BOJ Reports & Research Papers

Financial System Report

BANK OF JAPAN

OCTOBER 2011

12 major banks and 105 regional banks covered in this report are as follows.

The 12 major banks comprise Mizuho Bank, The Bank of Tokyo-Mitsubishi UFJ, Sumitomo Mitsui Banking Corporation, Resona Bank, Mizuho Corporate Bank, Saitama Resona Bank, Mitsubishi UFJ Trust and Banking Corporation, Mizuho Trust and Banking Company, The Chuo Mitsui Trust and Banking Company, The Sumitomo Trust and Banking Company, Shinsei Bank, and Aozora Bank. The 105 regional banks comprise the 63 member banks of the Regional Banks Association of Japan (Regional banks I) and the 42 member banks of the Second Association of Regional Banks (Regional banks II) as of September 30, 2011.

This *Report* basically uses data available as of September 30, 2011.

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Contents

Preface

The Bank of Japan began publishing the *Financial System Report* and the *Financial Markets Report* in 2005, with the objective of facilitating communication with concerned parties in order to ensure stability in the financial system. Starting with this issue, the Bank has decided to integrate the two reports and publish the new *Financial System Report* semiannually, in view of the recent growing importance of analyzing developments in domestic and overseas financial markets in assessing financial system stability.

The new *Report* assesses financial system stability while bearing in mind the greater importance of the macroprudential perspective. In the macroprudential framework, the stability of the financial system should be ensured by analyzing and assessing risks in the financial system together with the interconnectedness of the real economy, financial markets, and behavior of financial institutions; and then planning institutional designs and policy measures on these assessments.

This *Report* examines various risks in the banking system and assesses the robustness of the system, as previously. In addition, the analysis is enriched from the macroprudential perspective in the following points. First, as regards assessing the robustness of the financial system, macro stress testing is developed by assuming multiple scenarios in which stress occurs in the real economy and financial markets. Second, a feedback loop between the real economy and the financial system is better analyzed and assessed by using the newly developed Financial Macroeconometric Model. Third, from a cross-sectional dimension of the financial system, various risks are examined at insurance companies and other nonbank financial institutions, which are closely associated with banks. Fourth, new indicators of macro financial risk are included to assess an accumulation of financial imbalances from different perspectives. Fifth, analysis of risks observed in financial markets is enhanced in view of the influences of financial markets on Japan's financial system.

The Bank uses the results of the analysis made in the *Report* in planning measures to ensure stability in the financial system as well as in providing guidance and advice to individual financial institutions through on-site examinations and off-site monitoring. Moreover, the Bank makes use of them in international regulatory and supervisory discussions. In relation to the monetary policy, the assessment of financial system stability is also an important input for the Bank to assess risks in economic and price developments from a medium- to long-term perspective.

The Bank will continue to enhance the *Report* and contribute further to ensuring financial system stability.

I. Overview

Increasing future uncertainty over the external environment

Regarding the environment surrounding Japan's financial system, future uncertainty is increasing. In Europe, a series of sovereign debt problems have surfaced across peripheral countries since the end of 2009 and have led to a deterioration in banks' funding conditions. In the United States, amid the ongoing balance-sheet adjustments by households, the ratio of nonperforming housing loans remains at a high level. On the other hand, in emerging economies, the economic growth rate has recently slowed somewhat, although strong signs of overheating are still observed in the real estate market amid accommodative financial conditions. Under these circumstances, global financial markets remain nervous.

Meanwhile, in Japan, firms' funding conditions generally remain on an improving trend even after the Great East Japan Earthquake. However, some small and medium-sized firms and households have continued to face severe financial conditions.

Ongoing easiness in financial conditions

Financial conditions of firms and households in Japan have generally continued to ease amid the low interest rate environment. Even since the disaster, issuing conditions for CP and corporate bonds have generally been favorable, and banks' lending attitudes have been positive. Banks as a whole have expanded housing loans outstanding and have been extending loans in growing business areas. In the disaster areas, financial institutions have been providing funds to meet borrowing demand under public guarantee associated with the disaster.

Behind banks' positive lending attitudes lie sluggish borrowing demand of firms and households as well as steady inflows of deposits. In seeking a new source of profits, the major banks are actively undertaking overseas lending and the regional banks are increasing loans outside their home prefectures. Banks' lending competition has intensified particularly in metropolitan areas, thereby reducing bank loan rates.

Restrained risks at financial institutions

In Japan, macro risk indicators have not confirmed an accumulation of financial imbalances, as the ratio of total credit to GDP continues to hover around the long-term

trend. Risks borne by banks and other financial institutions have generally been restrained relative to capital. The credit cost ratio and the nonperforming-loan (NPL) ratio of Japan's financial institutions have remained lower than those of their U.S. and European counterparts, and their funding liquidity risk for the yen and foreign currencies has been restrained.

However, as correlations between domestic and overseas financial markets have been high, domestic financial markets remain slightly nervous. Japan's banks and life insurance companies continue to hold a high level of market risk associated with their stockholdings and have gradually increased market exposure through investment in Japanese government bonds (JGBs) and foreign bonds. Attention should therefore be paid to the fact that business conditions of financial institutions have become susceptible to developments in overseas financial markets both directly and indirectly. Moreover, despite the recent decrease in banks' credit costs, the quality of bank loans has not improved. The NPL ratio of consumer finance companies has also been on an increasing trend, and thus developments in credit costs also warrant due attention.

Sustained robustness of the financial system

Japan's financial system has maintained its robustness. Banks' capital bases as a whole would be able to avoid significant impairment, according to the macro stress testing conducted with a severe scenario of a considerable downturn in the economy and a plunge in stock prices taking place simultaneously or of domestic interest rates rising significantly. Nevertheless, for banks with relatively low profitability and weak capital bases, the possibility that their capital adequacy ratios will remain low requires attention.

Based on the results of macro stress testing, the following points warrant vigilance in order to ensure long-lasting stability in the financial system. First, if the economy becomes stagnant for a protracted period, banks' credit costs could increase and exceed their profits for some years. Second, given high correlations between domestic and overseas financial markets, changes in overseas government bond markets or stock markets could spread instantaneously to domestic markets and cause banks' realized gains/losses on domestic securities holdings to deteriorate significantly. Against this background, it has become more important for banks to reinforce their capital bases.

Challenges to ensure stability in the financial system

Japan's financial system as a whole has been maintaining stability since the disaster. In order to ensure long-lasting stability in the financial system and maintain smooth financial intermediation, the following three major challenges need to be addressed.

First, financial institutions should enhance the effectiveness of risk management. They are required to strengthen measures to help ailing borrowing firms improve their business conditions in order to raise the quality of their bank loans and eventually to contain credit risk. To contain market risk, they should take into account correlations between domestic and overseas financial markets to gauge risks associated with securities investment from multiple perspectives and then formulate balanced investment portfolios and manage market risk in an amount sufficiently covered by their capital. Furthermore, funding liquidity risk, particularly in foreign currencies, requires strict risk management.

Second, financial institutions should further strengthen their capital bases. Stable capital bases are indispensable for them to continue conducting smooth financial intermediation, including their responses to the demand for funds for rebuilding after the disaster as well as development and support of growing business areas. New Basel requirements will be applied in an orderly manner to internationally active banks from 2013. Financial institutions therefore face the need to strengthen their capital bases steadily.

Third, financial institutions should construct stable profit bases. They are required to secure stable profits to accumulate retained earnings or to smoothly increase capital in order to strengthen their capital bases. Financial institutions should continue to expand their profit bases by developing and supporting firms and business areas with high growth potential and make efforts to contain fluctuations in profits by setting prices to make new services profitable.

II. Examination of the external environment

As for the environment surrounding Japan's financial system, future uncertainty is increasing. In Europe, a series of sovereign debt problems have surfaced across peripheral countries since the end of 2009 and have led to a deterioration in banks' funding conditions. In the United States, amid the surfacing of the federal debt ceiling problem and the ongoing balance-sheet adjustments by households, the ratio of nonperforming housing loans remains at a high level. On the other hand, in emerging economies, the economic growth rate has recently slowed somewhat, although strong signs of overheating are still observed in the real estate market amid accommodative financial conditions. Under these circumstances, global financial markets remain nervous.

Meanwhile, in Japan, firms' funding conditions generally remain on an improving trend even after the Great East Japan Earthquake. Behind this stability lies the fact that firms have been taking a cautious stance in financing since the Lehman shock and maintaining a high level of on-hand liquidity. However, some small and medium-sized firms and households have continued to face severe financial conditions.

From the viewpoint of the effects on Japan's financial system, this chapter first summarizes risks in the global financial system and then examines economic developments and financial conditions of firms and households in Japan.

A. Global economy and financial system

1. Developments in global financial markets

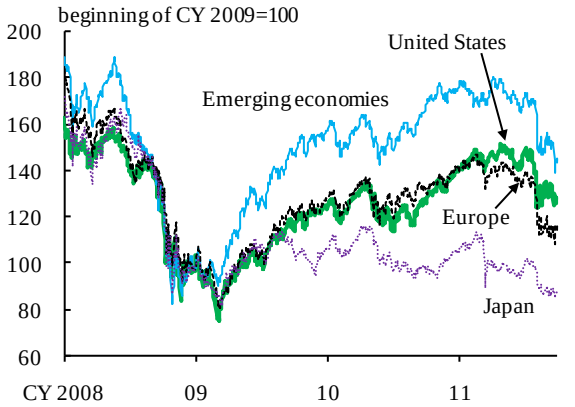
Globally active investors' risk-taking has become cautious, given the growing future uncertainty.[1] In global financial markets, following the political uncertainty over the Middle East and North Africa, sovereign debt problems surfaced in Europe and the United States. Concern grew about a slowdown in the global economy, including the U.S. economy, and that about the sovereign debt problem in Greece has recently increased.

Following a rising trend until the spring of 2011, stock prices fell worldwide through the summer (Chart II-1-1). At the same time, the U.S. dollar and the euro depreciated, while

[1] Until the spring of 2011, there had been active investment in emerging economies and commodity markets, as well as high-risk investment of covenant-lite loans (loans with relaxed financial covenants) though marginal.

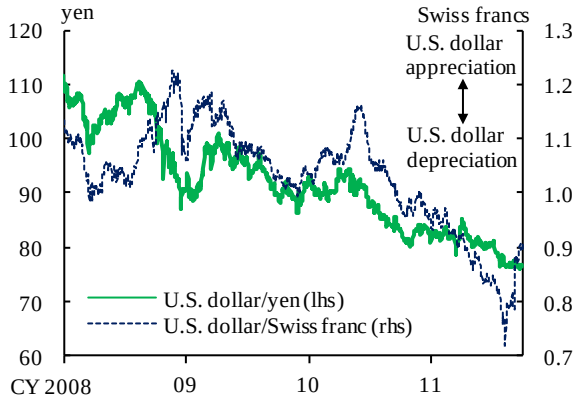
the yen and the Swiss franc appreciated significantly against the dollar and the euro (Chart II-1-2).

Chart II-1-1: Global stock prices[1]



Note: *1.* United States: S&P 500, Emerging economies: MSCI Emerging, Europe: EuroSTOXX 600, Japan: TOPIX.
Source: Bloomberg.

Chart II-1-2: Foreign exchange rates



Source: Bloomberg.

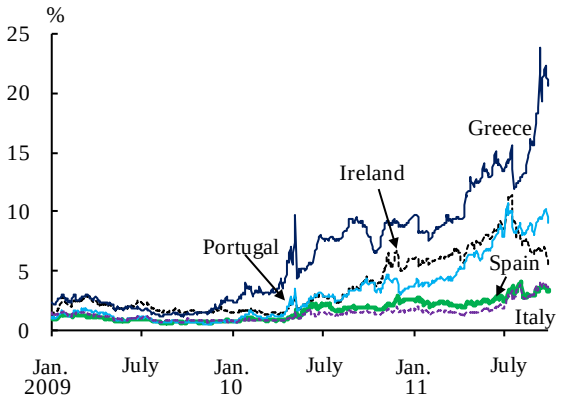
2. Sovereign debt problems in peripheral European countries

A series of sovereign debt problems

From the end of 2009, sovereign debt problems surfaced in succession in Greece and other peripheral European countries. The Greek fiscal problem intensified toward the spring of 2010. Then, excessive sovereign debt was called into question in Ireland in the summer of 2010 and in Portugal in early 2011, whereby concern grew over financing for redemption of government bonds. In the spring of 2011, the Greek problem reemerged, reflecting private-sector burden sharing and the debate in parliament over fiscal consolidation.

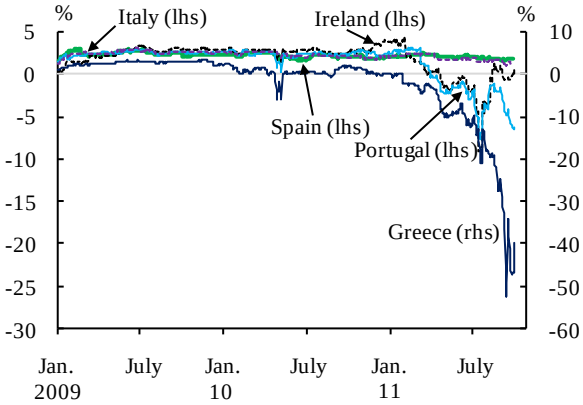
In the meantime, market participants' views of peripheral European countries have become increasingly severe. Credit rating agencies have successively lowered sovereign debt ratings of peripheral European countries since 2010. The government bonds of Greece, Ireland, and Portugal have been downgraded to speculative grade. Yield spreads between government bonds of Greece or other peripheral European countries and German government bonds (bunds) have widened significantly since 2010 (Chart II-1-3). The widening of yield spreads has spilled over to Spain and Italy. As for yield spreads between long-term and short-term government bonds, short-term yields have surpassed long-term ones in countries with strong market concern over fiscal soundness, such as Greece and Ireland (Chart II-1-4).

Chart II-1-3: Government bond yields[1]



Note: *1*. 10-year spreads over German bund yield.
Source: Bloomberg.

Chart II-1-4: Term spreads of government bonds[1]



Note: *1*. 10-year yield over 2-year yield.
Source: Bloomberg.

In July 2011, given that the European Union (EU) and the International Monetary Fund (IMF) reached agreement on a new assistance program for Greece, the widening of spreads on Greek government bond yields and on sovereign credit default swaps (CDSs) came to a halt. However, credit rating agencies continue to put peripheral European countries' sovereign debt ratings on review for possible downgrade. Concern over the Greek problem is surging once more. As a consequence, spreads on government bond yields and on sovereign CDSs of peripheral European countries have recently been widening again.

Deterioration in banks' funding conditions

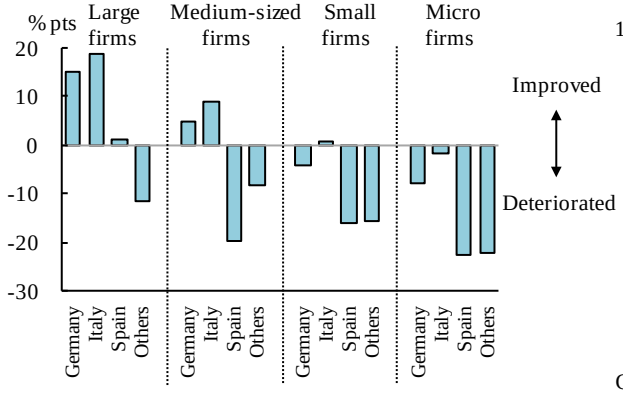
The growing concern over sovereign debt problems has adversely affected the funding of European banks through the lowering of their creditworthiness (see Box 1 for developments in money markets in Europe).

Deterioration in funding conditions has also influenced banks' lending. A rise in funding costs has been partly passed onto bank loan rates. In particular, a rise in market interest rates can be easily reflected in rates on housing loans extended by banks in peripheral European countries, because more than 70 percent of their housing loans have an adjustable interest rate. In addition, banks in peripheral European countries have become more cautious in their lending than banks elsewhere in Europe (Chart II-1-5).

Banks' funding conditions have not improved even since the strengthening of their capital bases was confirmed in the results published in July 2011 concerning the EU-wide stress-testing exercise on banks. As large redemptions of bank bonds continue in peripheral European countries, markets are likely to remain nervous about

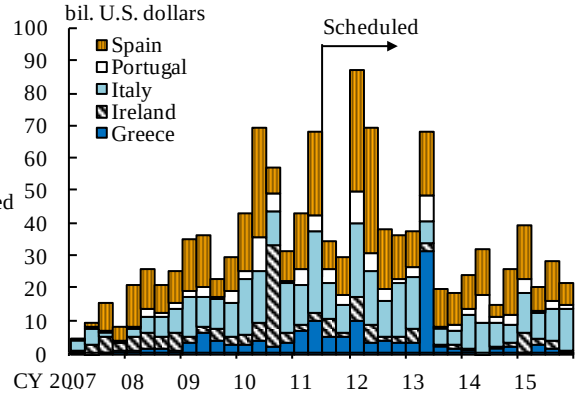
refinancing (Chart II-1-6).

Chart II-1-5: Lending attitudes of European banks[1]



Note: *1.* Banks' lending attitudes evaluated by firms in the euro area. The survey is conducted during the period from February to March 2011.
Source: ECB, "Survey on the access to finance of SMEs in the euro area."

Chart II-1-6: Redemption schedule of bank bonds[1]



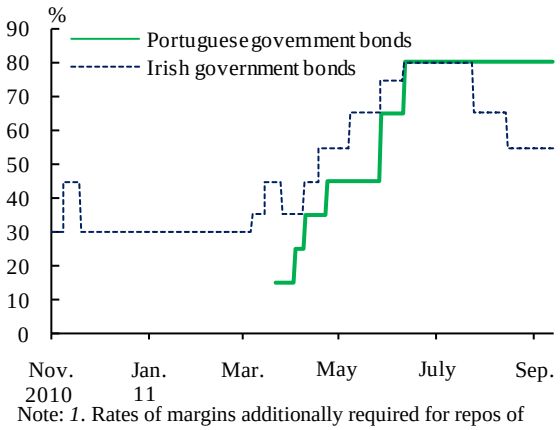
Note: *1.* Covered bonds are included.
Source: Dealogic.

Box 1: Money markets in Europe

As sovereign debt problems surfaced successively in Greece, Ireland, and Portugal from the end of 2009, market participants became bearish about government bonds in these countries and additional margin was sought in repo transactions backed by the government bonds (Chart B1-1). The creditworthiness of some peripheral European countries' government bonds as collateral is being questioned, and the share of repo transactions backed by such government bonds is declining. As a result, banks that hold a large amount of peripheral European countries' government bonds are facing difficulty in market funding. In addition, toward the end of 2010, nonresidents withdrew deposits from Irish banks, and the issuance of Irish bank bonds became difficult. Financing through bonds and deposits by Portuguese and Greek banks has also decreased. In response, these banks have increased their reliance on funds provided by the European Central Bank (ECB).

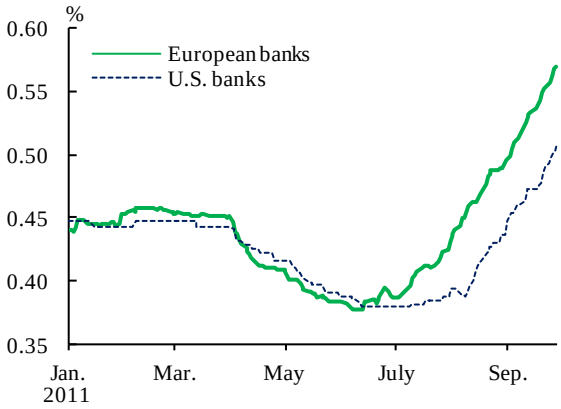
Since the summer of 2011, the reemergence of the Greek problem has caused strain in money markets to spread. As concern over counterparty risk has heightened, market participants have held back from investing in the markets. As a result, the usage of the ECB's deposit facility is increasing again. In addition, as uncollateralized transactions, especially term instruments, tend to be avoided, uncollateralized funding rates such as the Euribor have remained at high levels compared with funding rates for repo transactions. Under these circumstances, European banks cannot extend the maturity of funding and are becoming more nervous about refinancing.

Chart B1-1: Margins for government bond collateral[1]



Note: *1*. Rates of margins additionally required for repos of government bonds.
Source: LCH. Clearnet.

Chart B1-2: U.S. dollar Libor by bank[1]



Note: *1*. Simple averages of 6-month U.S. dollar Libor.
Source: Bloomberg.

The heightening of concern over counterparty risk is also seen in the U.S. dollar money markets. U.S. money market funds (MMFs) -- major providers of dollars -- have become cautious in choosing which entities they invest in, and have started to reduce the provision of dollar funds to banks, particularly investment in term instruments issued by European banks. In addition, they are differentiating the funding rates for European banks from others by asking them for additional premiums (Chart B1-2). Under these circumstances, the liquidity of longer-term instruments has decreased, and market interest rates are tending to be volatile (see Chapter IV.C for funding of Japan's banks in foreign currencies).

3. Balance-sheet adjustments and the debt ceiling problem in the United States

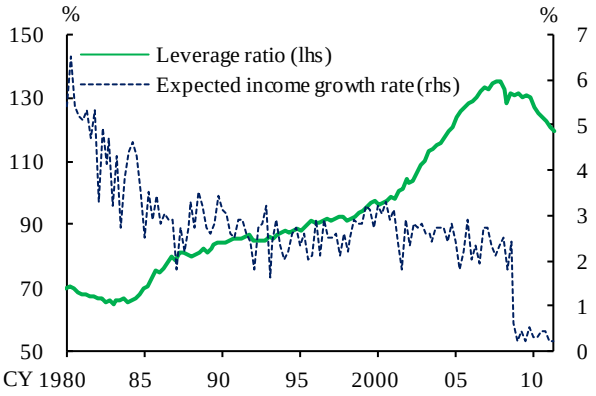
Balance-sheet adjustments of households and the housing market

In the United States, as households are still in the process of balance-sheet adjustments, the economy is tending to deviate downward. While households' leverage ratio (the ratio of debt outstanding to income) has been adjusted to a level close to the historical trend, they seem not to have overcome a sense of excessive debt relative to future income. This is because of significant decline in the expected growth rate of their income (Chart II-1-7). It is possible that the leverage ratio will be adjusted to below the historical trend.

Regarding home equity loans, the share of households with negative equity has increased. This is attributed to a decline in the collateral value due to the significant drop in housing prices (Chart II-1-8). In the housing market, inventories of new and second-hand homes are decreasing slowly. However, the foreclosure of borrowers'

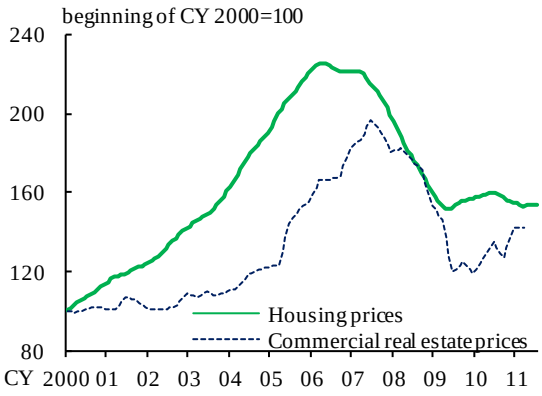
houses by financial institutions has remained at a high level. In addition, redefaults on housing loans with modified repayment terms have increased. Since these potential inventories will be disposed of by sale in the market, these could exert downward pressure on future housing prices.

Chart II-1-7: Leverage ratio of U.S. households[1]



Note: *1*. Leverage ratio is a ratio of debt outstanding to disposable income.
Sources: BEA, "National economic accounts"; FRB, "Flow of funds accounts of the United States"; Thomson Reuters.

Chart II-1-8: U.S. real estate prices

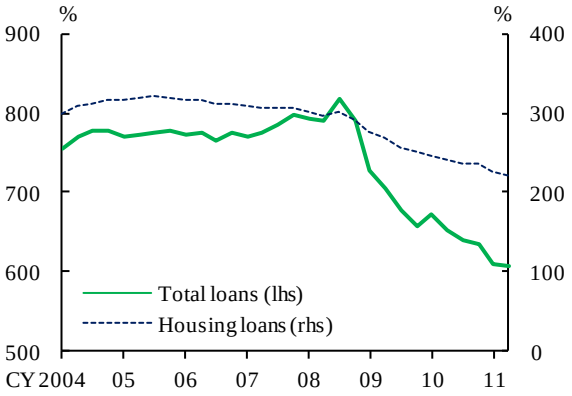


Sources: MIT Center for Real Estate, "Transactions based index"; S&P, "S&P/Case-Shiller home price indices."

Nonperforming loans of U.S. banks

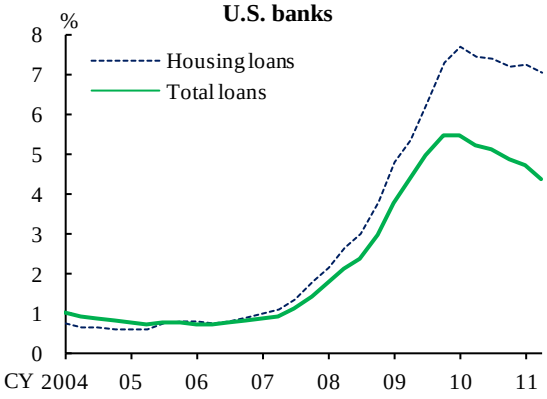
Meanwhile, U.S. banks have been reducing their loans outstanding and increasing their capital bases (Chart II-1-9). The ratio of NPLs to total loans outstanding peaked out around the end of 2009 and has been on a downtrend (Chart II-1-10). As banks have disposed of NPLs, their profitability has improved gradually and their risk-taking capacity has been recovering.

Chart II-1-9: U.S. bank loans outstanding[1]



Note: *1*. Ratios of loans to Tier I capital.
Source: FDIC.

Chart II-1-10: Nonperforming-loan ratios at U.S. banks



Source: FDIC.

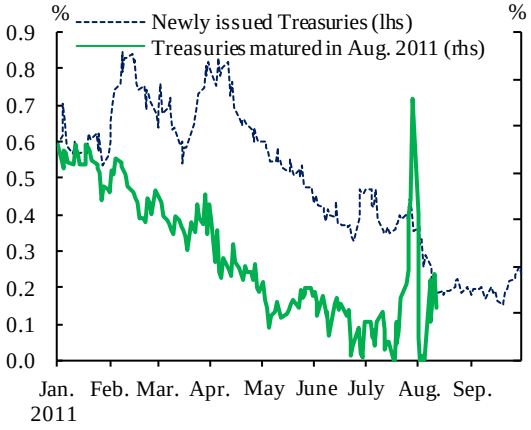
Nonetheless, the ratio of nonperforming housing loans remains high even in 2011.

While the employment and income situation has recovered only moderately, housing prices remain under strong downward pressure. In this situation, an increase in nonperforming housing loans remains a risk factor for banks. Moreover, U.S. housing loans are held not only by banks but also by investors in the form of securitized products. Due attention should be paid to the possibility that the decline in the quality of housing loans will have a broad impact on banks as well as other investors.

U.S. debt ceiling problem

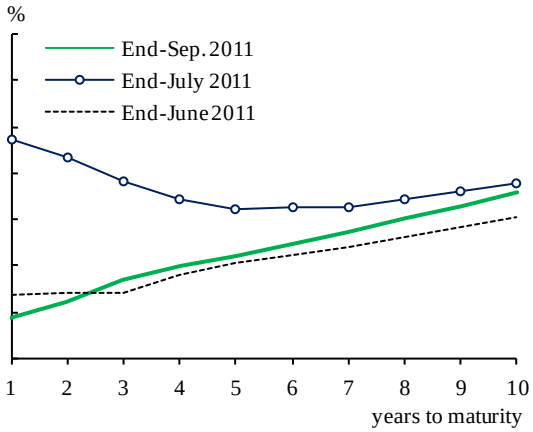
Also in the United States, a sovereign debt problem surfaced regarding the raising of the federal debt ceiling. As market participants feared that principal and interest of U.S. Treasuries would not be paid as scheduled, yields on Treasuries that matured in August 2011 surged and short-term sovereign CDS spreads temporarily exceeded long-term ones (Charts II-1-11 and II-1-12). In the money markets, repo rates also rose.[2] These rises in interest rates subsided after the U.S. Congress approved a rise in the debt ceiling at the last minute.

Chart II-1-11: 2-year U.S. Treasury yields



Source: Bloomberg.

Chart II-1-12: U.S. sovereign CDS spread curves



Source: Bloomberg.

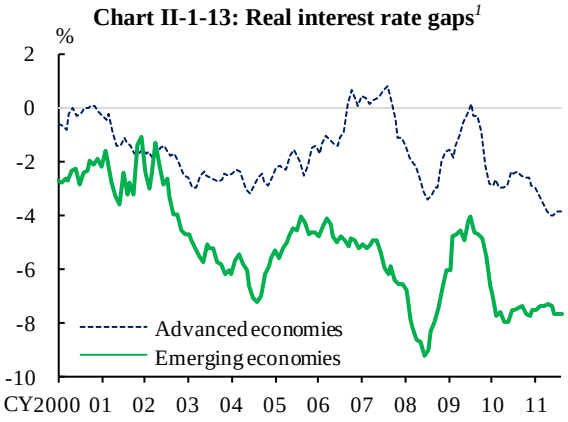
4. Developments in emerging economies

In emerging economies, although monetary tightening -- such as rises in their policy interest rates and implementation of lending regulations in response to growing inflationary pressure -- has been conducted, financial conditions remain accommodative judging from their low real interest rates relative to their potential economic growth

[2] At the end of July 2011, the Chicago Mercantile Exchange raised the collateral haircut for U.S. Treasuries in response to the U.S. debt ceiling problem.

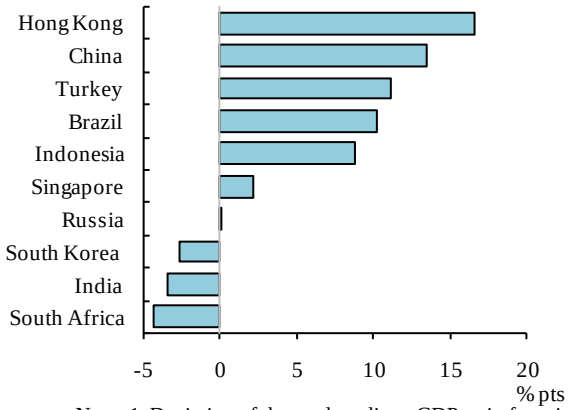
rates (Chart II-1-13). Under these circumstances, lending attitudes of banks in emerging economies have been positive. The ratio of total credit to GDP is above the historical trend in many emerging economies (Chart II-1-14). In China, where there is currently a large gap between the ratio and its trend, various measures have been taken since 2010 to restrain overheating in the real estate market. Despite these efforts, total bank loans -- including loans to the real estate and construction sectors -- continue to increase.[3] China's real estate market still shows apparent signs of overheating given the ongoing rise in real estate prices.

Chart II-1-13: Real interest rate gaps[1]



Note: *1*. Deviation of short-term real interest rates from potential economic growth rates (estimated by the HP filter). The latest data are as of August 2011.
Sources: Bloomberg; CEIC; IMF, "International financial statistics," "World economic outlook"; Ministry of Internal Affairs and Communications.

Chart II-1-14: Total credit-to-GDP ratios[1]



Note: *1*. Deviation of the total credit-to-GDP ratio from its long-term trend at 2010/Q4.
Source: Bank of England, "Financial stability report."

The economic growth rate in emerging economies has recently slowed somewhat reflecting the economic slowdown in the United States and Europe. In many of them, stock prices have declined and currencies have depreciated due to the growing future uncertainty. Attention should therefore be paid to whether emerging economies would make a soft landing with a good balance between price stability and economic growth.

B. Domestic economy and the balance sheets of firms and households

Effects of the Great East Japan Earthquake

As a result of the Great East Japan Earthquake that struck in March 2011, Japan's

[3] Some Chinese firms with limited access to domestic loans are conjectured to have received bank loans through their offices in Hong Kong, due to the tight regulation on total bank loans in China. In addition, China's local governments, which are prohibited from receiving bank loans, use investment companies such as "local government financial platforms" to receive loans. Such loans account for 10 percent of total bank loans.

