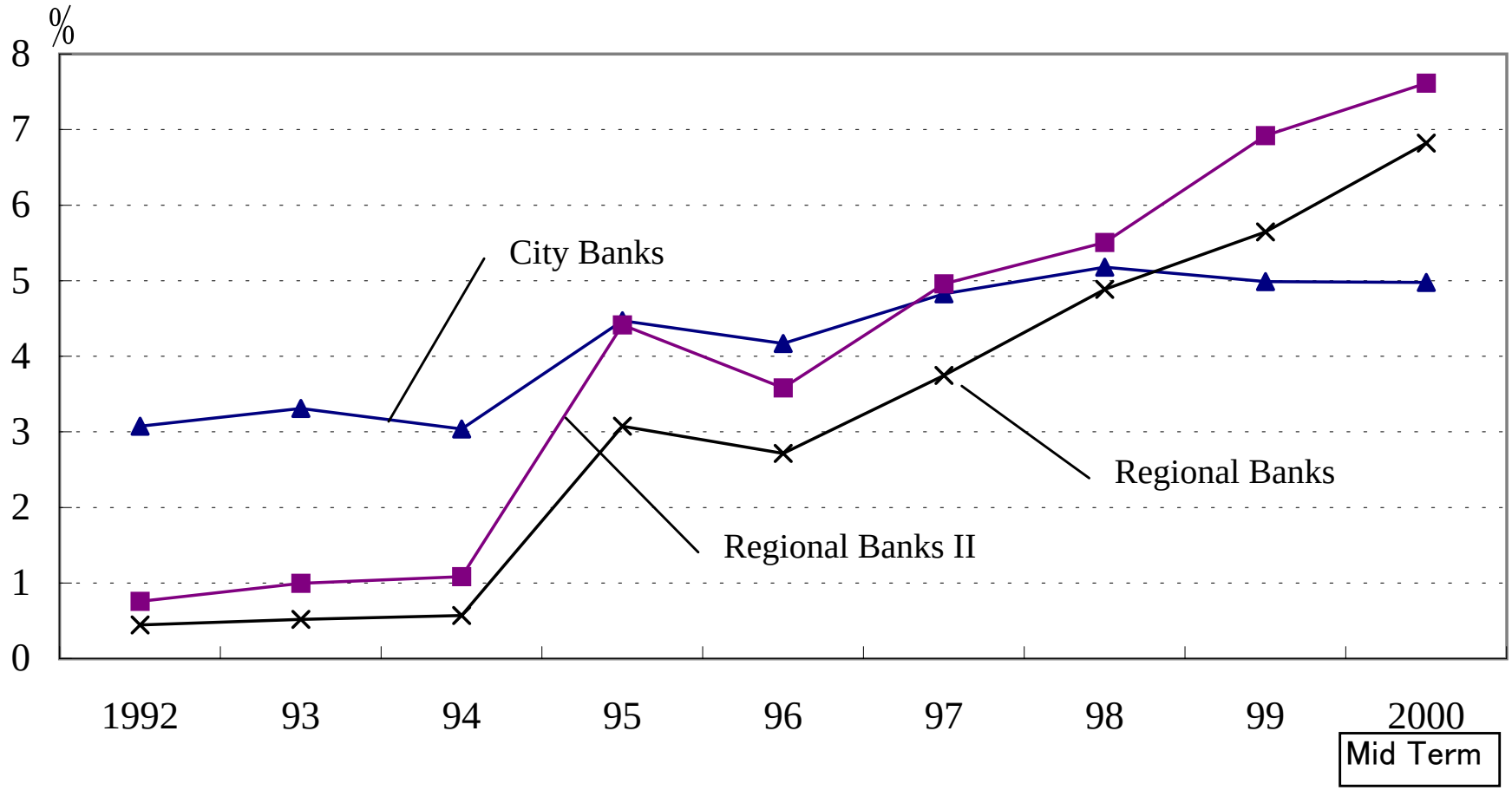
