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Insights into the Low Profitability of Japanese Banks:
Some Lessons from the Analysis of Trends in Banks' Margins

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Insights into the Low Profitability of Japanese Banks: Some Lessons from the Analysis of Trends in Banks' Margins [1]

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[1] Views expressed in this paper are the authors' and do not necessarily reflect those of the Bank of Japan or the Bank Examination and Surveillance Department.

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Abstract

1. Developments in overall margins of Japanese banks have shown no major change during the last twenty years: a slight contraction in the early 1980s, followed by a discrete expansion during the bubble period, have only served to highlight their extreme stability. Meanwhile, net overall margins after considering loan-losses have been negative since fiscal 1993 as overall margins failed to respond to soaring loan-losses.

2. By dividing overall margins into the lending spread and the fund-raising spread, we find that the fund-raising spread contracted considerably from the 1980s to the 1990s while the lending spread expanded considerably during the same period. The change in fund-raising spread is attributable to two factors: a decline in so-called "rent" owing to deregulation of deposit interest rates since the middle of the 1980s and a fall in market interest rates to close to zero. Meanwhile, the change in lending spread is partly attributable to a rising consciousness of credit risk among banks since the early 1990s. The expansion of lending spread, however, has only offset the contraction of fund-raising spread and stopped short of covering loan losses, suggesting that banks regarded soaring credit costs since the early 1990s as temporary losses to be covered by capital, not as current losses to be covered by overall margins.

3. The pricing behavior of Japanese banks is closely related to relationship banking, or their behavioral features that greatly count the middle or long-term relationship with borrowers. The main characteristics of this relationship banking are that: (1) it reduces agency costs; (2) it smooths the impact on borrowers of the business cycle; (3) a real estate collateral is extensively utilized; and (4) programs of action are occasionally worked out to resolve the problems of financially troubled borrowers. These characteristics are thought to have held down both the level and fluctuation of overall margins for a long time in Japan.

4. The external environment that had supported relationship banking, however, has changed dramatically since the late 1980s. The changes include a significant decline in the cost of production of information on credit risk due to the financial deregulation and innovation in information technology, an increase in uncertainty about the business cycle, a constant decline in land prices, and an increasing difficulty in restraining moral hazard through the traditional regulation system. Thus Japanese banks' behavioral features, which once worked quite efficiently, have been gradually losing their basis in reality and banks' delayed responses to the above changes have led to today's low profitability.

5. In order to improve the profitability of Japanese banks, therefore, they first need to reassess their risk-taking and associated return on assets, explicitly considering the above -mentioned changes in business environment. Then, they need to cut drastically those assets whose risk is not manageable or cannot be justified by the returns and at the same time expand the range of risk they can manage. In

other words, banks should (1) improve profitability by pricing loans consciously to cover the increased risk due to the changes in the business environment and by restructuring their balance sheets; (2) expand their playable market, which has been contracting due to the decrease in the production costs of information on credit risk and the increase in the average level of risk, by improving their information producing function (i.e. screening and monitoring of credit risk); and (3) improve their corporate governance by increasing their exposure to market discipline and thereby increase the effectiveness of (1) and (2) above.

6. It is also necessary to adapt Japan's financial system to the new environment so as to make it easier for banks to improve their profitability. Specific measures to be considered include (1) a reduction of the presence of public financial institutions; (2) easing of the "over-banking" situation; (3) improvement of corporate governance structure and of the system to restrain moral hazard; and (4) institutional support to smooth the reallocation of managerial resources.

1. Introduction

Japanese banks have been disposing of non-performing loans equal to, or exceeding, their operating profits and consequently posting negative overall margins[3] after realized credit costs in recent years are taken into account. There is no question that this situation has been mainly caused by a rapid increase in both the amount and disposal of non-performing loans after the collapse of bubble economy. Ways out of this plight, however, cannot be seen as long as the relationship between the low profitability of banks and several factors such as macroeconomic developments or behavioral features of Japanese banks are not identified. For example, even if Japanese banks were able to finish disposing the current non-performing loans, we might see the same problem recur if those non-performing loans derived from behavioral features of Japanese banks and these features themselves remained unchanged.

In this paper, we focus on overall margins on lending and deposit-taking operations of Japanese banks, and first analyze developments in overall margins and their determinant factors using econometric methods. Based on the results, we then consider the relationship between banks' pricing behavior and some external or institutional factors such as macroeconomic developments, Japanese banks' behavioral features, namely "relationship-banking", and the deregulation of the financial system. Finally, we discuss managerial tasks for banks and institutional tasks for the authorities to undertake to improve the profitability of Japanese banks.

2. Developments in and Determinant Factors of Overall margins of Japanese Banks

A. Developments in Overall margins

Developments in overall margins of Japanese banks[4] have shown no major change during the last twenty years: a slight contraction in the early 1980s, followed by a discrete expansion during the bubble period, have only served to highlight their extreme stability. Meanwhile, the level of overall margins of Japanese banks is consistently far lower than that of U.S. and European banks. As realized credit costs began to rise in fiscal 1993, the level of overall margins after taking into account realized credit costs[5] and general and administrative expenses, which is an indicator of ex-post profitability of loans, has been negative since that year. This means that net profits arising from loan operations have not been able to cover credit costs on an ex-post basis[6] (Chart 1).

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[3] In this paper, overall margins are defined as yields on domestic loans minus yields on average interest-bearing domestic liabilities after an adjustment for swap expenses and thus they are not exactly the same as overall margins on lending and deposit-taking operations as ordinarily defined. Also, overall margins in this paper are calculated based on the stock base rather than the flow base though the latter is more appropriate than the former to analyze bank's behavior. It is mainly due to the lack of availability of stock-base data, but we confirmed that there is no large difference between the trends of flow-base and stock-base numbers (Chart for footnote 3).

[4] Unless otherwise noted, "Japanese banks" refers to All Banks excluding bankrupt banks.

[5] In this paper, "realized credit costs" are defined as the ratio of disposal of non-performing loans to total loan outstanding. Therefore, they are different from "credit costs", which are equal to expected losses.

[6] Realized credit costs include materialization of both expected losses and unexpected losses. Therefore, when realized credit costs exceed overall margins, this does not necessarily mean that overall margins do not cover expected losses on an ex-ante basis. However, since the average of unexpected losses should be zero over time, the average realized credit costs need to be covered by overall margins.

The stability of overall margins can be seen as a natural outcome of Japanese banks' pricing behavior to some extent. During most of the 1980s, overall margins were almost fixed as both lending rates and deposit rates were linked to the official discount rates and the deregulation of interest rates progressed only gradually in the latter half of the decade. Overall margins were kept stable in the early 1990s, too, as a new short-term prime lending rate that includes a certain margin over average funding costs was introduced in line with the deregulation of deposit interest rates. Since then, however, there has been no institutional framework that would lead to formation of fixed margins, as (1) the so-called "individual spread method[7]" became widely used among banks; and (2) amid the surge in non-performing loans, banks began to pay more attention to additional spreads that correspond to each borrower's credit costs.

Whether banks set prices based on overall margins or on their components, that is, lending and fund-raising spreads separately, depends on the banking style adopted and also the external environment business banking business[8]. For instance, Japanese banks based their prices only on overall margins in the 1980s as the deregulation of deposit interest rates had only partially begun and also the complementarity between loan and fund-raising businesses was thought to be high owing to the dominant role of the branch network in those businesses. On the other hand, in the 1990s, their pricing is likely to concern more strongly lending and fund-raising spreads separately given the progress of financial deregulation, and an expansion and diversification of the financial market.

Therefore, we first divide overall margins into lending and fund-raising spreads in order to assess quantitatively the changes in banks' pricing behavior from the 1980s to the 1990s. The lending spread that should be charged to borrowers can be defined as the price for the reduction in agency cost and thereby offering a lower rate than the rate which borrowers have to pay otherwise. This is because banks produce information on credit risk through monitoring of borrowers and thereby reduce the agency cost caused by the asymmetry of information between banks and borrowers. The fund-raising spread that should be charged to depositors and creditors can be defined as the price for the payment and investment services they provide. In order to estimate the above-mentioned spreads, we need to deduct from them the effect of maturity gap, which should come under the operations of taking interest risk, not under the services mentioned above. Such a deduction based on the data, however, is difficult due to the lack of maturity gap data and therefore we estimate this effect and resulting lending and fund-raising spreads using econometric methods (for details, see Box).

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[7] After the financial deregulation started, an increasing number of banks changed the mechanism for setting their internal reference rates that allocate profits between headquarters and branches in a way that reflects maturity of assets and liabilities. Under this mechanism, overall margins are divided into three parts; lending spreads which are defined as the difference between lending rate and reference rate of a loan's average maturity, deposit spreads which are defined as the difference between deposit rate and reference rate of a deposit's average maturity, and the effect of maturity gap. Under this mechanism, since the effect of maturity gap can be transferred to the headquarters, branches no longer have to consider the impact of interest rate fluctuation on their profits (Chart for footnote 7).

[8] See ECB[2000]. And for details, see Freixas, Rochet[1997].

Box. Methods of Estimating Lending and Fund-raising Spreads

We use the following regression model to estimate the lending and fund-raising spreads.

(1) Three sample periods, 1982-1999, 1982-1989, and 1990-1999 (semi-annual basis) are examined assuming that the effects of the collapse of the bubble economy and financial deregulation can be highlighted by comparing the outcomes for the 1980s and the 1990s.

(2) We use two explained variables; quasi-lending and quasi-fund-raising spreads, which are obtained by simply dividing overall margins into two parts using a short-term interest rate (3-month CD rate[9]) as a reference rate.

(3) We use two explanatory variables; long and short-term interest rate spreads (5-year bank debenture yield minus 3-month CD rate) and short-term interest rate (a residual of the regression of short-term interest rate by long and short-term interest rate spreads). Then, we use SUR (Seemingly Unrelated Regression)[10] for a set of two equations (i.e. quasi-lending and quasi-fund-raising spread equations).

(4) From the estimation results, we see the estimated constants in two equations represent lending and fund-raising spreads since they are a part of margin that is independent of fluctuations of long and short-term interest rate spreads and short-term interest rates.

We use long and short-term interest rate spreads as an explanatory variable because these spreads can be a proxy variable for the effects of banks' taking interest rate risk on their overall margins so long as banks' maturity structure during the sample period is stable and the shape of the yield curve is linear. The validity of this assumption can be confirmed by the stability of the variables' parameters. We also use the short-term interest rate as another explanatory variable since interest spreads on loans and deposits, of which bearing interest rates are insensitive to market interest rates, such as non-performing loans and demand deposits, are strongly affected by the level of market interest rates.

Finally, we use the SUR model because there seem to be common shocks with opposite directions acting on both lending and fund-raising spreads given the stable developments in overall margins, which are close to the sum of the two spreads.

B. Results and Their Interpretation

The estimation results (Chart 2) are as follows;

(1) All explanatory variables are statistically significant with a 1% confidence level and the signs of all variables' parameters are consistent with our assumptions[11].

[9] Average interest rates on certificates of deposits (new issues, 90 days – 179days, domestically licensed banks).

[10] SUR is an information efficient estimation method in the case that there is a correlation between residuals in two or more regression equations. For details, see Greene[1997].

[11] Given that the average maturity of loans and liabilities of banks is more than three months and that quasi-lending and fund-raising spreads are obtained using 3-month CD rates as reference rates, the signs of parameters were assumed to be as follows; the parameter "c", in Chart 2, of long and short-term interest rate spreads variable in the lending spread equation is positive, the parameter "g" of the long and short-term interest rate spreads variable in the fund-raising spread equation is negative, the parameter "b" of the short-term interest rate variable in the lending spread equation is negative, and the parameter "f" of the short-term interest rate variable in the fund-raising spread equation is positive.

(2) The sum of the constants in two equations, which are supposed to be overall margins excluding the effects of long and short-term interest rate spreads, stayed at almost the same level during the 1980s and the 1990s (1.8 percent) and also stayed very close to the pre-adjusted overall margins during this period (1.7 percent to 2.3 percent).
(3) The lending spread increases from 0.1 percent in the 1980s to 0.9 percent in the 1990s. While, the fund-raising spread decreases from 1.6 percent in the 1980s to 0.9 percent in the 1990s. Thus the composition of overall margins has changed significantly.
(4) Sensitivities to long and short-term interest rate spreads of quasi-lending spreads increase slightly from 0.55 in the 1980s to 0.78 in the 1990s, and those of quasi-fund-raising spreads increase significantly from –0.25 to –0.91.
(5) Sensitivities to short-term interest rates of quasi-lending spreads decrease from 0.32 in the 1980s to 0.14 in the 1990s, and those of quasi-fund-raising spreads decrease from 0.45 to 0.15.

Since the model used is too simple to account for many other possibly important factors, its results should be interpreted with some reservations. Nevertheless, (1) and (2) above indicate that the estimated changes in lending and fund-raising spreads are likely to capture their real trends quiet reasonably.

The significant decrease in fund-raising spreads from the 1980s to the 1990s is mainly due to (1) the gradual progress of deregulation of deposit interest rates[12] and (2) a decline in market interest rates to near zero level. With regard to (1), the proportion of deposits with regulated interest rates to total deposits had declined significantly since the end of 1980s (Chart 3), consequently squeezing rents, which banks had enjoyed under the regulation regime. Regarding (2), stable spreads on demand deposits, particularly on the core amount that is insensitive to interest rate changes due to its settlement purpose, have contracted significantly due to a convergence of market interest rates to zero. With some assumptions, we estimate that the spreads on core demand deposits have contracted from an average 0.8 percent in the 1980s to 0.1 percent recently (the average in the 1990s is 0.4 percent), indicating that the decline due to this factor has reached about 0.7 percent (Chart 4).