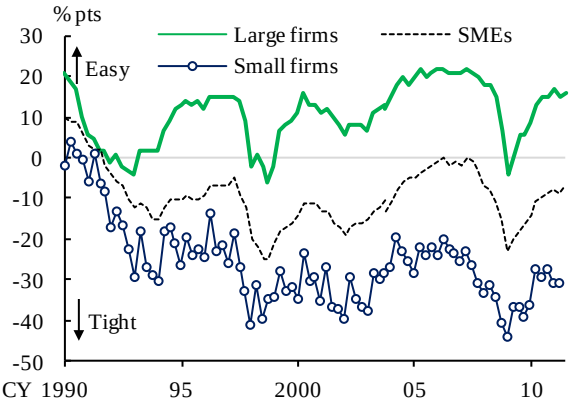
economy faced strong downward pressure. The earthquake and subsequent tsunami caused damage to capital stock in a broad area, from the Tohoku region to the Kanto region. According to the Cabinet Office, the impact on capital stock, mainly housing, stores, plants, and other buildings, is estimated at about 16.9 trillion yen. This is approximately 1.7 times as large as the damage caused by the 1995 Great Hanshin-Awaji Earthquake (9.9 trillion yen).

Damage to production facilities significantly curtailed production of firms in the disaster areas. Disruptions to supply chains impacted production in other areas. Moreover, the accident at the nuclear power plant led to constraints in electricity supply, mainly in the Kanto and Tohoku regions. Deterioration in business and household sentiment also exerted downward pressure on economic activity. Subsequently, the reconfiguration of supply chains progressed at a rapid pace. Supply-side constraints caused by the disaster have been mostly resolved at present.

Financial conditions of firms and households

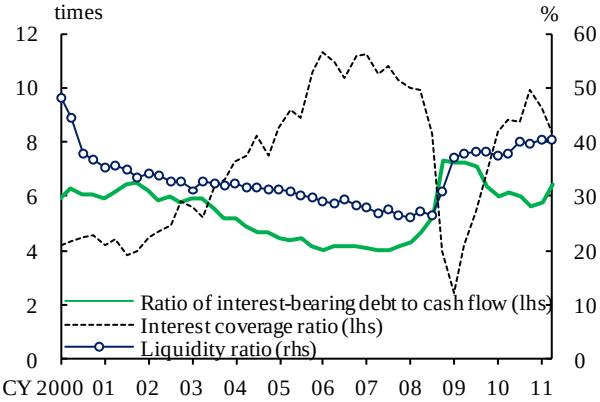
Firms have been maintaining the improving trend of financial conditions that existed before the disaster occurred (Chart II-2-1). Compared with the situation immediately after the Lehman shock, where funding conditions of firms deteriorated irrespective of their size and industrial type, the current case of deterioration in funding conditions is limited to some small and medium-sized firms.

Chart II-2-1: DIs of financial positions[1]



Note: *1*. "SMEs" stands for small and medium-sized enterprises.
Sources: Japan Finance Corporation, "Quarterly survey of small businesses in Japan"; BOJ, "*Tankan*."

Chart II-2-2: Large firms' debt servicing capacity[1]



Note: *1*. See Annex 2 for definitions of variables.
Source: Ministry of Finance, "Financial statements statistics of corporations by industry, quarterly."

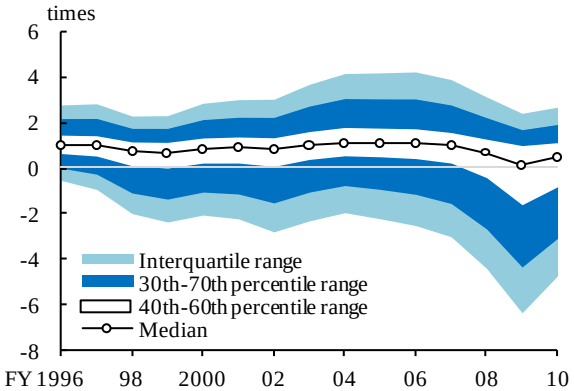
This situation reflects several factors. First, firms have taken a cautious stance in financing by, for example, maintaining a high level of on-hand liquidity, from the

experience of the Lehman shock. Large firms, in particular, have accumulated cash and deposits and kept their short-term debt servicing capacity at a sufficiently high level (Chart II-2-2). Given the decline in profits following the disaster, the amount of interest-bearing debt relative to cash flow and the interest coverage ratio (ICR), the latter of which represents the capacity to make interest payments in relation to profits, decreased somewhat. Nevertheless, a large amount of on-hand liquidity alleviated the deterioration in financial conditions triggered by the decline in profits.

Second, firms' funding conditions have been favorable. The issuance of CP and corporate bonds resumed shortly after the disaster, and banks' lending attitudes have remained positive (see Chapter III.B and C). This differs from the situation following the Lehman shock, when the deterioration in funding conditions was significant and persisted for a long time. Favorable funding conditions, together with firms' cautious financing stance, are considered to have averted tightening after the disaster.

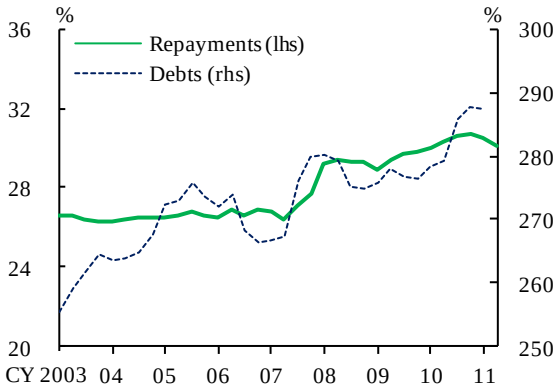
However, funding conditions of some firms, particularly small and medium-sized ones, have been severe (Chart II-2-1). Debt servicing capacity of some small and medium-sized firms, as seen in financial indicators such as the ICR, continues to deteriorate significantly (Chart II-2-3). The ratio of business-to-business credit to the amount of sales remains below the pre-financial crisis level. These weak business conditions and deterioration in financial conditions seem to have led to the tightening of funding conditions at small and medium-sized firms.

Chart II-2-3: SMEs' interest coverage ratio[1,2]



Notes: *1*. "SMEs" stands for small and medium-sized enterprises.
2. See Annex 2 for definitions of variables.
Source: CRD.

Chart II-2-4: Households' debt servicing capacity[1,2]



Notes: *1*. Ratios to disposable income. 4-month moving averages.
2. Households with housing loans are counted.
Source: Ministry of Internal Affairs and Communications, "Family income and expenditure survey."

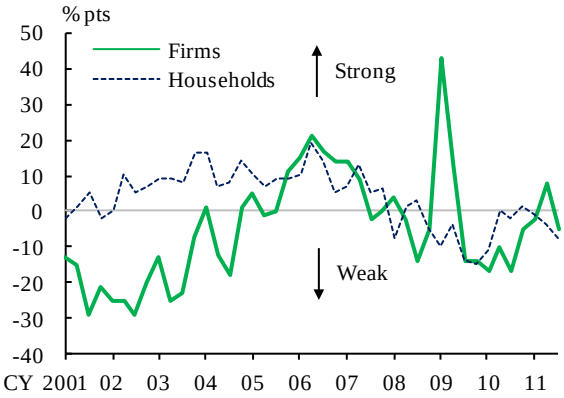
The employment and income situation of households remains severe due partly to the disaster. Under these circumstances, households' debt servicing capacity is deteriorating

gradually. Among households with housing loans, the ratio of principal and interest repaid to income has been relatively high (Chart II-2-4). The amount of debt to income has been on a gradual uptrend, reflecting sluggish income.

Still-sluggish borrowing demand

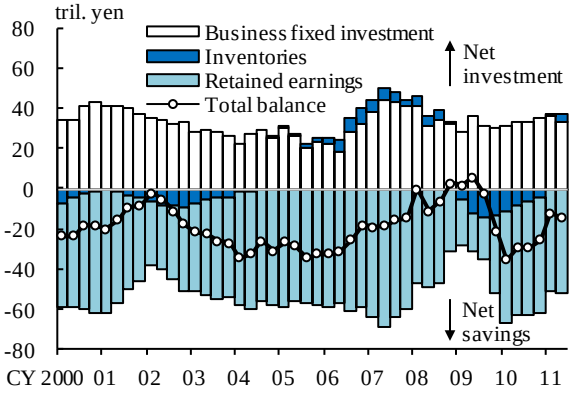
The amount of business fixed investment remains within the range of firms' cash flow, and borrowing demand for such investment has been sluggish (Chart II-2-5). As for the outlook, business fixed investment, including demand for rebuilding from the disaster, is likely to expand. Nevertheless, given that firms hold ample on-hand liquidity and cash flow will improve in tandem with economic recovery, firms' borrowing demand remains unlikely to increase (Chart II-2-6). Households' borrowing demand has been somewhat weak, given the severe income situation (Chart II-2-5).

Chart II-2-5: DIs of demand for loans



Source: BOJ, "Senior loan officer opinion survey on bank lending practices at large Japanese banks."

Chart II-2-6: Investment-saving balance of firms



Source: Ministry of Finance, "Financial statements statistics of corporations by industry, quarterly."

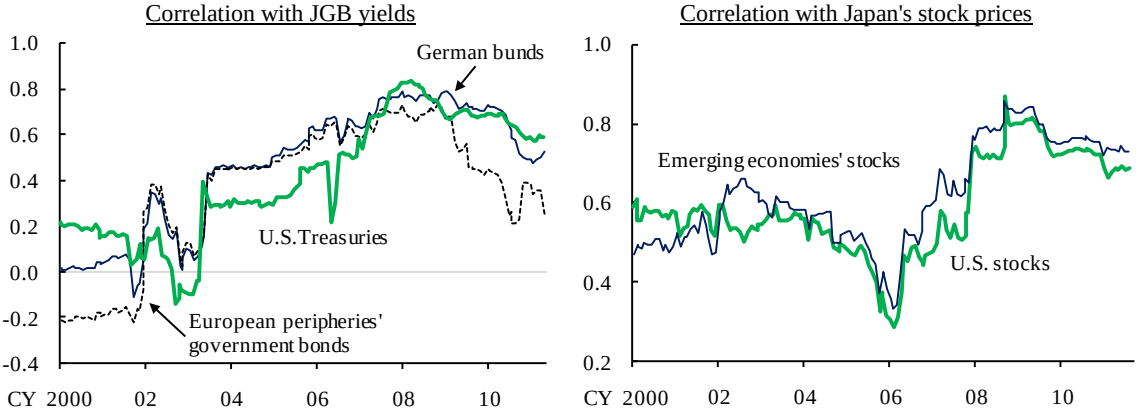
C. Issues related to Japan's financial system

Changes in the domestic and overseas environment could adversely affect Japan's financial system through two channels: the real economic channel and the financial channel.

For the real economic channel, a slowdown of the global economy would threaten corporate profits and lower the quality of domestic and overseas bank loans. Credit costs could increase particularly at financial institutions that extend a large amount of loans to small and medium-sized firms and households in severe financial conditions (see Chapter V.A).

With regard to the financial channel, there is the possibility that changes in overseas financial markets will spill over to domestic financial markets given the high correlations among the markets. Correlations between government bonds of Japan and peripheral European countries are low, whereas those of Japan and the United States or Germany are high (Chart II-3-1). Moreover, correlations between domestic and overseas stocks are high.

Chart II-3-1: Correlations between domestic and overseas financial markets[1]



Note: *1.* The vertical axis indicates correlation coefficients of monthly returns during a 3-year rolling window.
Sources: Bloomberg; JPMorgan.

As for securities held by Japan's banks, market risk associated with stockholdings remains large, while the share of JGB holdings continues to increase. Holdings of foreign government bonds by region indicate that investment in peripheral European countries is very small, at about 4.5 billion U.S. dollars as of end-June 2011, but that in the United States is large.[4] Moreover, life insurance companies have large holdings of foreign bonds. If overseas financial markets undergo changes, a fall in prices of foreign bonds could cause large losses at Japan's financial institutions that hold such bonds. Attention should also be paid to the possibility that such changes will adversely affect market prices of domestic bonds and stocks via market correlations and significantly impair their realized gains/losses on domestic securities holdings (see Chapter V.B).

[4] The figures are for the three major financial groups in Japan.

III. Examination of financial intermediation

Financial conditions of firms and households in Japan have generally continued to ease amid the low interest rate environment. Even since the disaster, issuing conditions for CP and corporate bonds have generally been favorable, and banks' lending attitudes have been positive. In the disaster areas, financial institutions have been providing funds to meet borrowing demand under public guarantee associated with the disaster. Behind banks' positive lending attitudes are their efforts to strengthen capital bases after the recent financial crisis and steady inflows of deposits. While borrowing demand of firms and households is sluggish, the major banks are actively undertaking overseas lending to seek a new source of profits and the regional banks are increasing loans outside their home prefectures. Banks' lending competition has intensified particularly in metropolitan areas, thereby reducing bank loan rates.

This chapter summarizes funding conditions of firms and households in both financial and loan markets and then examines financial intermediation in Japan and the related risks.

A. Financial conditions of firms and households

The Bank of Japan, as part of its comprehensive monetary easing policy, further enhanced monetary easing by increasing the total size of the Asset Purchase Program in March and August 2011.[5] In this situation, funding costs of firms and households remain on a downtrend. Interest rates paid by firms have generally been at low levels, and thus interest costs have been falling relative to corporate profits since the recent financial crisis. Moreover, households have benefited from low housing loan rates. These show that financial conditions of both firms and households have been easing.

B. Financial market conditions

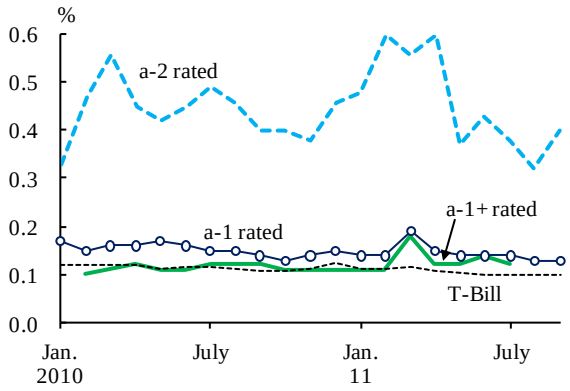
Issuing conditions for CP and corporate bonds

As for firms' market funding, issuing conditions for CP remain favorable in spite of the disaster. Although issuance rates on CP rose immediately after the disaster due to the

[5] The comprehensive monetary easing policy consists of (1) clarification of the virtually zero interest rate policy, (2) clarification of the policy time horizon based on the "understanding of medium- to long-term price stability," and (3) establishment of the Asset Purchase Program.

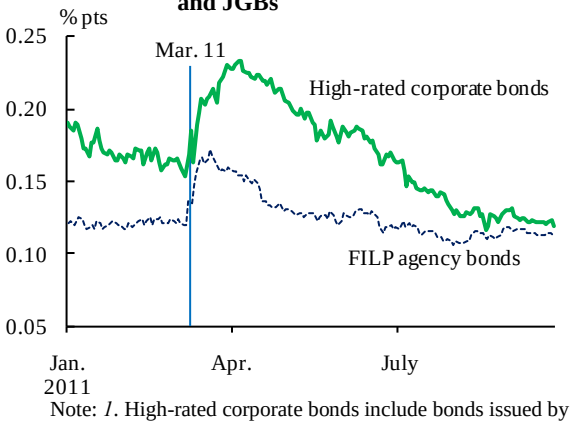
cautious stance of investors, the rise was small and only temporary partly due to the provision of ample funds by the Bank of Japan (Chart III-2-1).

Chart III-2-1: CP issuance rates[1,2]



Notes: *1*. Monthly average 3-month rates weighted by issuance volume.
2. The latest data are as of September 2011.
Sources: Japan Securities Depository Center; Japan Bond Trading.

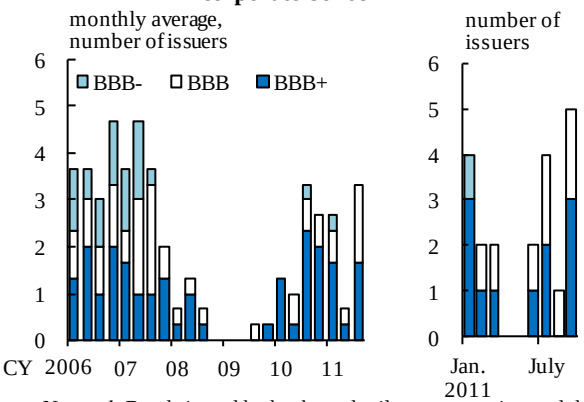
Chart III-2-2: Credit spreads between high-rated bonds and JGBs[1]



Note: *1*. High-rated corporate bonds include bonds issued by NTT, JR East, JR West, and JR Central. Fiscal Investment and Loan Program (FILP) agency bonds include bonds issued by the DBJ, JBIC, and JEHDRA.
Sources: Japan Securities Dealers Association; BOJ.

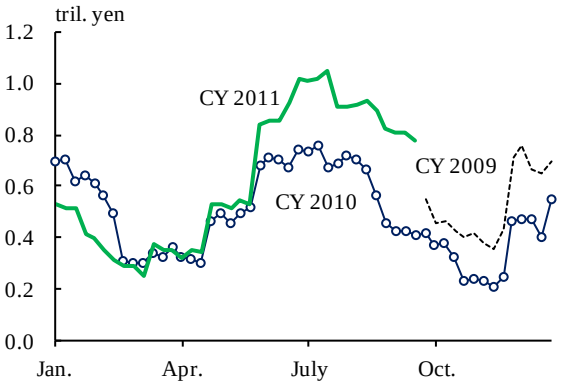
In corporate bond markets, issuance resumed shortly after a pause caused by a wait-and-see stance of both issuers and investors immediately after the disaster. Although some electric power company bonds were downgraded to speculative grade, other corporate bonds have not been increasingly downgraded. So far, the effects of the disaster on corporate bond markets overall have been limited. Credit spreads on bonds, including high-rated bonds, in the secondary market widened temporarily but narrowed gradually thereafter (Chart III-2-2). Recently, there has been an increased variety of issuers, as evident in a rise in issuance of BBB-rated bonds (Chart III-2-3). Issuing

Chart III-2-3: Number of issuers of BBB-rated corporate bonds[1,2]



Notes: *1*. Bonds issued by banks and railway companies, and those sold to individual investors are excluded.
2. The latest data are as of September 2011.
Sources: Capital Eye; I-N Information Systems.

Chart III-2-4: Amount outstanding of CP issued by electric power companies[1]



Note: *1*. The latest data are as of the week starting September 20, 2011.
Source: Japan Securities Depository Center.

conditions for corporate bonds remain favorable in Japan, despite the rises in credit spreads on corporate bonds in the United States and Europe. Nonetheless, issuing conditions for electric power company bonds, which consist of approximately 25 percent of the amount outstanding of corporate bonds issued, have been significantly affected by the accident at the nuclear power plant caused by the disaster. Although the widening of credit spreads on these bonds in the secondary market came to a halt, electric power companies still face difficulty in issuing corporate bonds. Therefore, some of them have shifted their funding source to CP issuance and bank loans (Chart III-2-4).

Real estate finance and derivative transactions

The impact of the disaster was also observed in other credit markets. Following the disaster, bond issuance by investment corporations had paused until the summer of 2011. Investment unit prices of Japan real estate investment trusts (J-REITs) temporarily dropped considerably in line with the stock prices decline after the disaster. Even in this situation, real estate investment corporations have actively increased their capital since late 2010, and therefore funding conditions have recently been relatively stable.

Amid the prolonged low interest rate environment, a wider range of investors have started to gradually expand their investment in high-yield structured products with embedded CDSs, such as credit-linked notes and credit-linked loans, and prompted an increasing volume of origination of these products. Especially since the disaster, reflecting the widening of CDS spreads, the origination of the products has gained momentum. In Japan, however, the size of these credit markets is small, and thus reference assets are limited to those with high credit ratings and liquidity. Moreover, complex credit instruments, such as collateralized debt obligations backed by CDSs (synthetic CDOs), seem to be rarely traded at present, unlike the time before the Lehman shock occurred.

C. Loan market conditions

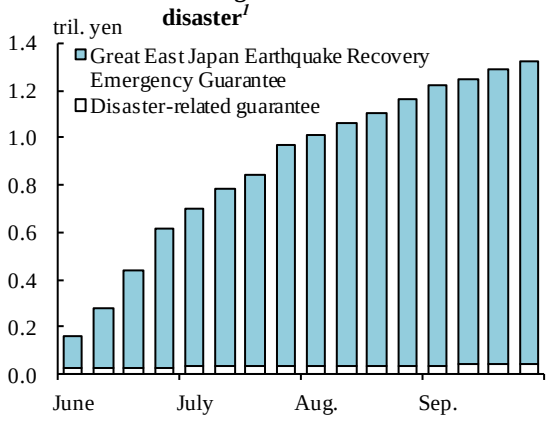
Financial intermediation in the disaster areas

In the disaster areas, further progress will be made to restore capital stock damaged by the disaster. While it is estimated that about 15 percent of the damaged capital stock will be covered by earthquake-related insurance, many firms and households in the areas will inevitably face a pressing need for additional loans, which are referred to as

"double loans."[6] The debt servicing capacity of disaster-stricken firms and households is deteriorating due to the drop in their profits and income.

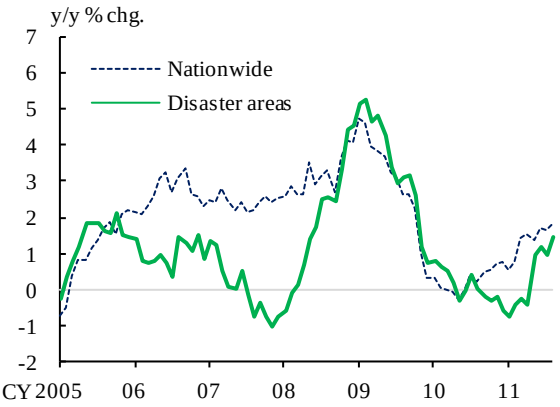
Financial institutions in the disaster areas experienced a considerable increase in credit costs in the second half of fiscal 2010 due to the disaster. They themselves also suffered serious damage, with many of their branches going out of service (see Box 2 for their responses to the disaster). Notwithstanding this severe situation, the financial institutions have been providing funds to meet borrowing demand under public guarantee associated with the disaster (Chart III-3-1). In the three prefectures that suffered the most severe damage (Iwate, Miyagi, and Fukushima), bank loans have recently been growing particularly to meet firms' demand for working capital (Chart III-3-2).

Chart III-3-1: Public guarantee associated with the disaster[1]



Note: *1*. Cumulative volume of guarantee accepted.
Source: Small and Medium Enterprise Agency.

Chart III-3-2: Loans outstanding of the regional banks[1]



Note: *1*. "Disaster areas" indicates loans outstanding of the regional banks with headquarters in the 3 severely damaged prefectures.
Source: BOJ, "Deposits, loans and bills discounted by prefecture (domestically licensed banks)."

Public financial institutions have established a new lending scheme for disaster-stricken firms and households and have been meeting their borrowing demand. The Bank of Japan has also been conducting funds-supplying operations for financial institutions in the disaster areas.[7]

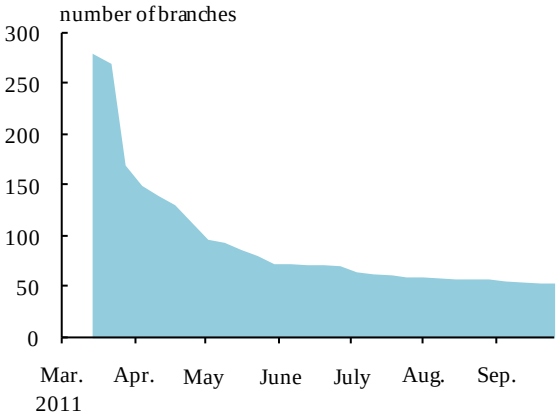
[6] As for the double-loan problem of households, a guideline on private liquidation of individual debtors has been put into effect. The treatment of the problem of small and medium-sized firms is currently under consideration by the national and local governments. In Iwate Prefecture, an institution to rebuild industries in the prefecture was established in September 2011 to purchase loan credit extended to disaster-stricken firms.

[7] In April 2011, the Bank decided to conduct the funds-supplying operation to support financial institutions in the disaster areas and the relaxation of the collateral eligibility standards, in order to support the financial institutions in their initial efforts to meet the funds demand for restoration and

Box 2: Business continuity arrangements of financial institutions

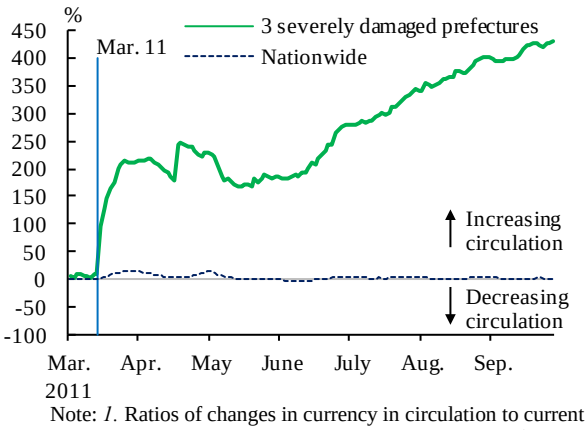
Many branches of financial institutions in the disaster areas, mainly along the coast, were destroyed and flooded, and consequently they were forced to close and their ATMs went out of operation (Chart B2-1). However, immediately after the disaster, financial institutions resumed their business by setting up temporary branches and sought to restore their branches that had closed. In cooperation with financial institutions in other areas, they continued to meet cash demand by allowing depositors without passbooks to withdraw deposits (Chart B2-2). The Bank of Japan supported financial institutions in the disaster areas by providing funds swiftly and sufficiently. Moreover, financial institutions responded constructively to the need of disaster-stricken firms and households for consultation about forbearance and for bridge loans to make salary payments. The experience of the disaster proved that the robustness of the financial infrastructure as well as payment and settlement infrastructures was underpinned by dedicated actions of concerned parties after the disaster, and by routine preparations of financial institutions, such as business continuity planning.

Chart B2-1: Number of closed bank branches in the disaster areas[1]



Note: *1.* Financial institutions with headquarters in the 6 prefectures of the Tohoku region and Ibaraki Prefecture are counted (total number of headquarters and branches is about 2,700).
Source: Financial Services Agency.

Chart B2-2: Currency in circulation by region[1]



Note: *1.* Ratios of changes in currency in circulation to current account balances at the BOJ (the balances are fixed at the level of March 10, 2011). Changes are accumulated from the beginning of March 2011. For "3 severely damaged prefectures," the regional banks headquatered in those prefectures are counted.
Source: BOJ.

Nevertheless, the disaster brought to the fore the following two issues regarding financial institutions' business continuity arrangements. The first issue is the sufficiency of disaster scenarios. Many financial institutions have taken account of earthquakes in

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rebuilding. As of September, the Bank provided 448.9 billion yen in funds through the operation.

their disaster scenarios and made necessary preparations, including ensuring business continuity staff and backup sites. What they have not necessarily assumed is a situation in which widespread areas suffer damage from tsunami all at once and the social infrastructure, including electricity supply and transportation, breaks down for a certain period.

The second issue is the effectiveness of business continuity arrangements. In a scenario where a disaster hits widespread areas and/or disaster-stricken financial institutions cannot carry out their usual business for a certain period, it becomes necessary to reexamine and reconsider the location of their branches and backup sites, the capability of business continuity staff to assemble, and the capacity of their private power generation to operate continuously. For example, it is necessary to monitor and test the capability of business continuity staff to assemble when assuming a scenario in which public transportation goes out of operation for a certain period.

Taking into account these issues, financial institutions should review disaster scenarios and enhance the effectiveness of business continuity arrangements not only within the financial industry but also in cooperation with a wide range of concerned parties, including providers of outsourced services and of various infrastructures.

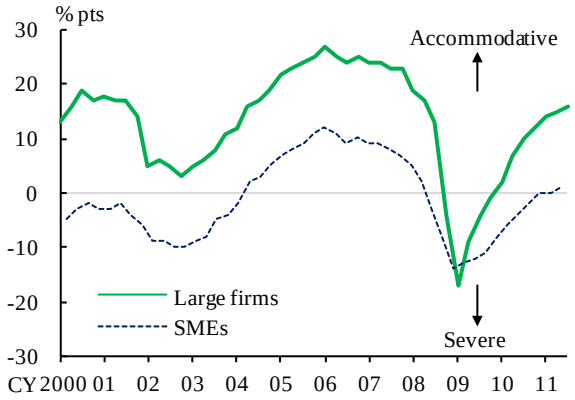
Banks' positive lending attitudes

Banks' lending attitudes remain positive, and firms continue to see them as being on an improving trend. Even following the disaster, the diffusion index (DI) of financial institutions' lending attitudes indicated a net increase in "easing" for loans to large firms and was flat for loans to small and medium-sized firms (Chart III-3-3). Since the Lehman shock, banks have strengthened their capital bases by increasing capital and accumulating retained earnings. This might have contributed to the positive lending attitudes following the disaster.

Nevertheless, loans outstanding after the disaster merely showed a slower year-on-year rate of decline (Chart III-3-4). Unlike the situation when the Lehman shock occurred, market funding conditions have been favorable recently, with the exception of conditions for electric power companies, and firms as a whole have secured sufficient on-hand liquidity. At the time of the Lehman shock, demand for working capital arose on a large scale particularly in the exporting industry, and as a result loans outstanding per large manufacturing firm increased (Chart III-3-5). Since the disaster, however, loans per borrower to both manufacturing and nonmanufacturing sectors seem not to

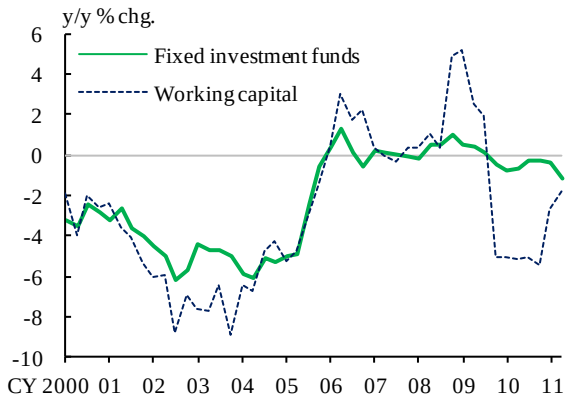
have increased.

Chart III-3-3: DIs of lending attitudes of financial institutions[1]



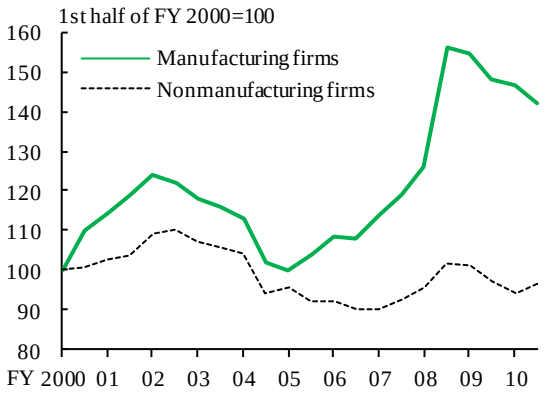
Note: *1*. "SMEs" stands for small and medium-sized enterprises.
Source: BOJ, "*Tankan*."

Chart III-3-4: Corporate loans outstanding by purpose



Source: BOJ, "Loans and bills discounted by sector."

Chart III-3-5: Loans outstanding per borrower[1]



Note: *1*. Loans to large firms.
Source: BOJ, "Loans and bills discounted by sector."

Banks' lending strategy by type of loans

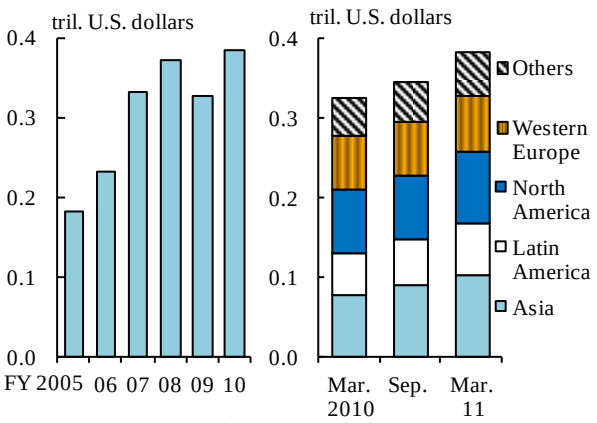
Behind the banks' positive lending attitudes lie sluggish borrowing demand of domestic firms and households as well as steady inflows of deposits. In order to maintain an amount of loans, the major banks are increasing overseas loans and the regional banks are extending loans outside their home prefectures.

The share of the major banks' overseas loans in their total loans increased from about 10 percent in 2005 to near 15 percent in March 2011.[8] In addition to the rise in loans to emerging economies such as Asia, loans to the United States have been growing recently (Chart III-3-6). Moreover, the major banks' investment in foreign bonds has

[8] The figures are for the three major financial groups in Japan.

