



**BOJ**  
*Reports & Research Papers*

# Financial System FSR report



BANK OF JAPAN

APRIL 2013

The total of 11 major banks, 105 regional banks, and 261 *shinkin* banks covered in this *Report* is as follows (as of March 31, 2013).

The 11 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, Sumitomo Mitsui Trust Bank, Shinsei Bank, and Aozora Bank. The 105 regional banks comprise the 64 member banks of the Regional Banks Association of Japan (Regional banks I) and the 41 member banks of the Second Association of Regional Banks (Regional banks II). The 261 *shinkin* banks are the *shinkin* banks that hold current accounts at the Bank of Japan.

This *Report* basically uses data available as of March 31, 2013.

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## Preface

### *Objective of the Financial System Report*

The Bank of Japan publishes the *Financial System Report* semiannually, with the objective of comprehensively analyzing and assessing the stability of Japan's financial system and facilitating communication with concerned parties in order to ensure such stability. 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 macro 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 *Report* assesses the stability of Japan's financial system while bearing in mind the 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.

Specifically, this *Report* analyzes and assesses the following points. First is the analysis of the external environment surrounding Japan's financial system. Second is the analysis of financial intermediation in Japan such as financial conditions of firms and households and developments in financial and loan markets. Third is the assessment of risks in the financial system. To assess the risks, this *Report* examines indicators of macro financial risk and a wide range of risks inherent in financial markets, banks, and insurance companies. And fourth is the assessment of the resilience of the financial system. To assess the resilience, this *Report* focuses on macro stress testing, which assumes a severe stress in the real economy and financial markets.

### *Current and future issues of the Report*

The analysis in the April 2013 issue of the *Report* is basically conducted on the basis of information as of the end of March 2013. In this issue, in addition to the regular examination of the financial system, the analysis has been enhanced in the following areas: (1) assessment of the profitability of overseas business of Japan's banks; (2) financial institutions' challenges in investments and loans to growing business areas; and (3) measures to improve the profitability of regional financial institutions.

The Bank will contribute further to ensuring financial system stability. To this end, it will continue to enhance the *Report*.

At the Monetary Policy Meeting held on April 3 and 4, 2013, the Bank introduced the "quantitative and qualitative monetary easing." This measure is expected not only to work through such transmission channels like longer-term interest rates and asset prices but also to drastically change the expectations of markets and economic entities. In the future issues of this *Report*, the Bank will analyze how the flow of funds in the financial system and the behavior of financial institutions and investors change under the quantitative and qualitative monetary easing.

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## I. Overview

### *The external environment surrounding Japan's financial system*

Regarding the external environment surrounding Japan's financial system, some signs of improvement have been observed, but uncertainty about the future is still high.

In global financial markets, investors' risk aversion has gradually abated. As for the real economy, the U.S. economy has been on a moderate recovery trend, and the Chinese economy has shown signs of picking up. Nevertheless, many problems remain to be resolved for the fundamental resolution of the European debt problem.

Japan's economy remained relatively weak from the second half of 2012, but has recently stopped weakening and shown some signs of picking up. In this situation, firms have been taking a cautious stance in financing, and firms' financial conditions have generally improved. However, some small and medium-sized firms have continued to face severe financial conditions, and principal and interest repayments relative to income for households with housing loans remain generally large. In the public sector, government debt has accumulated, with a continuing fiscal deficit.

### *Financial institutions' performance of financial intermediation*

Financial conditions of firms and households in Japan are accommodative. Issuing conditions for CP and corporate bonds have remained favorable on the whole. Banks' domestic loans outstanding have increased, particularly for working capital and funds related to mergers and acquisitions. Major banks have increased overseas loans, and some regional financial institutions have enhanced their initiatives to support overseas business expansions of small and medium-sized firms in their local areas. However, growth in the amount of investments and loans to start-ups has been weak.

### *Risks in the financial system*

Judging from the results of the examination of indicators of macro financial risk, thus far there is no indication that warns of financial imbalances stemming from bullish expectations. Due attention should be paid, however, to the fact that the amount outstanding of Japanese government bonds (JGBs) held by financial institutions remains large. Moreover, although the amount of risks borne by banks and *shinkin* banks has been decreasing relative to capital, their core profitability has declined.

### *Resilience of the financial system*

The macro stress testing shows that the resilience of Japan's financial system is generally strong as a whole. Banks' capital bases as a whole would be able to avoid significant impairment, even if a significant negative shock occurred such as the economic downturn similar to that observed after the Lehman shock. Nevertheless, capital adequacy ratios may plunge at banks whose core profitability or quality of loans is low. It appears that banks as a whole hold a sufficient amount of funding liquidity both in the domestic and foreign currencies.

### *Challenges to ensure stability of the financial system*

Japan's financial system as a whole has been maintaining stability. However, in order for financial institutions to maintain smooth financial intermediation, they need to address the following major management challenges.

First, financial institutions need to raise their profitability. It is important for financial institutions to tap potential demand for financial services by enhancing the effectiveness of their support for client firms that are reconstructing their business or that are engaged in growing business areas. They can enhance the effectiveness of such support by, for example, strengthening their expertise to identify projects' growth potential and risks or devising ways to effectively utilize a range of financial instruments. In addition, one potential option for financial institutions seeking to raise their profitability is to improve their business efficiency or expand their customer networks through mergers.

Second, financial institutions need to strengthen their capital bases. It is indispensable for them to enhance their capital to continue financial intermediation in areas with high risk and return through investments and loans to growing business areas at home and abroad.

Third, financial institutions need to continue to enhance the effectiveness of risk management. Given the recent increase in the extension of overseas loans and large-lot loans, it is vital for financial institutions to restrain concentration risk associated with loan portfolios at home and abroad and strengthen their risk management of large-lot loans, as well as to work further to support firms' reconstruction. It is also important for them to grasp a range of risks associated with bondholdings. In addition, they need to continue to manage market risk associated with stockholdings appropriately, taking into account the effects of developments in stock prices on, for example, their profits.

## **II. Examination of the external environment**

This chapter examines the external environment surrounding Japan's financial system. It first summarizes developments in the global financial system and overseas economies, and then examines economic developments, financial conditions of firms and households, and fiscal conditions in Japan.

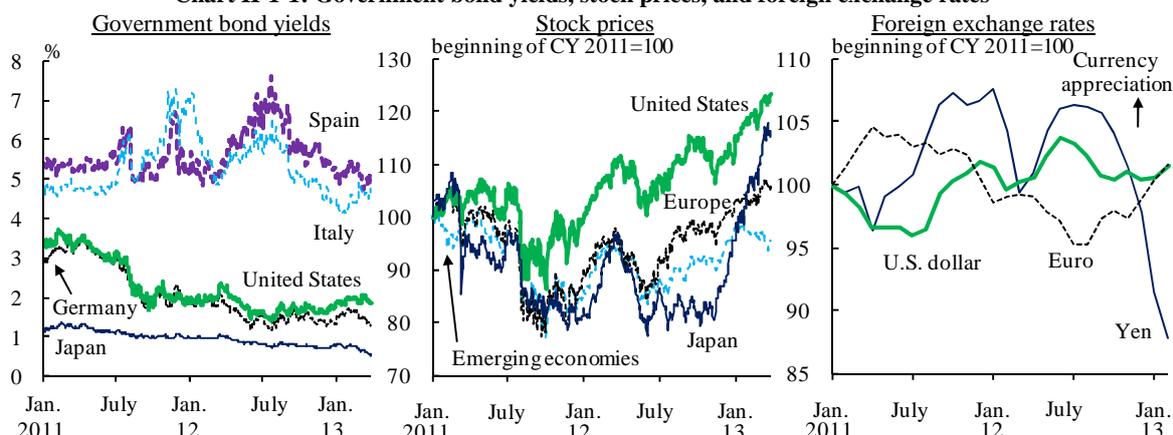
### **A. Developments in the global financial system and overseas economies**

#### **1. Developments in global financial markets**

In global financial markets, investors' risk aversion has gradually abated. This is because concerns have eased over the tail risks (risks with a low probability of materialization but a devastating impact if they materialize) associated with the European debt problem and the U.S. fiscal problem. The fact that central banks in major advanced countries are maintaining their stance on continued monetary easing also seems to have stimulated investors' risk-taking.

Stock prices have risen in a wide range of countries and regions, and government bond yields in peripheral European countries have declined (the left-hand and middle sides of Chart II-1-1). The value of the yen, for which demand was strong as a safe-haven currency, has fallen (the right-hand side of Chart II-1-1). In addition, amid the protracted low interest rate environment in major developed countries, demand has begun to rise for financial products with relatively high yields. For example, there were inflows of funds in the U.S. high-yield bond markets (Chart II-1-2). Although the growth rate of the world economy is expected to gradually pick up, the shift in global investors' stance toward risk-taking and the accompanying changes in the flow of funds warrant attention, as the degree of uncertainty remains high over the outlook for the world economy such as the outcome of the European debt problem (Chart II-1-3).

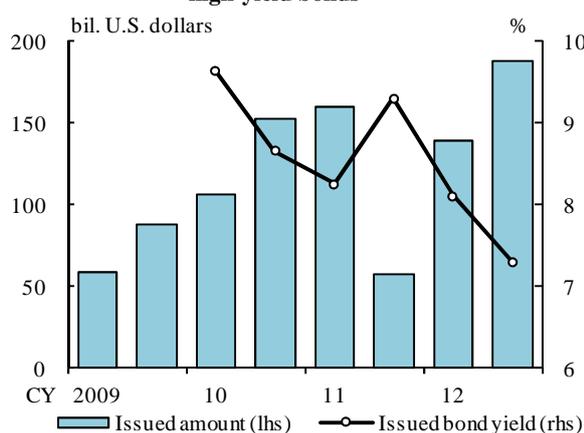
**Chart II-1-1: Government bond yields, stock prices, and foreign exchange rates<sup>1,2</sup>**



Notes: 1. The left chart shows 10-year government bond yields. The middle chart shows United States (S&P 500), emerging economies (MSCI Emerging), Europe (STOXX Europe 600), and Japan (TOPIX). The right chart shows nominal effective exchange rates. 2. The latest data in the left and middle charts are as of March 29, 2013, and those in the right chart are as of February 2013.

Sources: BIS; Bloomberg.

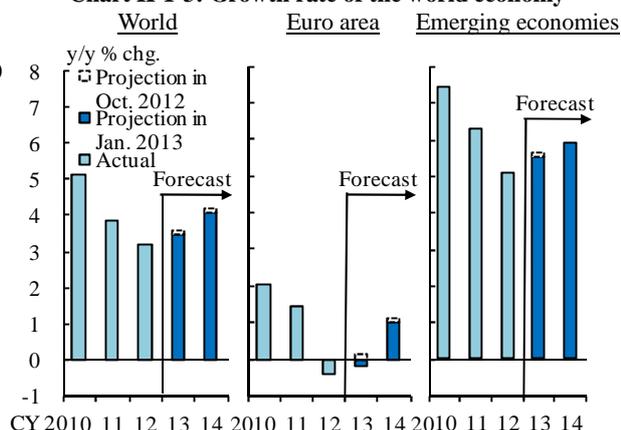
**Chart II-1-2: Issuance of and yields on U.S. high-yield bonds<sup>1</sup>**



Note: 1. Issued bond yield indicates 6-month average.

Source: Thomson Reuters.

**Chart II-1-3: Growth rate of the world economy**



Source: IMF, "World economic outlook."

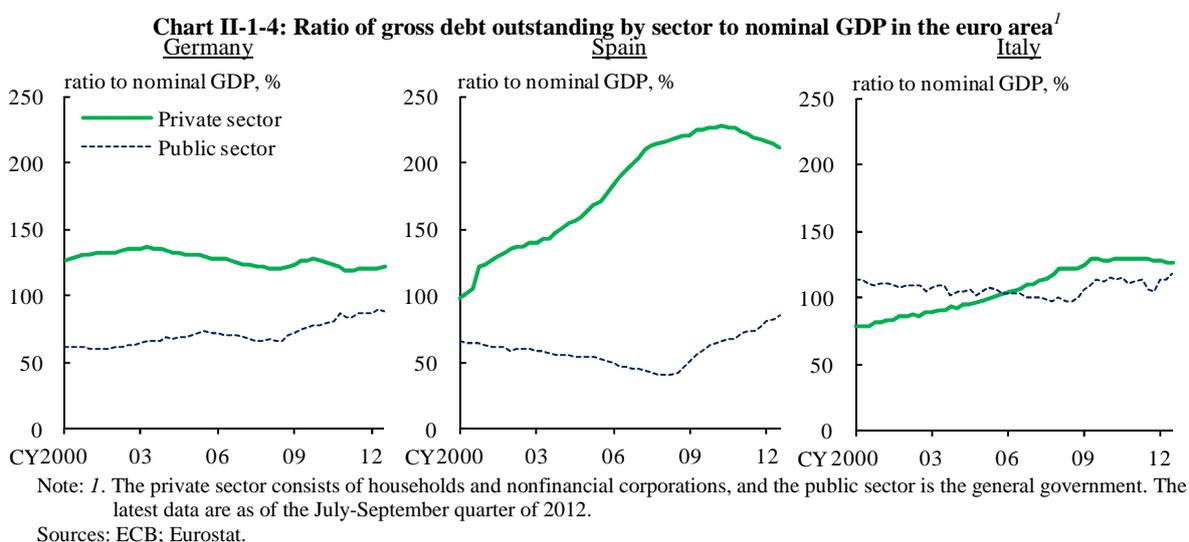
## 2. Developments in European economies

Since the second half of 2012, the policy authorities have made progress in addressing the European debt problem. In September 2012, the European Central Bank (ECB) decided to establish a new scheme called Outright Monetary Transactions (OMTs) that allowed for purchases of government bonds within the euro area. In October, the European Stability Mechanism (ESM), a permanent support fund for the countries in the euro area, started to operate.<sup>1</sup> In December, euro area countries agreed to set up a

<sup>1</sup> There are four kinds of ESM stability support instruments: (1) providing loans to euro area member states experiencing or threatened by severe financing problems; (2) purchasing bonds of an ESM member state in primary and secondary debt markets; (3) providing precautionary financial

Single Supervisory Mechanism, taking a further step toward the establishment of a banking union.

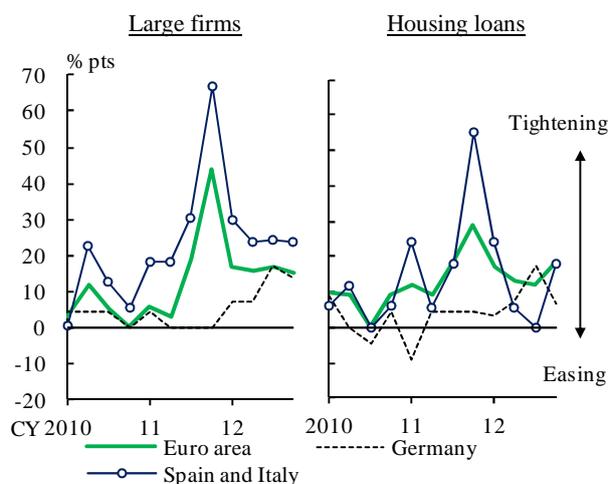
Reflecting these policy responses, concerns have eased over the tail risks associated with the European debt problem. Nevertheless, as economic activity in Europe has continued to recede slowly, the levels of debt outstanding of the public and private sectors remain high, particularly in the peripheral countries. Thus, further efforts are still necessary for fundamental resolutions of deleveraging and fiscal consolidation (Chart II-1-4). Moreover, the amount outstanding of nonperforming loans (NPLs) has remained high in some peripheral countries, and many European banks have maintained cautious lending attitudes (Chart II-1-5). In addition, the recent deterioration in corporate profits and household income may lead to an increase in banks' credit costs (Chart II-1-6).




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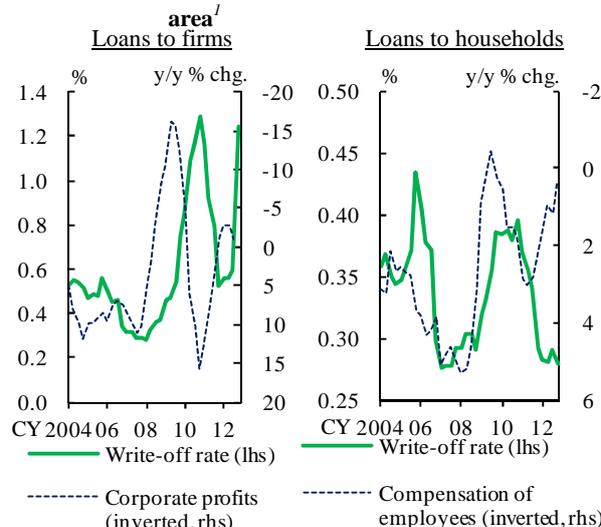
assistance in the form of a credit line; and (4) financing recapitalizations of financial institutions through loans to governments. The ESM's maximum lending capacity is 500 billion euros.

**Chart II-1-5: European banks' lending attitudes<sup>1</sup>**



Note: 1. Changes in banks' lending attitudes over the past 3 months. Figures for Spain and Italy are the average of the two countries. The latest data are as of the October-December quarter of 2012.  
Source: ECB, "The euro area lending survey."

**Chart II-1-6: Write-off rate on bank loans in the euro area<sup>1</sup>**



Note: 1. Corporate profits indicate the sum of entrepreneurial income in the SNA statistics during the recent four quarters. The write-off rate is the ratio of the sum of write-offs during the recent four quarters to loans outstanding. The definition of write-offs is not necessarily the same among the countries. The latest data are as of the October-December quarter of 2012 for the write-off rate and compensation of employees, and the July-September quarter of 2012 for the others.  
Sources: ECB; Eurostat.

Many problems remain to be resolved in Europe regarding fiscal conditions and the financial system, and it will take more time to fundamentally resolve such problems.

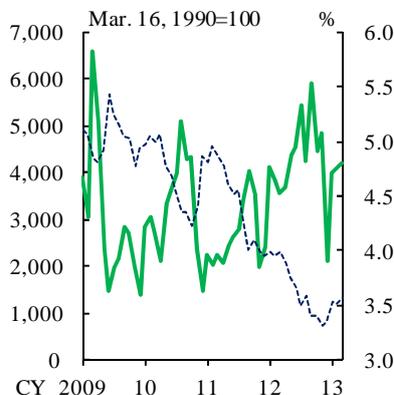
### 3. Developments in the U.S. economy

In the United States, amid the ongoing monetary easing, housing loan interest rates have remained at low levels, giving a boost to loan refinancing (Chart II-1-7). Refinancing of loans at low interest rates has contributed to easing the drag on households' balance-sheet adjustments by reducing the burden of interest payments. In the housing markets, housing investment has been at a low level, but a pick-up has become evident. Housing prices have also picked up (Chart II-1-8). However, the foreclosure of borrowers' houses by financial institutions has remained at a high level (Chart II-1-9). Attention should continue to be paid to the possibility that these potential housing inventories will weigh on future housing prices.

Meanwhile, a bill to avoid the "fiscal cliff," a scenario in which large fiscal spending cuts and significant tax increases would have occurred simultaneously, was approved in early 2013. However, the medium-term measure for reducing fiscal deficits was not included in the bill and Congress failed to reach agreement, triggering the automatic spending reductions based on the Budget Control Act of 2011 in early March. Thus,

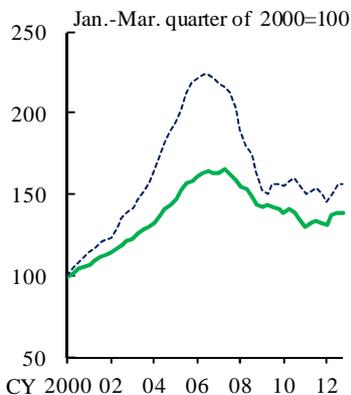
uncertainty about the fiscal problems in the United States has not yet been eliminated.

**Chart II-1-7: Interest rates and refinancing of housing loans in the United States<sup>1</sup>**



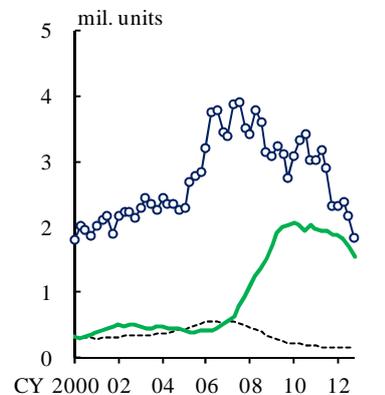
— MBA refinance index (lhs)  
 - - - Housing loan rates (30 years, rhs)  
 Note: 1. Housing loan rates are fixed rates. The latest data are as of March 2013.  
 Source: Bloomberg.

**Chart II-1-8: Housing prices in the United States<sup>1</sup>**



— FHFA house price index (excluding refinancing)  
 - - - S&P/Case-Shiller homeprice index (10-City)  
 Note: 1. The S&P/Case-Shiller home price index is a quarterly average. The latest data are as of the October-December quarter of 2012.  
 Sources: Federal Housing Finance Agency; S&P Dow Jones Indices.

**Chart II-1-9: Housing inventories and foreclosures in the United States<sup>1</sup>**

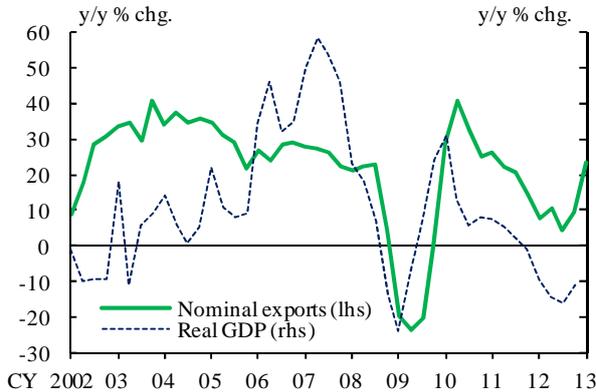


- - - New home inventories  
 — Second-hand home inventories  
 — Foreclosures  
 Note: 1. The latest data are as of end-December 2012.  
 Sources: Haver Analytics; National Association of Realtors; U.S. Census Bureau.

#### 4. Developments in emerging economies

Large dispersions are seen among emerging economies: some nations such as the ASEAN countries have maintained relatively high growth, but in other countries the pace of growth remains slow. In China, whose economy is the largest among emerging economies, signs of a pick-up have been observed in exports and production (Chart II-1-10). The NPL ratio of China's banking sector has remained at a low level thus far (Chart II-1-11). Nevertheless, in the real estate market, housing inventories still appear to be large, and thus attention should continue to be paid to future developments in housing prices and changes in the quality of real estate-related loans (Chart II-1-12). Furthermore, since fixed asset investment by Chinese manufacturing firms has been at high levels in recent years, these firms' supply capacity may have grown excessive relative to demand (Chart II-1-13). Therefore, it is possible that the quality of loans extended to firms with such excessive supply capacity will deteriorate if demand declines more than expected due to, for example, a further slowdown in overseas economies.

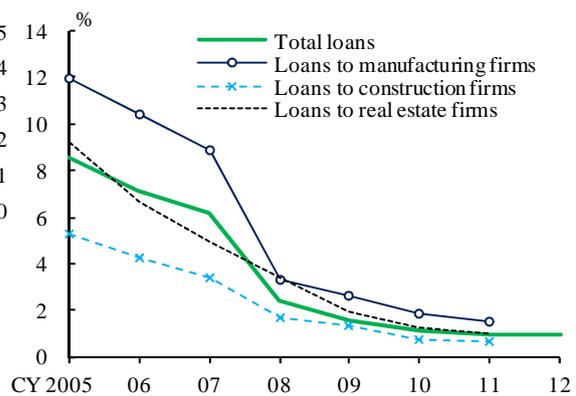
**Chart II-1-10: China's nominal exports and real GDP<sup>1</sup>**



Note: 1. The latest data are the January-February 2013 average for nominal exports, and as of the October-December quarter of 2012 for real GDP.

Source: CEIC.

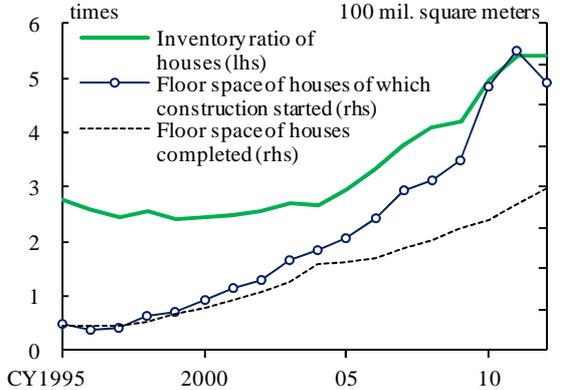
**Chart II-1-11: NPL ratio at commercial banks in China<sup>1</sup>**



Note: 1. The latest data are as of end-December 2012 for total loans, and as of end-December 2011 for the other loans.

Source: CEIC.

**Chart II-1-12: Inventory ratio of real estate in China<sup>1,2</sup>**

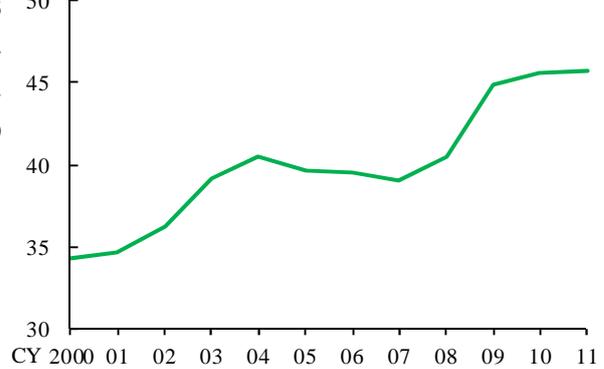


Notes: 1. The inventory ratio of houses is the ratio of floor space of houses under construction to floor space of houses completed.

2. The latest data are as of end-December 2012.

Source: CEIC.