The environment surrounding lending spreads changed dramatically from the 1980s to the 1990s, too. For instance, while globalization of the financial market and the expansion of the capital market tended to cause lending spreads to contract, the increase in credit risk due to the collapse of the bubble economy and consequent increasing consciousness of credit risk among banks tended to cause them to expand. The results of the estimation indicate that lending spreads have expanded significantly from the 1980s to the 1990s and thus implies that the effect of the two latter factors was bigger than that of the former two though a too low level of lending spreads during the 1980s may have caused an upward biased correction in the following period.

Banks' efforts to expand lending spreads are well evidenced in the developments in spreads on short-term prime lending rates, a good indicator of Japanese banks' pricing behavior. Although

[12] After the introduction of certificates of deposit in 1979, the deregulation of deposit interest rates progressed gradually and market-rate-linked products like MMC and bilaterally-negotiated-rate products like large-amount

banks were somewhat less aggressive in expanding the spreads due to their concerns about possible negative effects on lending volume just after the introduction in January 1989 of a new short-term prime lending rate[13] linked to market interest rates, the spreads have expanded steadily since the early 1990s (Chart 5)[14]. Given the stable movements of overall margins as previously mentioned, however, the expansion of lending spreads is likely to have been motivated by their policy of covering the decrease in fund-raising spreads rather by the increase in credit costs. In fact, we cannot find any signs of interaction between overall margins, realized credit costs and expense ratios[15], with the only exception that both overall margins and expense ratios decreased in the 1980s (Chart 1).

Finally, the increase in sensitivity of quasi-fund-raising and quasi-lending spreads to long and short-term interest rate spreads seems to be due to a lengthening of the maturity of both deposits (Chart 6)[16] and loans from the 1980s to the 1990s. For example, the ratio of short-term loans to total loans declined sharply from the middle of 1980s to the early 1990s (Chart 7).

C. Comparison with U.S. and European Banks

Developments in overall margins and realized credit costs of U.S. banks (Chart 1) contrast with those of Japanese banks in the following points; (1) overall margins of U.S. banks are far higher than those of Japanese banks, and (2) overall margins of U.S. banks expanded significantly in the early 1990s in line with the increase in credit costs in the late 1980s. In fact, it is often said that U.S. banks expanded their overall margins as a result of (1) their increasing consciousness of the relation between risk and return after experiencing the massive loan-losses of high risk loans such as real estate loans and LBO in the 1980s, the introduction of capital adequacy requirements, an improvement in credit risk management and the expansion of the junk-bond market[17]; (2) their efforts to expand loans with large margins, such as credit card loans. By contrast, overall margins of Japanese banks have so far showed no sign of expansion in spite of the large increase in realized credit costs in the late 1990s.

According to ECB [2000], overall margins of German banks and French banks are from 3 to

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time deposits were introduced only in 1985.

[13] The new short-term prime lending rate was introduced in 1989 in order to secure stable overall margins under the deregulation of deposit interest rates and thus replaced the former short-term prime lending rate which was linked to the official discount rate. In addition, the new long-term prime lending rate was introduced in 1991 and the rate was set with a certain margin corresponding to maturity length.

[14] Spreads on long-term prime lending rates also recovered to the level seen in the 1980s, or a range of 1.5 percent to 2.0 percent in 1993 from negative in the early 1990s.

[15] In this paper, “expense ratio” is defined as “general and administrative expense / average annual balance of interest-bearing assets” arising from overall domestic operations since sector-based operation expense data are not available. This ratio tends to be higher than the actual figures as the above expenses are not limited to those arising from loan operations.

[16] For instance, the volume of time deposits with less than 2 years’ maturity had increased by 40 percent from 1990 to 1993 when interest rates were still kept high. In addition, banks began to deal with small MMCs with a term of 2 years and 3 years in 1989 thanks to the easing of the authorities’ policy of separating short-term and long-term financing institutions.

[17] According to FRB[1989-1996], U.S. banks’ increasingly cautious stance on lending, in other words the credit crunch, and the introduction of capital adequacy regulation motivated U.S. banks to expand lending spreads and to reduce risk-adjusted assets in the early 1990s when interest rates declined. In addition, it is said that banks tried to keep high overall margins by delaying an increase in deposit interest rates after 1994 when interest rates began to rise.

4 percent (the average of EU banks[18] is about 4 percent), all the more highlighting the extremely low level of overall margins of Japanese banks.

D. Insensitive Overall Margins to Credit Costs: Its Possible Reasons

As previously mentioned, Japanese banks have been using the so-called "individual spread method" since the early 1990s and thus can now set different margins independently for loans and deposits, and for funds with different maturity using different reference rates. Moreover, Japanese banks have seen dramatic changes in their business conditions, including significant changes in credit risk, demand and supply conditions of loans and deposits, competitive conditions, and cost structures. Given all these changes, it is quite surprising that Japanese banks have kept not only the same pricing behavior focusing on the level of overall margins but also a constant level of margins for the last 20 years, with the result that the expansion of lending spreads had covered only the contraction of fund-raising spreads even after the late 1990s when realized credit costs increased rapidly. Why is this so? The following are possible explanations for these banks' behavior;

(1) Japanese banks regarded the large increase in credit costs as a "temporary" or "extraordinary" phenomenon mainly due to their past wrong assessment of credit risk and a one-off significant decline in land prices. With this judgement, Japanese banks might think there was no need to change their pricing behavior, or the way in which they set overall margins, which was assumed to cover "ordinary" costs.

(2) Japanese banks once had huge latent capital gains on their holdings of stocks, realization of which was a sufficient buffer against these "extraordinary" losses.

(3) Even if Japanese banks thought of some increase in credit costs as "ordinary" losses, it would have been quite difficult for them to expand lending margins unilaterally given their preferences for a long-term relationship with customers and particularly in the "over-banking" situation[19].

All these judgments of Japanese banks are deeply rooted in their behavioral features or so-called "relationship banking" and thus we focus on this issue in the next section[20].

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[18] These margins are calculated based on the flow numbers. ECB [2000] found that lending spreads have been contracting due to increasing competition with new entrants since 1997, while deposit spreads have been expanding and thereby keeping overall margins unchanged.

[19] Besides, there is also a possibility that Japanese banks have been adjusting credit risk through the "volume" of lending rather than its "price". In fact, the loan growth rate turned to negative after credit costs rose and surpassed lending spreads (Chart 13). From the theoretical point of view, given that banks cannot have a perfect grasp of the credit risk of all borrowers (asymmetry of information), banks may not respond to an increase in demand for funds by offering higher prices (so-called credit rationing), fearing a situation where only low-rated borrowers accept the new condition (so-called adverse selection). It is quite possible that changes in the environment around Japanese banks such as the deregulation and the deterioration in banks' capacity to assess credit risk due to their excessive dependence on real estate collateral (as described later) intensified "the credit rationing" through a rise in the degree of asymmetry of information or adverse selection.

[20] Other than these factors, the tax system concerning provision may have discouraged banks from putting aside an adequate amount of loan provision, which then should be reflected in overall margins. However, even if the tax system had affected banks' provisioning, it would not necessarily have impeded banks from expanding overall margins so long as they had correctly recognized the size of ordinary losses.

3. Changes in External Environment that supported "Relationship Banking" and their Effects on Japanese Banks

It has been said that Japanese banks' behavior is typical of "relationship banking", in which business profitability is evaluated based on long-term relations with customers. This type of banks is contrasted with "transaction banking", which regards the profitability of each transaction as important. In this section, we focus on the features of "relationship banking" and the environment that supported it, then examine how they relate to the movements of overall margins. Then, we examine how the environment has changed, leading to a deterioration in overall margins after realized credit costs have been taken into account.

A. Japanese Banks' Behavioral Features

The main features of the "relationship banking" of Japanese banks, often also called the " main bank system" are as follows (Chart 8);

(1) Reduction of Agency Cost (Production of information on Credit Risk)

Given the asymmetry of information between lenders and borrowers, lenders have difficulties in evaluating the creditworthiness of borrowers and thus there is cost (agency cost) instead on the alleviation of the problems arising from this asymmetry by, for example, monitoring borrowers' credit conditions. Banks are in a position to be able to collect information concerning borrowers' cash flow through demand deposits and other managerial conditions particularly in cases where banks have established a long-term relationship with borrowers. In other words, this banking function can be interpreted as producing information on credit costs of borrowers, or the information that is required by funds providers.

(2) Smoothing of Business Cycle Impacts

The credit risk of borrowers usually fluctuates with the phases of the business cycle, and under transaction banking this credit risk cycle leads to an increase in credit spread during the recession phase. Under relationship banking, which values the middle or long-term relationship with borrowers, however, banks naturally have incentives to smooth the impact of its fluctuations on them and thereby fortify their viability given that a bank's sunk costs in establishing a relationship with a borrower can no longer be recovered if the borrower defaults. To put it another way, banks absorb the credit risk of borrowers over the business cycle against the background of their capabilities of time diversification and adequate buffer[21].

(3) Occasional Arrangement of a Work-out Program for Financially Troubled Borrowers (Pro-active Monitoring Function)

[21] For instance, see Ikeo[1987].

Active production of information on borrower credit risk lays the ground for banks to be occasionally involved in an informal work-out program for their borrowers when they run into financial trouble. This is because low liquidity in capital and low mobility in labor markets in Japan make the cost of a formal work-out program extremely expensive[22].

(4) Extensive Utilization of Real Estate Collateral and Latent Capital Gains on Stocks

In the situation where land prices had been rising constantly, real estate collateral could reduce the credit risk of borrowers considerably and consequently support and promote Japanese banks' functions (1)-(3) above[23]. Also, cross-shareholdings with borrowers, a symbol of the long-term relationship with customers, had created huge latent capital gains as their stocks had been held for decades, which subsequently supported these functions (1)-(3), too, as a buffer against extraordinary losses.

These features of relationship banking certainly affected the banks' process of setting overall margins. In other words, both (1) and (2) prompt banks to set "fixed" overall margins as a way of maximizing business profitability over the medium or long-term, and (3) smooths the way realized credit costs are reflected in overall margins. At the same time, the types of banking behavior strengthen banks' tendency to regard profit fluctuations due to changes in credit costs as "temporary" or "extraordinary" ones and thus to be absorbed by latent capital gains on stocks thanks to (4) rather than by overall margins. Meanwhile, (1) and (4) contributed to the "low" overall margins, which were remarkable when compared to those of U.S. and European banks before the 1990s.

B. The External Environment supporting "Relationship Banking" and Changes in that Environment

We can point out several aspects of the external environment which helped relationship banking to work efficiently after the World War II. First, the costs of producing information on credit risks was prohibitive enough to justify banks' producing internal information through relationship banking. Secondly, Japan's business cycle was relatively stable. Thirdly, real estate prices were rising constantly, reflecting a strong expectation of future economic growth. Fourthly, arrangement by banks of work-out programs for financially troubled firms have often been the optimal strategy to minimize loss of firms' good will value given that banks had the ability to coordinate stake holders' interests in these programs and illiquid capital and immobile labor markets. Finally, there was an institutional and

[22] For instance, see Hoshi,Kashyap,Scharfstein[1990].

[23] For instance, Uemura, Sato [2000] pointed out that land prices in Japan have been changing from being sensitive to macrofactors and thus increasing or decreasing in a similar manner regardless of local factors, to being more sensitive to local factors. A resemble interpretation is that the formation of land prices until the 1980s was strongly influenced by high expectation of economic growth, rather than microfactors. In this sense, we can say that the reduction of credit risk through real estate collateral was a form of macroeconomy- wide risk sharing, which is possible only in a rapidly growing economy.

regulatory setup to support relationship banking[24].

However, these conditions have changed profoundly since the late 1980s, as will now be explained (Chart 9).

(1) Significant Decline in the Cost of Producing Information on Credit Risk

The cost of producing credit risk information has declined significantly as a result of the expansion of the capital market thanks to the financial deregulation and the innovation in information technology[25]. Accordingly, large and top-rated firms became able to raise funds advantageously and easily through the domestic and overseas capital markets, leading to "adverse selection", in other words only good firms leaving banks given a certain level of lending rates. This process immediately prompted banks to increase lending to high risk sectors such as small firms, non-banks, and real estate agencies (Chart 10).

(2) Increase in the Uncertainty of Business Cycle

There is no doubt that the excessive expectation of future economic growth played a major role in causing the excessive lending and subsequent financial bubble during the late 1980s. To be fair, however, the decline in potential economic growth rates after the collapse of bubble economy and the following business cycle instability that, for example, Okumura [2000] pointed out (Chart 11), were difficult to predict not only for banks but also for the government or even economists in the private sector. This unexpected and continuous worsening of the economy led to a deterioration in banks' loan portfolios and this deterioration was further intensified by the banks' behavioral feature of smoothing the impact of the phases of the business cycle on borrowers.

(3) Constant Decline in Land Prices and Stock Prices

Real estate was a quite effective form of collateral when land prices were steadily rising against the background of a high expectation of long-term economic growth. In a sense, real estate collateral can be seen a means to reduce credit risk significantly by using the expected grains of future economic growth in advance. When the continuously growing economy suddenly faces a historical turnaround, however, all these positive effects have been wound up, thereby causing a continuous decline in land prices and reducing significantly the effectiveness of collateral as a means of alleviating credit risk.

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[24] For instance, the comprehensive risk sharing structure of the Japanese safety net (Shimizu,Horiuchi[1997]), the so-called "convoy system" or "Hougachou (donation list) system", played a major role complementing functions (1) – (3) above, as well as real estate collateral and latent capital gains on stocks.

[25] With regard to the relation between information technology and banking services (particularly loan operations), see Uchida,Otani,Kawamoto [2000]. In this paper, they said that; (1) traditional banking services in the U.S. have declined due to an improvement of information processing capability and decreasing cost of information transmission though securitization, and derivatives transactions of banks have increased, (2) banks' advantage in their information production on credit risk is likely to be eroded once the credit risk assessment using the credit scoring model develops, or if a similar type of borrowers' information derived from the cash flow through demand deposits becomes available, (3) the small banks' share of banks services might fall if large banks offer

What is worse, it is thought that Japanese banks' ability to assess credit risk of borrowers deteriorated during the bubble period as a result of excessive dependence on real estate collateral. In fact, the ratio of loans secured by real estate to total loans rose rapidly from about 20 percent to 30 percent in the late 1980s (Chart 12). Thus, the decline in land prices produced a situation where the deterioration of banks' ability to assess credit risk led directly to an increase in loan-losses and falling profitability.