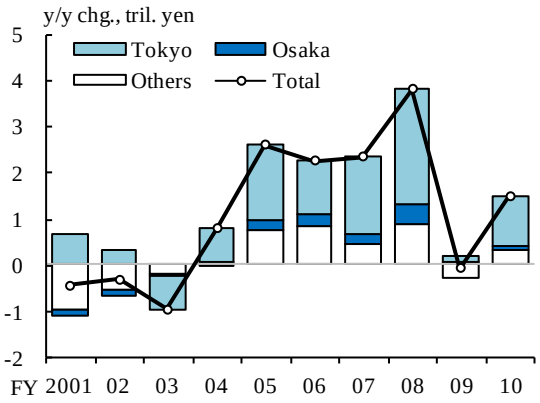
been expanding since fiscal 2010. These increases in credit extension to overseas have diversified the major banks' profit source but made their business conditions more susceptible to developments in overseas economies.

Chart III-3-6: Overseas loans of the major banks[1]



Note: *1*. The 3 major financial groups are counted on a non-consolidated basis.
Sources: Bloomberg; published accounts of each group.

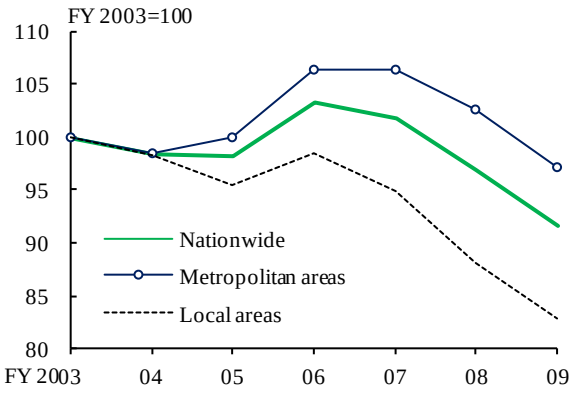
Chart III-3-7: The regional banks' loans outside their home prefectures



Source: BOJ, "Deposits, loans and bills discounted by prefecture (domestically licensed banks)."

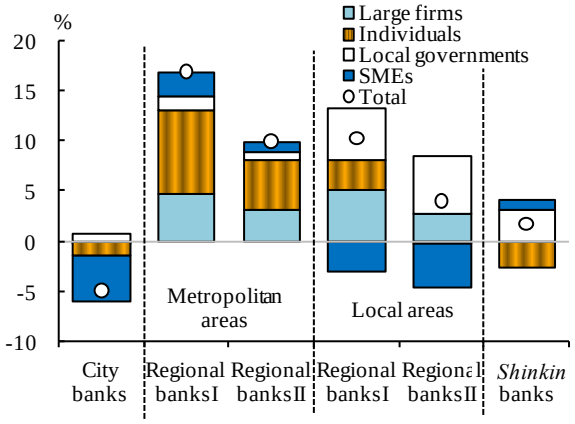
On the other hand, the regional banks have been expanding loans outside their home prefectures since the mid-2000s (Chart III-3-7). Since business conditions of firms in local areas are relatively severe, borrowing demand of small and medium-sized firms -- main borrowers from the regional banks -- has become sluggish (Chart III-3-8). The regional banks therefore are increasing loans to large firms in metropolitan areas such as Tokyo and are expanding business to their neighboring prefectures (Chart III-3-9).

Chart III-3-8: Sales at small and medium-sized firms[1]



Note: *1*. Metropolitan areas consist of the south Kanto, Tokai, and Kinki regions.
Source: Small and Medium Enterprise Agency, "Basic survey on small and medium enterprises."

Chart III-3-9: Loans outstanding by type and region[1,2]

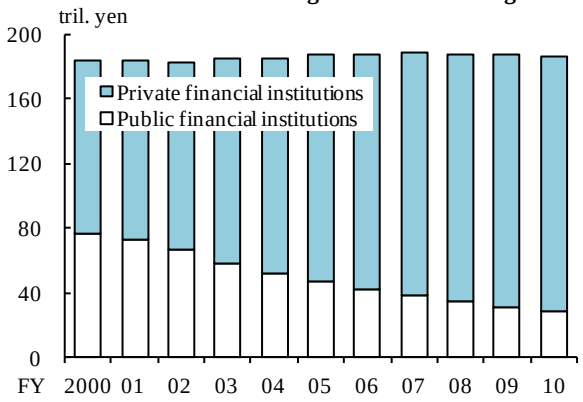


Notes: *1*. Changes from the end of fiscal 2005 to that of fiscal 2010.
2. See Note in Chart III-3-8.
Source: BOJ, "Loans and bills discounted by sector."

In home prefectures, the regional banks have been increasing loans to local governments. Among local governments, there is refinancing demand that was previously met by the Fiscal Loan Fund and growing demand for temporary borrowing due to falling tax income. This trend of loan expansion to local governments is particularly evident at the regional banks in local areas where private demand for funds is weak.

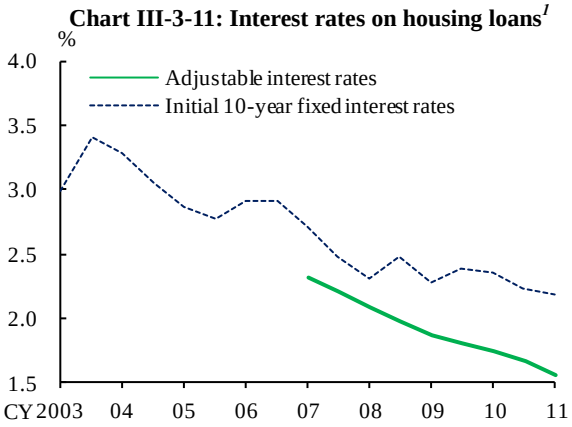
Housing loans are an area on which both the major banks and the regional banks are focusing. Banks have expanded housing loans outstanding by meeting demand for loans in place of the former Government Housing Loan Corporation (Chart III-3-10). Against the background of prolonged low interest rates, banks are increasingly offering preferred discounts mainly on housing loans with lowered base rates, such as adjustable rate housing loans. As a result, interest rates on housing loans dropped to a record-low level (Chart III-3-11).

Chart III-3-10: Outstanding amount of housing loans[1]



Note: *1*. Public financial institutions include Flat 35, a loan extended by the Japan Housing Finance Agency.
Source: BOJ, "Flow of funds accounts."

Chart III-3-11: Interest rates on housing loans[1]



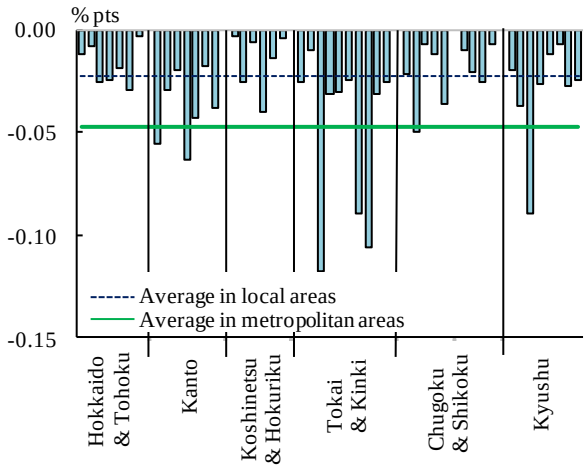
Note: *1*. Averages of effective interest rates (offered rates minus preferred discounts) of loans newly extended by the major banks and the regional banks.
Source: Japan Financial News, "Nikkin report."

The regional banks' efforts to maintain an amount of loans by, for example, actively extending loans outside their home prefectures have set off a decline in domestic loan rates through intensified lending competition. This declining trend in loan rates is particularly evident in metropolitan areas where lending competition is severe (Chart III-3-12).[9] Moreover, a decline in the regional banks' loan rates is attributable to

[9] The factor narrowing interest rate margins on loans by the regional banks is calculated by cross-sectional regression. A dependent variable is the change in the margins. Independent variables are squared changes in the regional banks' loan share within each prefecture and the change in the ratio of loans to large firms and local governments. For every type of variable, the change is the difference between fiscal 2009 and fiscal 2004. The larger the squared changes in loan share, the greater the lending competition.

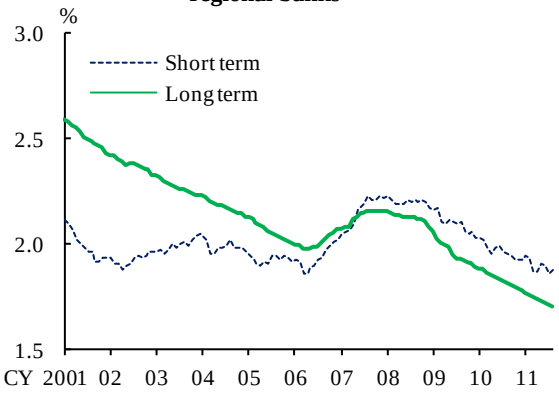
increases in loans to local governments and housing loans, the margin on which is narrower than that on loans to small and medium-sized firms. As a result of these changes in the regional banks' loan portfolios, their long-term loan rates have been lower than short-term loan rates since 2007 (Chart III-3-13).[10]

Chart III-3-12: Contribution of lending competition to narrowing margins on loans[1,2]



Notes: *1*. The bar graph shows estimated contribution of the competition factor (changes in each bank share) to a decline in interest rate margins on loans in the last 5 years averaged by prefecture. The horizontal lines indicate average contribution by region. The regional banks are counted.
2. See Note in Chart III-3-8.
Source: BOJ calculations.

Chart III-3-13: Interest rates on loans of the regional banks[1]



Note: *1*. On the basis of outstanding loans.
Source: BOJ, "Average contract interest rates on loans and discounts."

Measures for growing business areas

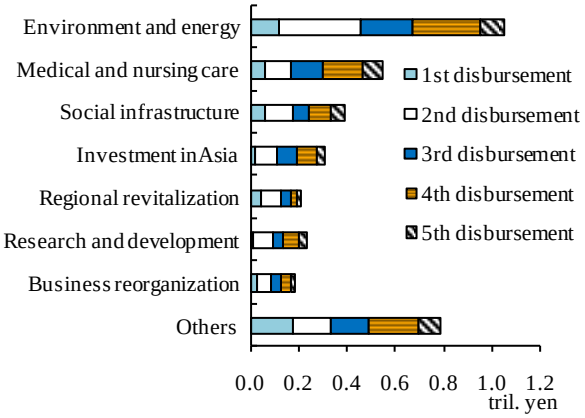
Corporate borrowing demand remains sluggish as a whole. Nevertheless, new demand for borrowing has arisen in growing business areas such as the environment and energy business and the medical and nursing care business. In June 2010, the Bank introduced a funds-provisioning measure to support strengthening the foundations for economic growth, in order to support lending and investment by financial institutions in growing business areas.[11] The Bank provided funds under this measure on five occasions up to

[10] The regional banks' short-term loans appear to consist of a relatively large share of loans to small and medium-sized firms. The regional banks' loan rates for small and medium-sized firms are falling by a relatively small degree, partly due to the deterioration in these firms' debt servicing capacity as indicated in Chart II-2-3. This is pointed out as another factor behind the phenomenon in which long-term loan rates are lower than short-term loan rates.

[11] Through the funds-provisioning measure to support strengthening the foundations for economic growth, the Bank supplies long-term funds at a low interest rate against eligible collateral to financial institutions in accordance with their lending and investment efforts to strengthen the foundations for economic growth.

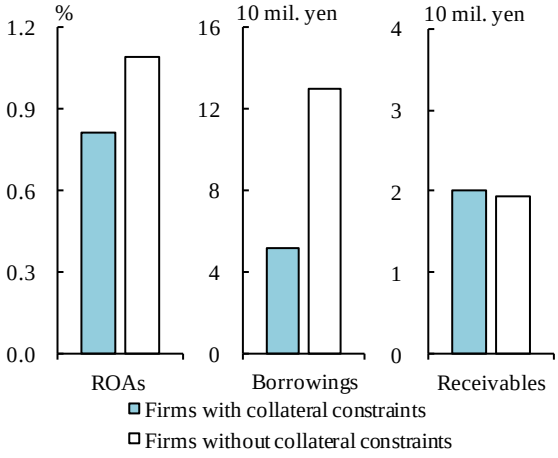
September 2011, and the outstanding amount of funds provided increased to near 3 trillion yen. The past five cases in which the Bank provided funds confirmed that financial institutions receiving such funds have extended loans and invested in growing business areas -- particularly in the environment and energy business -- in the amount of 200 million yen per project with an average term of about 6.5 years (Chart III-3-14).

Chart III-3-14: Distribution of investment and lending in growing business areas[1]



Note: *1*. Based on reports financial institutions made to the BOJ.
Source: BOJ.

Chart III-3-15: Characteristics of firms with collateral constraints[1]



Note: *1*. Firms with collateral constraints stand for firms that are estimated to be short of collateral with respect to their borrowing demand.
Sources: CRD; BOJ calculations.

Moreover, the Bank decided in June 2011 to establish a new line of credit for equity investment and asset-based lending (ABL). In Japan, borrowing with real estate set as collateral has long been the main channel. Therefore, firms without enough real estate collateral are likely to face borrowing constraints. Small and medium-sized firms with borrowing constraints, however, hold receivables as large as those held by firms without borrowing constraints (Chart III-3-15). If movable assets and monetary claims could be smoothly liquidated by collateralizing them, the firms' funding conditions would improve.

IV. Risks in the financial system

In Japan, macro risk indicators have not confirmed an accumulation of financial imbalances, as the ratio of total credit to GDP continues to hover around the long-term trend. Risks borne by Japan's financial institutions have generally been restrained relative to capital, as the credit cost ratio and the NPL ratio have remained lower than those of their U.S. and European counterparts.

However, as correlations between domestic and overseas financial markets have been high, there is the possibility that changes in overseas markets will affect Japan. Japan's banks and life insurance companies continue to hold a high level of market risk associated with their stockholdings and have gradually increased market exposure through investment in JGBs and foreign bonds. Attention should therefore be paid to the following facts. Business conditions of financial institutions have become susceptible to developments in both domestic and overseas financial markets. Moreover, despite the recent decrease in banks' credit costs, the quality of bank loans has not improved and the NPL ratio of consumer finance companies has been on an increasing trend.

This chapter examines some macro risk indicators associated with the financial system and then considers risks observed in financial markets. Furthermore, it summarizes risks to which banks and other types of financial institutions are exposed.

A. Macro risk indicators

Macro financial imbalances and risk-taking of firms and households

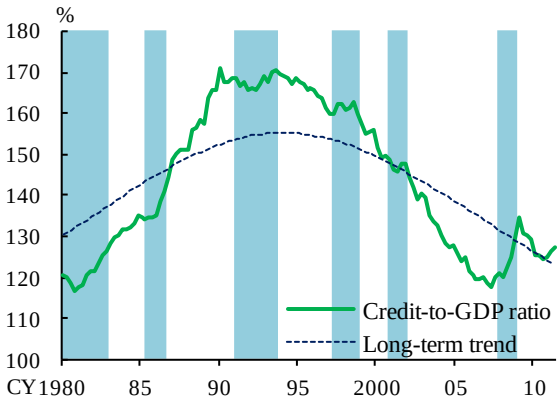
The ratio of total credit to GDP in Japan continues to hover around the long-term trend (Chart IV-1-1). The balance between total credit (loans and bond investment) extended by financial institutions to the private nonfinancial sector and economic activity has not confirmed an accumulation of financial imbalances. A slight increase in the ratio in early 2011 was caused by a decline in nominal GDP relative to total credit after the disaster.

Risk-taking indicators are examined to assess the macro risk associated with the investment behavior of firms and households.[12] The risk-taking indicator for firms

[12] The risk-taking indicator for firms is calculated by multiplying the ratio of corporate investment spending to operating profits by the size of corporate spending. The indicator for households is calculated by multiplying the ratio of household investment spending (housing investment and durable goods consumption) to disposable income by the size of household spending. The indicator for banks is the ratio of loans outstanding to operating profits from core business. In all cases, the

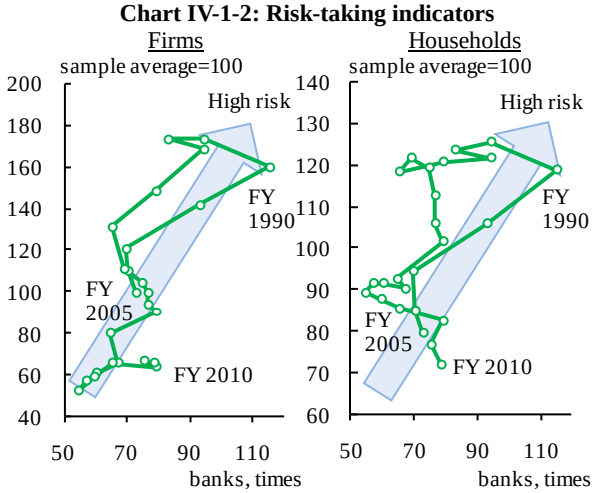
declined from the bursting of the bubble through the mid-2000s and since then has remained steady (the vertical axis in the left-hand side of Chart IV-1-2). The indicator for households has been on a moderate downtrend since 1990 (the vertical axis in the right-hand side of Chart IV-1-2). The indicator for banks, counterparts of firms and households, remained at a low level throughout the 2000s (the horizontal axis in Chart IV-1-2). There has been no accumulation of financial imbalances in the current situation, which is in contrast to the bubble period when firms and households as well as banks took on excessive risks.

Chart IV-1-1: Total credit-to-GDP ratio[1]



Note: *1.* Shaded areas indicate recession periods.
Sources: Cabinet Office, "National accounts"; BOJ, "Flow of funds accounts."

Chart IV-1-2: Risk-taking indicators



Sources: Cabinet Office, "National accounts"; Ministry of Finance, "Financial statements statistics of corporations by industry, quarterly."

Signs of financial overheating and systemic risk observed in stock markets

Excessive lending and investment, which could result in an accumulation of financial imbalances, can be inferred from market data. For example, the cumulative excess return (CER) on bank stocks relative to the Tokyo Stock Price Index (TOPIX) tends to increase in a situation where the markets evaluate profits of banks relatively optimistically. The CER on Japan's bank stocks rose abruptly in the late 1980s and then declined through the late 1990s (Chart IV-1-3). Since the 2000s, while the CERs on U.S. and U.K. financial stocks have experienced a surge and plunge, the CER on Japan's bank stocks has been flat and does not suggest excessive market expectations for banks' profits.

Next, the perspective of stock markets on systemic risk in the financial sector is

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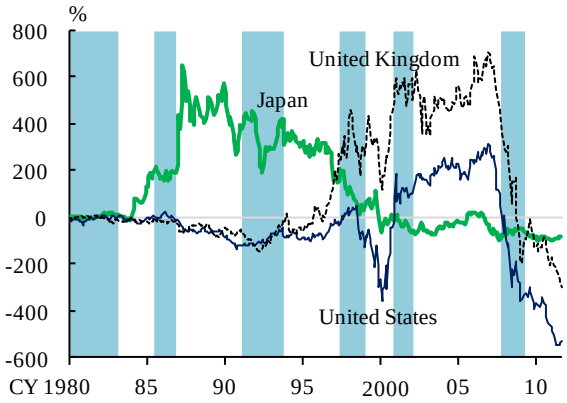
larger the risk-taking indicators, the more active the risk-taking in investment. In Chart IV-1-2, a move to the upper right side implies that both firms/households and banks are taking on risks and the macro financial risk is accumulating.

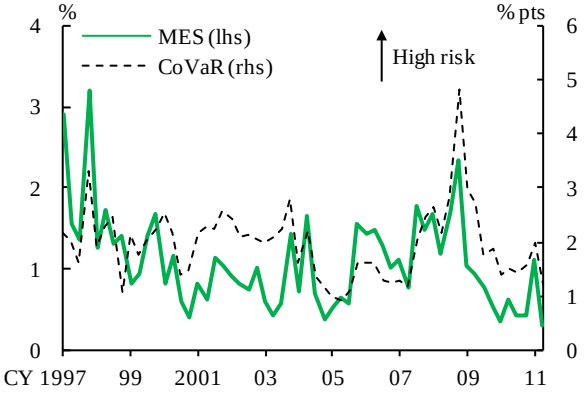
examined. The conditional value-at-risk (CoVaR) and marginal expected shortfall (MES) are indicators of systemic risk recognition extracted from stock prices. CoVaR shows changes in VaR of aggregate financial stocks if stock prices of a financial institution plunge.[13] As CoVaR becomes larger, the markets recognize that the stress occurred at individual financial institutions could widely spread to the entire financial sector. On the other hand, MES shows expected losses at individual financial institutions if VaR of aggregate financial stocks exceeds a threshold.[14] As MES becomes larger, the markets recognize that adverse effects from the stress occurred in the financial sector on individual financial institutions' corporate value could also become larger. Both indicators rose temporarily due to the disaster but have recently been at levels lower than those at the time of the Lehman shock (Chart IV-1-4). As far as these indicators are concerned, therefore, there is no sign of systemic risk recognition growing in stock markets.

Chart IV-1-3: Cumulative excess returns on financial stocks[1,2]



Notes: *1*. Differences between the cumulative returns on financial stocks (bank stocks for Japan) and those on the corresponding market index.
2. Shaded areas indicate recession periods for Japan.
Source: Global Financial Data.

Chart IV-1-4: Systemic risk indicators[1]



Note: *1*. Listed banks and major securities companies are counted. Ratios to Tier I capital.
Source: BOJ calculations.

Financial Cycle Indexes

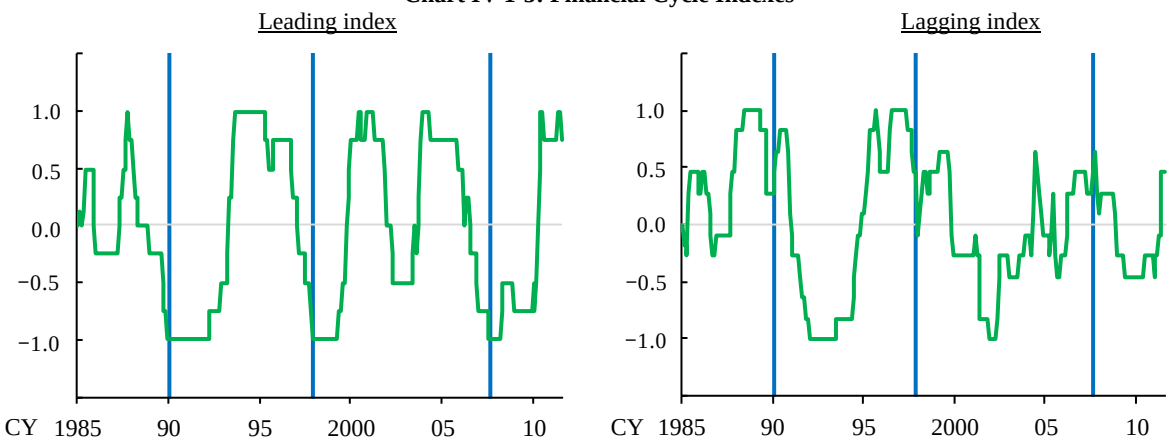
The Financial Cycle Indexes are DIs used to identify signs of future instability in the

[13] CoVaR in Chart IV-1-4 shows the average of how much financial stock VaR would increase from a normal state if individual financial institutions face a stress with a 5 percent probability of occurrence. For details, see Adrian, Tobias and Markus K. Brunnermeier, "CoVaR," *Federal Reserve Bank of New York Staff Report*, No. 348, September 2011.

[14] MES in Chart IV-1-4 shows the average of how much market value of stocks at individual financial institutions would fall if the rate of decline in market value of aggregate financial stocks exceeds the rate of decline with a 5 percent probability of occurrence. For details, see Acharya, Viral V., Lasse H. Pedersen, Thomas Philippon, and Matthew Richardson, "Measuring systemic risk," Federal Reserve Bank of Cleveland Working Paper, No. 10-02, March 2010.

financial system.[15] A change in the leading index from a positive figure to a negative one indicates that the financial system may become unstable in the near future. The same movement in the lagging index indicates that the financial system might have already become unstable. Recently both indexes have been positive, and neither shows a sign of instability in the financial system (Chart IV-1-5).

Chart IV-1-5: Financial Cycle Indexes[1]



Note: *1*. The left, middle, and right vertical lines indicate the collapse of Japan's asset price bubble, the default of Sanyo Securities, and the outbreak of the U.S. subprime problem, respectively.
Source: BOJ calculations.

At present, therefore, these indicators do not provide any solid evidence of accumulating financial imbalances.[16]

B. Risks observed in financial markets

Domestic financial markets remain slightly nervous, amid increasing flight from risk assets to safe assets seen worldwide through the summer of 2011. Stock prices continue to be susceptible to foreign investors' attitudes regarding investment. Government bond yields have comoved across advanced economies.

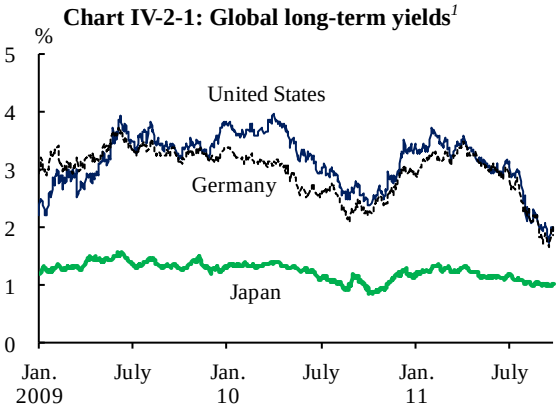
[15] The Financial Cycle Indexes has been developed by the Bank of Japan's Financial System and Bank Examination Department, based on a concept similar to that of the index of business conditions released by the Cabinet Office. The Indexes combines a number of financial and economic indicators, such as stock prices and DIs for lending attitude of financial institutions, to assess the phase of the financial cycle. For details on the Indexes, see Kamada, Koichiro and Kentaro Nasu, "The Financial Cycle Indexes for early warning exercise," Bank of Japan Working Paper, No. 2011-E-1, April 2011.

[16] Measures to assess macro financial risk have not yet been fixed. Therefore, accumulation of financial imbalances should be assessed multilaterally using a number of indicators.

1. Developments in financial markets

Domestic stock prices have fallen in line with U.S. and European stock prices and moved in the lowest range recorded since the Lehman shock. Meanwhile, following decreases in U.S. and German government bond yields, 10-year JGB yields have fallen, albeit at a relatively modest pace; they have recently been at around 1 percent (Charts II-1-1 and IV-2-1). The yen has appreciated against the U.S. dollar, surpassing the previous record high marked immediately after the disaster (Chart II-1-2).

Chart IV-2-1: Global long-term yields[1]



Note: *1.*10-year yields on government bonds.
Source: Bloomberg.

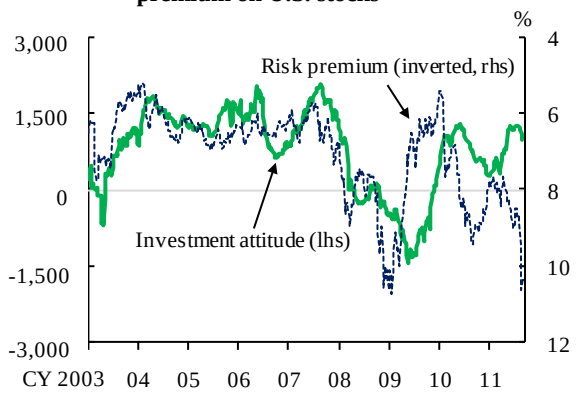
2. Risks implied in stock markets

Global correlations of stock prices

Given the high correlations between domestic and overseas financial markets, domestic stock prices are susceptible to overseas market developments. Foreign investors have changed their attitudes toward investment in Japan's stocks in view of the risk premium on U.S. stocks, and domestic stock prices tend to rise when foreign investors become net buyers (Chart IV-2-2).

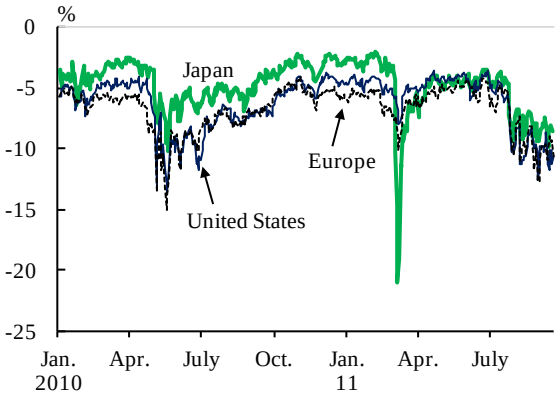
While domestic and overseas stock prices remain weak, risk reversals (the difference in implied volatility between call and put options) are more skewed toward negative territory in Japan, the United States, and Europe (Chart IV-2-3). This shows that investors have taken positions after having noted weakness in stock prices. The risk reversals of stock prices have shown similar developments to date among Japan, the United States, and Europe, and thus attention should continue to be paid to the possibility that instability in overseas stock markets will spread to domestic stock prices.

Chart IV-2-2: Foreign investors' investment attitude and risk premium on U.S. stocks[1,2,3]



Notes: *1*. Investment attitude indicates the average attitude toward investment in Japan's stocks for the past 48 weeks.
2. Risk premium is calculated by using the 3-stage dividend discount model.
3. The latest data are as of the week starting August 22, 2011.
Sources: Bloomberg; Consensus Economics; QUICK, "QUICK survey system report"; Thomson Reuters; Tokyo Stock Exchange; BOJ calculations.

Chart IV-2-3: Risk reversals of stock prices[1]

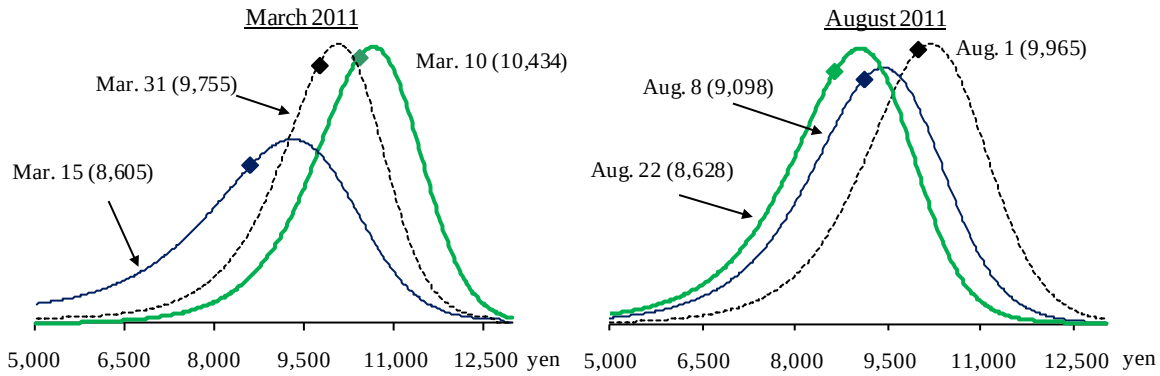


Note: *1*. Nikkei 225 options for Japan; S&P 500 options for the United States; EuroSTOXX 50 options for Europe.
Sources: Bloomberg; BOJ calculations.

Risk recognition of a decline in stock prices

The implied short-term distribution of the Nikkei 225 Stock Average extracted from the option market indicated that, immediately after the disaster, the mode of distribution shifted largely toward price declines and the left tail thickened, both of which showed stronger risk recognition of a decline in stock prices (the left-hand side of Chart IV-2-4). Nevertheless, at the end of March 2011, as the extent of disaster damage became clear, market participants relaxed their vigilance against a decline in stock prices. As a result, the skewness gradually decreased and stock prices briefly regained stability. Thereafter,

Chart IV-2-4: Implied distributions of the Nikkei 225[1,2,3]



Notes: *1*. Nikkei 225 options for June 2011 are used in the left chart. March 10 is the day before the Great East Japan Earthquake, and March 15 is the day when the Nikkei Index reached its trough immediately after the earthquake.
2. Nikkei 225 options for December 2011 are used in the right chart. August 8 is the day after the announcement of the downgrade of the U.S. Treasuries, and August 22 is the day when the Nikkei 225 reached its trough of August 2011.
3. Figures and markers in the chart indicate the closing prices of each day.
Sources: Bloomberg; BOJ calculations.