**Chart II-1-13: Fixed asset investment in China ratio to nominal GDP, %**

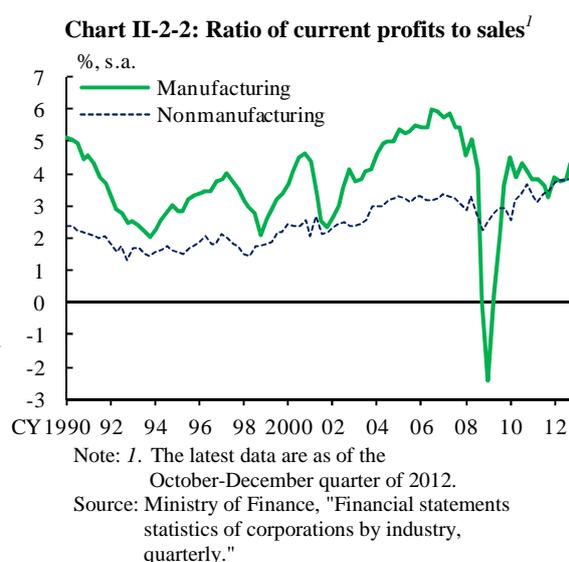
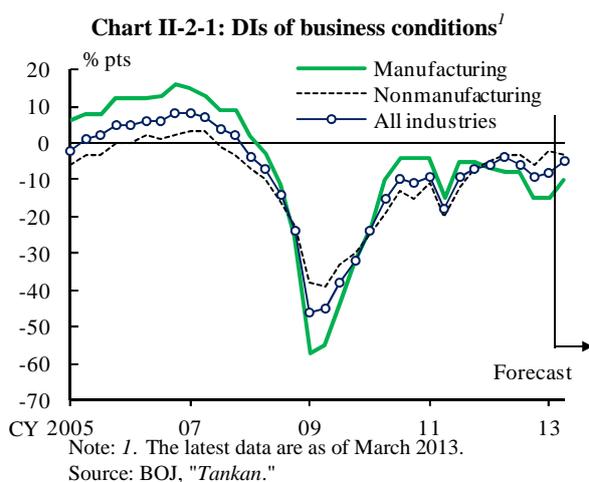


Source: CEIC.

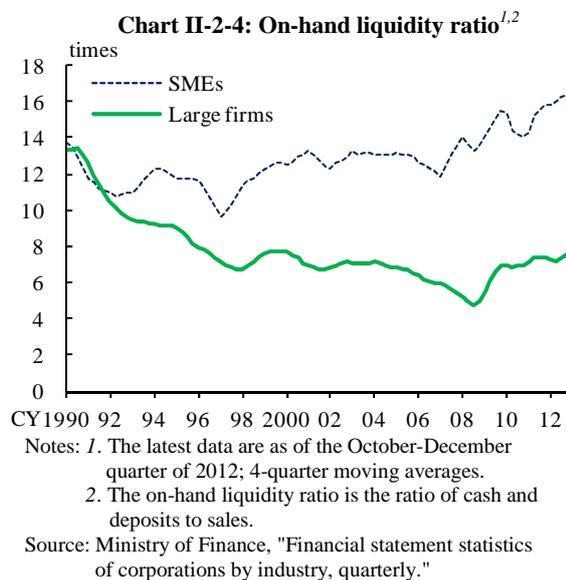
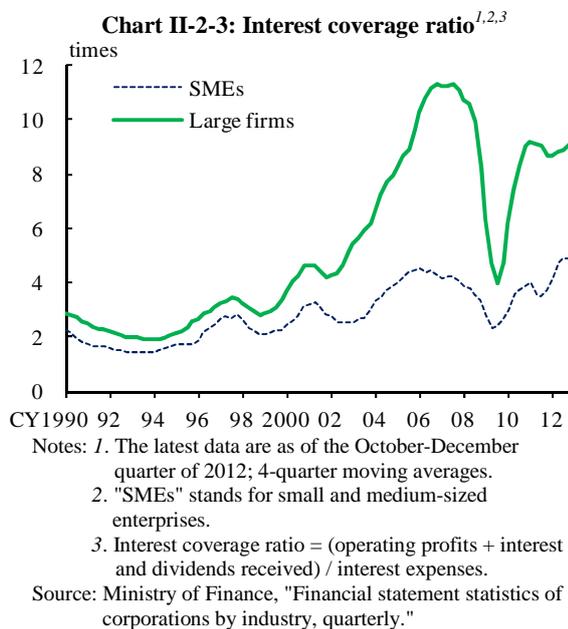
## B. Domestic economy, financial conditions of firms and households, and fiscal conditions

### *Domestic economy and firms' financial conditions*

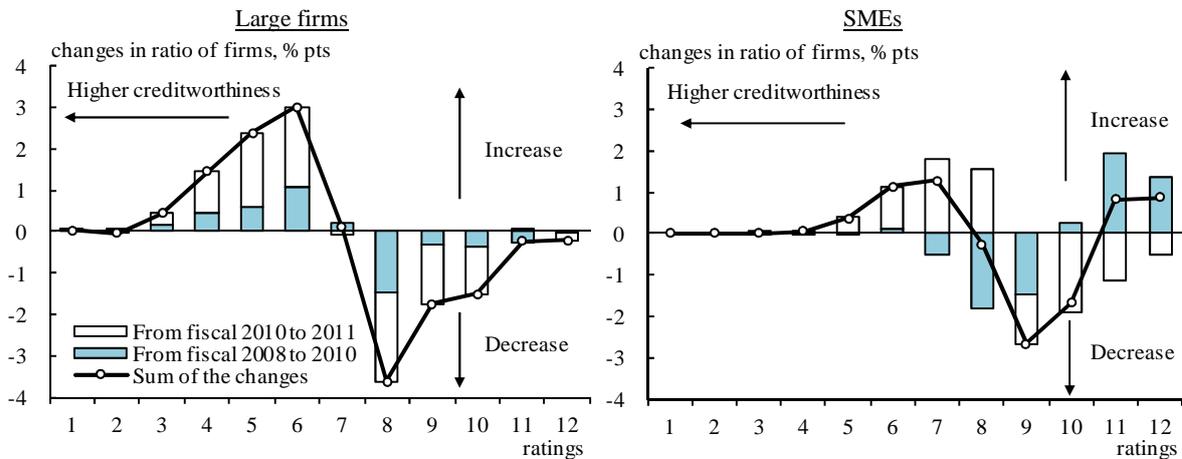
Japan's economy remained relatively weak from the second half of 2012, but has recently stopped weakening and shown some signs of picking up. Business sentiment, after becoming cautious especially among manufacturing firms through the end of 2012, has recently shown signs of improvement again (Chart II-2-1). As for corporate profits, although manufacturing firms are still affected by the slowdown in overseas economies, profits for nonmanufacturing firms have remained firm (Chart II-2-2).



Firms are maintaining their cautious stance toward financing, and their financial conditions have generally improved. Their interest payment capacity and the holdings of on-hand liquidity have remained at high levels (Charts II-2-3 and II-2-4). Reflecting this cautious stance toward financing, firms' credit ratings have been improving (Chart II-2-5). However, some small and medium-sized firms have continued to face severe financial conditions since the Lehman shock.



**Chart II-2-5: Changes in distributions of credit ratings<sup>1</sup>**

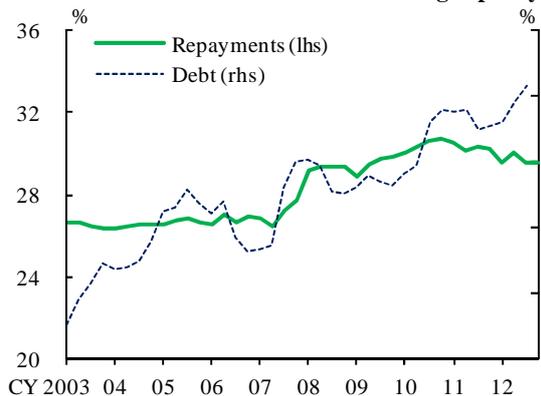


Note: 1. Figures are changes in distributions from fiscal 2008 to fiscal 2011.  
Source: Teikoku Databank, "SPECIA."

### Households' financial conditions

Although the employment and income situation has continued to be severe, supply and demand conditions in the labor market seem to have started to head for improvement. In these circumstances, housing investment has generally been picking up, and housing loans outstanding have increased, as will be described later. However, principal and interest repayments relative to income for households with housing loans have remained generally large (Chart II-2-6). On the other hand, among the elderly who have generally finished repaying housing loans and education loans, savings have maintained an uptrend (Chart II-2-7). Thus, households' financial surplus as a whole has expanded (Chart II-2-8). Households have continued to hold cash and deposits at relatively high levels and remain cautious about risk-taking (Chart II-2-9).

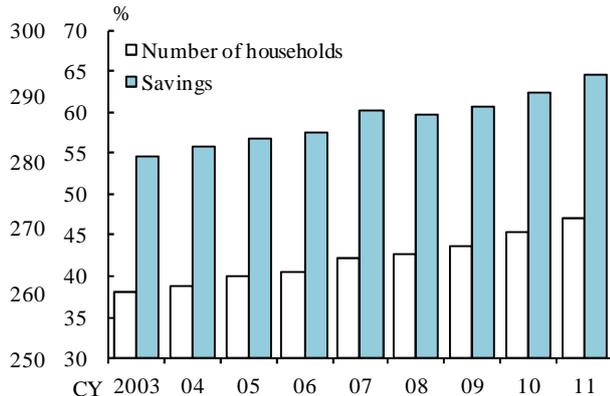
**Chart II-2-6: Households' debt servicing capacity<sup>1,2,3</sup>**



Notes: 1. Ratios to disposable income; 4-quarter moving averages.  
2. Households with housing loans are counted.  
3. The latest data are as of the October-December quarter of 2012 for repayments, and the July-September quarter of 2012 for debt.

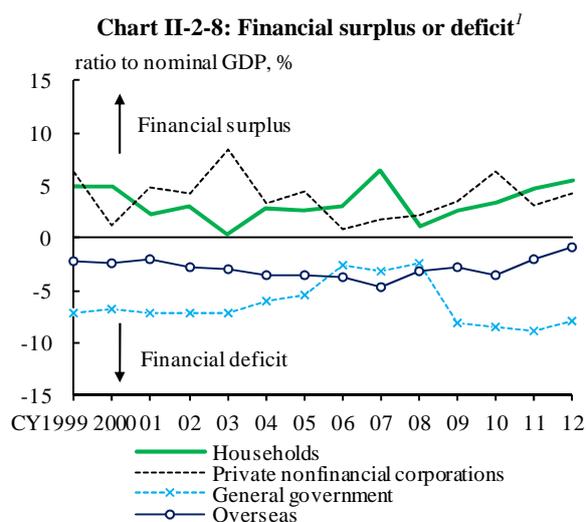
Source: Ministry of Internal Affairs and Communications, "Family income and expenditure survey."

**Chart II-2-7: Share of savings of elderly households<sup>1,2</sup>**

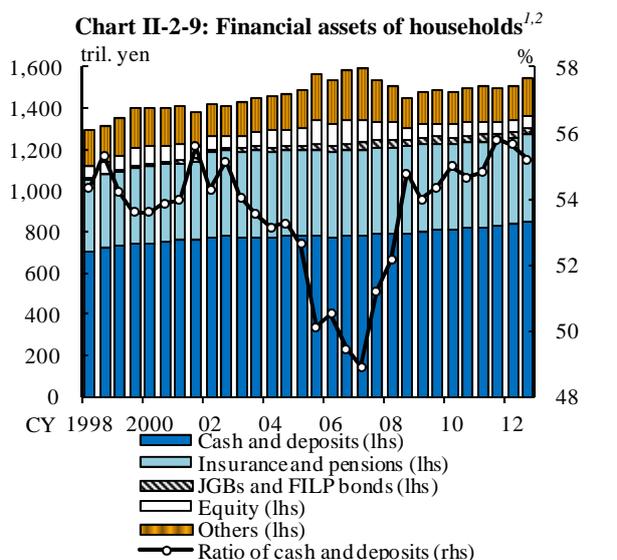


Notes: 1. Elderly households are households whose household heads are more than 60 years old.  
2. Shares of the number of elderly households to total number of households and shares of the amount of savings of elderly households to total amount of savings are depicted.

Source: Ministry of Internal Affairs and Communications, "Family income and expenditure survey."



Note: 1. The latest data are as of end-December 2012.  
Sources: Cabinet Office, "National accounts"; BOJ, "Flow of funds accounts."



Notes: 1. The latest data are as of end-December 2012.  
2. "FILP" stands for Fiscal Investment and Loan Program.  
Source: BOJ, "Flow of funds accounts."

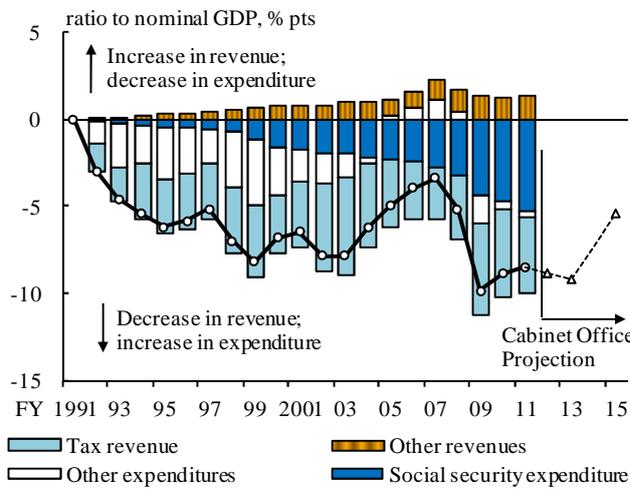
### Fiscal conditions

Fiscal deficits have continued to be observed in Japan, and government debt has accumulated. This is due to the weak growth in revenue given prolonged low economic growth and an increase in social security benefits against the backdrop of the rapid aging of society (Chart II-2-10).

Despite an accumulation of government debt in Japan, government bond yields remain at low levels, suggesting that market confidence in Japan's fiscal conditions has been maintained. However, as the aging of society will advance further, Japan's fiscal conditions are expected to remain severe. Efforts to achieve fiscal consolidation are still important to maintain market confidence in fiscal sustainability.

While government bond yields have remained at low levels, the government has increased the issuance of bonds with longer maturities (Chart II-2-11). The lengthening of maturities supports the government's stable funding. However, it should be noted that the lengthening may induce a risk factor in the financial system, if financial institutions hold many of these JGBs with lengthened maturities, expanding the maturity mismatch between their assets and liabilities.

**Chart II-2-10: Primary balance<sup>1,2,3,4</sup>**



ratio to nominal GDP, % pts

↑ Increase in revenue; decrease in expenditure

↓ Decrease in revenue; increase in expenditure

Cabinet Office Projection

FY 1991 93 95 97 99 2001 03 05 07 09 11 13 15

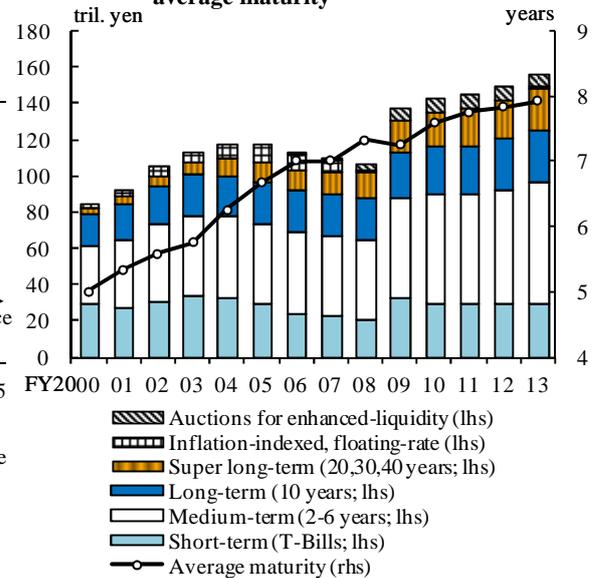
Legend:

- Tax revenue
- Other revenues
- Other expenditures
- Social security expenditure
- Primary balance

Notes: 1. Changes from fiscal 1991 in the ratios of revenues, expenditures, and the primary balance to nominal GDP.  
 2. The data are for the central and local governments.  
 3. The social security expenditure comprises the following items: social benefits other than social transfers in kind; social transfers in kind; and current transfers from the central and local governments to the social security funds.  
 4. Breakdown figures are calculated by the BOJ. The primary balances in fiscal 2012 and fiscal 2013 are estimates from the Cabinet Office. The figure for fiscal 2015 is the fiscal consolidation goal set by the government.

Sources: Cabinet Office, "Annual Report on the Japanese Economy and Public Finance 2012," "National accounts," "Recent economic and fiscal conditions."

**Chart II-2-11: Market issuance by type of JGBs and average maturity<sup>1,2</sup>**



tril. yen

years

FY2000 01 02 03 04 05 06 07 08 09 10 11 12 13

Legend:

- ▨ Auctions for enhanced-liquidity (lhs)
- ▤ Inflation-indexed, floating-rate (lhs)
- ▥ Super long-term (20,30,40 years; lhs)
- ▦ Long-term (10 years; lhs)
- ▧ Medium-term (2-6 years; lhs)
- ▨ Short-term (T-Bills; lhs)
- Average maturity (rhs)

Notes: 1. The amount of JGBs issued in scheduled auctions from April to the following March (calendar base). Figures until fiscal 2011 are actual and those for fiscal 2012 and 2013 are on a scheduled basis, taking into account the supplementary and initial budgets, respectively.  
 2. "Medium-term" includes coupon bonds and discount bonds.

Source: Ministry of Finance.

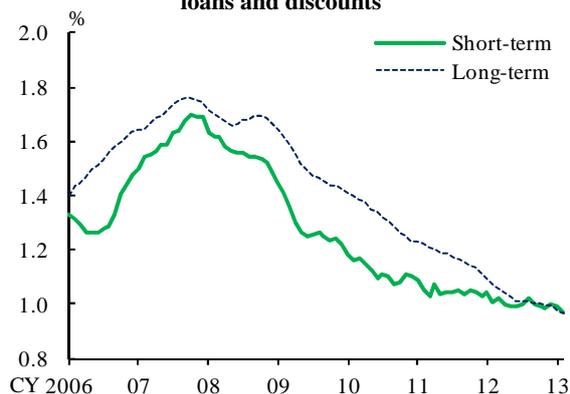
### III. Examination of financial intermediation

This chapter examines financial conditions of firms and households and then scrutinizes developments in financial institutions' performance of financial intermediation in financial and loan markets.

#### A. Financial conditions of firms and households

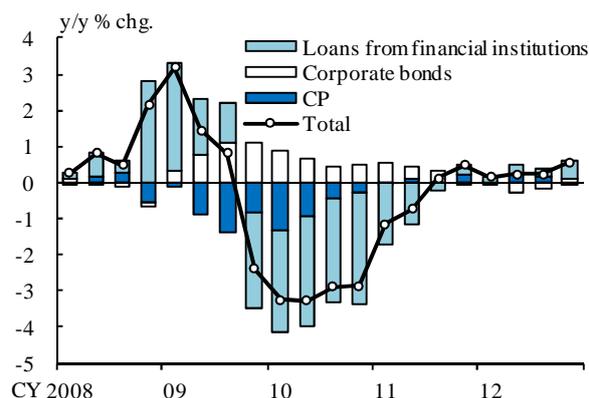
As the Bank of Japan has been pursuing powerful monetary easing, financial conditions of both firms and households are accommodative. Firms' funding costs have been hovering at low levels, and the amount outstanding of funding has increased, especially in borrowing from financial institutions (Charts III-1-1 and III-1-2). As will be described later, housing loan interest rates have continued to decline, and the amount outstanding of housing loans has increased.

**Chart III-1-1: Average contract interest rates on new loans and discounts<sup>1</sup>**



Note: 1. The latest data are as of February 2013; 6-month moving averages.  
Source: BOJ, "Average contract interest rates on loans and discounts."

**Chart III-1-2: Amount outstanding of firms' funding<sup>1,2</sup>**



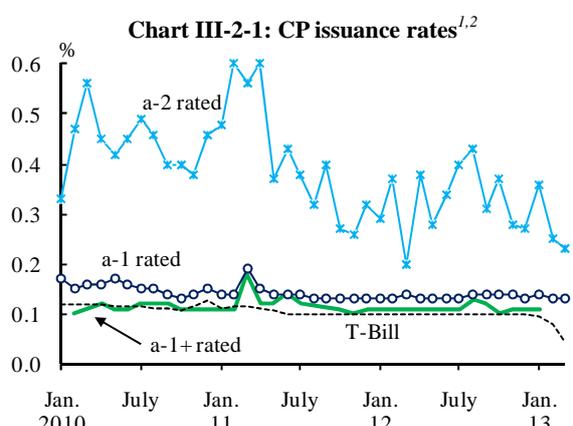
Notes: 1. The latest data are as of end-December 2012.  
2. Figures for CP are those for short-term corporate bonds registered under the book-entry transfer system. Those issued by banks, securities companies, and others such as foreign corporations are excluded; ABCP is included. Figures for corporate bonds are the sum of straight bonds issued in both domestic and overseas markets. Bonds issued by banks are included. Bonds that are issued in the domestic market are bonds registered under the book-entry transfer system.

Sources: I-N Information Systems; Japan Securities Dealers Association; Japan Securities Depository Center; BOJ, "Loans and bills discounted by sector."

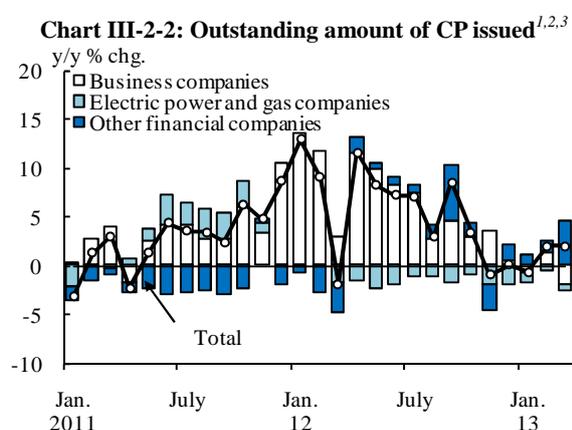
## B. Financial market conditions

### *CP and corporate bond market conditions*

In terms of firms' market funding, issuing conditions for CP have remained favorable on the whole. Issuance rates on CP have been stable at low levels on the whole, and even those on some issues of CP, which were at somewhat high levels, have clearly declined (Chart III-2-1). The outstanding amount of CP issued has been somewhat above its year-ago level on the whole. This is mainly because the outstanding amount of CP issued by "other financial companies" has been at a level higher than the previous year, although that of CP issued by electric power and gas companies -- which increased temporarily after the Great East Japan Earthquake -- has been at a level lower than the previous year (Chart III-2-2).



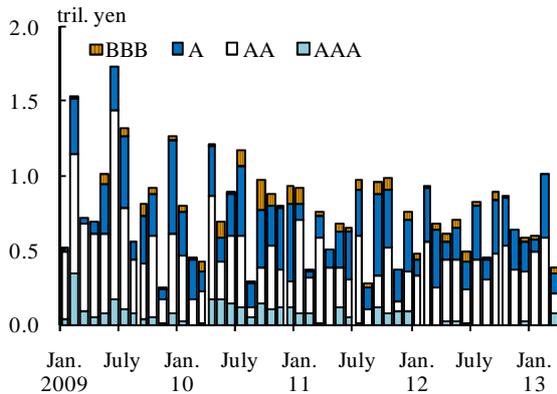
Sources: Bloomberg; Japan Bond Trading; Japan Securities Depository Center.



Source: Japan Securities Depository Center.

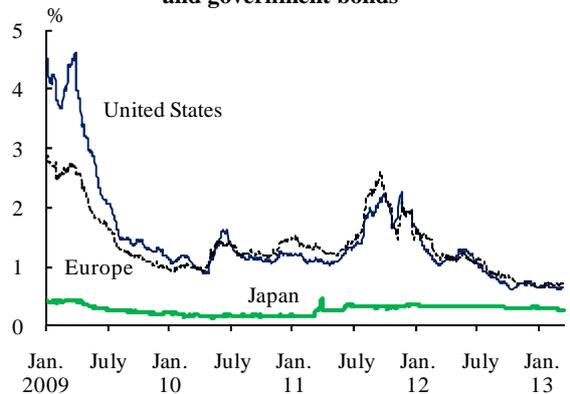
In corporate bond markets, issuing conditions have remained favorable on the whole as issuance rates have been at low levels amid solid demand from investors (Chart III-2-3). Yield spreads between AA-rated corporate bonds and government bonds in Japan have been stable at lower levels than those in the United States and Europe (Chart III-2-4).

**Chart III-2-3: Issuance amount of corporate bonds<sup>1,2</sup>**



Notes: 1. Based on the launch date.  
2. The latest data are as of March 2013.  
Sources: Capital Eye; I-N Information Systems.

**Chart III-2-4: Yield spreads between corporate bonds and government bonds<sup>1,2,3,4</sup>**



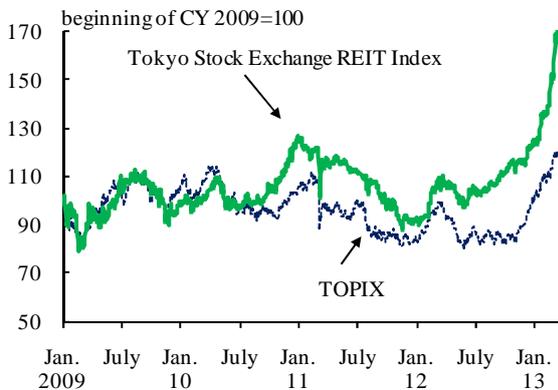
Notes: 1. Rated AA by R&I, Fitch, Moody's, and S&P.  
2. For Japan, average yield spreads of bonds with a residual maturity of 3 years or more but less than 7 years.  
3. For the United States and Europe, average yield spreads of bonds with a residual maturity of 3 years or more but less than 5 years. Bank of America Merrill Lynch, used with permission.  
4. The latest data are as of March 29, 2013.  
Sources: Bloomberg; Japan Securities Dealers Association; BOJ.