Chart 13 shows the relation between the estimated bankruptcy rates in Japan and banks' realized credit costs. As stated before, the reason realized credit costs were lower than bankruptcy rates until the early 1990s was mainly the contribution of real estate collateral. As real estate collateral lost much of its effectiveness and also the adverse selection impaired banks' loan portfolios related to the macroeconomy, however, realized credit costs first caught up with bankruptcy rates and then overtook them toward the middle of the 1990s.

Meanwhile, the latent capital gains of stocks had been working as a buffer against loan-losses until the late 1990s notwithstanding the decline in stock prices after the debacle of the financial bubble, and thus discouraged banks from setting lending interest rates in such a manner as to cover the increasing credit costs.

(4) Decline in Active Monitoring Capability of Main Banks

The rapid growth of loans during the bubble period is often cited as a reason for the deterioration in banks' active monitoring capability such as arrangement of the work-out programs for borrowers in financial trouble, as well as the capability to assess credit risk[26]. For example, the ratio of loans to firms belonging to the same "Keiretsu" to total loans had steadily declined during the 1980s (Chart 14), indicating that banks could collect less information on borrowers' credit risk and enforce less discipline in their restructuring. This likely contributed to the contraction of overall margins after taking realized credit costs into account as well as the deterioration in credit risk assessment capability.

(5) Difficulty in Restraining Moral Hazard through the Traditional Regulation System

Japan had long maintained the comprehensive risk-sharing structure (so called "convoy system", or "Hougachou (donation list) system") that covers almost all financial institutions with an unwritten rule of loss-sharing being biased toward large or profitable banks. This system as well as the effect of real estate collateral had likely weakened the banks' consciousness of credit cost and risk. Before the 1980s, various regulations on interest rates, opening branches, and lending volume had discouraged banks from taking excessive risks and thus struck a balance with the risk-sharing structure. Declines in costs of managing interest rate risk or of producing information on credit risk caused by innovation and financial deregulation, however, made the traditional regulations obsolete and

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lower loan rates, which are attractive enough to pay the costs of altering their main banks.

[26] For instance, see Okumura [2000].

ineffective, only leaving the unbalanced risk-sharing structure which easily tolerates moral hazard[27]. Unfortunately, the authorities' and the Bank of Japan's insufficient understanding of those environmental changes only accelerated this trend.

With the changes in external environment as mentioned above, Japanese banks' behavioral features, which once worked quite efficiently in a particular environment, have been gradually losing their basis in reality and the delayed responses to this change by Japanese banks have led to their present low profitability.

4. Managerial Tasks for Banks

The above analysis indicates that the current low profitability of Japanese banks is to some extent due outcome of inevitable macroeconomic phenomena, such as the increasing uncertainty of the business cycle accompanying the dramatic fall in growth rate, the long decline in land prices, and financial deregulation. Even after considering these phenomena, however, banks of course cannot be exempted from blame for their belated response to these changes in the business environment, in other words, the banks' behavior of continuing to set overall margins far below the level needed to cover the increasing credit costs.

Therefore, the most important tasks for Japanese banks are, besides improving efficiency by reducing expenses, to reassess their risk taking and associated return on assets, explicitly taking the changes in the environment fully into account. Then, they need to cut drastically those assets whose risk is not manageable or cannot be justified by the returns and at the same time expand the range of risk they can manage. Those tasks are equivalent to changing the Japanese banks' managerial style from the traditional relationship banking to banking that puts more emphasis on an adequate balance between risk and return using objective and convincing tools of risk management[28].

Specifically, banks should: (1) improve profitability by pricing loans consciously to cover the increased risk due to the changes in the business environment and by restructuring their balance sheets; (2) expand their playable market, which has been contracting due to the decrease in the production costs of information on credit risk and the increase in the average level of risk, by improving their information producing function (i.e. screening and monitoring of credit risk); and (3) improve their corporate governance by increasing their exposure to market discipline and thereby

[27] There is still a question to what extent the banks took risks "intentionally"' during the bubble era. In this connection, Shiratuka,Shimizu [2000] imply that banks took risks intentionally to some extent since the estimated credit risk amount, based on rational consequence of the macroeconomy, was well above the appropriate level.

[28] This does not necessarily mean that Japanese banking style should be transformed into Anglo-Saxon-style "transaction banking" or a financial system that is strongly oriented toward direct financing. For instance, relationship banking is still effective in the market for medium or small sized firms, since the information asymmetry is large enough to justify it. Sudden introduction of the Anglo-Saxon type of banking, therefore, might be extremely destructive in this market. After all, the new banking style that we require is not more or not less the one to deal with the risk that is manageable and should be managed in terms of return even under the

increase the effectiveness of (1) and (2) above.

A. Adequate Loan Pricing and Restructuring of Balance Sheets

Major banks are now in the process of introducing the firm-wide risk management system[29], which allocates risk capital to each business unit and measures each unit's performance based on the risk-adjusted profits, or profits after taking the costs of risk capital into account. Although there are still several difficulties in putting these concepts into practice, at least banks should: (1) price loans based on credit risk, (2) manage credit risk explicitly taking into account the risk of land price fluctuation, (3) increase transferability of loans and thereby enable flexible credit risk management.

First, with regard to loan pricing based on credit risk, as described in Bank of Japan [2001b], it seems that credit costs of low-rated firms are much higher than the current overall margins. In addition, there in no sign in the recent developments in variance of lending rates or in lending rates by industry (Chart 15) that banks' efforts to set lending rates based on credit costs have succeeded as yet. Hence it is important for banks to either secure overall margins that are high enough to cover the estimated credit risks, or remove the unprofitable loans from their balance sheet as soon as possible[30].

It is very likely that the efforts to change long-standing business practices with borrowers will cause much friction. Indeed, banks are to some extent right to be afraid that unilateral introduction of lending rates based on credit risk may only end up destroying their long-nurtured relationship with customers. In this case, banks prefer to spend some time gaining the understanding of customers in order to maximize long run profits. Moreover, given the illiquid capital and immobile labor markets and the fact that the institutional infrastructure is not adequate to support smooth corporate restructuring, a rush to enforce final disposals of non-performing loans will not always lead to the best solution.

The changes in the environment around banks, however, have definitely heightened the requiring cut-off rate to allow for the business with currently unprofitable borrowers with the expectation of future profits. Accordingly, banks are required to make accountable decisions to continue seemingly unprofitable business with customers, for instance, by disclosing basis of their decision to continue, which must be acceptable to investors and stockholders.

Next, with regard to credit risk management considering fluctuation of land prices, the ratio of loans secured by real estate to total loans is still high (Chart 12), showing that the tendency to depend on real estate collateral for managing credit risk persisted. However, the risk represented by the recovery rate of delinquent loans after disposing of real estate collateral has increased significantly due to the constant decline in land prices. For instance, the estimated risk volume, that is, "Value at Risk"[31], of land prices, after land price trends are taken into account, indicates that the maximum

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new environment.

[29] For details, see the Bank Examination and Surveillance Department, the Bank of Japan [2001a].

[30] In this connection, see the Bank Examination and Surveillance Department, the Bank of Japan [2001c].

[31] Value at Risk or VaR means the stochastic maximum loss under a certain condition. In this estimate, we use 3 years for the holding period because it usually takes this amount of time to finally dispose of land collateral after recognizing a borrower's default.

decline (with a confidence level of 99 percent) of land prices for the coming 3 years (holding period) changed from -8 percent in the 1980s to -21 percent in the 1990s for "all areas", and from -28 percent to -71 percent in the Tokyo area (Chart 16). The figures clearly illustrate that banks need to assess the risk of land price fluctuation and also the correlation between credit risk and land price risk, particularly when land prices have been declining constantly, as is the case.

Finally, banks need to replace traditional loans with more easily transferable ones given the increase in credit risk arising from long-term commitment to loans under the present situation where there is increasing uncertainty in the business cycle and a deterioration in banks' monitoring capability. Specifically, banks need to accelerate the current movement toward issuing structured security backed by loan collateral, arranging syndicated loans, and expanding the loan trading market. They also need to extend these initiatives, which are currently limited to large firms, to small and medium-sized firms[32].

Meanwhile, the fund-raising spread, which is estimated to have been 0.9 percent in the 1990s, is also likely to be insufficient to cover the cost of offering deposit services, considering those of U.S. banks and European banks are around 2 percent. As stated before, this low level is mainly attributable to the current near zero level of interest rates in the market, which leaves no room for deposit rates to go below them. In this connection, even if the market interest rate is zero, it is quite natural for banks to charge an appropriate level of fees (for instance, account maintenance charges) to cover the costs of providing deposit services[33].

B. Enhancement of Capability of Producing Information on Credit Risk

As previously mentioned, while the financial deregulation has led to a contraction in banks' playable loan market vis-a-vis large firms, economic stagnation and the malfunctioning of real estate collateral have led to a contraction of banks' playable market vis-à-vis small and medium-sized firms, too, owing to the level of their credit risk rising beyond what the banks can manage. Under these circumstances, adequate loan pricing and restructuring of balance sheets will surely improve profitability but in most cases only at the expense of further contraction of banks' playable markets. The contraction of markets for banks, if left untouched, can lead to further deterioration in the current over-banking situation and intensify excessive competition, possibly wrecking any improvement in profitability in the end. Therefore, banks need not only to improve profitability but also to expand their playable markets while taking into account the time required for addressing the current over-banking situation.

For example, banks need to expand financial intermediary services for small and medium-

[32] In this connection, see Adachi, Ohsawa [2000].

[33] Japanese banks often insist that under the current transfer pricing mechanism which allocates profits between headquarters and branches (see footnote 7), keeping the current base of deposits even with unprofitable interest rates is important as these deposits are expected to contribute to profits once interest rates start to rise. Even in this case, however, it is necessary to recognize the increase in risk arising from this fixed position with quasi-long maturity mainly due to changes in the business environment such as the increasing uncertainty of the business cycle.

sized firms including venture business and individuals, areas where information asymmetry tends to be high, through the enhancement of their capability to produce information on credit risk. Recently, major banks have been trying to expand these markets through alliances with non-banks and consulting firms or by transferring part of the risk to investors using loan securitization. In order for all these efforts not to end up with marginal ones only to complement their traditional businesses, it is very important for banks to place the right staff in the right places for this purpose, using an appropriate organization style and incentive scheme.

C. Enhancement of Banks' Corporate Governance through Market Discipline

One of the reasons that banks have not responded to the changes in the business environment quickly enough, or have implemented the above mentioned measures only slowly in spite of their understanding of their own needs, can be found in the weak corporate governance structure, and also in the characteristics of the employment system such as lifetime employment. For instance, given the cross-shareholding among large firms and the lifetime employment system, it is extremely difficult for third parties (e.g. non-cross-holding shareholders) to be involved in management issues, particularly where banks need drastic changes that will affect strongly both managers and employees. As a result, banks have been less motivated to respond promptly to the changes in the business environment however big they were[3435]. In this respect, banks' behavior contrasts with that of other industries, which have recently introduced foreign capital and subsequently been forced to improve profitability by drastically changing long-standing business and employment practices[36].

Though it is not realistic to expect rapid change in the corporate governance structure, this should not be an excuse for delaying the reinforcement of the corporate governance mechanism through market discipline by way of aggressive disclosure policy or disentangling of cross-shareholdings. For instance, banks should have a sense of the costs arising from insufficient disclosure. In other words, banks should brace themselves for an increase in fund raising costs or a decline in their stock prices when they disclose insufficient information and thus create more uncertainty over their performance[37]. Furthermore, banks should limit their holding of stocks to a level, which, from the

[34] There seems to be a so-called "institutional complementarity" between the cross-shareholdings and lifetime employment system on the one hand, and Japanese relationship banking on the other, which came into being in order to maximize future growth rates under a stable environment (for details, see Osano [1996]). This issue is beyond the area examined in this paper, but, if we accept this argument, the transformation of the Japanese banking style would also need a radical change for the current policy of banks of keeping friendly shareholders in a majority, and in their employment policy.

[35] In this connection, the risk inherent in the seniority-oriented promotion or lifetime employment system is quite similar to the risk inherent in loans or cross-shareholdings under relationship banking. For instance, the lifetime employment system can be interpreted as a system for retaining intangible assets, namely employees, for the more than 30 years from graduation from university to retirement. In this case, the risk is unexpected changes in the net values of their skills, which seems to be relatively small tempered with the sunk costs of supporting their skill accumulation during the period of stable economic growth. From the 1990s when the potential growth rate dropped dramatically and the uncertainty of the business cycle increased, however, this risk has significantly increased. Banks might therefore need to increase the transferability of human resources for the same reasons as are argued in the context of loans and cross-holding stocks.

[36] For instance, see Takahashi, Oyama [2000].

[37] Banks sometimes show their skepticism regarding the market's ability to absorb disclosed information

perspective of their risk and return, is rational and convincing enough to gain the understanding of market participants.

5. Institutional Tasks for the Authorities

In order to improve the banks' profitability smoothly, in addition to each bank's efforts as stated before, the financial system and infrastructure of Japan should also be adapted to the new environment. Specifically, we should consider the following four issues; reduction of the presence of public financial institutions, easing the "over-banking" situation, improvement of the corporate governance structure and of the system to prevent moral hazard, and support for smooth reallocation of managerial resources.

A. Reduction of the Presence of Public Financial Institutions

In addition to ensuring a smooth supply of funds during the high growth era, public financial institutions have played an important role in the area where the private sector could not cover all the needs, such as a supply of additional long-term fixed-rate loans, and loans to small firms which tend to suffer from credit rationing, and also in alleviating the monopolistic behavior of banks in the lending market (See Higo[2001]). However, Japan's transition to a low growth economy and the subsequent decrease in funds shortages in the private sector, together with financial deregulation and innovation which strengthened the capability of private institutions' intermediary function, have been reducing the area needing to be covered by the public sector.