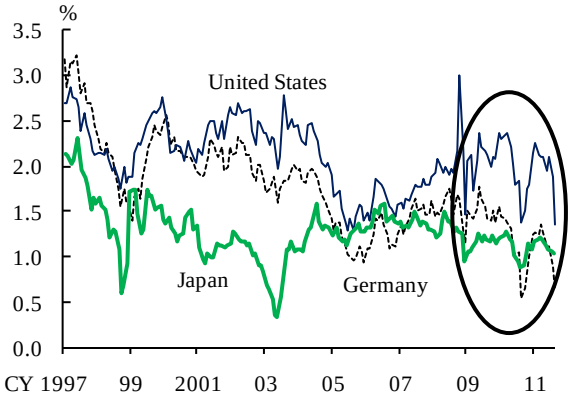
vigilance against a decline in stock prices reemerged in domestic stock markets, reflecting growing future uncertainty around the globe. The reemergence was confirmed in August, when the left tail of the distribution thickened again (the right-hand side of Chart IV-2-4).[17]

3. Risks implied in government bond markets

Global correlations of government bond yields

Government bond markets have been highly correlated globally as well. There seem to be global correlations among real interest rates reflecting the real economy and also among term premiums on long-term holdings of government bonds (Chart IV-2-5).[18,19] These developments partly reflect the fact that globally active investors have rebalanced their bond portfolios and imply that JGB yields are affected to some extent by changes in the risk-taking behavior of foreign investors. The fact that Japan's financial institutions have recently increased their foreign bond investment may also have contributed to the high global correlations to some extent.

Chart IV-2-5: Global correlation of term premiums[1]



Note: *1*. The latest data are as of August 2011.
Sources: Bundesbank; FRB; Japan Bond Trading; U.S. Department of the Treasury; BOJ calculations.

As seen in the downgrade of sovereign debt ratings of the United States and European

[17] At the same time, the left tail of the implied short-term distribution of U.S. stock prices also thickened. Therefore, as indicated in the aforementioned risk reversals, risk recognition of a decline in Japan's and U.S. stock prices might have comoved and strengthened.

[18] The *ex post* real interest rates (nominal long-term interest rates minus the realized inflation rate) of advanced economies followed similar developments in terms of the level and fluctuation.

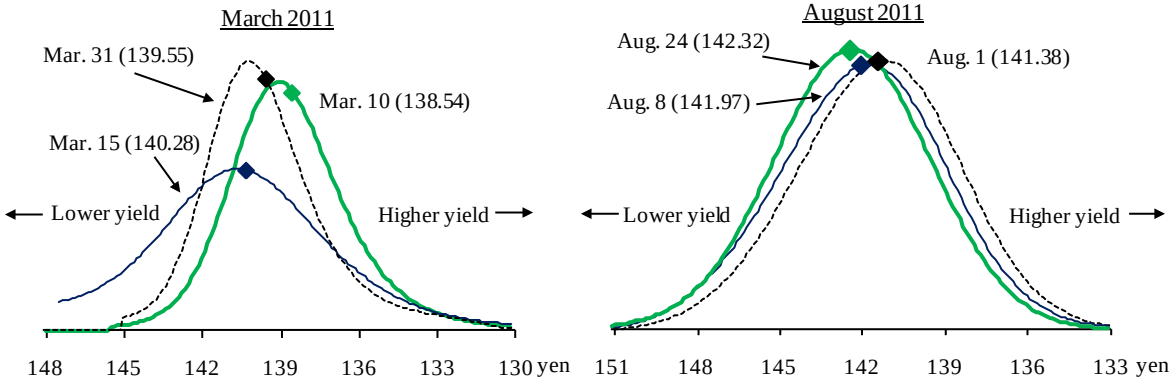
[19] Since the estimates of term premiums depend on assumptions, the level of the premiums should be interpreted with some latitude.

countries and also Japan, market participants' views on advanced economies' fiscal conditions have recently grown more severe. Although JGBs are held mostly by domestic investors, attention should be paid to potentially large comovements in yields on domestic and overseas government bonds given the wariness toward problems and ratings of advanced economies' sovereign debt.

Risk recognition of an uptrend in yields

Also in government bond markets, risk recognition of market fluctuations grew. In the implied short-term distribution of government bond futures, the mode shifted toward a yield decline and both tails of the distribution widened due to a flight to safe assets immediately after the disaster (the left-hand side of Chart IV-2-6). The fact that both the left and right tails of the distribution widened implies that market participants recognized as a tail risk -- the risk of large yield fluctuations albeit is low in probability -- a yield rise caused by an increase in JGB issuance after the disaster as well as a yield decline caused by a deterioration in the economic outlook.[20]

Chart IV-2-6: Implied distributions of JGB futures[1,2,3]



Notes: *1*. JGB futures options for June 2011 are used in the left chart. March 10 is the day before the Great East Japan Earthquake, and March 15 is the day when JGB futures for June 2011 reached their peak immediately after the earthquake.
2. JGB futures options for December 2011 are used in the right chart. August 8 is the day after the announcement of the downgrade of the U.S. Treasuries, and August 24 is the day after the announcement of the downgrade of JGBs.
3. Figures and markers in the chart indicate the closing prices of each day.
Sources: Bloomberg; BOJ calculations.

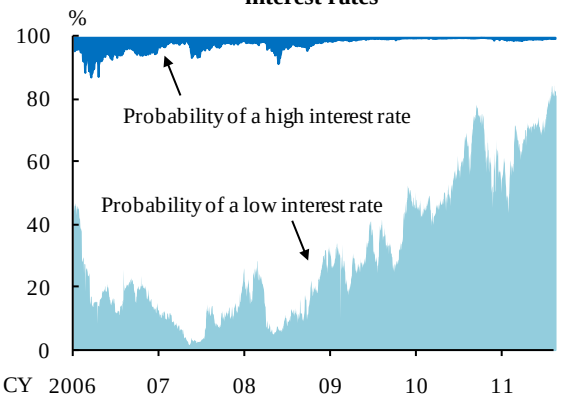
As discussions on the first supplementary budget for fiscal 2011 did not include an increase in issuance of JGBs, vigilance against the risk of a yield rise subsided to some extent (the right-hand side of Chart IV-2-6). At the time of a decline in long-term yields in August

[20] In Chart IV-2-6, while the right tail of the distribution remained unchanged before and after the disaster, the mode of the distribution shifted toward a yield decline immediately after the disaster, indicating that the risk of surge in interest rates grew large temporarily.

2011, the right tail of the implied short-term distribution did not thicken. This indicated that concern over the risk of a yield rise has not increased even though sovereign debt problems surfaced in Europe and Japan's sovereign debt rating was downgraded.

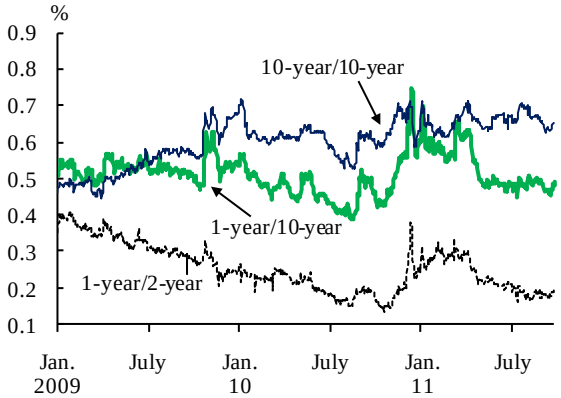
The abovementioned distribution of government bond futures shows risk recognition for the next 3 months.[21] In what follows, market perception of risk of yield fluctuations is examined from a long-term perspective. The probability of the 6-month yen Libor to be 3 percent or higher (the probability of a high interest rate) 2 years ahead -- calculated by using price information on an interest rate cap (an option to hedge the future interest rate rise) -- has recently declined to around 0.5 percent (Chart IV-2-7). The probability of Libor to be 0.5 percent or lower (the probability of a low interest rate) remains on an uptrend. In Japan's markets for interest rate derivatives, expectations that low interest rates would continue remain dominant. The implied volatility of swaptions (options on interest rate swaps) has been more or less unchanged or has declined slightly, with the exception of super-long-term swaptions whose implied volatility remains at a high level (Chart IV-2-8). Sovereign CDS spreads are widening gradually in Japan given the growing awareness of sovereign risk overseas, but remain at a low level (Chart IV-2-9). As these market indicators showed, there has been no sign of growing vigilance against an interest rate rise in the long term.[22]

Chart IV-2-7: Probability of high and low interest rates[1,2]



Notes: *1*. Probability of 2-year-ahead 6-month Libor to be 0.5 percent or lower is defined as the probability of a low interest rate, and that to be 3 percent or higher is defined as the probability of a high interest rate.
2. The latest data are as of August 31, 2011.
Sources: Bloomberg; Japan Bond Trading; BOJ calculations.

Chart IV-2-8: Implied volatility of swaptions[1]

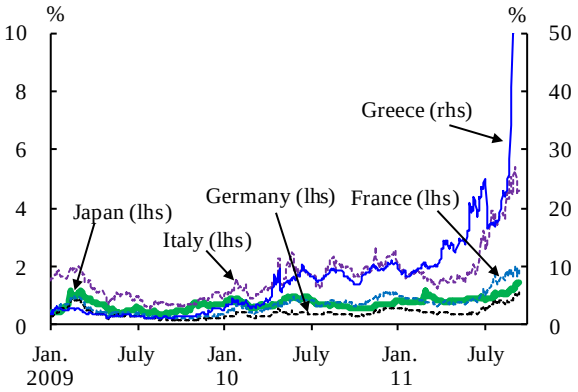


Note: *1*. *m*-year/*n*-year indicates a swaption with an *m*-year expiry period and an *n*-year swap tenor.
Source: Bloomberg.

[21] In Chart IV-2-6, the implied distributions of government bond futures for March 2011 were extracted from JGB futures options for June 2011, while the implied distributions for August 2011 were from the options for December 2011.

[22] Since market liquidity of instruments such as swaptions and sovereign CDSs is not necessarily high, these should be interpreted with some latitude.

Chart IV-2-9: Sovereign CDS spreads[1,2]



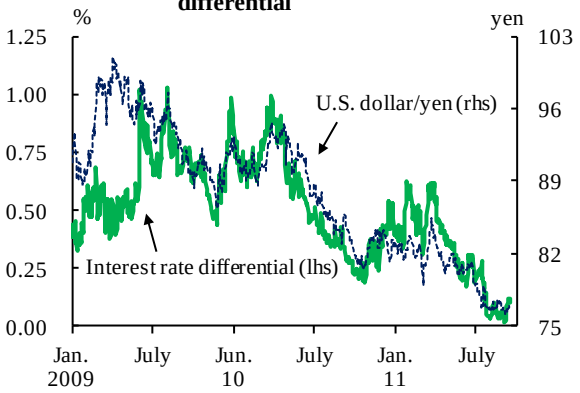
Notes: *1*. 5-year CDSs.
2. The latest data of Greece are as of September 15, 2011.
Source: Bloomberg.

4. Risks implied in foreign exchange markets

Risk recognition of the yen's appreciation

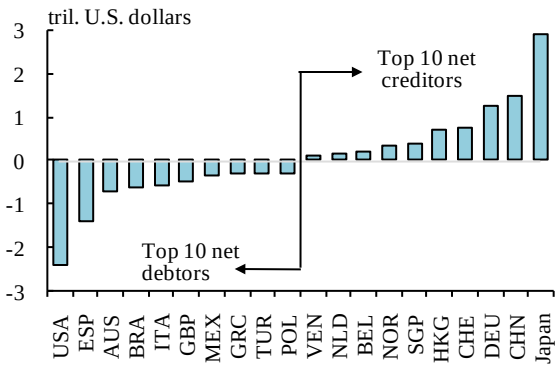
The yen continues to appreciate against the U.S. dollar, partly reflecting the narrowing of the interest rate differential between Japan and the United States (Chart IV-2-10). In particular, the yen tends to be bought against the dollar and the euro, against the background of sovereign debt problems in Europe and concern about a further economic slowdown in the United States and Europe (see Box 3 for details on the trading behavior of retail investors as a factor behind changes in foreign exchange rates). The yen is preferred as a safe currency backed by massive net external assets, and therefore, market participants have become increasingly aware of a risk of the yen's appreciation when strain intensifies in foreign exchange markets (Chart IV-2-11).

Chart IV-2-10: U.S. dollar/yen rate and interest rate differential[1]



Note: *1*. Interest rate differential is the 2-year yield of U.S. Treasuries over JGBs.
Source: Bloomberg.

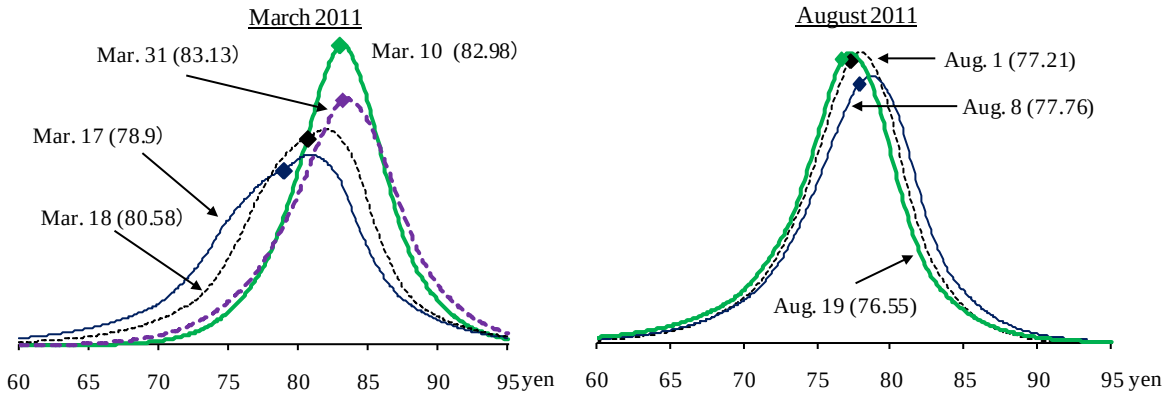
Chart IV-2-11: External assets and liabilities[1,2]



Notes: *1*. See Annex 2 for country specification.
2. As of the end of 2009.
Source: IMF, "International financial statistics."

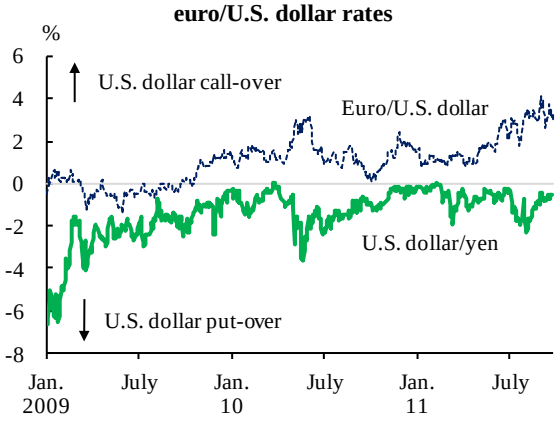
Immediately after the disaster, the implied short-term distribution of the U.S. dollar/yen rate shifted toward the yen's appreciation as a whole and the left tail of the distribution widened significantly, thereby suggesting strong vigilance against the risk of a surge in the yen (the left-hand side of Chart IV-2-12). In response to the concerted intervention in foreign exchange markets conducted by major countries after the emergency conference call of G7 finance ministers and central bank governors, the skewness of the distribution toward the yen's appreciation decreased briefly. Foreign exchange intervention following the disaster had an effect of easing market participants' concern over the risk of a surge in the yen in the short run.

Chart IV-2-12: Implied distributions of U.S. dollar/yen rate[1,2,3]



Notes: *1*. Figures are calculated from 3-month options.
2. March 10 is the day before the Great East Japan Earthquake, March 17 and 18 are the days before and after the foreign exchange intervention, respectively. August 8 is the day after the announcement of the downgrade of the U.S. Treasuries, and August 19 is the day when the yen marked a record high against the U.S. dollar.
3. Figures and markers in the chart indicate the closing prices of the New York market each day.
Sources: Bloomberg; BOJ calculations.

Chart IV-2-13: Risk reversals in U.S. dollar/yen and euro/U.S. dollar rates



Source: Bloomberg.

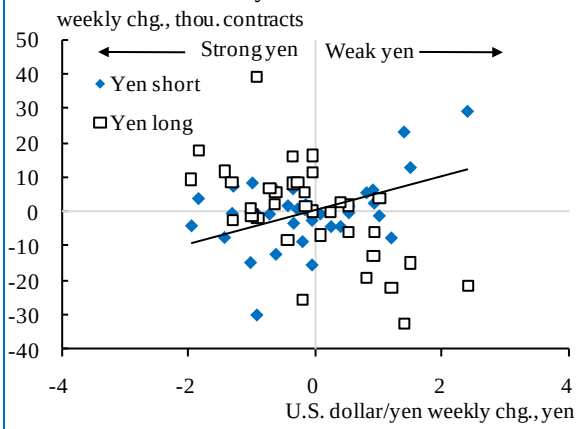
Thereafter, in view of sovereign debt problems in Europe, market concern has reemerged over appreciation of the yen through the summer of 2011 (the right-hand side

of Chart IV-2-12). However, the left tail of the distribution has not thickened as market participants are aware of foreign exchange intervention. The Risk reversal in the U.S. dollar/yen rate showed a slight narrowing of dollar put-over, implying a somewhat lower awareness about the yen's appreciation (Chart IV-2-13).

Box 3: Trading behavior of retail investors in foreign exchange markets

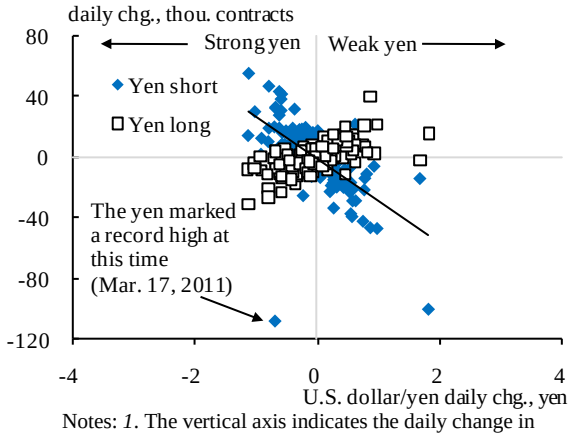
As the yen continues to appreciate, the impact on the yen market of trading behavior of Japan's retail investors cannot be ignored. They are considered to take contrary positions. When the yen's appreciation becomes clearer, they take contrary positions in foreign exchange margin trading and increase their short positions in the yen. This contrasts with an increase in speculators' long positions in the yen shown in the International Monetary Market (IMM) futures net positions of noncommercial investors (Charts B3-1 and B3-2). Such investment positions of the retail investors are considered to restrain fluctuations in the yen market, but when taken amid the rapid appreciation of the yen, loss-cuts (unwinding of short positions) are induced and the yen market could show larger fluctuations.[23] By August 2011, the upper limit on the leverage ratio of

Chart B3-1: Net IMM futures positions and U.S. dollar/yen rates[1,2,3]



Notes: *1*. The vertical axis indicates the weekly change in IMM positions.
2. Solid line indicates the trend line of the yen's short position.
3. Sample period is CY 2011. The latest data are as of the week starting September 26, 2011.
Source: Bloomberg.

Chart B3-2: Foreign exchange margin trading and U.S. dollar/yen rates[1,2,3]



Notes: *1*. The vertical axis indicates the daily change in margin trading positions.
2. Solid line indicates the trend line of the yen's short position.
3. Sample period is CY 2011.
Sources: Bloomberg; Tokyo Financial Exchange.

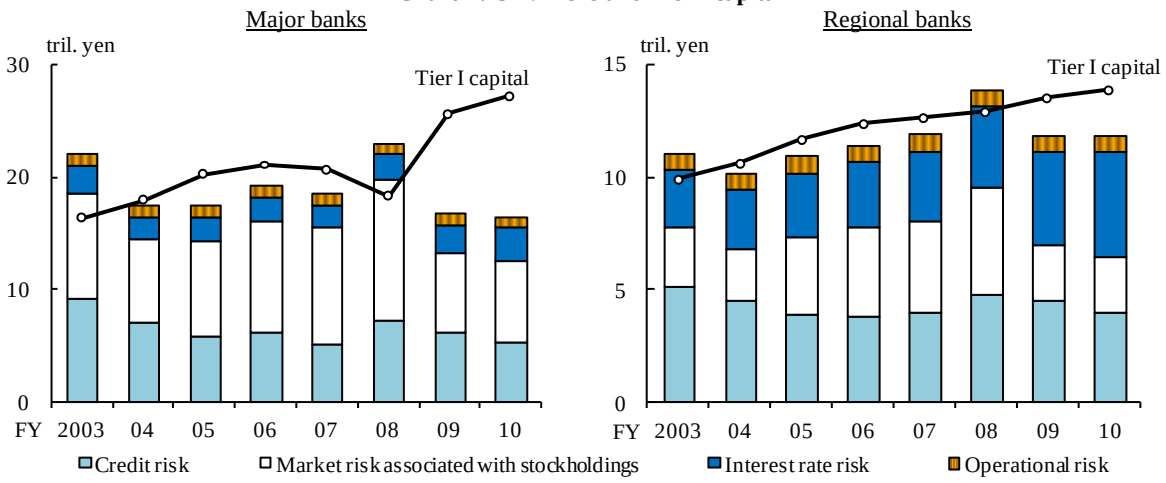
[23] In the recent phase of the yen's appreciation, the yen has tended to appreciate sharply, immediately after the close of the New York market, when liquidity is low. In the market, it is believed that margin trading to cut losses triggered a sudden appreciation of the yen. For example, in May 2010, when the flash crash caused a stock market plunge, and in March 2011, when the yen marked a record high at that time against the U.S. dollar, data on margin trading indicated that retail investors substantially unwound their short positions in the yen.

margin trading was lowered from 50 to 25 times, but attention should continue to be paid to the impact of retail investors' active margin trading on the fluctuations in the yen market.

C. Risks in the banking system

The amount of risks borne by Japan's banks relative to Tier I capital has continued to decrease (Chart IV-3-1). Their capital bases have been steadily reinforced through accumulated retained earnings. Funding liquidity risk has been restrained for both domestic and foreign currencies. However, despite the low credit costs, the quality of bank loans has not improved. Moreover, market risk associated with stockholdings has been large, and interest rate risk has been accumulating reflecting the increase in JGB investment.

Chart IV-3-1: Risks and Tier I capital[1]



Note: *1*. Credit risk: unexpected loss with a 99 percent confidence level. Market risk associated with stockholdings: value-at-risk with a 99 percent confidence level and 1-year holding. Interest rate risk: 100 basis point value. Operational risk: 15 percent of gross profits.
Source: BOJ.

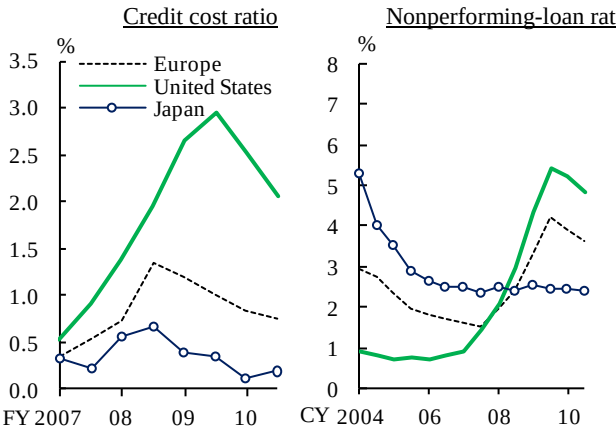
1. Credit risk

Decline in credit costs of the banking sector

Banks' credit cost ratio rose slightly in the second half of fiscal 2010 due to the disaster, but the ratio for the entire fiscal year turned out to be lower than the previous year, and the NPL ratio declined slightly (Chart IV-3-2). The credit cost ratio and the NPL ratio of Japan's banks remained low compared with those of U.S. and European banks. As for bank loans outstanding by borrower classification, the decline in the ratio of "normal"

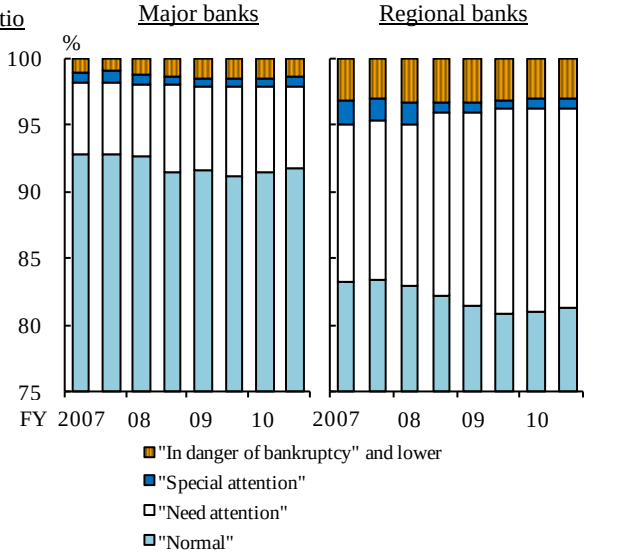
loans to total loans and the increase in the ratio of "need attention" loans -- trends that had continued since fiscal 2008 -- came to a halt in fiscal 2010 (Chart IV-3-3). A factor behind this was the improvement in firms' debt servicing capacity, as described in Chapter II.B. In addition to this factor, various policy measures contributed to a decline in credit costs.[24] Due to the effects of these measures and others, the number of corporate bankruptcies nationwide did not increase markedly after the disaster.

Chart IV-3-2: Credit risk indicators[1,2]



Notes: *1*. Left chart: net write-off for the United States, and credit costs of major banks for Europe.
2. Right chart: ratios for Japan are counted in March and September; those for the United States are in June and December; and those for Europe are each December (the latest data are as of June).
Sources: ECB, "Consolidated banking data," "EU banking sector stability"; FDIC; BOJ.

Chart IV-3-3: Loans outstanding by borrower classification



Source: BOJ.

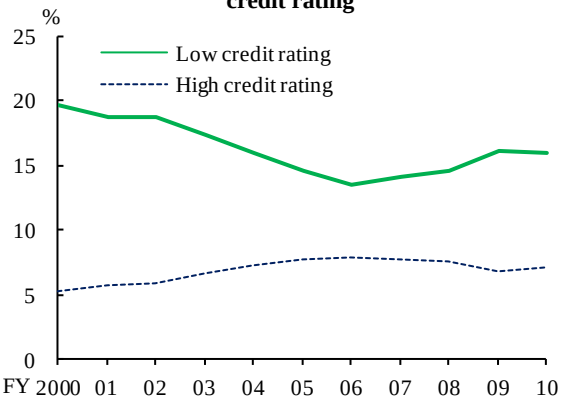
Decline in bank loans' quality

There is a possibility that the quality of bank loans extended to some small and medium-sized firms is declining. The credit rating of small and medium-sized firms based on financial indicators shows that the share of bank loans to firms with low creditworthiness has been rising since fiscal 2007 (Chart IV-3-4). While firms' debt servicing capacity has been improving as a whole, the debt servicing capacity of borrowing firms classified as "need attention" or below seems to have remained in a deteriorated state. In fact, the rate at which borrowing firms are upgraded from "need

[24] Restructured loans are not treated as loans requiring "special attention" if borrowing firms have reasonable and feasible fundamental reconstruction programs. The Financial Services Agency relaxed such requirements for restructured loans in November 2008. Furthermore, in December 2009, the requirements for restructured loans to borrowers were relaxed. As a result, loans to borrowers that satisfied certain conditions are not treated as restructured loans during the first year of restructuring.

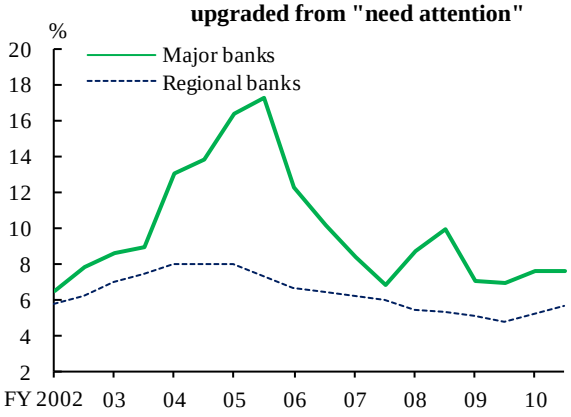
attention" to "normal" at the regional banks, which hold many loans to small and medium-sized firms, has remained at a lower level than before (Chart IV-3-5).

Chart IV-3-4: Share of bank loans to SMEs by credit rating[1,2]



Notes: *1*. "SMEs" stands for small and medium-sized enterprises.
2. "High credit rating" and "low credit rating" stand for the highest 3 and lowest 3 categories among 10 classified categories based on the credit ratings, respectively.
Source: CRD.

Chart IV-3-5: Rate of borrowing firms being upgraded from "need attention"



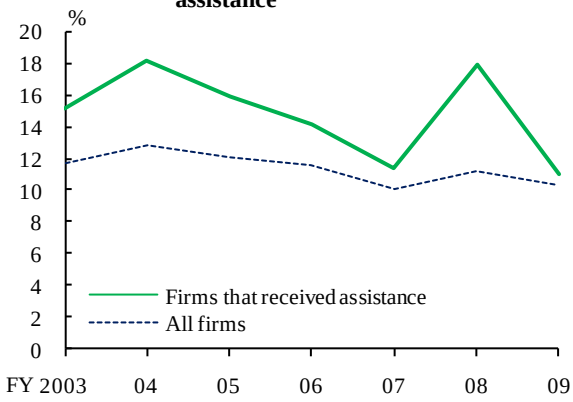
Source: BOJ.

This situation suggests that if improvements in small and medium-sized firms' business conditions do not proceed, significant credit costs relative to banks' profits could be generated. Banks are required to accurately and continuously gauge the actual business conditions of borrowing firms after extending loans and planning reconstruction programs and to encourage these firms to improve their business conditions, thereby pushing up the rate of upgrading of borrower classification (see Box 4 for specific efforts being made to improve business conditions).

Box 4: Financial institutions' efforts to improve the business conditions of borrowing firms

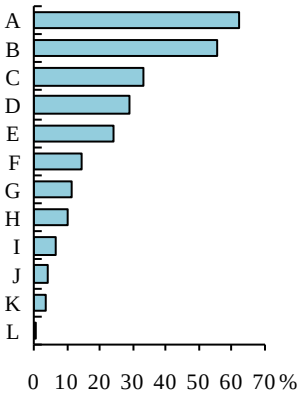
Financial institutions have been helping borrowing firms with deteriorating performance to improve their business conditions. For example, assistance is made in the form of advice on expense reduction and asset sales, arrangement of tie-ups, and formulation of reconstruction programs in cooperation with outside professionals such as Small and Medium-sized Enterprise Revitalization Support Councils, management consultants, and certified public accountants. These efforts have paid off to a degree, as the rate of upgrading in creditworthiness of borrowing firms that received such assistance is higher than the rate of overall borrowing firms (Chart B4-1).

Chart B4-1: Upgrading rates of firms that received assistance[1]



Note: *1*. Firms borrowing from the regional banks are counted.
Sources: Financial Services Agency; BOJ.

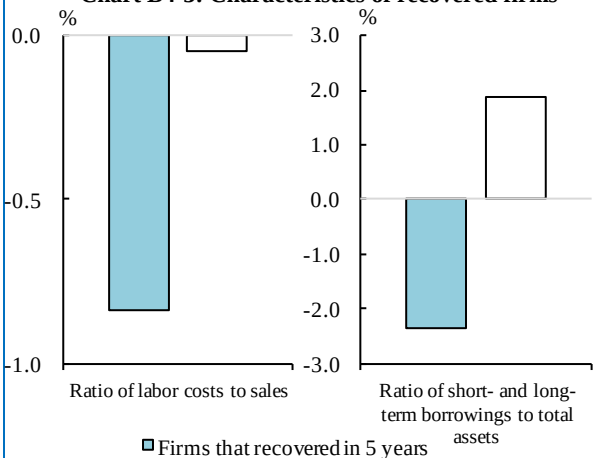
Chart B4-2: Reconstruction programs[1,2]



A: Personnel reduction
B: Cost revision
C: Retreat from unprofitable business
D: Restructuring of business
E: Capital reduction
F: Revision of management indicators
G: Capital expansion
H: Business transfer
I: Others
J: Use of financial support
K: Company split
L: Application of the law for industrial revitalization

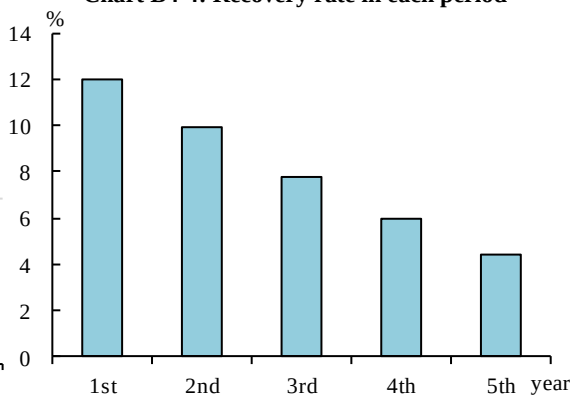
Notes: *1*. Small and medium-sized firms filing for procedure under the Civil Rehabilitation Act are counted.
2. Totals do not add up to 100 percent due to multiple responses.
Source: Small and Medium Enterprise Agency, "2011 white paper on small and medium enterprises in Japan."