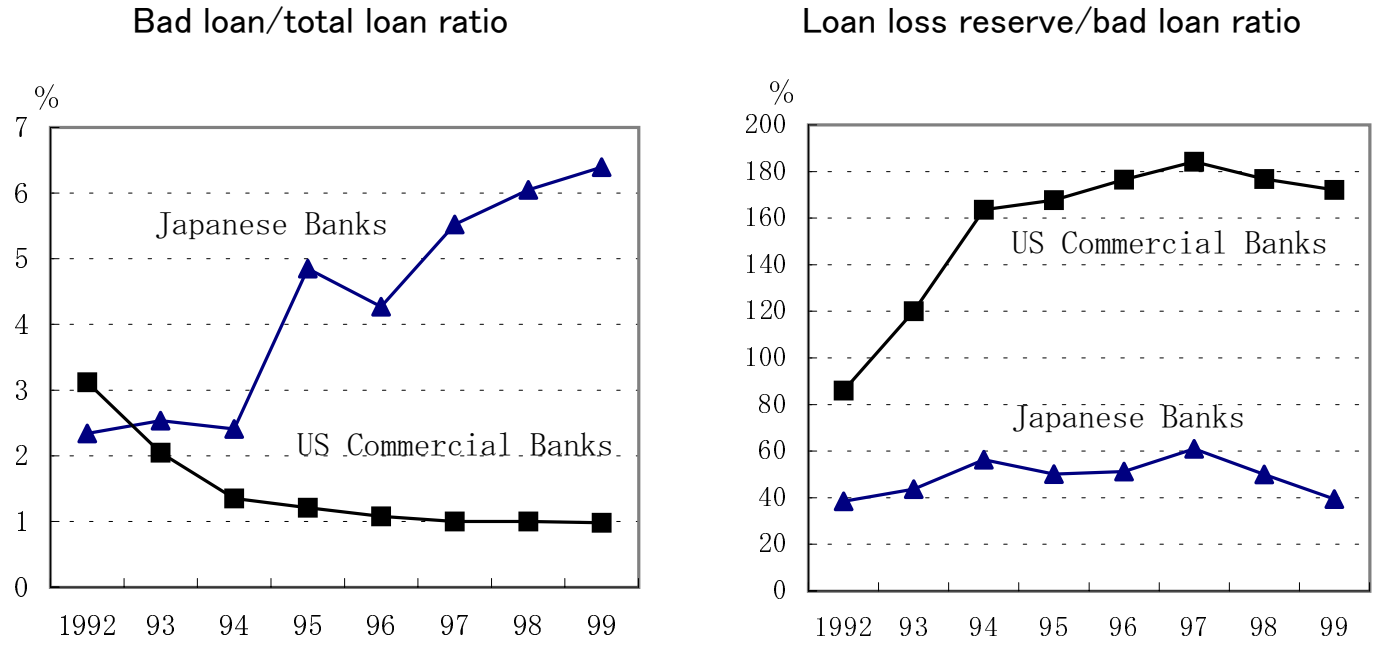