In particular, it is often said that the overwhelming presence of the public sector in housing loans, which is one of the major profit centers for both U.S. and European banks, makes it difficult for Japanese banks to diversify their profit structure. U.S. banks, for example, improved their profitability significantly in the early 1990s and this is partly explained by their aggressive promotion of housing loans. The ratio of housing loans to total loans in the U.S. increased from a little under 10 percent to almost 25 percent during this period[38] (Chart 17), and this ratio could be even higher seen from an origination base rather than a stock base viewpoints, since almost 60 percent of new housing loans are securitized. Thus, the Government Housing Loan Corporation, whose role is being reviewed by the government's Secretariat for the Promotion of Administrative Reform, should seek a new role supplementing that of private institutions and fostering the still-immature securitization market.

B. Easing the "Over-Banking" Situation

Whether Japan is over-banked or not depends on how one defines the term. Still, the fact is

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correctly. Maybe they are right to say that the markets' interpretation sometimes looks distorted, but this distortion should be overcome by offering more consistent and convincing information rather than by limiting it.

[38] The rapid growth in housing loans in the U.S. is also due to (1) the active role of the housing GSE, such as Fannie Mae and Ginnie Mae, in expanding and increasing the efficiency of the market through securitization and offering guarantees, and (2) an easing of restraints on banks' fund-raising thanks to securitization and subsequent flexible portfolio control. For details, see Nakagawa[1998].

that many studies[39], including those that compare the volume of traditional banking operations with the size of the macroeconomy or those that seek to determinate the optimum number of banks given a certain volume of loans and deposits, indicate that Japan is over-banked. The reasons are various but tend to center on diminished profit opportunities for traditional banking operations due to the massive structural changes since the 1980s, such as innovation, globalization and deregulation.[40][41]. Resolution of this over-banking problem should be left to the market mechanism in principle. But in practice, reliance on the market mechanism alone does not necessarily work out smoothly to solve this problem, partly due to the government's provision of a safety net and the high sunk cost of the banking industry, which is often categorized as a capital intensive industry. One way to address this problem, for instance, is to improve the corporate governance structure and the system to prevent moral hazard, options which are discussed later. Such action would promote a correction of "over-banking" through stronger market discipline.

C. Enhancement of Corporate Governance Structure and of the System to Prevent Moral Hazard

A new regulation plan that aims to limit amounts of stocks held by banks is now under discussion and is expected to reduce banks' risk exposure. Importantly, another possible effect of this type of plan is to encourage banks and firms to unwind cross-shareholdings and thereby improve the corporate governance structure. Encouraging banks to raise funds by issuing debentures or subordinated debts is another option which could enhance the monitoring of banks' management by institutional investors. Regarding the system to prevent moral hazard, the authority's bank monitoring system has already been beefed up through the introduction of "Financial Inspection Manuals" in 1998, the year when the "Prompt Correction Action" framework was introduced. These efforts to improve the bank monitoring system by the authorities should be continued from now on. In addition, the authorities need to encourage banks to expand the range of disclosure items in accordance with the idea of Pillar III of the new Basel Accord proposal, and also might better examine the feasibility of introducing a system of variable deposit insurance premiums that reflects the creditworthiness of the individual bank. Finally, a constant review of the current accounting standards so as to increase the transparency of banks' management is also an important task for the authorities as well as for the private sector.

D. Support to Smooth Reallocation of Managerial Resources

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[39] For instance, see Ishida and Mio[2000], Hoshi and Kashyap[1999]. The former concludes that deposit volumes and banking size are not excessive because of the stability of M1/GDP and M1/M2 ratios. The latter, by contrast, concludes that the size of lending and deposit taking operations should decrease by 30 – 50 percent if the Japanese financial system is to transform into the U.S. type.

[40] BIS [1999] indicates that the over-supply situation of traditional banking services is not limited to Japan but rather a phenomenon which is commonly observed in advanced countries.

[41] As previously mentioned, if banks cannot take further risk due to a limited ability to assess credit risk, the estimated degree of "over-banking" turns out to be worse in a recession period when the overall level of credit risk becomes higher, than in a recovery period.

As measures to promote fair and efficient loss-sharing among creditors of the debts of firms that have defaulted, several new rules, such as The Civil Rehabilitation Law and guidelines regarding the process of reconstruction of firms in financial difficulties by out-of-court workout, have already been introduced. Together with promoting these reforms further, the authorities need to seek ways to promote DIP finance and to increase mobility in the labor market. Since banks need enough leeway to organize an appropriate risk-return structure of their portfolios in order to perform their financial intermediary function smoothly, it might also be necessary to revise the current commercial code, which severely restricts their right to purchase stocks, the rights of preferential shareholders, and issuance of classified stocks[42].

Sometimes, when examining a policy intended to promote reallocation of capital and labor, the authorities tend to require banks to consider what amount to social policy measures, such as an increase in loans to small or medium-sized firms. It should be noted, however, that these measures are often not compatible with other requirements such as an increasing their soundness and efficiency. Accordingly, the authorities should delegate implementation of these social policy measures to banks only after identifying the associated costs to be covered by the authorities.

E. Other Tasks

In addition to these institutional tasks, the macroeconomic policies to reduce the overall risk inherent in the Japanese economy, namely to stabilize the business cycle and to escape from the zero interest rate situation, are important to improve the environment surrounding banking business. For instance, a more normal interest situation would make it much easier for banks to expand fund-raising spreads and also contribute to increase the margin of market interest rates so as to reflect banks' risk premium and thereby enhance the corporate governance structure through market discipline.

6. Concluding Remarks

As explained in the preceding overviews, the significant deterioration in Japanese banks' profitability[43] since the 1990s is mainly due to the significant changes in the Japanese economy and the surrounding environment since the late 1980s. The Japanese banking system based on relationship banking had played the central role in maintaining high economic growth since the end of World War II. In this sense, it seems natural that Japanese banks suffered the most from the sluggish economy after the collapse of the financial bubble.

After experiencing low profitability for many years, the banking industry has recently sometimes been labeled as another "structurally depressed industry". However, considering that the banking industry still plays a major role in allocating capital, improvement of which is much needed in

[42] In this connection, see Kobayashi,Kato[2001].
[43] It should be noted that this paper focuses on banks' profitability only from the viewpoint of overall margins, and thus the analysis of other factors affecting profitability such as securities investment and the cost structure of Japanese banks still remain as a subject for future study.

the current Japanese economy, the banking industry has the potential to be a “growth industry” rather than a depressed one. In order to realize this potential, therefore, Japanese banks need to take bold decisions to reallocate their managerial resources so that they can respond promptly to the changes in the business environment, and also to diversify and enhance their financial intermediary functions to overcome the ongoing and coming structural changes in the Japanese economy.

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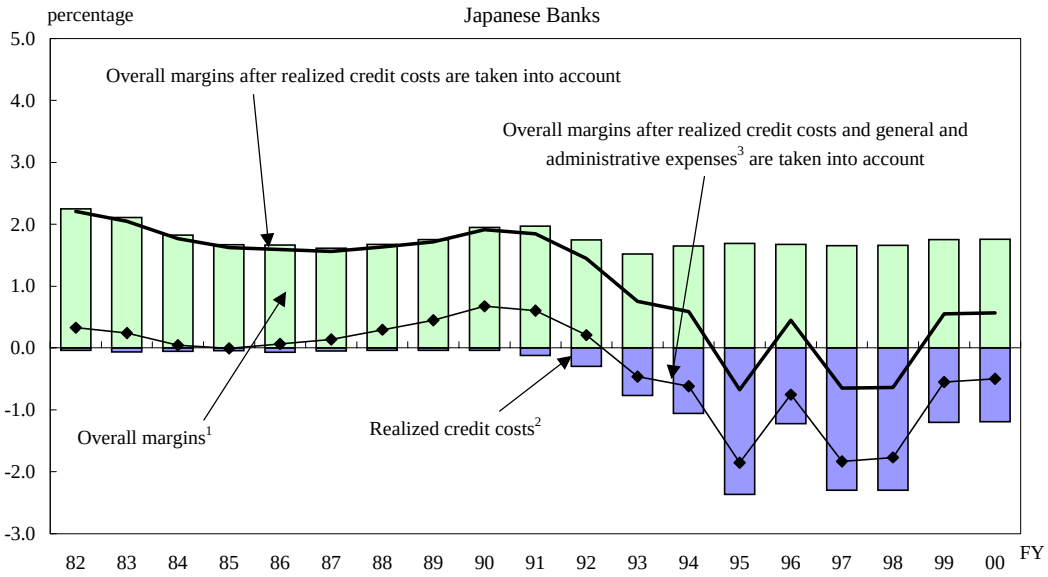
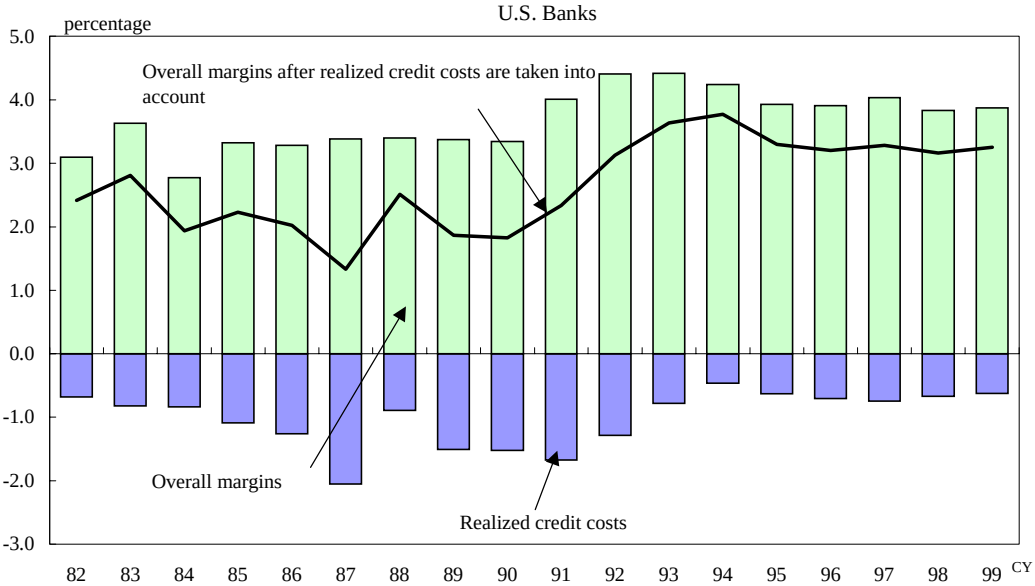
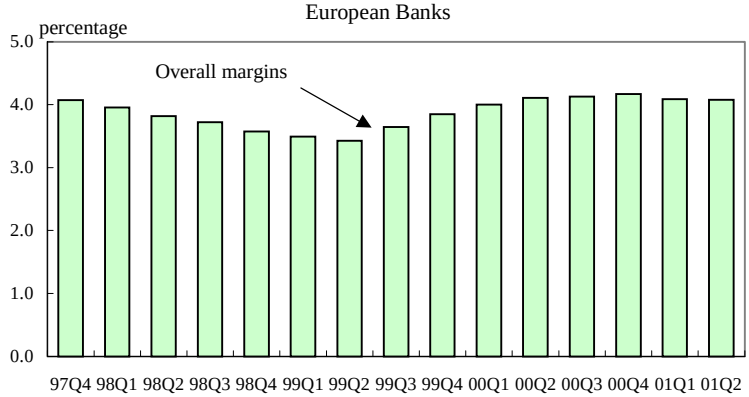
Chart 1. Developments in Overall Margins
–Comparison with U.S. and European Banks



Notes: 1.Overall margins are defined as yields on domestic loans minus yields on average interest-bearing domestic liabilities after an adjustment for swap expenses.
2.Realized credit costs are defined as the ratio of disposal of non-performing loans to total loan outstanding. Therefore, they are different from "credit cost" which is equal to expected losses.
3.General and administrative expenses. Based on overall domestic operations because data for operations by sector are not available.

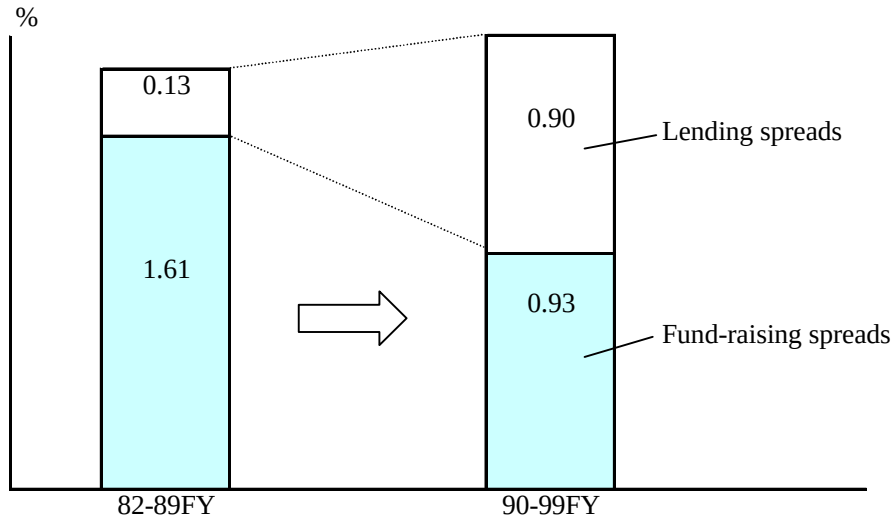


Note: Insured commercial banks. Source: FDIC "Historical Statistics on Banking"



Source :ECB[2000].