*Real estate finance and securitization market conditions*

As investors' risk-taking has recovered, investment unit prices of Japan real estate investment trusts (J-REITs) have risen significantly, mainly reflecting expectations of improvement in the office market and growing attention to dividend yields in the low interest rate environment (Chart III-2-5). By type of investor, capital inflows have been seen from foreign investors as well as individual investors via investment trusts.

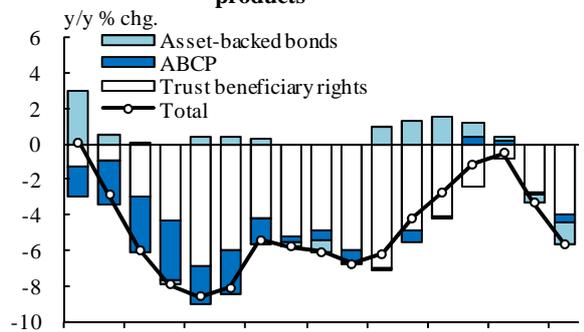
The outstanding amount of securitized products decreased markedly at the end of December 2012 mainly due to a higher rate of decline in trust beneficiary rights and asset-backed bonds, although the pace of decrease had slowed as a trend since the beginning of fiscal 2011 (Chart III-2-6).<sup>2</sup>

**Chart III-2-5: REIT index<sup>1</sup>**



Note: 1. The latest data are as of March 29, 2013.  
Source: Bloomberg.

**Chart III-2-6: Outstanding amount of securitized products<sup>1,2</sup>**



Notes: 1. Securitized products in the form of securities.  
2. The latest data are as of end-December 2012.  
Source: BOJ, "Flow of funds accounts."

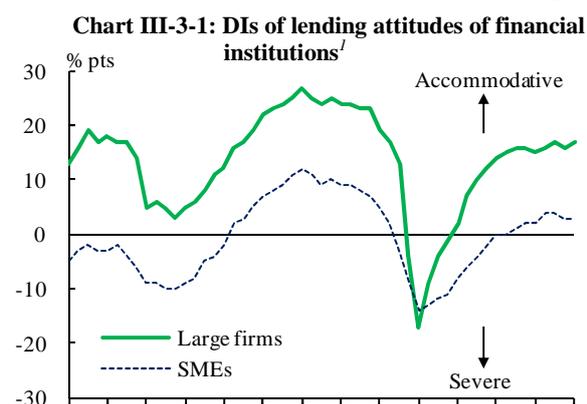
<sup>2</sup> The fiscal year in Japan starts in April and ends in March. Fiscal 2011 was the period from April 2011 to March 2012.

Amid the prolonged low interest rate environment, the volume of origination of high-yield structured products with embedded credit default swaps (CDSs), such as credit-linked notes and credit-linked loans, seems to be increasing. In Japan, however, the size of these credit markets is still small, and thus it appears that reference assets have remained limited to those with high credit ratings and liquidity.

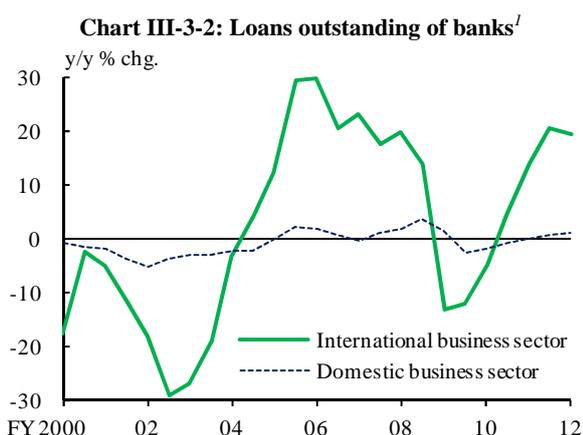
## C. Loan market conditions

### *Developments in loans outstanding*

The proportion of firms perceiving financial institutions' lending attitudes as "accommodative" has continued to exceed that perceiving them as "severe" (Chart III-3-1). In this situation, financial institutions' loans outstanding have increased. Specifically, the amount outstanding of overseas loans has risen substantially, especially among major banks, and that of domestic loans to both individuals and firms has also increased (Charts III-3-2 and III-3-3). As for loans to firms, loans to the electric power industry have increased since the Great East Japan Earthquake, and in the disaster areas bank loans have been growing for the purpose of resumption of business. Domestic firms have continued to actively conduct mergers and acquisitions involving overseas firms, and they have financed part of the necessary funds with bank loans (Chart III-3-4). Moreover, although loans for business fixed investment have been sluggish in many industries, they have increased among firms in the electric power, medical care and welfare, and real estate industries, among others (Chart III-3-5).

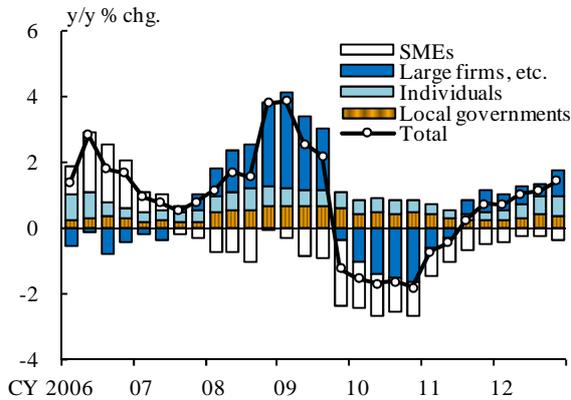


Note: 1. The latest data are as of March 2013.  
Source: BOJ, "Tankan."



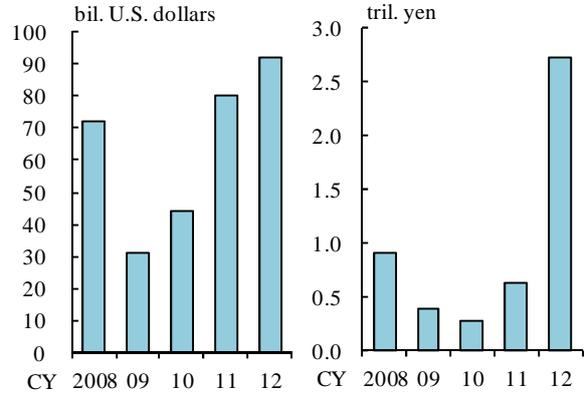
Note: 1. Major banks and regional banks are counted. The latest data are as of end-September 2012.  
Source: BOJ.

**Chart III-3-3: Domestic loans outstanding of financial institutions<sup>1</sup>**



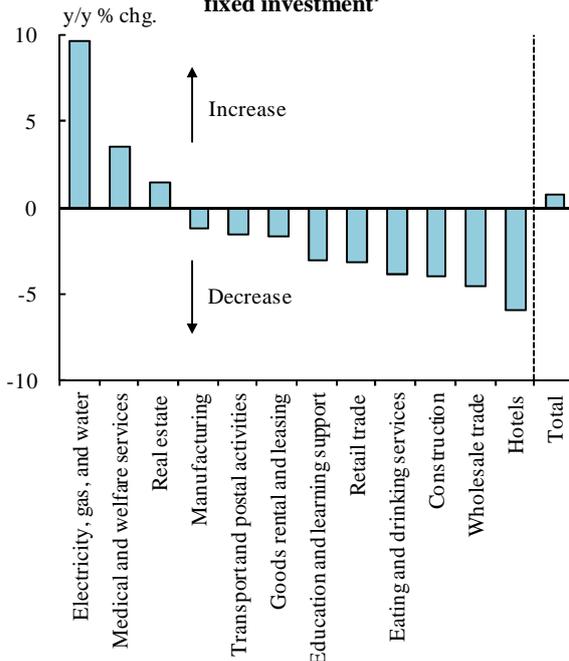
Note: 1. Banks and *shinkin* banks are counted. The latest data are as of end-December 2012.  
Source: BOJ, "Loans and bills discounted by sector."

**Chart III-3-4: Corporate M&A<sup>1,2</sup>**  
Amount of M&A      Amount of syndicated loans for M&A



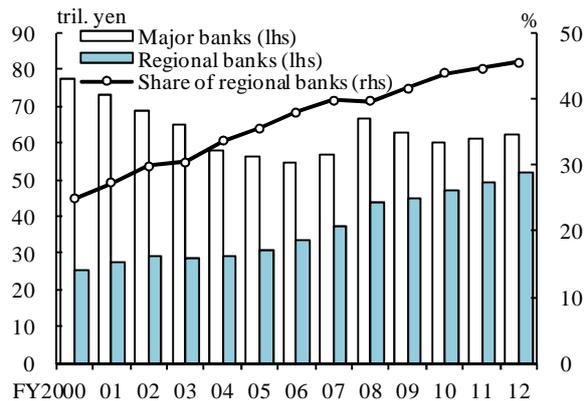
Notes: 1. The left chart depicts the total amount of M&A in which domestic firms acquired or merged with foreign firms.  
2. The right chart depicts syndicated loans extended to domestic firms.  
Sources: RECOF; Thomson Reuters.

**Chart III-3-5: Loans outstanding for business fixed investment<sup>1</sup>**



Note: 1. Banks and *shinkin* banks are counted. The data are as of end-December 2012.  
Source: BOJ, "Loans and bills discounted by sector."

**Chart III-3-6: Loans outstanding for large firms<sup>1</sup>**



Note: 1. The latest data are as of end-December 2012.  
Source: BOJ.

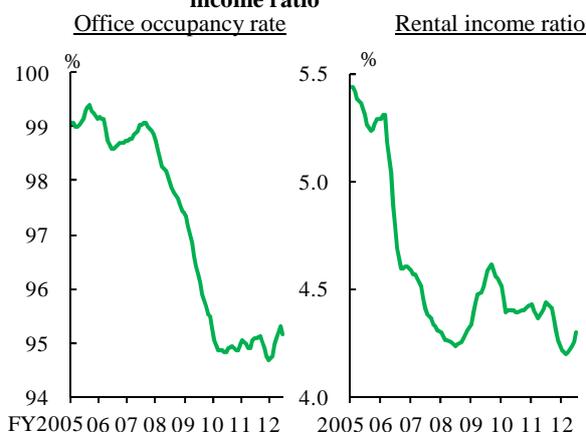
Financial institutions have increased domestic loans especially to large firms. In particular, there has been a prominent increase in loans from regional banks to large firms. In recent years, demand for funds has been weak at small and medium-sized firms in many regions, and regional banks have faced sluggish growth in loans to these firms. In these circumstances, they have actively extended loans to large firms through

their branches in metropolitan areas to secure an adequate volume of loans.<sup>3</sup> As a result, the share of regional banks' loans in the amount outstanding of loans to large firms has been on an uptrend, and recently reached approximately 45 percent (Chart III-3-6).

### Developments in real estate-related loans

It appears that both major banks and regional banks have been actively extending real estate-related loans recently. In metropolitan areas, the supply-demand balance in the real estate market has been improving, as seen in the gradual rise in the occupancy rates of real estate such as offices, and rental income from J-REITs has also started to recover (Chart III-3-7). In this situation, the numbers of new listings and public offerings by J-REITs have increased, and major banks have expanded loans to real estate funds including J-REITs (Chart III-3-8). Regional banks, which have been making efforts to secure an adequate volume of loans, have increased loans to individuals for the renting of their properties, and loans to real estate companies have also recently grown.<sup>4</sup>

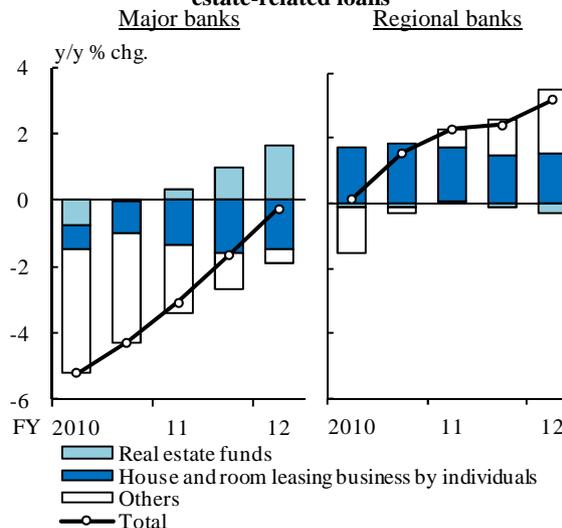
**Chart III-3-7: Office occupancy rate and rental income ratio<sup>1,2,3</sup>**



Notes: 1. The latest data are as of October 2012; 3-month moving averages. Offices in Chiyoda-City, Chuo-City, and Minato-City in Tokyo possessed by listed J-REITs are counted.  
 2. Occupancy rate = total leased areas / total leasable areas.  
 3. Rental income ratio = net operating income from real estate / market values of real estate at the beginning of each period.

Source: Association for Real Estate Securitization.

**Chart III-3-8: Amount outstanding of real estate-related loans<sup>7</sup>**



Note: 1. The latest data are as of end-September 2012.  
 Source: BOJ.

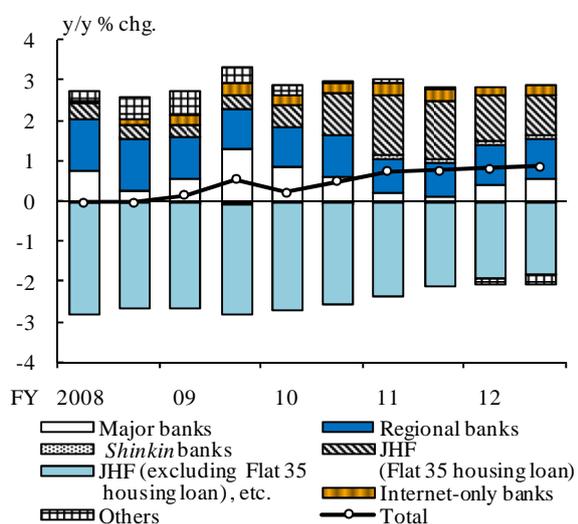
<sup>3</sup> For developments in regional banks' loans to local firms, see the October 2012 issue of the *Report*.

<sup>4</sup> Loans to real estate companies are included in "others" in Chart III-3-8.

### Developments in housing loans

As housing investment has been picking up, the amount outstanding of housing loans extended by financial institutions has increased (Chart III-3-9). The amount outstanding of Flat 35 housing loans -- long-term fixed interest rate loans -- extended by the Japan Housing Finance Agency (JHF) has continued to increase, and the amount outstanding of housing loans extended by banks such as Internet-only banks has also risen on the back of low loan interest rates (see Box 1 for developments at Internet-only banks and other types of banks). Growth in the amount outstanding of housing loans extended by major and regional banks had tended to slow, but recently increased partly reflecting a further decline in loan interest rates (Charts III-3-9 and III-3-10).

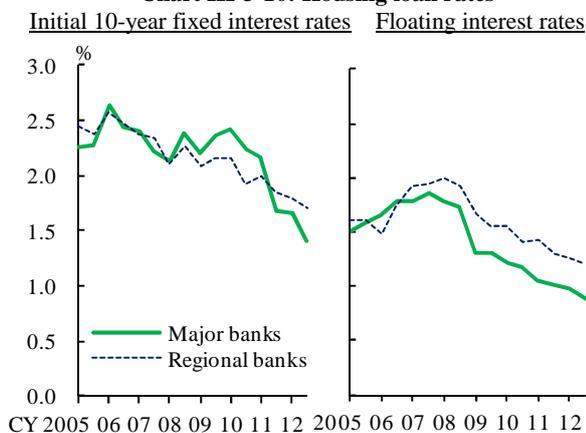
**Chart III-3-9: Housing loans outstanding<sup>1,2</sup>**



Notes: 1. The data are as of end-June and end-December of each year. For 2012, the data are as of end-June and end-September.  
2. Figures for Internet-only banks are the sum of four major ones.

Sources: Japan Housing Finance Agency; BOJ.

**Chart III-3-10: Housing loan rates<sup>1</sup>**



Note: 1. Housing loan rates are preferential rates. The latest data are as of October 2012.

Source: Japan Financial News, "Nikken report."

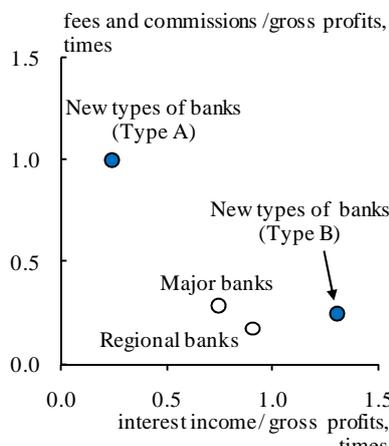
### Box 1: Developments at Internet-only banks and other types of banks

Since 2000, some business firms have entered the banking sector. They include Internet-only banks that conduct transactions with customers using communication media such as the Internet and telephone and those that have automated teller machines (ATMs) and branches mainly at commercial facilities (hereafter referred to as "new types of banks"). The amount outstanding of deposits at these banks has been

increasing, and reached about 9 trillion yen at the end of September 2012.<sup>5</sup>

New types of banks can be categorized into payment and settlement-focused banks and investment-focused banks according to differences in their profit structures (Chart B1-1). At the payment and settlement-focused banks, the main profit source is commissions for payment and settlement transactions such as transfers and cash withdrawals collected from partner financial institutions and retail customers. On the other hand, the main profit source at the investment-focused banks is interest income earned mainly from loans to individuals such as housing loans and from investment in securities. Recently, payment and settlement-focused banks have demonstrated a higher rate of return than existing banks. On the other hand, the rate of return of investment-focused banks remains at low levels, since housing loan interest rates have been set at relatively low levels even though deposit interest rates are relatively high (Chart B1-2). At new types of banks, personnel expenses are relatively low, but non-personnel expenses are high, as investment in information systems and advertising expenses are at high levels (Chart B1-3). In order to secure stable profits in business operations related to housing loans, it is important for these banks to set their interest rates by taking into account credit risk and such costs as non-personnel expenses.

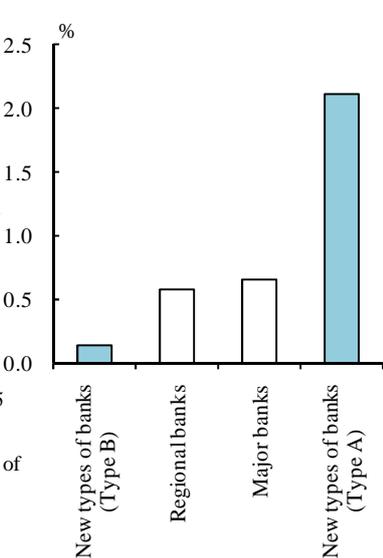
**Chart B1-1: Fees and commissions and interest income<sup>1,2</sup>**



Notes: 1. The data are as of the first half of fiscal 2012.  
2. Type A is payment and settlement-focused banks, and Type B is investment-focused banks. Type A includes three banks, and Type B includes five banks. All of them are new entrants from 2000 onward.

Source: BOJ.

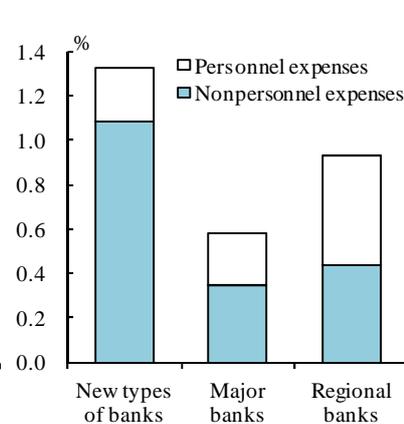
**Chart B1-2: Operating profit ROA<sup>1,2</sup>**



Notes: 1. The data are as of the first half of fiscal 2012 (annualized).  
2. See Footnote 2 in Chart B1-1.

Source: BOJ.

**Chart B1-3: Expense ratio<sup>1,2</sup>**



Notes: 1. Ratio to total assets. The data are as of the first half of fiscal 2012 (annualized).

2. Figures for new types of banks are the sum of eight banks.

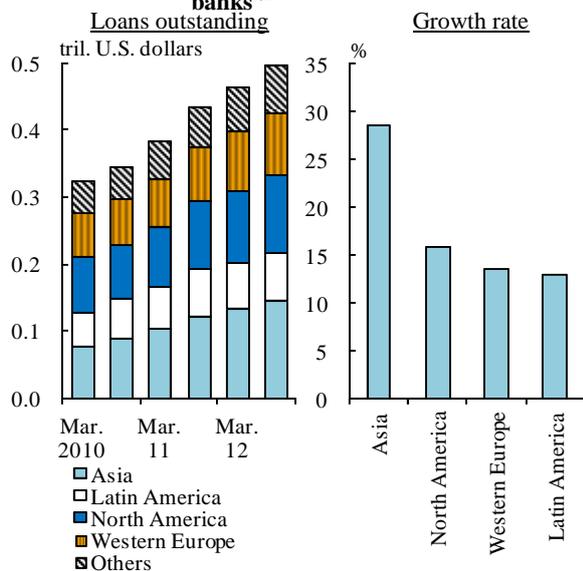
Source: BOJ.

<sup>5</sup> For reference, the amounts outstanding of deposits at major banks and regional banks were 335 trillion yen and 281 trillion yen, respectively (as of the end of September 2012).

### Initiatives in extending overseas loans

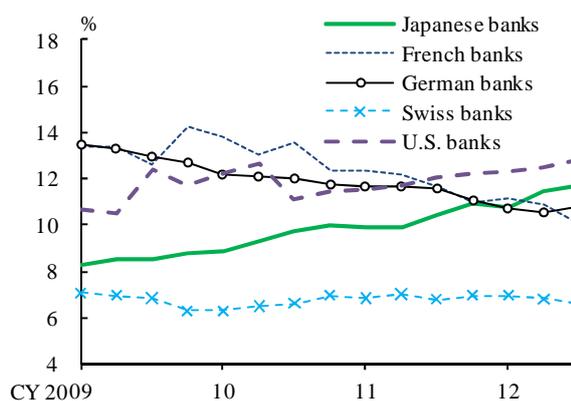
Major banks have increased loans to a range of regions in the world, and the share of their loans has grown in the global loan market (Charts III-3-11 and III-3-12).<sup>6</sup> Loans to emerging economies such as those in Asia have increased due to strong demand for funds on the back of relatively high economic growth and high profitability in loan extension to these economies. The stable financial bases and funding conditions of major banks have also contributed to the increase in overseas loans. Specifically, major banks have been able to smoothly raise funds in foreign currencies because the creditworthiness of these banks, which have secured an adequate level of capital, has been relatively high compared to foreign financial institutions, particularly European ones (Chart III-3-13).

**Chart III-3-11: Overseas loans outstanding of major banks<sup>1,2</sup>**



Notes: 1. Banks in the three major financial groups are counted on a non-consolidated basis.  
 2. The right chart shows the annualized growth rates from end-March 2010 to end-September 2012.  
 Sources: Published accounts of each group.

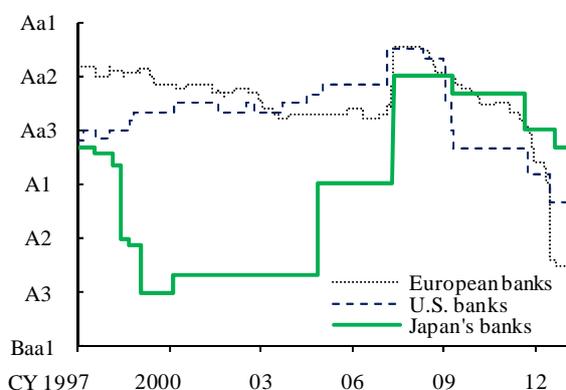
**Chart III-3-12: Share in cross-border claims of banks<sup>1</sup>**



Note: 1. The share is based on the cross-border claims on banks, the public sector, and the nonbank private sector on an ultimate risk basis. The latest data are as of end-September 2012.  
 Source: BIS, "Consolidated banking statistics."

<sup>6</sup> Calculations are based on three major financial groups: Mitsubishi UFJ Financial Group, Sumitomo Mitsui Financial Group, and Mizuho Financial Group.

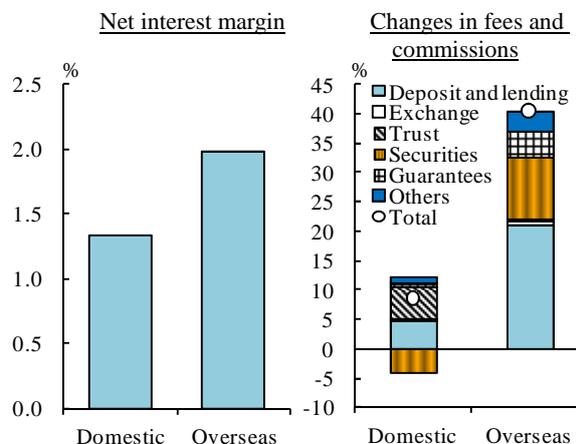
**Chart III-3-13: Bank ratings<sup>1,2</sup>**



Notes: 1. The latest data are as of end-January 2013.  
2. The ratings are the average of leading banks whose ratings are available since 1997. The ratings before mergers are in principle substituted by those for succeeding banks.

Source: Bloomberg.

**Chart III-3-14: Net interest margin and fees and commissions<sup>1,2</sup>**

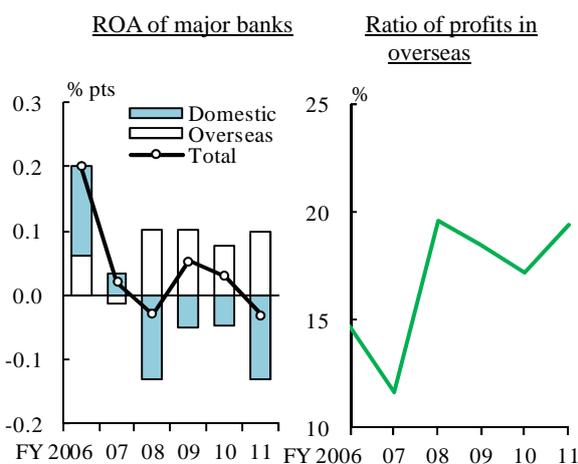


Notes: 1. The three major financial groups are counted on a consolidated basis.  
2. The data for the left chart are as of fiscal 2011. The right chart shows the changes from fiscal 2005 to fiscal 2011.