Chart 12
Comparison of Bad Loan Situations in Japan and the United States



1) Japan: fiscal year, US: calendar year
2) Figures after FY 1997 do not include data of Hokkaido Takushoku Bank, Tokuyo City Bank, Kyoto Kyoei Bank, Naniwa Bank, Fukutoku Bank, and Midori Bank.
3) Japanese bad loan ratio = Risk control loans/total loans
US bad loan ratio = (loans with arrears for more than 90 days + loans that do not count accrued interest rates as asset + restructured loans)/total loans.

Source: Japan Center for Economic Research, *Monetary Policy Under Deflation* , March 2001 (in Japanese).

Table 8

Trillion yen

Financial Year	1989	90	91	92	93	94	95	96	97	98	99
Lending Margin (A)	7.5	7.1	8.9	9.8	9.2	9.7	10.8	10.7	10.0	9.6	9.7
Other Revenue (B)	2.5	2.6	2.2	2.5	2.8	2.1	3.3	3.7	3.6	3.1	2.5
Operating Costs (C)	6.6	7.1	7.5	7.7	7.7	7.8	7.8	8.0	8.0	7.5	7.3
Salaries and Wages	3.5	3.7	3.9	4.0	4.0	4.0	4.0	4.0	4.0	3.6	3.5
Gross Profit (D)=(A)+(B)-(C)	3.3	2.6	3.5	4.5	4.3	4.0	6.3	6.4	5.6	5.2	4.9
Loan Loss (E)	1.4	0.8	1.0	2.0	4.6	6.2	13.3	7.3	13.5	13.5	6.3
Net Operating Profit (F)=(D)-(E)	1.9	1.8	2.5	2.5	-0.4	-2.2	-7.0	-1.0	-7.9	-8.3	-1.4
Realized Capital Gains (G)	2.8	2.0	0.7	0.0	2.0	3.2	4.4	1.2	3.6	1.4	3.8
Net Profit (F)+(G)	4.7	3.8	3.3	2.5	1.7	1.0	-2.6	0.2	-4.2	-6.9	2.3
Asset	943.6	927.6	914.4	859.5	849.8	845.0	848.2	856.0	848.0	759.7	737.2

Note: Financial Statement of All Commercial Banks.

Other revenue (B) includes all the other profit such as dealing profits and fees but excludes realized capital gains of stocks and real estates.

Realized capital gains includes gains of stocks and real estates.

Table 9
Distribution of Adjusted Capital/Asset Ratio of Major Japanese Banks

	Number of Banks						Weighted	Nikkei 225
	Total	Less than -2%	-2% to 0%	0% to 2%	2% to 4%	4% to 6%	Average %	index
March-98	19	2	6	8	3	0	0.93	16527
March-99	17	0	2	10	5	0	2.07	15837
March-00	17	0	0	4	9	4	3.48	20337
September-00	15	0	0	5	10	0	2.36	15747
February-01	15	0	1	8	6	0	1.86	12883

Note Adjusted Capital = Core Capital + Unrealized Capital Gains and Losses
+ Loan Loss Reserves - Estimated Loan Losses
- Deferred Tax Asset
Estimated Loan Losses = 100% of defaulted loans + 70% of risk loans
+ 20% of doubtful loans + 1% of normal loans
Adjusted Capital/Asset Ratio = Adjusted Capital/Gross Asset

Source: Japan Center for Economic Research, *Monetary Policy Under Deflation* , March 2001 (in Japanese).