Chart 2. Estimation of Lending and Fund-raising Spreads



	SPL				SPF			
	a	b	c	R^2	d	f	g	R^2
82-89 FY	0.13 (2.48)	-0.32 (-7.70)	0.55 (5.40)	0.85	1.61 (25.00)	0.45 (8.99)	-0.25 (-2.06)	0.84
90-99 FY	0.90 (8.49)	-0.14 (-2.15)	0.78 (8.41)	0.79	0.93 (8.48)	0.15 (2.28)	-0.91 (-9.47)	0.83
82-99 FY	0.43 (5.38)	-0.24 (-6.48)	0.95 (11.00)	0.82	1.38 (16.80)	0.31 (8.19)	-1.02 (-11.46)	0.85

t-statistic in parentheses

<Model>

SPL = a + b CD + c SP

SPF = d + f CD + g SP

<Variables>

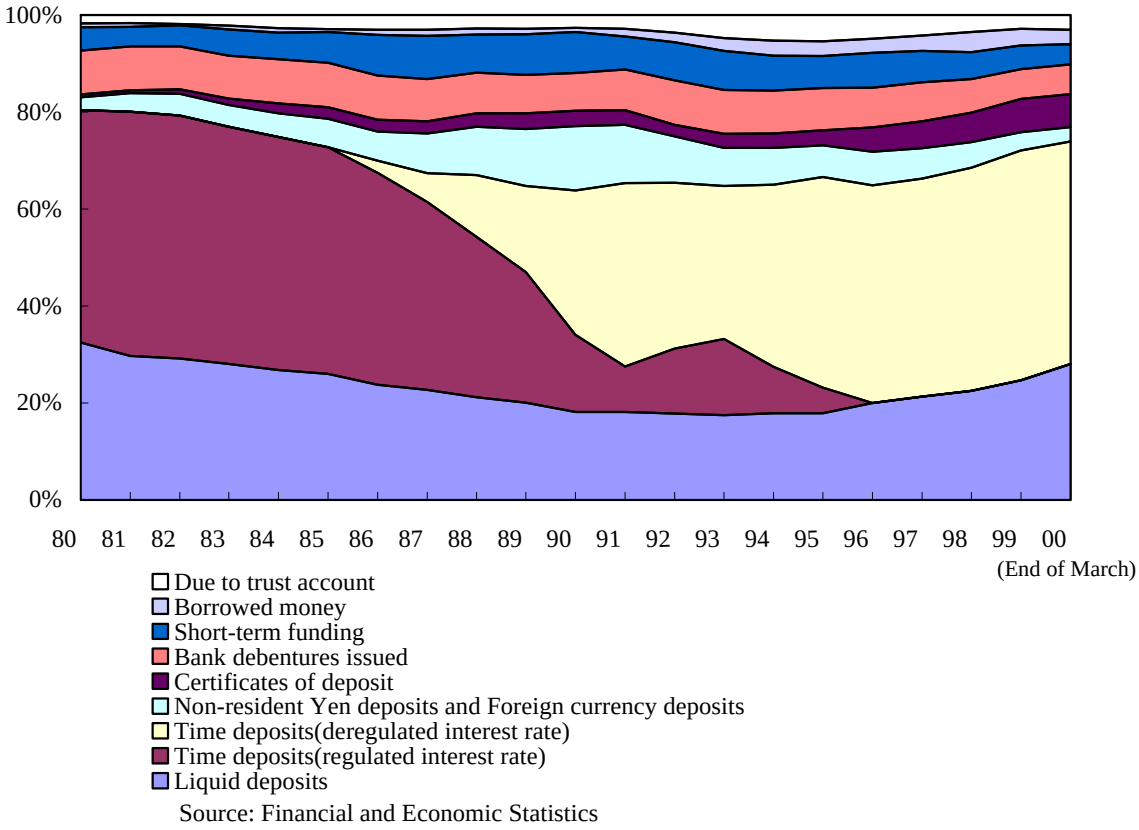
SPL : Quasi-lending spreads, obtained by simply dividing overall margins into two parts using short-term interest rate (3-month CD rate) as a reference rate.

SPF : Quasi-fund-raising spreads, obtained by simply dividing overall margins into two parts using short-term interest rate (3-month CD rate) as a reference rate.

CD : Short-term interest rate (a residual of the regression of short-term interest rate by long and short-term interest rate spreads).

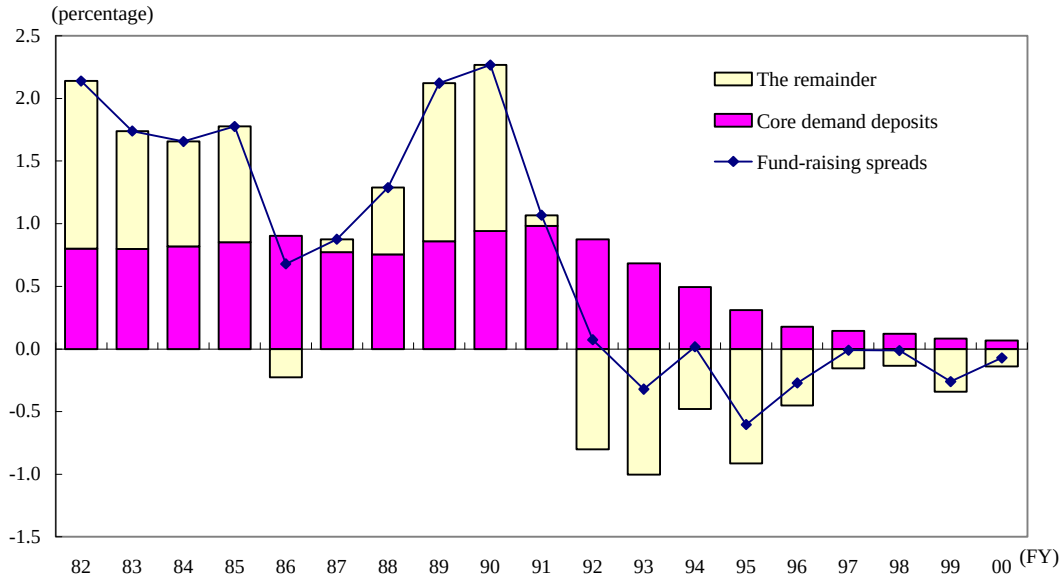
SP : Long and short-term interest rate spreads (5-year bank debenture yield minus 3-month CD rate).

Chart 3. Components of interest-bearing liabilities



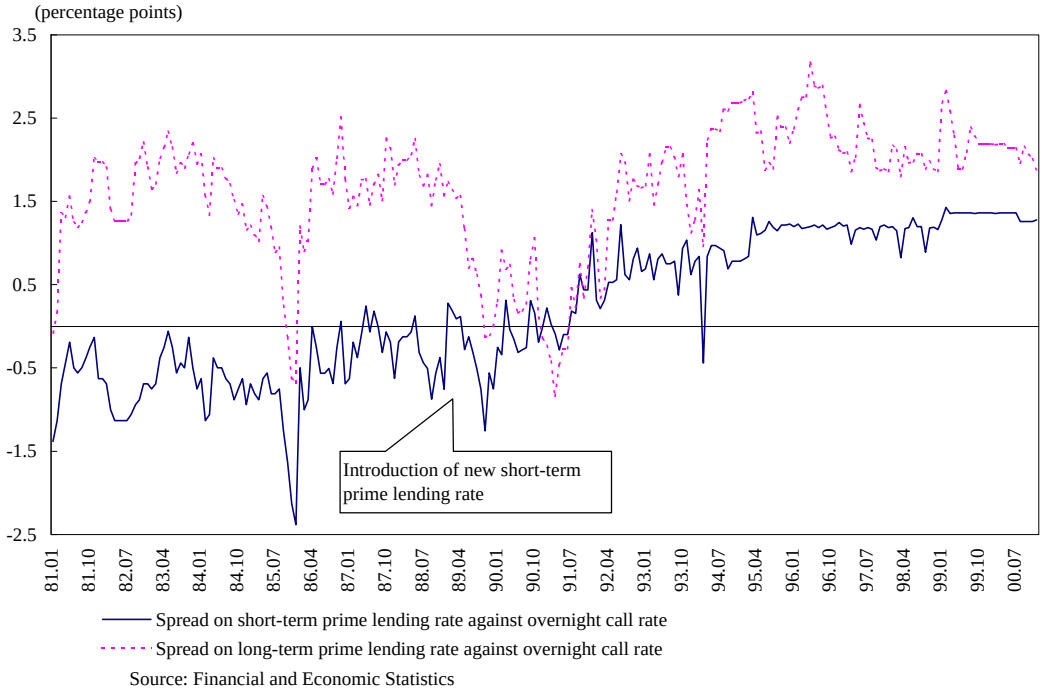
Source: Financial and Economic Statistics

Chart 4. Spreads of core demand deposits



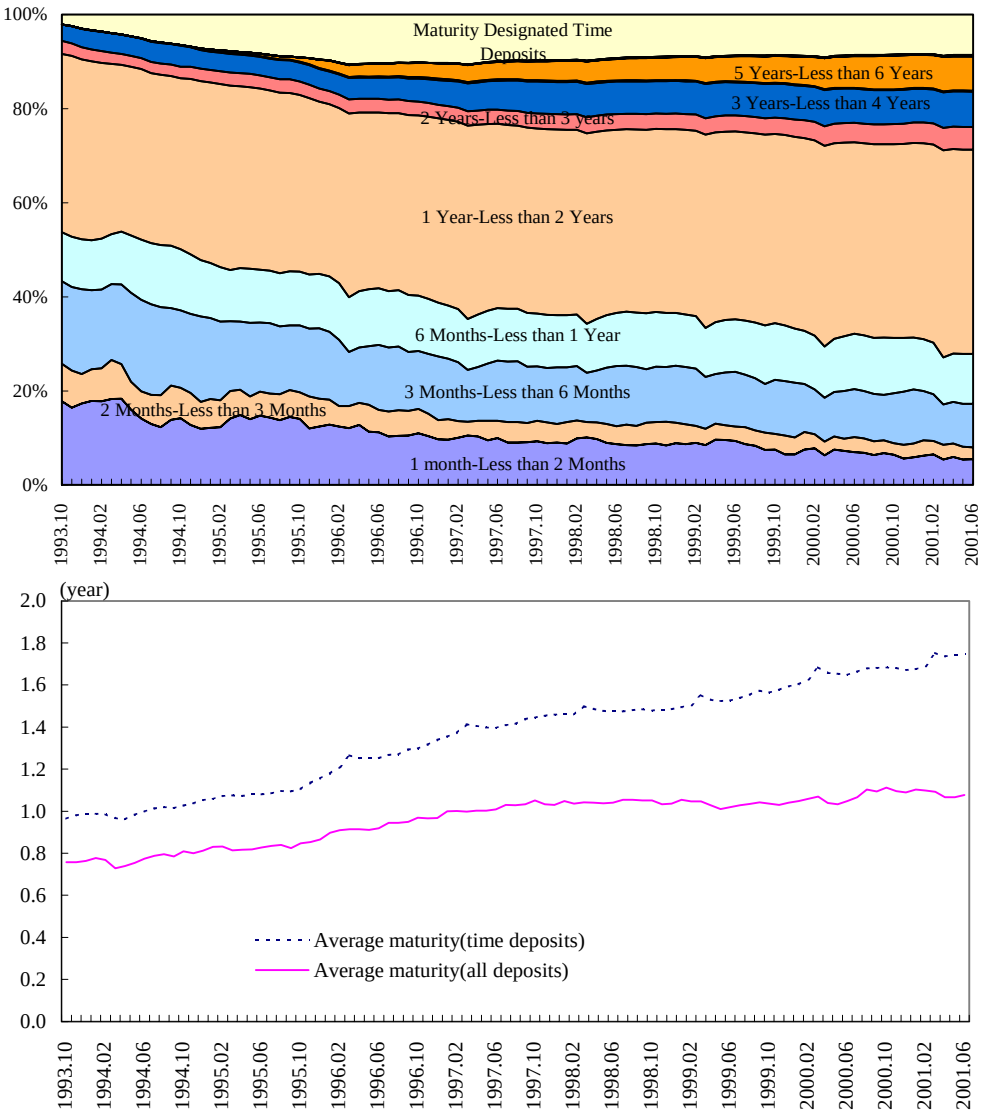
Note: Fund-raising spreads are divided into two portions, a spread on core demand deposits which are used for settlement purposes and thus their amounts are insensitive to interest rate changes, and the remainder. The former is obtained assuming the bottom of the ratio of core demand deposits to interest-bearing liabilities -20 percent in the early 1990s- as core portion. Regarding their interest rate, we use an interest rate of ordinary deposits.
Source: Financial and Economic Statistics et al.