Chart B4-3: Characteristics of recovered firms[1]



Note: *1*. 5-year average after business conditions deteriorated.
Source: CRD.

Chart B4-4: Recovery rate in each period[1]



Note: *1*. Recovery rate indicates a ratio of the number of firms that recovered in the *t*-th year to the number of firms that have been in deteriorating business conditions for *t*-1 years.
Source: CRD.

The reconstruction programs for small and medium-sized firms mainly consist of a restructuring including a reduction in personnel and expenses and a retreat from unprofitable business (Chart B4-2). In fact, a comparison of firms that succeeded in recovering from deterioration and were able to resume interest payments and firms that failed shows that the former cut the ratio of labor costs to sales and the ratio of borrowings to total assets considerably more than the latter (Chart B4-3).[25] Moreover,

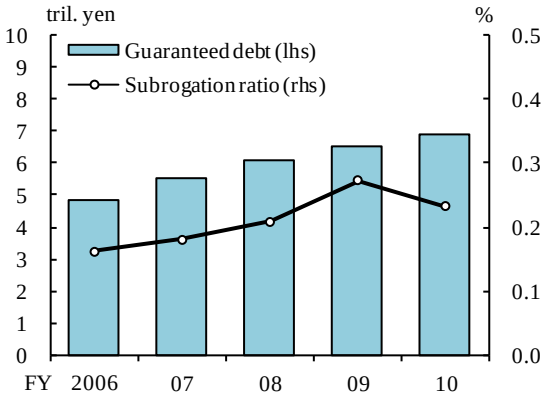
[25] Here, the deterioration in business is defined as the state where a borrower is (1) delinquent for 3 months or more, (2) downgraded to de facto bankrupt or bankrupt, or (3) subrogated by credit

the longer the period of deterioration in borrowing firms' business conditions, the lower the probability of recovery (Chart B4-4). This implies that firms' swift responses to the deterioration may affect whether they successfully recover or not.

Credit risk on housing loans

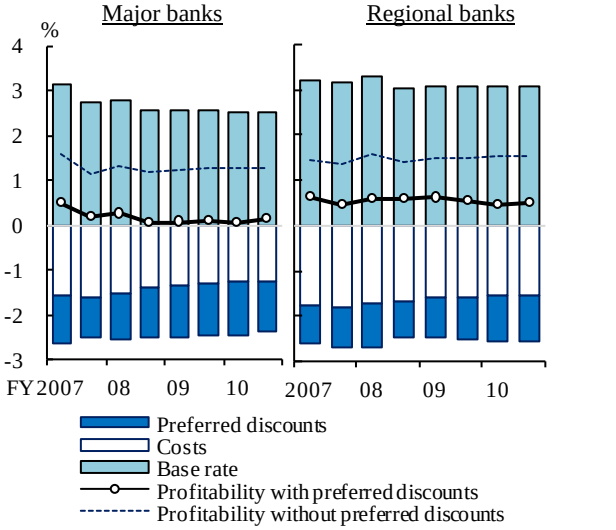
Credit costs from housing loans are limited at present, as housing guarantee corporations' subrogation ratio (the amount of subrogation relative to outstanding guaranteed loans) declined slightly in fiscal 2010 partly due to policy measures (Chart IV-3-6). Although the NPL ratio of households has recently started to rise gradually, it remains at a low level.

Chart IV-3-6: Subrogation ratio on housing loans



Source: Zenkoku Hosho.

Chart IV-3-7: Profitability of housing loans[1,2]



Notes: *1*. Profitability at the time of origination.
2. Costs are the sum of funding rate, premium of group credit life insurance (assumed to be 0.3 percent), and general expense rate (assumed to be the same as that for the whole business).
Sources: Japan Financial News, "Nikkin report"; Japan Housing Finance Agency, "Survey of private mortgage loans"; Ministry of Land, Infrastructure, Transport and Tourism, "Survey of true state of private mortgage loans"; BOJ.

Intensifying lending competition among banks has caused decreases in bank loan rates through greater preferred discounts and decreases in the profitability of housing loans (Chart IV-3-7). In the severe employment and income situation, households' debt servicing capacity is gradually deteriorating (Chart II-2-4). When the increase in credit

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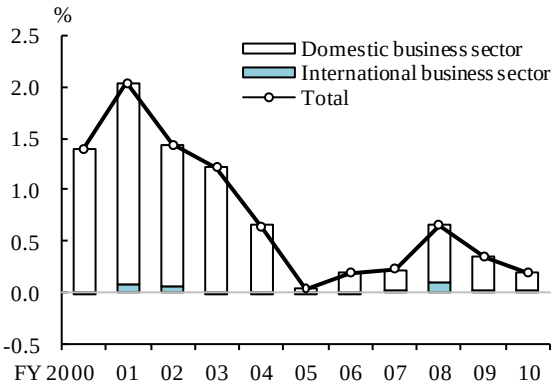
guarantee corporations; and where the interest paid is below the short-term prime rate. On the other hand, the recovery in business is defined as the state where the interest paid exceeds the short-term prime rate and operating profits turn positive.

costs from banks' affiliated housing guarantee corporations is taken into account, it is possible that the profitability of housing loans is further declining.

Credit risk on overseas loans

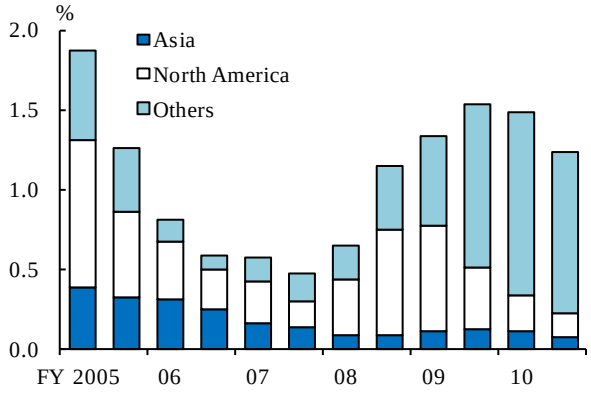
Mainly at the major banks, the share of overseas loans in overall loans has been increasing, but credit costs from overseas loans have affected their entire credit costs only marginally to date (Chart IV-3-8). The ratio of nonperforming overseas loans remains slightly above 1 percent (Chart IV-3-9). As for nonperforming overseas loans by region, such loans to the United States rapidly increased immediately after the Lehman shock occurred, but have since declined. Those to Asian economies have been at a low level. In contrast, NPLs to Europe and the Middle East, where uncertainty over financial and economic conditions has heightened, have been relatively large.

Chart IV-3-8: Credit cost ratios by sector[1]



Note: *1*. The major banks and the regional banks are counted.
Source: BOJ.

Chart IV-3-9: Ratios of nonperforming overseas loans[1]



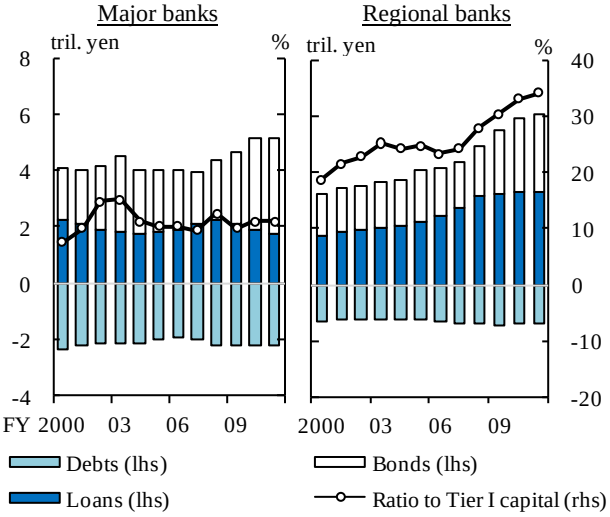
Note: *1*. The 3 major financial groups are counted on a non-consolidated basis.
Source: Published accounts of each group.

2. Interest rate risk and market risk associated with stockholdings

Accumulation of interest rate risk

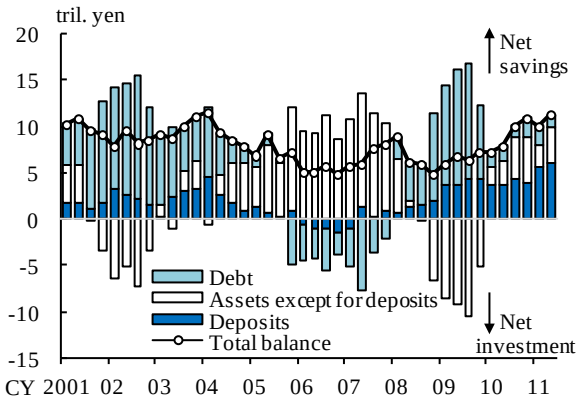
Banks have been taking on additional interest rate risk, mainly through bond investment. The 100 basis point value of interest rate risk, calculated under the assumption that interest rates of all maturities would rise simultaneously by 1 percentage point, rose in fiscal 2010 by about 0.5 trillion yen at the major banks and about 0.4 trillion yen at the regional banks (Chart IV-3-10). Increases in interest rate risk associated with bond investment are evident at both the major banks and the regional banks.

Chart IV-3-10: Interest rate risk (100 bpv)[1,2]



Notes: *1*. 100 basis point value in the banking book. Off-balance sheet transactions are not included.
2. The latest data for interest rate risk and Tier I capital are as of end-June and end-March, respectively.
Source: BOJ.

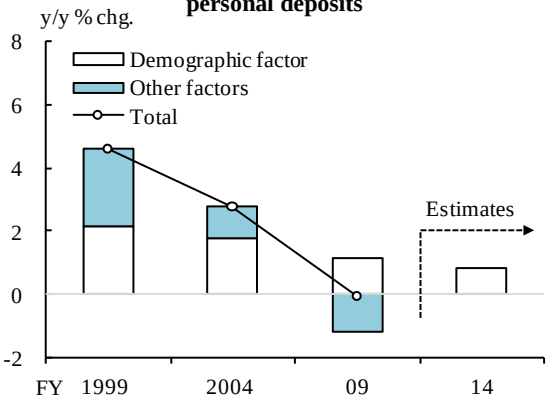
Chart IV-3-11: Investment-saving balance of firms and households



Source: BOJ, "Flow of funds accounts."

Since the Lehman shock, inflows of deposits have been steady from firms and households, both of which hold excess savings (Chart IV-3-11). The growth rate in corporate deposits is increasing, reflecting firms' cautious stance in financing. The growth rate in personal deposits remains at a relatively high level due to the continuous rise in the number of elderly households with a large amount of bank deposits (Chart IV-3-12). Against the background of these inflows of deposits, banks' total assets

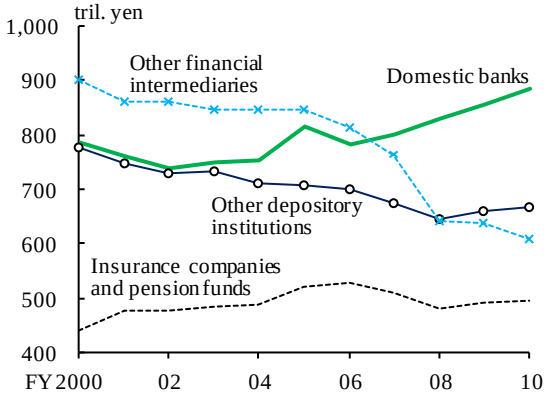
Chart IV-3-12: Effects of demographic factor on personal deposits[1]



Note: *1*. "Demographic factor" indicates changes in outstanding amounts of deposit due to changes in the number of family units. "Other factors" indicate changes in outstanding amounts of deposit per family unit.
Sources: Ministry of Internal Affairs and Communications, "National population census", "National survey of family income and expenditure"; National Institute of Population and Social Security Research, "Population & household projection."

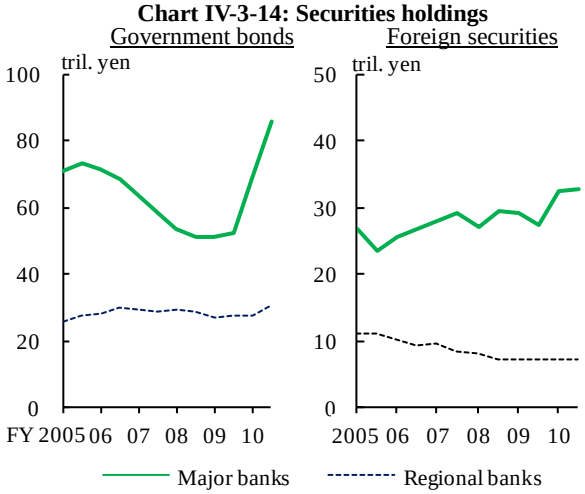
increased by about 84 trillion yen from fiscal 2007, the year before the Lehman shock, through fiscal 2010 (Chart IV-3-13). This contrasts clearly with the nonbank financial sector, whose total assets are either more or less unchanged or decreasing. Since growth in bank loans has been sluggish, the inflows of deposits have consequently induced banks to invest more in bonds, particularly JGBs (Chart IV-3-14). The major banks have been expanding bond investment to foreign bonds as well. The amount outstanding of their foreign bond investment has continued to increase even since fiscal 2010.

Chart IV-3-13: Total assets of financial institutions



Source: BOJ, "Flow of funds accounts."

Chart IV-3-14: Securities holdings



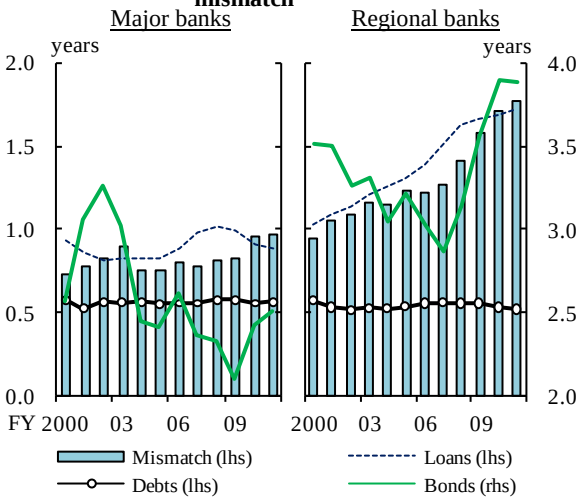
Source: BOJ.

Lengthening maturity of bond investment

The major banks and the regional banks provide a contrast in terms of the maturity of bond investment. The major banks continue to invest mainly in short- to medium-term bonds with a maturity of 5 years or less in order to restrain interest rate risk (Chart IV-3-15). The average maturity of their bond investment in fiscal 2010 extended slightly to around 2.5 years, but remained at a low level.

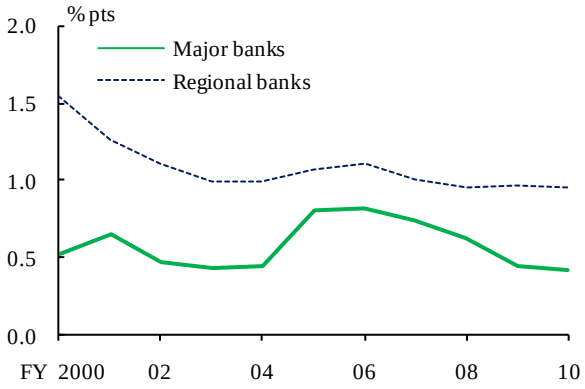
On the contrary, the regional banks have invested even more in long-term bonds. The average maturity of their bond investment extended to slightly below 4 years and marked a record high for the period from the 2000s. Behind this active investment in long-term bonds lay the regional banks' efforts to keep yields on their bondholdings from declining. The regional banks have clearly been striving to maintain their profitability with these efforts, because their interest rate margins on loans have been diminishing with the sluggish borrowing demand of firms and households. They have increased investment in long-term JGBs with relatively high yields and also in municipal bonds and corporate bonds. Margins on securities invested by the regional banks have been more or less unchanged, whereas those by the major banks have continued to decline since the mid-2000s (Chart IV-3-16).

Chart IV-3-15: Average maturity and maturity mismatch[1]



Note: *1*. The latest data are as of the end of June.
Source: BOJ.

Chart IV-3-16: Margins on securities holdings

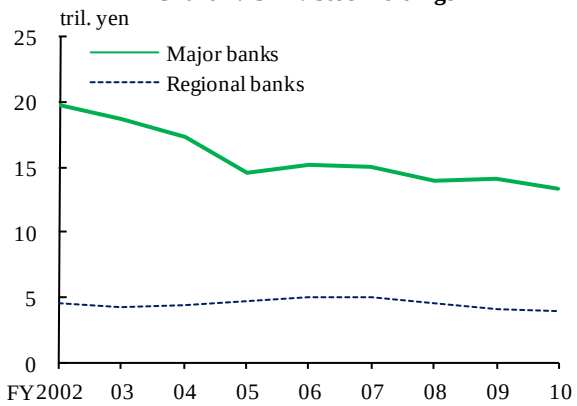


Source: BOJ.

Delayed reduction in market risk associated with stockholdings

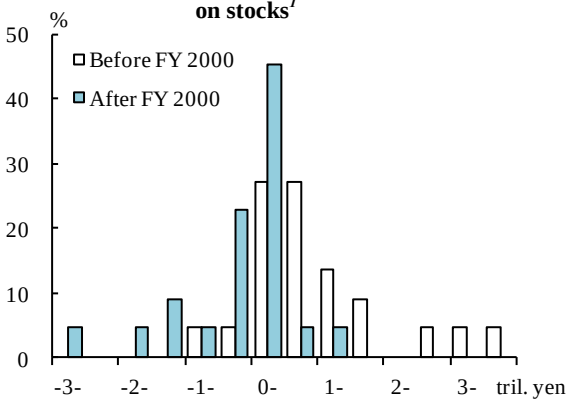
Many banks have regarded a reduction in market risk associated with stockholdings as an important management challenge and have been making efforts in this regard. However, the pace of reduction in banks' market risk associated with stockholdings has been slower than planned, partly due to the sluggish stock prices observed from fiscal 2010. Banks' stockholdings have remained more or less unchanged (Chart IV-3-17).

Chart IV-3-17: Stockholdings[1]



Note: *1*. On an acquisition price basis.
Source: BOJ.

Chart IV-3-18: Distribution of realized gains/losses on stocks[1]



Note: *1*. Distributions of yearly realized gains/losses. Sample period is from the 1st half of fiscal 1989 to the 2nd half of fiscal 2010. The major banks and the regional banks are counted.
Source: BOJ.

The fall in stock prices remains one of the main factors disrupting banks' financial soundness. Particularly since the 2000s, the distribution of banks' realized gains/losses

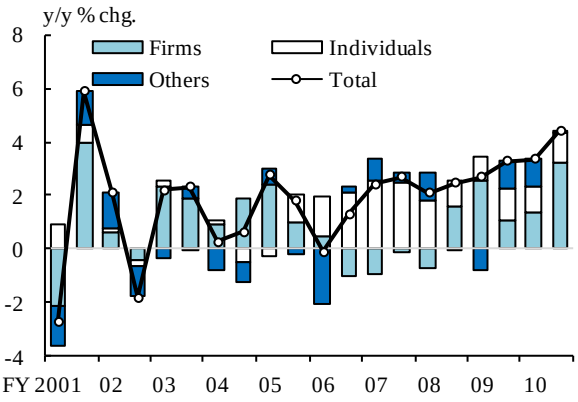
on stockholdings has become skewed toward net losses, recording relatively large net losses, against the background of the decrease in unrealized gains on stockholdings and conservative impairment accounting procedures (Chart IV-3-18). Unrealized gains/losses on stockholdings were posted as part of other comprehensive income in consolidated financial statements from fiscal 2010. With the current amount of stockholdings taken as given, banks' profits on a comprehensive income basis could fluctuate more than their profits on a net income basis.[26] Banks should continue to strive to reduce market risk associated with their stockholdings as scheduled, while objectively examining the business merits arising from stockholdings.

3. Funding liquidity risk

Funding conditions for the yen

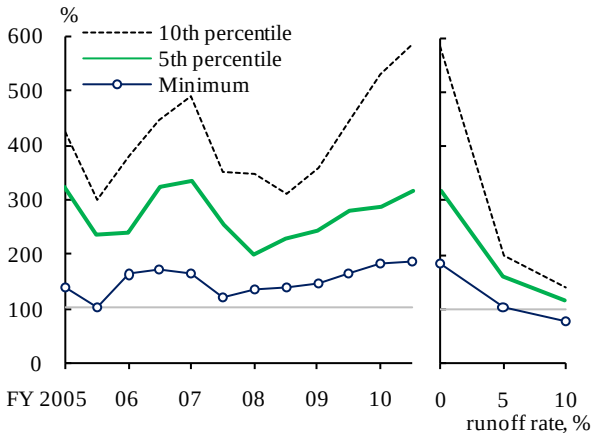
Funding liquidity risk for the yen has been restrained at Japan's banks, supported by the increase in the amount of bank deposits. In September 2010, when the Incubator Bank of Japan failed, the failed-bank resolution with limited deposit protection was executed for the first time in Japan. Nevertheless, no major change in the behavior of depositors has occurred, even among those with deposits of over 10 million yen (Chart IV-3-19).

Chart IV-3-19: Outstanding amounts of deposits over 10 million yen



Source: BOJ, "Amounts outstanding of deposits by depositor."

Chart IV-3-20: Liquid asset ratios[1,2,3]



Notes: *1*. See Annex 2 for definitions of variables.
2. The major banks and the regional banks are counted.
3. Left chart: distribution of the liquid asset ratio when the deposit runoff rate is 0 percent (the latest data are as of the end of fiscal 2010). Right chart: distribution of the ratio when the runoff rate changes from 0 to 10 percent based on the level at end-March 2011.
Source: BOJ calculations.

[26] For the fluctuation in comprehensive income of Japan's banks, see Yamashita, Yuji and Toshiyuki Sakiyama, "Profits of Japanese banks and market valuations -- comparison between net income and comprehensive income," *Bank of Japan Review*, No. 2011-E-5, October 2011.

Even since the disaster, the growth rate in bank deposits has been as high as around 2 percent per annum, while the Bank of Japan has continued to provide ample funds.[27] Banks' short- and long-term market funding, through the issuance of their bonds, CP, and certificates of deposit (CDs), indicates that funding conditions have been favorable.In terms of banks' asset portfolios, liquid asset ratios have been rising both at the major banks and the regional banks. Even under an assumption of a strong liquidity shock in which market funding comes to a complete stop for 3 months, those banks would be able to secure sufficient liquid assets to satisfy short-term funding demand (the left-hand side of Chart IV-3-20).[28] Moreover, even if a more severe liquidity shock is assumed in which a certain portion (from 0 to 10 percent) of deposits is drained (deposits whose term until the renewal of the deposit rate is 3 months or less), most banks would be able to weather the shock as they hold sufficient liquid assets (the right-hand side of Chart IV-3-20).

In terms of banks' funding structure, the ratio of long-term funds raised to the amount of long-term fixed investment has increased, and thus the structure has become more secure. This reflects the fact that on the funding front the outstanding amount of time deposits is stable and banks' capital is increasing, whereas on the investment front, long-term investment such as corporate loans is decreasing. However, since the end of 2010, the pace of increase in the amount of time deposits has slowed amid a further decline in interest rates on those deposits. To maintain a secure funding structure, inflows and outflows in time deposits warrant attention.

Funding conditions for foreign currencies

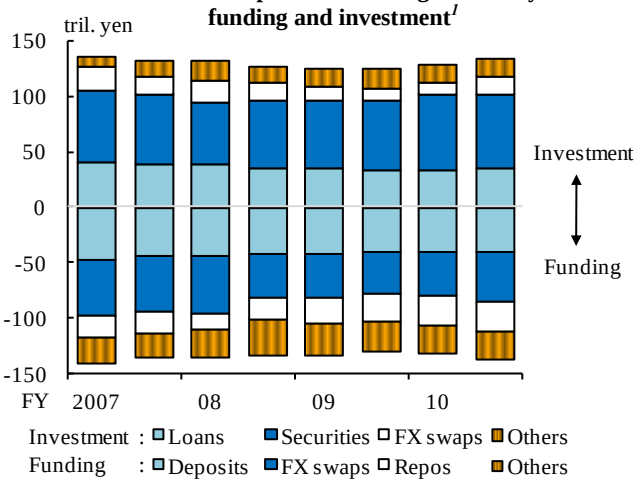
Funding liquidity risk for foreign currencies is generally restrained. Foreign currency investment by the major banks has been financed in markets mainly through repos and foreign exchange swaps (Chart IV-3-21). Given this funding structure, Japan's banks have begun to carefully craft arrangements for funding liquidity risk management, including setting specified limits by currency and hub and conducting stress testing at

[27] Immediately after the disaster, the Bank conducted the same-day funds-supplying operation for 6 consecutive business days and resumed CP repo operations for the first time since the end of 2009. As a result, the current account balance reached a historical high of 42.6 trillion yen, higher than the balance when the quantitative easing policy was taken. For details on the Bank's funds-supplying operations conducted immediately after the disaster, see the Bank of Japan, Financial Markets Department, "Money market operations in fiscal 2010," *Bank of Japan Research Paper*, May 2011.

[28] The 5th percentile and the 10th percentile in Chart IV-3-20 indicate the level of banks classified in the bottom 5 percent and the bottom 10 percent, respectively, of the distribution of liquid asset ratios by bank.

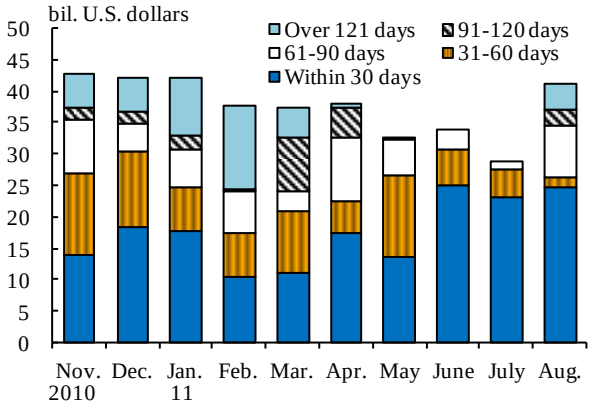
each hub.

Chart IV-3-21: Composition of foreign currency funding and investment[1]



Note: *1.* International operations of the major banks, the regional banks, and central organizations for financial cooperatives.
Source: BOJ.

Chart IV-3-22: U.S. MMFs' assets under management by remaining maturity[1]



Note: *1.* U.S. major MMFs' investment in Japan's financial institutions.
Sources: Published accounts of MMFs.

In U.S. dollar money markets, providers of dollars have shown caution (see Box 1). U.S. MMFs, major providers of dollars, limited dollar investment to Japan's banks and shortened the maturity after the disaster (Chart IV-3-22). The markets have recently been slightly nervous partly due to the reemergence of European sovereign debt problems. However, central banks' decisions to extend dollar funds-supplying operations through August 2012 and to conduct over-the-year-end 3-month dollar funds-supplying operations fostered a sense of security among market participants. U.S. MMFs' investment to Japan's banks increased in August. Japan's banks have been funding foreign currencies without major difficulty even since the downgrade of JGBs by a credit rating agency.

Foreign currency funding of Japan's banks depends on market funding through foreign exchange swaps and repos. Their position is therefore affected by changes in market conditions. They should continue to rigorously manage funding liquidity risk by securing a sufficient liquidity buffer against liquidity shock, given the growing strain in overseas money markets.

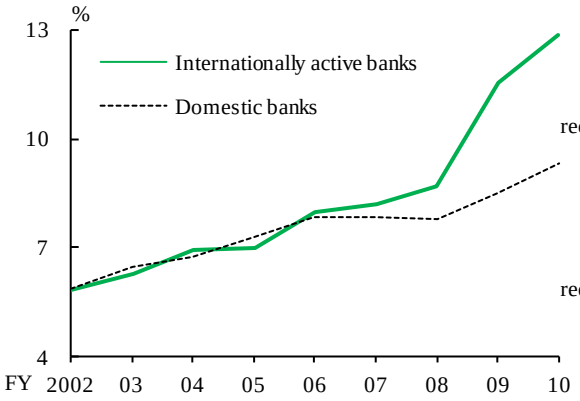
4. Banks' capital and profitability

New Basel requirements

The Tier I capital ratio of Japan's banks at the end of fiscal 2010 was 12.8 percent for

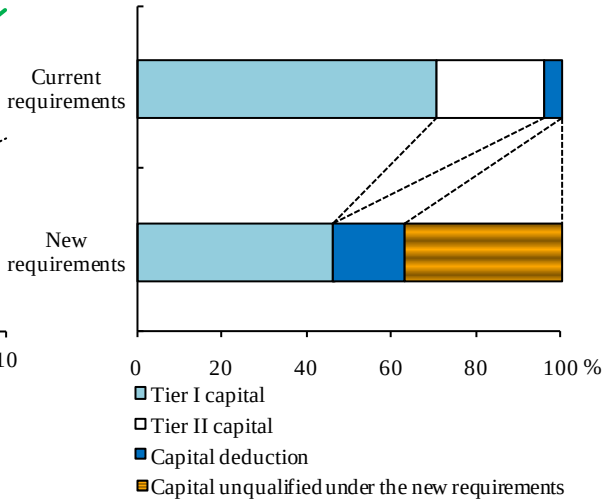
internationally active banks and 8.7 percent for domestic banks, increased by 1.3 percentage points and 0.2 percentage point from the previous year, respectively (Chart IV-3-23). Internationally active banks have been accumulating retained earnings in the run-up to the implementation of new Basel requirements, whereby their Tier I capital has been increasing steadily.

Chart IV-3-23: Tier I capital ratios[1]



Note: *1*. Based on the current requirements.
Source: BOJ.

Chart IV-3-24: Capital components[1,2]



Notes: *1*. Internationally active banks are counted.
2. BOJ calculations based on questionnaires about financial conditions at end-September 2010. Grandfathering measures are not considered.

Source: BOJ.

New Basel requirements will mandate further deductions of some items from capital in addition to tighter criteria for inclusion in capital. In the calculation of risk assets, the coverage of counterparty credit risk will be strengthened. These regulatory reforms will lead to a reduction in the capital adequacy ratio.

Under the new Basel requirements, the amount of deductions from capital for items of intangible assets, deferred tax assets, and equity investment will be larger than before. Existing Tier I capital comprises a certain proportion of preferred investment securities, and existing Tier II capital comprises a certain proportion of hybrid debt capital instruments such as subordinated bonds and subordinated loans. None of the instruments that have already been issued seems to meet the new criteria for inclusion in capital.[29] Therefore, it is probable that both Tier I and Tier II capital calculated under

[29] The new requirements state prerequisites for including preferred investment securities and hybrid debt capital instruments in the capital as follows. At the point of non-viability, the terms and conditions have a provision that requires those products to either be written off or converted into common equity, or the jurisdiction over resolution to conform to the clause.

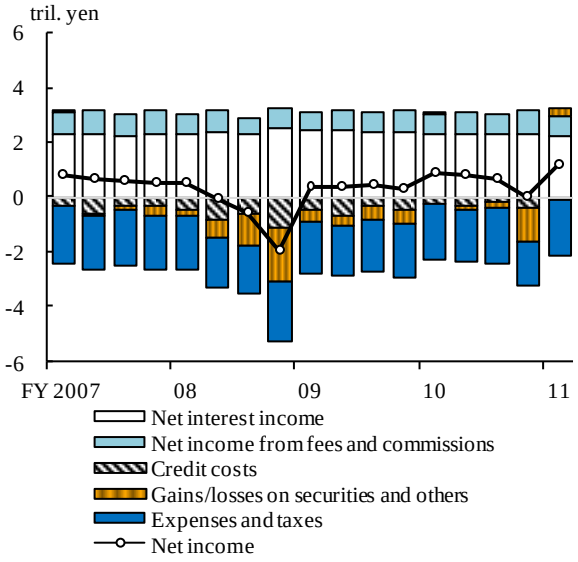
the new Basel requirements will be lower than currently (Chart IV-3-24).