Table 10

Stock portfolios and capital in the banking sector

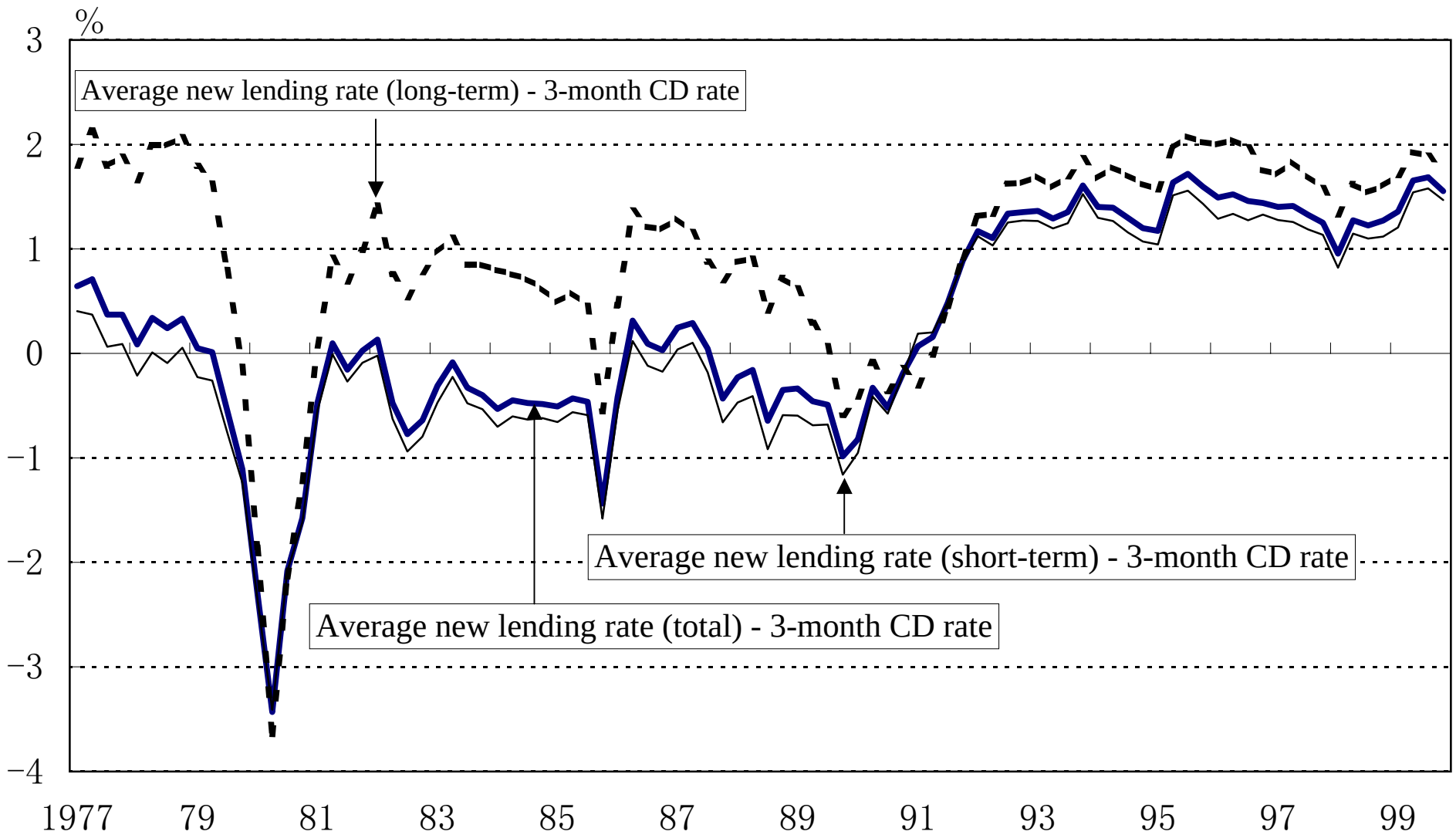
(trillion yen)

	Market value of shares A	Book value of shares B	Capital account (Core capital) C	Deferred tax asset D	Equity capital held by the government E	Net capital Account C+(A−B)×0.6−D−E	Nikkei225 Index
Mar-86	*46.9*	11.9	12.3	0.0	0.0	33.3	15860
Mar-87	*63.7*	13.4	13.8	0.0	0.0	44.0	21567
Mar-88	*77.6*	17.6	17.2	0.0	0.0	53.2	26260
Mar-89	*97.1*	23.2	22.5	0.0	0.0	66.8	32839
Mar-90	*88.6*	29.7	28.6	0.0	0.0	63.9	29980
Mar-91	*77.7*	33.1	30.2	0.0	0.0	57.0	26292
Mar-92	56.4	34.5	31.3	0.0	0.0	44.4	19346
Mar-93	56.4	34.5	31.8	0.0	0.0	44.9	18591
Mar-94	61.9	36.5	32.3	0.0	0.0	47.5	19112
Mar-95	52.0	39.8	32.3	0.0	0.0	39.6	15140
Mar-96	64.3	43.0	27.9	0.0	0.0	40.7	21407
Mar-97	54.1	42.9	28.5	0.0	0.0	35.2	18003
Mar-98	50.8	45.7	24.5	0.0	0.0	27.6	16527
Mar-99	47.1	42.7	33.7	8.9	7.5	20.0	15837
Mar-00	54.5	44.4	35.2	8.2	7.5	25.6	20337

Source of data: Federation of Bankers Associations of Japan, "Analysis of Bank Financial Statements," various issues; securities reports for individual banks. Note that both market and book values represent listed shares only.