Chart 5. Spread of short-term and long-term prime lending rates



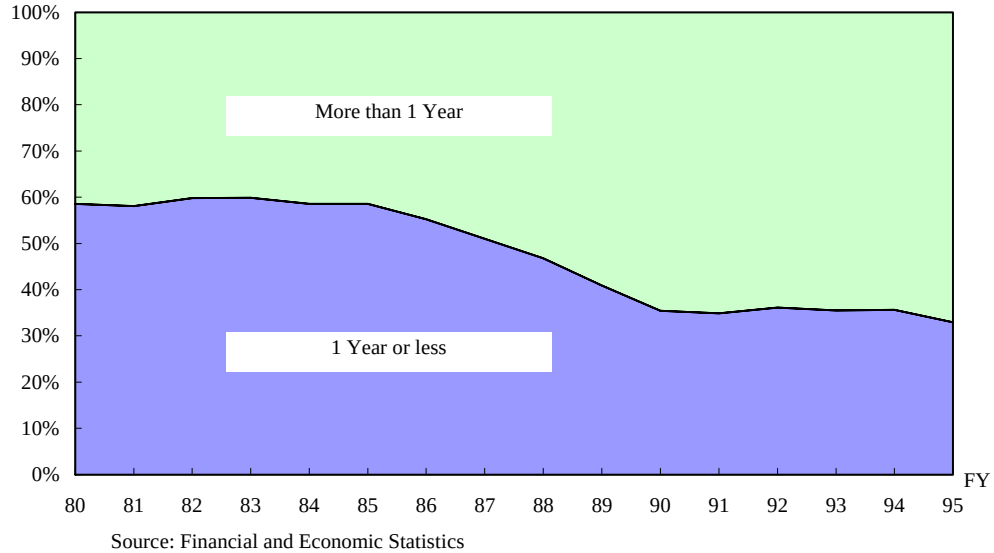
Source: Financial and Economic Statistics

Chart 6. Deposits by term and maturity



Note: Average maturity is calculated from deposits outstanding by term.
Deposits based on a regulated interest rate are not included in time deposits.
Source: Financial and Economic Statistics

Chart 7. Loan outstanding by term



Source: Financial and Economic Statistics

Chart 8. Japanese Banks' Behavioral Features and their Impact on Overall Margins

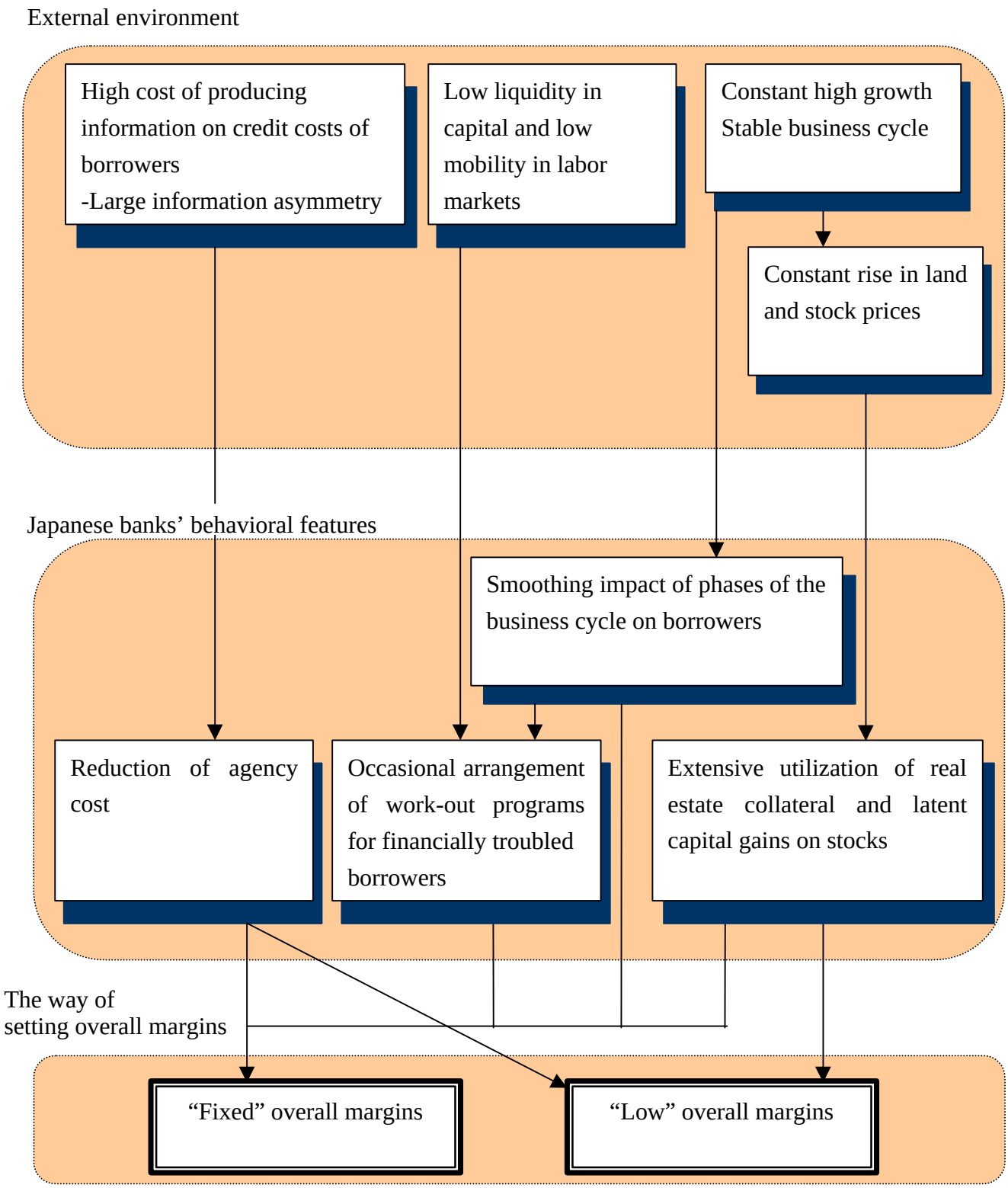


Chart 9. External Environment supporting “Relationship Banking” and changes in that environment

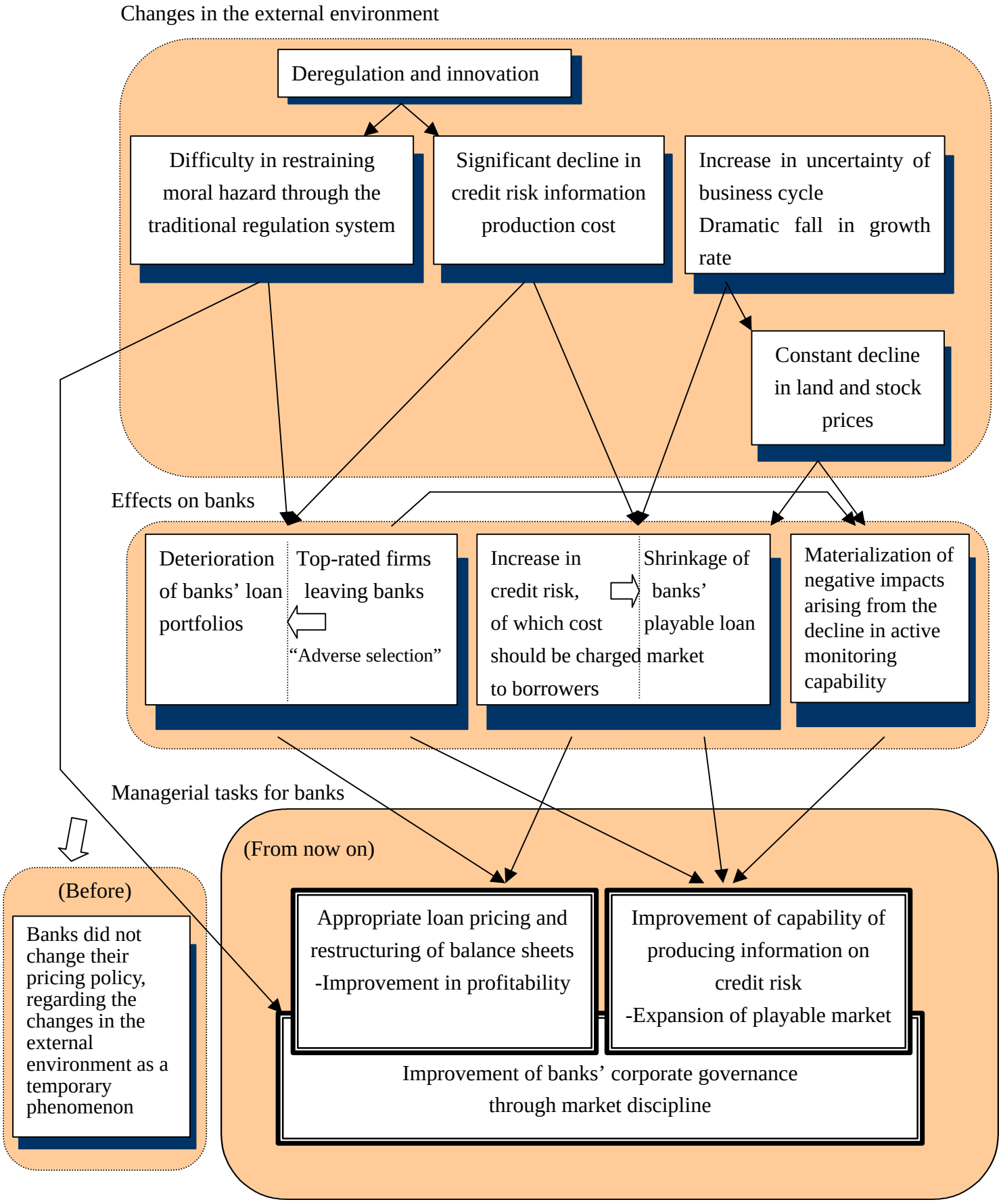


Chart 10-1. Loan portfolio by industry

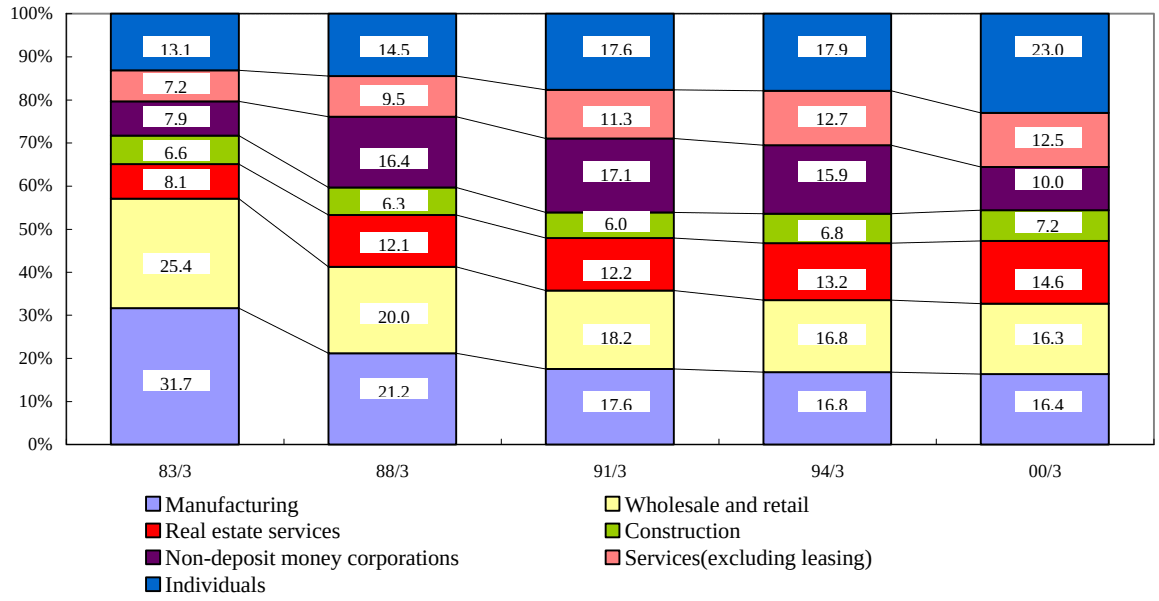
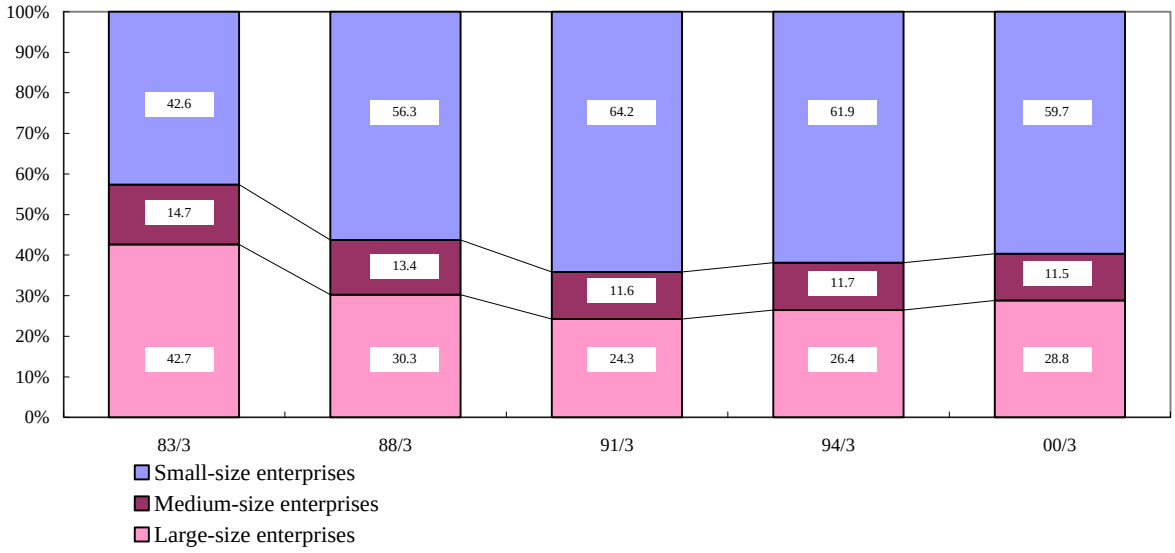