Sources: Published accounts of each group.

The increase in overseas loans has helped boost major banks' profits. The interest rate margins on overseas loans (loan interest rates minus funding rates) have exceeded those on domestic loans. In addition, banks' overseas business operations tend to create more opportunities for gaining fees and commissions since the extension of overseas loans is accompanied by other business operations such as arrangement of syndicated loans (Chart III-3-14). For these reasons, the increased weight of overseas business operations has raised the share of overseas business operations in the profits of major banks to about 20 percent (Chart III-3-15).

**Chart III-3-15: Profitability of major banks<sup>1,2</sup>**

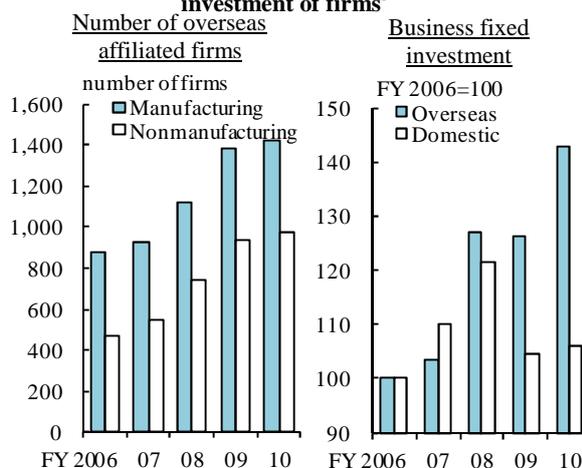


Notes: 1. The three major financial groups are counted on a consolidated basis.

2. The left chart shows the cumulative changes in gross operating profit ROA from fiscal 2005.

Sources: Published accounts of each group.

**Chart III-3-16: Overseas expansion and business fixed investment of firms<sup>1</sup>**



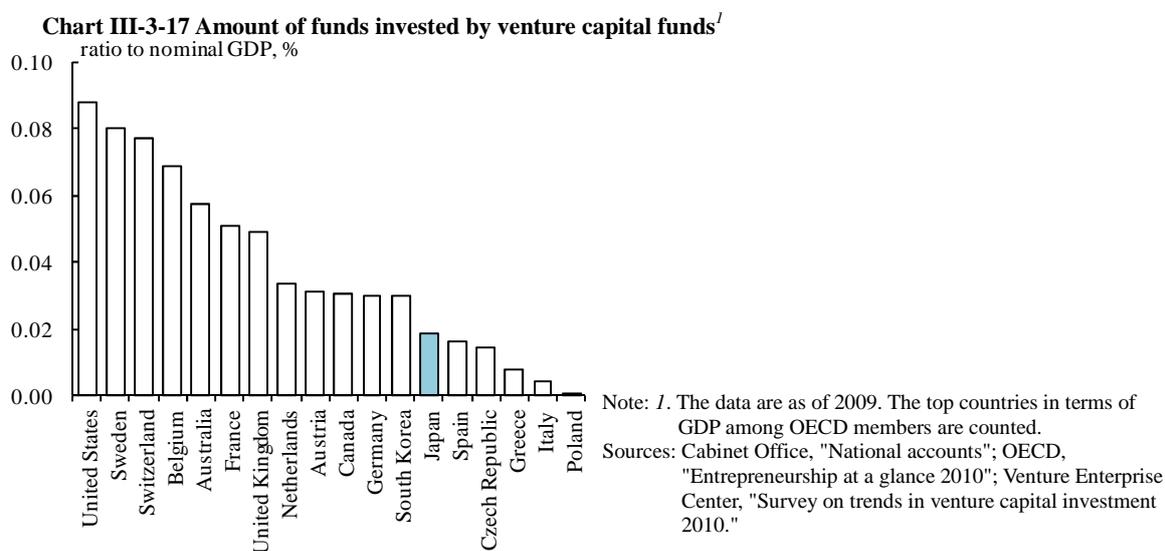
Note: 1. Japanese firms whose capital amounts to 100 million yen or less are counted.

Sources: Ministry of Economy, Trade and Industry, "Basic survey on overseas business activities"; Small and Medium Enterprise Agency, "Basic survey on small and medium enterprises."

In addition, some regional financial institutions have strengthened their initiatives to support overseas business expansions by small and medium-sized firms in their local areas. In recent years, small and medium-sized firms have increased their overseas business expansions to reduce costs and tap demand overseas (Chart III-3-16). Against this backdrop, some regional financial institutions have established overseas branches and provided a range of services in cooperation with other financial institutions at home and abroad as well as with the government.<sup>7</sup> The government has approved the direct extension by *shinkin* banks of loans to borrower firms' overseas subsidiaries. It has also been deliberating on allowing banks to intermediate financial transactions between local banks overseas and firms that have expanded their business overseas, and/or to conduct such transactions on behalf of local banks overseas.

### *Investments and loans to start-ups*

Growth in the amount of investments and loans to start-ups has been weak. For example, the amount of funds invested by venture capital funds in Japan is small by international standards, as is the size of emerging stock markets (Chart III-3-17; see Box 2 for recent developments in emerging stock markets in Japan).



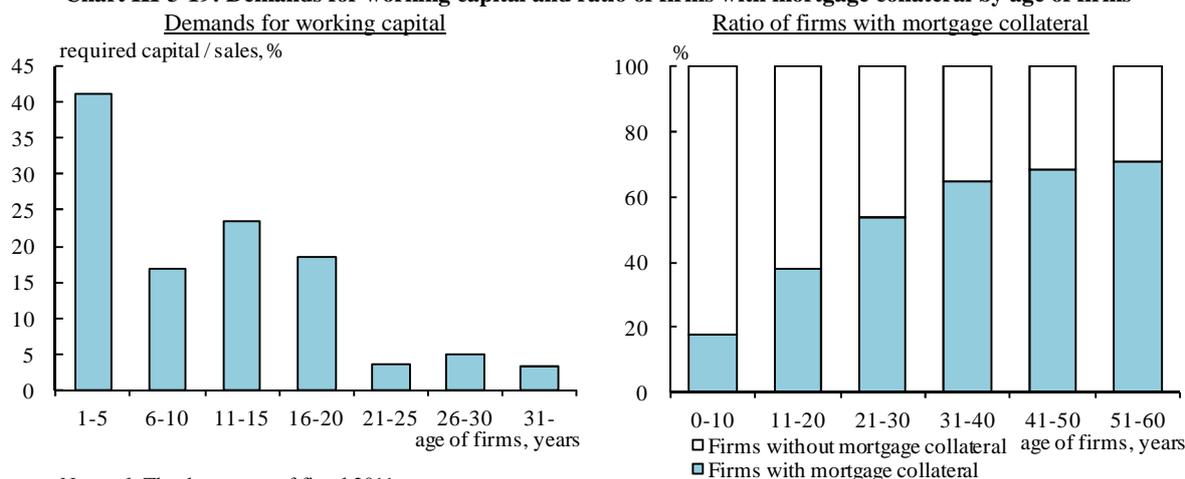
The distribution of firms' sales growth rates shows that the proportion of firms with high growth rates has decreased. Nevertheless, a look at developments at start-ups shows that

<sup>7</sup> For example, in some cases regional financial institutions have extended loans to borrower firms' overseas subsidiaries via the firms' offices in Japan and provided guarantees for loans that borrower firms' overseas subsidiaries received from local banks overseas. In cooperation with financial institutions at home and abroad, regional financial institutions have provided various types of information to borrower firms about the local areas overseas to which the firms wish to expand overseas business. Regional financial institutions have also introduced local firms overseas to borrower firms to help establish business relationships.



the use of asset-based lending (ABL) can be effective in facilitating funding among start-ups. Furthermore, as will be described below, it is vital for a wide range of financial intermediaries that develop and sell financial products or conduct investments and loans -- banks, investment trusts, securities companies, pension funds, and other funds -- to enhance their ability to identify the growth potential of projects and risks.

**Chart III-3-19: Demands for working capital and ratio of firms with mortgage collateral by age of firms<sup>1,2</sup>**



Notes: 1. The data are as of fiscal 2011.

2. The left chart shows the ratio of required capital (accounts receivable + bills receivable + inventories - accounts payable - bills payable - cash and deposits) to sales.

Source: Teikoku Databank, "SPECIA."

## Box 2: Recent developments in emerging stock markets in Japan

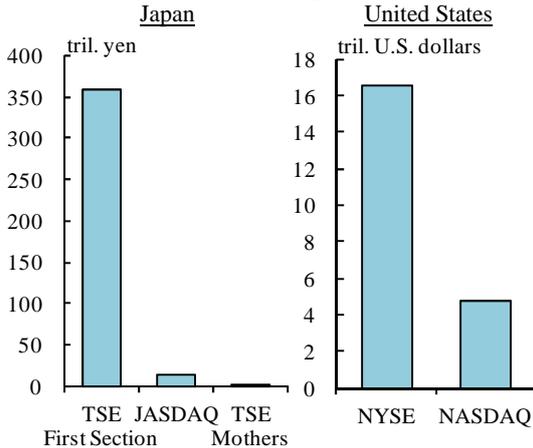
Market capitalization of emerging stock markets in Japan is notably small compared to that in the United States. While the market capitalization of NASDAQ, an emerging stock market in the United States, has expanded to about one-third of that of the New York Stock Exchange, the market capitalization of Japanese emerging stock markets (Mothers and JASDAQ) is only about 4 percent of that of the First Section of the Tokyo Stock Exchange (TSE) (Chart B2-1).

Many of the listed firms in the Japanese emerging stock markets are relatively young, and the share of nonmanufacturing industries such as the services industry and the information and communications industry is high in these markets (Charts B2-2 and B2-3). This situation differs significantly from the First Section of the TSE, where the share of the manufacturing industries is high and the age of firms is older. However, the composition of industries in the Japanese emerging stock markets approximates Japan's industrial structure more closely than the First Section of the TSE.

The Tokyo Stock Price Index (TOPIX) and the Nikkei 225 Stock Average Index remained weak after the Lehman shock, but stock prices in the JASDAQ market have

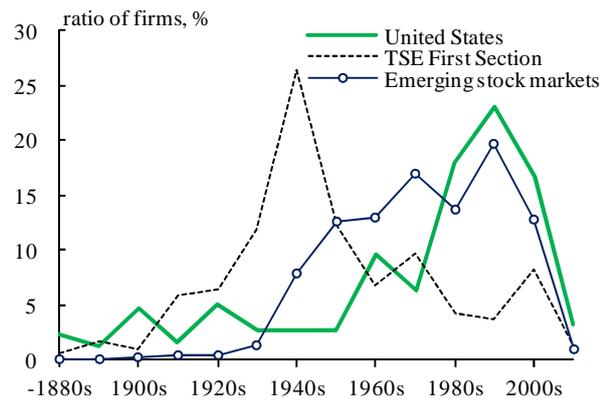
exceeded the levels observed prior to the Lehman shock and their recovery has been comparable to that of U.S. stock prices (Chart B2-4). A potential factor behind the robustness in Japanese emerging stock prices is that the performance of the nonmanufacturing firms that account for a large share in the markets was relatively unaffected by the appreciation of the yen and the overseas economic downturn after the Lehman shock.

**Chart B2-1: Market Capitalization<sup>1</sup>**



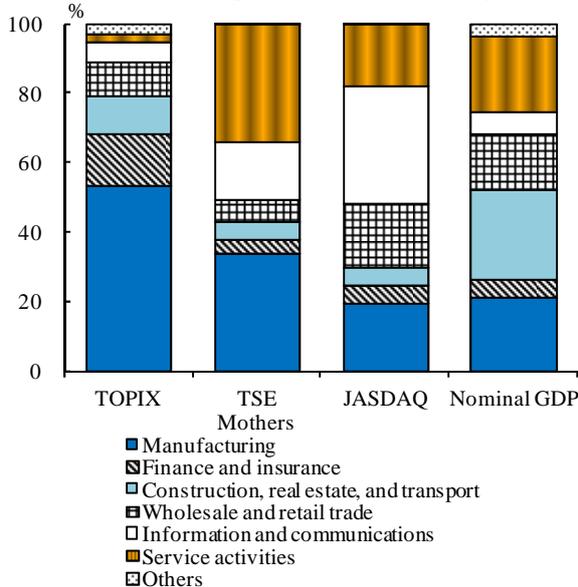
Note: 1. The data are as of end-March 2013 for Japan, and of end-February 2013 for the United States.  
Sources: Osaka Securities Exchange; Tokyo Stock Exchange; World Federation of Exchanges.

**Chart B2-2: Distributions of year of establishment of listed firms<sup>1,2</sup>**



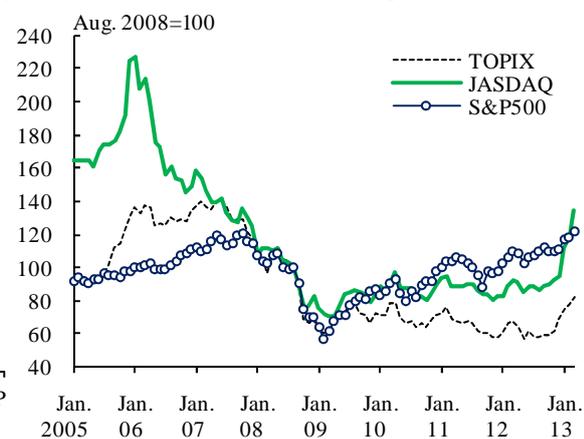
Notes: 1. The latest data are as of end-January 2013 for Japan and end-December 2012 for the United States.  
2. For the United States, U.S. firms whose size of market capitalization is in the top 300 are counted. For emerging stock markets, firms listed on the TSE Mothers and JASDAQ are counted.  
Sources: Financial Quest; Thomson Reuters.

**Chart B2-3: Composition of listed firms by industry<sup>1,2</sup>**



Notes: 1. The data are as of 2011 for nominal GDP, and end-January 2013 for others.  
2. Nominal GDP is that of industries.  
Sources: Bloomberg; Cabinet Office, "National accounts"; Osaka Securities Exchange; Tokyo Stock Exchange.

**Chart B2-4: Stock prices<sup>1</sup>**



Note: 1. The latest data are as of March 29, 2013.  
Source: Bloomberg.

### *Firms' growth potential and financial institutions' expertise in identifying the growth potential of projects and risks*

As uncertainty about the outlook for Japan's economy has risen, it has become increasingly difficult for financial institutions to assess the growth potential of firms. As mentioned earlier, the proportion of firms with high growth has declined, while that of firms with negative growth has increased. Unlike in the past, when Japan's economy recorded high growth amid an increase in population, in recent years firms are continually required to devise unique business strategies to attain growth. Thus, the importance of intangible assets as well as tangible assets in terms of enhancing firms' profitability has been rising.<sup>10</sup> The term "intangible assets" here is used in a broad sense: it is not limited to what the accounting standards define as intangible assets but includes a wide range of resources such as a firm's technological capability, branding techniques, and the qualifications of senior management. It is difficult to measure such intangible assets objectively, but an estimate based on some assumptions shows that intangible assets in a broad sense have been steadily increasing relative to tangible fixed assets (Chart III-3-20).<sup>11</sup> The results of another estimate suggest that several intangible assets such as firms' technological capability and the qualifications of senior management may have significant explanatory power for the prospective growth rate of firms and the size of risks they bear (see Box 3 for firms' growth potential and risks).

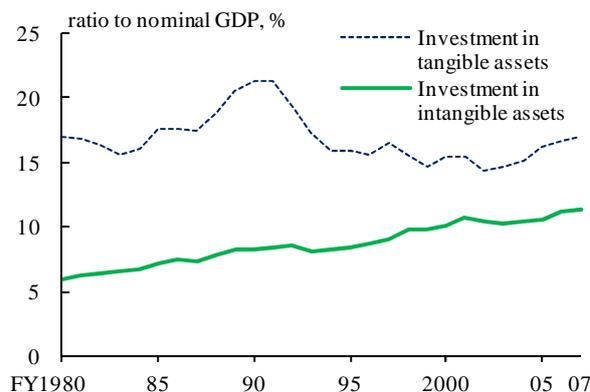
Some financial institutions have sought to enhance their expertise in identifying firms' growth potential and risks by fostering staff with technical knowledge in certain areas and cooperating with more specialized institutions, but many financial institutions still face the need to enhance such ability (Chart III-3-21). In order for financial institutions to enhance this ability, they could utilize qualitative information as well as quantitative information such as financial data.

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<sup>10</sup> For details on the importance of intangible assets in a broad sense, see *Annual Report on the Japanese Economy and Public Finance 2011*, Cabinet Office, 2011.

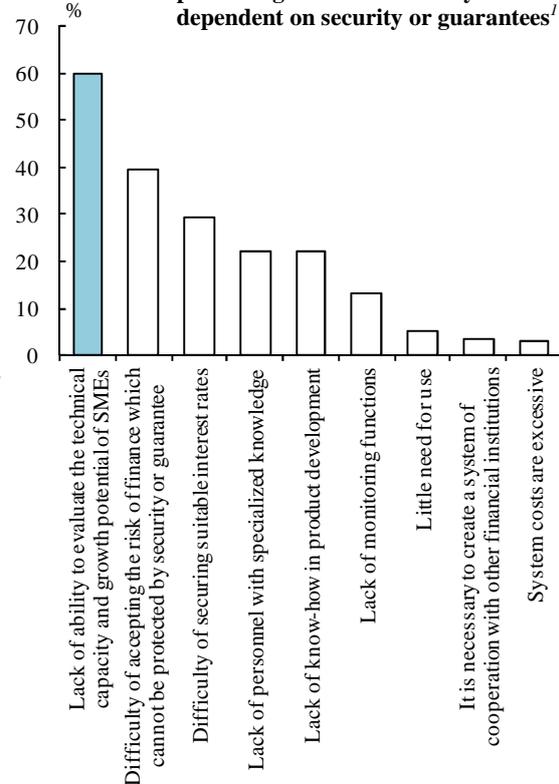
<sup>11</sup> In Chart III-3-20, intangible assets in a broad sense include computerized information (e.g., software and databases), innovative property (e.g., research and development and copyright), and economic competencies (e.g., brand assets and human capital unique to individual firms). These are estimated using a range of statistics. For more details, see *Annual Report on the Japanese Economy and Public Finance 2011*, Cabinet Office, 2011.

**Chart III-3-20: Investment in tangible and intangible assets<sup>1</sup>**



Note: 1. Nominal GDP is that of industries.  
 Source: Cabinet Office, "Annual report on the Japanese economy and public finance 2011."

**Chart III-3-21: Issues regarded as relevant to promoting finance not overly dependent on security or guarantees<sup>1</sup>**



Note: 1. Respondents of the survey were regional financial institutions.  
 Source: Small and Medium Enterprise Agency, "2008 white paper on small and medium enterprises in Japan."

**Box 3: Firms' growth potential and risks**

In order to assess firms' prospective growth or risks, it is important to take into consideration both financial data such as financial statements and other types of information. However, the latter types of such information are hard to quantify, and this sometimes causes difficulties for financial institutions in deciding on loans and investments. Some recent studies have sought to assess firms' growth potential and risks using qualitative information that is often hard to measure objectively. This information has been collected for purposes of comparison through surveys and other means. Examples of such information include firms' strength in research and development, management principles, and employee training policies.

Following existing studies, this Box estimated the extent to which firms' technological capability and the qualifications of senior management could explain differences in firms' growth potential and risks. An index of the values of patents held by an individual firm was used as an indicator for the firm's technological capability, and a score of senior management's qualifications -- such as decisiveness and planning capabilities, as

graded by investigators -- was used as an indicator for senior management's qualifications.<sup>12</sup> According to the estimation results, both of these indicators have statistically significant explanatory power for firms' prospective growth rate (3-year-ahead cumulative sales growth rate) and credit risk (3-year-ahead cumulative default probability) (Chart B3-1).<sup>13</sup> At firms with high indicators for technological capability and senior management's qualifications, the prospective sales growth rate is about 2 percentage points higher than the average, and the prospective default probability is lower than the average by about 0.3-1.0 percentage point.

Of course, a number of factors other than technological capability and senior management's qualifications are important in appropriately evaluating firms' growth potential and risks. It should be noted also that the correlation between the two

<sup>12</sup> The index of the values of patents owned by an individual firm was constructed by Kudo & Associates, a patent firm, using information on the degree of public interest in a firm's patents (measured in terms of requests for inspection, information provided to examiners to prohibit patent acquisition, requests for patent invalidation, and registrations of license agreements at the Japan Patent Office). The score of senior management's qualifications was the sum of scores on 25 items related to senior management such as "decisive," "high planning capability," and "vision." The score for each item was based on the grade provided by Teikoku Databank, whose investigators graded each firm's senior management. The score was one if qualified and zero otherwise.

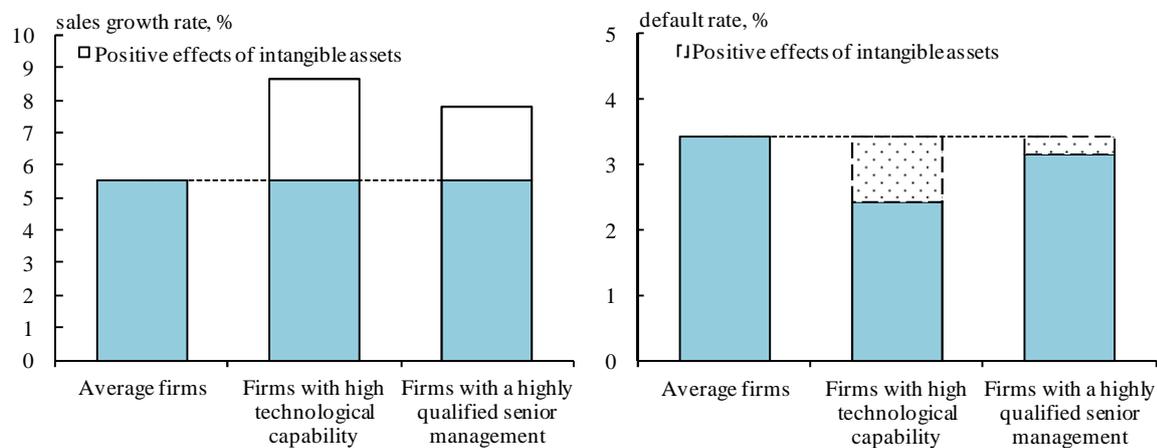
<sup>13</sup> For firms' prospective growth rate, a fixed-effects panel model was estimated using the 3-year-ahead cumulative sales growth rate as the dependent variable. Independent variables were the indicators for technological capability and senior management's qualifications, and total assets and tangible fixed assets per employee. For credit risk, a logit model was estimated using an indicator variable of whether the firm defaulted within 3 years as the dependent variable. Independent variables were the capital adequacy ratio and the on-hand liquidity ratio (the ratio of cash and deposits to sales) in addition to the independent variables used in the estimation of firms' prospective growth rate. The estimation period was from fiscal 2003 to fiscal 2010, and the sample included 3,691 firms. The estimation results appear in the table below (\*\*\*) and \* indicate statistical significance at the 1 percent and 10 percent levels, respectively).

In Chart B3-1, "average firms" shows the average of 3-year sales growth rates or 3-year default rates from fiscal 2003 to fiscal 2007. The effects from intangible assets for "firms with high technological capability" were calculated by multiplying the corresponding estimated parameter by the difference between the average of the values of the indicator of technological capability among the firms in the upper 10th percentile and the overall average of the values of the indicator. The effects from intangible assets for "firms with highly qualified senior management" were calculated in a similar manner.

	Constant	Technological capability	Senior management's qualifications	Total assets	Tangible fixed assets	Capital adequacy ratio	On-hand Liquidity ratio	R <sup>2</sup>
Sales growth rate	12.6***	0.01*	0.01***	-0.59***	0.00***	--	--	0.44
Default rate	-0.39	-0.14***	-0.05*	-0.11***	0.00***	-0.50***	-0.46*	0.03

indicators and firms' growth rates can differ depending on each firm's characteristics or sample periods.

**Chart B3-1: Sales growth rate and default rate of firms<sup>1</sup>**  
Sales growth rate Default rate



Note: 1. For details, see Footnote 13.

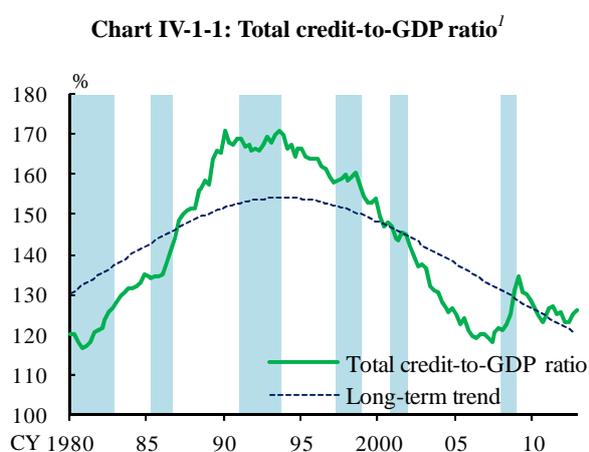
Sources: Kudo & Associates; Teikoku Databank, "SPECIA"; BOJ.

## IV. Risks in the financial system

This chapter examines macro financial risk and then considers risks observed in financial markets. It also summarizes risks to which banks, *shinkin* banks, and other types of financial institutions are exposed.