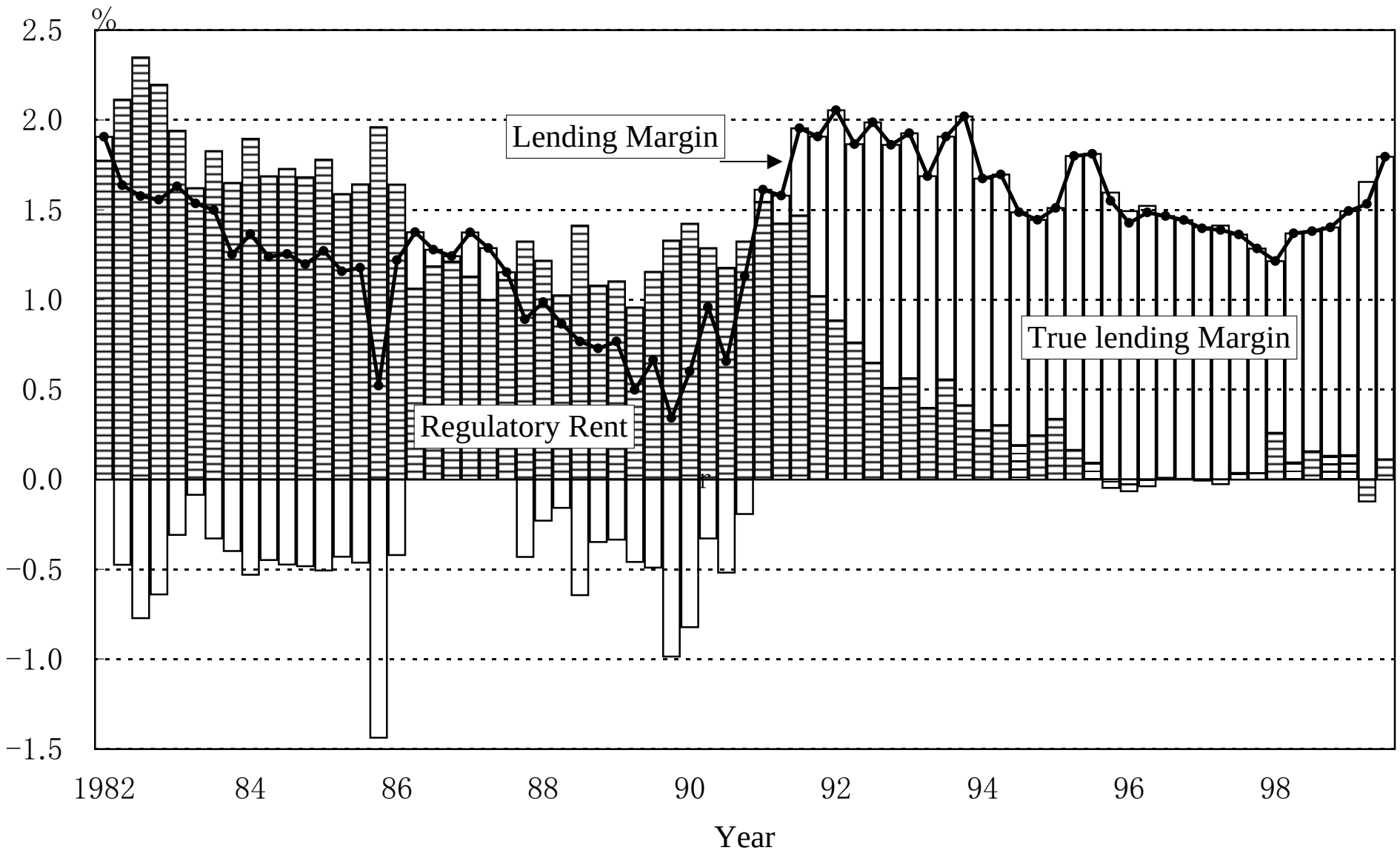
Note: Tables represent amounts on the banking accounts of all banks in Japan. The market value of stock portfolios was not published prior to March 1990, so we have estimated backwards using the Niikkei 225 share price index from the end of March 1991. However, the tables for 1985-1986 should be discounted, because bank stock portfolios have been gradually increasing, so that values estimated from the end of fiscal 1990 will have an upwards bias the father back one goes. Net capital is not adjusted for bad loans. 40% corporate tax rate is assumed.