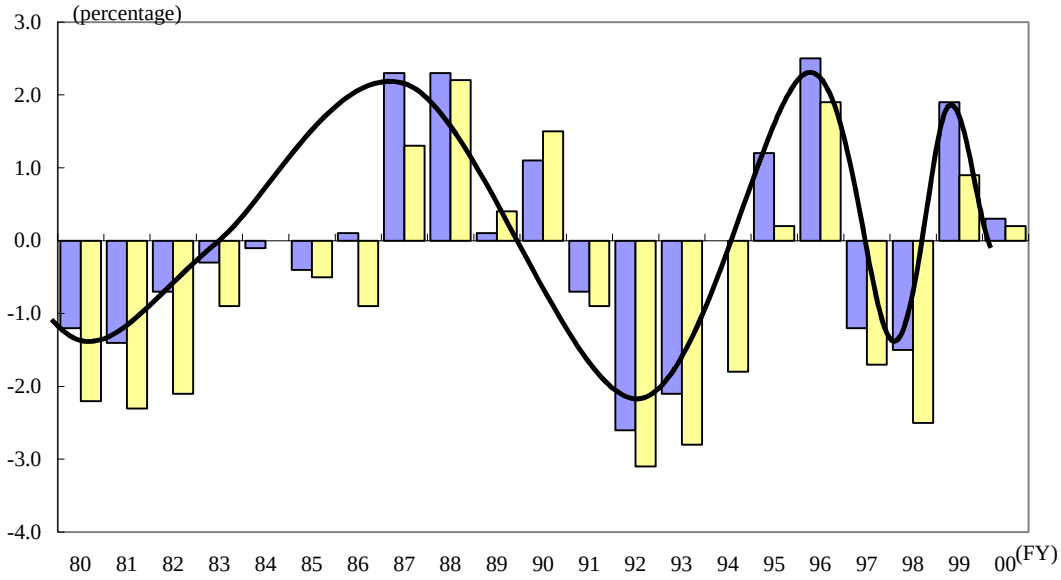
Chart 10-2. Loan portfolio by size of borrower



Source: Financial and Economic Statistics Monthly

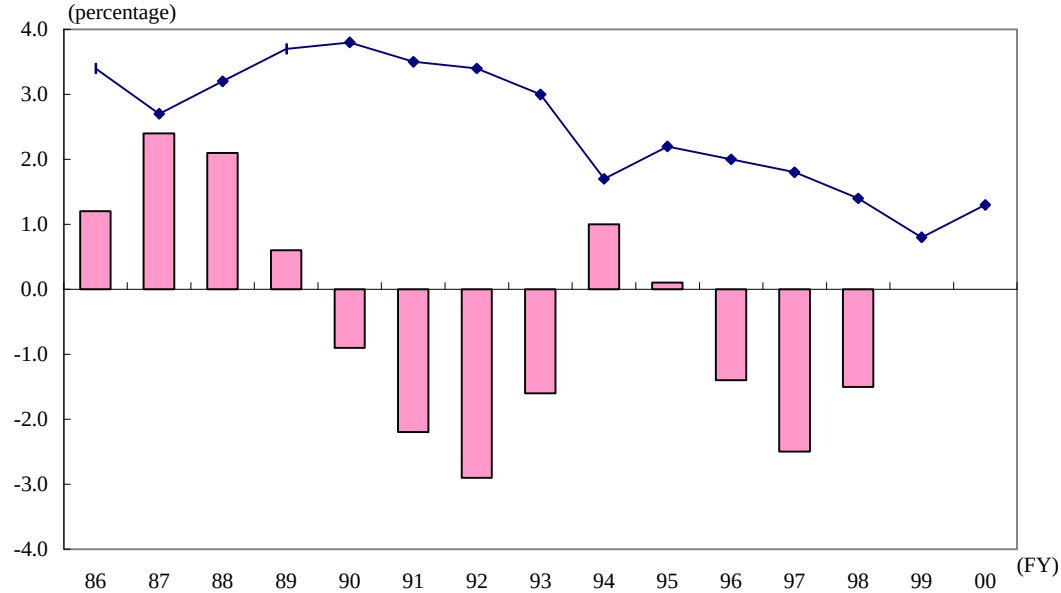
Chart 11. Difference between results and prediction of economic growth rate

[Private sector prediction and government prediction]



Source: Japan Economic Research Center, Economic Planning Agency, Cabinet Office.

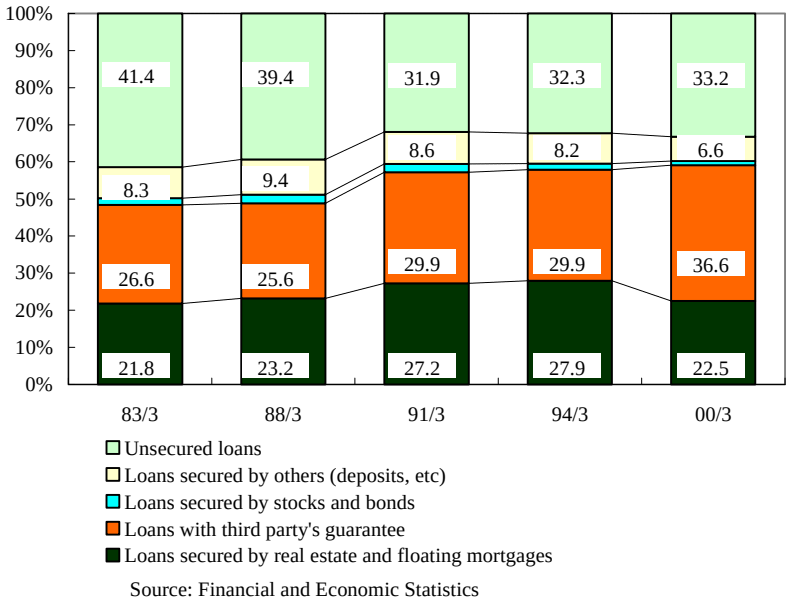
[Corporate sector average prediction of medium-term economic growth rate]



Source: Economic Planning Agency

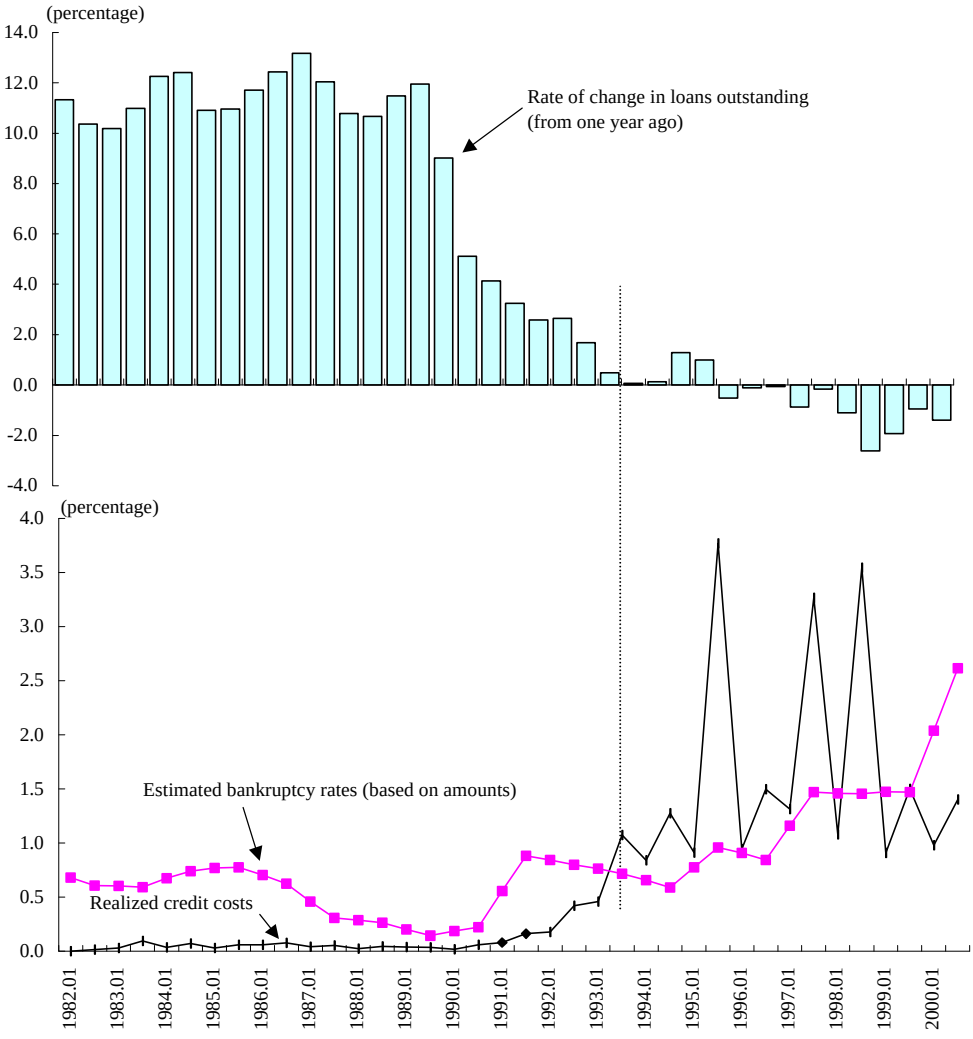
Note: Three-year average growth rate of real GDP predicted by listed corporations.

Chart 12. Loan portfolio by type of collateral



Source: Financial and Economic Statistics

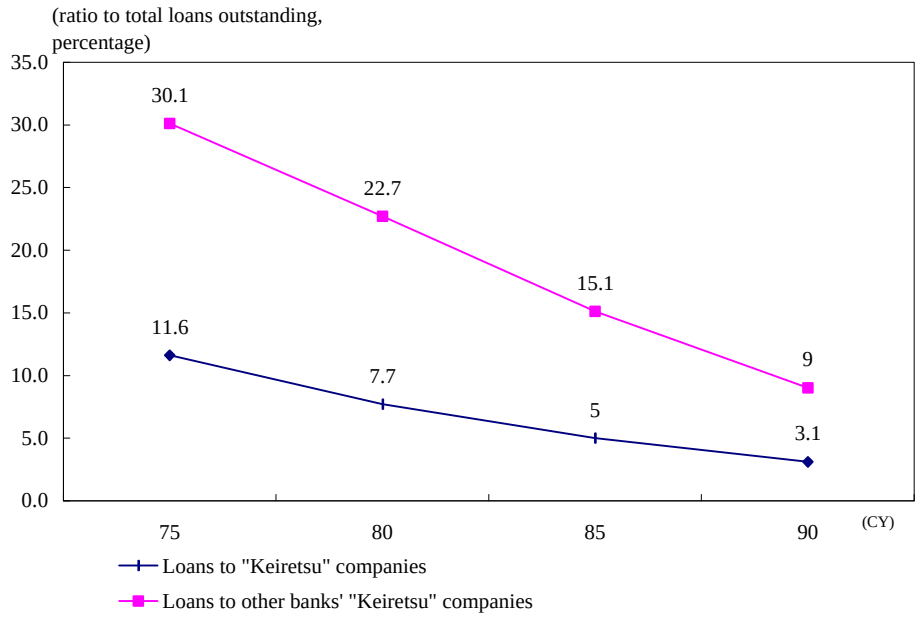
Chart 13. Realized credit costs and estimated bankruptcy rates



Note: Estimated bankruptcy rates are defined as the ratio of half of debt outstanding at bankruptcy(source: Shoko research) to bank loans each year. The assumption that the half of debt corresponds to bank loan is based on Financial Statements Statistics of Corporations by Industry. The rapid increase in debt outstanding at bankruptcy in 2000 is attributable to bankruptcies of several insurance companies.

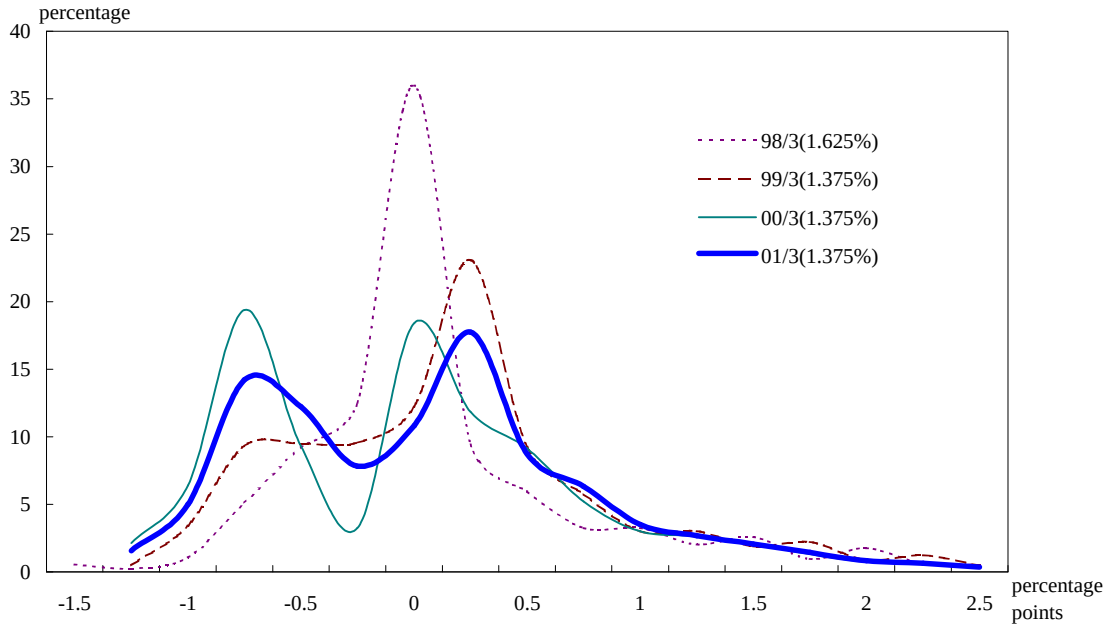
Source: Financial and Economic Statistics, Shoko research et al.

Chart 14. Ratio of loans to firms belonging to the same “Keiretsu” to total loans



Source: Shimizu, Horiuchi[1997].