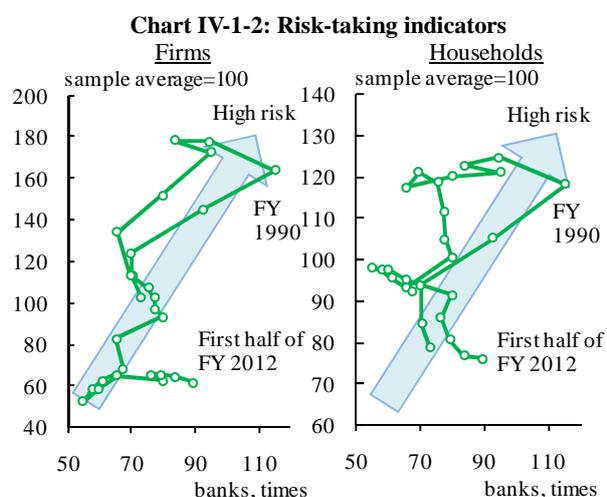
### A. Macro risk indicators

In Japan, total credit from financial institutions to firms and households relative to GDP continues to hover around its long-term trend (Chart IV-1-1). An assessment of the risk-taking behavior of firms and households by the size of investment spending compared with profits and income (risk-taking indicators for firms and households) shows that the indicators have been more or less unchanged at low levels (the vertical axis in Chart IV-1-2).<sup>14</sup> Looking at the risk-taking behavior of banks by the level of the amount outstanding of loans relative to profits (the risk-taking indicator for banks), the indicator has recently risen slightly due to the increase in loans outstanding (the horizontal axis in Chart IV-1-2).



Note: 1. Shaded areas indicate recession periods. The latest data are as of the October-December quarter of 2012.

Sources: Cabinet Office, "National accounts"; BOJ, "Flow of funds accounts."



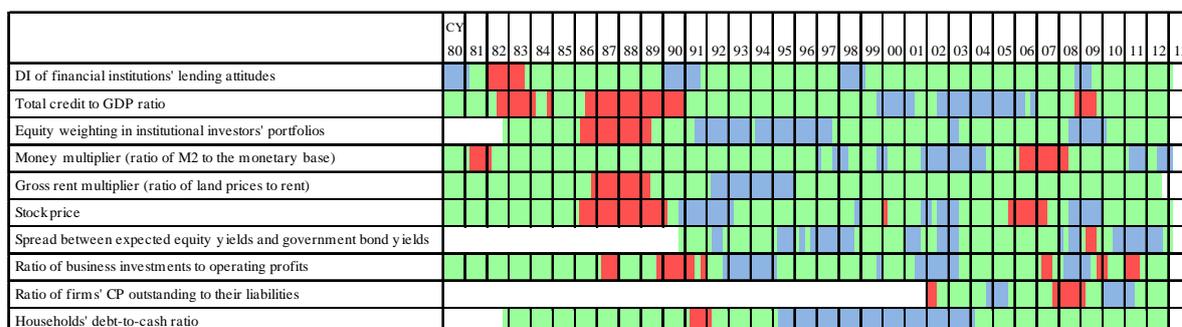
Sources: Cabinet Office, "National accounts"; Ministry of Finance, "Financial statements statistics of corporations by industry, quarterly"; BOJ.

The Financial Activity Index (FAIX) does not show any sign of financial overheating

<sup>14</sup> The risk-taking indicator for firms is calculated by multiplying the ratio of corporate investment spending to operating profits by the amount 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 amount of household spending. The indicator for banks is the ratio of loans outstanding to operating profits from core business.

(Chart IV-1-3).<sup>15</sup> The Financial Cycle Indexes, which identify signs of future instability in the financial system, also show no sign of instability in the financial system, as evidenced by the fact that both the leading and lagging indexes have recently been positive (Chart IV-1-4).<sup>16</sup>

Chart IV-1-3: Heat map of Financial Activity Index<sup>1</sup>



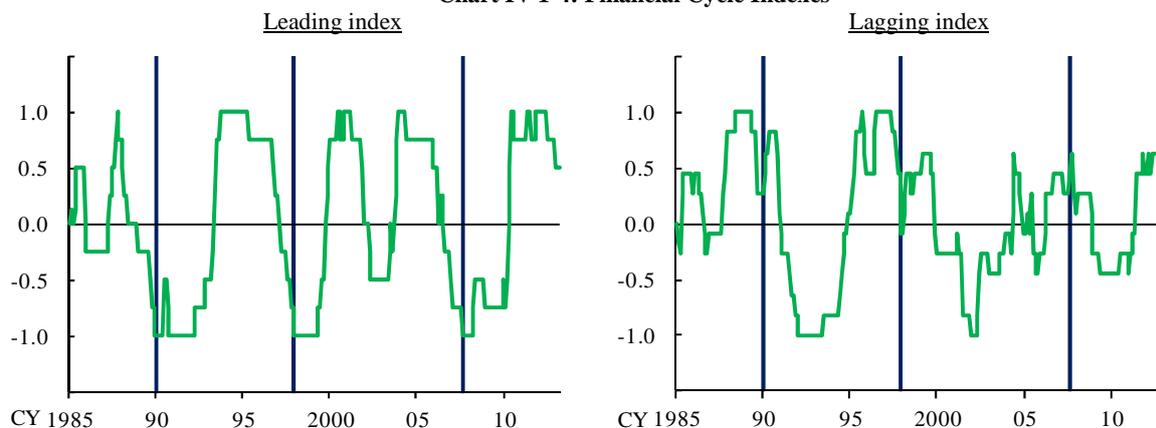
Note: 1. The latest data for DI of financial institutions' lending attitudes, stock price, and spread between expected equity yields and government bond yields are as of the January-March quarter of 2013. Those for money multiplier (ratio of M2 to the monetary base) and gross rent multiplier (ratio of land prices to rent) are January-February 2013 average and the July-September quarter of 2012, respectively. Those for other indicators are as of the October-December quarter of 2012.

Sources: Bloomberg; Cabinet Office, "National accounts"; Japan Post Holdings, "The former Japan Post statistical data"; Japan Real Estate Institute, "Urban land price index"; Ministry of Finance, "Financial statements statistics of corporations by industry, quarterly"; Ministry of Internal Affairs and Communications, "Consumer price index"; Ministry of Posts and Telecommunications, "Annual statistical report of postal services," "Annual statistical report of postal service administrations"; Thomson Reuters; BOJ, "Flow of funds accounts," "Monetary base," "Money stock," "Tankan."

<sup>15</sup> The FAIX consists of ten financial indicators and judges whether financial activity is overheating or overcooling, based on how far individual indicators deviate from their historical trend. Shaded areas in Chart IV-1-3 represent the following: (1) areas shaded in red (the darkest shaded areas) show that an indicator has risen by more than one standard deviation from the trend, that is, it is tilted to overheating; (2) areas shaded in blue (the second darkest shaded areas) show that an indicator has declined by more than one standard deviation from the trend, that is, it is tilted to overcooling; (3) areas shaded in green (the most lightly shaded areas) show everything in between; and (4) areas in white show the periods without data. For details on the FAIX, see Atsushi Ishikawa, Koichiro Kamada, Kazutoshi Kan, Ryota Kojima, Yoshiyuki Kurachi, Kentaro Nasu, and Yuki Teranishi, "The Financial Activity Index," Bank of Japan Working Paper, No. 2012-E-4, April 2012.

<sup>16</sup> The Financial Cycle Indexes are diffusion indexes (DIs) used to identify signs of future instability in the financial system. 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. For details on the indexes, see Koichiro Kamada and Kentaro Nasu, "The Financial Cycle Indexes for Early Warning Exercise," Bank of Japan Working Paper, No. 2011-E-1, April 2011.

Chart IV-1-4: Financial Cycle Indexes<sup>1,2</sup>

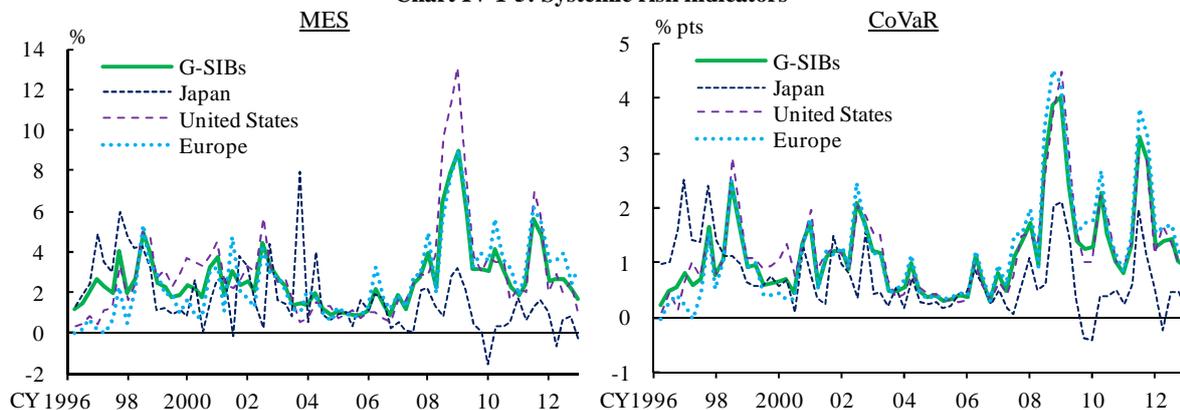


Notes: 1. The left, middle, and right vertical lines indicate the collapse of Japan's asset price bubble, the default of Sanyo Securities, and the outbreak of the U.S. subprime problem, respectively.

2. The latest data are as of March 2013.

Source: BOJ.

Chart IV-1-5: Systemic risk indicators<sup>1,2</sup>



Notes: 1. The latest data are as of end-March 2013.

2. G-SIBs are counted.

Sources: Bloomberg; BOJ.

Stock markets have not shown an increase in awareness of systemic risk in the financial sector (Chart IV-1-5). The conditional value-at-risk (CoVaR), which measures the degree of propagation of stresses occurring at individual financial institutions through the entire financial sector, has been at a low level recently for Japan's banks.<sup>17</sup> The marginal expected shortfall (MES), which measures the size of adverse effects of the entire financial sector's stresses on individual financial institutions' corporate value, has been low for Japan's banks, suggesting that the degree of propagation of stresses

<sup>17</sup> As CoVaR increases, propagation of stresses occurring at individual financial institutions to the entire financial sector becomes stronger. CoVaR is estimated based on the VaR of stocks of 28 major banks around the world (i.e., global systemically important banks [G-SIBs]). For details, see Tobias Adrian and Markus K. Brunnermeier, "CoVaR," Federal Reserve Bank of New York Staff Report, No. 348, September 2011.

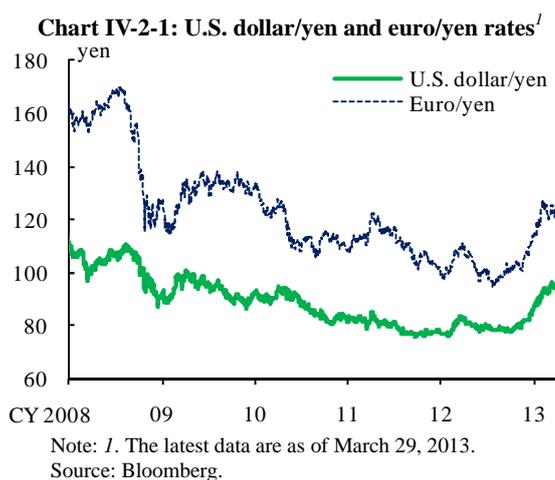
occurring at foreign financial institutions to Japan's banks is also limited.<sup>18</sup>

No solid evidence of instability in the financial system is observed in these indicators.

## B. Risks observed in financial markets

### 1. Risks implied in foreign exchange markets

In foreign exchange markets, the yen has depreciated against a wide range of currencies compared with autumn 2012 (Chart IV-2-1).<sup>19</sup> Factors behind this depreciating trend include the following: (1) demand for the yen as a safe-haven currency declined, given improvement in investors' risk sentiment with the subsiding of tail risks such as the European debt problem and the fiscal cliff in the United States; (2) market participants were concerned about Japan's weaker external balances such as an increased deficit in the trade balance; and (3) expectations grew over Japan's policy actions.



Next, the model-free implied volatilities (MFIVs) of the U.S. dollar/yen rate and the euro/yen rate are examined to explore market participants' risk recognition of future foreign exchange rate fluctuations.<sup>20</sup> The MFIVs of these exchange rates had been on a

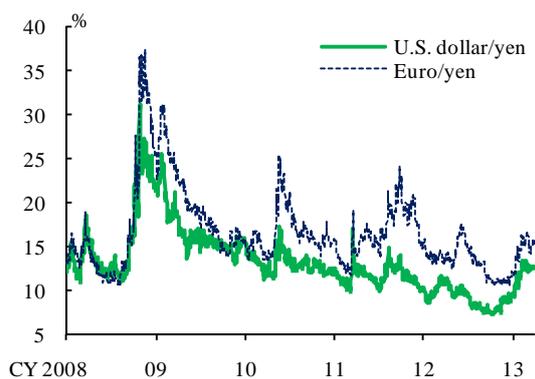
<sup>18</sup> The MES shows expected losses at an individual financial institution if the VaR of aggregate financial stocks exceeds a certain threshold. Specifically, an individual financial institution's MES is the rate of change in market value of the stocks on the day when the market value of aggregate financial stocks falls below the value with the lowest 5 percent probability of occurrence. The sample includes 28 major banks around the world (G-SIBs). For details, see Viral V. Acharya, Lasse H. Pedersen, Thomas Philippon, and Matthew Richardson, "Measuring Systemic Risk," Federal Reserve Bank of Cleveland Working Paper, No. 10-02, March 2010.

<sup>19</sup> Since early April 2013, reflecting the Bank's introduction of quantitative and qualitative monetary easing, the yen has depreciated further. In addition, some developments, such as the slight skew favoring dollar calls in the 1-year U.S. dollar/yen risk reversal, suggest that market participants have factored in further depreciation of the yen.

<sup>20</sup> MFIVs of the U.S. dollar/yen rate and the euro/yen rate are calculated by using data on 3-month

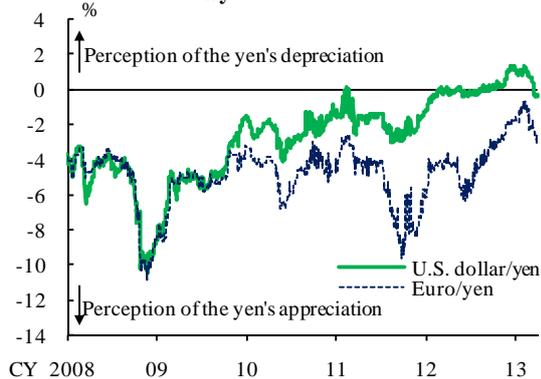
declining trend from the second half of 2011, albeit with some fluctuations. However, they have risen, reflecting a sharp depreciation of the yen from autumn 2012, indicating that uncertainty has increased somewhat (Chart IV-2-2). Meanwhile, the 1-year dollar/yen risk reversal -- which indicates the direction of future currency rate changes recognized by options market participants -- had skewed slightly toward dollar calls (concern over the dollar's appreciation and the yen's depreciation) since autumn 2012. Since the middle of March 2013, however, the 1-year dollar/yen risk reversal has skewed faintly toward dollar puts, implying lowered expectations of substantial depreciation of the yen (Chart IV-2-3). As for the 1-year euro/yen risk reversal, the skew favoring euro puts (concern over the euro's depreciation and the yen's appreciation) diminished from the second half of 2012, given policy responses on the European debt problem. Since late February 2013, however, the risk reversal has skewed increasingly toward euro puts due to growing uncertainty over the situation in Italy and Cyprus, implying concerns about a risk of depreciation of the euro.

**Chart IV-2-2: MFIVs of U.S. dollar/yen and euro/yen rates<sup>1,2</sup>**



Notes: 1. 3-month MFIVs.  
2. The latest data are as of March 29, 2013.  
Source: Bloomberg.

**Chart IV-2-3: Risk reversals of U.S. dollar/yen and euro/yen rates<sup>1,2</sup>**



Notes: 1. 1-year risk reversals.  
2. The latest data are as of March 29, 2013.  
Source: Bloomberg.

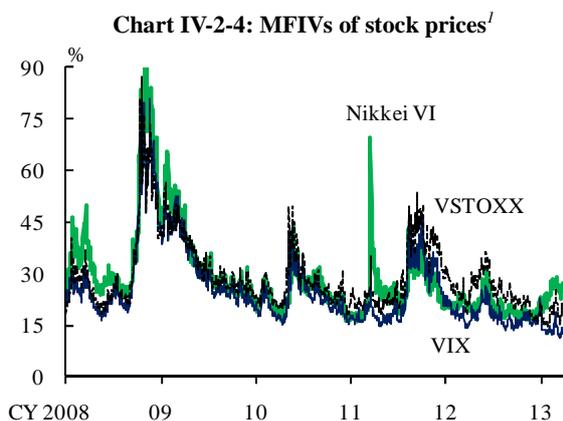
## 2. Risks implied in stock markets

Japan's stock prices have been on an uptrend since autumn 2012. The uptrend in stock prices seems to reflect improvement in global market sentiment with the subsiding of tail risks such as the European debt problem and the fiscal cliff in the United States, the subsequent rise in U.S. and European stock prices, and the depreciation of the yen. In

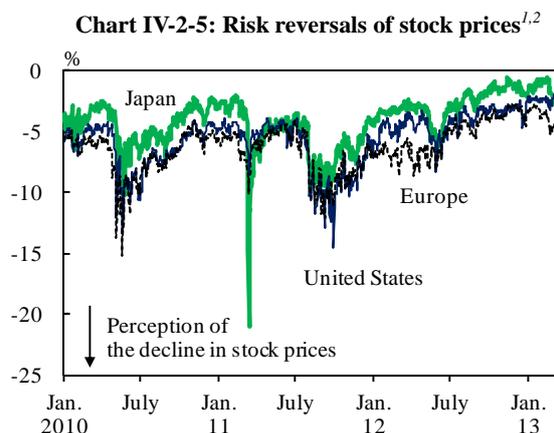
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over-the-counter option prices. The results correspond to options market participants' expected change in foreign exchange rates for the next 3 months. Unlike the standard implied volatility, MFIVs capture the recognition of tail risks.

addition, there seem to be idiosyncratic factors in the case of Japan, such as expectations for policy actions. Under these circumstances, MFIV and risk reversals (the difference in implied volatilities between call and put options) of Japan's stock prices seem to have generally become less correlated with the United States and Europe since autumn 2012 (Charts IV-2-4 and IV-2-5).<sup>21</sup>



Note: 1. The latest data are as of March 29, 2013.  
Source: Bloomberg.



Notes: 1. Nikkei 225 options for Japan; S&P 500 options for the United States; EURO STOXX 50 options for Europe.  
2. The latest data are as of March 29, 2013.  
Source: Bloomberg.

Since late February 2013, however, due to growing uncertainty over the situation in Italy and Cyprus, the negative value of risk reversals has increased in both Japan and Europe, indicating the heightening of concern over a decline in stock prices. Given that correlations of MFIVs in Japan, the United States, and Europe had surged in the past in the wake of the U.S. and European shocks, attention should be paid to the possibility that Japan's stock market will be strongly affected again by developments in U.S. and European stock markets.

### 3. Risks implied in government bond markets

#### *Yields on long-term JGBs*

Yields on 10-year JGBs temporarily rose from the middle of December 2012, along with the depreciation of the yen and the rise in stock prices, as well as the increase in U.S. long-term interest rates. However, due in part to solid demand for JGBs from

<sup>21</sup> The volatility index (VIX) of the Chicago Board Options Exchange, the VSTOXX of the Eurex, and the Nikkei Stock Average Volatility Index (VI) of Nikkei Inc. are MFIVs calculated by using the price information on S&P 500 options, EURO STOXX 50 options, and Nikkei 225 options, respectively. They correspond to options market participants' expected rate of change in stock prices for the next month.

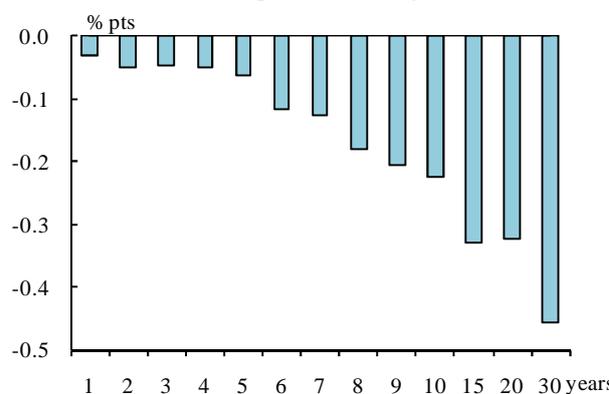
investors with strong expectations for additional monetary easing, yields on 10-year JGBs declined again (Chart IV-2-6).<sup>22</sup> Looking at changes in yields by maturity, a decline in medium- to super-long-term yields was limited until the middle of February 2013, but these yields have been under strong downward pressure thereafter (Chart IV-2-7). As a result, yield spreads between super-long-term and 10-year JGBs have narrowed rapidly, after recording the highest level observed during the past decade (Chart IV-2-8). This is mainly because the supply-demand balance of super-long-term JGBs has tightened reflecting growing expectations for additional monetary easing.

**Chart IV-2-6: Long-term JGB yields<sup>1,2</sup>**



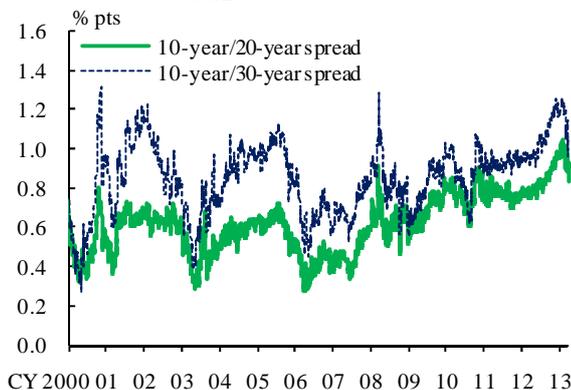
CY 2000 01 02 03 04 05 06 07 08 09 10 11 12 13  
 Notes: 1. Monthly averages of daily figures.  
 2. The latest data are as of March 2013.  
 Source: Bloomberg.

**Chart IV-2-7: Changes in the JGB yield curve<sup>1</sup>**



Note: 1. Changes are from October 31, 2012 to March 29, 2013.  
 Source: Bloomberg.

**Chart IV-2-8: Yield spreads on super-long-term JGBs<sup>1</sup>**



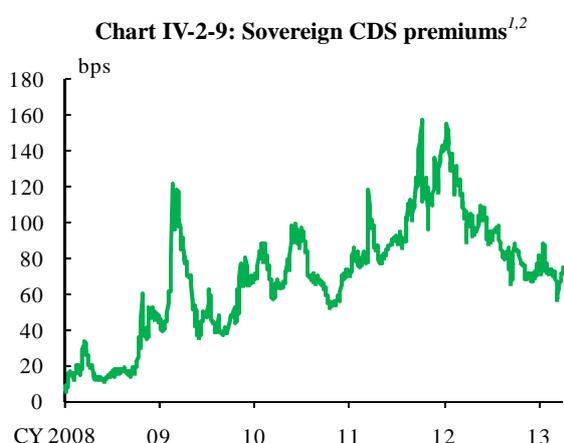
Note: 1. The latest data are as of March 29, 2013.  
 Source: Bloomberg.

### *Risks of long-term JGB yield fluctuations*

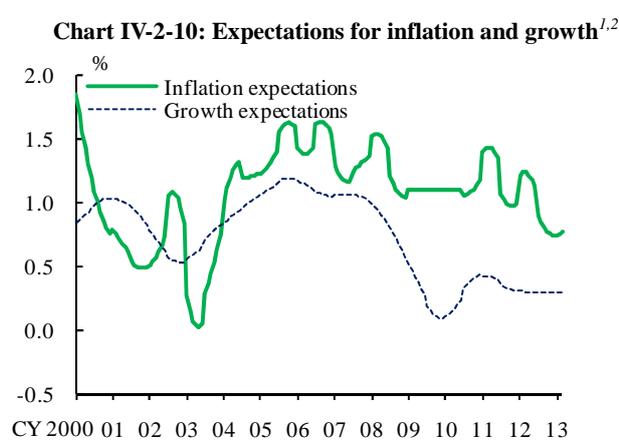
The level of long-term yields is determined by expectations for growth and inflation as well as numerous factors such as risk premiums associated with concern over fiscal

<sup>22</sup> In early April 2013, yields on 10-year JGBs declined to the 0.4-0.5 percent level (on a closing basis), reflecting the Bank's introduction of quantitative and qualitative monetary easing.

imbalances and expectations about monetary policy. Among these factors, interest rate risk arising from concern over fiscal imbalances can be examined from Japan's sovereign CDS premiums. Although it should be noted that Japan's sovereign CDS premiums do not necessarily reflect its fiscal conditions accurately due to the low liquidity in the sovereign CDS market, they have not increased markedly, and thus do not appear to indicate the heightening of concern over fiscal imbalances (Chart IV-2-9). Since it is difficult to fully quantify other various factors, risks of long-term JGB yield fluctuations are evaluated below by comparing them to expectations for growth and inflation.



Notes: 1. 5-year CDSs.  
2. The latest data are as of March 29, 2013.  
Source: Bloomberg.



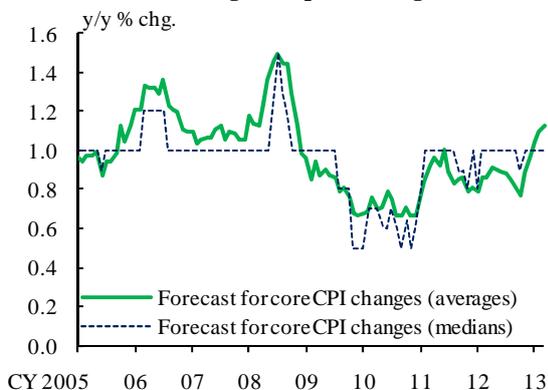
Notes: 1. "Inflation expectations" and "growth expectations" indicate economists' forecasts for long-term CPI changes and the potential growth rate, respectively. Figures after October 2012 are assumed to be unchanged, and semiannual observations are converted into monthly data.  
2. The latest data are as of March 2013.  
Sources: Consensus Economics Inc.; BOJ.

