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Financial  
system  
FSR report



**Bank of Japan**  
**July 2006**

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as at July 10, 2006.

# Financial System Report

Bank of Japan  
July 2006

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## Preface

The Bank of Japan began the publication of the *Financial System Report* last year. The purpose of this report can be summarized as follows:

- To present a comprehensive analysis and assessment of the stability and the functioning of the Japanese financial system and to highlight and examine potential risks to financial system stability.
- To facilitate communication with concerned parties on maintaining the stability and enhancing the functioning of the financial system and thereby contribute to long-term financial stability and the sound development of the economy.

Japan's financial system has almost overcome the non-performing-loan (NPL) problem that it has been grappling with for over ten years since the bursting of the asset price bubble and is now entering a new phase. The environment surrounding the Japanese financial system has also been changing significantly: financial markets have become increasingly global, financial activities have been deregulated, and technology and its application in financial services have made further substantial progress. In this new phase, the main players, such as private financial institutions and the central bank, need to respond proactively to the changing environment and take necessary action to further enhance the stability and the efficiency of Japan's financial system. This is crucial to achieve a sound development of Japan's economy.

The Bank of Japan will continue to analyze and evaluate the stability and the efficiency of the financial system and to make its assessment publicly known. Furthermore, the Bank will take appropriate policy measures. Through these activities, the Bank will contribute to maintaining the stability and enhance the efficiency of the financial system.

## **An Assessment of Financial System Stability: An Overview**

- Japan's financial system overall has regained stability.
- With the improvement in the performance of the corporate sector, the ratio of banks' NPLs to total credit exposure has been on a declining trend. The quality of banks' loan portfolios has improved substantially. Furthermore, banks posted large reversals of allowances for loan losses during the past fiscal year, pushing down further the level of aggregate credit costs. Banks' profits have increased significantly, mainly due to the above-mentioned decline in credit costs. In fiscal 2005, the profits of both the major banks and the regional banks marked record highs.
- In the area of market risks, the interest rate risk in banks' bond portfolios as a whole is subdued, partly due to a shortening of the average duration of bonds held. Some banks have started to consider increasing their stockholdings, but so far the increase in risks associated with such stockholdings is limited. At the same time, banks' capital has been increasing, reflecting the expansion in banks' retained earnings and capital procurement. The ratio of deferred tax assets to banks' capital has decreased. The amount of risk taken by banks has generally been restrained, and banks' capital has risen both in terms of quality and quantity. Accordingly, constraints on banks' activities due to capital adequacy concerns have eased further.
- The environment for Japan's financial system has been shaped by the continuing globalization of economic activity and financial markets. Innovation in information and communication technology (ICT) and deregulation have been making further progress in the financial sector. As for the macroeconomic environment, economic and

price conditions have improved, and market interest rates, reflecting these trends, have gradually moved higher. Land prices in the metropolitan areas have bottomed out and started to rise. The "quantitative easing policy" by the Bank of Japan was terminated in March 2006. With regard to banks' business activities, increased capital buffers have expanded banks' risk-taking capacity and the public's and market participants' confidence in the financial system has also grown. Against this background, banks are showing increased dynamism in their operations and are embarking on the provision of new services to customers.

- Banks' lending attitude has become more positive, and private-sector credit demand has bottomed out. As a result, the rate of change in aggregate bank loans entered positive territory during fiscal 2005. The amount of housing loans outstanding continues to increase and the year-on-year rate of change in corporate loans outstanding recently has also turned positive. Meanwhile, competition among banks in the loan business has become intense and interest margins on loans (i.e., lending rates minus banks' funding costs) have continued to contract. These developments imply that the current financial environment is accommodative and is strongly supportive of economic activity in the private sector. From the viewpoint of maintaining financial stability, however, it is also important to examine carefully whether the levels of loan rates and interest margins properly reflect borrowers' credit risks. So far, banks, through the application of advanced methods for credit risk management, have generally managed credit risks prudently. It is important for banks to continue to pay due attention to the balance of risk and return in managing their loan business.
- Looking at banks' activities in the changing financial environment, banks are cautiously managing the interest

rate risk in their bond portfolios. In addition, the economic recovery in progress now and future rises in market interest rates are likely to have a positive impact on banks' operating profits. Consequently, the influences of the rise in market interest rates reflecting economic and price developments are likely to be absorbed by the increased overall capital buffer in the banking sector. Regarding liquidity risks, since the full removal of the blanket guarantee of deposits in April 2005, there has been no noticeable problem with regard to banks' liquidity management. In this situation, money markets are on the way to functioning more and more normally and the transaction volume in the interbank market has been gradually recovering. In sum, it is not likely that problems with regard to banks' management of liquidity risks will cause a systemic impact on the financial system in the near future.

- As for new types of investment, there is continued growth in the volume of "alternative investments" such as structured bonds, hedge funds, and real estate funds. Although the possibility is very small that risks emerging from alternative investments may have a destabilizing effect on the overall financial system, banks need to sufficiently recognize the magnitude and the characteristics of these risks and manage them effectively.

- Banks have also been expanding "fee business" such as the sale of investment trusts and insurance products. They have also been offering new services and diversifying their business activities, partly through alliance with companies in other business areas. These developments are likely to contribute to ongoing innovation in financial services that meet the needs of firms and households and to the enhancement of the functioning of the financial system. On the other hand, however, those new activities of banks are also likely to

be associated with new risks such as operational risks and compliance risks. Thus, it is imperative for banks to manage those diversified risks effectively while pressing ahead with new activities.

- The resilience of the financial system to withstand a macroeconomic downturn has grown stronger, as evidenced by the quality of banks' loan assets, increased capital levels, and improvements in risk management practices. With regard to interest rate risks and liquidity risks, it is unlikely that in the near future these risks will lead to a situation in which the overall stability of the financial system is threatened. Banks' new investment and operations generally fall well within their enhanced capacity to bear risk. However, since cyclical fluctuations of the economy are inevitable, it is necessary to expect possible future increases in credit costs, although such increases are not likely to reach levels experienced in the recent past. Furthermore, in view of the changes in the financial environment, it is necessary for banks to manage interest rate risks and liquidity risks based on various stress scenarios. It is extremely important for banks to effectively adapt to this changing environment and to manage the various risks appropriately. This is a critical task to ensure the stability and enhance the functioning of the financial system and to achieve sustainable economic growth.



# I. Japan's Financial System: A Return to Stability

## A. Decreases in NPLs and Credit Costs

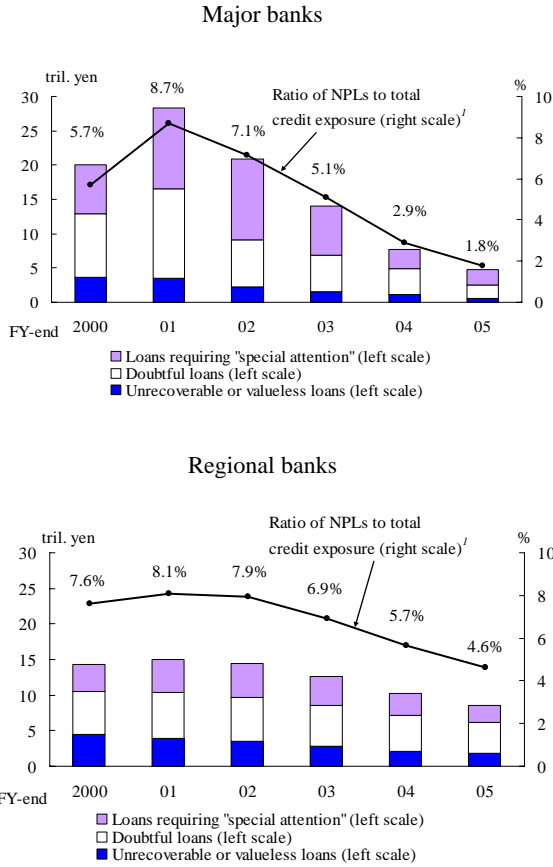
The NPL problem has been a central issue in Japan's financial sector since the early 1990s. Having almost overcome that problem, Japan's financial system has now returned to stability.

The Japanese economy has been improving for more than four and a half years, and firms' business performance has been picking up. Banks have made significant progress in disposing of NPLs and struggling firms have been on the mend. Under these circumstances, the ratio of NPLs to total credit exposure of the major banks (12 large nationwide commercial and trust banks) declined significantly to 2.9 percent at the end of fiscal 2004 from 8.7 percent at the end of fiscal 2001, after they achieved the target set by the government of halving the ratio as of the end of fiscal 2001 within three years. It continued to decline to 1.8 percent at the end of fiscal 2005. The ratio of NPLs at the regional banks (111 local commercial banks) declined to 4.6 percent at the end of fiscal 2005 from 8.1 percent at the end of fiscal 2001 (Chart 1).

Credit costs (net losses from the NPL disposal, etc) and the credit cost ratio (the ratio of credit costs to total outstanding loans) have also been declining with the decrease in banks' outstanding NPLs. In fiscal 2005, the credit cost ratio was negative (-0.18 percent) for the major banks and was notably low (0.32 percent) for the regional banks (Chart 2).

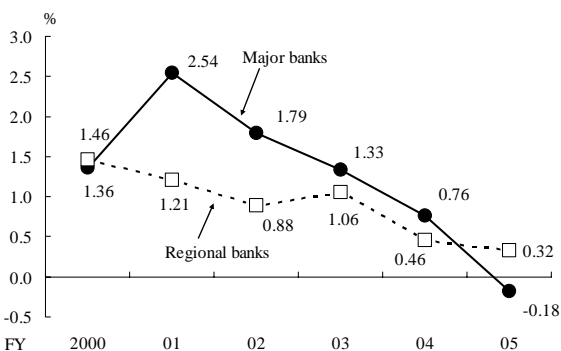
This decrease in credit costs reflects the fact that a generation of NPLs has been contained. This was possible for the following reasons. First, the recovery of the Japanese economy has continued and firms' business performance has improved. Second, the restructuring of struggling firms by banks has made

Chart 1: NPL Ratios



Note: 1. NPLs disclosed under the Financial Reconstruction Law.

Chart 2: Credit Cost Ratios<sup>1</sup>



Note: 1. Credit cost ratio = credit costs/total outstanding loans.

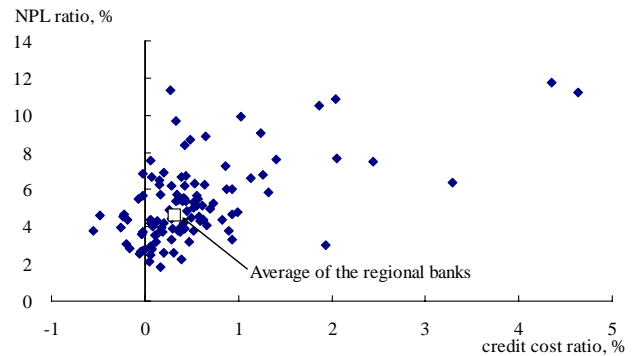
progress. Moreover, the major banks in particular recently posted large reversals of allowances for loan losses due to improvements in borrower firms' credit quality, and this lowered credit costs in fiscal 2005. It is necessary to note, however, that the reversals were temporary owing to the fact that a period where banks appropriated a large amount of allowances for loan losses followed an improvement in economic conditions and firms' business performance.

The pace of decline in the NPL ratio at the regional banks has been relatively moderate compared with that at the major banks (Chart 1). One of the reasons behind this may be the moderate pace of recovery of the local economies in which the regional banks operate, compared with the recovery of the metropolitan areas. Another reason seems to be the difference in regional banks' attitude toward the disposal of NPLs when compared with the major banks. This difference stems from the fact that the regional banks tend to put more focus on maintaining long-term business relationships with borrower firms. The NPL ratio has been declining at the regional banks on the whole, but some regional banks' NPL ratios are still high (Chart 3). As market participants' monitoring and assessment of financial institutions' business conditions are stricter than before, these banks are required to make further efforts to resolve the NPL problem.

### B. Increases in Banks' Profits

Banks' profits have increased significantly, mainly due to the above-mentioned decline in credit costs. In fiscal 2004, both the major and the regional banks recorded net income: the former for the first time since fiscal 2000 and the latter for the first time since fiscal 1994. Their net income continued to increase in fiscal 2005 and exceeded the previous record, both at the major

Chart 3: Credit Cost and NPL Ratios at the Regional Banks<sup>1,2</sup>



Notes: 1. Calculated based on figures at the end of fiscal 2005.  
2. Excluding Ashikaga Bank.

Chart 4: Net Income/Loss

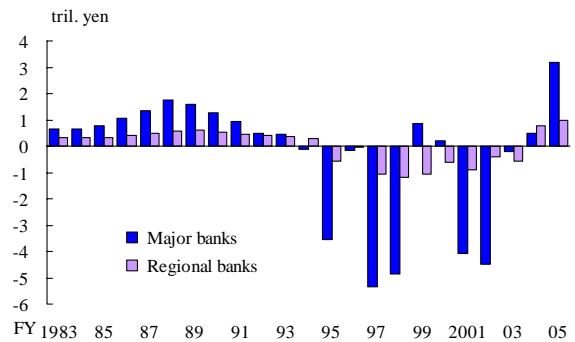
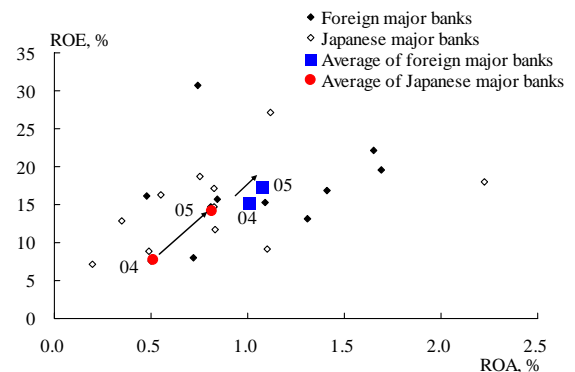
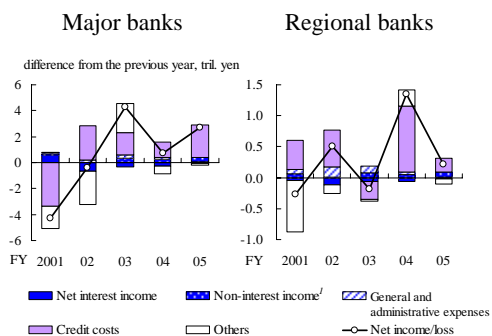


Chart 5: ROE and ROA of the Japanese Major Banks and the Foreign Major Banks<sup>1,2</sup>



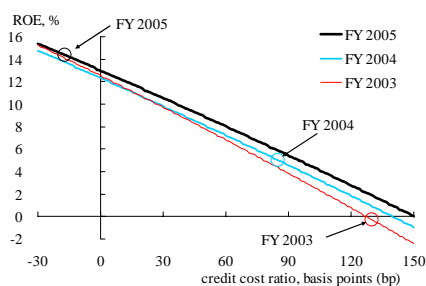
Notes: 1. Foreign major banks are comprised of Citigroup, Bank of America, HSBC, JP Morgan Chase, Wells Fargo, Royal Bank of Scotland, UBS, Wachovia, Banco Santander, and Barclays.  
2. The average ROE (or ROA) = the sum of ROE (or ROA) for each bank/the number of banks.

Chart 6: Contributions to Changes in Net Income/Loss



Note: 1. Non-interest income = net fees and commissions + profits on specified transactions + other operating profits - net realized bond-related gains/losses.

Chart 7: Profitability of the Major Banks<sup>1,2,3</sup>



Notes: 1. See Box 1 for details.  
2. ROE is recalculated by eliminating factors causing fluctuation such as credit costs and gains/losses on securities.  
3. One basis point (bp) = 0.01 percent.

Chart 8: ROE of the Regional Banks

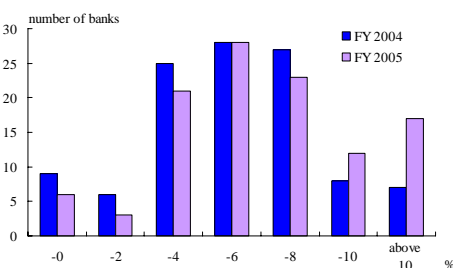
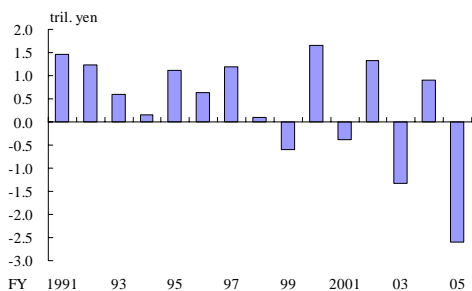


Chart 9: Overall Gains/Losses from Bond Investment<sup>1</sup>



Note: 1. The sum of net realized bond-related gains/losses and changes in net unrealized bond-related gains/losses on a year-on-year basis. The aggregate figure for both the major and the regional banks.

and the regional banks (Chart 4). As a result, the ROE of the major banks is now comparable to that of foreign major banks (Chart 5).

In addition to the decline in credit costs mainly due to the reversal of allowances for loan losses mentioned above, an increase in fee business income also contributed to boosting banks' profits (Chart 6). Meanwhile, interest income has recently been on a declining trend mainly because the increase in loan volumes in fiscal 2005 was insufficient to compensate for the decrease in interest margins (Chart 6).

According to a simple calculation of banks' profitability after excluding the influence of changes in credit costs and gains/losses on securities, the profitability of the major banks has increased due to rationalization and the expansion of fee business. The extent, however, is still limited (Chart 7; see Box 1 for details). The profitability of the regional banks varies considerably across individual banks (Chart 8). It seems that this variation is not only attributable to a variation in credit costs but, to a considerable extent, also to a variation in other factors such as business efficiency, the strength of the regional economy in which they operate, and the degree of competition in their own business areas (see Chart 30 in the 2005 issue of the *Financial System Report*). Improving competence in generating profits is still an important task for banks.

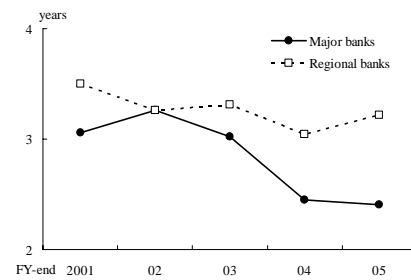
### C. Developments in Risk Associated with Bond Holdings and Stockholdings

With loans declining since the 1990s, the proportion of bond holdings in banks' operating assets has been increasing, and consequently, the fluctuation of gains/losses from bond investment due to, for example, interest rate changes, has been significant (Chart 9).

Against the background of this composition of their balance sheets, the major banks have been making efforts to shorten the average duration of bonds by raising the proportion of bonds with shorter maturity and to suppress an increase in interest rate risk in bond portfolios, heeding the lesson from the experience of rising long-term interest rates in 2003 and 2004 (Chart 10). At the major banks, the ratio of the risk associated with yen-denominated bond holdings (100 basis point value [bpv]) relative to Tier I capital, or core capital, has been declining since fiscal 2004 (Chart 11). On the other hand, the regional banks have been raising the proportion of floating-rate bonds in their balance sheets as a hedging tool against risk associated with a steepening of the yield curve. However, at the regional banks, the ratio of the risk associated with yen-denominated bond holdings relative to Tier I capital has increased slightly, because the amount of bond holdings has increased and the duration of these bonds has recently become slightly longer (Chart 11).

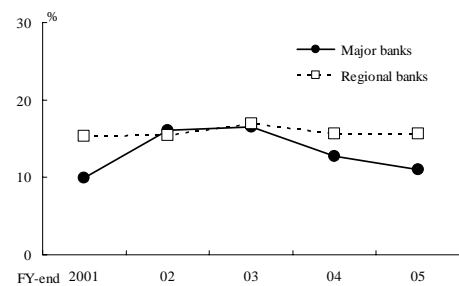
With respect to risk associated with stock price fluctuations, banks, particularly the major banks, have decreased their stockholdings to a large extent, and have thus reduced this risk since 2000 (Chart 12). In the process, they took advantage of the stock-purchasing program introduced by the Bank of Japan in the fall of 2002. However, since fiscal 2005, they have almost stopped reducing their stockholdings and some banks have even started to consider increasing their stockholdings, responding to their business counterparties' requests against the background of an increase in the number of M&As as well as to firm stock prices (Chart 12). Meanwhile, the risk associated with stockholdings measured as Value at Risk (VaR) under several assumptions has slightly increased due to a recent rise in stock price volatility. Looking at the relative size of the risk vis-à-vis banks' core capital

Chart 10: Duration of Banks' Yen-Denominated Bond Portfolios<sup>1</sup>



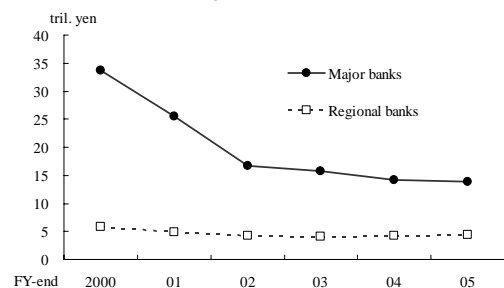
Note: 1. Calculated by the Bank of Japan. Duration of 15-year floating-rate JGBs is assumed to be less than half a year.

Chart 11: Ratios of Risks Associated with Banks' Holdings of Yen-Denominated Bonds to Tier I Capital<sup>1,2</sup>



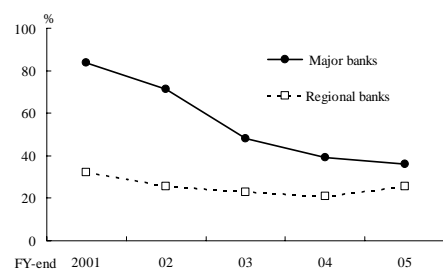
Notes: 1. The risks are estimated based on the assumption that market interest rates increase by 100 basis points on all maturities.  
2. Calculated by the Bank of Japan. Duration of 15-year floating-rate JGBs is assumed to be less than half a year.

Chart 12: Banks' Stockholdings<sup>1</sup>



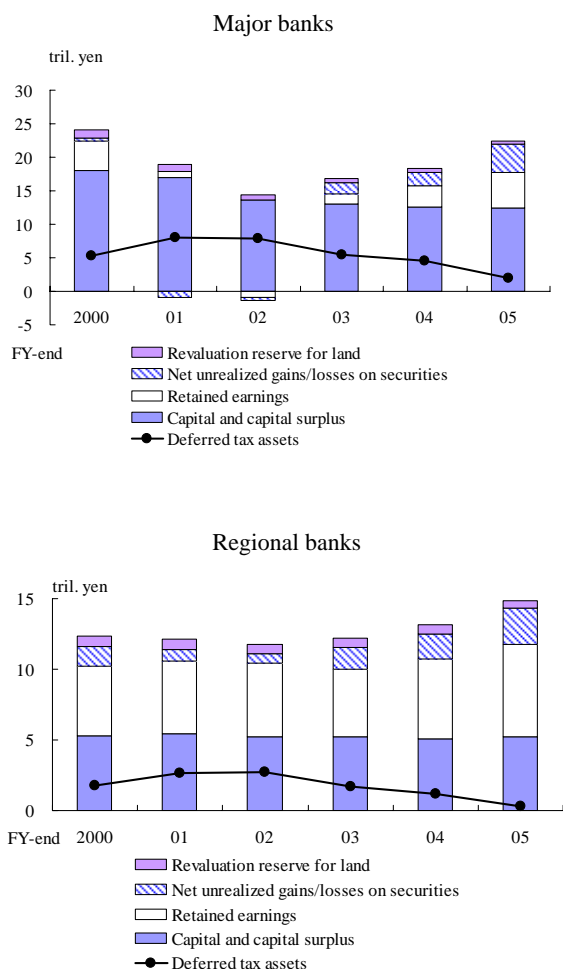
Note: 1. Figures are based on acquisition prices.

Chart 13: Ratios of Risks Associated with Banks' Stockholdings to Tier I Capital<sup>1</sup>



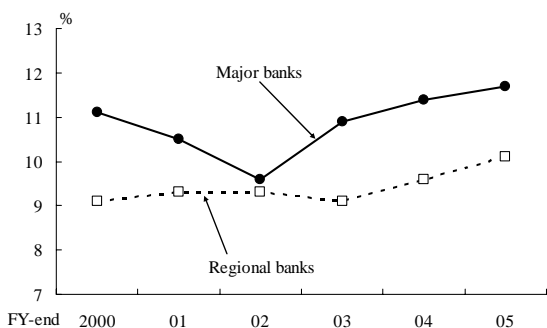
Note: 1. Calculated by the Bank of Japan. VaR uses TOPIX as the risk factor and is adjusted to a 99 percent confidence interval and a 1-year holding period.

Chart 14: Developments in Capital<sup>1</sup>



Note: 1. On a nonconsolidated basis.

Chart 15: Capital Adequacy Ratios<sup>1</sup>



Note: 1. On a consolidated basis.