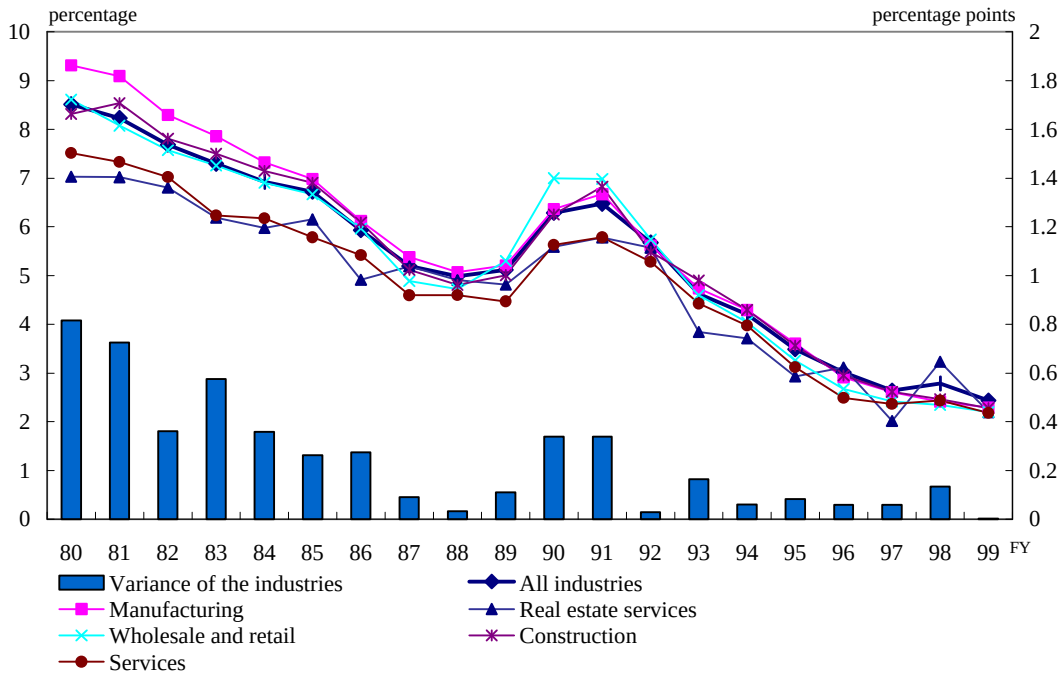
Chart 15-1. Distribution of short-term loans by interest rate



Source: Financial and Economic Statistics

Note: Calculated from loans outstanding of banking accounts of domestically licensed banks by interest rate. The horizontal axis represents deviations from short-term prime lending rates (the figures in parentheses) for each year. The vertical axis represents ratios of loans by interest rate to total loans. Short-term loans are defined as total loans minus loans on bills and deeds.

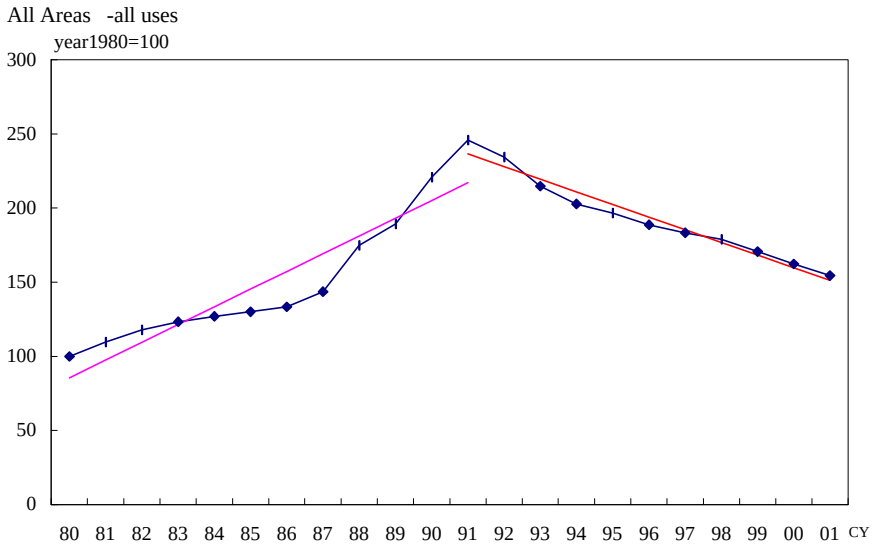
Chart 15-2. Average borrowing rate by industry



Source: Financial Statements Statistics of Corporations by Industry.

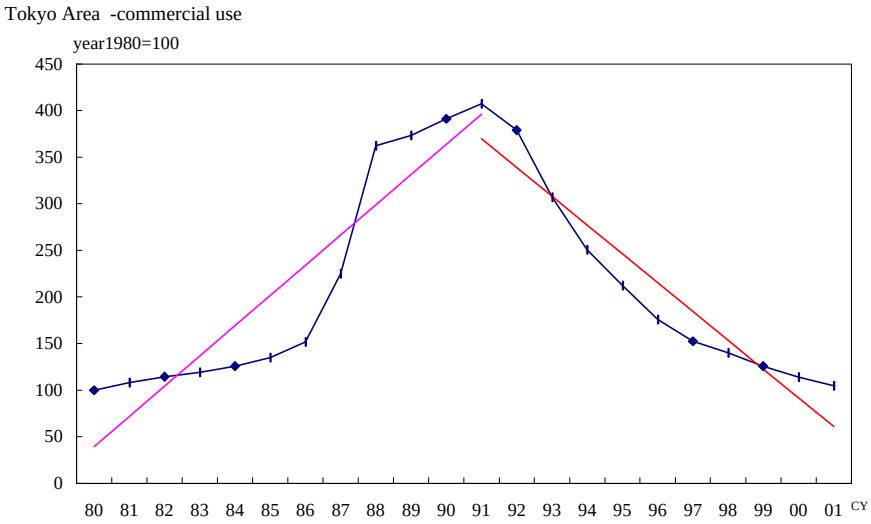
Note: It should be noted that the composition of short and long-term loans differ with industries and thus could affect the variance of borrowing rates of the industries.

Chart 16. Developments in land prices



Note: officially announced land price.

	80 - 91CY	91 - 01CY
trend	+8 %	- 4 %
average deviation from trend	8 %	2 %



	80 - 91CY	91 - 01CY
trend	+15 %	- 14 %
average deviation from trend	18 %	7 %

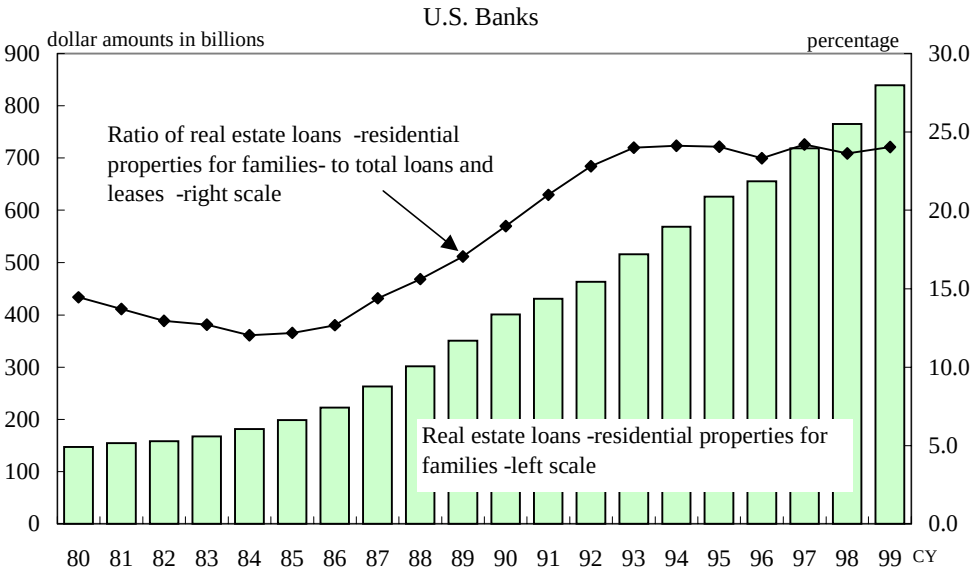
Note: Method of calculating VaR of land price

-holding period; 3 years, confidence level; 99%, taking trend into account

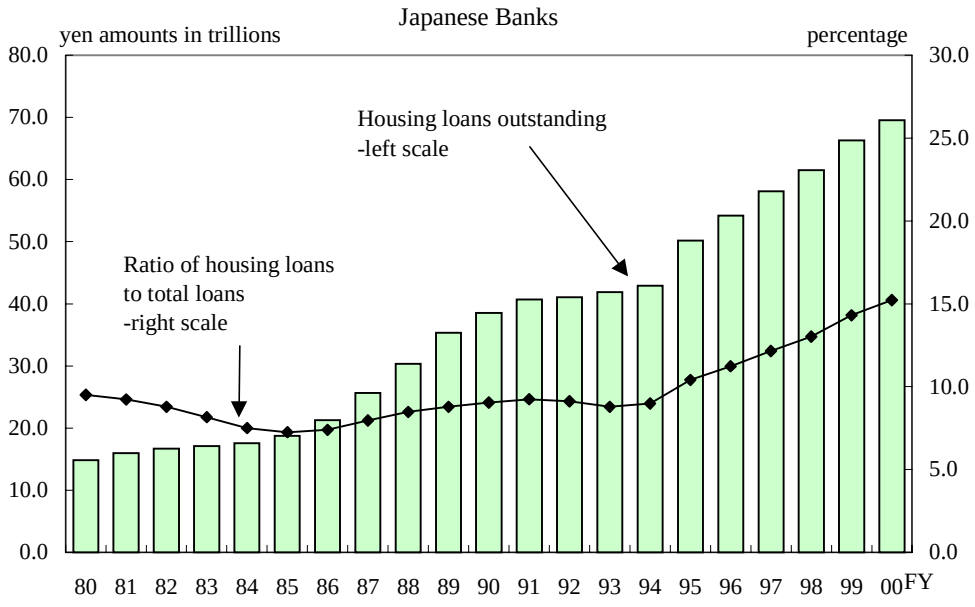
VaR = 3 years' change of land price based on the trend
+ average deviation from the trend * root 3 * 2.33

- Assuming that the distribution of land prices (deviation from the trend) follows the normal distribution.

Chart 17. Housing loans outstanding

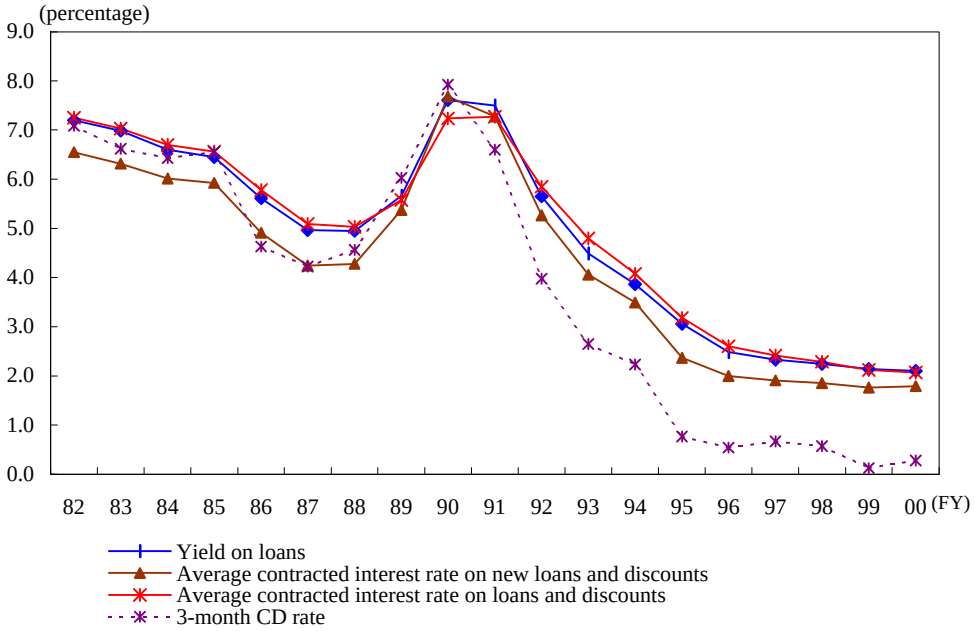


Note; Insured commercial banks, 1-4 family residential properties
Source: FDIC "Historical Statistics on Banking"



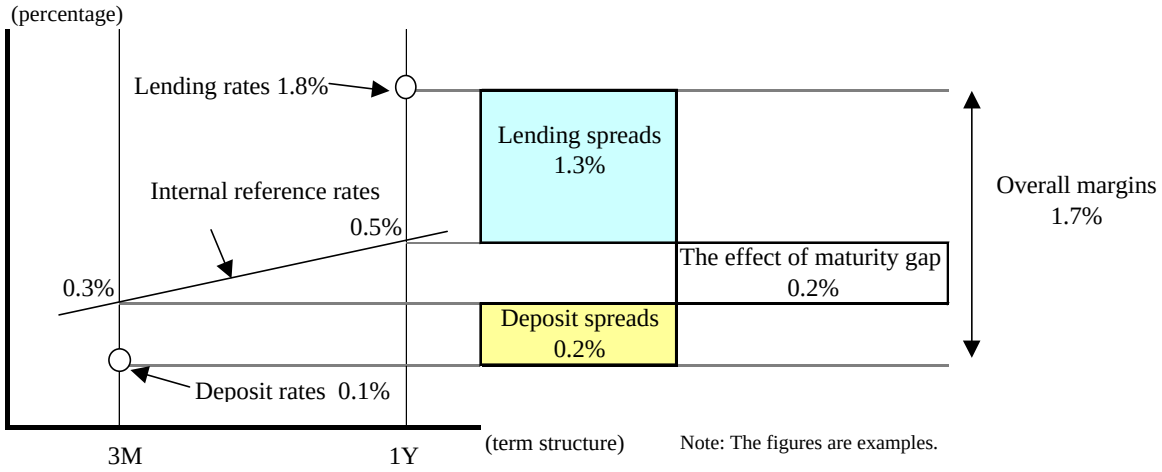
Source: Financial and Economic Statistics

Chart for footnote 3. Average contracted interest rate on loans and discounts



Source: Financial and Economic Statistics et al.

Chart for footnote 7. Mechanism of the “Individual spread method”



Note: The figures are based on deposit rates (3 months) and lending rates (one year). Lending spreads are defined as the difference between lending rates and reference rates of loan's average maturity. Deposit spreads are defined as the difference between deposit rates and reference rates of deposits' average maturity. Under this mechanism, since the effect of maturity gap can be transferred to the headquarters, branches no longer have to consider the impact of interest rate fluctuation on their profits.