In order to achieve a smooth transition to the new Basel requirements, various transitional periods and grandfathering measures will be applied from 2013 through full-fledged implementation in 2019. Banks need to continue to strengthen their capital bases in a planned manner by, for example, accumulating retained earnings and increasing instruments to be included in capital under the new requirements, in order to improve the quality of their capital and their capital adequacy ratios.

Banks' profitability

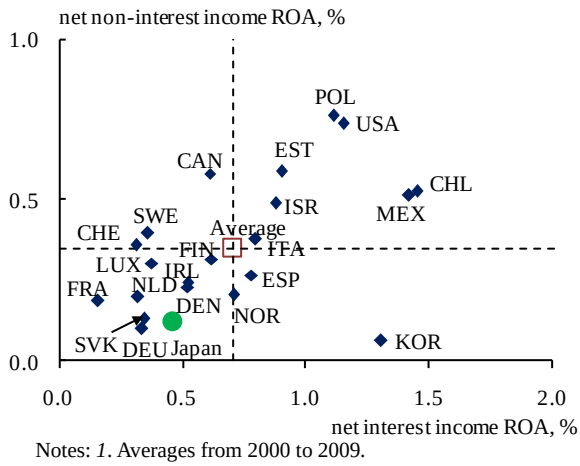
Profits of Japan's banks have been on an improving trend. Net income in fiscal 2010 increased mainly due to the decline in credit costs and the improvement in realized gains/losses on bondholdings, while their net interest income and realized gains/losses on stockholdings deteriorated (Chart IV-3-25). In the April-June quarter of 2011, net income continued to expand because the adverse effects of the disaster were limited as a whole.

Chart IV-3-25: Net income[1,2]



Notes: *1*.The major banks and the regional banks are counted.
2. On a consolidated basis. Credit costs (losses on disposal of NPLs) and expenses are of a non-consolidated basis. See Annex 2 for definitions of variables.
Source: Financial Quest.

Chart IV-3-26: International comparison of net interest income and net non-interest income[1,2,3]

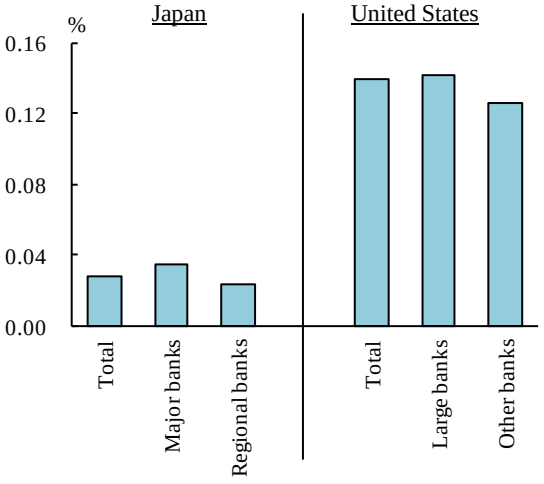


Notes: *1*. Averages from 2000 to 2009.
2. On an expense-adjusted basis.
3. See Annex 2 for country specification.
Source: OECD, "Bank profitability."

Nevertheless, profitability of Japan's banks is not necessarily favorable when compared

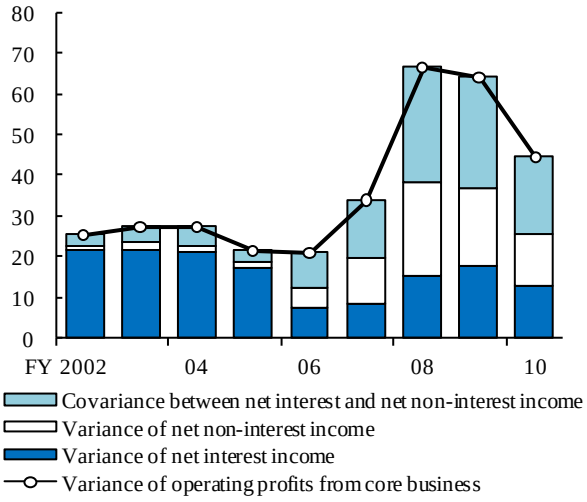
globally.[30] In particular, their net non-interest income, which includes fees and commissions received for providing financial services, is rather low among major economies (Chart IV-3-26). Return on assets (ROA) in banks' deposit-related business, which yields a large share of net non-interest income, is about 0.03 percent for Japan's banks, less than one-quarter of the 0.14 percent recorded by U.S. banks (Chart IV-3-27). One of the reasons for the gap could be the fact that Japan's banks put priority on maintaining their deposit bases and provide services at low prices, while U.S. banks apply carefully crafted fees and commissions according to the type of service or customer attribute (see Box 5 for the profitability of deposit-related business at U.S. banks and Japan's banks).

Chart IV-3-27: Return on assets in deposit-related business[1]



Note: *1*. U.S. large banks are those with assets of more than a billion U.S. dollars.
Sources: FDIC, "Statistics on depository institutions"; BOJ.

Chart IV-3-28: Variance of banks' profits[1,2]

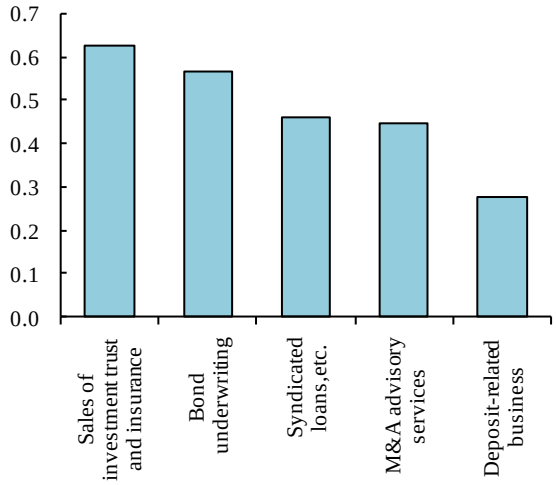


Notes: *1*. Figures are calculated from annual ROAs in the preceding 5 years.
2. On an expense-adjusted basis.
Source: BOJ calculations.

Under such circumstances, Japan's banks have undertaken a variety of services with a view to making fee- and commission-based business one of the main sources of profits. In particular, fees and commissions received from agency sales of investment funds and insurance products account for a growing proportion of overall profits. Nevertheless, since investment fund sales are susceptible to the business cycle, they could cause banks' profits to fluctuate (Charts IV-3-28 and IV-3-29). In fact, the degree of fluctuation in net non-interest income at Japan's banks is rather large among major economies (Chart IV-3-30).

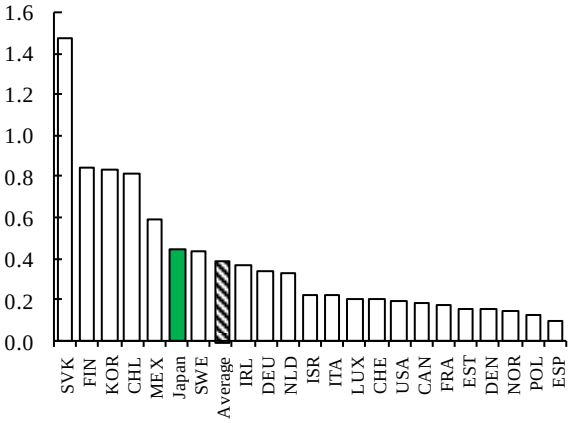
[30] For details on the profitability of Japan's banks, see the September 2007, September 2008, September 2009, and March 2010 issues of the *Report*.

Chart IV-3-29: Variation coefficient of net non-interest income[1,2]



Notes: *1*. Coefficients are defined as standard deviations over averages. Sample period is from 2001 to 2010.
2. On an expense-adjusted basis.
Source: BOJ.

Chart IV-3-30: International comparison of variation coefficient of net non-interest income[1,2,3]

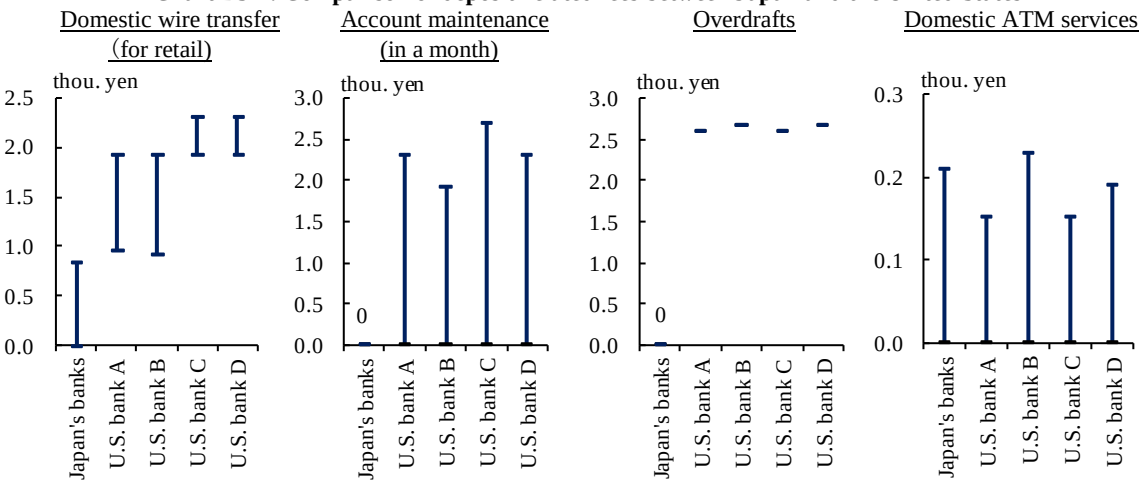


Notes: *1*. Sample period is from 2000 to 2009.
2. On an expense-adjusted basis.
3. See Annex 2 for country specification.
Source: OECD, "Bank profitability."

Box 5: Profitability of deposit-related business

There is a clear contrast in the setting of fees and commissions for deposit-related business between U.S. banks and Japan's banks. U.S. banks apply carefully crafted fees and commissions according to the type of service.[31] A comparison of the fees for wire

Chart B5-1: Comparison of deposit-related fees between Japan and the United States[1,2]

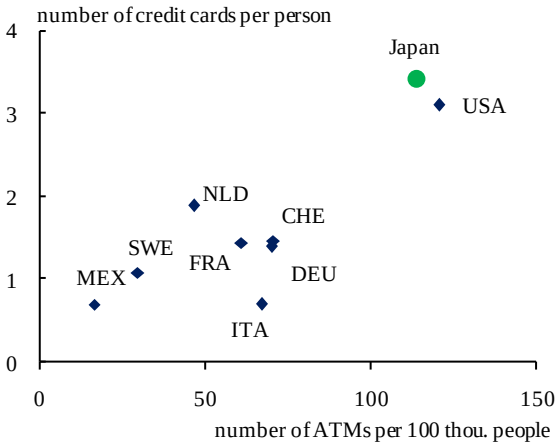


Notes: *1*. Figures for Japan's banks are the average of the 3 major banks.
2. Figures for U.S. banks are converted into Japanese yen at the closing rate of 76.715 yen to the U.S. dollar on September 15, 2011.
Sources: Disclosure of each bank; BOJ.

[31] For net non-interest income of Japan's banks, see Inaba, Kei-ichiro and Masazumi Hattori, "A contemporary aspect of Japanese commercial banking: Expansion of fee-based business and its impact on management stability," Bank of Japan Working Paper, No. 2007-E-9, May 2007.

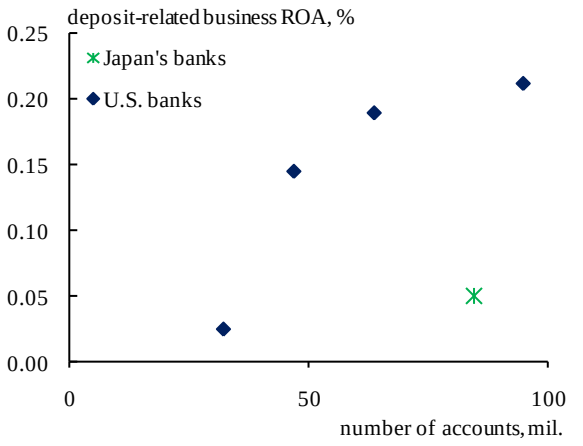
transfers among domestic banks shows that U.S. banks charge about 3 times as much as Japan's banks (Chart B5-1). Account maintenance fees, which are charged when the minimum balance of deposits is not satisfied, are applied in the United States but are rarely charged in Japan. The level of fees charged by U.S. banks varies by customer and region. These carefully crafted fees and commissions contribute to the high profitability of deposit-related business at U.S. banks.

Chart B5-2: ATMs installed and credit cards issued[1]



Note: *1*. See Annex 2 for country specification.
Source: BIS, "Statistics on payment and settlement systems."

Chart B5-3: Deposit-related business ROA and number of accounts[1,2]



Notes: *1*. Figures for Japan's banks are the average of the 3 major banks as of end-fiscal 2010.
2. Figures for U.S. banks are as of the end of 2010.
Source: FFIEC, "Consolidated reports of condition and income for a bank with domestic and foreign offices."

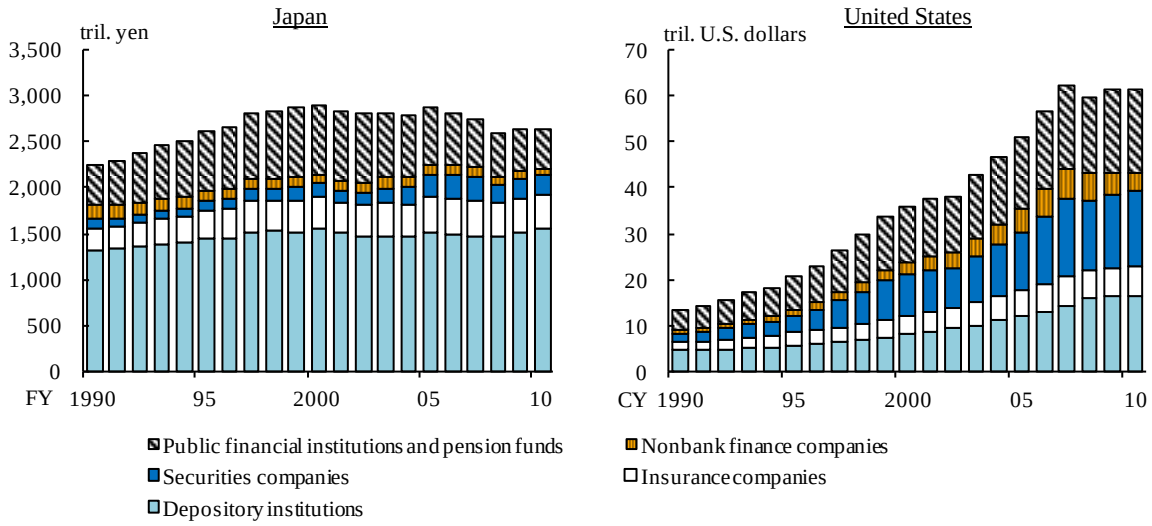
On the other hand, Japan is among those countries that provide the largest number of cash cards and ATMs per capita (Chart B5-2). Japan's banks have invested considerably to provide high-value-added services, such as 24-hour ATM services, given the strong demand for deposit-related services. At present, however, they place top priority on attracting customers and therefore set fees and commissions at levels that are relatively low and not necessarily sufficient to cover costs (Chart B5-3). As previously pointed out, the degree of fluctuation in net non-interest income at Japan's banks is large. Expanding fee and commission income from deposit- and settlement-related business that is relatively unaffected by the business cycle would help secure more stable profit bases.

D. Risks borne by the nonbank financial sector

Financial intermediation in Japan is being maintained mainly through indirect financing, while the nonbank financial sector has a relatively small presence (the left-hand side of

Chart IV-4-1). This contrasts clearly with the United States, where only about one-quarter of financial intermediation is performed by depository financial institutions and larger shares are performed by the securities sector such as MMFs and the securitization sector (the right-hand side of Chart IV-4-1). Japan's nonbank financial sector has a close relationship with banks in a number of respects, including transaction ties. Once a risk materializes in the sector, therefore, the entire banking system may be adversely affected. This section mainly summarizes risks borne by companies that are deeply involved with banks: market risk borne by insurance companies, liquidity risk by securities companies, and credit risk by consumer finance and credit card companies.

Chart IV-4-1: Amount outstanding of credit by sector



Sources: FRB, "Flow of funds accounts in the United States"; BOJ, "Flow of funds accounts."

1. Insurance companies

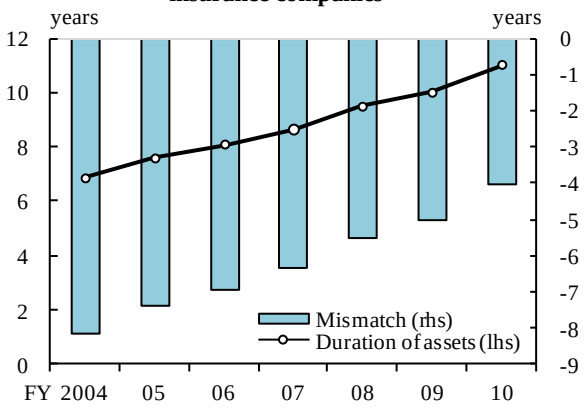
Market risk borne by life insurance companies

One of the challenges for life insurance companies in their asset management is to reduce duration mismatches between assets and liabilities. To clear the mismatches where the maturity of insurance policies on their liabilities exceeds the maturity of investment on their assets, they have been extending the maturity of assets by increasing their investment particularly in super-long-term JGBs. As a result of their efforts, the mismatches are narrowing (Chart IV-4-2).

Another challenge is to dissolve negative spreads in which the yield guaranteed to insurance policyholders exceeds the actual investment yield. In fiscal 2010, negative spreads remained at a total of nine major life insurance companies, although some of

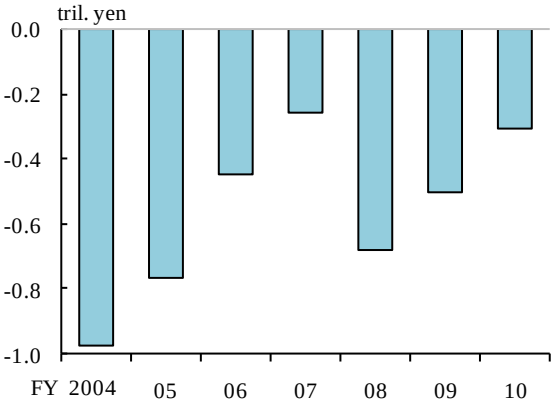
them had dissolved the negative spreads (Chart IV-4-3). Life insurance companies have actively invested in foreign bonds to improve yields on their investment (Chart IV-4-4). Growing investment in foreign bonds, however, has made their profits more susceptible to sovereign risk and foreign exchange risk.

Chart IV-4-2: Duration mismatch of life insurance companies[1,2]



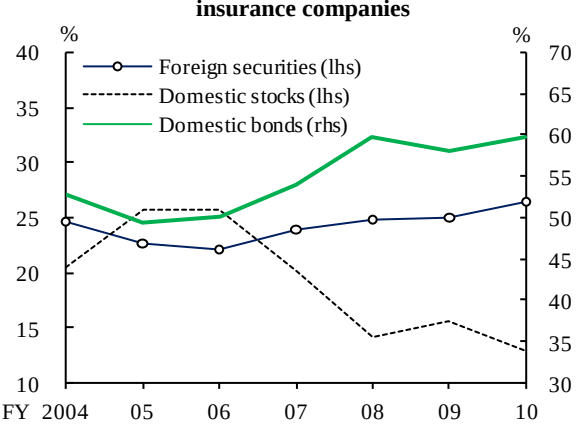
Notes: *1*. The 9 major domestic life insurance companies are counted.
2. Duration of liabilities is assumed to be constant at 15 years.
Source: Published accounts of life insurance companies.

Chart IV-4-3: Negative spread of life insurance companies' investment[1]



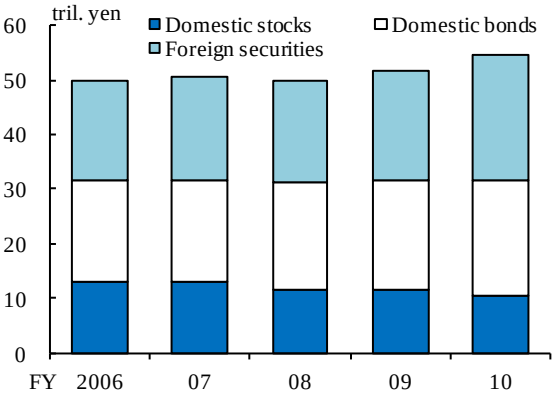
Note: *1*. The 9 major domestic life insurance companies are counted.
Source: Published accounts of life insurance companies.

Chart IV-4-4: Share of securities held by life insurance companies



Source: Published accounts of life insurance companies.

Chart IV-4-5: "Available-for-sale securities" held by life insurance companies[1]



Note: *1*. On a book-value basis.
Source: Published accounts of life insurance companies.

Furthermore, to reduce market risk associated with stockholdings is another challenge. The weighting of asset investment risk in portfolios will change with a new regulation on the solvency margin ratio to be applied from financial results for fiscal 2011 (ending in March 2012).[32] The nine major life insurance companies reduced their domestic

[32] Due to the revision of the solvency margin ratio from financial results for fiscal 2011 (ending in March 2012), the coefficient for risks associated with domestic stock price fluctuations will be raised from 10 percent to 20 percent. This will cause life insurance companies to reduce the share of domestic stocks in their portfolios and increase the share of foreign bonds, whose coefficient for the

stockholdings by about 1 trillion yen in fiscal 2010 by selling stocks with a high risk weight. However, among the portfolios of "available-for-sale securities," which are subject to valuation under mark-to-market accounting, the share of stocks remains high (Chart IV-4-5).

Effects of insurance payments related to the disaster

As regards the earthquake disaster, the amount of insurance claims met by five major nonlife insurance companies for the earthquake-related damage is 1.1 trillion yen for households and 600 billion yen for firms.[33] The payments for households are mostly covered by the government and the Japan Earthquake Reinsurance Company, while the payments for firms are partly covered by reinsurance companies. Meanwhile, the amount of insurance claims met by life insurance companies for earthquake-related casualties is estimated at about 200 billion yen.[34] These insurance payments by both nonlife and life insurance companies are expected to fall largely below the policy reserves and therefore have a very minor impact on business conditions of the insurance companies.

In the future, a greater amount of earthquake-related insurance for households is expected to be bought, while the insurance for firms is likely to place a heavier burden on nonlife insurance companies and firms. Amid the growing recognition of earthquake risk in Japan, overseas reinsurance companies have started to raise reinsurance premiums, and the catastrophe bond market has also begun to charge higher premiums.[35]

2. Securities companies

Leverage of securities companies

Securities companies are financial institutions with a high leverage ratio. However, they

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associated risks, including foreign exchange risk, is relatively low at 11 percent.

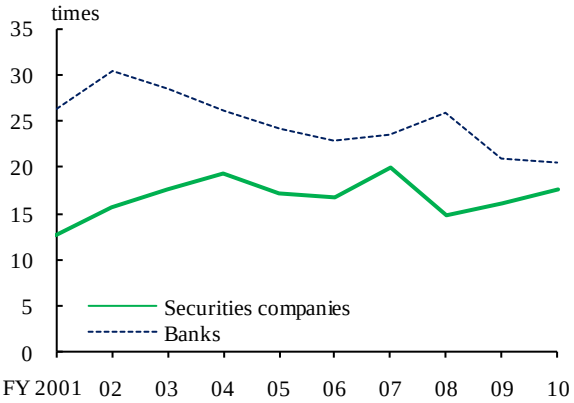
[33] The amount of insurance payments for households was surveyed by the General Insurance Association of Japan as of August 2011, while that for firms was surveyed by the Financial Services Agency as of May 2011.

[34] The estimated amount was surveyed by the Financial Services Agency, while the actual amount paid was about 114.9 billion yen as of August 2011.

[35] The catastrophe bonds are structured products that allow forgiving principal payments to investors in case of a specified catastrophe such as a natural disaster. Such bonds are issued mainly by insurance companies for the purpose of reinsurance.

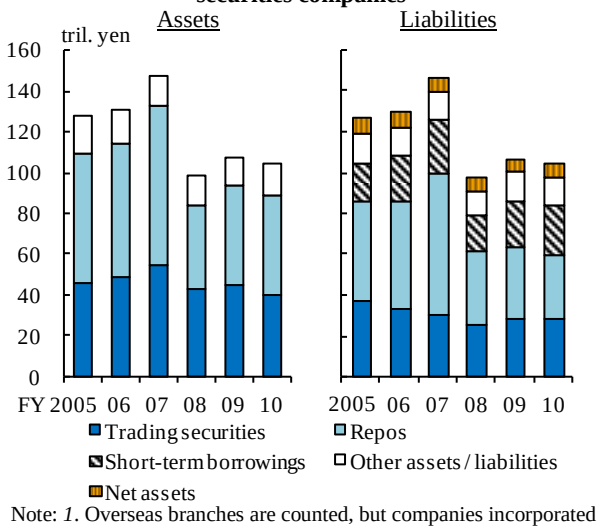
have become cautious about taking on risks and have maintained their leverage ratio almost flat as banks' ratio, since experiencing a financial crisis in the late 1990s (Chart IV-4-6). Before the Lehman shock, Japan's securities companies undertook investment with restrained leverage, whereas overseas investment banks increasingly leveraged investment across the board. On the balance sheets of Japan's securities companies, the outstanding amount of repo transactions recently has been decreasing with the decline in market transactions of JGBs (Chart IV-4-7). Their total assets correspond to about 60 percent of the recent peak.

Chart IV-4-6: Leverage ratios[1]



Note: *1*. Figures for securities companies are ratios of total assets to net assets. Figures for banks (the major banks and the regional banks are counted) are ratios of total assets to Tier I capital.
Sources: Japan Securities Dealers Association, "Composite balance sheet of securities firms and number of customer accounts, etc."; BOJ.

Chart IV-4-7: Balance-sheet components of securities companies[1]



Note: *1*. Overseas branches are counted, but companies incorporated abroad are not.
Source: Japan Securities Dealers Association, "Composite balance sheet of securities firms and number of customer accounts, etc."

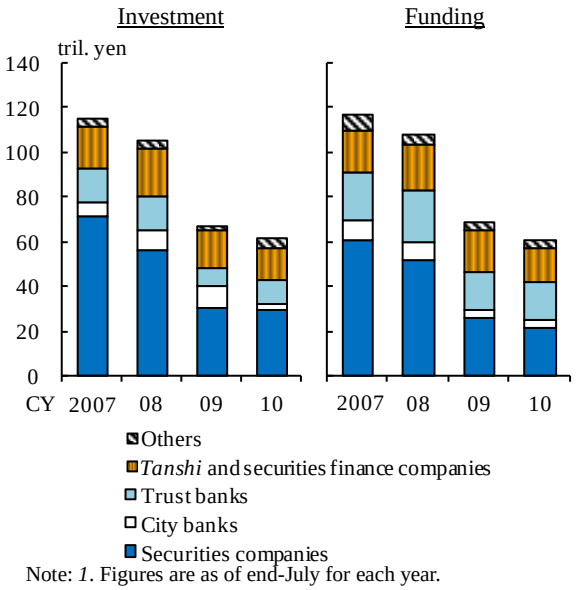
Liquidity risk in the repo market

Securities companies have the greatest presence in both funding and investing in the repo market (Chart IV-4-8). Their position in repo transactions therefore affects funding conditions of other financial institutions participating in this market. Currently in the repo market, there is no noticeable problem with regard to funding of securities companies, since the market is functioning stably with the provision of ample funds by the Bank of Japan.

The depth of the repo market, however, shrank as the transaction volume decreased following the Lehman shock (Chart IV-4-9). Attention should be paid to the possibility that execution of large-value repo transactions will become difficult if funding demand arises abruptly. For example, when long-term yields rose in November 2010, sales of JGBs by some major banks eventually exerted upward pressure on JGB repo rates, by

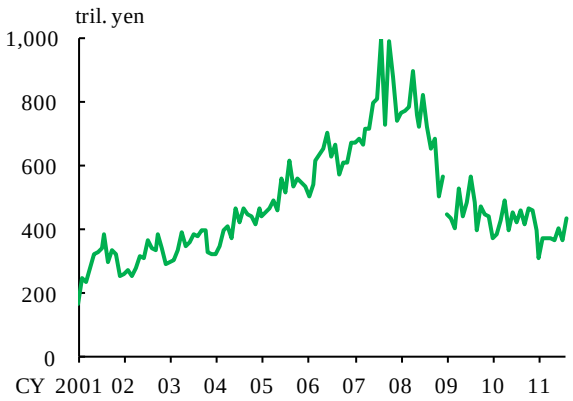
causing JGBs to accumulate at securities companies and increasing their demand for inventory funding.

Chart IV-4-8: Trading volume of repos by sector[1]



Note: *1*. Figures are as of end-July for each year.
Source: BOJ.

Chart IV-4-9: Amount outstanding of repos[1]



Note: *1*. Securities leasing against cash collateral. The series is discontinued at end-2008.
Source: Japan Securities Dealers Association, "Bond margin loans."

Comparison of the balance sheets of securities companies with those of banks shows that securities companies' on-hand liquidity, such as cash, is relatively small, while short-term funding, such as those through repos and short-term loans, takes up a large share of their liabilities (Chart IV-4-7). This implies that if a stress in the markets leads to additional margin calls or a rise in haircut rates of JGB collateral in repo transactions, liquidity risk may increase at securities companies. If securities companies face greater difficulty in inventory funding for JGBs or in borrowing JGBs, their function as market makers may deteriorate and thus JGB prices may also be adversely affected.

3. Consumer finance companies and credit card companies

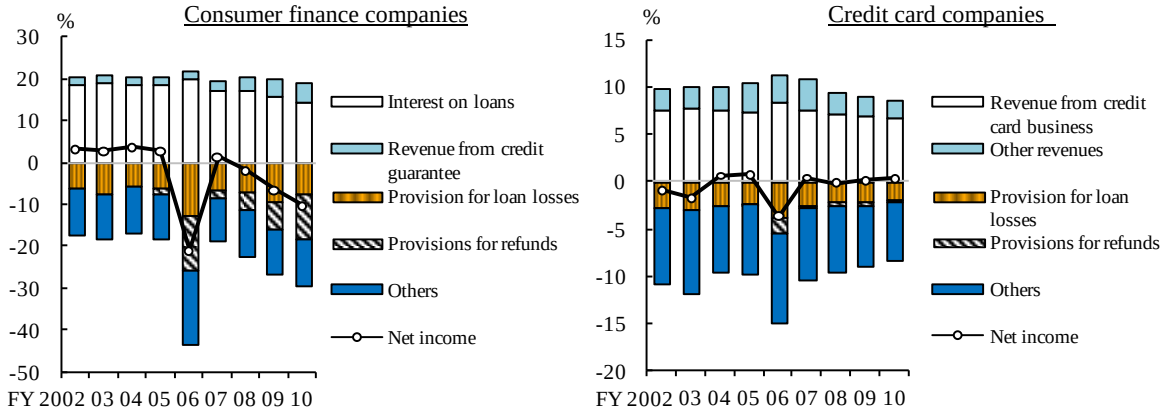
Business conditions of consumer finance companies

Profits of both consumer finance companies and credit card companies have been sluggish since the amendments of laws in 2006, including the Money Lending Business Act (Chart IV-4-10).[36] In particular, consumer finance companies have suffered

[36] The amendments made a number of changes, such as (1) ensuring the appropriateness of money-lending business activities through stricter requirements for entering the business, (2) curbing excessive lending through introduction of an aggregate debt limit at one-third of the borrower's annual income, and (3) ensuring the appropriateness of the interest rate through abolishment of the gray-zone interest rate under the pre-amended Money Lending Business Act, and lowering to the 20

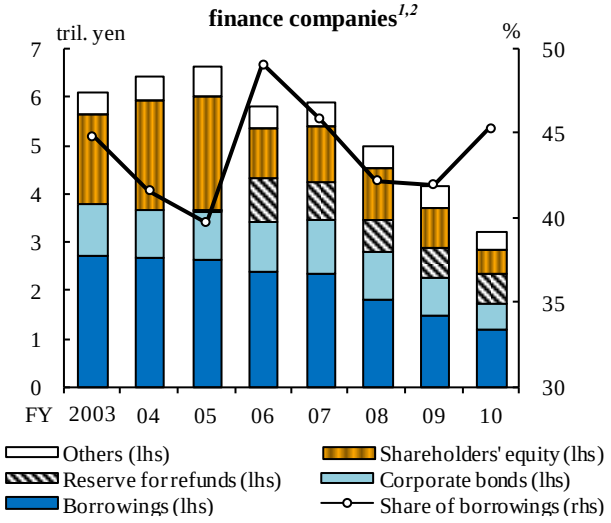
growing deficits for the past few years. This is because provisions for borrowers' claims for refunds on overpaid interest have surged and interest rate margins on consumer finance companies' loans have edged down, following gradual lowering of the interest rate cap under the amended laws. The capital of consumer finance companies has declined as their deficits have increased (Chart IV-4-11). On the other hand, credit card companies have recorded profits with only small provisions for borrowers' claims for refunds on overpaid interest, but their profits are being squeezed as interest rate margins edge down under the amended law.