(Tier I capital), the VaR calculation shows that the risk associated with stockholdings is a little less than 40 percent of Tier I capital at the major banks and about a fourth of Tier I capital at the regional banks (Chart 13).

#### D. Easing Constraints on Capital

Banks' capital, the capital on banks' balance sheets at both the major and the regional banks, has been on an increasing trend since bottoming out at the end of fiscal 2002 (Chart 14). At the end of fiscal 2005, a higher level was recorded than in the previous fiscal year at both the major and the regional banks. This reflects the expansion in retained earnings, the increased appraisal gains from stockholdings due to the rise in stock prices, and capital procurement. Capital adequacy ratios have also been rising at both the major and the regional banks (Chart 15). In addition, banks' high profits have enabled them to decrease deferred tax assets, and the ratio of deferred tax assets to their capital has been on a declining trend (Chart 14).

In accordance with these movements, banks have accelerated the repayment of public funds they had received to boost their capital. Until the end of fiscal 2005, they had repaid about 6 trillion yen (at face value) of public funds by using increased net income and procuring capital from markets. As a result, about half of the total 12 trillion yen in public capital injection since 1998 was repaid by the end of fiscal 2005 (Chart 16). In fiscal 2006, a few major banks used secondary offerings to repay public fund preferred shares.

Overall, constraints on banks' operations due to capital adequacy concerns have eased further; banks' capital has improved both in terms of quality and quantity, and loan portfolio quality has improved. Making certain assumptions, it is possible to calculate the total risk

associated with banks' operations by aggregating the various types of risk, such as credit risk and interest rate risk, and then compare the total risk with their Tier I capital. The calculation shows that the total risk at the major banks has fallen below their combined Tier I capital and, similarly, the total risk at the regional banks has fallen below their combined Tier I capital. It is thus clear that since fiscal 2004, the risk-taking capacity of banks has risen thanks to the increased capital buffer (Chart 17).

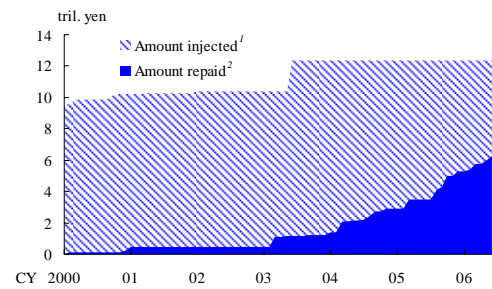
### E. Improvement in the Market's Evaluation of the Japanese Financial System

The assessment of the Japanese financial system by concerned parties such as financial market participants has been improving.

Even though the blanket guarantee of deposits was fully removed in April 2005, there were no significant shifts of funds between financial institutions either before or after the removal, in marked contrast with the drastic shift of funds after the partial removal of the blanket guarantee of deposits in April 2002. Against this background, assessments of Japan's financial system have gradually improved. The prices of bank stocks have been on a continuous upward trend since bottoming out in the first half of fiscal 2003. In particular, they rose substantially after the summer of 2005 (Chart 18). Moreover, the credit spread (between interest rates of bonds issued by banks and of government bonds) and banks' credit default swap (CDS) premium have both narrowed substantially and are at a low level (Chart 19).

Another development is that the number of bank upgrades by credit rating agencies has been exceeding the number of downgrades since fiscal 2003. During 2005 in particular, many banks saw an upgrading of

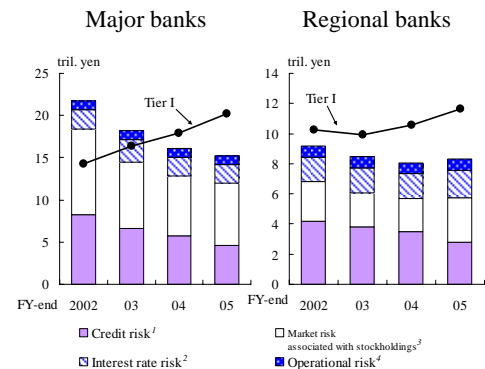
Chart 16: Repayment of Public Funds



Notes: 1. The sum of public funds injected pursuant to the Early Strengthening Law, the Financial Function Stabilization Law, the Deposit Insurance Law, and the Financial Reorganization Promotion Law.  
2. At face value.

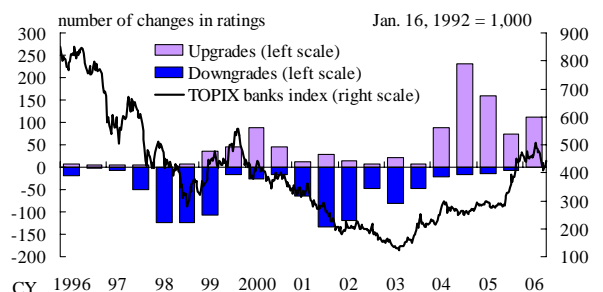
Source: Deposit Insurance Corporation of Japan.

Chart 17: Risk Levels and Tier I Capital



Notes: 1. Credit risk is the probable maximum loss based on the Basel II risk weight formulas with a confidence interval of 99 percent. In the estimation, borrowers classified as requiring "special attention" or below (in terms of credit quality) are considered to be in a state of default.  
2. Bond portfolio is limited to yen-denominated bond portfolios.  
3. Market risk associated with interest rate and stockholdings are calculated by the same methods as in charts 11 and 13, respectively.  
4. Operational risk is defined to be 15 percent of gross profits based on the Basel II basic indicator approach.

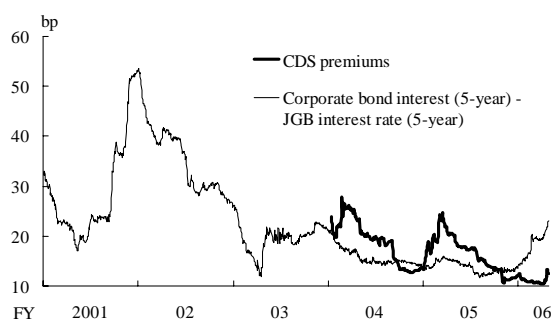
Chart 18: Credit Rating and Prices of Bank Stocks<sup>1,2</sup>



Notes: 1. The number of upgrades and downgrades is the sum of the number of changes in ratings made by the following credit rating agencies: Moody's Investors Service, Standard and Poor's, Fitch Ratings, Rating and Investment Information, and Japan Credit Rating Agency.  
2. Data are up to June 30, 2006.

Source: Bloomberg.

Chart 19: Credit Spreads of Three Major Banks<sup>1,2</sup>



Notes: 1. Figures are the simple averages of Mizuho Corporate Bank, Bank of Tokyo-Mitsubishi (data of Bank of Tokyo-Mitsubishi UFJ from January 1, 2006 due to integration of Bank of Tokyo-Mitsubishi and UFJ Bank), and Sumitomo Mitsui Banking Corporation.

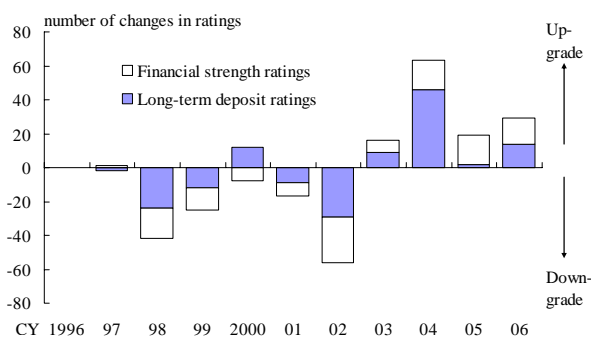
2. Data are up to June 30, 2006.

Sources: Tokyo Financial Exchange Inc.; Bloomberg.

their "financial strength rating," which does not take any support from the public sector into account, while their "long-term deposit rating" remained relatively unchanged. This indicates that the Japanese financial system has been regaining stability on its own and that public-sector support for maintaining this stability is no longer necessary (Chart 20).

As seen above, banks' NPLs and the ratio of NPLs to total credit exposure have decreased further and credit costs have declined significantly. As a result, the NPL problem no longer seems to constrain banks' business and their risk-taking capacity. At the same time, banks' capital as a buffer for taking additional risks has been augmented both in terms of quality and quantity, and consequently, it seems that risks associated with bond holdings and stockholdings can be absorbed by this capital increase. Moreover, the market's evaluation of the financial system has improved considerably. Based on the above assessment, it can be concluded that, all in all, the Japanese financial system has regained its stability.

Chart 20: Changes in Ratings on Banks' Financial Strength and Long-Term Deposits<sup>1</sup>



Note: 1. Figures for the net number of changes in ratings. Data for 2006 are from January 1 to June 30.

Source: Moody's Investors Service.

## Box 1: An Assessment of the Profitability of the Major Banks Measured by ROE

Net income of the major banks has been fluctuating significantly since the 1990s due to factors such as the large amount of credit costs from the disposal of NPLs and gains/losses on securities (Chart 1 for Box 1).

Therefore, we examined whether the profitability of the major banks' core business has improved through the rationalization of operations and an expansion in fee business by a simple calculation. For this assessment, ROE is recalculated by eliminating the factors causing any fluctuations of net income mentioned above.

This calculation shows that the profitability of the major banks has improved, but the degree of improvement is limited.

ROE is recalculated with net income and stockholders' equity adjusted as follows.

First, net capital gains/losses on securities and losses from the write-down of securities are deducted from net income; in addition, net unrealized gains on securities are deducted from stockholders' equity. Second, reported credit costs on the income statement are deducted from net income. That is, credit-cost-adjusted gross income is calculated. Adjusted net income is then calculated by using credit costs and the credit costs are calculated by multiplying total outstanding loans by various credit cost ratios.

The improvement in the profitability of the major banks based on their core business corresponds to an upward shift in the ROE line shown in Chart 2 for Box 1. The calculation above shows that the ROE line has shifted slightly upward, reflecting the improvement in the profitability of the major banks based on their core business since fiscal 2003. However, the improvement in ROE remains within a range of 0-2 percent (Chart 7 in the main text). Given that the major banks have almost completed their cost-cutting efforts, it is important for them to offer higher-value-added financial services and set their deposit and loan rates appropriately in order to further increase their profitability.

Chart 1 for Box 1: Net Operating Profits from Core Business

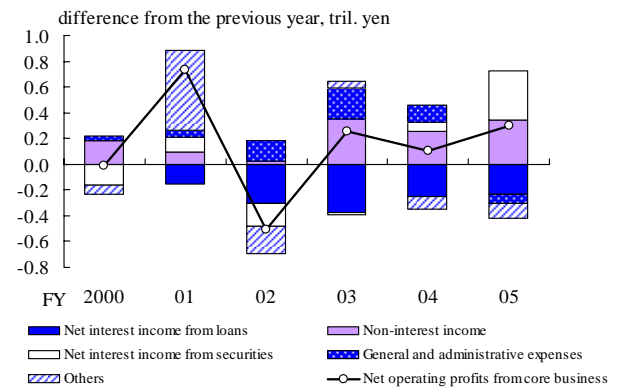
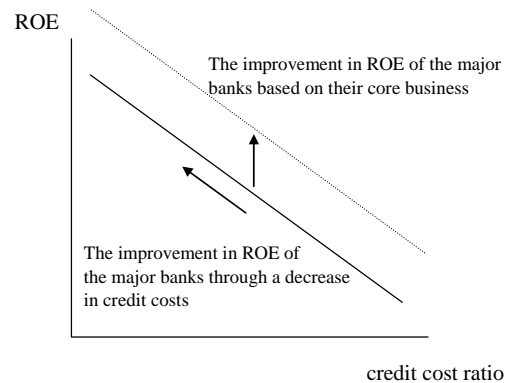


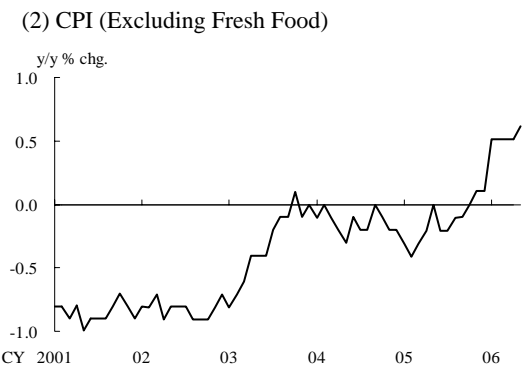
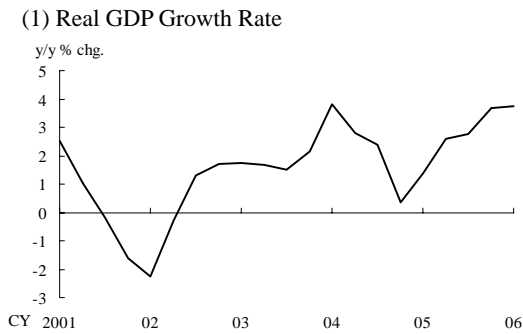
Chart 2 for Box 1: Improvement in ROE



Note: 1. This simple analysis assumes that the efforts of the major banks to minimize credit costs in order to improve their profitability (for example, by adopting advanced risk-management techniques) does not shift the ROE line, but instead moves the ROE ratio upward along the same ROE line.

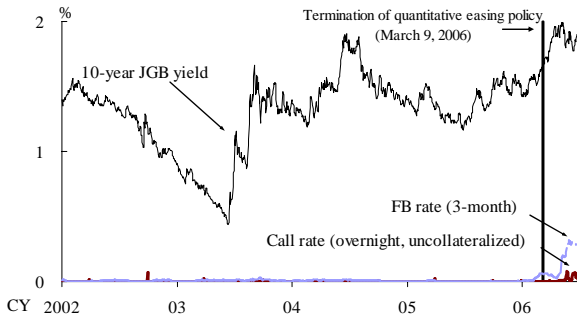


Chart 21: Real GDP Growth Rate and CPI in Japan



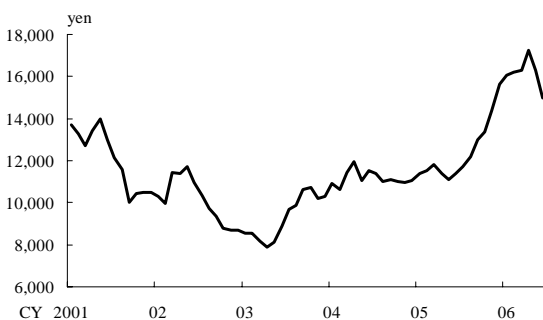
Sources: Cabinet Office, "National Accounts"; Ministry of Internal Affairs and Communications, "Consumer Price Index."

Chart 22: Market Interest Rates<sup>1</sup>



Note: 1. Data are up to June 30, 2006.  
Sources: Bank of Japan; Japan Bond Trading Company.

Chart 23: Stock Prices (Nikkei 225 Stock Average)<sup>1</sup>



Note: 1. Data are monthly averages available up to June 2006.  
Source: Bloomberg.

## II. The Financial System in a Changing Environment: Risks and Financial Institutions' Responses

The circumstances in which the Japanese financial system operates have recently seen a number of changes.

The economic recovery has continued for more than four and a half years now (Chart 21). Moreover, the environment for prices has gradually improved, and the year-on-year rate of change in the consumer price index has been positive since the end of 2005 (Chart 21). Against this background, the Bank of Japan in March 2006 terminated the so-called policy of "quantitative easing," which had been in force since 2001 and targeted the outstanding balance of current accounts held at the Bank, and switched back to targeting the uncollateralized overnight call rate. Since then, the uncollateralized overnight call rate has been effectively zero percent.

Against these favorable developments in economic activity and prices as well as interest rate rises in overseas markets, money market rates and medium- to long-term interest rates have increased, and stock prices have been buoyant (charts 22 and 23). Land prices in major cities, such as the 23 wards of Tokyo, have bottomed out and started to increase (Chart 24).

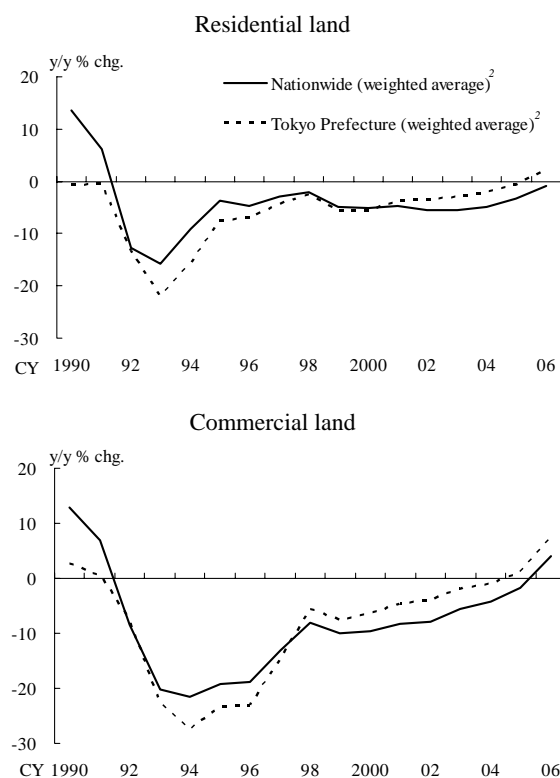
Structural changes are also continuing. The globalization of economic activity and financial markets are proceeding, and in the financial sector, deregulation and ICT-related innovation are making progress (Chart 25). Moreover, a new international capital adequacy framework, commonly known as Basel II, is to come into effect in Japan at the end of March 2007.

Under these new circumstances, the behavior of banks has been changing due to the easing of their capital

constraints and recovery of their business and risk-taking capacities. With regard to banks, the following three points are noteworthy. First, their lending attitude has become more aggressive. Second, with the aim of diversifying sources of profits, they are expanding their fee business, including the sale of investment trusts and private pension policies, as well as the provision of loan-related services such as loan syndication arrangements. And third, they are seeking to supply new financial services and expand their business lines by undertaking new fixed investment and forming business alliances with non-bank companies.

This section examines how both the new environment and related changes in banks' behavior have affected the stability, the robustness to shocks, and the general functioning of the Japanese financial system.

Chart 24: Land Prices<sup>1</sup>



Notes: 1. As of January 1.

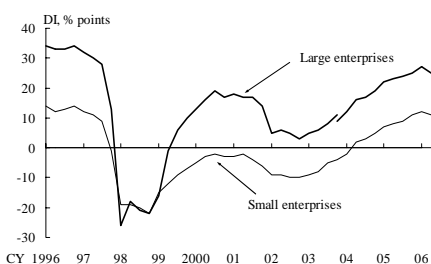
2. Weighted averages are calculated by the Bank of Japan, averaging the rate of change in land prices weighted by the level of land prices per square meter at individual locations surveyed in the previous year.

Source: Ministry of Land, Infrastructure and Transport, "Land Price Publication."

Chart 25: Deregulation of Financial Services

Sep. 1998	Enactment of the Law on Securitization of Specified Assets by Special Purpose Company (SPC Law). -- The law established the scheme concerning special purpose companies incorporated for asset liquidation and securitization.
Dec. 1998	Removal of ban on sales of investment trust certificates by banks.
Apr. 2000	Establishment of a scheme to guarantee certain bonds. -- The Credit Guarantee Corporation started providing guarantees for private placement bonds.
Nov. 2000	Amendment to the SPC Law. -- The amended law expanded the type of assets that can be liquidated and securitized to include property rights in addition to real estate, and simplified procedures to incorporate special purpose companies.
Apr. 2001	Partial removal of ban on sales of insurance policies by banks. -- Sales of long-term fire insurance policies related to housing loans, and overseas travel insurance policies, were exempted from the ban.
Apr. 2002	Removal of ban on sales of exchange traded funds (ETFs) by banks. Easing of criteria for provision of guarantees for private placement bonds.
Oct. 2002	Expansion of the type of insurance policies sold by banks. -- Personal pension insurance policies, zaikai (asset formation) insurance, and casualty insurance policies with income endowment were exempted from the ban.
Dec. 2004	Removal of ban on securities brokerage business by banks.
Dec. 2005	Expansion of the type of insurance policies sold by banks. -- Single premium endowment insurance and single premium permanent life insurance were exempted from the ban.
Apr. 2006	Deregulation related to bank agency business. -- The deregulation allowed companies to enter some areas of banking business by acting as a "bank agency."

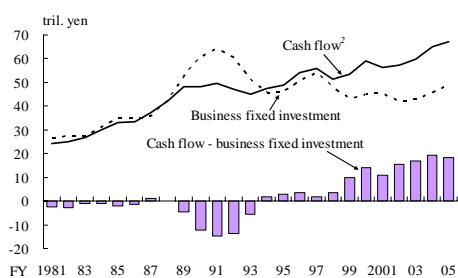
Chart 26: Lending Attitude of Financial Institutions as Perceived by Enterprises<sup>1</sup>



Note: 1. DI = "Accommodative" - "Severe."

Source: Bank of Japan, "Tankan -- Short-term Economic Survey of Enterprises in Japan."

Chart 27: Cash Flow and Business Fixed Investment<sup>1</sup>

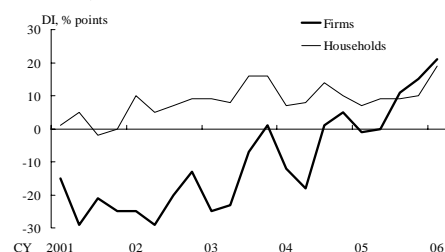


Notes: 1. Figures are for all sample firms in all industries, adjusted for changes in the sample firms.

2. Cash flow after tax is calculated by current profits multiplied by 0.5 (the approximate tax rate) plus depreciation.

Source: Ministry of Finance, "Financial Statements Statistics of Corporations by Industry."

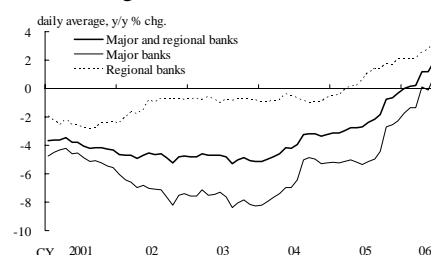
Chart 28: Demand for Loans as Perceived by Banks (by Type of Borrower)<sup>1</sup>



Note: 1. DI for demand for loans = (percentage of respondents selecting "substantially weaker" + percentage of those selecting "moderately weaker"  $\times$  0.5) - (percentage of those selecting "substantially stronger" + percentage of those selecting "moderately stronger"  $\times$  0.5).

Source: Bank of Japan, "Senior Loan Officer Opinion Survey on Bank Lending Practices at Large Japanese Banks."

Chart 29: Bank Lending



Source: Bank of Japan, "Principal Figures of Financial Institutions."

## A. Changes in Banks' Behavior in the Loan Business

### 1. Increases in bank loans

Banks' lending attitude has become more positive as their risk-taking capacity has been restored (Chart 26). Meanwhile, firms' demand for funds has ceased to fall and, in fact, has started to rise again (charts 27 and 28) due to the recovery of the economy, a letup in firms' financial restructuring efforts, and an increase in business fixed investment.

Reflecting the change in supply and demand conditions, the total amount of bank loans outstanding began to increase in fiscal 2005, and the year-on-year rate of increase has accelerated since then (Chart 29). Looking at bank loans by type of borrower, the annual growth rate of loans extended to individuals continues to increase with housing loans as the driving force, while the growth rate of loans extended to small and medium-sized enterprises has turned positive. Although the growth rate of loans extended to major enterprises is still negative, the pace of decline has diminished (Chart 30). Besides extending domestic loans, banks began to increase their investment in foreign-currency denominated financial assets again in fiscal 2005, which had been declining until then (Chart 31).

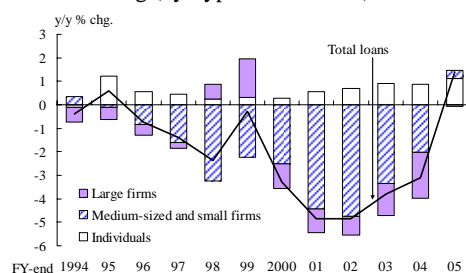
## 2. Continued contraction of interest margins on loans

Interest margins on loans have diminished (Chart 32) due to the downward trend in lending interest rates and the limited room for cutting deposit interest rates further. As in fiscal 2004, competition among banks in the loan business intensified in fiscal 2005. Among banks focusing their lending strategies on the expansion of loan portfolios, there was a tendency for the major banks to expand their loan business in rural areas, while the regional banks did so in urban areas (Chart 33).

Looking at the total amount of bank loans outstanding by the level of interest rates on loans, bank loans with low interest rates, such as less than 1 percent, have increased, and this has spurred the rebound in the growth rate of bank loans (Chart 34). This, in conjunction with the maturing of loans with high interest rates, has also led to a contraction in lending margins. Banks' recent stance with respect to setting interest margins on loans is illustrated by the fact that the margins that banks have charged borrowers with high and intermediate credit ratings have continued to shrink while margins to borrowers with low credit ratings are unlikely to continue to widen (Chart 35).