First, growth expectations have moved around 0.5-1.0 percent (Chart IV-2-10). As for inflation expectations, although economists' forecasts for long-term consumer price index (CPI) changes have trended lower in recent years, the survey results for March 2013 show that the long-term inflation rate expected by market participants has increased to some extent, and the zero coupon inflation swap (ZCIS) rate and the break-even inflation (BEI) rate derived from inflation-indexed bonds have also risen somewhat (Charts IV-2-10 to IV-2-12).<sup>23</sup> Nevertheless, these measures of inflation expectations should be interpreted with some latitude given that (1) market liquidity of inflation swaps and inflation-indexed bonds is low; and (2) the survey results, the inflation swap rate, and the BEI rate may be affected by the scheduled hike in the

<sup>23</sup> ZCIS is a derivatives contract that exchanges a floating rate linked to the rate of change in the CPI and a fixed rate (zero coupon) paid in a lump sum at maturity. If the CPI is expected to decline, the ZCIS rate will be negative. And contrarily, if the CPI is expected to rise, the ZCIS rate will be positive.

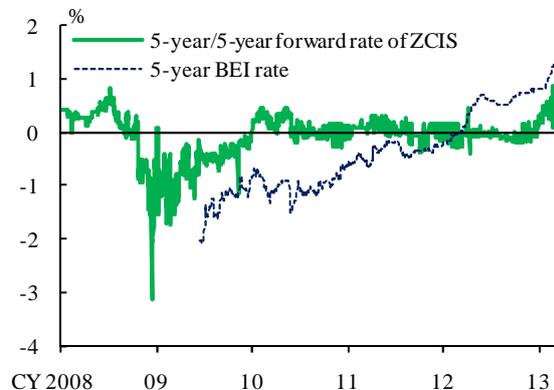
consumption tax rate.

**Chart IV-2-11: Market participants' expectations of long-term price changes<sup>1,2</sup>**



Notes: 1. Forecasts for the next 10 years.  
2. The latest data are as of March 2013.  
Source: QSS Report<Bond>.

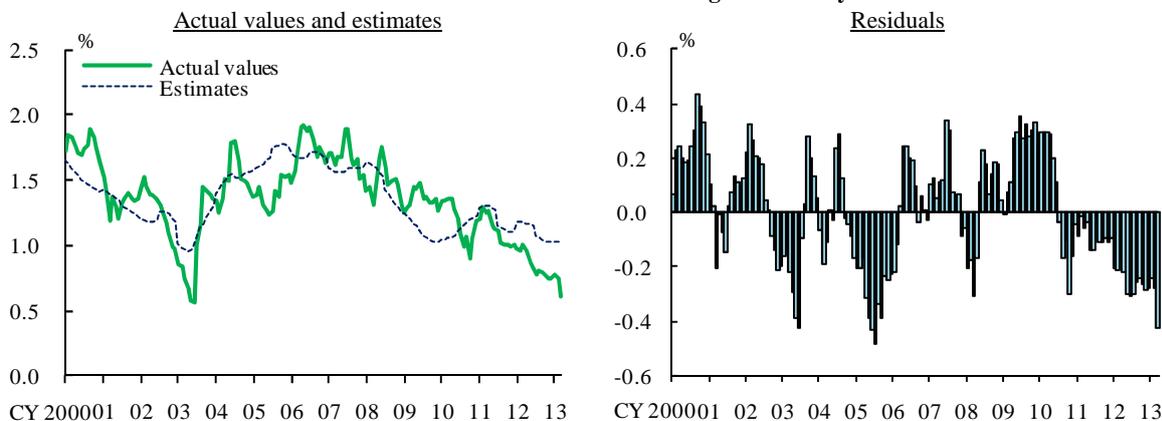
**Chart IV-2-12: Inflation swap and BEI rates<sup>1</sup>**



Note: 1. The latest data are as of March 29, 2013.  
Source: Bloomberg.

When long-term yields are regressed on expectations for growth and inflation, both positive and negative residuals are often seen, but recently somewhat large negative residuals have been observed (Chart IV-2-13). This suggests that other factors omitted here have recently exerted downward pressure on long-term yields.

**Chart IV-2-13: Estimation results of long-term JGB yields<sup>1,2</sup>**

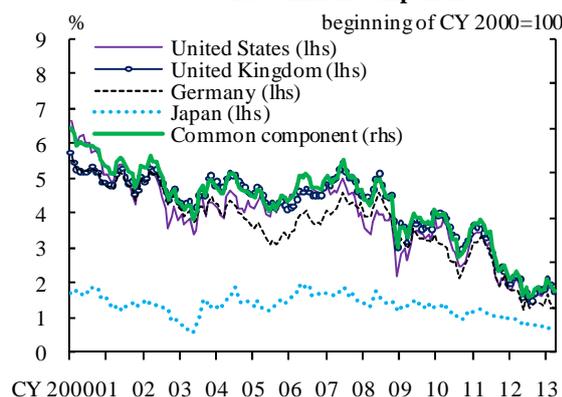


Notes: 1. Constant term, economists' forecasts of long-term CPI changes, and potential growth rates are used as explanatory variables. All estimates are significantly different from zero at the 1 percent level.  
2. The latest data are as of March 2013.  
Sources: Bloomberg; Consensus Economics Inc.; BOJ.

In addition, a factor decomposition of long-term JGB yields is conducted by using another method. First, by applying principal component analysis to the fluctuations in long-term U.S., U.K., German, and Japanese government bond yields that have generally shown similar developments, the "common component" (first principal component) that can be regarded as a global common factor is obtained (Chart

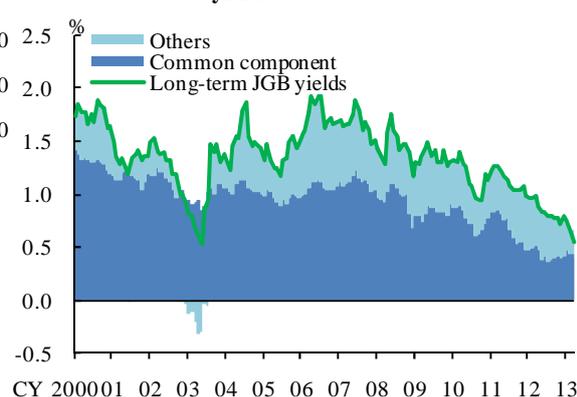
IV-2-14).<sup>24</sup> Next, the long-term JGB yields are decomposed into the common component and others (domestic factor). The result shows that although long-term JGB yields have most recently declined mainly due to a decrease in others (domestic factor), the declining trend in recent years is driven by the global common component (Chart IV-2-15).

**Chart IV-2-14: Long-term government bond yields and common component<sup>1,2</sup>**



Notes: 1. "Common component" is defined as the first principal component of government bond yields.  
2. The latest data are as of end-March 2013.  
Source: Bloomberg.

**Chart IV-2-15: Decomposition of long-term JGB yields<sup>1,2,3</sup>**



Notes: 1. "Common component" is defined as the first principal component of U.S., U.K., German, and Japanese government bond yields.  
2. "Others" is the sum of the constant term and residuals from regression of JGB yields on "common component" and the constant term.  
3. The latest data are as of end-March 2013.  
Source: Bloomberg.

Taking these two estimation results together, although long-term JGB yields seem to have declined most recently due to idiosyncratic factors such as stronger expectations for additional monetary easing in Japan compared to the United States and Europe, it can be pointed out that the declining trend in recent years may have been affected significantly by the global common component. Specifically, it is possible that increased demand for government bonds as safe-haven assets -- mainly due to strengthened financial regulations and a growing demand for secured funding -- or central banks' purchases of safe-haven assets have exerted downward pressure on long-term yields through the tightening of the supply-demand balance of government bonds.

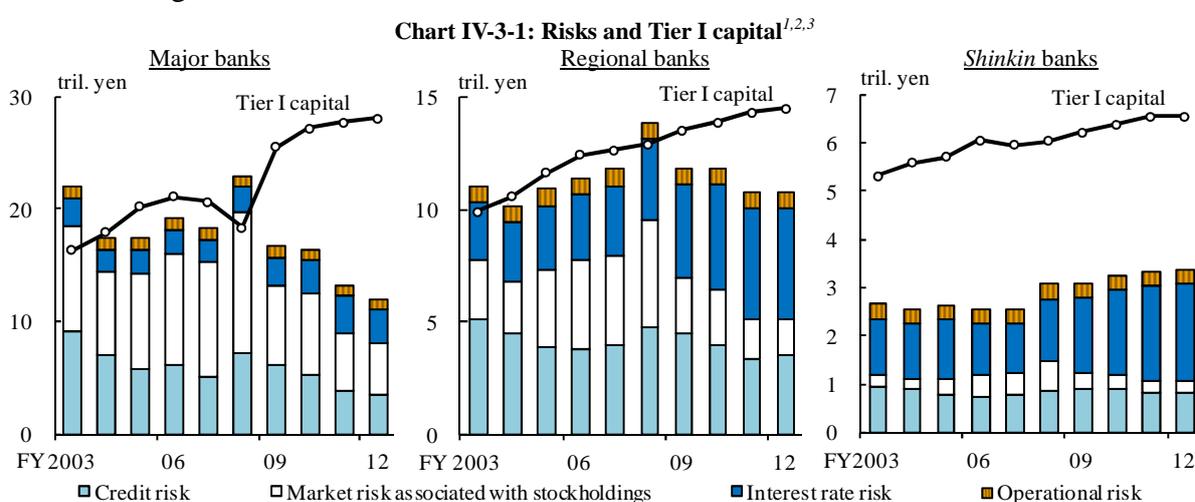
Given these points, attention should also be paid to, for example, a potential rise in long-term JGB yields if overseas long-term yields rise, triggered by factors such as speculation about future unwinding of unconventional monetary policy measures, as well as interest rate risk arising from concern over Japan's fiscal imbalances.

<sup>24</sup> Principal component analysis is a method to summarize data into a smaller number of vectors (principal components) formed by a linear combination of variables. The obtained common component (first principal component) explains about 90 percent of the fluctuations.

## C. Risks at banks and *shinkin* banks

### 1. Amount of risks relative to capital

The amount of risks banks and *shinkin* banks bear as a whole has been decreasing relative to their capital (Chart IV-3-1). However, as described below, the quality of bank loans has not improved substantially, despite the low credit costs. Moreover, the amount of interest rate risk borne by regional financial institutions has increased, as the weight of investment in securities including JGBs has risen in their portfolios. In addition, major banks are still exposed to a high degree of market risk associated with stockholdings.



Notes: 1. Credit risk: unexpected losses 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.

2. The latest data are as of end-September 2012.

3. For *shinkin* banks, figures for Tier I capital, the amount outstanding of stockholdings, and credit risks in fiscal 2012 are assumed to be unchanged from end-March 2012, and those for gross profits are assumed to be unchanged from fiscal 2011.

Source: BOJ.

### 2. Credit risk

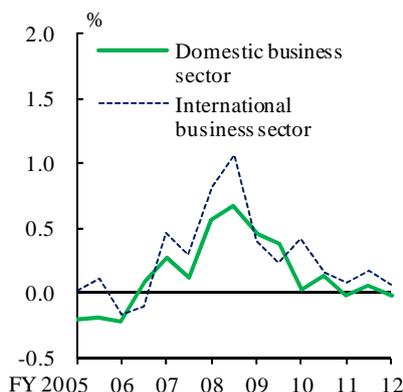
#### *Credit costs*

Banks' credit cost ratio remains at low levels. At major banks, the ratio turned negative for domestic loans in the first half of fiscal 2012, and has remained low for overseas loans (Chart IV-3-2).<sup>25</sup> At regional banks, in the first half of fiscal 2012 the ratio remained at the lowest level observed since 2000 (Chart IV-3-3). In addition, the NPL ratio has remained low at major and regional banks, while it has increased somewhat at

<sup>25</sup> Credit costs can turn negative when reversals of provisions for loan losses and/or recoveries of write-offs are recorded.

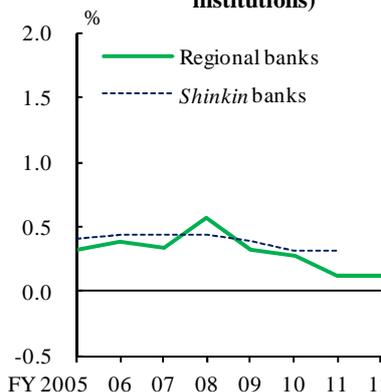
*shinkin* banks (Chart IV-3-4). Such stable developments in credit costs are partly attributable to the continued decrease in the number of domestic corporate bankruptcies (Chart IV-3-5). As for overseas loans, selective lending by major banks has led to the low credit costs.

**Chart IV-3-2: Credit cost ratio (major banks)<sup>1</sup>**



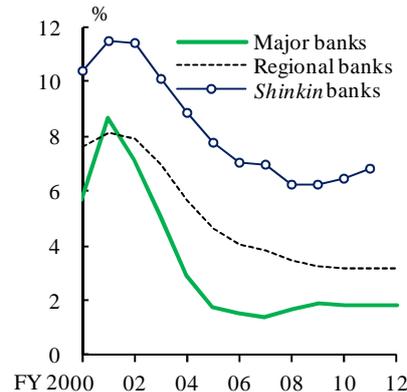
Note: 1. The latest data are as of the first half of fiscal 2012 (annualized).  
Source: BOJ.

**Chart IV-3-3: Credit cost ratio (regional financial institutions)<sup>1</sup>**



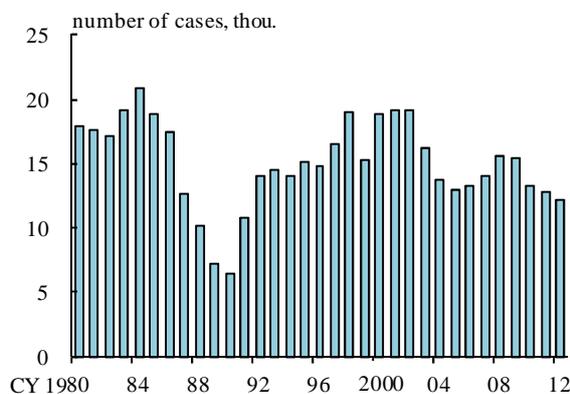
Note: 1. The latest data for regional banks are as of the first half of fiscal 2012 (annualized), and those for *shinkin* banks are as of fiscal 2011.  
Source: BOJ.

**Chart IV-3-4: Nonperforming-loan ratio<sup>1</sup>**



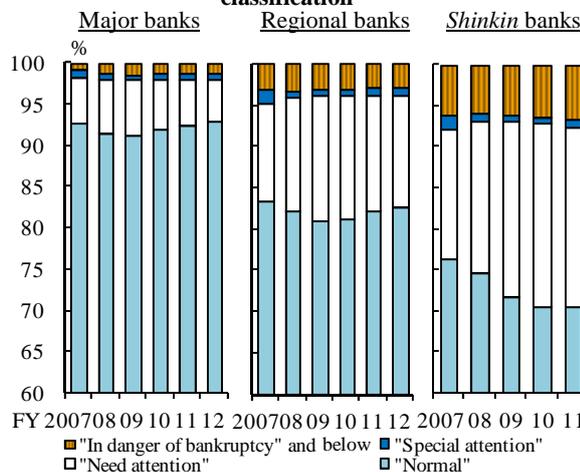
Note: 1. The latest data for major banks and regional banks are as of the first half of fiscal 2012, and those for *shinkin* banks are as of fiscal 2011.  
Source: BOJ.

**Chart IV-3-5: Corporate bankruptcies**



Source: Tokyo Shoko Research Ltd., "Tosan Geppo (Monthly review of corporate bankruptcies)."

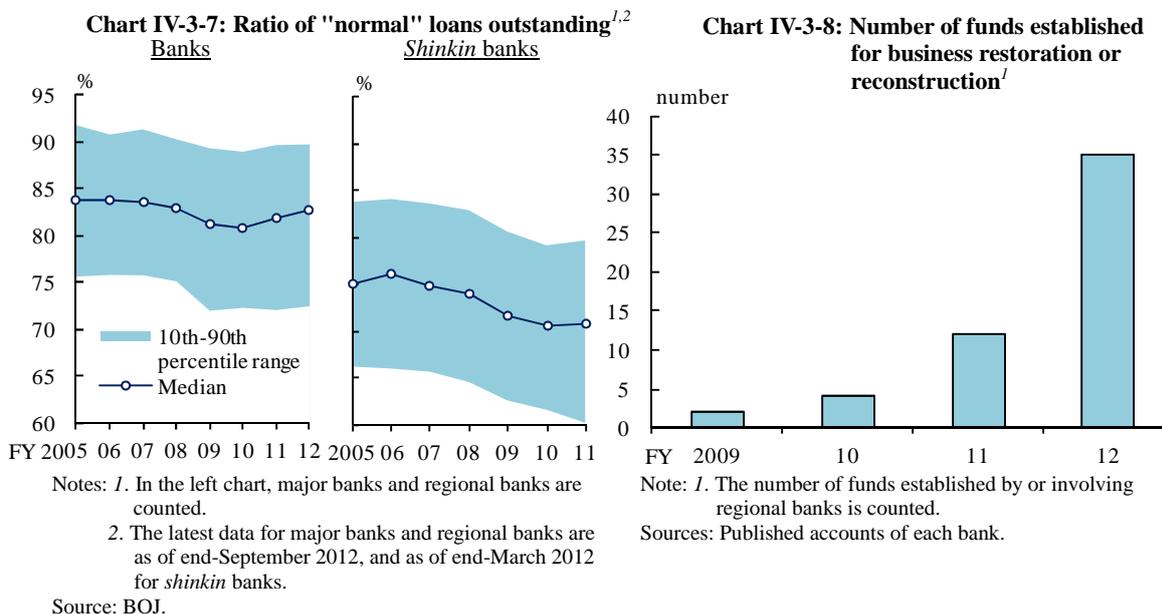
**Chart IV-3-6: Loans outstanding by borrower classification<sup>1</sup>**



Note: 1. The latest data are as of end-September 2012 for major and regional banks, and as of end-March 2012 for *shinkin* banks.  
Source: BOJ.

However, the quality of loans has not improved substantially at some regional financial institutions, as some small and medium-sized firms remain in severe financial conditions. The ratio of "normal" loans to total loans has increased moderately as a whole at regional banks, but at some banks it has not yet recovered sufficiently after declining following the Lehman shock (Charts IV-3-6 and IV-3-7). As for most *shinkin*

banks, the ratio decreased in fiscal 2011.

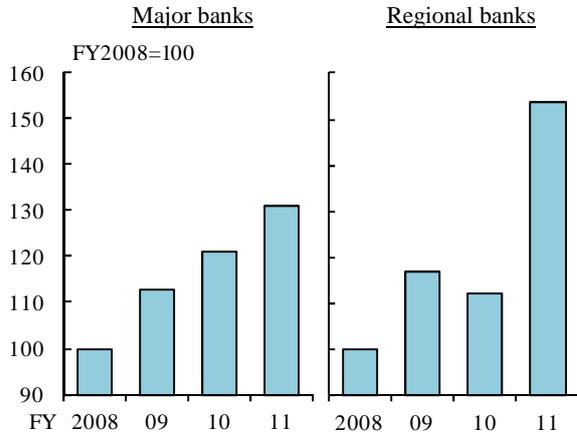


Given this situation, financial institutions have proceeded with their efforts to help ailing borrowing firms improve their business. A growing number of financial institutions have cooperated with outside professionals such as Small and Medium-sized Enterprise Revitalization Support Councils, and the number of cases has increased in which financial institutions set up funds to support firms' business reconstruction (Chart IV-3-8). As mentioned in Chapter III.C, financial institutions need to improve their ability to identify the growth potential and risks of firms. Based on this ability, they need to help firms enhance the effectiveness of the firms' reconstruction plans by actively proposing measures in accordance with individual firms' management challenges.

#### *Developments in loans to large-lot borrower firms*

An increase has been observed in the amount outstanding of loans to large-lot borrower firms (defined in this *Report* as borrower firms whose amount of loans from a bank exceeds 3 percent of the bank's capital) (Chart IV-3-9). As mentioned in Chapter III.C, this is partly because loans have increased to firms in the electric power industry or firms conducting mergers and acquisitions. Another factor is active extension of loans to large firms by regional banks. Most large-lot borrower firms are large firms or smaller but prominent firms in local areas, and many of their credit ratings have been relatively high. However, credit ratings of some of large-lot borrower firms have deteriorated somewhat since the Lehman shock (Charts IV-3-10 and IV-3-11).

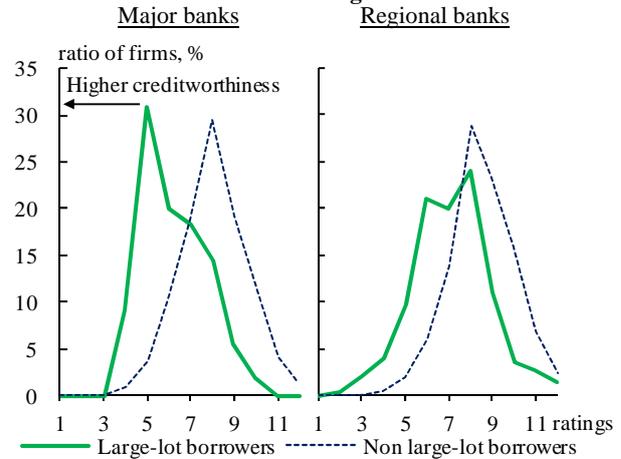
**Chart IV-3-9: Amount outstanding of loans to large-lot borrowers<sup>1,2</sup>**



Notes: 1. Large-lot borrowers are defined as borrower firms whose amount of loans from a bank exceeds 3 percent of the bank's capital.  
2. Figures are the amount outstanding of loans to firms that were large-lot borrowers as of fiscal 2011.

Source: Teikoku Databank, "SPECIA."

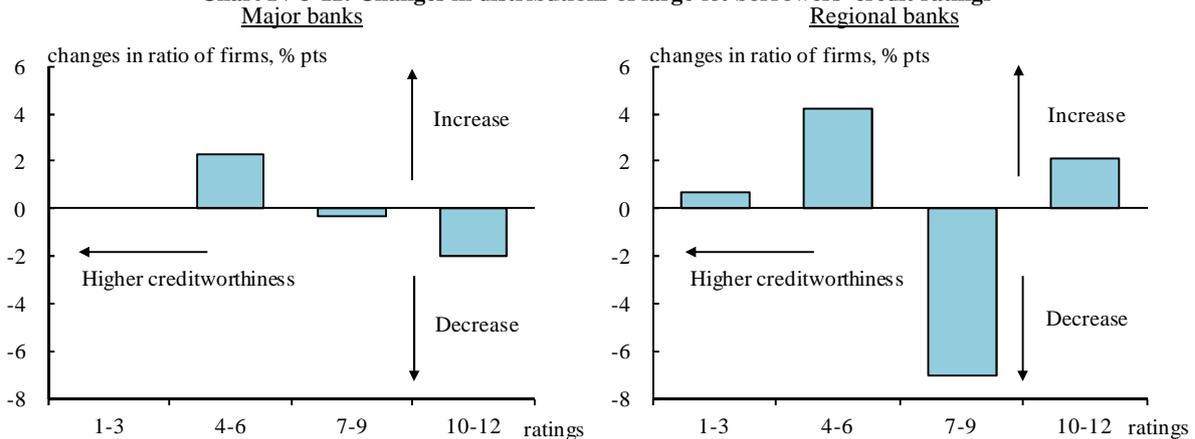
**Chart IV-3-10: Distributions of large-lot borrowers' credit ratings<sup>1,2</sup>**



Notes: 1. The data are as of fiscal 2011.  
2. Large-lot borrowers are defined as borrower firms whose amount of loans from a bank exceeds 3 percent of the bank's capital.

Source: Teikoku Databank, "SPECIA."

**Chart IV-3-11: Changes in distributions of large-lot borrowers' credit ratings<sup>1,2</sup>**



Notes: 1. Figures are changes in distributions from fiscal 2008 to fiscal 2011.

2. Large-lot borrowers are defined as borrower firms whose amount of loans from a bank exceeds 3 percent of the bank's capital.

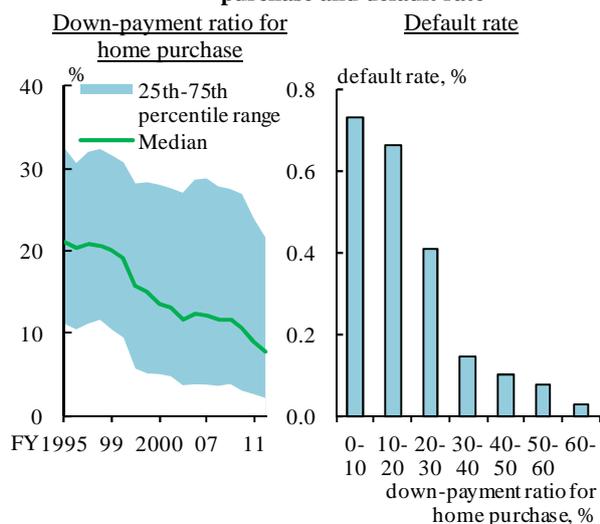
Source: Teikoku Databank, "SPECIA."

Deterioration in business conditions of large-lot borrower firms can have a significant impact on financial institutions' profits through an increase in credit costs and a decline in stock prices. Moreover, it is often difficult for financial institutions that are not the main banks of large firms to secure detailed information on the firms' financial conditions in a timely manner. Therefore, financial institutions need to comprehensively manage exposure ceilings on loans, corporate bonds, and stocks, and conduct strict credit management by using both financial statements and other types of information such as market data.

### Credit risk on housing loans

Banks have eased their lending standards for and reduced interest rates on housing loans. For example, regarding lending standards, the down-payment ratio for home purchase has been on a downtrend (Chart IV-3-12). This suggests the easing of lending standards, given that a lower down-payment ratio tends to accompany a higher default rate. Moreover, the debt-to-income (DTI) ratio and the loan-to-value (LTV) ratio for housing loans among young people in their 20s and 30s are both estimated to be on an uptrend (Chart IV-3-13). On the other hand, housing loan rates have been declining, and some banks have been providing housing loans at very low rates (Chart IV-3-14). In metropolitan areas, where the competition among banks appears to be intense, housing loan rates have declined at a fast pace and the size of increase in the DTI ratio has been large (Chart IV-3-15). This suggests that the easing of lending standards and a reduction in interest rates are progressing particularly in these areas.