Chart 13 New lending rate and short-term market rate



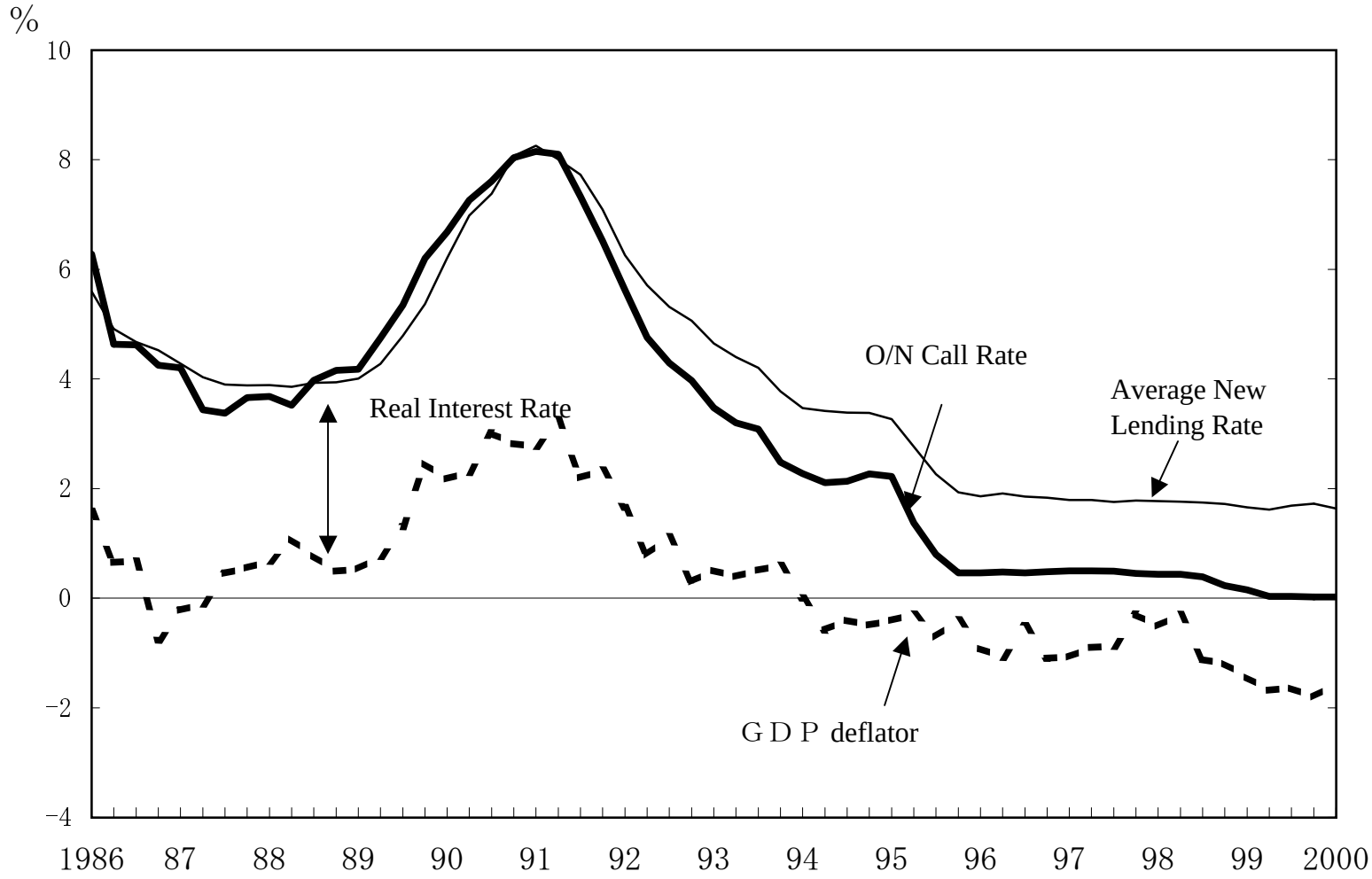
Note: Estimated by Ikuko Fueda of Japan Center for Economic Research

Chart 14 Decompostion of Lending Margin



Source: Ikuko FUEDA, "Financial liberalization, asset bubble, and bank behavior," in M. Fukao and JCER ed, Empirical Analysis of Financial Recession," Japan Ecoonmic Journal, 2000.