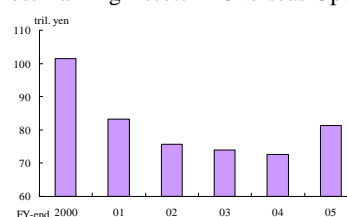
This situation suggests that financial intermediation is supporting economic activity in the private sector, as banks at large have restored their stability and risk-taking capacity. Furthermore, banks with higher risk-taking capacity seem to be responding to the increasing demand for loans by extending lower interest loans. For instance, it has been observed that banks with a higher growth rate of loans tend to charge narrower lending margins (Chart 36). In addition, there is evidence that banks with a higher capital adequacy

Chart 30: Bank Lending (by Type of Borrower)<sup>1</sup>



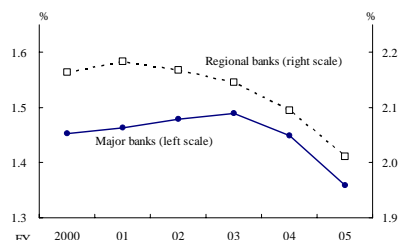
Note: 1. Amount outstanding of loans extended by domestically licensed banks. Domestically licensed banks are defined as the banks which are established and licensed under Japanese legislation (excluding Bank of Japan and government-related organizations).  
Source: Bank of Japan, "Loans and Discounts Outstanding by Sector."

Chart 31: Interest-Earning Assets in Overseas Operations<sup>1</sup>



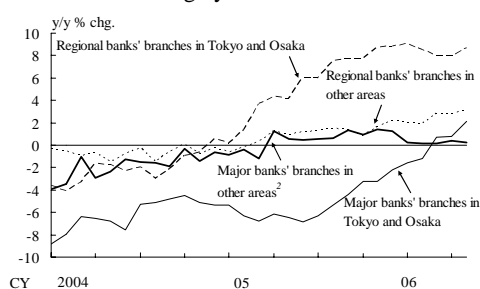
Note: 1. Amount outstanding. The aggregate figure for both the major and the regional banks.

Chart 32: Interest Margins on Loans Extended in Domestic Operations<sup>1</sup>



Note: 1. Interest margin on loans (lending margin) = interest rate on lending - interest rate on interest-bearing liabilities.

Chart 33: Loans Outstanding by Banks' Branch Location<sup>1</sup>

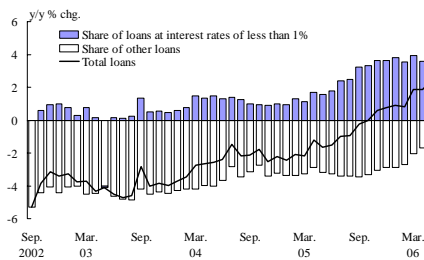


Notes: 1. Excluding Resona Bank and Saitama Resona Bank because of the discontinuity in their data on loans outstanding caused by their reorganization.

2. Other areas for the major banks exclude Tokyo, Osaka, and Aichi, while those for the regional banks exclude Tokyo, Osaka, and the prefecture where their head offices are located.

Source: Figures based on the Bank of Japan's "Table of Deposits, Vault Cash, and Loans and Discounts Outstanding of Domestically Licensed Banks by Prefecture."

Chart 34: Loans Outstanding by Lending Rate<sup>1</sup>

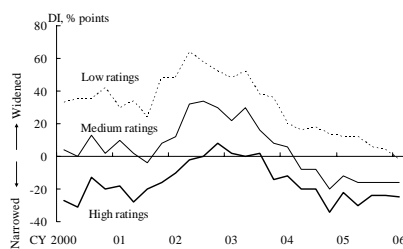


Note: 1. Amount outstanding of loans extended by domestically licensed banks.

Source: Bank of Japan, "Loans and Discounts Outstanding by Interest Rate."

ratio tend to charge narrower lending margins (Chart 37). These relationships, on the other hand, are considered to be one of the reasons why increases in bank loans have not led to a recovery in banks' net interest income.

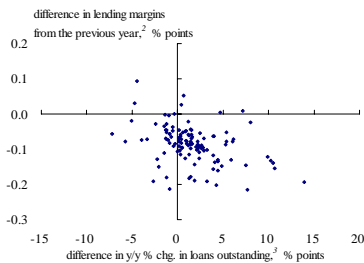
Chart 35: Spreads of Loan Rates over Banks' Cost of Funds<sup>1</sup>



Note: 1. DI for spread of loan rates = percentage of respondents selecting "widened" - percentage of respondents selecting "narrowed." All responses were given considering lending margins set over the past three months.

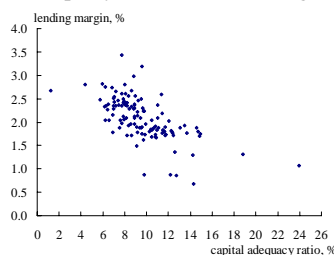
Source: Bank of Japan, "Senior Loan Officer Opinion Survey on Bank Lending Practices at Large Japanese Banks."

Chart 36: Loans Outstanding and Lending Margins<sup>1</sup>



- Notes: 1. Figures for both the major and the regional banks, excluding outliers caused by special factors such as business mergers.  
 2. The year-on-year change in lending margins from fiscal 2004 to 2005.  
 3. The difference in year-on-year changes in average loans outstanding from fiscal 2004 to 2005.

Chart 37: Capital Adequacy Ratios and Lending Margins<sup>1,2</sup>



- Notes: 1. Figures for both the major and the regional banks excluding Ashikaga Bank.  
 2. Capital adequacy ratios are calculated after deducting net deferred tax assets.

### 3. Credit risks in lending

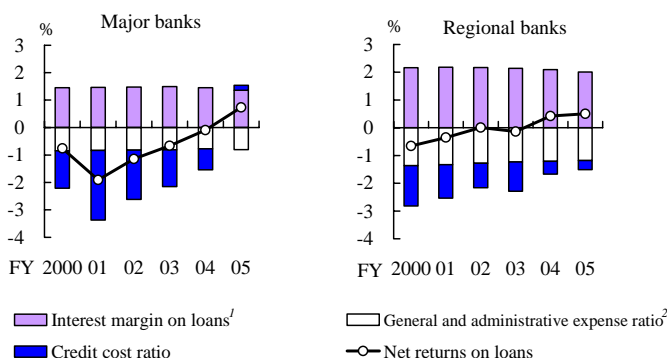
From the perspective of improving the business capacity and profitability of banks and thereby securing financial system stability, an important point is whether banks set interest rates on loans and charge interest margins that properly reflect borrowers' credit risks, which, of course, vary over a credit period.

The profitability of banks' loan business is depicted in Chart 38, which shows that the decrease in interest margins has been offset by a substantial drop in the credit cost ratio, which is defined as the ratio of credit costs to total outstanding loans, so that the overall returns on loans have turned positive. In this context, it should be mentioned that banks' credit cost ratio and the default rate of firms are much lower than their historical averages (Chart 39). This phenomenon has been observed also in other countries including the United States, in which banks' credit cost ratio and the default rate of firms have been on a downward trend after having risen during the recession in the early 2000s. Both have recently been at very low levels (Chart 40).

An analysis of the Japanese data shows that there is a negative correlation between the business climate and the default rate of firms; that is, the default rate of firms tends to fall when the business climate improves and vice versa (Chart 41).

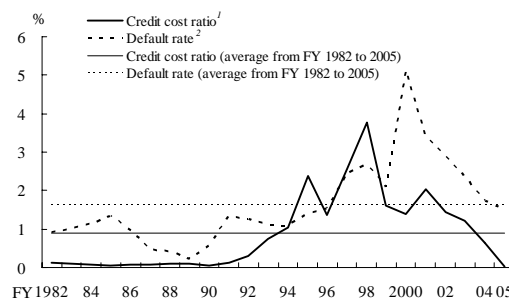
It is difficult to envisage that banks' credit costs will increase markedly to the level experienced between the late 1990s and the early 2000s, even if the business climate deteriorates over the cycle. This is because in recent years firms have reduced their excessive debt levels and continued to strengthen their financial position, while banks have further developed their credit risk management by, for example, adopting

Chart 38: Net Returns on Loans of Banks



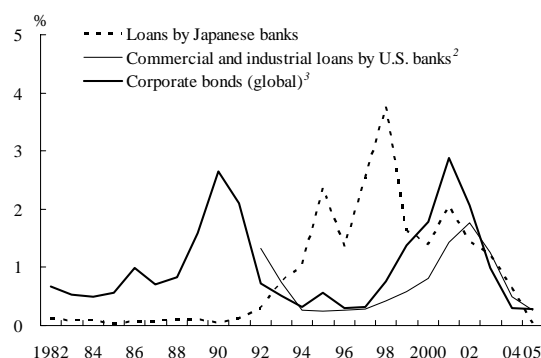
Notes: 1. Lending margin = interest rate on lending - interest rate on interest-bearing liabilities.  
2. General and administrative expense ratio = general and administrative expenses/amount outstanding of total interest-earning assets.

Chart 39: Banks' Credit Cost Ratios and Firms' Default Rates



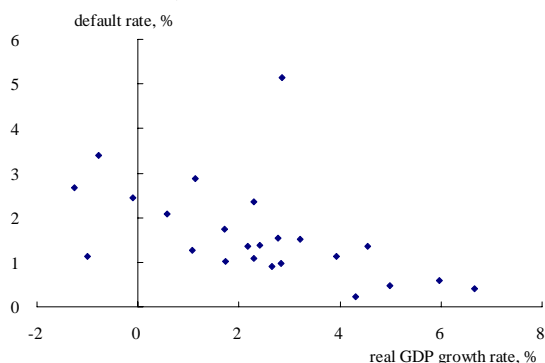
Notes: 1. Figures for both the major and the regional banks.  
2. Default rate = amount outstanding of liabilities of firms that went bankrupt/amount outstanding of total liabilities in the corporate sector.  
Sources: Tokyo Shoko Research, "Tosan Geppo (Monthly Review of Corporate Bankruptcies)"; Bank of Japan, "Flow of Funds."

Chart 40: Credit Cost Ratios<sup>1</sup>



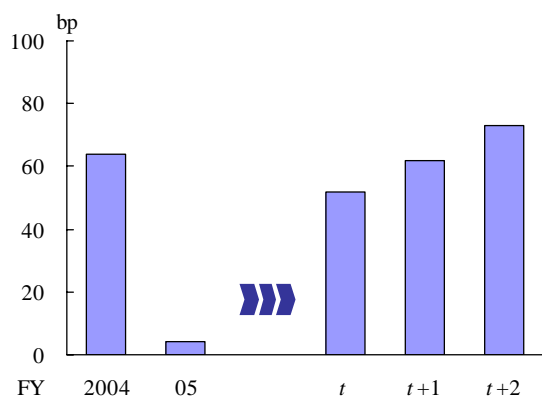
Notes: 1. Data for Japanese banks are on a fiscal-year basis, and those for others are on a calendar-year basis.  
2. U.S. banks are commercial banks, which are the members of the FDIC.  
3. Credit cost ratio for corporate bonds: default rate × (1 - recovery rate).  
Sources: FDIC, "Statistics on Banking"; Moody's Investors Service, "Default and Recovery Rates of Corporate Bond Issuers, 1995-2005."

Chart 41: GDP Growth Rates and Firms' Default Rates (Fiscal 1982 to 2005)



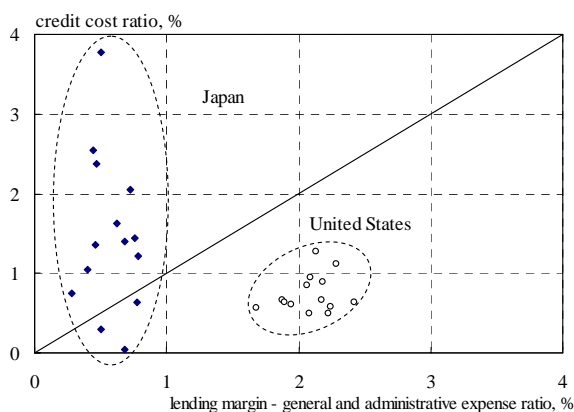
Sources: Tokyo Shoko Research, "Tosan Geppo (Monthly Review of Corporate Bankruptcies)"; Cabinet Office, "National Accounts."

Chart 42: Trial Calculation of Future Credit Cost Ratios<sup>1,2</sup>



Notes: 1. The aggregate figure for both the major and the regional banks.  
2. See Box 2 for details.

Chart 43: Credit Cost Ratios and Lending Margins<sup>1</sup>



Note: 1. Figures for Japan are for fiscal 1992 to 2005, and those for the United States are for calendar 1992 to 2005.

Source: FDIC, "Statistics on Banking."

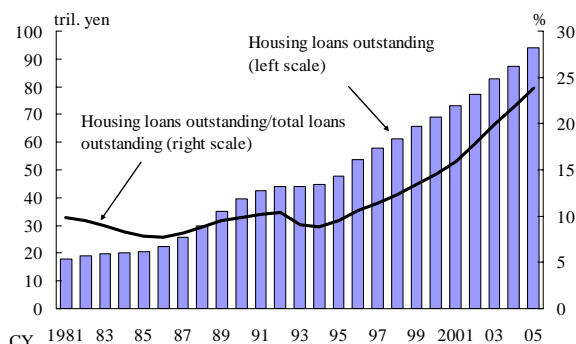
internal systems for grading borrowers' creditworthiness. Moreover, a variety of measures for revitalizing enterprises and industries have already been implemented. However, for the following reasons, it should still be borne in mind that both banks' credit cost ratios and the default rate of firms may vary in response to a change in the business climate. First, the coexistence of a prolonged economic boom and low interest rates in Japan as well as other industrial countries seems to have contributed to a reduction in banks' credit costs. Second, the key reason for the current low level of banks' credit costs in Japan is the large reversal of allowances for loan losses. Finally, relevant data and examples from both Japan and other countries show that changes in both banks' credit cost ratios and the default rate of firms are influenced by business cycles.

Therefore, the current low levels of both banks' credit cost ratios and the default rate of firms should not lead banks to underestimate the needs when making loans of considering several scenarios of future economic developments and of evaluating borrowers' credit risks in order to balance estimated risks with expected returns. Chart 42 shows the results of a trial calculation of how much banks' credit costs would increase in the case of a cyclical economic downturn. This estimation depends on assumptions made on the basis of self-assessment and loan-loss provisioning systems actually employed by banks in Japan. The technical specifics of the estimation are explained in Box 2. The result suggests that banks' credit costs would increase by a non-negligible degree. Even if banks' credit costs were to increase, banks should theoretically be able to mitigate the negative impact by flexibly raising interest rates on loans. In practice, however, it has not been easy for banks to implement such a flexible revision of lending interest rates (Chart 43).

The premises on which banks base the current narrow interest margins they charge on loans deserve to be examined. Some banks may accept narrow lending margins now on the assumption that interest rates on loans will increase in the future. In fact, some bank loans are extended with reference to market interest rates. In addition, some housing loans have been extended at specially reduced rates of interest, which are available in several promotional campaigns for housing loans that have been run by individual banks, but this reduction is to disappear or become smaller after a predetermined period of time. In these cases, borrowers' interest costs will increase if interest rates rise, and this may negatively affect their creditworthiness. Other banks may accept narrow lending margins now on the premise that they can compensate the disadvantage with fee income from financial services they supply to borrowers. In this case, the overall profitability of both loan and fee business conducted with borrowers would need to be examined.



Chart 44: Housing Loans Extended by Banks<sup>1</sup>

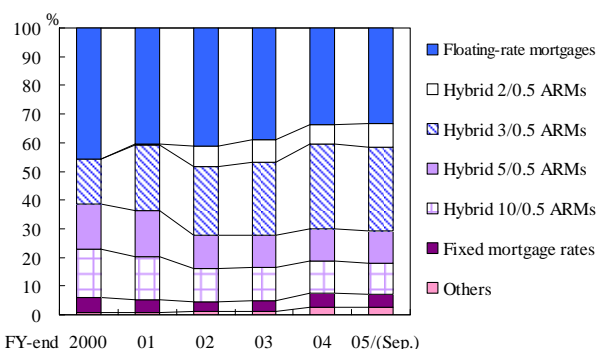


Note: 1. Total outstanding loans extended by domestically licensed banks.  
Sources: Bank of Japan, "Loans and Discounts Outstanding by Sector," "Loans to Individuals (Housing Funds)."

#### 4. Increases in housing loans

Banks have expanded the provision of housing loans in recent years and housing loans came to account for about a quarter of all bank loans in 2005 (Chart 44). This is against the background of sluggish corporate loans due to firms' efforts to reduce interest-bearing debt. A further factor is that the Government Housing Loan Corporation, which is due to be transformed into an independent administrative agency, has decreased its housing loan activity.

Chart 45: Housing Loans by Type of Interest Rate<sup>1</sup>

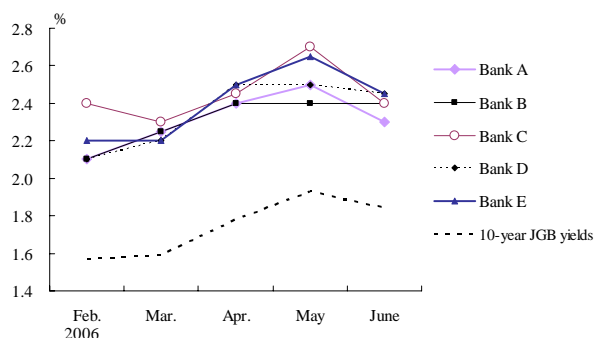


Note: 1. See Box 3 for details on Japanese hybrid adjustable rate mortgages (ARMs).  
Source: Ministry of Land, Infrastructure, and Transport, "Heisei 17 Nendo Minkan Jutaku Loan Ni Kansuru Chousa (A Survey on Housing Loans by Private Financial Institutions in Fiscal 2005)."

This increase in banks' housing loans has been made through their promotional campaigns offering specially reduced interest rates (Chart 45). More recently, banks have been increasing long-term fixed-rate housing loans in response to customers' increasing desire to hedge the risk of a hike in interest rates.

Partly as a result of banks' promotional campaigns for low interest rate housing loans, the interest rate differential between interest rates on 10-year housing loans and yield rates on 10-year government bonds has diminished to around 0.5 percent (Chart 46). This suggests that the design of housing loans and the setting of interest rates are based on the assumption that housing-loan borrowers generally have a high creditworthiness. Nevertheless, credit risks related to housing loans can vary over the credit period, and therefore even if actually incurred credit costs are small at a certain point in time, it is necessary for banks to carefully control the risks from a long-term perspective (Chart 47). In addition, changes in the macroeconomic environment, such as the level of household income, can affect housing loan holders' creditworthiness. For reference, the U.S. credit cost ratio for housing loans increased during the recession after 2000, but in recent years has been falling again,

Chart 46: Interest Rates on Housing Loans<sup>1,2</sup>



Notes: 1. Fixed rates on hybrid 10/0.5 ARMs after special discounts offered by each bank during campaign periods.  
2. Data for interest rates on housing loans are as of the beginning of each month, and those for 10-year JGB yields are as of the end of each previous month.  
Sources: Information from the five banks; Bloomberg.

dropping to a very low level around 0.1 percent (Chart 48).

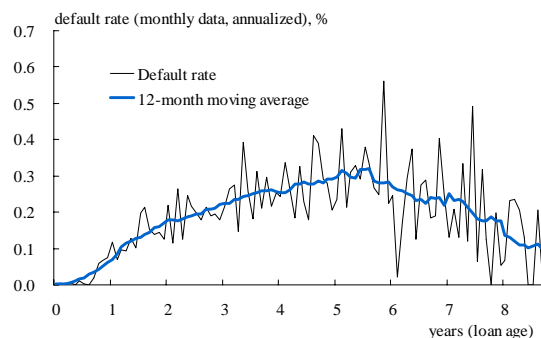
Both credit and interest rate risks related to housing loans are intertwined in complex ways. For instance, borrowers bear the risk of a hike in interest rates when they obtain variable-rate housing loans, which increase their payments as interest rates rise. This potentially lowers their creditworthiness, which may in turn have an impact on lender banks.

Regarding housing loans extended at specially reduced rates of interest, when the initial privileged period expires, the amount of monthly payment will increase in a discontinuous fashion. Coupled with a potential hike in market interest rates, this "payment shock" can accelerate the increment in borrowers' monthly payments (Chart 49). The possibility of a "payment shock" requires banks to examine borrowers' debt servicing capacity on the assumption that interest rates on housing loans will increase due to the expiry of the privileged period or due to an increase in market interest rates. In fact, most banks conduct credit checks with reference to different scenarios of future interest rates that could be testing to borrowers.

Responding to developments of interest rates and economic conditions, borrowers may repay loans early. Alternatively, they may refinance loans by switching between flexible and fixed interest rate products, or by switching to housing loans with more favorable conditions offered by rival banks. This will create a risk that the pattern and profitability of repayments assumed by banks may change ex post facto (refer to examples in Box 3).

Therefore, it is important for banks to appropriately determine interest rates on housing loans and design relevant terms and conditions. In this respect, banks

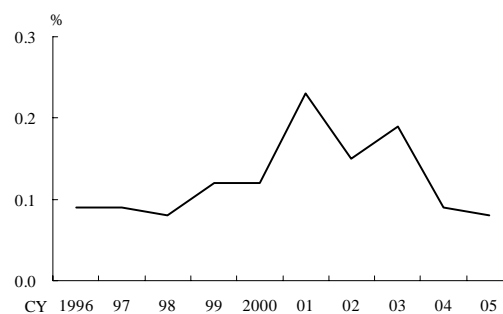
Chart 47: Default Rates on Housing Loans at Each Loan Age<sup>1,2,3</sup>



Notes: 1. Default rate on loans extended by the Government Housing Loan Corporation (GHLC) in Japan is the ratio of defaulted loans outstanding to total loans outstanding. Defaulted loans for the GHLC are defined as the loans which the GHLC requires borrowers to prepay because they are more than six months overdue, etc.  
2. Data for the loans extended since 1996.  
3. "Loan age" refers to the number of years since the extension of a loan.

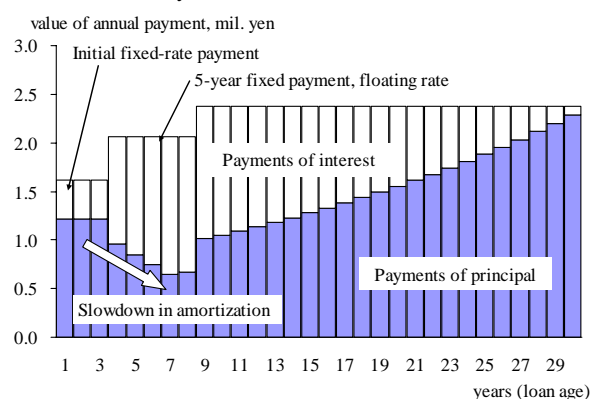
Source: Government Housing Loan Corporation, "Shokan-Rireki Data (Historical Redemptions Data)."

Chart 48: Credit Cost Ratio on Housing Loans in the United States



Source: FDIC, "Statistics on Banking."

Chart 49: Case of Payment Shock<sup>1</sup>



Note: 1. Based on the following assumptions. Mortgage type: Hybrid 3/0.5 ARMs with the interest rate changing to floating rate after the first 3-year fixed rate payment. Maturity: 30 years. Floating rate in the future: forward rate + current spread (2.375 percent) - discount rate (0.4 percent, but 1.3 percent during the first 3 years). Loan amount: 42 million yen.

Chart 50: Loans to the Real Estate Sector<sup>1</sup>



Note: 1. Amount outstanding of loans extended by domestically licensed banks.

Source: Bank of Japan, "Loans and Discounts Outstanding by Sector."

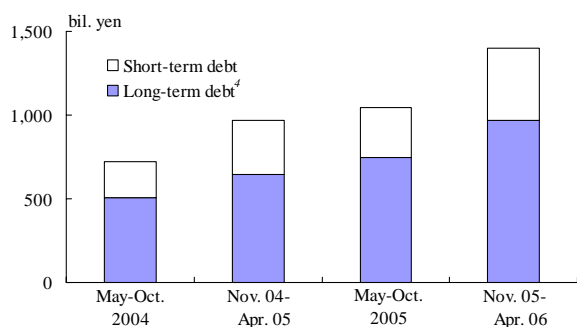
need to carefully examine the following three points with reference to different scenarios of future developments in market interest rates and other pertinent factors. The first is the impact of potential increases in interest rates on borrowers' creditworthiness. The second is the impact of potential increases in interest rates on the profitability and riskiness of banks' housing loan portfolios through early repayment or refinancing by borrowers. And the third is the likelihood that banks can securitize housing loans and sell them in the market in better terms, which means that it is important to monitor the market value of housing loan portfolios.

### 5. Increases in real estate-related loans

Against the background of land prices that are beginning to rise again in urban areas, banks have recently increased real estate-related loans (Chart 50). However, the size of this increase is limited in comparison with the asset-price bubble of the late 1980s. Having learned from the experience of that period, banks as a whole are acting prudently and manage credit exposures well on the basis of land prices calculated by the capitalization method.