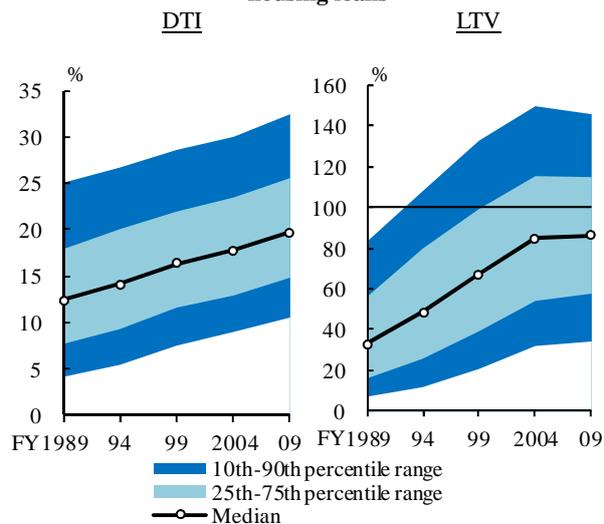
**Chart IV-3-12: Down-payment ratio for home purchase and default rate<sup>1</sup>**



Note: 1. In the left chart, the latest data are as of the first half of fiscal 2012. In the right chart, the default rate was calculated based on the data from fiscal 2002 to fiscal 2011.

Source: Mitsubishi Research Institute, Inc., "Housing loan consortium."

**Chart IV-3-13: DTI and LTV of households with housing loans<sup>1,2,3,4</sup>**



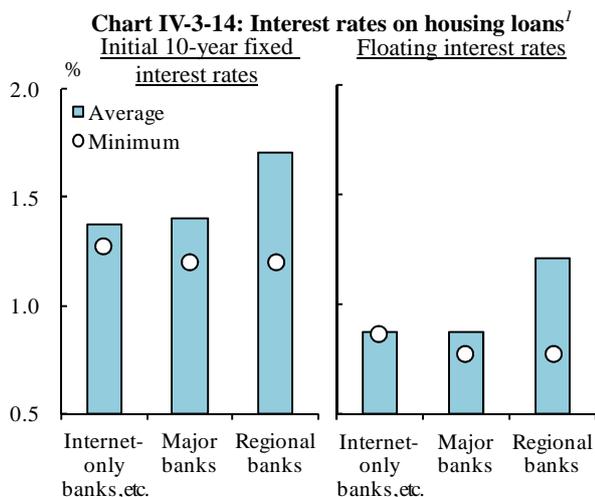
Notes: 1. The DTI is the ratio of payments of debt for houses and land to disposable income.

2. The LTV is the ratio of liabilities for purchase of houses and/or land to the prices of houses and residential land.

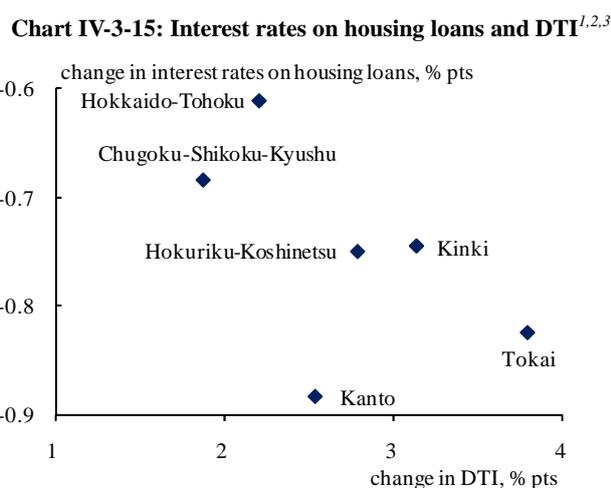
3. Two-or-more person households with housing loans whose household heads are less than 40 years old are counted.

4. For this chart, the data in "National survey of family income and expenditure" provided by the Ministry of Internal Affairs and Communications were reorganized by the BOJ.

Source: Ministry of Internal Affairs and Communications, "National survey of family income and expenditure."

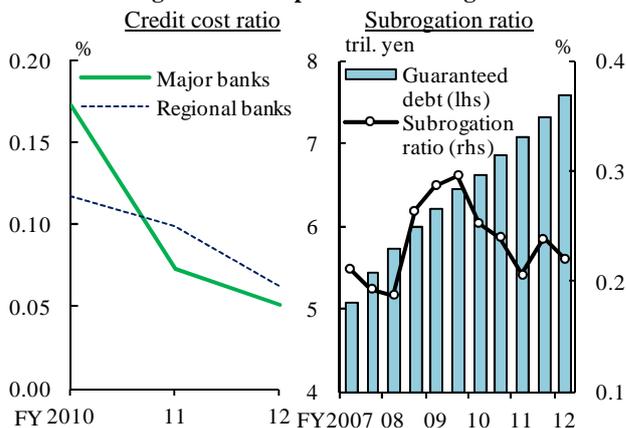


Note: 1. Figures are effective interest rates (offered rates minus preferential rates) as of October 1, 2012.  
Source: Japan Financial News, "Nikken report."



Notes: 1. The changes in interest rates on the housing loans and the DTI are from October 2004 to October 2012 and 2004 to 2009, respectively.  
2. The interest rates on housing loans are weighted averages of floating and initial 2-year to 20-year fixed interest rates. Weights are based on the composition of newly extended housing loans by type of interest rate and region. Interest rates on housing loans are effective interest rates (offered rates minus preferential rates).  
3. For this chart, the data in "National survey of family income and expenditure" provided by the Ministry of Internal Affairs and Communications were reorganized by the BOJ.  
Sources: Japan Financial News, "Nikken report"; Japan Housing Finance Agency, "Survey of private mortgage loans"; Ministry of Internal Affairs and Communications, "National survey of family income and expenditure"; BOJ.

**Chart IV-3-16: Credit cost ratio of housing loans and housing guarantee corporations' subrogation ratio<sup>1,2</sup>**



Notes: 1. The latest data are as of the first half of fiscal 2012.  
2. Credit cost ratio = (credit cost on a non-consolidated basis + credit cost on affiliated housing loan guarantee corporations) / (amounts outstanding of housing loans without guarantees + amount outstanding of guaranteed loans on affiliated housing loan guarantee corporations).  
Sources: Zenkoku Hoshō; BOJ.

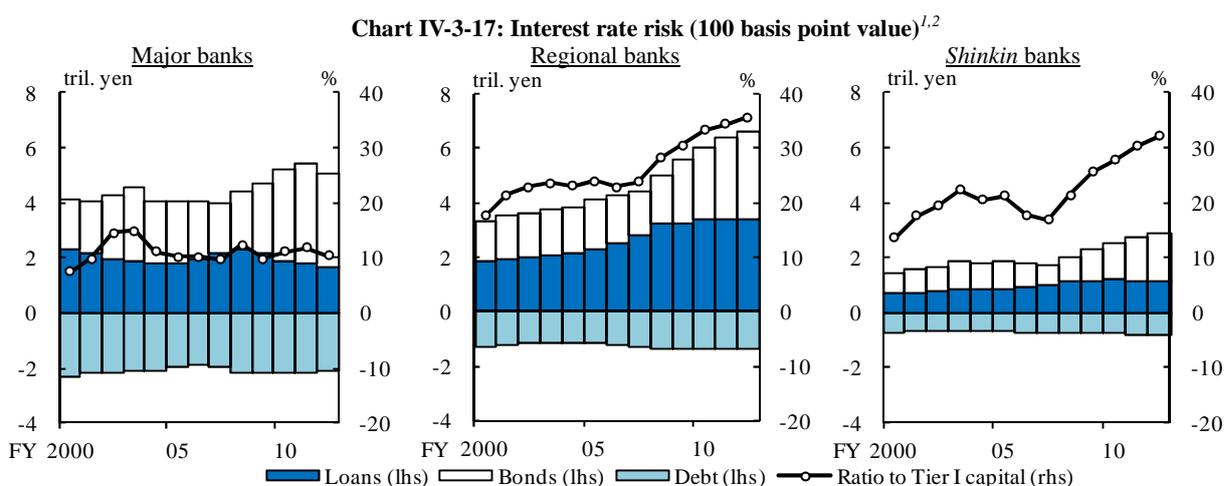
Despite the easing of lending standards, credit costs induced by housing loans remain at low levels. Banks' credit cost ratio continued to decline during the first half of fiscal 2012, and housing guarantee corporations' subrogation ratio (the amount of subrogation relative to outstanding guaranteed loans) has been around 0.2 percent (Chart IV-3-16). Nevertheless, attention should be paid to the possibility that if the easing of lending standards continues amid the reduction of housing loan rates, the credit costs will

eventually increase, further undermining the profitability of housing loans.

### 3. Market risk

#### *Developments in interest rate risk*

The amount of interest rate risk borne by banks and *shinkin* banks has generally been increasing. Although the ratio to Tier I capital of the 100 basis point value of interest rate risk -- calculated under the assumption that interest rates would rise by 1 percentage point -- has been more or less unchanged at major banks, it has continued to increase at regional and *shinkin* banks (Chart IV-3-17).<sup>26</sup> In addition, a large dispersion in the ratio is observed among financial institutions, and the ratio exceeded 50 percent at some regional and *shinkin* banks (Chart IV-3-18). The increase in the amount of interest rate risk borne by regional and *shinkin* banks has been induced by increases in both the amount of bond investment and the maturity mismatch (the difference between the average remaining maturities of assets and liabilities) (Charts IV-3-19 and IV-3-20).<sup>27</sup>

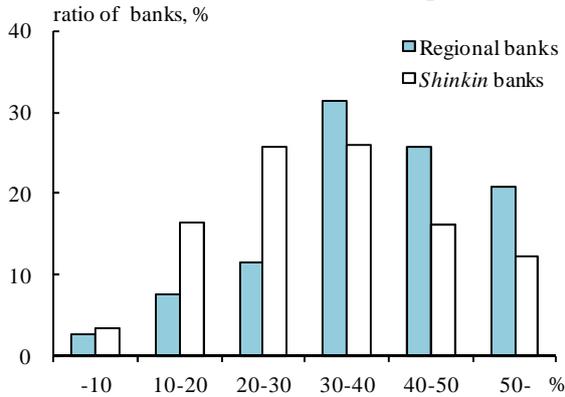


Notes: 1. 100 basis point value in the banking book. Off-balance-sheet transactions are not included.  
 2. The latest data for interest rate risk are as of end-December 2012. Those for Tier I capital of major banks and regional banks are as of end-September 2012, and those of *shinkin* banks are as of end-March 2012.  
 Source: BOJ.

<sup>26</sup> The 100 basis point value is calculated only for interest rate risk associated with holding yen-denominated assets (loans and bonds) and liabilities, and it does not reflect risk associated with holding foreign currency-denominated assets and liabilities. In addition, in measuring the 100 basis point value of interest rate risk associated with liabilities, outflows of demand deposits are assumed to take place within 3 months from the rise in interest rates.

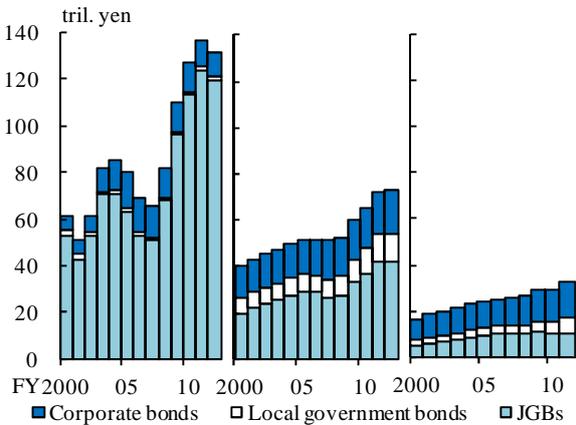
<sup>27</sup> In Chart IV-3-20, the mismatch is the difference between the average remaining maturity of assets and that of liabilities. The average remaining maturity of assets is the weighted average of loans and bonds.

**Chart IV-3-18: Distribution of ratio of interest rate risk to Tier I capital<sup>1,2</sup>**



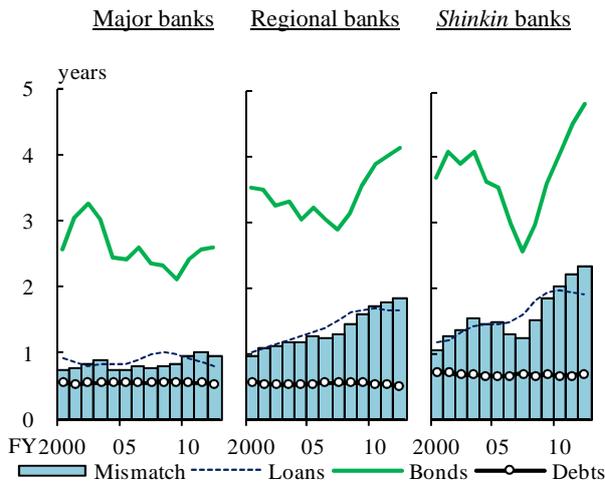
Notes: 1. The horizontal axis indicates the ratio of interest rate risk to Tier I capital. The vertical axis indicates the share of regional banks and *shinkin* banks.  
2. The data for interest rate risk are as of end-December 2012. Those for Tier I capital of regional banks are as of end-September 2012, and those of *shinkin* banks are as of end-March 2012.  
Source: BOJ.

**Chart IV-3-19: Domestic bondholdings<sup>1</sup>**



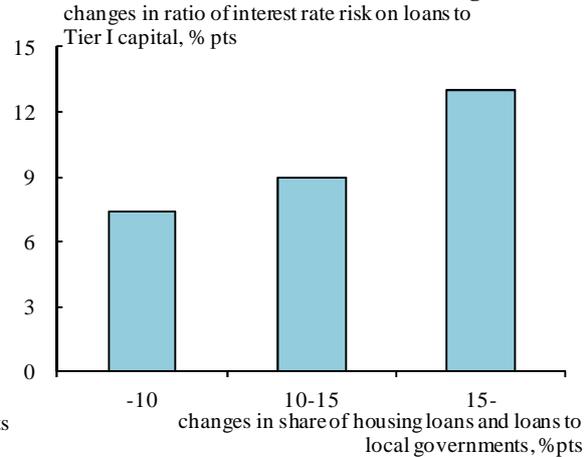
Note: 1. The latest data for major banks and regional banks are as of end-September 2012. Those for *shinkin* banks are as of end-March 2012.  
Source: BOJ.

**Chart IV-3-20: Average maturity and maturity mismatch<sup>1</sup>**



Note: 1. The latest data are as of end-December 2012.  
Source: BOJ.

**Chart IV-3-21: Interest rate risk on loans and amounts outstanding of housing loans and loans to local governments<sup>1</sup>**



Note: 1. Regional banks are counted. Figures are changes from end-March 2001 to end-September 2012. The vertical axis shows the average of changes across the banks.  
Source: BOJ.

The average remaining maturity of bond investment has been at around 2.5 years at major banks, whereas it has lengthened to around 4 years at regional banks and nearly 5 years at *shinkin* banks. Meanwhile, the average remaining maturity of loan extension has also been longer than in the past due to the increases in housing loans and loans to local governments, whose maturities tend to be long (Chart IV-3-21).

As will be described later, unrealized losses on securities holdings caused by a rise in interest rates will basically not affect the capital adequacy ratios of domestic banks, as

the current treatment of exempting these banks from including unrealized losses on securities holdings in their capital will become permanent.<sup>28</sup> However, domestic banks need to continue to manage interest rate risk appropriately, since the effects on their profits of changes in interest rates will be significant if the maturity mismatch is large.

#### *Developments in market risk associated with stockholdings*

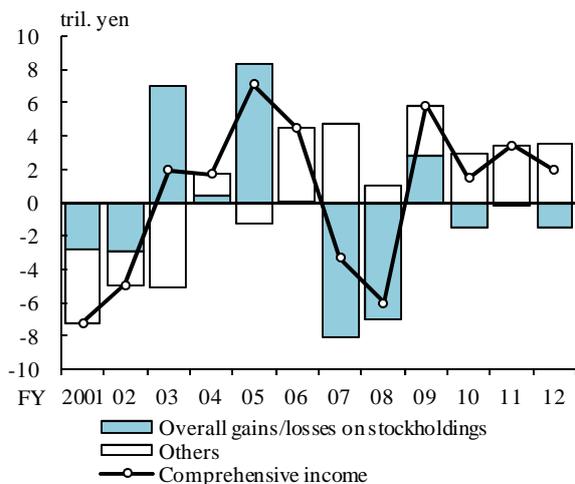
Many banks have regarded a reduction in market risk associated with stockholdings as an important management challenge and have been seeking to reduce such risk. Nonetheless, they recorded losses on stockholdings in the first half of fiscal 2012 due to a decline in stock prices (Chart IV-3-22). In the second half of fiscal 2012, banks' gains/losses from sales/purchases of stocks and unrealized gains/losses on stockholdings most likely improved, as the TOPIX rose and recovered to the level observed in October 2008. The prices of stocks to which major banks have a large exposure have moved mostly in line with the TOPIX, and banks' profits have still tended to be greatly influenced by gains/losses on stockholdings (Chart IV-3-23). The composition of these stocks by industry is biased toward specific industries relative to Japan's industrial structure, suggesting the existence of industry concentration risk in the banks' stock portfolios (Chart IV-3-24). Moreover, banks tend to extend more loans to firms as their holdings of the firms' stocks increase. If the business conditions of these firms deteriorate, banks could incur severe losses from both stockholdings and loans (Chart IV-3-25).<sup>29</sup>

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<sup>28</sup> When the market value of securities decreases substantially and is unlikely to recover, the losses must be included in the statement of profits and losses, and this depresses the capital adequacy ratios. A loss in the market value of 50 percent or more is regarded as a "substantial decrease in the market value," while a loss of 30 to 50 percent is assessed properly after taking into account the circumstances. The rates of increase in interest rates that induce a 50 percent decline in the market value would be 7.7 percentage points for 10-year JGBs (with a coupon rate of 0.9 percent) and 15.0 percentage points for 5-year JGBs (with a coupon rate of 0.2 percent).

<sup>29</sup> For details, see the April 2012 issue of the *Report*, and Kazutoshi Kan, Yoshiyuki Fukuda, Yoshihiko Sugihara, and Shinichi Nishioka, "Correlation Risk between Stockholdings and Loans or Bondholdings at Japan's Banks," *Bank of Japan Review*, No. 2012-E-5, June 2012.

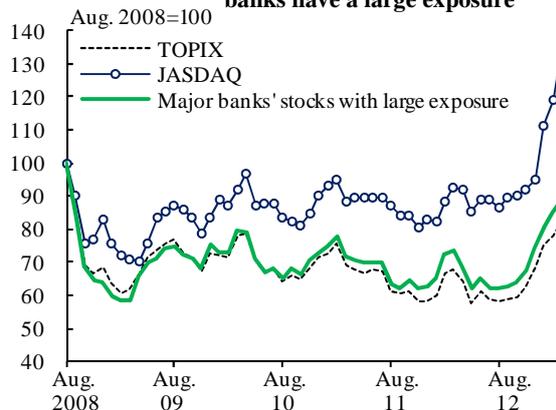
**Chart IV-3-22: Banks' comprehensive income<sup>1,2</sup>**



Notes: 1. Major banks and regional banks are counted. The latest data are as of end-September 2012.  
 2. Overall gains/losses on stockholdings are the sum of realized gains/losses multiplied by 0.6 and changes in unrealized gains/losses on stockholdings.

Source: BOJ.

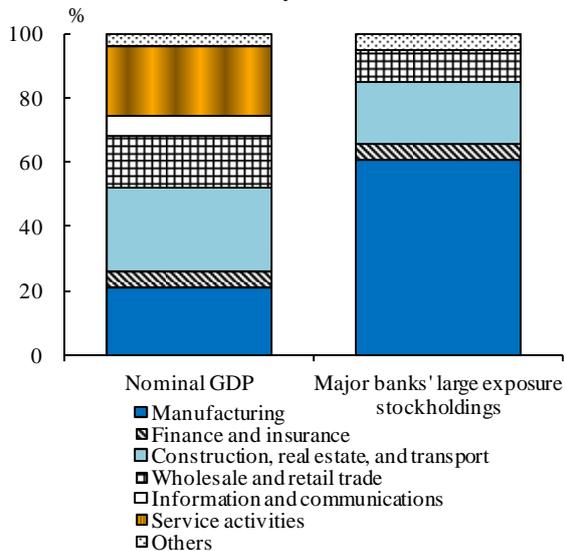
**Chart IV-3-23: Prices of stocks to which major banks have a large exposure<sup>1</sup>**



Note: 1. Stocks with a large exposure are stocks for strategic stockholdings. The Bank of Tokyo-Mitsubishi UFJ, Sumitomo Mitsui Banking Corporation, and Mizuho Corporate Bank are counted. The latest data are as of end-March 2013.

Sources: Bloomberg; Published accounts of each bank.

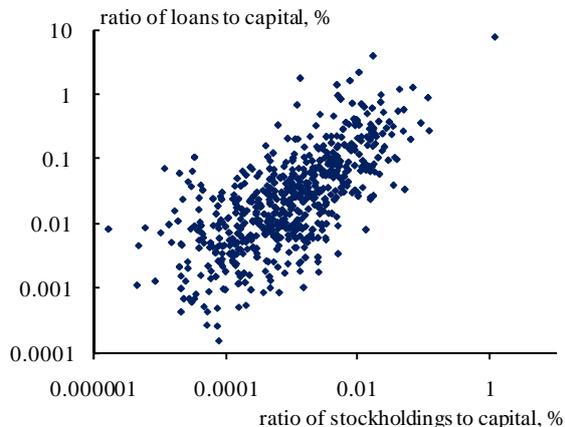
**Chart IV-3-24: Breakdown of major banks' large exposure stockholdings by industry<sup>1,2,3</sup>**



Notes: 1. Nominal GDP is that of industries. The data are as of 2011.  
 2. Large exposure stockholdings are strategic stockholdings. The data are as of end-March 2012.  
 3. The Bank of Tokyo-Mitsubishi UFJ, Sumitomo Mitsui Banking Corporation, and Mizuho Corporate Bank are counted for major banks' large exposure stockholdings.

Sources: Cabinet Office, "National accounts"; "Published accounts of each bank.

**Chart IV-3-25: Amounts outstanding of stockholdings and loans<sup>1,2</sup>**



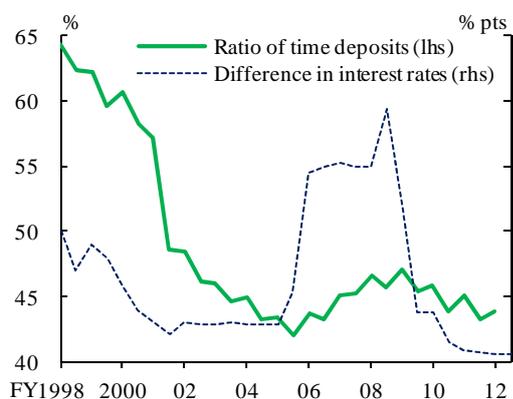
Notes: 1. The data are as of fiscal 2011. Major banks are counted.  
 2. Loans outstanding are those of major banks. The amount outstanding of stockholdings is the amount of stocks held by major banks that were issued by firms to which they have extended loans.

Sources: Teikoku Databank, "SPECIA"; BOJ.

#### 4. Funding liquidity risk

The inflow of deposits into banks and *shinkin* banks has been steady, and funding conditions for the yen have been stable. In addition, banks' funding conditions in terms of, for example, the issuance of bonds and CP have remained favorable. However, the share of time deposits in total deposits has decreased somewhat, as interest rates on these deposits have declined close to 0 percent (Chart IV-3-26).

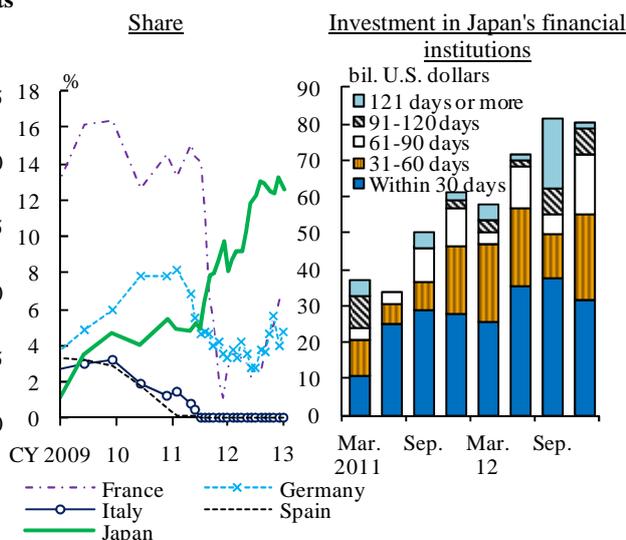
**Chart IV-3-26: Ratio of time deposits and difference between interest rates on time deposits and ordinary deposits<sup>1,2,3</sup>**



Notes: 1. For the ratio of time deposits, major banks and regional banks are counted. The latest data are as of end-September 2012. For the difference in interest rates, banks, *shinkin* banks, and Shoko Chukin Bank are counted. The latest data are as of end-March 2013.  
2. The ratio of time deposits is the ratio of time deposits to total deposits.  
3. Interest rates for time deposits are those for deposits that are less than 3 million yen and whose maturity is 1 year.

Source: BOJ.