Chart 15 Interest Rates and Inflation Rate



Note: GDP deflator inflation rate is adjusted for changes in consumption tax rate in1989 and 1997
Source: Japan Center for Economic Research, *Monetary Policy Under Deflation* , March 2001 (in Japanese).

Table 11

Relative Size of Government Sponsored Financial Institutions (end of 2000)

	Asset Trillion yen	Share Percent	GDP ratio Percent
Loan			
Government sponsored agencies	163	26	32
Private banks	464	74	90
Total	627	100	122
Deposit			
Postal Saving System	255	34	50
Private banks	486	66	95
Total	741	100	144
Life Insurance (asset)			
Postal Life Insurance	119	40	23
Private life insurance companies	180	60	35
Total	299	100	58

Note: Prepared by the author from the data in the Bank of Japan, *Financial and Economic Statistics Monthly* , March 2001.

Table 12

Lending rates of government sponsored agencies
Interest rates on February 9, 2001

Government Lending Agencies	Basic loan rate (percent)	Average terms (years)
Japan Development Bank	2.05	16.7
People's Finance Corporation	2.05	7.3
Japan Finance Corporation for Small Business	2.05	8.9
Japan Finance Corporation for Municipal Enterpr	1.9	N.A.
Housing Loan Corporation	2.7	25.4

Note: Loan rates are fixed.

Memorandum

Average Loan Rate of All Banks	2.12	Less than 1
Fixed rate housing loan of Fuji Bank	4.65	20

Source: Japan Center for Economic Research, *Monetary Policy Under Deflation* , March 2001 (in Japanese).

Table 13

Top Five Shareholders of Major Japanese Banks
At the end of September 2000

	1st	2nd	3rd	4th	5th
Mizuho Holdings	*Daiichi Life: 4.1*	*Nippon Life: 2.7*	Sumitomo Trust: 2.1	*Yasuda Life: 2.0*	*Asahi Life: 1.9*
Sakura Bank	*Mitsui Life: 3.6*	*Taiyo Life: 3.6*	*Nippon Life: 3.6*	State St.: 3.2	Chuo-Mitsui Trust: 3.0
Sumitomo Bank	*Sumitomo Life: 4.5*	*Nippon Life: 4.0*	Matsushita: 3.3	Sumitomo Trust: 2.4	Sanyo Electric: 2.0
Sumitomo Trust	*Sumitomo Life: 2.5*	State St.: 2.4	Sumitomo Bank: 2.2	Sumitomo Trust: 2.1	Mitsubishi Trust: 1.9
Bank of Tokyo Mitsubishi	*Meiji Life: 5.0*	*Nippon Life: 3.6*	Sumitomo Trust: 2.7	Tokyo Marine: 2.7	*Daiichi Life: 2.5*
Mitsubishi Trust	BOTM: 4.1	*Meiji Life: 3.9*	Mitsubishi Heavy: 2.7	Sumitomo Trust: 2.4	Asahi Glass: 2.2
Sanwa Bank	Toyo Trust: 4.1	*Nippon Life: 4.0*	SumitomoTrust: 3.3	*Daido Life: 3.0*	*Meiji Life: 2.7*
Tokai Bank	Toyota: 5.0	*Chiyoda Life: 3.7*	*Nippon Life: 3.0*	Toyoshima: 2.4	*Daiichi Life: 1.7*
Asahi Bank	*Daiichi Life: 4.1*	*Chiyoda Life: 3.2*	*Yasuda Life: 2.8*	*Asahi Life: 2.1*	Sumitomo Trust: 2.0
Daiwa Bank	Nomura Sec: 3.2	*Tokyo Life: 2.9*	Fuji Fire Ins: 2.6	Osaka Gas: 2.5	Nichido Fire Ins: 1.8

Note: Italics are life insurance companies. BOTM; Bank of Tokyo Mitsubishi.
Chiyoda Life failed in October 2000 and Tokyo Life failed in March 2001.
Source: Nikkei Kaisha Joho, spring 2001.