In real estate-related loan business, however, rises in land prices tend to push up the collateral value of land and encourage lenders to extend further loans. This increases the availability of funds for borrowers, which in turn amplifies the demand for land. This mechanism of optimistic expectations regarding future land prices and incomes accruing from land has actually interacted with an expansion of credit and increased both the amplitude of business cycles and financial instability in many countries around the world, including Japan during the bubble period. Therefore, it is particularly important to keep a close eye on real estate-related loans in order to guarantee the stability of the financial

Chart 51: Interest-Bearing Liabilities of J-REITs: Size of Real Estate Non-Recourse Loans at Borrowers<sup>1,2,3</sup>



Notes: 1. Real estate non-recourse loans are extended not only for J-REITs but also for private funds. However, since figures for private funds are not available, data contain debts only of J-REITs.

2. The aggregate figure for all J-REITs listed on the Tokyo Stock Exchange and Osaka Securities Exchange.

3. Data are the sum of figures for each accounting period because the date of book closings differs among investment corporations.

4. Long-term debt includes investment corporation bonds.

Sources: Financial statements of investment corporations; Bloomberg.

system. In this respect, the following two issues are of importance. The first is whether or not the risk-return relationship in a real estate business run by the use of land pledged as collateral is well balanced. Several indicators are useful for answering this question, particularly the capitalization rate, or "cap rate." The second issue is whether or not evaluations of the profitability of real estate-related loans are based on realistic projections of borrowers' real estate businesses. Unrealistic projections are often based on optimistic forecasts of the stream of future cash flows, on optimistic expectations regarding the future resale value of land pledged as collateral, or on both.

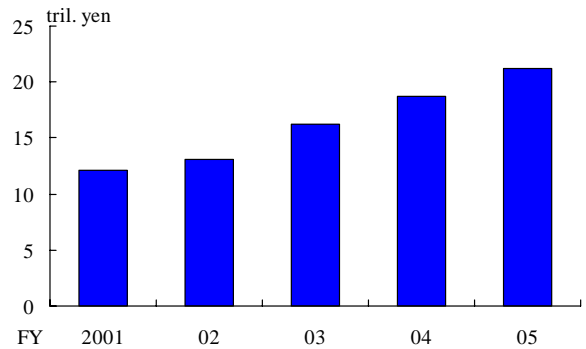
Additionally, in recent years, non-recourse loans have come into wide use in real estate-related finance (Chart 51). In this type of lending, when a borrower defaults the scope of a lender's debt collection is limited only to land pledged as collateral. This feature requires banks to carefully estimate the stream of future cash flows arising from land pledged as collateral, and to design covenants so that they can flexibly respond in a changing environment.

## 6. Increases in new-type loans

Recently, banks have expanded new types of loans, such as syndicated loans and uncollateralized business loans for small firms (charts 52 and 53). The former allows lender banks to share related risks while enabling borrower firms to finance large amounts of money at one time. The latter also provides small firms with a new channel of financing. Thus, the emergence of these new kinds of bank loans can be expected to lead to an improvement in the functioning of the financial system and the promotion of efficient risk redistribution.

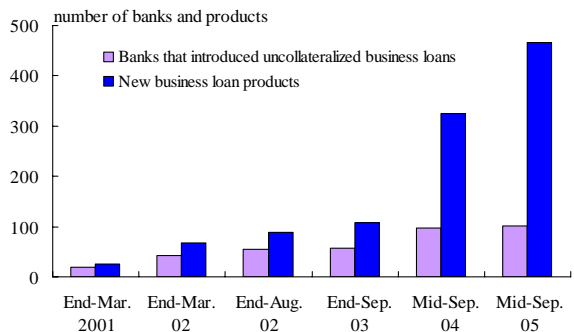
On the other hand, these new types of loans create new challenges for banks' risk management. An example

Chart 52: Loans Syndicated in Japan<sup>1</sup>



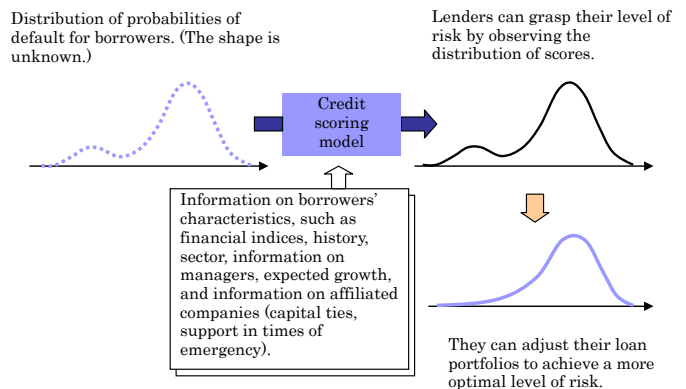
Note: 1. The figures for fiscal 2003, 2004, and 2005 were 19.0 trillion yen, 21.6 trillion yen, and 25.9 trillion yen, respectively, in the Bank of Japan's "Loans Syndicated and Loans Transferred."  
Source: Thomson Financial.

Chart 53: Uncollateralized Business Loans for Small Firms



Source: Yano Research Institute, "2006 Nen-Ban Business Loan Shijou no Jittai to Tenbou (Business Loan Market 2006)."

Chart 54: Purpose of Utilizing a Credit Scoring Model



concerns uncollateralized business loans for small firms. Here, a number of small loans are pooled in order to gain diversification effects, and typically a statistical credit examination method, the so-called "credit scoring model," is employed in order to control credit risks (Chart 54). Thus, a premise of great importance is that the underlying mathematical model is appropriate. In managing loan portfolios using an appropriately built model, it is important to monitor developments in risk attributes, such as changes in the default rate of firms by industry type or in the credit rating of borrower firms, on an ongoing basis. It is of increasing importance to take advantage of an appropriate model based on such frequently updated data in flexibly determining lending rates of interest, setting/revising credit lines, and weighing the timing of securitizing part of the loans.

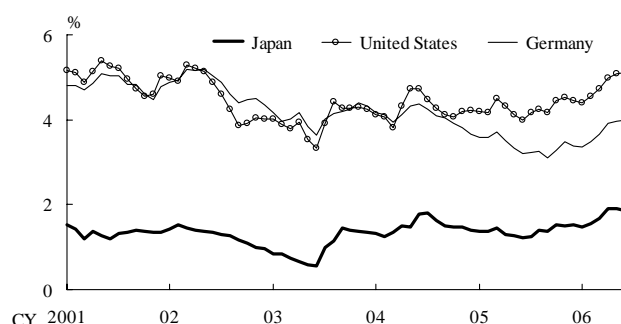
## B. Banks' Response to the Risk of Interest Rate Rises

As the economy has been recovering for a few years and the inflation rate has turned positive after prolonged declines, market interest rates have edged up. Long-term interest rates abroad are also on the rise as the world economy continues to expand and international commodity prices, such as oil prices, exert inflationary pressures (Chart 55). In this financial environment, the problem of how to handle the risk of interest rate hikes is a significant challenge for both individual banks and the financial system overall, since the hikes are bound to generate capital losses, paper losses, or both, in banks' bond portfolios.

Until the middle of 2005, bank loans were decreasing. Reflecting this, banks' investment in bonds increased and came to account for around 15-20 percent of total bank assets in the early 2000s (Chart 56). In this situation, the major banks are now attempting to reduce interest rate risks associated with their bond portfolios by shortening the duration of bonds under the framework of integrated risk management. The regional banks, on the other hand, are holding bonds of a longer duration than the major banks, so as to respond to revenue needs. In addition, the interest rate risk of the bond portfolio of some regional banks seems to be rather large (Chart 57).

Moreover, a number of banks have increased their holdings of 15-year floating-rate government bonds, which to some extent allow hedging against risks related to a steepening of the yield curve. Associated with this type of bond, however, is the risk that bond prices go down due to a flattening of the yield curve. In fact, this risk materialized in the fall of 2005. This episode shows that there is a need for banks to manage the risks associated with their bond portfolios by considering the characteristics of each type of bond.

Chart 55: 10-Year Government Bond Yields in Japan, the United States, and Germany<sup>1</sup>



Note: 1. Data are monthly averages available up to June 2006.  
Sources: Japan Bond Trading Company; Bloomberg.

Chart 56: Ratio of the Amount Outstanding of Bond Investments to Total Bank Assets

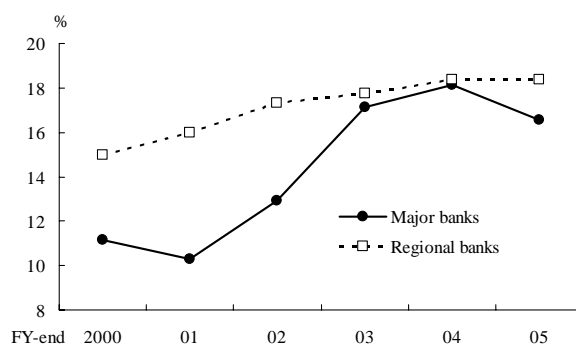
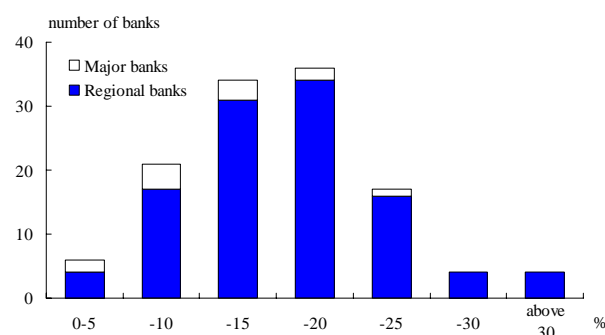
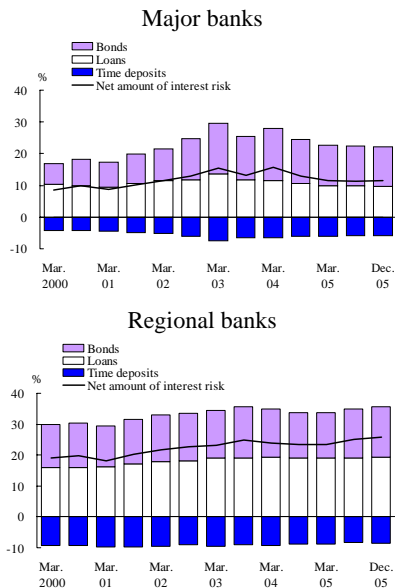


Chart 57: Interest Rate Risks Associated with Banks' Bond Portfolios as a Percentage of Tier I Capital (100 bpv)<sup>1</sup>



Note: 1. 100 bpv is calculated by the same method as in Chart 11.

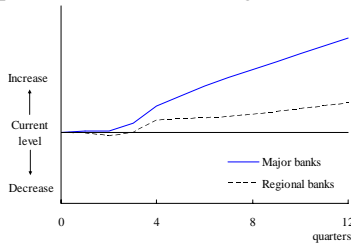
Chart 58: Interest Rate Risks Contained in Banking Accounts as a Percentage of Tier I Capital (100 bpv)<sup>1</sup>



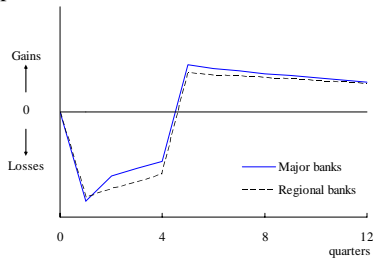
Note: 1. 100 bpv is calculated by the same method as in Chart 11.

Chart 59: Impact of Rises in Market Interest Rates on Banks' Equity Capital<sup>1</sup>

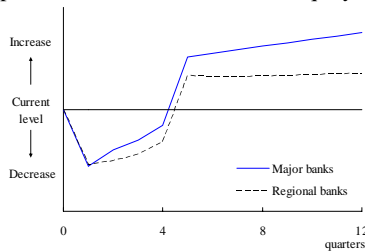
(1) Impact on Periodical Earnings



(2) Impact on Bond-Related Unrealized Gains/Losses



(3) Impact of Total Gains/Losses on Equity Capital



Note: 1. Estimated impact of an upward shift in the yield curve on the future path of periodical earnings, bond-related unrealized gains/losses, and total gains/losses of the banking sector. The yield curve is assumed to shift upward evenly by 25 basis points for four quarters.

Looking at banks' overall accounts and the associated interest rate risk, this risk has remained almost unchanged for the major banks, but has increased slightly for the regional banks (Chart 58). The increase in case of the regional banks is mainly due to a rise in the share of bond holdings in their portfolios as well as an increase in the average duration of loans due to increases in the extension of housing loans.

The Bank has developed a model to analyze the impact of rises in market interest rates on the future path of net profits in the banking sector. Details of this analysis are discussed in Box 4, while the results are shown in Chart 59 and can be summarized as follows. Rises in market interest rates contribute negatively to net profits due to capital losses arising from bond holdings at the initial stage. In the long run, this negative effect does not exceed the positive effect of interest rate hikes on bank profits. That is, deposit interest rates increase less than loan interest rates, and therefore the spread between the two rates widens, contributing to improving interest incomes.

In reality, with market interest rates increasing in 2006, banks have set deposit interest rates in the following manner (Chart 60; see Box 5 for details). First, compared with increases in market interest rates, increases in deposit interest rates have been relatively limited. Second, there has been the tendency that the shorter the duration of deposits, the less have deposit interest rates been raised, against the background of banks' expectation for the rise in the market interest rates in the future. These patterns in the setting of deposit interest rates by banks seem consistent with the results of the above model-based analysis. On the other hand, banks have begun to change interest rates on housing loans in response to increasing market interest rates. Thus, as long as banks manage risks appropriately, potential rises in market interest rates do

not necessarily have to have a destabilizing effect on individual banks or the financial system overall.

Ordinary and current deposits came to account for about 50 percent of total bank deposits in fiscal 2005, in part due to a large shift from time deposits to the two other categories of deposits in response to the removal of the blanket guarantee for time and savings deposits in April 2002 (Chart 61). Both the size of the interest rate risk taken by banks and the potential impact on banks' profits depend on how the duration of demand deposits is measured and to what extent they are withdrawn and/or shifted into time deposits. Moreover, competition among banks in the loan business is becoming fiercer and it is difficult at this stage to estimate how much banks will actually raise loan interest rates.

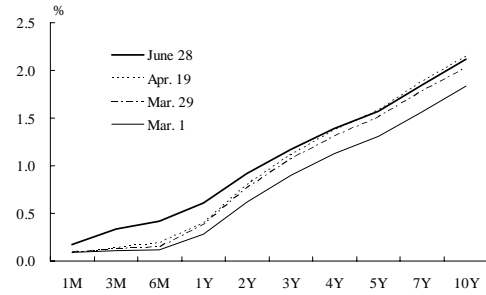
Taking the above-mentioned recent changes in the financial environment into account, it is imperative for banks to manage risks and allocate capital with a view to potential rate hikes and flows of funds in response to these hikes. In addition, given that low interest rates to date have kept firms' interest costs low, banks need to keep in mind the risk that interest rate hikes will push up their credit costs and thereby negatively affect the profitability of their loan business. Two further issues need to be taken into account. The first is how any changes in banks' liabilities, a large share of which at present consists of demand deposits, would affect banks' interest rate and liquidity risks. The second is how any changes in the size and structure of banks' bond portfolios would affect their interest rate risks and developments in financial markets.

### C. Banks' Handling of Liquidity Risks

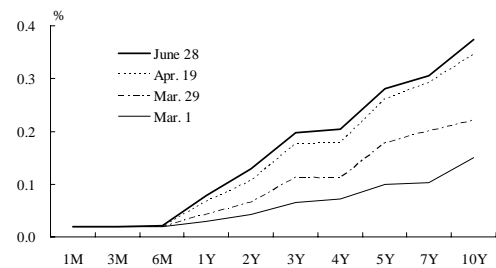
Under the Bank's quantitative easing policy, financial institutions did not have to pay much attention to

Chart 60: Sensitivity of Time Deposit Rates to Changes in Market Interest Rates<sup>1,2</sup>

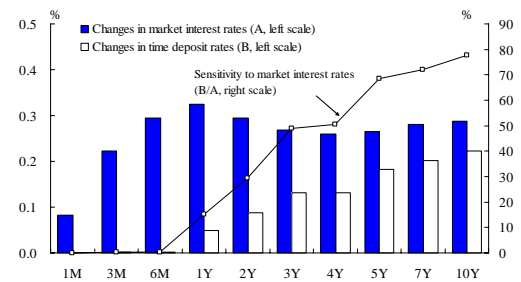
(1) Market Interest Rates



(2) Interest Rates on Time Deposits (Less than 3 Million Yen, National Average)

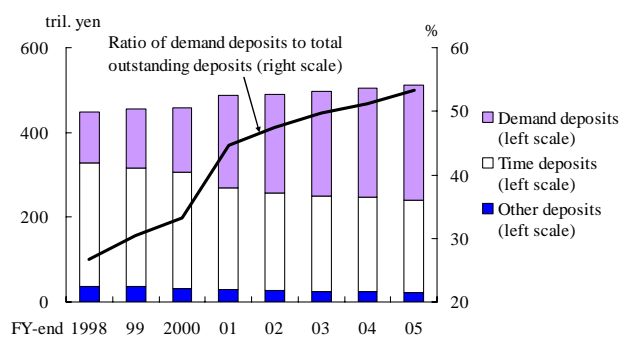


(3) Sensitivity of Time Deposit Rates to Changes in Market Interest Rates



Notes: 1. Market interest rates for less than 1-year maturity are LIBORs, those for 2-year maturity or more are swap rates.  
2. Sample periods are from March 1 to June 28, 2006.  
Sources: Bank of Japan; Bloomberg.

Chart 61: Demand Deposits Outstanding<sup>1,2</sup>

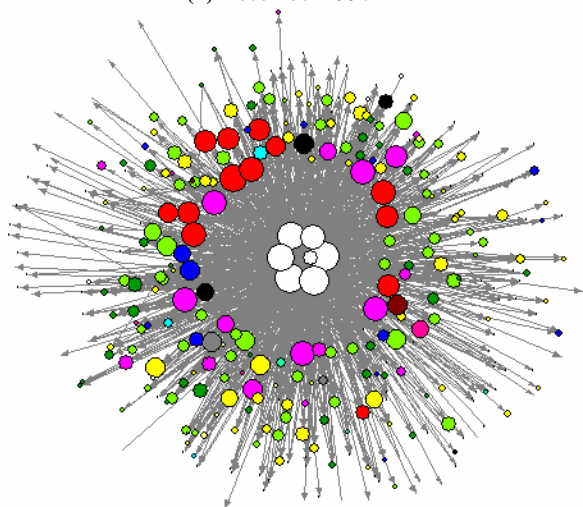


Notes: 1. The aggregate figure for both the major and the regional banks.  
2. The figure for demand deposits is the sum of figures for ordinary and current deposits.

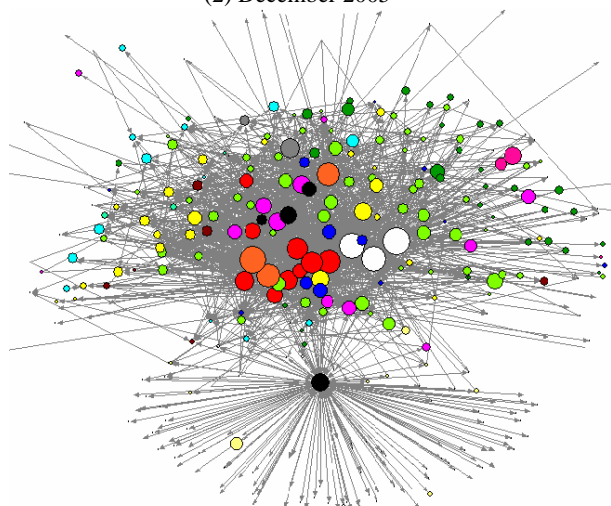


Chart 62: Change in Structure of Call Money Transactions<sup>1,2</sup>

(1) December 1997



(2) December 2005



liquidity risks. This situation, coupled with a resurgence in markets' confidence in the stability of the Japanese financial system, would explain why the full removal of the blanket guarantee of deposits in April 2005 did not cause any problems regarding banks' liquidity management. However, as the outstanding balance of current accounts held at the Bank has gradually decreased since the termination of the quantitative easing policy in March 2006, liquidity management is of increasing importance for banks.

The structure of the call money market has changed in response mainly to three phenomena. First, against the background of the quantitative easing policy and the previous zero interest rate policy, market participants' desire to lend money in the interbank money market has declined. Second, Japan's financial structure has changed, as suggested by decreases in the deposit-loan ratio of many banks. And third, the Bank introduced real-time gross settlement (RTGS) in its financial network system in 2001. Specifically, one characteristic of the old structure of call money transactions was that a large part of transactions was conducted via money market brokers (Chart 62 and Box 6). In contrast, more recently, the structure of call money transactions has been characterized by a diversification and decentralization of transactions due to the prevalence of bilateral transactions, so-called "direct deals," among the major banks and other respects (Chart 62 and Box 6). It is not clear yet how this change in the call money market affects the efficiency of fund transactions and the robustness to shocks of the overall transaction network. Nevertheless, taking into account the above-mentioned fact that more financial institutions get to handle bilateral transactions, these institutions are required to control credit exposure to individual counterparties in a more sensitive fashion.

Notes: 1. Circles, colors, sizes, and arrows indicate financial institutions, type of financial institutions, monthly transaction value, and money flows, respectively.  
2. The white circles located in the center of the chart for December 1997 are money market brokers (*tanishi*).

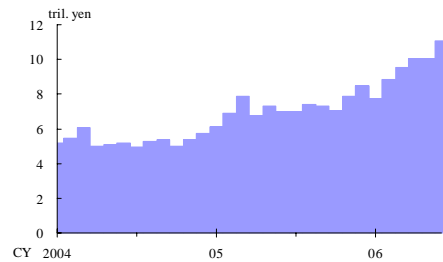
Looking at financial institutions' recent behavior concerning liquidity management, they have improved the monitoring of flows of funds, and, as a means of accumulating experience, have been funding transactions. The volume of transactions remains on an upward trend in the call money market (Chart 63). This suggests that the market is functioning better than before, and that an environment is being created in which financial institutions perform money market-based management of liquidity risks. In addition, the application of the Bank's complementary lending facility (a Lombard-type lending facility) has increased since the change in monetary policy in March 2006 (Chart 64). This seems to show that financial institutions are attempting to control liquidity risks with the help of the Bank's facility of providing liquidity. Based on these developments, it seems unlikely that problems in financial institutions' management of liquidity risk will have systemic impacts on the financial system in the near future.

#### D. Increases in "Alternative Investment" by Banks

In recent years, banks have increased investing in alternative financial products, such as structured bonds, securitized products, hedge funds, private equity funds, and real estate funds (charts 65 to 67). The two main reasons for this increase in "alternative investments" are banks' increasing needs to achieve higher rates of return in the face of decreasing deposit-loan ratios and low interest rates, and the emergence of new financial products due to technological innovation in finance. The alternative investments pose new challenges for the risk management of banks investing in these products.

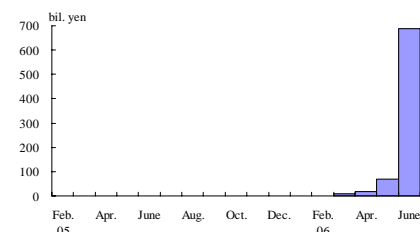
Challenges relating to alternative investment products

Chart 63: Amount Outstanding in the Uncollateralized Call Money Market<sup>1,2</sup>



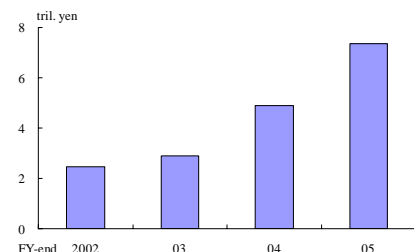
Notes: 1. Data are monthly averages available up to June 2006.  
2. The aggregate figure for three markets (Tokyo, Osaka, and Nagoya).  
Source: Bank of Japan, "Amounts Outstanding in Short-term Money Markets."

Chart 64: Amount Outstanding of Loans and Discounts by the Bank of Japan<sup>1</sup>



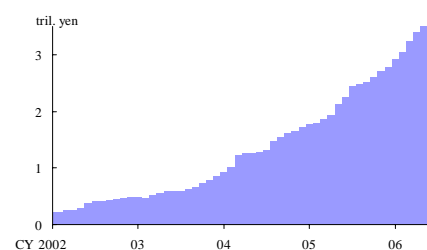
Note: 1. Data are monthly averages available up to June 2006.  
Source: Bank of Japan.