Chart IV-4-10: Net income ROA[1]



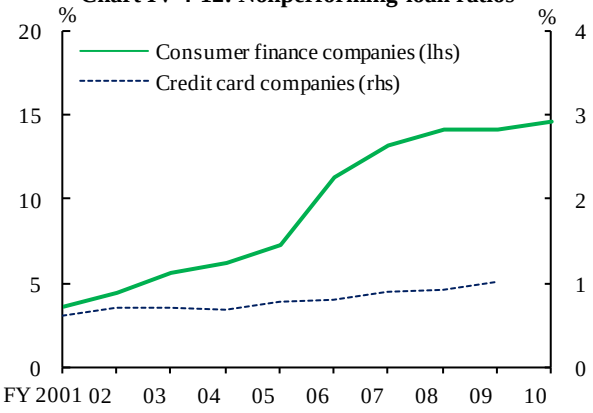
Note: *1*. The 3 major companies and the 6 major companies are counted for consumer finance companies and credit card companies, respectively.
Source: Thomson Reuters.

Chart IV-4-11: Liabilities structure of consumer finance companies[1,2]



Notes: *1*. Share is defined as borrowings over the sum of borrowings, corporate bonds, shareholders' equity, and others.
2. The 3 major companies are counted.
Source: Thomson Reuters.

Chart IV-4-12: Nonperforming-loan ratios[1,2]



Notes: *1*. The 3 major companies are counted for consumer finance companies.
2. Nonperforming loans of credit card companies are loans delinquent for 6 months or more.
Sources: Published accounts of consumer finance companies; Japan Consumer Credit Association, "Consumer credit statistics of Japan."

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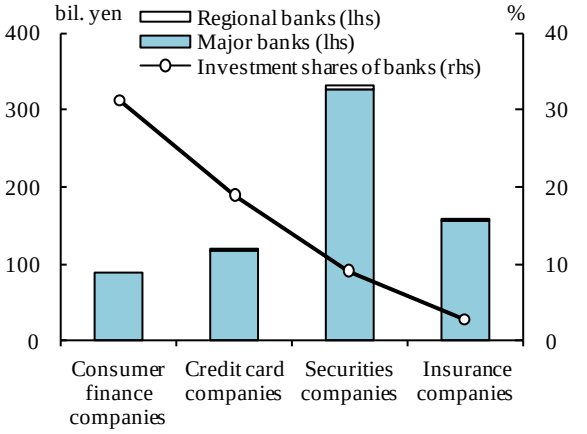
percent level of the interest rate cap under the Act on Regulation of Receiving of Capital Subscription, Deposits, and Interest Rates.

Meanwhile, the NPL ratio of consumer finance companies has been on an increasing trend and reached a high level of over 10 percent (Chart IV-4-12). This is attributable to the decline in households' debt servicing capacity, as noted in Chapter II.B.

Heavier dependence of consumer finance companies on banks

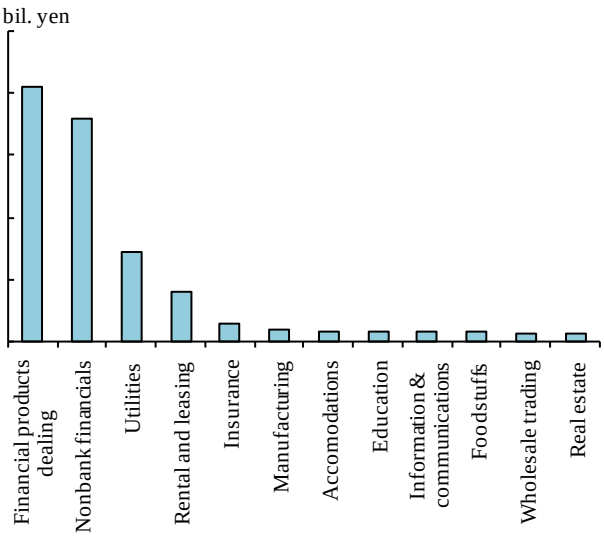
Consumer finance companies continue to depend heavily on bank loans for funding (Chart IV-4-11). On the other hand, it is mainly the major banks that have regarded the consumer finance business as strategically important and have supported business expansion of consumer finance companies by undertaking equity investment and extending loans since the early 2000s (Chart IV-4-13). Although banks have recently been gradually reducing loans to consumer finance companies, the amount of loans extended per consumer finance company remains larger than that per firm in other industries (Chart IV-4-14).

Chart IV-4-13: Banks' equity investments



Sources: Bloomberg; Financial Quest.

Chart IV-4-14: Loans outstanding per borrower[1]



Note: *1*. As of the end of fiscal 2010.
Source: BOJ, "Loans and bills discounted by sector."

Credit risk borne by consumer finance companies is likely to affect banks' business conditions through bank loans or equity investment. The repercussions of borrowers' claims for refunds on overpaid interest and the impact of the amended Money Lending Business Act on the consumer finance business continue to warrant vigilance.

V. Robustness of the financial system

Japan's financial system has maintained its robustness. Banks' capital bases as a whole would be able to avoid significant impairment, according to the macro stress testing conducted with a severe scenario of a considerable downturn in the economy and a plunge in stock prices taking place simultaneously. Banks as a whole should be able to maintain a sufficient amount of capital, even under a stress where financial markets undergo changes, such as a rise in JGB yields. Nevertheless, for banks with relatively low profitability and weak capital bases, the possibility that their capital adequacy ratios will remain low requires attention.

Based on the results of macro stress testing, the following points warrant vigilance in order to ensure long-lasting stability in the financial system. First, if the economy becomes stagnant for a protracted period, banks' credit costs could increase considerably relative to their profitability. This applies especially to banks with relatively low-quality loans. Second, given high correlations between domestic and overseas financial markets, changes in overseas government bond markets or stock markets could spread instantaneously to domestic markets and cause banks' realized gains/losses on domestic securities holdings to deteriorate significantly. This is highly probable at the regional banks, which have been actively investing in long-term JGBs. Against this background, it has become more important for banks to reinforce their capital bases.

This chapter assesses the robustness of Japan's financial system and the possible future effects on financial intermediation by conducting macro stress testing under scenarios of fluctuations in the macroeconomy and financial markets. The macro stress testing conducted in this chapter does not aim to predict the future of the financial system. Rather, it aims to clarify the characteristics of risks banks face and assess the robustness of the financial system. The results of stress testing should be interpreted with some latitude, since they are calculated based on some assumptions and omit some elements for the sake of simplicity.

A. Robustness against macroeconomic shocks

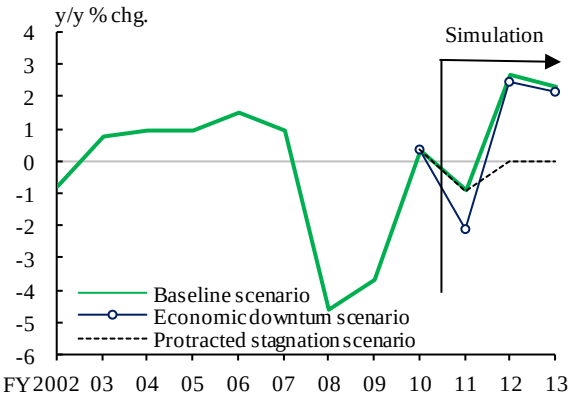
Baseline scenario and economic downturn scenario

In what follows, a baseline scenario -- the starting point of analysis -- and two stress scenarios -- an economic downturn scenario and a protracted stagnation scenario -- are

set (see Annex 4 for the framework of macro stress testing).

First, a baseline scenario and an economic downturn scenario are explained. The baseline scenario sets the end of fiscal 2010 as the base point. The baseline scenario assumes that, in line with private-sector forecasts made as of July 2011, the nominal GDP growth rate would be slightly less than minus 1 percent in fiscal 2011 and would then turn positive in the range of 2-3 percent in fiscal 2012 (Chart V-1-1).[37]

Chart V-1-1: Nominal GDP growth under the scenarios



Sources: Economic Planning Association, "ESP forecasts"; Cabinet Office, "National accounts."

Second, the economic downturn scenario assumes simultaneous negative shocks with a 5 percent probability of occurrence -- that is, at a frequency of once every 5 years on a quarterly basis -- to the economy and stock prices. This is a harsh scenario, because it assumes that an additional shock would hit in fiscal 2011, following the huge stress of the disaster in fiscal 2010.[38] Under the economic downturn scenario, the following changes would occur. The nominal GDP growth rate would be slightly more than minus 2 percent in fiscal 2011 and would then turn positive in the range of 2-3 percent in fiscal 2012. Stock prices (the TOPIX) would decline from 884 points at the end of fiscal 2010 to 741 points at the end of fiscal 2011, and would rebound toward the end of fiscal 2013. Long-term loan rates would decline by about 0.2 percentage point toward the end of fiscal 2013. In conjunction with the decline in long-term loan rates, interest rate margins on loans would narrow, and this would cause net interest income to decline.

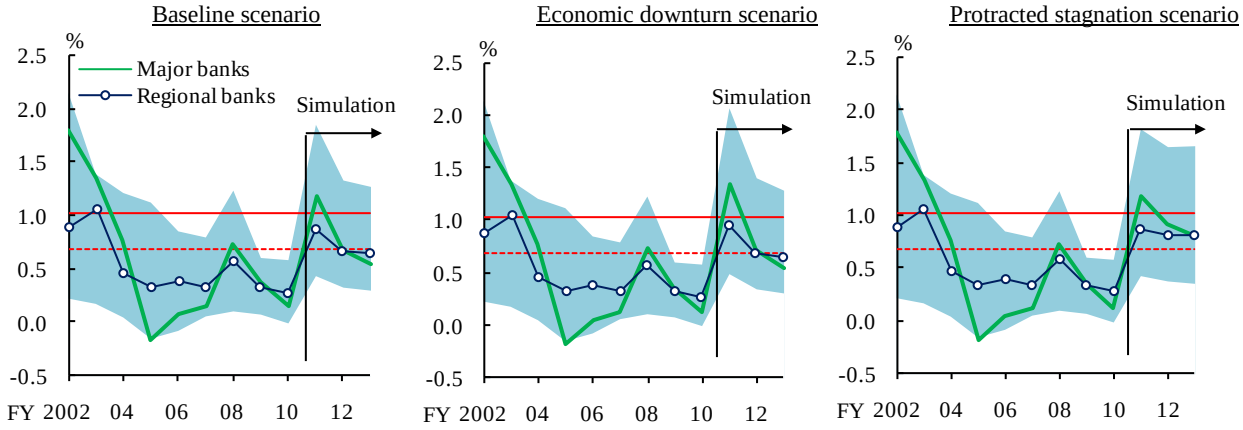
[37] In the baseline scenario, stock prices and long-term loan rates are assumed to remain constant at the levels of the base point.

[38] The stress scenario is set by estimating the vector autoregression model with five variables: the real effective exchange rate, real GDP, the GDP deflator, the long-term loan rate, and stock prices (the TOPIX).

Effects on banks' credit costs and capital

Banks' credit costs under the two scenarios are estimated as follows. Under the baseline scenario, the estimated credit cost ratios for the major banks and the regional banks would both increase to above the break-even point in fiscal 2011, and the ratios would then decline to below the break-even point through fiscal 2013 (the left-hand side of Chart V-1-2). A nominal GDP growth rate of nearly minus 1 percent in the first fiscal year of simulation is equivalent to the growth rate under the stress scenario in the September 2010 issue of the *Report*. This means that the upward pressure similar to that exerted under the previous stress scenario would act on the credit cost ratios in the first fiscal year under the current baseline scenario.[39] The estimated credit cost ratios under the economic downturn scenario for the major banks and the regional banks would both surge to above the break-even point in fiscal 2011, and would plunge thereafter to below the break-even point as the economy recovers (the middle of Chart V-1-2).

Chart V-1-2: Credit cost ratios[1]



Note: *1*. Shaded areas indicate the 10th-90th percentile range. The horizontal lines indicate the break-even points of the major banks (solid line) and the regional banks (dashed line) in fiscal 2010.
Source: BOJ calculations.

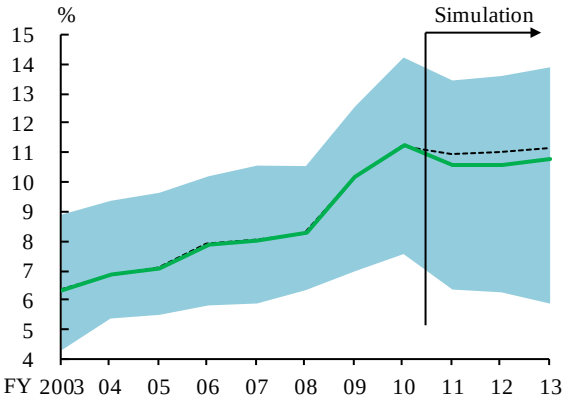
Next, banks' Tier I capital ratio is calculated, based on estimated credit costs, unrealized losses on stockholdings, and operating profits from core business under each scenario. The Tier I capital ratio under the baseline scenario would decline slightly in fiscal 2011 and would moderately recover through fiscal 2013 (Chart V-1-3).

On the other hand, the Tier I capital ratio under the economic downturn scenario would decline by 0.7 percentage point in fiscal 2011 from the base point of fiscal 2010, but

[39] This analysis, however, does not explicitly take policy measures into account. Therefore, attention should be paid to the possibility that an increase in the credit cost ratios could be contained if policy measures are taken in reaction to materialization of stress.

would be maintained at a level similar to that at the end of fiscal 2009. The portion of the decline caused by unrealized losses on stockholdings would only be 0.3 percentage point for the average of all banks, while it would be 0.5 percentage point for the major banks with a large amount of strategic stockholdings. The distribution of Tier I capital ratios shows that more than half of Japan's banks would maintain the ratios above 8 percent even under the economic downturn scenario, suggesting that their capital bases as a whole would avoid significant impairment. However, for some banks, at the tail of the distribution, Tier I capital ratios would continue to decline even after fiscal 2012, when the nominal GDP growth rate is assumed to be positive. There is the possibility that the Tier I capital ratios of banks with relatively low profitability and weak capital bases will remain low.

Chart V-1-3: Tier I capital ratios[1,2,3]



Notes: *1*. The major banks and the regional banks are counted.
2. Simulation results under the economic downturn scenario. Shaded area indicates the 10th-90th percentile range measured by each bank's share of loans.
3. The dashed line indicates the result under the baseline scenario.
Source: BOJ calculations.

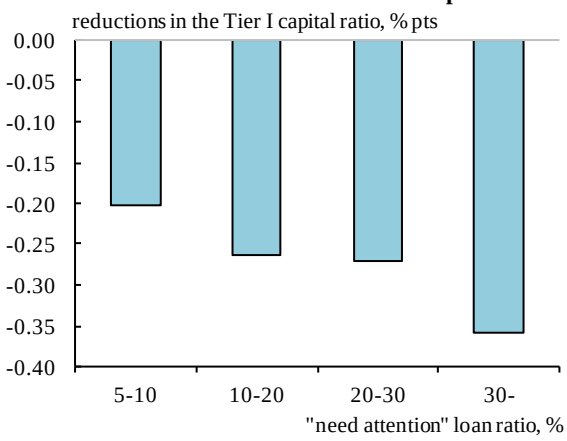
Impact of the protracted economic stagnation

Apart from the economic downturn scenario, another stress scenario (a protracted stagnation scenario), where the nominal GDP growth rate would not turn positive after being negative for some time, is formulated to examine the impact on banks' Tier I capital ratio. Examples of the protracted stagnation scenario are cases in which the U.S. and European balance-sheet adjustments would continue for an even longer period and in which restraints on electricity supply would remain for a long time. Under this scenario, the nominal GDP growth rate in fiscal 2011 would be slightly less than minus 1 percent, which is the same as the growth rate under the baseline scenario, and would

remain 0 percent in fiscal 2012 and 2013 (Chart V-1-1).[40]

Under the protracted stagnation scenario, the estimated credit cost ratios for the major banks and the regional banks would both surge in fiscal 2011 (the right-hand side of Chart V-1-2). Although the ratio for the major banks would fall moderately thereafter, that for the regional banks would remain high above the break-even point. An increase in the credit cost ratio as of the end of fiscal 2013 would reduce the Tier I capital ratio by 0.2 percentage point relative to the ratio estimated under the economic downturn scenario. This additional decline in the Tier I capital ratio would be larger at banks whose quality of loans is relatively low (Chart V-1-4).

Chart V-1-4: Reductions in Tier I capital ratio[1]



Note: *1*. Distribution of each bank's difference between Tier I capital ratio under the protracted stagnation scenario and that under the economic downturn scenario as of end-fiscal 2013. The regional banks are counted.
Source: BOJ calculations.

B. Robustness against financial market fluctuations

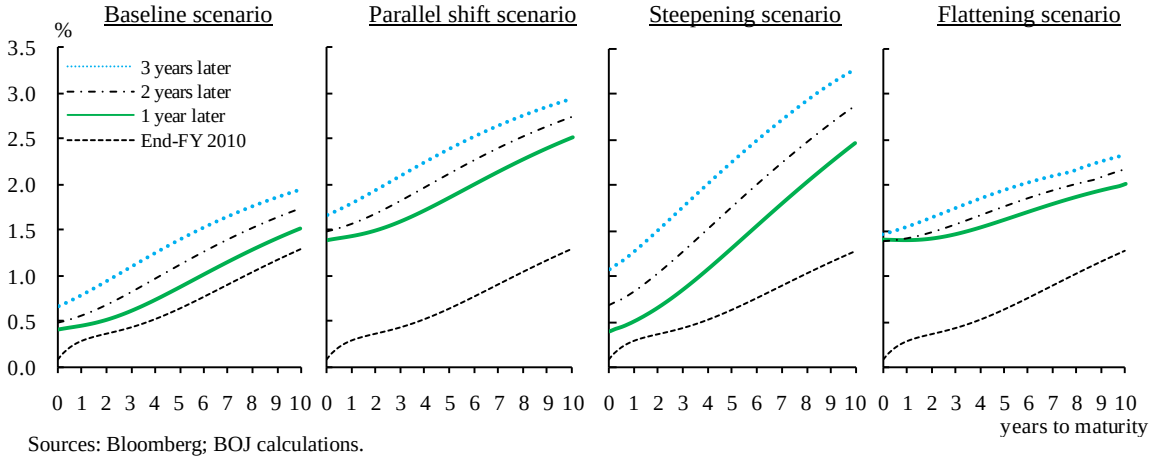
Net interest income and unrealized gains/losses amid a rise in interest rates

In this section, four scenarios of an upward shift in the yield curve are assumed, based on banks' investment-funding balance at the base point of the end of fiscal 2010 to calculate net interest income and unrealized gains/losses on bondholdings. A baseline and three stress scenarios are as follows: (1) a baseline scenario in which future interest rates follow the path factored into the market yield curve at the base point; (2) a parallel shift scenario in which interest rates for all maturities shift upward from the baseline by 1 percentage point; (3) a steepening scenario in which the 10-year rate shifts upward

[40] Stock prices and long-term loan rates assumed in the protracted stagnation scenario are the same as those assumed in the economic downturn scenario.

from the baseline by 1 percentage point; and (4) a flattening scenario in which the overnight rate shifts upward from the baseline by 1 percentage point (Chart V-2-1).[41] Banks' investment-funding balance essentially changes according to the shape of the yield curve, but it is assumed to remain constant here.

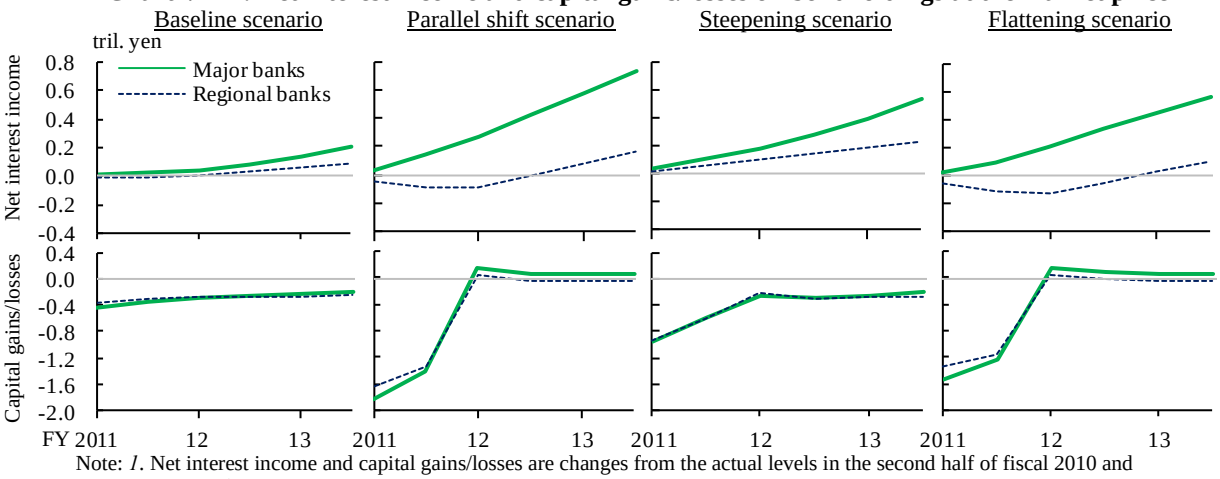
Chart V-2-1: Upward shift in spot rate curves for scenarios



Sources: Bloomberg; BOJ calculations.

The results of the scenario analysis show a tendency similar to that in the previous issues of the *Report*. In all scenarios, net interest income would be sluggish in the early stage of rises in interest rates (the upper row of Chart V-2-2).[42] Even when market

Chart V-2-2: Net interest income and capital gains/losses on bondholdings at the market price[1]



Note: *1*. Net interest income and capital gains/losses are changes from the actual levels in the second half of fiscal 2010 and changes from the previous period, respectively.
Source: BOJ calculations.

[41] In the scenario analysis, the spread between the time deposits/loan rates and the corresponding market rates is assumed to converge to its historical average in the long run, and ordinary deposit rates are assumed to hover around 25 percent of 1-month Libor. See the March and September 2007 issues of the *Report* for details.

[42] Net interest income is defined as interest income minus interest expenses, and it does not include realized and unrealized gains/losses on bondholdings. See Annex 2 for details.

interest rates fluctuate, interest rates on investment and funding would not move uniformly due to the difference in the term structure between investment and funding and in the follow-up ratio to market interest rates. At the early stage of rising interest rates, the increase in short-term funding rates would be relatively large and net interest income would be restrained. This would be evident at the regional banks, whose difference in the term structure between investment and funding is large (Chart IV-3-15).

The effects of a decline in bonds' market value on unrealized gains/losses on bondholdings have become more pronounced as both the major banks and the regional banks have increased their bondholdings (the bottom row of Chart V-2-2). As banks invest mostly in short- to medium-term bonds, they would suffer larger losses under the parallel shift and flattening scenarios, in which a rise in interest rates on these bonds would be relatively strong. Under the parallel shift scenario, the ratio of unrealized losses on bondholdings to Tier I capital would be 11.9 percent at the major banks and 21.4 percent at the regional banks in fiscal 2011. After taking profits into account, the Tier I capital ratio would decline due to unrealized losses on bondholdings only by around 0.3 percentage point at the major banks while the ratio would decline by as large as 0.8 percentage point at the regional banks as of the end of fiscal 2011.[43] The regional banks are susceptible to a rise in interest rates as they bear a large amount of interest rate risk relative to their capital.

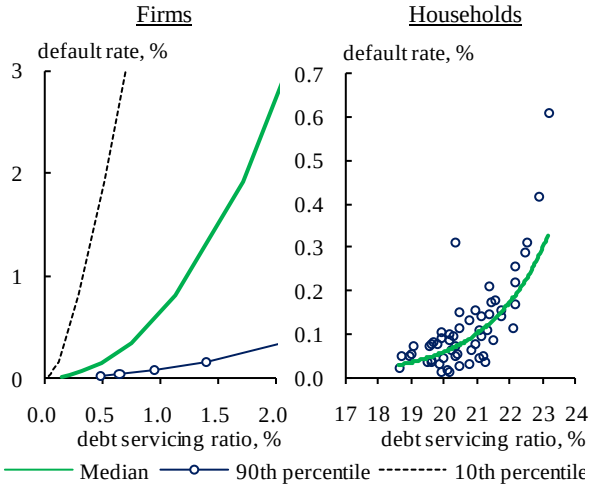
Credit costs from a rise in interest rates

A rise in market interest rates could lead to an increase in credit costs by causing adjustable interest rates on loans to rise. Banks are increasingly providing loans whose loan rates move in tandem with short-term market rates. For example, bank loans offered at adjustable interest rates accounted for about 90 percent of corporate loans as of the end of fiscal 2010 and about 40 percent of housing loans as of the end of fiscal 2009. As a result, a rise in market interest rates could easily increase the burden of repayments on firms and households. This section estimates the degree to which a rise in adjustable interest rates would affect the debt servicing of firms and households and also credit costs borne by banks.

[43] The profits are defined as operating profits from core business minus credit costs and corporate tax. Net interest income is estimated under the parallel shift scenario; and net non-interest income, general and administrative expenses, and credit costs are assumed to remain unchanged from fiscal 2010.

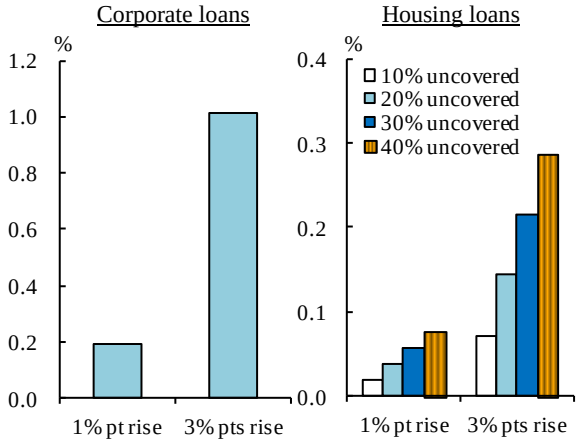
For both corporate and housing loans, a positive correlation is observed between debt servicing ratios (measured by the ratio of interest payments to sales for firms, and the ratio of principal and interest payments to disposable income for households) and default rates (Chart V-2-3). Based on this correlation and an assumed rise of 1 percentage point in short-term interest rates (and the assumption that sales and income remain constant), debt servicing ratios of firms and households would increase from 0.6 percent to 1.2 percent and from 20.7 percent to 22.8 percent, respectively.[44] At the same time, if the uncovered amount of defaulted loans were written off all at once, banks' credit cost ratios as a whole would rise by 0.2 percentage point for corporate loans and by slightly below 0.1 percentage point for housing loans (Chart V-2-4).

Chart V-2-3: Debt servicing ratio and default rate[1,2]



Notes: *1*. Defaults of firms and households are defined as loans delinquent for 3 months or more, etc. (see footnote 25) and delinquent for 6 months or more, respectively.
2. Sample is from fiscal 1995 to fiscal 2010 for firms, and consists of loans extended from March 2001 to August 2008 for households.
Sources: CRD; Japan Housing Finance Agency.

Chart V-2-4: Credit cost ratios of adjustable rate loans[1,2]



Notes: *1*. Defaulted loans due to an interest rate rise (horizontal axis) are assumed to be immediately written off.
2. The major banks and regional banks are counted.
Source: BOJ calculations.

The credit cost ratio, which is calculated from the sum of credit costs from corporate and housing loans when interest rates rise by 1 percentage point, is estimated to be as small as 0.13 percent. This is attributed to the fact that an increase in the default rate would remain insignificant even if interest rates rose by 1 percentage point, given the current debt servicing capacity of firms and households. The high coverage ratio for bank loans also contributes to restrain credit costs. However, these estimates are made,

[44] Here, interest rates are assumed to rise under the flattening scenario. Credit costs generated under the flattening scenario would be about the same as those under the parallel shift scenario in which short-term interest rates rise by the same degree of 1 percentage point as in the flattening scenario. On the other hand, hardly any credit costs would be generated under the baseline and steepening scenarios in which short-term interest rates do not rise as much.

based on the assumption that the amount of sales and disposable income remains constant. If interest rates rise amid sluggish sales and income, credit costs could increase. Moreover, a rise in the default rate is apt to accelerate when debt servicing ratios exceed a threshold (Chart V-2-3). Therefore, in a case where short-term interest rates rise by 3 percentage points, the credit cost ratios could more than triple: more than 1 percent for corporate loans and about 0.3 percent for housing loans (when the uncovered loan ratio is 40 percent).

Unrealized losses on securities holdings caused by a shock in overseas markets

Correlations between domestic and overseas financial markets have recently been high, as mentioned in Chapter IV.B. A shock generated in overseas financial markets easily induces higher volatility in domestic markets, thereby raising the amount of market risk associated with JGBs and domestic stocks held by Japan's banks. This section estimates the amount of risks and unrealized losses associated with JGBs held by Japan's banks under a stress scenario in which a shock is generated in the U.S. Treasury market. Specifically, it examines changes in JGBs' VaR, based on correlations in price volatility between U.S. Treasuries and JGBs, by calculating the degree of rise in the JGB yield volatility by maturity when U.S. Treasury yields rise.[45]

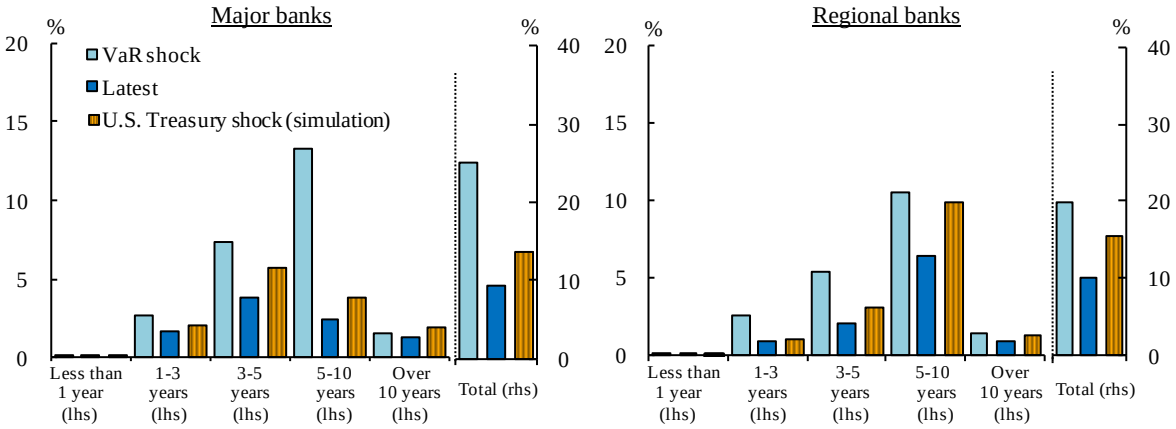
A stress scenario of an upward shock with a 1 percent probability in the U.S. Treasury yield curve (equivalent to a rise of 0.4 percentage point in the 10-year Treasury yield) would raise the volatility interactively between the U.S. Treasury market and the JGB market. As a result, the ratio of JGBs' VaR, with a 99 percent confidence level and 1-year holding, to Tier I capital rises from 9.3 percent to 13.8 percent at the major banks and from 10.1 percent to 15.5 percent at the regional banks (Chart V-2-5). While the ratio at the major banks is about half the ratio observed when the VaR shock hit in 2003, the ratio at the regional banks is as high as the level reached then. When these rises in the VaR are converted into the ratio of unrealized losses on bondholdings to Tier I capital, the ratio is about 3.5 percent for all banks.[46] By maturity of government bonds, the volatility in short-term JGB yields barely responds to an upward shock in U.S. Treasury yields. This is attributable to the fact that short-term yields on JGBs are more susceptible to domestic factors -- such as a monetary policy anchor. On the other hand,

[45] The estimation is based on a bivariate generalized autoregressive conditional heteroskedasticity (GARCH) model with domestic and overseas market prices for government bonds.