Table 14 Cross Holding Structure among Life Insurance Companies and Banks 100 Million

		DKB	Sakura	Fuji	BTM	Asahi	Sanwa	Sumitomo	Daiwa	Tokai	IBJ	Other banks	Subtotal	Sub-debt of LIs	Sub-debt of Banks	Total
Nippon	S notes	235	235	235	235	n.a	235	235	n.a	235	n.a	1,055	2,700	0	—	2,700
	Shares	1,115	1,326	632	2,804	291	1,376	2,151	n.a	470	754	9,866	20,785	—	10,762	31,547
Daiichi	S notes	88	88	88	88	88	88	88	n.a	88	88	708	1,500	1,000	—	2,500
	Shares	1,077	516	899	2,197	666	699	685	n.a	242	1,728	5,150	13,858	—	7,964	21,823
Sumitomo	S notes	n.a	100	100	100	n.a	n.a	600	n.a	100	150	540	1,690	3,950	—	5,640
	Shares	n.a	121	34	325	n.a	n.a	2,281	n.a	168	137	5,199	8,266	—	6,716	14,982
Meiji	S notes	n.a	n.a	n.a	150	n.a	90	n.a	n.a	60	90	210	600	0	—	600
	Shares	n.a	n.a	n.a	3,708	n.a	884	n.a	n.a	204	941	7,153	12,890	—	8,496	21,386
Asahi	S notes	300	n.a	n.a	n.a	80	n.a	n.a	n.a	80	n.a	30	490	2,730	—	3,220
	Shares	1,387	n.a	n.a	n.a	350	n.a	n.a	56	209	257	1,931	4,189	—	6,632	10,820
Yasuda	S notes	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	300	300	1,113	—	1,413
	Shares	n.a	n.a	1,805	n.a	454	n.a	n.a	n.a	n.a	n.a	2,755	5,014	—	5,148	10,162
Mitsui	S notes	n.a	100	n.a	n.a	n.a	n.a	n.a	n.a	n.a	30	210	340	1,450	—	1,790
	Shares	n.a	1,154	n.a	n.a	n.a	n.a	n.a	n.a	n.a	70	1,378	2,602	—	4,177	6,779
Taiyo	S notes	0	250	0	0	0	50	0	0	0	0	0	300	850	—	1,150
	Shares	n.a	1,154	n.a	924	n.a	291	512	n.a	n.a	n.a	400	3,282	—	3,423	6,705
Daido	S notes	20	n.a	20	20	n.a	24	20	n.a	n.a	12	20	136	0	—	136
	Shares	16	n.a	19	32	n.a	952	11	n.a	n.a	13	856	1,900	—	1,697	3,597
Fukoku	S notes	0	0	0	0	0	0	0	0	0	0	0	0	325	—	325
	Shares	430	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	820	1,251	—	1,710	2,961
Kyoei	S notes	0	0	0	0	0	0	0	0	0	0	0	0	455	—	455
	Shares	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	391	391	—	3,514	3,905
Chiyoda	S notes	n.a	n.a	n.a	n.a	160	n.a	n.a	n.a	460	n.a	280	900	879	—	1,779
	Shares	n.a	n.a	n.a	n.a	506	n.a	n.a	n.a	503	n.a	751	1,759	—	2,700	4,459
Nichidan	S notes	0	0	0	0	0	0	0	0	0	0	0	0	450	—	450
	Shares	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	265	265	—	3,108	3,373
Tokyo	S notes	n.a	n.a	n.a	n.a	n.a	n.a	n.a	120	n.a	n.a	170	290	400	—	690
	Shares	n.a	n.a	n.a	n.a	n.a	n.a	n.a	181	n.a	n.a	250	431	—	850	1,281
Total	S notes	643	773	443	593	328	487	943	120	1,023	370	3,523	9,246	13,602	—	22,848
	Shares	4,024	4,271	3,390	9,990	2,268	4,202	5,640	237	1,796	3,900	37,165	76,883	—	66,896	143,779

Note: S notes: Surplus Notes

Source: Fukao and Japan Center for Economic Research [2000]. Data are taken from disclosure materials of individual financial institutions.