Chart 65: Alternative Investment: Banks' Investment in "Other Securities"<sup>1,2</sup>



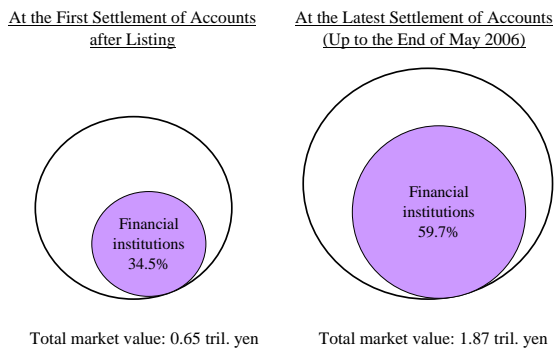
Notes: 1. The aggregate figure for both the major and the regional banks. Amount outstanding.  
2. "Other securities" are banks' holdings of securities other than JGBs, corporate bonds, and stocks.

Chart 66: Alternative Investment: Market Size of J-REITs<sup>1,2</sup>



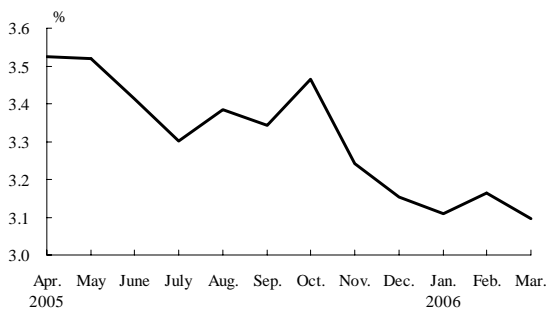
Notes: 1. Market size is the total market value of all J-REITs listed on the Tokyo Stock Exchange and Osaka Securities Exchange.  
2. Data are monthly averages available up to June 2006.  
Source: Association for Real Estate Securitization, "J-REIT View."

Chart 67: Alternative Investment: Financial Institutions' Share of Investment in Top Eight J-REITs<sup>1,2,3</sup>



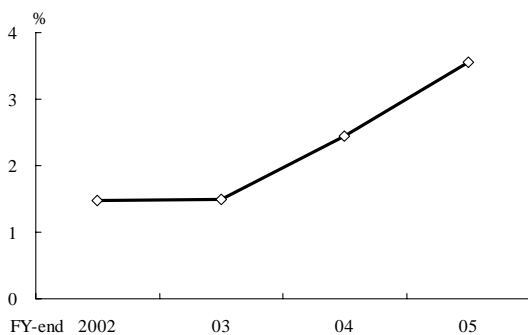
Notes: 1. Figures for the top eight J-REITs by market value as of the end of fiscal 2005. They accounted for about 62 percent of the total market value of all J-REITs listed on the Tokyo Stock Exchange or Osaka Securities Exchange.  
 2. The date of book closings differs among investment corporations. The first book closing of each investment corporation after listing was made during the period from December 2001 to April 2004.  
 3. Including securities companies' holdings.  
 Source: IR materials of investment corporations.

Chart 68: Dividend Yield on J-REITs listed on the Tokyo Stock Exchange in Fiscal 2005



Source: Bloomberg.

Chart 69: Ratio of the Amount Outstanding of "Other Securities" to Total Securities Outstanding<sup>1</sup>



Note: 1. The aggregate figure for both the major and the regional banks.

include information constraints and liquidity issues. The risk and return profiles of these products are not easy to quantify due to the complexity of their design and the limited availability of information required for the quantification of risk. In addition, it is often difficult to liquidate investments in alternative products in a timely fashion because of the extended period of notice for withdrawals. For example, hedge funds often skirt around regulations on information disclosure through private placement offerings, and typically it is difficult to find out their going prices on a frequent basis. For this reason, it is important for banks investing in hedge funds to devise means to overcome such information constraints. In this context, one option for banks would be to encourage hedge funds to disclose more information. Doing so would lead to a strengthening of market discipline with respect to hedge funds, and may contribute to the sound development of hedge fund markets. Meanwhile, in the case of investment in structured bonds whose risks and returns are susceptible to stock prices and foreign exchange rates, it is necessary to understand risk profiles through the use of appropriate pricing models and scenario analyses.

Two factors contributed to the increase in alternative investments. One was the expectation that, in the context of the low interest rate environment in Japan, alternative financial products would yield higher returns. The other was the assumption that the prices of alternative financial products would be relatively uncorrelated with those of traditional financial products. However, reflecting increases in the supply of property in the real estate market and rises in land prices in urban areas, the average rates of return of real estate funds were on a downward trend in fiscal 2005 (Chart 68). In addition, it is not necessarily the case that investments in hedge funds are uncorrelated with

investors' other portfolios, since some investments overlap. Therefore, when banks invest in alternative financial products, they need to consider the risk and return profiles of these products carefully.

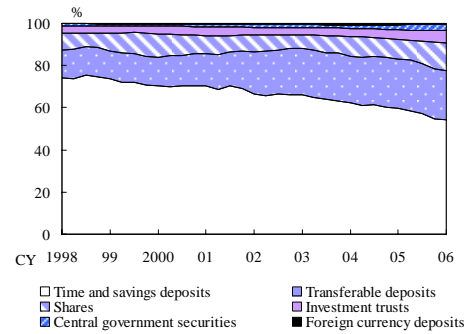
At present, "other securities," the category into which alternative investments fall, account for only 3-4 percent of the total balance of securities investments on banks' balance sheets (Chart 69). On this basis, it seems unlikely that banks' alternative investments represent a significant risk factor for the banking sector in the near future. Nevertheless, the increase in alternative investments in recent years means that banks need to carefully monitor the nature and extent of the risks associated with investments in alternative financial products.

### E. Developments in New Financial Services

Firms' and households' needs for financial services are becoming increasingly diversified and complex. Firms face globalization and the spread of strategic M&A activities, while households face the maturation of the economy and the aging of society. Changes in the financial environment, such as the economic recovery and the rise in stock prices, encourage both firms and households to increase investments in financial instruments other than bank deposits (Chart 70). In addition, financial deregulation is continuing. Against this background, banks in recent years have attempted to expand their fee business, such as selling investment trusts, private pension policies, derivatives, and arranging the securitization of loan assets, with the aim of diversifying revenue sources.

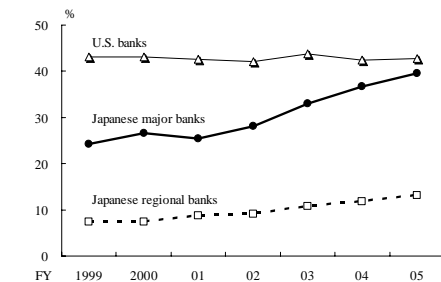
Reflecting these supply and demand conditions, banks have recently posted an increase in their fee income. In fiscal 2005, for the major banks, non-interest income accounted for about 40 percent of their profits, while

Chart 70: Composition of Households' Financial Assets



Source: Bank of Japan, "Flow of Funds."

Chart 71: Ratios of Non-Interest Income to Gross Operating Profits<sup>1</sup>



Note: 1. Ratio of non-interest income to gross operating profits from core business = non-interest income/(net interest income + non-interest income).

Chart 72: Fee Income from New Financial Services

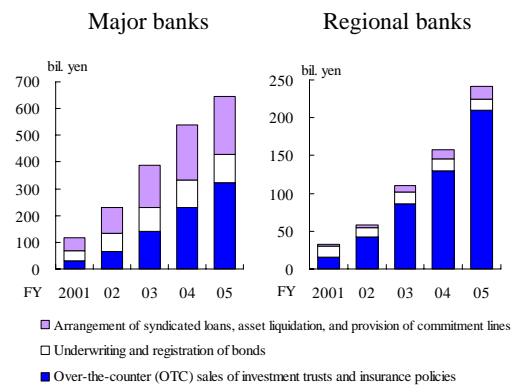


Chart 73: Contributions to Increase in Fees and Commissions from Domestic Operations

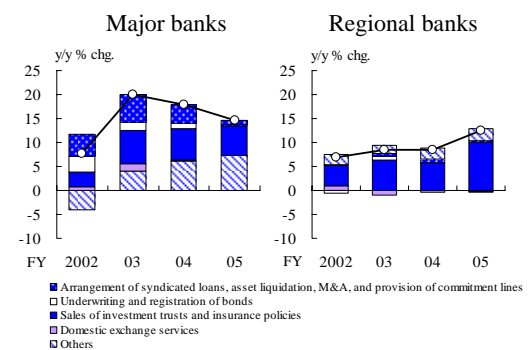
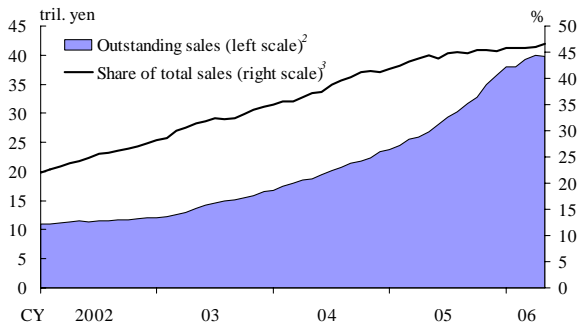
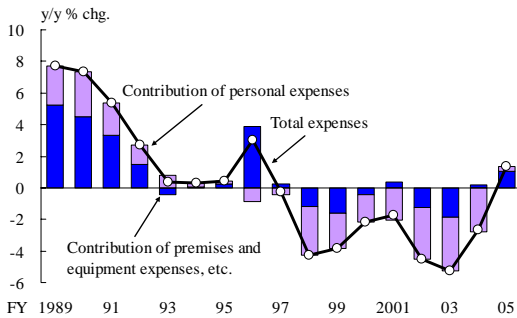


Chart 74: Investment Trusts Sold by Banks<sup>1</sup>



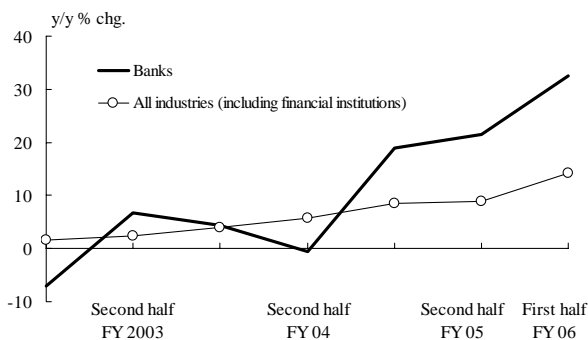
Notes: 1. "Banks" are equivalent to the registered financial institutions in the source.  
 2. Amount outstanding of investment trusts sold by banks on commission.  
 3. Share of banks' sales in the total sales.  
 Source: Investment Trusts Association, Japan, "Investment Trusts."

Chart 75: General and Administrative Expenses<sup>1</sup>



Note: 1. The aggregate figure for both the major and the regional banks.

Chart 76: Japanese Banks' Fixed Investment<sup>1,2</sup>



Notes: 1. Including software investment, and excluding land purchasing expenses.  
 2. Figures for fiscal 2003 to 2005 are actual results, and those for the first half of fiscal 2006 are forecasts.  
 Source: Bank of Japan, "Tankan -- Short-term Economic Survey of Enterprises in Japan."

for the regional banks, it accounted for about 15 percent (Chart 71). Although the proportion of fee income to banks' total income is still smaller in Japan than in the United States, the gap in the ratio of fee incomes to gross profits between Japanese and U.S. banks has narrowed in recent years, because the ratio for Japanese banks has increased whereas that for U.S. banks has remained almost unchanged.

Looking at the components of Japanese banks' fee income, the major banks have seen an increase in income not only from the sale of investment trusts and private pension policies, but also from loan-related fee business, such as syndicating loans and liquidizing loan assets. On the other hand, most of the increase in the regional banks' incomes is accounted for by income from the sale of investment trusts and private pension policies (charts 72 and 73). Investment trusts sold over bank counters now account for about half of the total sales of investment trusts (Chart 74).

The expansion of banks' fee business is leading to a diversification of their sources of profit and an effective utilization of their managerial resources. For firms and households, on the other hand, it is increasing both the convenience of financial services and the functioning of the financial system. For example, the sale of riskier investment products, such as investment trusts, and the development of private banking enable bank customers to access new financial services through banks' extensive branch networks. In addition, from a macro viewpoint, the sale of riskier investment tools through banks helps to foster new ways of financial intermediation, bypassing banks as financial intermediaries and enhancing the efficiency of risk-sharing between banks and households, thus helping to prevent the excessive accumulation of risk in the banking sector.

Reflecting their restored risk-taking capacity, banks are also showing growing dynamism in the provision of new financial services. Banks are now keenly using alternative supply outlets for their services such as the Internet. Moreover, they are actively investing in new business areas and are forming business alliances with non-bank companies.

Regarding banks' expenditure, the continuous reduction in general and administrative expenses since the middle of the 1990s, especially in personnel expenses, has recently come to a halt (Chart 75). In addition, banks have begun to increase fixed investments with the aim of starting new operations (Chart 76). Further developments are business alliances between financial institutions of different types, such as banks, securities companies, and insurance companies; business mergers by the regional banks across prefectural boundaries; and the entry into consumer finance by banks through joint ventures or partnerships with consumer finance companies. Moreover, banks have started to offer new financial services, such as means of small-value payments, by joining hands with firms that have physical or electronic networks such as railway and mobile phone companies (Chart 77).

Both the expansion of business lines and the supply of new financial services by banks pose new challenges for banks' risk management. For example, the former increases the need for banks to improve compliance programs, and this is widening the menu of operational risks taken on by banks. In addition, the spread of ICT gives rise to the potential for new financial crimes, such as the counterfeiting of ATM cards and "phishing." These trends place new demands on banks to control and reduce operational risks and cope with financial crime.

Chart 77: Three Mega-Financial Groups' Major Capital and Business Alliances<sup>1,2</sup>

	Mizuho Financial Group	Sumitomo Mitsui Financial Group	Mitsubishi UFJ Financial Group
Consumer credit / credit card company	<ul style="list-style-type: none"> <li>● UC Card Co., Ltd.</li> <li>● Credit Saison Co., Ltd.</li> <li>△ Orient Corporation</li> </ul>	<ul style="list-style-type: none"> <li>● Sumitomo Mitsui Card Co., Ltd.</li> </ul>	<ul style="list-style-type: none"> <li>● DC Card Co., Ltd.</li> <li>● UFJ NICOS Co., Ltd.</li> </ul>
Consumer finance	--	<ul style="list-style-type: none"> <li>● Promise Co., Ltd.</li> </ul>	<ul style="list-style-type: none"> <li>● Acom Co., Ltd.</li> </ul>
Public utility	<ul style="list-style-type: none"> <li>● NTT DoCoMo, Inc.</li> <li>○ East Japan Railway Company</li> </ul>	<ul style="list-style-type: none"> <li>● NTT DoCoMo, Inc.</li> <li>○ East Japan Railway Company</li> </ul>	<ul style="list-style-type: none"> <li>○ KDDI Corporation</li> <li>○ East Japan Railway Company</li> </ul>
Others	--	<ul style="list-style-type: none"> <li>● Yahoo Japan Corporation</li> <li>○ Bitwallet, Inc.</li> </ul>	<ul style="list-style-type: none"> <li>○ Bitwallet, Inc.</li> </ul>

Notes: 1. ●: capital alliance including subsidiaries and affiliated companies, △: comprehensive or strategic business alliance, and ○: alliance or incorporation of joint venture for offering means of small-value payments, etc.  
 2. Bank of Tokyo-Mitsubishi UFJ and Sumitomo Mitsui Banking Corporation have been stockholders of Bitwallet, Inc. since its establishment.

Source: IR materials.

Regarding the impact of increases in fee incomes on banks' profitability, it is possible that some fee income may come at the expense of some interest income. Reportedly, some banks are recommending that their customers purchase investment trusts instead of depositing their funds, while other banks are offering discounts on their lending interest rates in order to attract fee business from borrowers. On the other hand, fee business allows banks to make profits without dealing with assets and to enhance the profitability per risk taken. However, fee business, especially selling riskier investment products to customers, also poses new challenges to banks' risk management, for example, the formulation of compliance programs to ensure accountability to customers.

Banks have also made progress in streamlining the processing of daily transactions, upgrading electronic systems and centralizing functions in head offices or outsourcing them. In fact, in fiscal 2005, several banks unified what used to be several systems into one system. Meanwhile, although the frequency of large-scale system failures, such as a complete system failure, is decreasing, small-scale failures involving some inconvenience for customers are on the rise. In addition, system failures relating to securities trading are occurring more frequently than before. At the same time, there is growing interest in developing business continuity programs in order to cope with an emergency. In this situation, it is of increasing importance for individual banks to manage risks associated with the operation of information systems and to build an effective business continuity program.

Thus, banks have responded to the new environment by starting new business operations, such as making new kinds of loans and developing new financial services, in which they are aided by their restored risk-taking capacity. This development is helping to

enhance the functioning of the financial system by promoting financial intermediation and addressing firms' and households' demand for complex and sophisticated financial services.

On the other hand, the new environment and banks' actions in this environment may generate new risks for the financial system. At present, however, these risks are relatively small and, all in all, not beyond the capacity of accumulated capital to act as a buffer against them. In addition, the robustness of the financial system to shocks generated by changes in the business climate and/or interest rates has been raised. Therefore, the discussed changes in the environment and banks' responses to them are unlikely to reduce the stability of the financial system overall.

Finally, it should be mentioned that the stability and robustness of the Japanese financial system will be ensured as long as banks carry on managing risks properly. For this reason, it is of paramount importance for all banks to control both credit and interest rate risks in consideration of potential changes in the business climate and interest rates, and to control operational risks in the evolution of financial businesses.

## Box 2: Development of Credit Costs

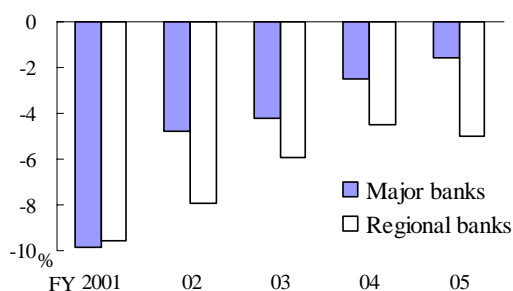
The negative correlation between the business cycle and the credit default rate in the corporate sector means that Japanese banks are faced with a potential resurgence in large credit costs (Chart 41 in the main text). However, price competition in loan markets intensifies during an economic boom, and it might be difficult for banks to raise lending rates during a recession to fully cover realized credit costs. Banks must prepare for a potential rise in credit costs in the pricing strategy for loan rates, the management of required capital against risk, and the allocation of capital across their business lines. Otherwise, uncontrolled increases in credit costs may undermine banks' stability.

In this box, we examine the extent to which the risk of a deterioration in the quality of banks' loans during recession may result in an expansion of credit costs. While the magnitude of those credit costs largely depends on the assumed scenario for the deterioration in loan quality and the assumptions of the model, the calculations suggest that, given the current regime of self-assessment and loan-loss provisioning rules by Japan's FSA, banks are likely to face an increase in such costs.

Under current rules, the main factors determining banks' credit cost are (1) adjustments in loan-loss provisioning stemming from the ranking up or down of credit ratings by the FSA, (2) adjustments following banks' collection/supply of loans, and (3) losses from loan write-offs and the disposal of bad loans by sale.

Developments in credit ratings are usually monitored using a matrix of rating transition probabilities or by calculating the "rating drift," i.e., the share of loans ranked up minus the share of loans ranked down. The rating drift for Japanese banks, both the major banks and the regional banks, is measured using rating transition probabilities based on loans outstanding classified into rating categories based on the FSA rules. Loans outstanding are calculated at the beginning of and the end of the fiscal year. The rating

Chart 1 for Box 2: Rating Drifts



drift suggests that (1) even in fiscal 2005, exposure to credit that was ranked down still exceeded exposure to credit that that was ranked up, both in the case of the major banks and the regional banks; and (2) the extent of the negative rating drift has declined, especially for the major banks.

Developments in banks' credit costs also depend on the rating category of the loans that are ranked up or down, because provisioning rates, i.e., provisioning divided by credit exposure, differ greatly across rating categories. Predicting banks' credit costs, therefore, requires an econometric model to forecast the rating transition matrix. To build the model, historical averages of the shares of loans outstanding by rating category and thresholds for the categories are calculated so that the integral of the standard normal distribution from a threshold to the next represents the average share of a category. Given the fixed thresholds, an upward shift of the mean of the normal distribution represents an improvement in the quality of banks' loans, in other words, an increase in lower-risk credit and a decrease in higher-risk credit. In the model, the change in the mean can be used to generate a rating transition matrix. Since the mean represents credit quality, it will be called the Credit Quality Index (CQI) hereafter. The rating transition matrix at time  $t$  can be estimated using the CQI at the beginning of period  $t$  and its change during the period. A decline in the CQI indicates that the loans outstanding that were ranked down exceed loans outstanding that were ranked up. The results show that the changes in the CQI for the regional banks during a fiscal year were consistently negative (see Chart 2-1 for Box 2), which is consistent with the continuous decline in the rating drift. In contrast, changes in the CQI for the major banks became almost zero after fiscal 2002 (see Chart 2-2 for Box 2), which is consistent with the decline in the excess of down-grading measured by the rating drift.



Chart 2-1 for Box 2: CQI for Regional Banks

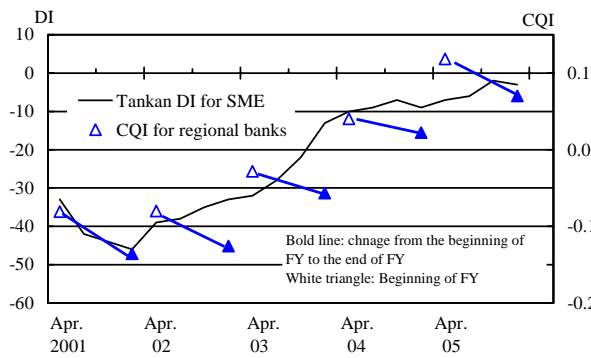
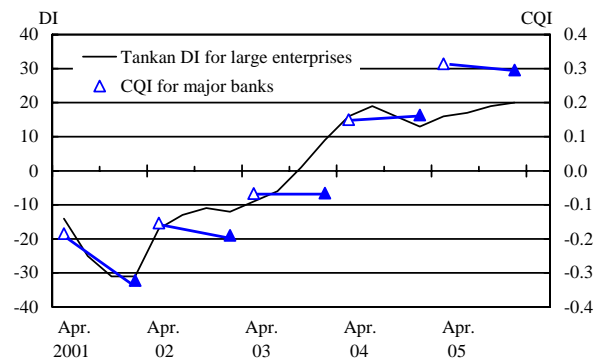


Chart 2-2 for Box 2: CQI for Major Banks



A discontinuity between the CQI at the end of one fiscal year and the beginning of the next fiscal year can be observed both for the major and the regional banks. This indicates that the improvement in banks' loan portfolios is partly attributable to write-offs, disposals by sale, and the collection of loans in lower rating categories through the resolution of the NPL problem. Recent efforts by firms to reduce their debt have led to a decline in bank loans, including bank loans in lower-risk categories, causing a reversal of loan-loss provisions in the lower-risk categories. In fiscal 2005, this reversal in loan-loss provisions contributed to a reduction in credit costs both for the major and the regional banks (see Chart 3-2 for Box 2). Special loan-loss provisions for higher credit-risk categories have accumulated in the case of the regional banks, reflecting the negative rating drift for the regional banks.

Chart 3-1 for Box 2: Loan Collection/Credit Exposure at the Beginning of the Fiscal Year

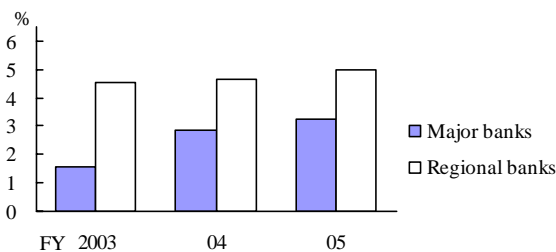
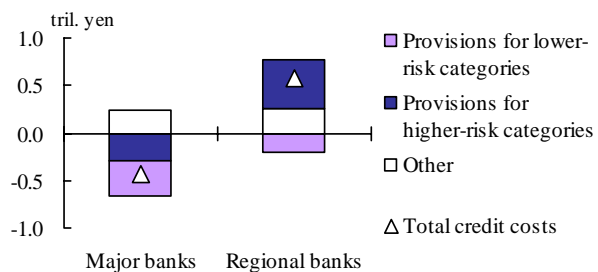


Chart 3-2 for Box 2: Credit Costs in Fiscal 2005



The estimation of the CQI for bond rating transition as well as loan rating transition shows that CQIs co-move with the Japanese business cycle (see the *Financial System Report* for the previous year). Given the scenario of a declining CQI in the future, we estimate the potential increase in credit costs in a recession (see Chart 4-1 for Box 2, measured on the basis of all banks). The estimation is based on the following assumptions: (1) the CQI remains unchanged from the end of one year to the beginning of the next, that is, we assume a CQI without progress in loan collection and forbearance lending, both of which cause discontinuity in the movement of the CQI; (2) we assume constant provisioning rates for each rating category; (3) for higher-risk categories, we assume a constant ratio of exposure to credit secured by collaterals to total exposure; and (4) we disregard losses due to write-offs and disposals by sale. The results show that credit cost ratios, the costs divided by exposure, rise to some extent through an increase in provisions for down-grading (Chart 42 in the main text and Chart 4-1 for Box 2). The results also suggest that credit cost ratios increase rapidly at the early stage of the CQI decline, when the shares of lower-risk categories are high, i.e., period *t* in the chart below. This phenomenon results from the fact that required provisioning rates for higher-risk categories are substantially higher than for lower-risk categories.