[46] The conversion from the VaR to unrealized losses is done based on the historical relationship between the price changes and the volatility level in the JGB market.

the volatility in long-term JGBs moves closely with that in U.S. Treasuries, and an upward shock in U.S. Treasury yields may affect banks' unrealized gains/losses on long-term JGBs. Due attention should be paid particularly to the effects on the regional banks' unrealized gains/losses on bondholdings, because these banks have been actively investing in long-term JGBs and have become susceptible to overseas market developments.

Chart V-2-5: Value-at-risk of JGB holdings relative to Tier I capital[1,2]



Notes: *1*. Value-at-risk with a 99 percent confidence level and 1-year holding.
2. Figures for the "VaR shock" and "latest" are as of July-September 2003 and January-March 2011, respectively.
Source: BOJ calculations.

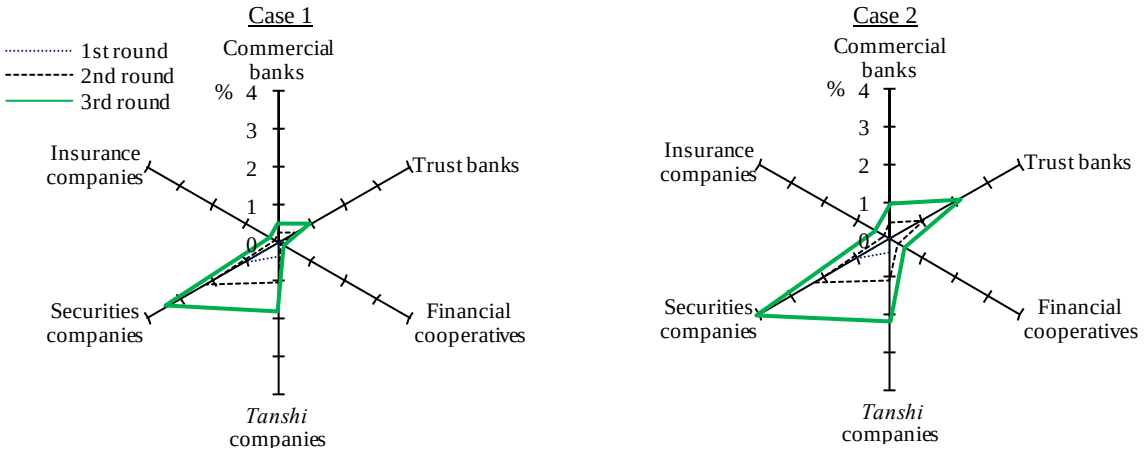
As pointed out in Chapter III.C, Japan's major banks have gradually increased their overseas exposure to, for example, foreign bond investment. Potential effects of a shock generated in overseas markets on Japan's financial institutions warrant vigilance in terms of both a direct channel through unrealized losses on foreign bondholdings and an indirect one through unrealized losses on domestic securities holdings.

Unwinding of repo transactions in response to a rise in JGB volatility

If the JGB market becomes extremely unstable in response to a shock such as the previously described shock in the U.S. Treasury market, financial institutions in repo transactions backed by JGBs may be requested to pledge an additional margin (additional collateral) or to raise the rate of haircuts. In this section, the following stress scenario is assumed: (1) a 1 percent margin is requested; (2) financial institutions that undertook both investment and funding positions in the repo market scale down the existing funding (securities lending) position due to inability to meet such a margin call; and (3) they unwind their funds investment (securities borrowing) position in line with the change in their funding position. If this unwinding of positions occurs in succession,

the outstanding amount of repo transactions would come under downward pressure (the right-hand side of Chart V-2-6). In particular, brokers of repo transactions such as securities companies hold a larger funding or securities lending position, and therefore downward pressure would be exerted on their repo transactions to a greater degree than on other industries.

Chart V-2-6: Pressure to reduce repos outstanding[1,2]



Notes: *1*. Figures are rates of reductions in repos outstanding for both funding and funds investing from the base point. Number of trials indicates the number of chain reactions of unwinding.
2. Case 1: Brokers (securities and *tanshi* companies) are assumed to reduce funds investment in line with a decrease in funding. Case 2: All participants are assumed to do so.
Source: BOJ calculations.

Many financial institutions could pledge more liquid assets (such as cash or current account balances at the Bank of Japan) as collateral in response to additional margin calls, and this would exert less downward pressure on their repo transactions than the above calculations (the left-hand side of Chart V-2-6). Nevertheless, when assuming that financial institutions pledge on-hand liquidity as additional collateral, this does not make much difference in terms of putting the brokers under greater downward pressure than the pressure exerted on other industries. Moreover, as described in Chapter IV.D, securities companies' liquid assets consist of only a small amount of cash and other on-hand liquidity and consist mostly of JGBs. Therefore, securities companies may be unable to maintain their JGB repo positions unless they secure other means of financing. The unwinding of their positions could have widespread effects on other participants in the repo market.

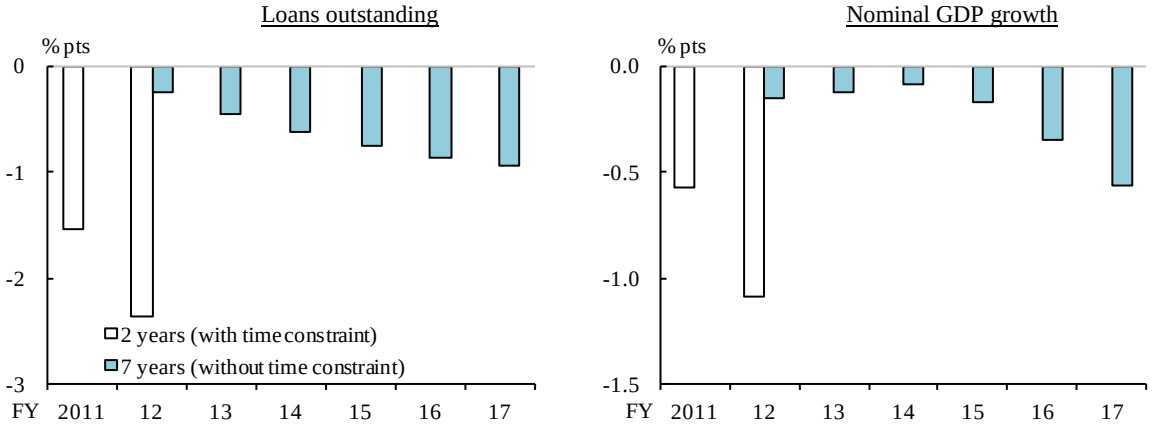
C. Feedback loop between the financial system and the real economy

A decline in banks' capital could adversely affect the real economy by restraining banks

from taking on credit risk. Based on the results of the macro stress testing in assessing the robustness of banks' capital bases in Chapter V.A, this section examines how materialization of stress would affect the real economy through financial intermediation. To this end, the Financial Macroeconometric Model (FMM), which incorporates a feedback loop between the lending of banks and the spending of firms and households, is employed. In the FMM, banks are assumed to recover the Tier I capital ratio following a decline by accumulating retained earnings and restraining bank lending, that is, their risk assets.

Here, the same shock under the economic downturn scenario described in Chapter V.A is assumed to occur in fiscal 2011. In the process by which the Tier I capital ratio recovers to the level of the base point at the end of fiscal 2010, the restraint on bank lending acts to contain spending by firms and households. If banks, according to the historical pattern, are to rebuild their Tier I capital ratio to the fiscal 2010 level in the next 7 years by fiscal 2017, the nominal GDP growth rate would inevitably fall by 0.6 percentage point (an average of 0.1 percentage point per annum) when compared with the rate under the economic downturn scenario (the right-hand side of Chart V-3-1).

Chart V-3-1: Loans outstanding and nominal GDP growth[1]



Note: *1*. Figures are cumulative changes from the economic downturn scenario during the period for recovering Tier I capital ratio to the level at the base point. "With time constraint" is the case where loans outstanding are reduced further to recover Tier I capital ratio in 2 years.
Source: BOJ calculations.

Moreover, if banks attempt to rebuild their Tier I capital ratio earlier, the expected fall in the nominal GDP growth rate would inevitably become greater. For example, rebuilding the Tier I capital ratio in the following 2 years by fiscal 2012 would cause the nominal GDP growth rate to fall by 1.1 percentage points (an average of 0.5 percentage point per annum) when compared with the economic downturn scenario.

The new Basel requirements mandate that banks secure a minimum level of capital

adequacy ratio by 2019. To prepare for the implementation of the requirements and changes in financial and economic conditions, banks need to strengthen their capital bases by, for example, accumulating retained earnings.

VI. Approach toward ensuring stability in the financial system

This chapter presents a comprehensive assessment of the stability in Japan's financial system based on the earlier discussions. It then summarizes the challenges for Japan's financial institutions to further ensure stability in the system.

A. Assessment of the financial system stability

Japan's financial system as a whole has been maintaining stability since the disaster.

Macro risk indicators have not confirmed an accumulation of financial imbalances. The ratio of total credit to GDP in Japan continues to hover around the long-term trend. Both firms and households remain cautious about risk-taking. Developments in bank stocks and the Financial Cycle Indexes have not shown any sign of instability in the financial system.

Risks borne by banks and other financial institutions generally remain restrained relative to their capital. The credit cost ratio and the NPL ratio of Japan's financial institutions remain low, compared with those of their U.S. and European counterparts, due to the improvement in borrowing firms' debt servicing capacity and the effects of various policy measures. Funding liquidity risk of Japan's banks, including funding liquidity risk for foreign currencies, has been restrained although European banks' funding conditions are deteriorating. Even if a severe stress arises in the external environment, such as the simultaneous occurrence of a considerable downturn in the economy and a plunge in stock prices or such as a significant rise in domestic interest rates, banks' capital bases as a whole are estimated to avoid significant impairment.

Global financial markets remain nervous, due to concern over the sovereign debt problems in Europe and a global economic slowdown. In order to ensure long-lasting stability in Japan's financial system and smooth financial intermediation, the following points warrant attention. First, domestic financial markets are slightly nervous given high correlations between domestic and overseas financial markets. Japan's banks and life insurance companies are still exposed to high market risk associated with stockholdings and are gradually increasing their holdings of JGBs and foreign bonds. It is possible that a change in the U.S. Treasury market will immediately spread to the JGB market, thereby significantly impairing realized gains/losses on domestic bondholdings. Particular attention should be paid to the susceptibility to overseas market developments of the regional banks, which have been actively investing in

long-term JGBs.

Second, although financial institutions' credit costs have decreased as a whole, the quality of bank loans has not improved. Interest rate margins on loans are narrowing due to the intensifying lending competition among banks. If a considerable downturn in the economy and a plunge in stock prices occur simultaneously, capital adequacy ratios are likely to remain low at banks with relatively low profitability and weak capital bases. Moreover, if the economy remains stagnant for a protracted period, possible materialization of credit risk could cause credit costs to increase and exceed profits of banks. Such a risk warrants attention particularly at banks with a larger proportion of loans extended to small and medium-sized firms, because many of these firms are comparatively slow in improving their financial conditions. In view of these possibilities, it has become more important for financial institutions to strengthen their capital bases.

B. Challenges for Japan's financial institutions

In order for financial institutions to continue to conduct smooth financial intermediation while ensuring their readiness to respond to possible financial and economic shocks, they need to predominantly address the following three challenges. The Bank of Japan, in view of these challenges, will continue to conduct on-site examinations and off-site monitoring, hold seminars of the Bank's Center for Advanced Financial Technology, and take part in international discussions.

Enhancing the effectiveness of risk management

Financial institutions should continue to enhance the effectiveness of risk management, particularly for credit and market risks. Their appropriate risk management is expected to stabilize their profits on a risk-adjusted basis, by restraining credit costs and realized losses on securities holdings.

As for credit risk on loans, it is particularly important to strengthen risk management after extending loans and measures to help ailing borrowing firms improve their business conditions. Ever since the Lehman shock, the quality of bank loans has declined amid the deterioration in business conditions of borrowing firms. Financial institutions need to contain credit risk by supporting borrowing firms' swift formulation and implementation of reconstruction programs.

Regarding securities investment, it is possible that domestic financial markets will become unstable within a short period due to their correlations with overseas financial markets. Financial institutions are required to take into account this possibility and to examine market risk from various perspectives, utilizing multiple risk measurement methods including stress testing, in order to formulate balanced investment portfolios and manage market risk in an amount sufficiently covered by their capital. They should steadily reduce their market risk associated with stockholdings as scheduled after thoroughly examining the relative merits of business transactions arising from strategic stockholdings.

Funding liquidity risk particularly in foreign currencies requires strict risk management. Japan's financial institutions depend on the markets for foreign currency funding and therefore are susceptible to changes in market conditions. Foreign currency funding thus needs to be managed closely amid a growing strain in overseas money markets.[47]

The March 11 disaster caused tail risk in business continuity to materialize by damaging a widespread area and putting electricity supply and other social infrastructures out of service for an extended period. The financial system is a crucial infrastructure that sustains people's lives and economic activity. Therefore, financial institutions need to continually examine business continuity arrangements to prevent and address system disruptions, and to make necessary rearrangements. Moreover, based on the lessons learned from the disaster, they should check the appropriateness of assumptions in their disaster scenarios and reconsider the effectiveness of their business continuity arrangements, including the location of their backup sites and the capability of their business continuity staff to assemble. In addition, it is extremely important to conduct "street-wide training" with a broad range of concerned parties -- from the financial sector, the Bank, operators of payment and settlement systems, public utility companies, to the regulatory and supervisory authorities -- based on a common disaster scenario such as an epicentral earthquake.[48]

A series of risk management processes should be implemented not only by the risk

[47] In response to a growing strain in global financial markets, the Bank has strengthened the monitoring of foreign currency funding of Japan's banks that are internationally active and yen funding of foreign banks resident in Japan. The Bank has also continually offered U.S. dollar funds-supplying operations in cooperation with major overseas central banks. Although there have been no bids since August 2010, financial institutions are expected to utilize the operations if the market functioning of foreign currency funding deteriorates, thereby avoiding market instability.

[48] In November 2010, the Japanese Bankers Association organized the first street-wide training that assumed the occurrence of the new strain of highly virulent influenza. The Bank participated in the training as an observer.

management department but also with the active involvement of corporate management. Amid growing future uncertainty over the external environment, it is important for financial institutions to examine risks from a company-wide perspective as well as their readiness to respond to changes occurring in the financial and economic environment and their *ex post* responses.

Strengthening capital bases

Financial institutions should further strengthen their capital bases. In order for them to keep conducting smooth financial intermediation into the future, including their responses to the demand for funds for rebuilding after the disaster, stable capital bases are indispensable.[49] They may face considerable credit costs as they advance into new business areas related, for example, to lending to Asian economies as well as investment and lending to growing business areas, because they cannot apply to these new areas their experience gained in existing ones. Therefore, to be fully able to advance into new areas, they need to secure sufficient capital to cover losses in case a stress occurs.

New Basel requirements will be applied in an orderly manner to internationally active banks from 2013. Grandfathering measures regarding deductions from banks' capital and methods of raising capital will be phased out. Financial institutions are required to strengthen their capital bases steadily by, for example, accumulating retained earnings, with a view to improving the quality of their capital and increasing their capital adequacy ratios.[50]

Constructing stable profit bases

Financial institutions should secure stable profits to accumulate retained earnings or to smoothly increase capital for strengthening their capital bases.

The profitability of Japan's banks is low when compared with counterparts overseas, while fluctuations in profits are relatively large. The low profitability is attributed to the

[49] To this end, the Act on Special Measures for Strengthening Financial Functions was amended in June 2011 and the conditions to provide public funds were eased for financial institutions that were in need of more capital to smoothly extend credit following the disaster. In September, it was decided to inject public funds into 2 banks in the disaster areas.

[50] In overseas financial markets, a new capital instrument called contingent capital has recently been issued in view of the new Basel requirements to be applied. On contingent capital, see Kamada, Koichiro, "Understanding contingent capital," Bank of Japan Working Paper, No. 2010-E-9, October 2010.

decline in interest rate margins on loans due to the intensification of lending competition amid sluggish borrowing demand. The large fluctuations in profits, meanwhile, are attributed to the fact that net interest and non-interest income are susceptible to the business cycle amid the low profitability of deposit- and settlement-related business. Financial institutions should continue to expand their profit bases by identifying and supporting firms and business areas with high growth potential and make efforts to contain fluctuations in profits by setting prices to make new services profitable.

In lending business, there is a tendency for financial institutions to set loan rates according to the debt servicing capacity of borrowing firms to support corporate financing, and not necessarily in accordance with the firms' credit risk. Financial institutions should carefully check the balance between credit risk-taking and the loan rate setting while accurately gauging borrowing firms' business conditions. This should include a review of the setting of loan rates as well as a reduction in credit costs through the aforementioned support for ailing borrowing firms as they improve their business conditions.

Japan's banks have the advantages of stable deposit bases and close relationships with customers. Drawing on these advantages, they should support firms' and households' economic activity through the provision of financial and information services, thereby gaining profit opportunities.

Annex 1: List of charts

II. Examination of the external environment

III. Examination of financial intermediation

IV. Risks in the financial system

V. Robustness of the financial system

Annex 2: Glossary

Financial statements of banks

Operating profits from core business = net interest income + net non-interest income – general and administrative expenses.

Net interest income = interest income – interest expenses.

Net non-interest income = net fees and commissions + profits on specified transactions + other operating profits – realized gains/losses on bonds.

Overall gains/losses on securities = realized gains/losses on securities + changes in unrealized gains/losses on securities.

Realized gains/losses on securities = realized gains/losses on stocks + realized gains/losses on bonds.

Realized gains/losses on stocks = gains on sales of stocks – losses on sales of stocks – losses on devaluation of stocks.

Realized gains/losses on bonds = gains on sales of bonds + gains on redemption of bonds – losses on sales of bonds – losses on redemption of bonds – losses on devaluation of bonds.

Credit costs = loan-loss provisions + write-offs – recoveries of write-offs.

Credit cost ratio = credit costs / total loans outstanding.

Tier I capital ratio = Tier I capital / risk-weighted assets.

Tier I capital is the core capital including the common shares and retained earnings

Risk-weighted assets are bank's assets weighted according to credit risk.

Liquid asset ratio = (deposits with the Bank + cash + government bonds) / (net market funding matured within 3 months + runoff of deposits with a renewal time within 3 months)

Financial statements of firms

Interest coverage ratio = (operating income + interest and dividends received) / interest expenses.

On-hand liquidity ratio = (cash and deposits + securities) / sales.

Ratio of Interest-bearing debt to cash flow = (borrowings + bond debts) / (current profits / 2 + depreciation)

Three letter code of countries

AUS: Australia, BEL: Belgium, BRA: Brazil, CAN: Canada, CHE: Switzerland, CHL: Chile,

CHN: China, DEN: Denmark, DEU: Germany, ESP: Spain, EST: Estonia, FIN: Finland,

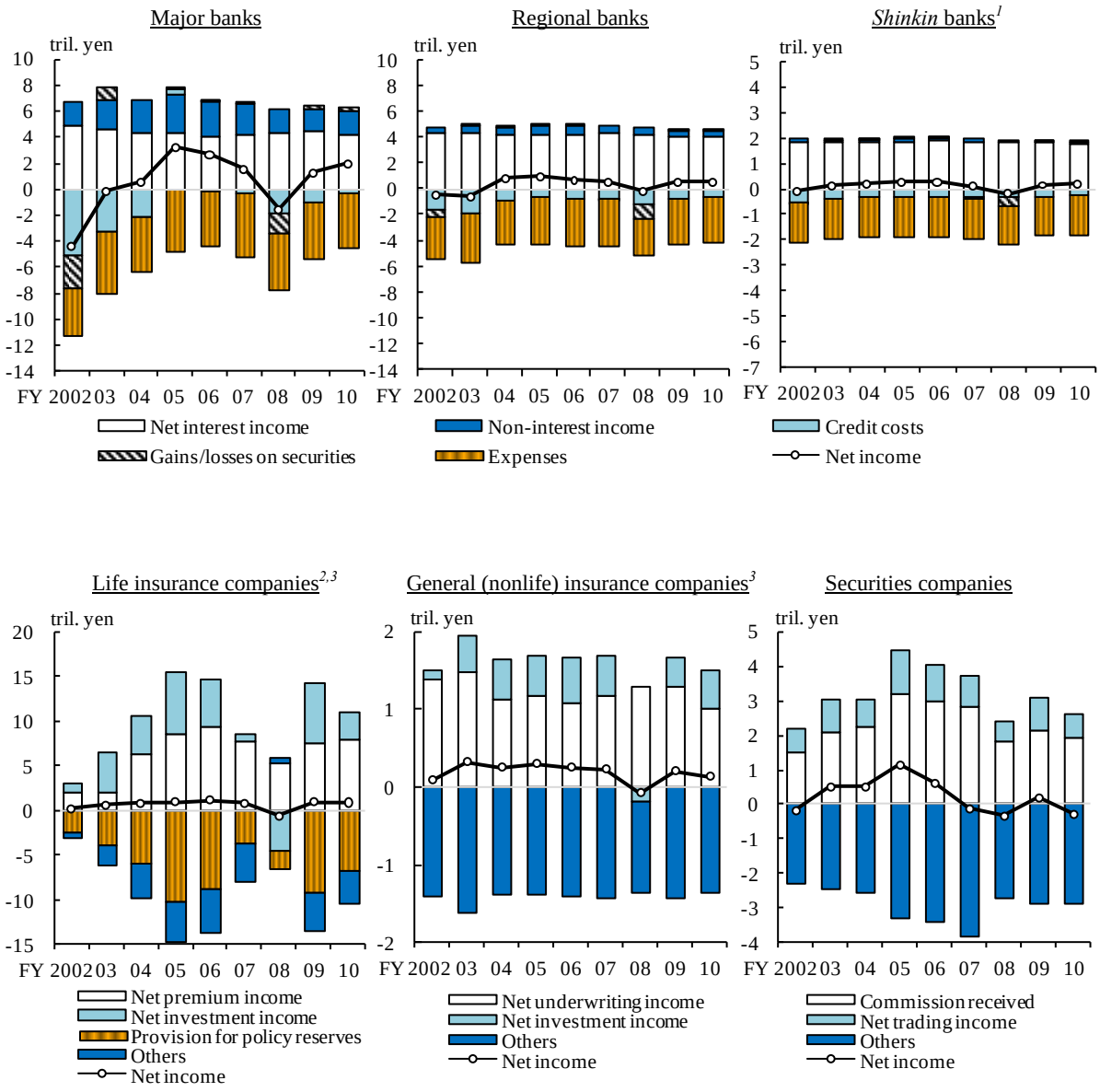
FRA: France, GBP: U.K., GRC: Greece, HKG: Hong Kong, IRL: Ireland, ISR: Israel, ITA: Italy,

KOR: South Korea, LUX: Luxemburg, MEX: Mexico, NLD: Netherlands, NOR: Norway,

POL: Poland, SGP: Singapore, SVK: Slovakia, SWE: Sweden, TUR: Turkey, USA: United States,

VEN: Venezuela.

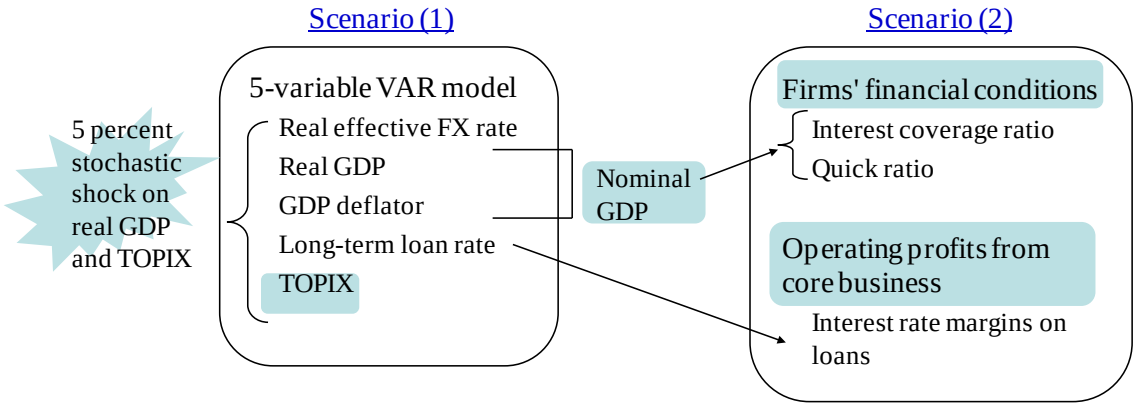
Annex 3: Financial results of Japan's financial institutions for fiscal 2010

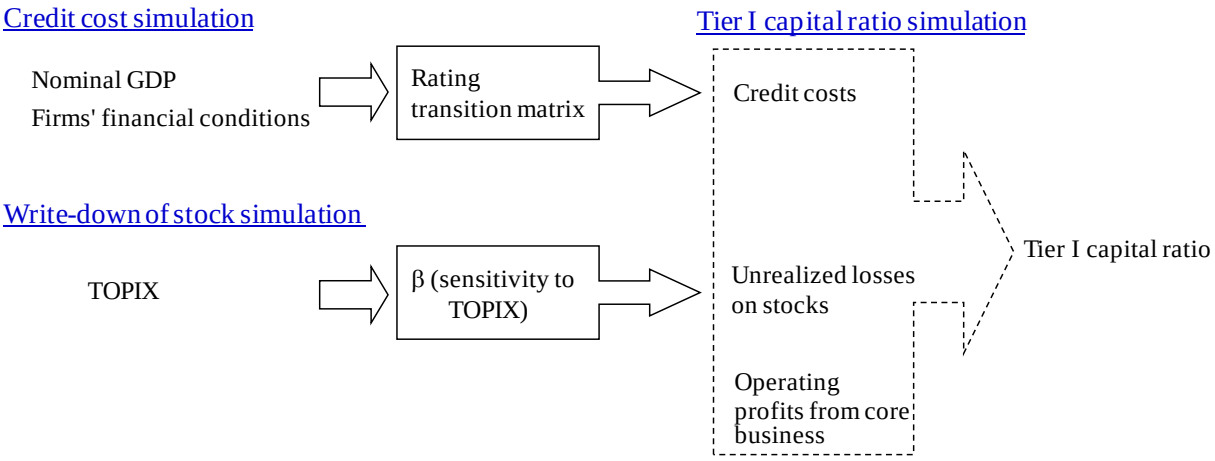


Notes: *1*. *Shinkin* banks stand for 262 *shinkin* banks that hold accounts at the Bank of Japan, as of March 31, 2011.
2. Net premium income = Premium income and others - Insurance benefits paid.
3. Net investment income = Investment income - Investment expenses.
Sources: The Life Insurance Association of Japan, "Summary of life insurance business"; The General Insurance Association of Japan, "Business result"; Japan Securities Dealers Association, "Financial overview of regular members."

Annex 4: Framework of macro stress testing

Evaluation of robustness against macroeconomic shock





Annex 5: Major events in the financial system (since October 2010)

Oct. 1, 2010	U.S.: Financial Stability Oversight Council (FSOC) held the first meeting.
Oct. 5	Japan: Bank of Japan decided to implement the comprehensive monetary easing policy.
Oct. 20	Europe: European Commission set out its plans for a new crisis management framework in Europe.
Oct. 29	Europe: European Council approved the establishment of a permanent crisis mechanism.
Nov. 11	Europe: Alternative Investment Fund Managers Directive (AIFMD) was passed by the European Parliament.
Nov. 12	G20 approved the Seoul Action Plan at the Seoul Summit.
Nov. 26	Germany: Act introducing bank levies and establishing bank resolution funds was passed.
Nov. 28	Europe: EU, IMF, and other states agreed on the provision of 85 billion euros of financial support to Ireland.
Dec. 9	U.K.: HM Treasury published Finance Bill 2011, including the introduction of bank levies.
Dec. 16	BCBS issued the "Basel III rules text and results of the comprehensive quantitative impact study (QIS)."
	Europe: European Council agreed on the establishment of the European Stability Mechanism (ESM).
Jan. 1, 2011	Europe: European Banking Authority, European Securities and Markets Authority, and European Insurance and Occupational Pensions Authority officially came into being as new European supervisors.
Jan. 20	Europe: ESRB held its inaugural meeting.
Jan. 25	Europe: European Financial Stability Facility (EFSF) issued its inaugural bond for financial support for Ireland (5 billion euros).
Feb. 21	Spain: Banco de España announced measures to further strengthen Spanish banks' capital.
Mar. 11	Japan: Great East Japan Earthquake occurred.
	Europe: Eurogroup agreed on a Pact for the Euro to strengthen economic policy coordination.
Mar. 14	Japan: Bank of Japan decided to enhance monetary easing.
Mar. 31	Japan: The bill for extension of comprehensive measures to facilitate financing for small and medium-sized firms was enforced.
	Central Bank of Ireland announced the Financial Measures Programme.
May 5	Europe: European Commission and IMF announced a joint statement about financial support for Portugal.
May 16	Europe: Eurogroup agreed on financial support for Portugal.
June 16	U.K.: Bank of England held the first meeting of Interim Financial Policy Committee.
June 22	Japan: Act on Special Measures for Strengthening Financial Functions was amended.
June 24	Europe: European Council released statements on the implementation of the comprehensive package of economic measures, etc.
June 25	Group of Central Bank Governors and Heads of Supervision agreed on measures for global systemically important banks.
July 15	Europe: European Banking Authority released the results of the EU-wide stress test.
July 21	Europe: European Council announced further measures of financial support to Greece and the improvement of the effectiveness of EFSF.
	U.S.: Consumer Financial Protection Bureau (CFPB) was established with the passage of 1 year following the enactment of Dodd-Frank Act.
July 26	U.S.: FSOC released its first annual report.
Aug. 2	U.S.: Budget Control Act of 2011 was enacted.
Aug. 4	Japan: Bank of Japan decided to enhance monetary easing.
Sep. 9	G7 announced an agreement.
Sep. 12	U.K.: Independent Commission on Banking released its final report on reform of the U.K. banking sector.
Sep. 14	Japan: Financial Services Agency announced the injection of public funds into 2 banks in the disaster areas.

Annex 6: Financial system related speeches and reports

-- Publications by the Bank of Japan after the September 2010 issue of the *Report*.

Speeches and remarks

Masaaki Shirakawa, Governor, "Insurance Companies and the Financial System: A Central Bank Perspective," Keynote Address at the 18th Annual Conference of the International Association of Insurance Supervisors in Seoul, September 30, 2011.

Kiyohiko G. Nishimura, Deputy Governor, "Macro-Prudential Policy Framework from an Asian Perspective," Speech at ADBI-FSA Conference in Tokyo, September 30, 2011.

Masaaki Shirakawa, Governor, "How to Address Tail Risks," Speech at Annual General Meeting 2011 of the Foreign Bankers' Association in the Netherlands, June 27, 2011.

Masaaki Shirakawa, Governor, "Money, Government Securities and A Central Bank: Interdependency of Confidence," Speech at the 2011 Spring Meeting of the Japan Society of Monetary Economics, May 28, 2011.

Kiyohiko G. Nishimura, Deputy Governor, "The Importance of Financial Infrastructure in Seeking a More Resilient Financial System --From an Asian Regional Perspective--," Keynote Speech at the Bank of Korea International Conference 2011, May 26, 2011.

Masaaki Shirakawa, Governor, "150 Years of Innovation and Challenges in Monetary Control," Speech at Goethe-Universitaet Frankfurt am Main, March 8, 2011.

Kiyohiko G. Nishimura, Deputy Governor, "A Central Banker's Perspective on the International Monetary System," Remarks at the International Symposium of the Banque de France, March 4, 2011.

Masaaki Shirakawa, Governor, "Global Imbalances and Current Account Imbalances," Remarks at the Banque de France Financial Stability Review Launch Event, February 18, 2011.

Hirohide Yamaguchi, Deputy Governor, "Challenges for Japan's Financial System after the Financial Crisis," Speech at the Symposium Co-Hosted by the University of Tokyo and Development Bank of Japan, December 10, 2010.

Kiyohiko G. Nishimura, Deputy Governor, "Toward Strengthening the Foundations for Economic Growth: Efforts of Financial Institutions and the Bank of Japan," Speech at

Symposium 2010 on "Cooperation among Finance, Industry, Academia, and Government", December 2, 2010.

Bank of Japan Reports

Bank of Japan, "The Bank of Japan's Initiatives on the Macroprudential Front," October 18, 2011.

Financial Markets Department, "Money Market Operations in Fiscal 2010," May 31, 2011.

Financial System and Bank Examination Department, "Questionnaire Survey on Business Continuity Management (November 2010)," April 28, 2011.

Bank of Japan, "On-Site Examination Policy for Fiscal 2011," April 12, 2011.