Chart 4-1 for Box 2: CQI Estimates and Scenario of Decline in CQI

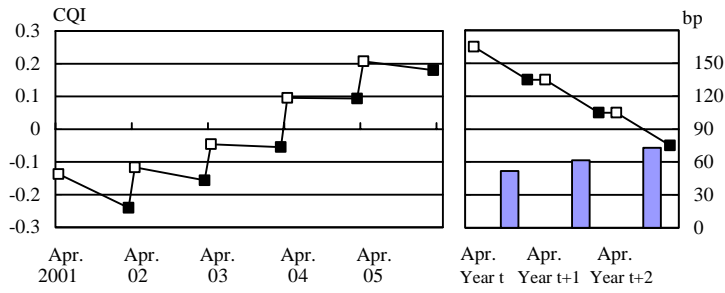
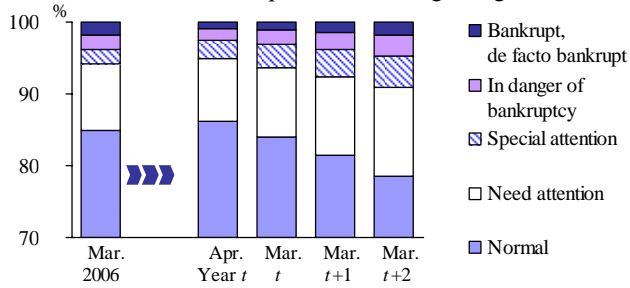


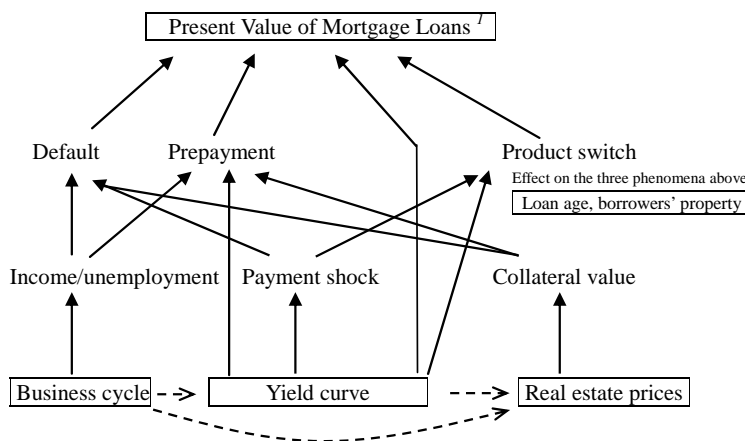
Chart 4-2 for Box 2 : Composition of Rating Categories



### Box 3: Banks' Mortgage Loans and Interest Rate and Credit Risks

Mortgage loans involve various risks that spring from interest rate risk and credit risk, and the complex interaction of these risks. Some of these interrelationships are shown in Chart 1 for Box 3. Elements in the bottom row of the chart represent underlying risk factors that directly influence risk factors in the third row. The second row shows phenomena that are caused by the risk factors shown in the third and fourth row. All of these factors and phenomena directly and indirectly affect the value of mortgage loans (see Note 1 to Chart 1 for Box 3). Here, we investigate the interest rate risks shown in the chart, especially the impact of product switch between ARMs and hybrid ARMs on banks' profit (Japanese hybrid ARMs provide borrowers a free option to roll over to new hybrid ARMs at the end of the current fixed-rate period). We also compare the risk-return properties of mortgage products by type and highlight critical issues in banks' risk management.

Chart 1 for Box 3: Interaction of various risk factors



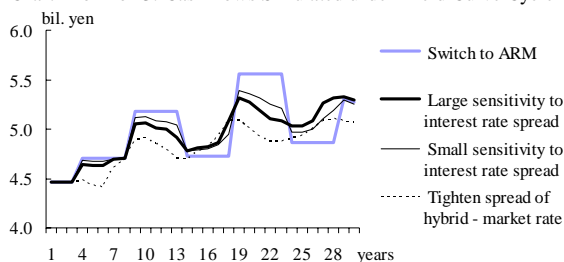
Note: 1. There are many reasons why cash flow from mortgage loans can diverge from the cash flow that banks assume at the time of loan origination: product switch including roll over of hybrid ARMs and a move from hybrid ARMs to ARMs without execution of the roll over option, partial and complete prepayment of the total debt with refinancing from another bank. The change in cash flow alters the value of mortgage obligations. Changes in the yield curve may cause a shift in borrowers' preferences among mortgage products and may also lead to a discontinuous jump in monthly payments. The changes in the yield curve, therefore, can trigger either product switching or refinancing. Obviously, a yield curve shift has a direct effect on the current value of mortgage obligations. The jump in the payment burden represents a payment shock which raises the default risk of the borrower. A fall in the value of real estate used as collateral lowers the recoverable value and also restrains prepayment because the lower resale value is often far below the remaining debt.

Hybrid ARMs with a highly discounted fixed rate have been a driving force behind the recent upsurge in banks' mortgage loans in the current low interest rate environment, and hybrid ARMs now account for the largest share in banks' sale of mortgage loans. Taking a hybrid 3/1 ARM as an example, the effect of borrowers' choice of mortgage product at the end of the fixed-rate period on the internal rate of return is examined below (since the interest rate on ARMs in Japan is updated semi-annually, a more accurate name for the hybrid ARM would be "hybrid 3/0.5 ARM"). In order to examine how borrowers might substitute between a normal ARM and the hybrid ARM as a result of changes in the interest rate differential, we generate a scenario for the short-term market rate and the 3-year swap rate for a 30-year period using term structure theory and ignoring the term premium. The short-term market rate is set to follow a cyclical development. Assuming a constant spread of mortgage rates over market rates, we obtain a series of mortgage rates each for the normal ARM and the hybrid ARM. Next, we assume that the substitution function describing borrowers' choice is in proportion to the difference between the two mortgage rates.

There has been keen discount competition in the mortgage loan market since fiscal 2002. At the same time, the fixed rate for the hybrid ARM has been lower than that for the normal ARM due to the flat curve in the short- to medium-term range. However, this situation reversed this spring as a result of a steepening curve. Suppose pricing of the hybrid ARM is based on the assumption that all borrowers move to the normal ARM without executing their option to roll over to a new hybrid 3/1 ARM, then arbitrage by borrowers, that is, cherry-picking between the two products without incurring any switching costs, may cause banks to post losses on their mortgage business.

The simulation, however, shows how the internal rate of return is insensitive to fluctuations in the share of the hybrid and the normal ARMs (see Chart 2 for Box 3 depicting cash flows). This insensitivity results from the lock-in effect of the hybrid; borrowers who chose the hybrid in the flat curve period, that is, during a recession, cannot move to the normal ARM during the fixed-rate period even when the normal ARM becomes more attractive during an economic upturn with a steep curve. Since refinancing from another bank in order to obtain a more favorable rate involves considerable initial costs, such as real estate registration fees, only a large spread between the two mortgage rates is likely to lead to refinancing. This switching barrier strengthens the lock-in effect. However, excess returns, defined as the internal rate of return minus administrative costs, default premiums, and funding costs, are not high. As competition for customers intensifies and banks offer deeper discounts and loosen restrictions on the roll over of hybrid ARMs before the end of the fixed-rate period, total profits over the span of mortgage may be too low for it to make financial sense.

Chart 2 for Box 3: Cash flows Simulated under Yield Curve Cycle<sup>1</sup>



Note: 1. Assumptions for the simulation: The simulation is based on a hypothetical portfolio of 100 billion yen worth of mortgages with a 30-year maturity. The scenario of the trend in the short-term market rate is designed to reproduce the term spread between 3- and 1-year rates observed after 1990 which ranged from more than 1 percentage point to a little less than zero. Product switching and refinancing in the fixed-rate period for the hybrid are excluded. The hybrid rolled over in one year offers again a next-to-free option to choose a new product after three years. Some borrowers switch to a normal ARM and others roll over their hybrid ARMs, and the ratio of the two groups is determined by the spread between the two mortgage rates. A normal ARM in Japan has payment stabilization functions: the payment amount is fixed for five years and there is a 125 percentage point cap against an upsurge of payment at the recalculation of the next 5-year payment.

Recent months have seen an increase in the demand for FRMs because an upturn in interest rates is expected. Comparing the risk-return properties of three typical mortgage products, FRMs, hybrid ARMs, and normal ARMs at their current rates, the internal rates of return of the three are close, but interest rate risks measured in terms of 100 bpv are significantly different because of differences in their durations (see Chart 3 for Box 3). Since mortgage loans do not have to be valued at market rates and help to generate cash flow as long as there are zero defaults, it is difficult to observe interest rate risks. However, such risks obviously exist and if they were to be actualized, the profitability of banks' mortgage business would decline, for instance, because of a lack of profit opportunities at the same time that interest rates rise and because of a decline in excess returns over funding costs. Banks either have to keep sufficient premiums against the interest rate risk, or have to liquidate their mortgage loans via RMBS immediately after their loan origination, in other words, shift to fee business from balance-sheet business, if they sell long-duration FRMs and hybrid ARMs such as a hybrid 10/0.5 ARM.

Almost all banks have executed stress tests against payment shocks as part of their loan examination in order to ensure that potential borrowers can repay their loans even when interest rates rise sharply. However, banks still have some way to go in improving their credit models for mortgage loans using qualitative as well as quantitative information and in storing historical records to track the performance of their models. Challenges in the area of credit risk control remain, such as how to assess model and data in the context of the ongoing changes in Japanese employment practices and household incomes, how to prevent borrowers from defaulting and how to minimize the costs of any defaults that do occur.

Chart 3 for Box 3: Risk-Return Properties of three mortgage products

Product <sup>1</sup> Prepayment <sup>2</sup>	FRM	ARM	Hybrid 3/0.5 ARM	
	Tent shape <sup>3</sup>	Nothing	Spike shape <sup>4</sup>	Nothing
IRR <sup>5</sup>	3.1%	3.5%	3.1%	3.3%
100 bpv	8.6%	0.2%	3.5%	3.4%
IRR / 100 bpv	0.4	15.0	0.9	0.9
WAL (years) <sup>2</sup>	15.1	15.5	15.3	15.4
Present value (tril.yen) <sup>6</sup>	117	124	117	121
Valuation profit	17	24	17	21

- Notes: 1. Mortgage rates are set to 3.0% for FRM, 1.675% for ARM with 0.7% lifetime discount on list rates, and 2.0% fixed rate for a hybrid 3/0.5 ARM with 0.7% lifetime discount on list rates. Maturities are set to 30 years for all products.
2. Since refinancing money is borrowed from another bank, prepayment can be regarded as a return flow to the original bank. Hence, WAL is almost equal to one without prepayment.
3. A conditional prepayment rate (CPR) increases from zero to 10 percent during the first ten years, and decreases from 10 to zero percent during the remaining period.
4. Ninety percent of the value of the outstanding loan is rolled over at the end of the fixed-rate period, and then CPR is stable at 5 percent until loan maturity.
5. Funding cost rises as the future short-term rate moves along the forward curve. The average of the short-term rate is 2.3 percent.
6. 100 trillion yen mortgage portfolio in the initial period.

#### "Financial stability and the design of risk sharing mechanisms"

The institutional design of the mortgage market and the products available have a significant effect on the distribution of credit and interest rate risks across the different types of agents in the economy. In the United Kingdom, for example, the most common mortgage product is the normal ARM, meaning that households carry the interest rate risk. When interest rates in the United Kingdom rose in the early 1990s, mortgage defaults by households increased sharply, causing substantial damage to the economy. In the United States, the interest rate risk is partly transferred to institutional investors via RMBSs, but recently, new products which are designed to be refinanced through the rise in real estate prices have become increasingly popular. The risk of a slump in the real estate market poses a threat to households and financial institutions providing credit guarantees for RMBSs involving these new products.

In Japan, the Housing Loan Corporation used to be a major supplier of FRMs, that is, the government sector bore both interest rate and credit risks. The recent reform of the corporation made it possible to transfer the interest rate risk to other financial institutions, including institutional investors through the RMBSs issued by the corporation. The share of mortgage loans supplied by private banks increased and the increase in short-term hybrid ARM products has partly transferred the interest rate risk to households. The benefit for households is that they pay lower mortgage rates in exchange for taking on this extra risk, in other words, they swapped the payment of term premiums for the risk of payment fluctuations. Quantitative examinations, both of the contagion paths of the various risk factors mentioned at the beginning of this box and of the mechanism of risk sharing in the Japanese mortgage system, are worthwhile exercises that help to understand the interaction between the financial and the real sector of the economy and to guarantee financial stability.

## Box 4: Impact of a Rise in the Market Interest Rate on Net Profits

We model the impact of a rise in the market interest rate on the future path of net profits of the banking sector, incorporating the actual balance-sheet structure of the major banks and the regional banks and their past price-setting behavior (see Chart 59 in the main text).

In the analysis, we first set a future yield curve scenario. Here, we assume that the yield curve shifts upward evenly in each quarter by 25 basis points from the end of March 2006 until the end of March 2007 (Chart 1 for Box 4). Second, we estimate the future paths of deposit and lending rates (e.g., the 6-month time deposit rate and the short-term prime lending rate; Chart 2 for Box 4), given the yield curve scenario and banks' past price-setting behavior. Third, we estimate the maturity structure of banks' balance sheets. We assume that every product maturing at each point in time is reinvested in the same product with the same maturity (e.g., a matured time deposit is reinvested in a time deposit with the same maturity). This assumption allows us to treat the maturity structure of the banks' balance sheets as being unchanged. Finally, we estimate and aggregate the future path of net interest income from deposit taking, lending, and bond holding, as well as the net capital gain from bond holding.

Chart 1 for Box 4: Yield Curve Scenario

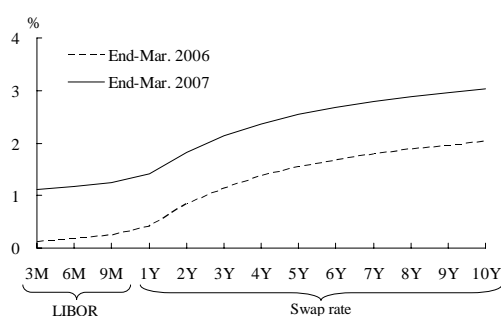
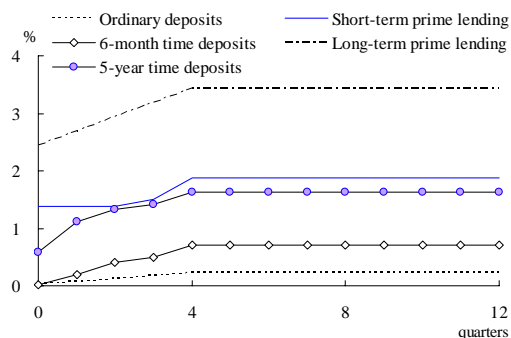


Chart 2 for Box 4: Future Paths of Deposit and Lending Rates



The results are shown in Chart 59, which indicates that an increase in the market interest rate initially leads to negative net profits due to the capital loss from bond holdings. However, the capital loss disappears one year later when the yield curve stops shifting. On the other hand, the widened spread between lending rates and deposit rates contributes to increased (positive) net interest income.

The results for the major banks and the regional banks exhibit the following differences: (1) the capital loss from bond holdings tends to be slightly larger for the regional banks than for the major banks, since the average duration of the bonds held by the regional banks is longer than that of bonds held by the major banks. (2) The major banks' net interest income picks up faster than that of the regional banks, since the major banks' lending is more market-oriented and their average lending rates are more elastically adjusted to changes in market interest rates.

Note that the analysis assumes that the actual balance-sheet structure and the empirical regularity of the past price-setting behavior of the banks remain unchanged. However, these assumptions may not hold in reality. It is possible that demand deposits, accumulated as a result of the termination of the blanket guarantee for time and savings deposits in April 2002 and/or the low interest rate environment, will be shifted into time deposits or other financial products. Also, it is highly uncertain whether banks can raise lending rates in the current competitive environment in the lending market. The aim of the analysis here is to use a simple framework to capture not the finer details of the impact of a rise in market interest rates, but the big picture.

## Box 5: On Recent Changes in Time Deposit Interest Rates

Reflecting the termination of the Bank of Japan's so-called policy of "quantitative easing" on March 9, 2006 and subsequent changes in the financial environment -- and in particular a rise in market interest rates -- banks have recently changed the interest rate they offer for time deposits.

The following features stand out in terms of the deposit interest rate setting by banks. First, interest rates for time deposits of less than 1-year duration have remained almost unchanged. Second, interest rates for time deposits of one year or more have increased. And finally, the longer the deposit period, the more have deposit interest rates kept up with rises in market interest rates (see Chart 60 in the main text).

Here, we empirically examine the effect of changes in market interest rates on deposit interest rates. The estimation functions are designed to replicate the past relationship between market and deposit interest rates, and different functional forms are used for different deposit period lengths.

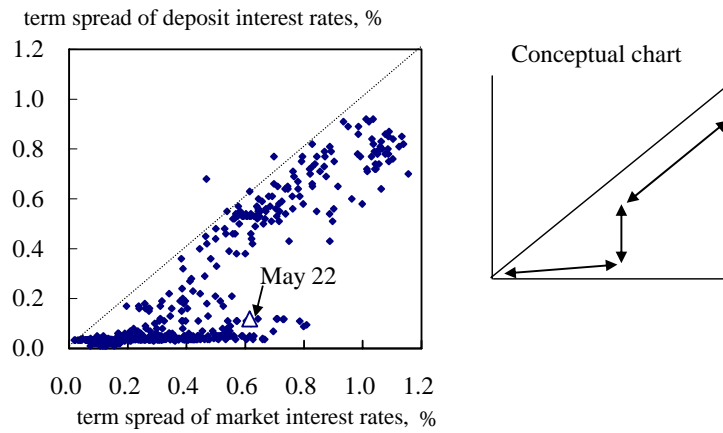
### 1. The Interest Rate on 6-Month Time Deposits

Since 1996, the interest rate on 6-month time deposits has been roughly 60 percent of LIBOR. Therefore, the function we use to estimate changes in 6-month time deposit interest rates assumes that they are 60 percent of LIBOR. In addition, we assume that a change in LIBOR by a certain percentage points triggers a change in the deposit rate. Reflecting the assumed relationship of interest rate changes, this function yields stepwise movements in the deposit rate.

### 2. The Interest Rate on Time Deposits of One Year or More

Interest rates on time deposits of one year or more in the past have been characterized by the following features. First, changes in interest rates are synchronized with changes in market interest rates of the same term. Second, the longer the term, the higher the deposit interest rate; a "reverse-yield curve" alignment of time deposit interest rates has been rare. Based on these observations, we estimate a function which sets the spread between the deposit rates for different period lengths (six months vis-à-vis one year, one year vis-à-vis three years, and three years vis-à-vis five years) as a certain percentage of the corresponding yield spread in market interest rates. Moreover, the rate of response, the "certain percentage," in the formula is set differently for yield spreads above and below a certain threshold. That is, the rate of response of deposit term spreads to the corresponding yield spread in market interest rates above the threshold is bigger than in the case of yield spreads below the threshold (see charts 1 and 2 for Box 5).

Chart 1 for Box 5: Relationship between Term Spread of Market Interest Rates and Deposit Interest Rates (Spread between 1-Year Rates and 3-Year Rates)<sup>1</sup>

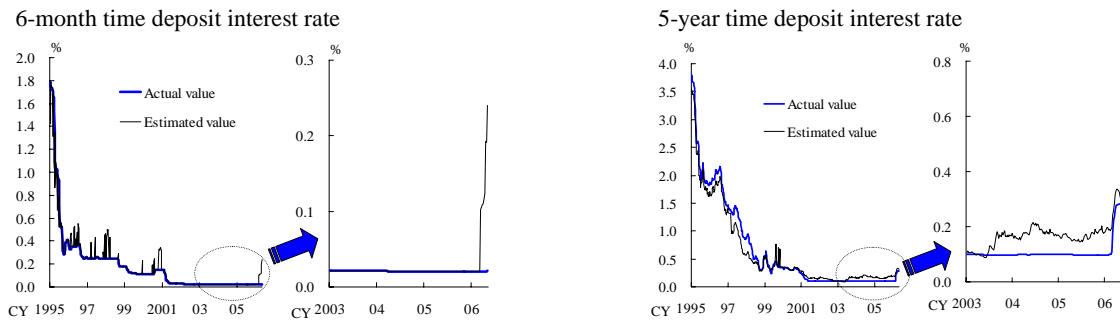


Note: 1. Data are weekly averages during the period from January 1995 to the end of May 2006.  
Sources: Bank of Japan; Bloomberg.

A comparison of actual recent changes in time deposit rates with our estimation results shows the following.

First, observed rises in time deposit interest rates are almost always smaller than the estimated values. Second, the shorter the deposit term, the larger is the differential between the observed and the estimated increase in time deposit interest rates. For example, the estimated 6-month time deposit rate following the end of the policy of quantitative easing is higher than before by a little more than 0.2 percent, while the actual rate in fact has remained almost unchanged. In contrast, the estimated 5-year time deposit interest rate is very close to its actual value.

Chart 2 for Box 5: Interest Rates on Time Deposits: Estimated and Actual Values<sup>1</sup>



Note: 1. Sample periods are up to the end of May 2006.  
Sources: Bank of Japan; Bloomberg.



## Box 6: Networks in Call Money Transactions

Transaction flows in the call money market have changed dramatically due to the start of RTGS in 2001, the introduction of the quantitative easing policy, the emergence of master trust banks as a large fund-supplier, the increase in direct dealing, and the discontinuation of relay settlement via money market broker accounts in transactions of unsecured call money. Here, we examine the structural change in the call money market, comparing settlement data from the BOJ-NET in December 1997, before the zero interest rate policy, with data from December 2005.

First, a look at the money flows across categories of financial institutions shown in Chart 1 for Box 6 and in Chart 62 suggests that the structure of the network of money flows changed from a "star network," where money market brokers intermediated between any two of the business categories, to a "decentralized network," where various alternative links connect business categories directly.

Chart 1-1 for Box 6: Money Flow<sup>1</sup> in Dec. 1997

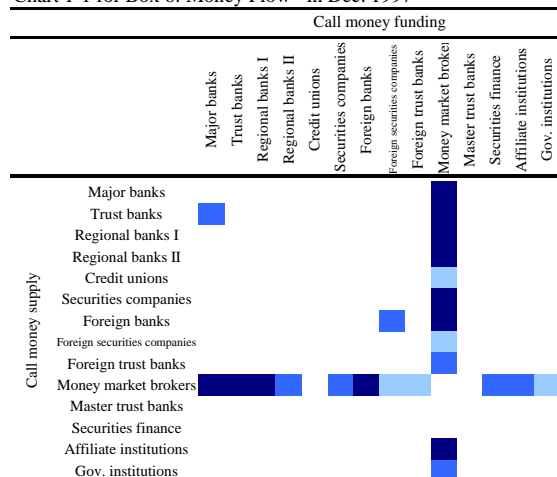
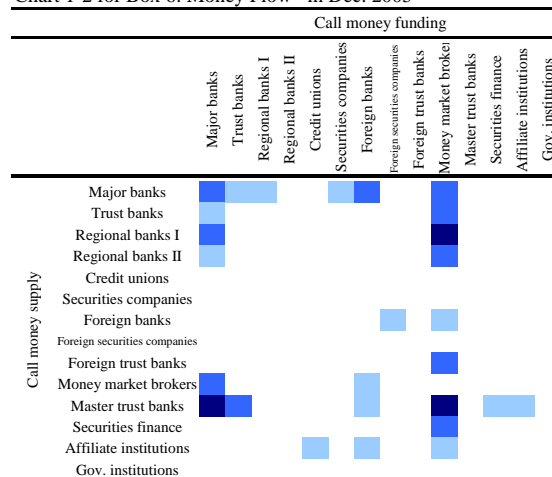


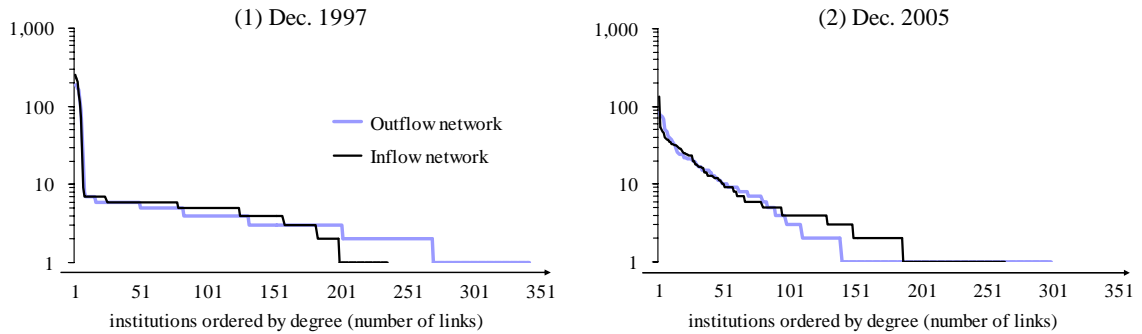
Chart 1-2 for Box 6: Money Flow<sup>1</sup> in Dec. 2005



Note: 1. Monthly aggregates of transaction amounts. Navy, blue, and aqua represent transactions of more than 30 trillion yen, of more than 5 trillion and less than 30 trillion yen, and of more than 2 trillion and less than 5 trillion yen, respectively.

Second, the change of the network is examined using statistics of "Social Network Analysis." We investigate initially the number of counterparties that financial institutions with current accounts at the Bank made deals with, that is, the number of links an institution has with other institutions in the transaction network. The distribution of links is drawn separately for money outflow and money inflow networks separately (see Chart 2 for Box 6). While in 1997, the network showed a high concentration of transactions conducted by a small number of money market brokers, in 2005 middle-ranking institutions in the network had more links than in 1997. In addition, the number of links of lower-ranking institutions (i.e., institutions with few links) declined further, especially in the outflow network. A low interest rate environment may make funds suppliers reluctant to invest their money in the call money market, which may lead to a reduction of links in the outflow network.

Chart 2 for Box 6: Degree (Number of Links)



Central players in the transaction network can be identified by the "Core degree" indicator (see Note 1 to Chart 3 for Box 6). The core members are made up of money market brokers, the major banks, master trust banks, affiliate institutions, large securities companies, trust banks, and large regional banks. The distribution of the indicator illustrates that (1) the highest value of the degree  $k$  rose from 12 in 1997 to 18 in 2005, which means that the density of links in the network formed by the core members became higher, and (2) the number of core members in the highest degree increased.

Next, the "cluster coefficient" is examined. This is an alternative measure of the density of links in a sub-network composed of an institution and other institutions that have links stemming from the institution. The cluster coefficient, together with the number of links of an institution is mapped in Chart 4 for Box 6. The dots in the circled area represent institutions which have a small number of links and belong to a sub-network with a high density (see Note 2 to Chart 4 for Box 6). In contrast, dots in the lower right area of the chart correspond to institutions that function as a hub, with vast links and that belong to a large sub-network with a lower density. The members of the latter group almost overlap with the core members identified by the  $k$ -Core.

Chart 3 for Box 6:  $k$ -Core<sup>1</sup>

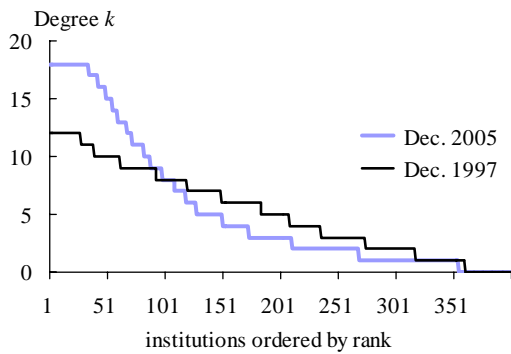
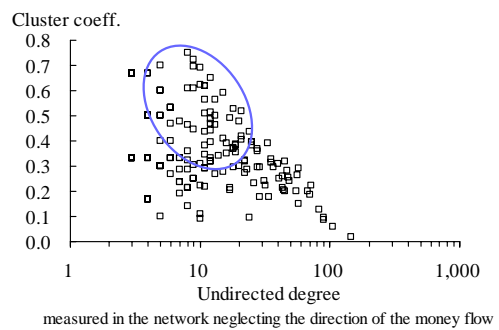


Chart 4 for Box 6: Cluster Coefficient<sup>2</sup> and Degree



- Notes: 1. A sub-network in which every member has links to other members greater than or equal to  $k$ . If  $k$  is close to the number of the sub-network members, the network is a nearly "complete network" in which case every member is directly linked to all other members.
2. The denominator is the maximum number of links that potentially exist in a sub-network centering on an institution;  ${}_{n+1}C_2$  in the case where the sub-network includes  $n+1$  institutions. The numerator is the real number of links in the sub-network.

The network statistics discussed above suggest that (1) the current network of call transaction takes a "double shell" structure composed of a core and a periphery, (2) the core is a nearly complete network, (3) the core plays the role of a hub toward the periphery, and (4) institutions at the periphery tend to form a cluster whose members are mutually linked in small sub-networks and connect to the hub (see Chart 5 for Box 6 and Chart 62).

Structural changes in the call money market network have prompted discussions regarding the possibility of systemic risk. The structure of the network may influence significantly the process in which either a settlement failure or liquidity shock breaks out in a financial institution and propagates around the whole network. It also may influence the mechanics of how those shocks can dissipate. A "static" approach to this issue is given by the network statistic of average distance. The statistic measures how many steps are required for an institution to reach another institution that is potentially accessible and is calculated as an average of these distances for each institution. The distribution of the statistic for 2005 shows that high-ranking institutions such as the top 200 can access all possible areas with only three steps in the web of links. The short distance clearly reveals the network to be a "small world" (see Note 1).

Further investigation on the network's robustness against negative shocks should include a dynamic simulation analysis. It also needs to be noted that institutions exposed to difficulties must take actions to extend their credit line in the call market by finding new counterparties. Reactions such as this may change the network structure and its properties. These are challenges that must be taken into account in the surveillance of the behavior of financial institutions in the future.

Chart 5 for Box 6: Conceptual Structure

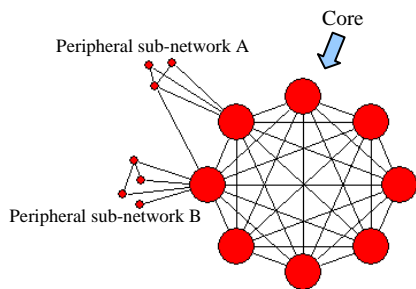
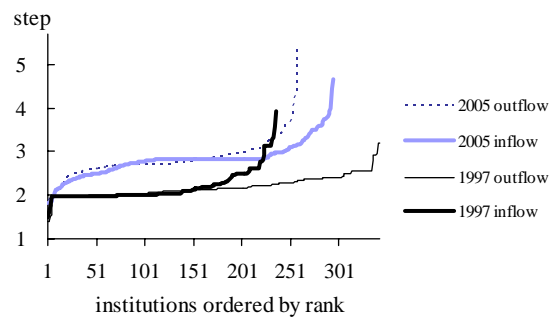


Chart 6 for Box 6: Average Distance



Note: 1. The small world network is defined by (1) "sparseness" relative to its number of elements, (2) clustering within neighbor elements and (3) short distance. While the third property looks like a contradiction of the first two, a few hubs and shortcut links across a long distance allow those three properties to coexist in a network.

### III. Enhancing the Stability and Functioning of the Financial System

As discussed in the previous section, the environment surrounding Japan's financial system and the behavior of financial institutions have been evolving. This section highlights issues important for maintaining the stability and enhancing the functioning of the financial system amid such evolution.

#### A. Enhancing the Value-Added of Financial Services and Establishing Attractive Business Models

Innovations in financial technology make it possible to unbundle and reconstruct various financial products. For example, traditional lending activity can be divided into several distinct operations, such as searching for new borrowers, taking on credit risk, monitoring, and servicing (Chart 78). The spread of the Internet and ongoing financial deregulation provide a diversity of supply channels to bring financial services to customers (Chart 79).

Under these circumstances, each financial institution needs to construct attractive business models that utilize its resources and creativity in order to increase the value-added of financial services. This is important in two respects. First, it will enable financial institutions to meet the diversified needs of firms and households. Second, since the profitability of low-value-added services is likely to shrink, building attractive business models helps to maintain profitability and thereby contributes to the financial stability of individual institutions.

Since the options available to financial institutions have been expanding, each institution needs to identify its relative advantages and redistribute its resources

Chart 78: Unbundling of Financial Services through Securitization: Examples

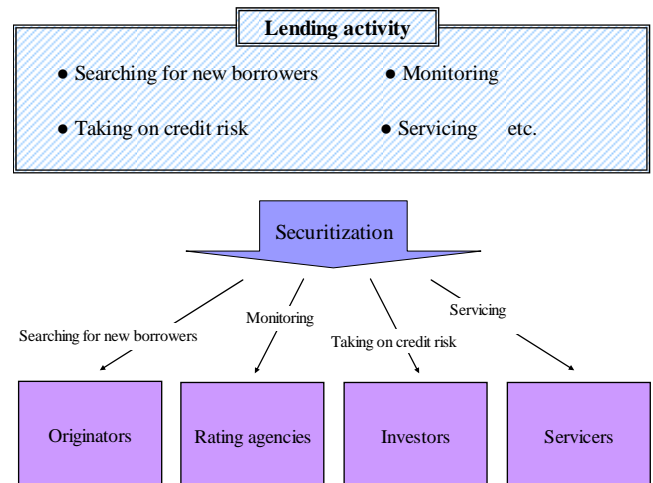


Chart 79: Financial Services Offered over the Internet and Mobile Phones: Examples

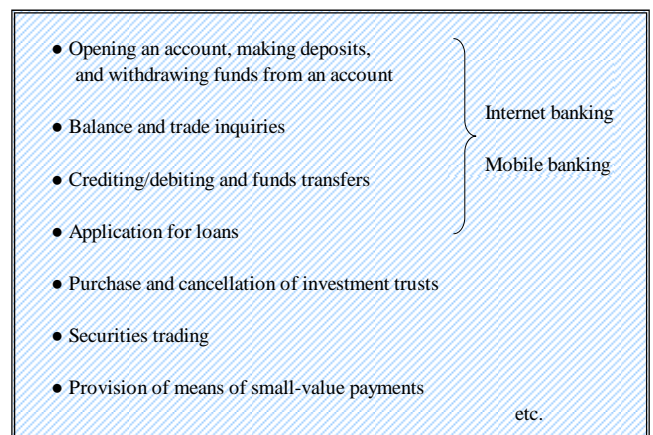
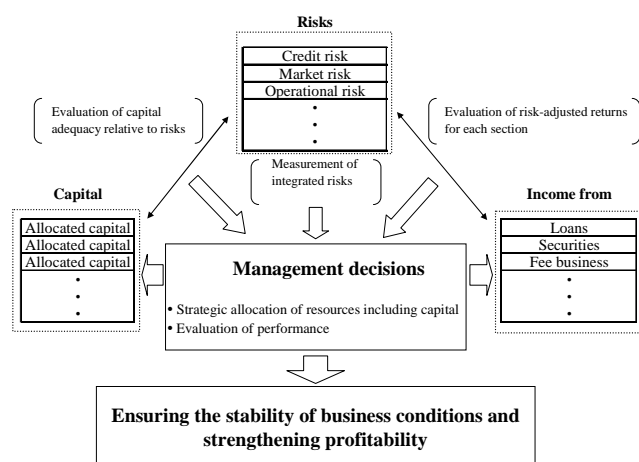


Chart 80: Integrated Risk Management Framework



strategically. The fact that financial institutions have regained the capacity to take risks provides a good basis for efforts in this direction.

## B. Further Enhancement of Risk Management

Providing advanced financial services and expanding the frontiers of business also expose financial institutions to new and complicated risks. Obviously, it is therefore important for individual financial institutions to enhance their risk management in order to maintain the stability and efficient functioning of the financial system. In addition, risk management is one of the core functions of the banking industry. Therefore, enhanced risk management by financial institutions is a prerequisite for increasing the value-added of services and ensuring a profitable environment.

In order to enhance risk management in practice, it is useful for each financial institution to develop a so-called *integrated risk management* framework. Under this framework, a set of risks, such as credit risk, market risk, and operational risk, are unified and managed in order to help review capital adequacy, evaluate risk-adjusted returns for each section, and judge the efficiency of the allocation of capital (Chart 80).

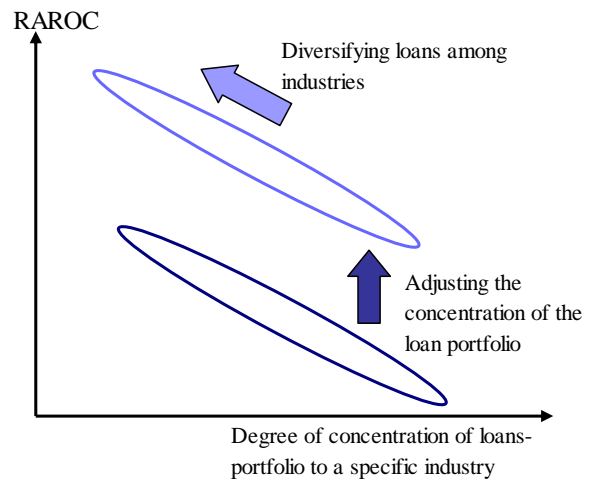
The major banks have, in large part, incorporated this framework, while the regional banks have been catching up steadily. However, there remain considerable challenges for banks in the application of this framework, for example with regard to the risk-adjusted pricing of lending rates and the efficient allocation of capital across sections. Banks are expected to continue to make efforts to construct a more sophisticated framework and adopt it efficiently in their management processes.

The focus of credit risk management has been evolving due to the fact that the Japanese financial system has almost overcome the NPL problem. For example, financial institutions need to appropriately manage risks generated by the concentration of borrowers' types in terms of industry type or geographical location. Risk management from a *through-the-cycle* perspective is also important. That is, financial institutions must always be prepared for a sudden emergence of a large credit cost and/or the deterioration of a large portion of their credit portfolio due to the positive correlation in the credit quality of loans during a recession. For this reason, it is important to adjust credit exposures that may lead to a large increase in unexpected loss (UL) or that are biased toward specific industries or regions.

*Active Credit Portfolio Management (ACPM)* can be an effective framework in order to make progress in this respect. In this framework, financial institutions control credit exposure for each loan, taking into account the risk of incurring a large UL and/or the correlation with other loans in the portfolio. An analysis of the empirical relationship between the degree of concentration of a bank's loan portfolio and its risk-adjusted return on capital (RAROC) shows that a high degree of concentration of loans to a specific industry or firm tends to result in low risk-adjusted returns on the loan portfolio (Chart 81; see Box 7 for details). This result suggests that reducing the concentration of credit exposure through ACPM may help to improve banks' risk-adjusted returns.

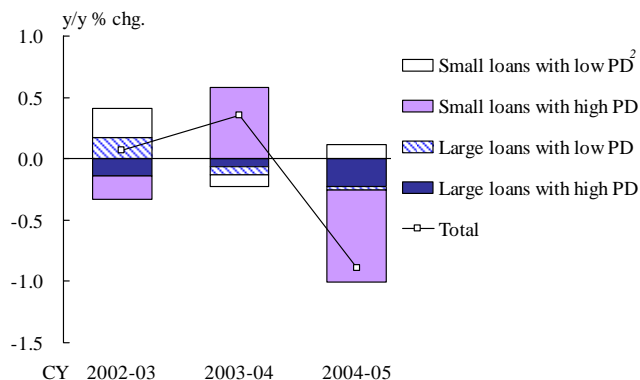
In applying ACPM, banks need to measure the risk of their loan portfolios in a quantitative manner. State-of-the-art techniques make it possible to break down the sources of expected loss (EL) and UL for individual loans, and changes in EL and UL into changes in the default rate or the amount of loans. Using this

Chart 81: Degree of Concentration of Loan Portfolio and RAROC<sup>1</sup>



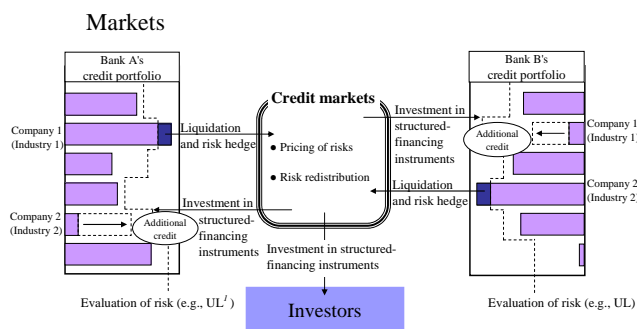
Note: 1. RAROC stands for risk-adjusted return on capital. See Box 7 for details.

Chart 82: Contributions to Changes in the Ratio of Maximum Losses to Total Credit Exposure: A Simulated Credit Portfolio<sup>1</sup>



Notes: 1. See Box 8 for details.  
2. PD stands for probability of default.

Chart 83: Active Credit Portfolio Management and Credit



Note: 1. UL stands for unexpected loss.

technique, it is even possible to break down changes in the maximum loss of a credit portfolio (i.e., EL plus UL) into certain categories of banks' loan portfolios, such as large or small loans and/or loans with a high or low probability of default (PD). In addition, it is possible to break down changes in the maximum loss of a credit portfolio into changes in the amount of loans and/or into changes in the PD (Chart 82; see Box 8 for details). These methods may work as effective tools for the risk-adjusted pricing of lending rates and the efficient allocation of capital based on a recognition of the potential risk associated with individual loans.

One of the key environmental elements for the diffusion of ACPM is the development of credit-related markets, such as markets for liquidated and securitized loans, as well as the development of the syndicated loan market mentioned in the previous section (Chart 83). Credit-related markets function as a tool for banks to manage their credit portfolios effectively, act as a marketplace for the smooth intermediation of funds and the efficient transfer of risk, and provide asset management opportunities to investors. Furthermore, improvements in banks' ability to appropriately manage concentration in credit portfolios and evaluate risks will stimulate the development of credit-related markets. In other words, progress in banks' ACPM and the development of credit-related markets are expected to mutually reinforce each other in broadening channels of credit supply and enhancing the functioning of the financial system as a whole.

So far, the application of ACPM remains a future task for most banks, although some major banks have gradually started to introduce it. Again, ACPM may contribute to improving the risk-adjusted returns of individual financial institutions as well as increasing

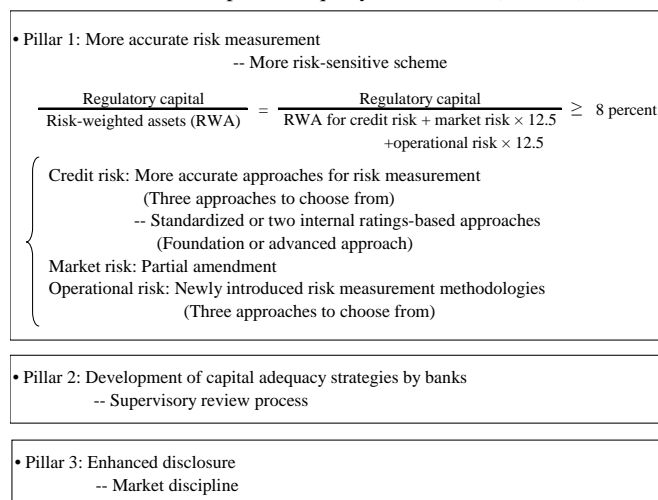
efficiency in risk-sharing among various economic agents. Each financial institution is expected to upgrade its risk-measuring techniques and organizational structure for evaluating risk in terms of its entire credit portfolio.

### C. Establishing Corporate Governance and Internal Controls, and Information Disclosure

As discussed above, risks surrounding financial institutions, such as credit risk and interest rate risk, are becoming more complex. In order to manage and respond to this set of diversified risks, financial institutions are increasingly required to not only introduce the integrated risk management mentioned above, but also establish frameworks for corporate governance and internal controls. Ensuring that financial institutions face incentives to control their risks is a very important task to maintain the stability of the financial system.

In addition, as information disclosure by financial institutions has accelerated and financial markets have deepened, market participants have become more vigilant in assessing and monitoring financial institutions' management. Recent regulatory and supervisory practices place emphasis on maintaining the stability of the financial system and the health of individual financial institutions through a feedback process between market participants and financial institutions. That is, financial institutions disclose information, for example, on their framework for risk/business management, including the structure of corporate governance and internal controls, and market participants use this information to assess the risks faced by the financial institution. This concept is also reflected in the new capital adequacy framework, commonly known as Basel II, which is to be

Chart 84: The New Capital Adequacy Framework (Basel II)





implemented in Japan at the end of March 2007 (Chart 84).

Under these circumstances, it is important for each financial institution to actively disclose information regarding the economic value and risk associated with its assets, including loans, regarding its own capital which acts as a buffer for taking risks, and regarding its governance and internal controls, in order to gain credibility in the markets. Active disclosure and advanced internal controls will improve financial institutions' standing in financial markets. Thus, effective feedback between markets and financial institutions -- that is, markets' positive assessment of financial institutions and the better discipline of financial institutions' management resulting from the monitoring by markets -- will help to enhance the stability and functioning of the Japanese financial system.

#### **D. Conclusion**

As discussed above, the Japanese financial system has been regaining stability, and its robustness against various shocks, including a potential downturn in business conditions and a rise in interest rates, has been increasing.

Meanwhile, the environment surrounding the Japanese financial system has been evolving, and the recovery in the risk-taking capacity of the banking sector has stimulated various changes in banks' behavior.

These changes in general will further enhance the functioning of the Japanese financial system. They will also contribute to the sound development of the Japanese economy by encouraging efficient risk redistribution among economic agents. So far, the capital buffer accumulated by the banking system is

expected to be sufficient to absorb risks associated with these changes in banks' behavior. Therefore, there seems to be little possibility of a systemic problem occurring in the financial system in the near future.

At the same time, given the evolution of the environment surrounding the financial system, it is becoming increasingly important for financial institutions to actively manage risks, taking into account uncertainties regarding firms' business performance, market interest rates, and asset prices. In this context, each financial institution needs to identify the economic value of its assets and overall transactions, as well as their potential volatility, and control risks by enhancing its risk management framework. Financial institutions' efforts to enhance risk management not only add to financial institutions' stability but also help to maintain the necessary conditions for introducing creative business operations that meet the needs for diversified financial services. Consequently, these efforts should have great significance in ensuring the stability and improving the functioning of the financial system.

### Box 7: The Effect of Active Credit Portfolio Management

Banks traditionally hold loan assets until they reach maturity. From the 1990s onward, major banks, especially those from the United States, began to change their business models to optimize the risk-return profile of their loan portfolios by actively substituting loan assets and hedging credit risks. This activity is called Active Credit Portfolio Management (ACPM). Against this background, several large Japanese banks also began considering the adoption of ACPM.

ACPM is assumed to improve risk-adjusted returns by reducing the concentration of loans to specific industries or firms. In Japan, the major banks have been burdened by bad loans resulting from the financial problems of a number of large companies. One possible way to tackle this problem is to sell some part of the large loan volume to specific firms and/or hedge their credit risk by use of credit default swaps (CDS) in advance. Moreover, a diversification of loans across industries can help to mitigate the effect of idiosyncratic shocks in particular industries on loan portfolios.

In this box, we investigate whether ACPM can improve banks' performance using data on the major and the regional banks (121 samples, fiscal 2001 to fiscal 2004). We conduct a panel data regression using the following estimation equation (see Note 1)

$$RAROC_{i,t} = c + \alpha RAM_{i,t} + \beta Cost_{i,t} + \gamma ICON_{i,t} + \theta FCON_{i,t} + \varepsilon_{i,t}$$

where subscript  $i$  denotes an individual bank,  $RAROC$  stands for the risk-adjusted rate of return based on pretax profits. In concrete, it is defined as ROE divided by the standard deviation of ROE (see Note 2).  $RAM$  and  $Cost$  are the interest margin on loans minus credit costs and the ratio of administrative expenses to total assets, respectively.  $ICON$  is an index expressing the degree of loan concentration on specific industries and takes a large value when loan concentration on specific industries is larger than the average for the banking sector as a whole (see Note 3).  $FCON$  represents the degree of loan concentration on specific firms.  $FCON$  is the ratio of loan volume given to the top 0.1 percent firms against the total loan volume, and thus a large value illustrates a high concentration of loans to specific firms. The expected signs of the regression coefficients are as follows:  $\alpha$  is expected to be positive,  $\beta$  negative, and  $\gamma$  and  $\theta$  negative, since a low concentration on specific industries and firms raises risk-adjusted returns. In the estimation results, all parameters have the expected sign and are significant. This suggests the possibility that ACPM should improve Japanese banks' performance by decreasing loan concentration on specific industries and firms.

Chart for Box 7: Estimation Result

$c$	2.96 ( 5.22)***
$\alpha$	62.16 (10.98)***
$\beta$	- 92.36 ( 2.97)***
$\gamma$	- 1.62 ( 2.79)***
$\theta$	- 0.04 ( 2.96)***
Adj-R <sup>2</sup>	0.30

Note: Figures in parentheses are  $t$ -statistics.  
\*\*\* Significant at the 1 percent level.

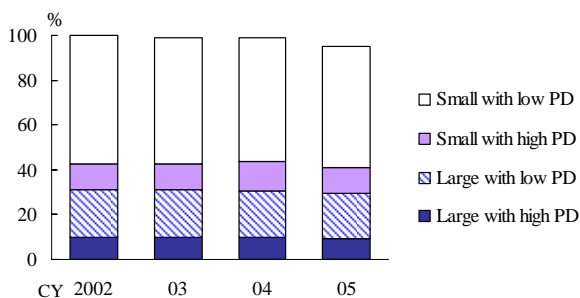
- Notes: 1. Note that we use a random effects model in the estimation. We also calculated the degree of loan concentration in specific regions using the formula for  $ICON$  and then estimated the relationship between  $ICON$  and  $RAROC$ . However, the estimation result was not significant.
2. The standard deviation is calculated based on data for the past five years.
3.  $ICON$  is calculated by  $\sum_j |s_{i,j} - s_j|$ , where  $j$  denotes the industry (33 industries),  $s_{i,j}$  is the ratio of the loan volume to industry  $j$  by bank  $i$  to its total loan volume, and  $s_j$  expresses the ratio of the loan volume to industry  $j$  by all banks to their total loan volume. Note that ideally we should use the optimal ratio maximizing  $RAROC$  as  $s_j$ . However, since the optimal ratio is unknown, we use  $s_j$  defined above.

## Box 8: Factor Analysis of EL and UL Developments

Credit risk management using econometric models takes three elementary risk factors for individual exposure into account: probability of default (PD), exposure at default (EAD), and loss given default (LGD). The potential loss for a loan portfolio is estimated based on a probability distribution and the key properties of the distribution are described by the expected loss,  $EL = PD \times EAD \times LGD$ , and the unexpected loss, UL. The latter is defined as the difference between EL and the maximum loss under a given stress scenario with a very low probability. A concept that has come into wide use in risk management is that provisions of the same amount as EL are required to cover expected credit costs and UL should be covered by risk capital, in other words, a certain amount of capital must be set aside to cover the credit risk corresponding to UL.

While the estimation of EL and UL using simulation methods is common, in order to understand how these risk measures fluctuate it is necessary to identify the factors driving trends in these variables. We conduct such a decomposition analysis for EL and UL for a hypothetical loan portfolio relying on analytical approximation rather than simulation methods to estimate UL. The analytical approximation makes it possible to break down the causes for UL movements in a portfolio into the contribution of individual loans in the portfolio (see Note 1). We classify loans according to whether they are large or small and whether they have a high or low PD, yielding four loan categories to compare driving factors for EL and UL in those categories.

Chart 1 for Box 8: Loans Outstanding (2002 = 100)



The hypothetical portfolio, designed to imitate developments in credit risk faced by the regional banks and credit unions, was constructed using Credit Risk Database (CRD), which collects financial data and other information on SMEs throughout Japan. Loans outstanding and PD estimated by CRD models are used for the analysis (see Note 2). We have data on 340,000 firms for the years 2002 to 2005 and classify as firms with "large loans outstanding" firms that fall into the top 1 percent of firms in terms of loans outstanding. This group

accounted for 31 percent of total loans outstanding in 2002, and we fix the member of this group for the remaining years. We also classify firms into those with a PD of more than 3.5 percent and those with less. The high PD group accounts for 10 percent of the total number of firms. All firms are categorized into one of the four groups according to the size of their loans outstanding and their PD. LGD is set to 100 percent for all firms. The distribution of loans by group is shown in Chart 1 for Box 8.

EL increased until 2004 despite the economic recovery, suggesting that the EL of the portfolio of loans to SMEs lagged behind the business cycle (Chart 2-1 for Box 8). The decline in EL observed in 2005 mainly resulted from a reduction in loans outstanding to the small size/high PD group and a decline in the PD for the large size/high PD group (charts 2-1 and 2-2 for Box 8). The effect of the economic recovery on loans outstanding differs for the group of firms representing large loans outstanding and those representing small loans outstanding even when the PD category is the same. The decline in UL in 2005 is also chiefly due to a reduction in loans outstanding to the small size/high PD group (charts 3-1 and 3-2 for Box 8).

It is frequently pointed out that the decline in the EL and UL of loan portfolios that include large corporations was caused by the disposal of loans made to large struggling corporations as a solution to the NPL problem. The recent increase in the reversal of loan-loss provisions partly results from the decline in the PD for those corporations. The analysis also shows that portfolios of SME loans also saw an improvement in EL and UL for the same reason. Since these results imply that EL and UL may rise in a recession, banks' strategies with respect to current lending rates need to take not only the current but also the

future PD into account. Otherwise, banks need to consider the feasibility of raising rates.

Chart 2-1 for Box 8: Decomposition of Change in EL

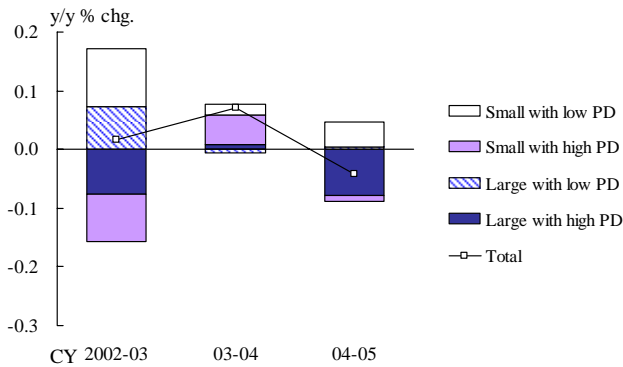


Chart 2-2 for Box 8: Contributions of Changes in Loans Outstanding

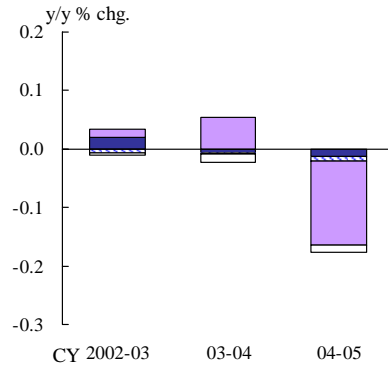


Chart 3-1 for Box 8: Decomposition of Change in UL

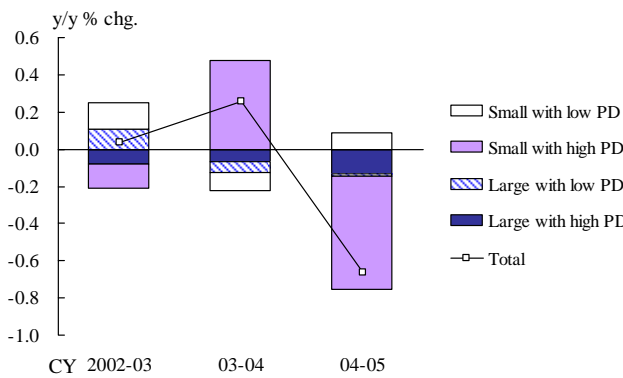
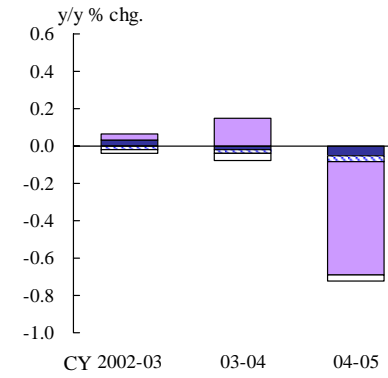


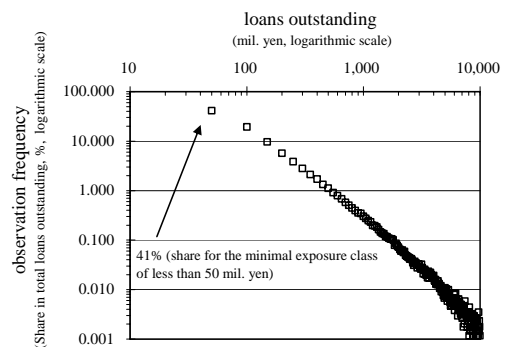
Chart 3-2 for Box 8: Contributions of Changes in Loans Outstanding



Notes: 1. The one factor Merton model is used to calculate the credit risk of the portfolio through analytical approximation. The risk decomposition of the maximum loss and UL into individual borrowers' contribution is based on the partial differentiation of the analytical formula with respect to individual exposures. Factor decomposition of developments in the maximum loss and UL is derived from total differentiation of the analytical approximation for the maximum loss and UL with respect to PD and EAD. The confidence level for the maximum loss is set to 99 percent, and the correlation coefficient of the Merton model is set to 0.1 for all firms. For details on the methodology used for the analytical approximation and factor decomposition, see (1) Yoshitaka Ando, "Analytical Methodology for Calculating Risk in Credit Exposure," Bank of Japan, *Kinyu Kenkyu*, Vol. 24 No. 1, July 2005, in Japanese, <http://www.imes.boj.or.jp/japanese/kinyu/fkinyu05.html>, and (2) Hideaki Higo, "Analytical Approximation of UL Decomposition in an Individual Firm's Contribution and Its Application for Loan Portfolio Management," Bank of Japan, the Centre for Advanced Financial Technology (CAFT), presentation material for the CAFT seminar, July 2006, in Japanese (<http://www.boj.or.jp/theme/finsys/center/index.htm>).

2. Due to data limitations, the 2005 sample also includes firms whose financial year ends in the 2005 calendar year. Since about half of the sample consists of firms whose financial year ends in March, figures for fiscal 2004 are also included in the 2005 sample. The large number of observations means that our hypothetical portfolio is more diversified than the typical actual portfolio of the regional banks and UL in our calculations may therefore be smaller than in reality. The distribution of the size of loans outstanding shows a high concentration in loans to very small firms, such that firms with loans outstanding of less than 50 million yen account for a 41 percent share of total loans outstanding, while firms with loans outstanding of 50 million to 100 million yen make up 19 percent. However, there are also large loans of several dozen billion yen, and as a whole, the distribution seems to follow the power law distribution with a very long fat tail (see Chart 4 for Box 8). The actual distribution of banks' individual loans by size roughly follows this distribution, independent of bank size, implying that controlling the risk of concentration of loans to large firms is a challenge not only for large banks but also for small banks. This means that banks may face severe problems if a few large firms default, although the probability of this occurring is low.

Chart 4 for Box 8: Power Law Distribution of Size of Loans Outstanding



## Measures Taken by the Bank of Japan for Financial System Stability

On March 18, 2005, the Bank released a paper entitled "The Bank of Japan's Measures regarding the Financial System after the Full Removal of Blanket Guarantee of Deposits (hereafter, "Measures regarding the Financial System")." In this paper, the Bank clarified its basic stance regarding financial system policy, specifying that it will shift its focus from crisis management to supporting private-sector initiatives aimed at providing more efficient and advanced financial services via fair competition, while maintaining overall system stability.

The following is a summary of the measures taken by the Bank since the release of the *Financial System Report* in August 2005.

- The Bank continued to ensure that it had an accurate grasp of the performance of financial institutions through its on-site examinations and off-site monitoring, so as to be ready to act as the lender of last resort. The Bank also focused on encouraging financial institutions' efforts to improve their management of risks and business activities and to develop innovative services tailored to customer needs.

- The Bank put into full operation the Center for Advanced Financial Technology, newly established in the Financial Systems and Bank Examination Department (created by merging the Financial Systems Department and the Bank Examination and Surveillance Department in July 2005). Various seminars were organized by the Center for Advanced Financial Technology.

- The Bank began exchanging financial data with financial institutions using eXtensible Business Reporting Language (XBRL).

- The Bank reviewed the procedures for selecting current account holders with a view to clarifying the eligibility criteria.

- The Bank terminated the measure to extend special loans to Ashikaga Bank, thus concluding the last remaining case of such special loans.

## **A. Supporting Private-Sector Initiatives toward Developing Advanced Financial Technology**

### **1. Establishing the Center for Advanced Financial Technology and hosting open seminars**

As described in the previous year's *Financial System Report*, the Bank established the Center for Advanced Financial Technology within the Financial Systems and Bank Examination Department (created by merging the Financial Systems Department and the Bank Examination and Surveillance Department) on July 8, 2005.

Specific activities of the center include (1) researching and developing advanced risk management techniques and publishing the findings, (2) organizing seminars targeting mainly businesspeople including managers at financial institutions, and (3) organizing training programs for the staff of the Financial Systems and Bank Examination Department and of the Bank's branches. Of these activities, holding seminars provides an opportunity for the Bank to share with financial institutions its viewpoints on the issues that need to be addressed in supporting financial institutions' efforts to improve financial services as well as its viewpoints on possible solutions. They are also seen as a third channel through which the Bank can communicate with financial institutions, in addition to on-site examinations and off-site monitoring.

Materials and papers produced by the center are available at the following URL.

<http://www.boj.or.jp/en/theme/finsys/center/index.htm>

Since its establishment in July 2005, the center has held a total of 28 seminars (as of June 2006).

The seminars are categorized into three types: (1) large-scale open seminars held in Tokyo, targeting all financial institutions that hold current accounts at the Bank; (2) small-scale sectoral seminars held at the Head Office of the Bank; and (3) sectoral seminars held at the Bank's branches targeting regional financial institutions that hold current accounts at the Bank.

Topics of discussion at the large-scale open seminars included "Enhancing the Risk Control and Business Management of Financial Institutions," "Development of an Advanced Financial Information Exchange Network," and "Toward the Advancement of Information Security at Financial Institutions."

At the sectoral seminars held at the Head Office and branches, various topics on risk management, including integrated risk management, were addressed.

### **2. Publication of papers to enhance risk management by financial institutions**

In July 2005, the Financial Systems and Bank Examination Department released three papers that address viewpoints and methods of risk management at financial institutions ("Advancing Credit Risk Management through Internal Rating Systems," "Advancing Operational Risk Management," and "Advancing Integrated Risk Management").

The department also released a summary of discussions at the study group on how to enhance credit risk management (the group comprises practitioners with expertise in risk management) in addition to other technical papers addressing individual risk management issues.

### **3. Exchanging financial data with financial institutions using XBRL**

The Bank implemented XBRL for financial data reporting from February 2006.

The Bank had been working on the development of a new data transfer scheme based upon the XBRL, in order to improve the efficiency with which financial data are exchanged with financial institutions. As soon as the system was installed and ready to be activated, the Bank began gathering monthly balance-sheet data using XBRL.

The Bank will support the improvement of the financial data exchange network by expanding the range of data collected through XBRL.

## **B. On-Site Examinations**

### **1. Number of financial institutions examined**

In fiscal 2005, the Bank conducted on-site examinations at a total of 160 financial institutions: 42 domestically licensed Japanese banks, 73 *shinkin* banks, and 45 other institutions including securities companies and Japanese branches of foreign banks.

### **2. On-site examination policy for fiscal 2006**

In on-site examinations for fiscal 2006, the Bank, as described in the "Measures regarding the Financial System," focuses on encouraging financial institutions' efforts to improve their management of risks and business activities and to develop innovative services tailored to customer needs, thereby contributing to the enhancement of the functioning and robustness of the overall financial system.

It is all the more important for financial institutions to manage risks and business activities with an emphasis on the future outlook, taking into consideration various uncertainties related to, for example, business performance in the corporate sector, market interest rates, and asset prices. The Bank will hold in-depth discussions with each financial institution regarding management issues in these areas, and support its efforts toward finding appropriate solutions.

Specifically, the Bank will conduct its on-site examinations based on the "On-Site Examination Policy for Fiscal 2006" (endorsed by the Policy Board on April 7, 2006), with the following five core elements (see Box 9 for details).

- (1) Assessing the economic value and risk associated with assets and financial transactions

- (2) Developing and utilizing integrated risk management
- (3) Active credit portfolio management
- (4) Ensuring smooth settlement and business continuity
- (5) Establishing internal controls

The Bank will continue to give due consideration to easing the burden of on-site examinations on financial institutions. Specifically, based on the "On-Site Examination Policy for Fiscal 2006," the Bank will further shift the focus of its on-site examinations from the assessment of individual assets to that of their risk management framework. Along with this shift, the Bank will reduce the number of sample observations extracted from financial institutions' overall loan portfolios, based on the condition of their risk management. In addition, the Bank will take a more flexible approach to decide the scope and duration of on-site examinations, and the size of examination teams, depending on the financial and business conditions at each financial institution.

## **C. The Bank's Current Account Services and Lending Facilities**

### **1. Basic policy regarding provision of current account services**

In pursuing its objective of "ensuring smooth settlement of funds among banks and other financial institutions, thereby contributing to the maintenance of an orderly financial system" as prescribed in Article 1, Paragraph 2 of the Bank of Japan Law, the Bank provides current account services to financial institutions which satisfy certain criteria set by the Bank, for example, such financial institutions must play a major role in payments.

The Bank selects current account holders from financial institutions applying for current account services. In selecting current account holders, the Bank bases its decision on whether providing the services to the applicant financial institution will contribute to achieving the Bank's above objective.

The Bank selects current account holders based on the "Criteria for Parties Eligible to Hold Current Accounts with the Bank and That Have Access to the Bank's Lending." However, there are cases where the Bank, if it is determined appropriate by the Policy Board, provides those that do not fulfill the criteria with current account services.

### **2. New current account holders**

From April 2005 to June 2006, the Bank began the provision of current account services to seven institutions. As of the end of June 2006, the total number of current account holders was 584.



### **3. Amendments to the eligibility criteria for current account holders**

On January 12, 2006, the Bank amended the "Criteria for Parties Eligible to Hold Current Accounts with the Bank and That Have Access to the Bank's Lending" to clarify the treatment of Japanese branches of foreign securities companies with offices locally incorporated in Japan.

On May 23, 2006, the Bank again amended and implemented the criteria, as the new corporate law became effective in May.

### **4. Review of the Bank's lending facilities**

On October 3, 2005, the Bank announced, with immediate effect, the implementation of a measure whereby a financial institution would be notified of the Bank's intent to terminate a contract for the complementary lending facility prior to termination. The measure aims to encourage financial institutions' efforts to restore their capital adequacy ratios when they fall below the required standard.

The Bank's complementary lending facility (Lombard-type lending) is a standby lending facility through which the Bank extends loans, in the form of electronic lending, at the requests of counterparties approved as eligible by the Bank in advance, provided that the amount of such loans shall not exceed the value of collateral submitted by the counterparty.

Before the new measure was implemented, when a financial institution's capital adequacy ratio fell below the required standard, the Bank immediately terminated the contract enabling it to use the complementary lending facility.

Instead, the new measure permits the Bank to issue notification to a financial institution prior to terminating the contract if there is a prospect that its capital adequacy ratio will regain the required standard within six months. With this measure, the Bank aims to encourage financial institutions' efforts to restore their capital adequacy ratios (see Box 10 for details).

### **D. Termination of the Measure to Extend Special Loans to Ashikaga Bank**

On November 29, 2005, the Bank terminated the measure to extend special loans to Ashikaga Bank.

On November 29, 2003, the Bank decided to provide liquidity to Ashikaga Bank, as the Prime Minister decided that it was necessary to take measures to temporarily nationalize Ashikaga Bank pursuant to Article 102, Paragraph 1, Item 3 of the Deposit Insurance Law.

However, the Bank found that ultimately the funding of Ashikaga Bank was quite stable and thus decided to terminate the above measure. During this period, the Bank did not extend special loans, as Ashikaga Bank was able to raise the necessary funds on its own.

Since the termination of the above measure, no measure concerning special loans has been taken as of the end of June 2006 (see Box 11 for the four principles underlying the Bank's extension of special loans).

## Box 9: Outline of the Bank's Policy on On-Site Examinations for Fiscal 2006

### **A. Core Elements of the Bank's Policy on On-Site Examinations**

The Bank will focus on encouraging financial institutions' efforts to improve their management of risks and business activities and to develop innovative services tailored to customer needs, thereby contributing to the enhancement of the functioning and robustness of the overall financial system.

Given the recent changes in the economic and financial situation, it is all the more important for financial institutions to manage risks and business activities with an emphasis on the future outlook, taking into consideration various uncertainties related to, for example, business performance in the corporate sector, market interest rates, and asset prices.

#### **1. Assessing the economic value and risk associated with assets and financial transactions**

- As for loan assets, the Bank will broadly apply the approach based on the discounted cash flow (DCF) method and work to develop a common understanding with financial institutions regarding the assessed economic value and risk involved in assets including new types of loans such as syndicated loans and real estate non-recourse loans. With respect to credit pools of small loans, such as mortgages, the Bank will examine the extent to which financial institutions have developed systems for managing the associated risks on a collective basis.
- The Bank will also evaluate risks involved in credit portfolio concentration as well as the effects of the business cycle on associated risks. It will then discuss methods for controlling credit risk and setting lending rates, based on the quantification and analysis of risks.
- The Bank will utilize pricing models to assess the economic value of assets held by financial institutions for which market prices are not available, for example, structured bonds, privately placed real estate funds, and hedge funds.

#### **2. Developing and utilizing integrated risk management**

- The Bank will encourage financial institutions to develop and utilize an integrated risk management framework, taking their specific financial and business conditions into consideration.
- Considering the possibility of future interest rate fluctuations, it is becoming increasingly important for financial institutions to appropriately control interest rate risk within an integrated risk management framework, and to engage in asset-liability management (ALM) so as to control the interest rate risk associated with banking account transactions such as deposits and loans.

#### **3. Active credit portfolio management**

- The Bank will support financial institutions' efforts toward active credit portfolio management through measures including active reshuffling of their assets, and will also hold in-depth discussions with them on necessary measures, such as reviewing legal frameworks and business practices.

#### **4. Ensuring smooth settlement and business continuity**

- Taking into consideration the probable change in the financial environment after the termination of the quantitative easing policy, the Bank will identify risks inherent in the overall payment and settlement system and also carefully examine financial institutions' liquidity management, with a view to preventing the materialization of systemic risk.
- The Bank intends to hold in-depth discussions on establishing effective business continuity arrangements for emergencies, namely, natural disasters and terrorist attacks.

#### **5. Establishing internal controls**

- The Bank will support financial institutions' efforts to establish internal control systems by giving due consideration to their specific financial and business conditions. The Bank will identify risks associated with financial institutions' management and operations, examine the functioning of control activities such as the separation of power and responsibility as well as internal authorization procedures, and discuss the effectiveness of monitoring activities such as internal audits.

### **B. Practical Issues Relating to On-Site Examinations**

The Bank will continue to give due consideration to easing the burden of on-site examinations on financial institutions. Specifically, the Bank will further shift the focus of its on-site examinations from the assessment of individual assets to that of their risk management framework.

- Along with this shift, the Bank will reduce the number of sample observations extracted from financial institutions' overall loan portfolios based on the condition of their risk management.

The Bank intends to make greater use of the online data exchange system so as to exchange the data used in its on-site examinations and off-site monitoring more efficiently and safely.

- The Bank will make greater use of the online data exchange system and expand the range of data collected through XBRL.

## Box 10: Outline of the Measure regarding Notification Before Terminating Contracts for the Complementary Lending Facility

The Bank issues a notification to financial institutions eligible for the use of the Bank's complementary lending facility whose capital adequacy ratios fall below the required standard, as stated in (1) to (3) below, but are expected to recover within the next six months. This notification serves as a warning prior to terminating the contract for the lending facility. However, if the Bank determines that their capital ratios remain unlikely to recover and achieve the required standard, the measure allows the Bank to immediately terminate the contract.

- (1) Financial institutions subject to international standard: 8 percent
- (2) Financial institutions subject to domestic standard: 4 percent
- (3) Securities companies, securities finance companies, and money market brokers: 200 percent

After the notification is issued, the following steps are taken.

- (1) If the Bank determines that the financial institutions have achieved the required capital adequacy ratios within six months, the Bank withdraws the notification (in this case, the contract for the complementary lending facility is maintained).
- (2) If the Bank determines that the financial institutions have no possibility of achieving the required capital adequacy ratios within six months, the Bank immediately terminates the contract for the complementary lending facility.
- (3) If the Bank determines that the financial institutions have failed to achieve the required ratios within six months, the Bank terminates the contract for the complementary lending facility after the six months have passed.

In the case that capital adequacy ratios of financial institutions fall below the following standards, the Bank immediately terminates the contract, regardless of the above conditions.

- (1) Financial institutions subject to international standard: 2 percent
- (2) Financial institutions subject to domestic standard: 1 percent
- (3) Securities companies, securities finance companies, and money market brokers: 100 percent

### Box 11: Four Principles Underlying the Bank's Extension of Special Loans

The Bank extends loans pursuant to Article 38 of the Bank of Japan Law (so called “special loans”) to maintain the financial system stability based on the following four principles.

Principle 1. There must be a strong likelihood that systemic risk will materialize.

Principle 2. There must be no alternative to the provision of central bank money.

Principle 3. All relevant parties are required to take clear responsibility to avoid moral hazard.

Principle 4. The financial soundness of the Bank itself must not be impaired.