**Chart IV-3-27: U.S. MMFs' investment<sup>1,2</sup>**



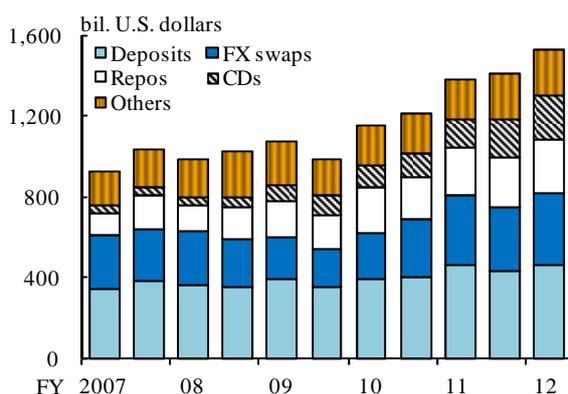
Notes: 1. The latest data in the left chart are as of January 2013.  
2. The right chart shows the amount outstanding of major U.S. MMFs' investment in Japan's financial institutions.  
Sources: Fitch ratings; published accounts of major U.S. MMFs.

Major banks have been gaining greater creditworthiness in global markets, and this has facilitated their foreign currency funding. For example, U.S. money market funds (MMFs) -- the major providers of U.S. dollars -- have been increasing dollar investment in Japan's banks, and dollar funding costs in the foreign exchange swap market have remained low (Chart IV-3-27). Nonetheless, banks' maturity mismatch of foreign currency-denominated assets and liabilities has remained large, as their investment in foreign bonds with longer maturities has been increasing while the degree of their dependence on short-term market funding such as repos and certificates of deposit (CDs) has been high (Charts IV-3-28 and IV-3-29).<sup>30</sup> Major banks need to continue to

<sup>30</sup> The average remaining maturity in Chart IV-3-29 is calculated based on the data for the three major financial groups (Mitsubishi UFJ Financial Group, Sumitomo Mitsui Financial Group, and Mizuho Financial Group).

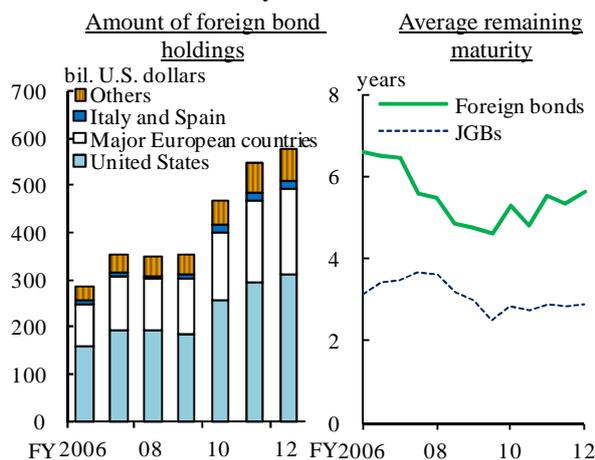
enhance the stability of foreign currency funding by lengthening the maturities of market funding or expanding their funding from customers' deposits, given that their management policy calls for continuing to increase foreign currency-denominated assets to secure profits.

**Chart IV-3-28: Amount outstanding of foreign currency funding<sup>1</sup>**



Note: 1. Major banks and regional banks are counted. The latest data are as of end-September 2012.  
Source: BOJ.

**Chart IV-3-29: Amount outstanding of foreign bond holdings and average remaining maturity<sup>1,2,3,4</sup>**



Notes: 1. In the left chart, major banks and regional banks are counted. In the right chart, banks in the three major financial groups are counted on a non-consolidated basis.  
2. The latest data are as of the end of first half of fiscal 2012.  
3. The amount outstanding is converted to U.S. dollars using the exchange rate at the end of each period.  
4. The amount of bond holdings and its regional breakdowns are estimated using the banking sector's debt securities investment to OECD countries in "Regional portfolio investment and financial derivatives position (assets)." Major European countries consist of Germany, the United Kingdom, France, the Netherlands, Belgium, Switzerland, Luxembourg, and Sweden.  
Sources: Published accounts of each group; BOJ.

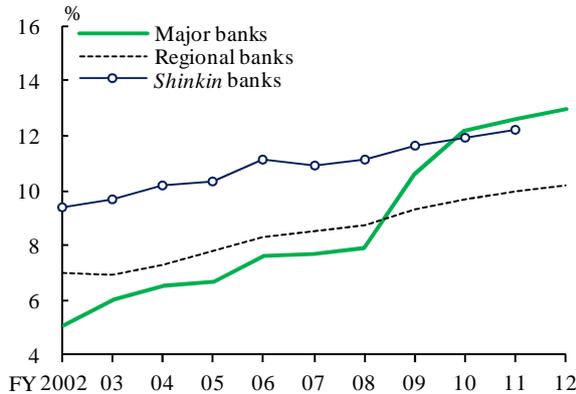
## 5. Banks' capital and profitability

### Developments in banks' capital adequacy ratios

The Tier I capital ratios of banks and *shinkin* banks (under the Basel II requirements) have increased, reflecting accumulation of retained earnings (Chart IV-3-30). In addition, the ratio of Tier I capital to total assets of banks and *shinkin* banks, which indicates their leverage, is increasing moderately with the increase in Tier I capital (Chart IV-3-31).<sup>31</sup>

<sup>31</sup> Under the Basel III requirements, the leverage ratio is planned to be introduced to supplement the

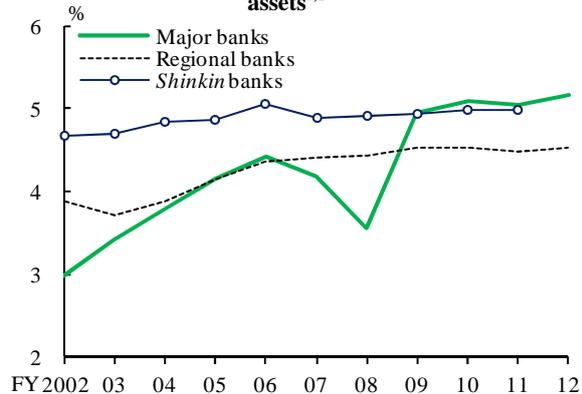
**Chart IV-3-30: Tier I capital ratio<sup>1,2</sup>**



Notes: 1. Based on the Basel II requirements. The Tier I capital ratios of major banks and regional banks are on a consolidated basis.  
2. The latest data for major banks and regional banks are as of the first half of fiscal 2012. Those for *shinkin* banks are as of fiscal 2011.

Source: BOJ.

**Chart IV-3-31: Ratio of Tier I capital to total assets<sup>1,2</sup>**



Notes: 1. The ratio of Tier I capital to total assets is on a non-consolidated basis.  
2. The latest data for major banks and regional banks are as of the first half of fiscal 2012. Those for *shinkin* banks are as of fiscal 2011.

Source: BOJ.

Internationally active banks became subject to the new Basel requirements (Basel III requirements) from the end of March 2013. Under the Basel III requirements, internationally active banks are required to maintain a certain level of capital with high capacity to absorb losses.<sup>32</sup> For instance, a minimum level of common equity Tier I capital, which is the highest-quality capital, was introduced. According to the data disclosed by individual banks and other information, as of the end of September 2012 all the internationally active banks satisfied the minimum level (as of the end of March 2013) of the common equity Tier I capital ratio of 3.5 percent under the Basel III requirements. It should be noted, however, that the minimum level is scheduled to be raised gradually and that tighter criteria for inclusion of various capital instruments will be introduced. Moreover, the Basel III requirements will oblige internationally active banks to hold additional capital such as a capital conservation buffer starting from 2016.

For domestic banks, new requirements to be applied from the end of March 2014 were made public in March 2013. Under the new requirements, the minimum capital adequacy ratio is kept unchanged at 4 percent, whereas the regulatory capital is redefined as "core capital," which consists mainly of common equities and retained earnings. Subordinated loans and some other capital instruments are not included in core capital. Domestic banks are thus required to improve the quality of their capital,

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capital adequacy ratio that sets capital requirements on risk by type of asset and transaction. For details, see the October 2012 issue of the *Report*.

<sup>32</sup> For the outline of the Basel III requirements and their implication for the capital of internationally active banks, see the October 2012 issue of the *Report*.

but some measures are being taken to promote the smooth functioning of financial intermediation.<sup>33</sup> In addition, there will be a transition period of 10 years in principle.

To prepare for the Basel III requirements, financial institutions need to continue to strengthen their capital bases in a planned manner by, for example, accumulating retained earnings, in order to improve the quality of their capital and raise their capital adequacy ratios.

### *Developments in banks' profitability*

Major banks have enhanced their profitability by actively expanding overseas business. However, regional financial institutions, whose source of earnings is mostly domestic business, have faced severe business conditions.

Reflecting the decreasing population and the aging of society observed particularly in nonmetropolitan areas, regional financial institutions' loans to local firms have been sluggish due to weak demand for funds at small and medium-sized firms.<sup>34</sup> Against this background, lending competition has intensified among and across different types of financial institutions, as they attempt to tap demand from existing top-rated firms.<sup>35</sup> For example, the number of competitors in the extension of loans has increased for both regional and *shinkin* banks (Chart IV-3-32). In addition, a look at the breakdown of firms' main banks by type of financial institution shows that a large proportion of firms changed their "main banks" from *shinkin* banks to regional banks during the last decade (Chart IV-3-33).

Reflecting weak demand for funds at small and medium-sized firms and active lending attitudes at financial institutions, the profitability of regional and *shinkin* banks has weakened (Chart IV-3-34). Among them, there are some banks whose core profitability is lower than the historical average of credit costs (calculated for the period from fiscal 2006 to fiscal 2011; Chart IV-3-35). At financial institutions with low profitability, the profitability of their lending is low and the ratio of general and administrative expenses

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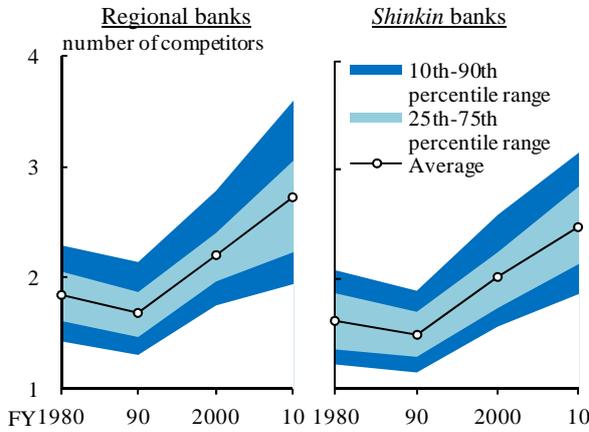
<sup>33</sup> For example, the limit on the amount of general loan-loss provisions included in capital is raised. In addition, the so-called flexible treatment of the capital adequacy requirement, which was introduced as a temporary measure and allows domestic banks to exclude unrealized losses on securities holdings from capital, has become a permanent rule.

<sup>34</sup> For details on the business environment surrounding small and medium-sized firms and financial institutions, see the October 2012 issue of the *Report*.

<sup>35</sup> For details on the competitive environment surrounding financial institutions and their profits, see the October 2011, April 2012, and October 2012 issues of the *Report*.

to interest-earning assets is high (Chart IV-3-36).

**Chart IV-3-32: Number of competing financial institutions<sup>1,2</sup>**



Notes: 1. To obtain the number of competitors of a particular financial institution, the number of financial institutions that a client firm has business transactions is averaged across all client firms.

2. Firms in the upper 25th percentile in terms of credit rating are counted.

Source: Teikoku Databank, "SPECIA."

**Chart IV-3-33: Shift in main banks<sup>1,2</sup>**

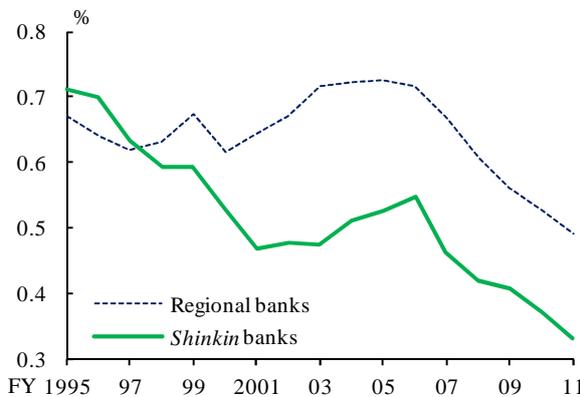
		Main banks as of fiscal 2010			
		Shinkin banks	Regional banks	Major banks	Other financial institutions
Main banks as of fiscal 2000	Shinkin banks	-	10.3	5.6	0.9
	Regional banks	2.7	-	2.9	1.1
	Major banks	3.9	7.2	-	1.1

Notes: 1. The share of firms that changed their main banks as of fiscal 2000 to different main banks in fiscal 2010.

2. SMEs with capital of less than 1 billion yen that are in the upper 25th percentile in terms of credit rating are counted.

Source: Teikoku Databank, "SPECIA."

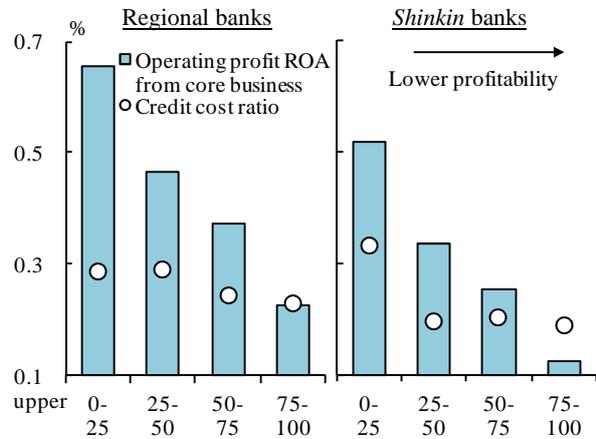
**Chart IV-3-34: Operating profit ROA from core business<sup>1</sup>**



Note: 1. Operating profits ROA from core business = operating profits from core business / total assets.

Source: BOJ.

**Chart IV-3-35: Operating profit ROA from core business and credit cost ratio<sup>1,2</sup>**



operating profit ROA from core business, percentile

Notes: 1. Operating profit ROA from core business is as of fiscal 2011.

2. Credit costs ratio (credit costs / total assets) is the average from fiscal 2006 to fiscal 2011.

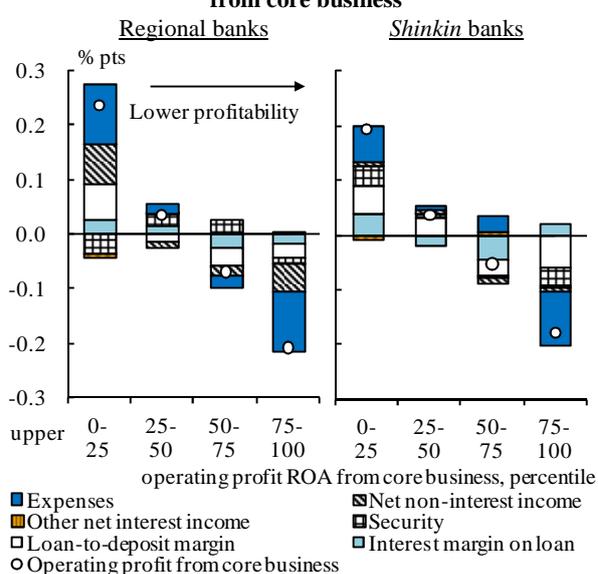
Source: BOJ.

To improve their profitability, financial institutions need to explore potential demand for funds, and/or enhance their services to earn greater commissions by allocating resources to areas other than lending operations.<sup>36</sup> In addition, costs reductions can create a

<sup>36</sup> For details on the efforts made by financial institutions in the areas other than lending business, see Atsushi Ishikawa, Saiki Tsuchiya, and Shinichi Nishioka, "Financial Institutions' Efforts to Support the Business Conditions of Small and Medium-Sized Firms: Intermediation Services Utilizing Corporate Information and Customer Networks," Bank of Japan Review, No. 2013-E-1,

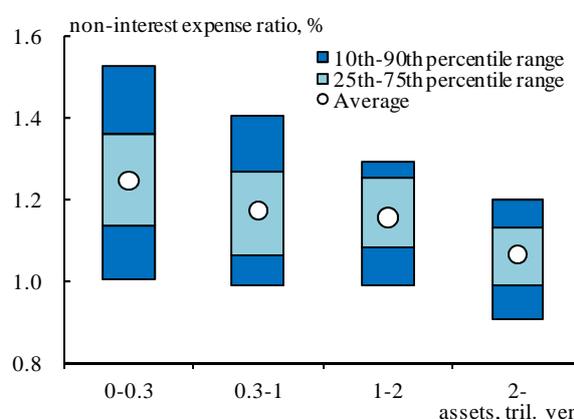
competitive advantage over rival financial institutions and boost profitability. Business integration or mergers are a potential option to improve management efficiency, because the ratio of general and administrative expenses to interest-earning assets tends to decline as the size of financial institution increases (Chart IV-3-37).<sup>37</sup> In fact, some financial institutions have achieved cost reductions through mergers and succeeded in keeping their decline in profitability smaller than the average among financial institutions of the same type (see Box 4 for mergers of financial institutions).

**Chart IV-3-36: Difference from the average for the same type of institution in operating profits from core business<sup>1</sup>**



Note: 1. The data are as of fiscal 2010. The figures are differences from the averages for the same type of institution.  
Source: BOJ.

**Chart IV-3-37: Asset size and non-interest expense ratio<sup>1,2</sup>**



Notes: 1. Regional banks and *shinkin* banks are counted. The data are as of fiscal 2011.  
2. Non-interest expense ratio = general and administrative expenses / interest-earning assets.  
Source: BOJ.

#### Box 4: Changes in the profitability of financial institutions due to mergers

The number of financial institutions in Japan has been decreasing mainly as a result of mergers since the second half of the 1990s. Compared with 1990, the number of major banks has decreased from 23 to 11, regional banks from 132 to 105, and *shinkin* banks from 454 to 270.

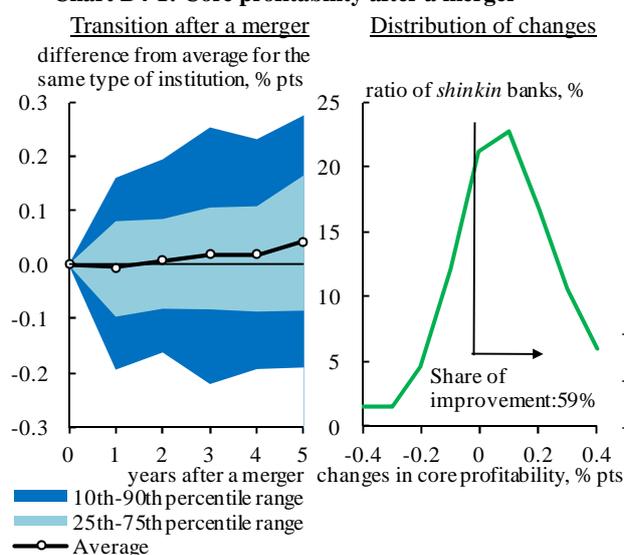
The record of mergers of *shinkin* banks shows that about 60 percent of *shinkin* banks that underwent mergers succeeded in improving their core profitability (the ratio of operating profits from core business to total assets) to the level above the average

January 2013.

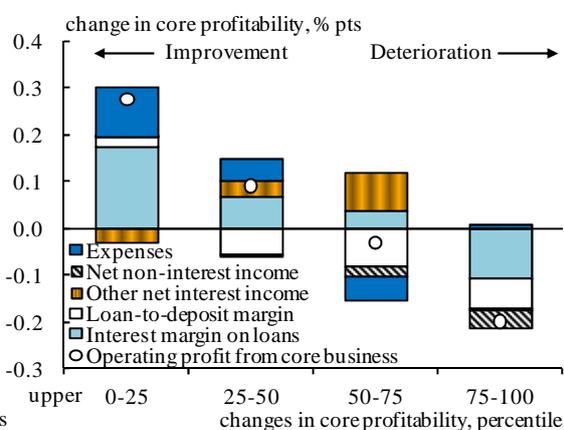
<sup>37</sup> For details on the relationship between the size of financial institutions and their profits, see the September 2008 issue of the *Report*.

profitability of all *shinkin* banks within 5 years after the mergers. This implies that overall the profitability of *shinkin* banks improved to a level above the average in more cases after the mergers than otherwise (Chart B4-1).<sup>38</sup> In many cases, the decline in the ratio of general and administrative expenses to interest-earning assets contributed to the improvement in profitability. The decrease in the ratio grows particularly large when the geographical distance between the merged *shinkin* banks is short (Chart B4-2 and the left-hand side of Chart B4-3). This is probably because proximity facilitates the streamlining of redundant branches and personnel costs.

**Chart B4-1: Core profitability after a merger<sup>1,2,3</sup>**



**Chart B4-2: Factors for changes in core profitability after a merger<sup>1</sup>**



Note: 1. Changes in core profitability from the previous year of the merger to 5 years after the merger are depicted. The figures are the difference from the average for the same type of institution.

Source: BOJ.

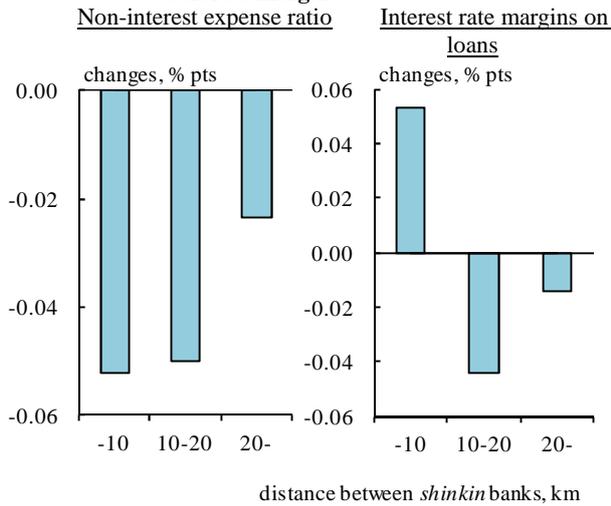
Source: BOJ.

Nonetheless, integrating lending operations of different *shinkin* banks through mergers does not always improve core profitability. In cases where core profitability increased because of mergers to a level above the average profitability of *shinkin* banks, interest rate margins on loans rose, while the amount of deposits and the loans outstanding decreased to the same extent (Chart B4-4). On the other hand, in cases where profitability declined after mergers, both the loan-to-deposit ratios and interest rate margins on loans tended to decrease as the amount of deposits rose significantly faster

<sup>38</sup> The cases of mergers of *shinkin* banks since fiscal 1991, excluding those where business was transferred from failed to robust financial institutions, are considered.

than the pace at which loans increased. In such cases, a further expansion in the scale of business might have been sought even after mergers by setting high interest rates on deposits and low interest rates on loans.

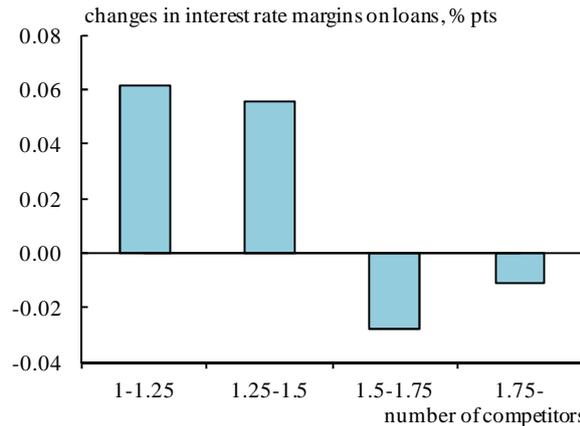
**Chart B4-3: Changes in the non-interest expense ratio and interest rate margins on loans and the distance between *shinkin* banks before a merger<sup>1,2,3</sup>**



Notes: 1. Non-interest expense ratio = general and administrative expenses / interest-earning assets.  
 2. Interest rate margins on loans = loan interest rate - funding rate.  
 3. Changes in the non-interest expense ratio and interest rate margins on loans from the previous year of the merger to 5 years after the merger are depicted. The figures are the difference from the average for the same type of institution.

Sources: National Association of Shinkin Banks; BOJ.

**Chart B4-5: Number of competitors and interest rate margins on loans<sup>1,2</sup>**



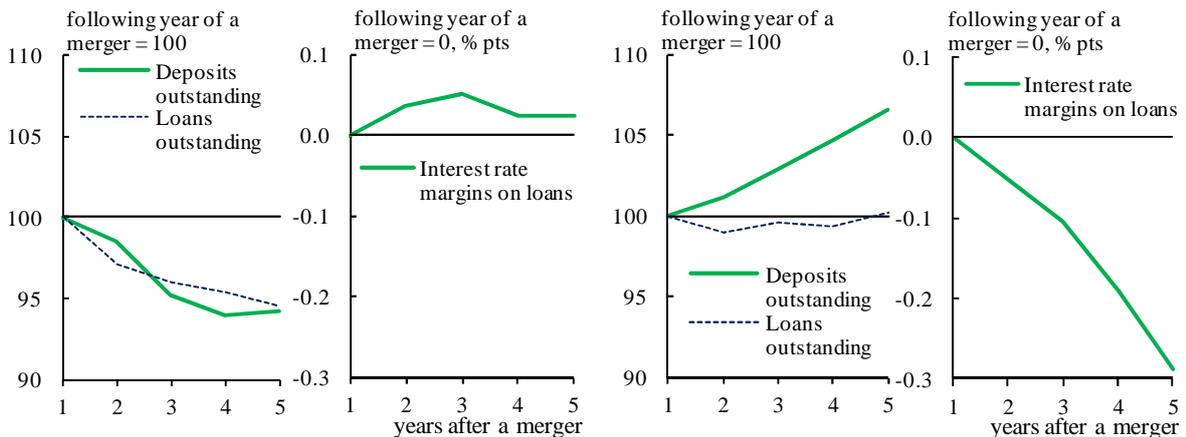
Notes: 1. Changes in interest margins on loans from the previous year of the merger to 5 years after the merger are depicted. The figures are the difference from the average for the same type of institution.  
 2. The data for the number of competitors are as of fiscal 2010.

Sources: Teikoku Databank, "SPECIA"; BOJ.

**Chart B4-4: Outstanding amounts of deposits and loans, and interest rate margins on loans after a merger<sup>1,2,3</sup>**

Upper 25th percentile in the changes of core profitability

Lower 25th percentile in the changes of core profitability



Notes: 1. *Shinkin* banks that underwent mergers in and after fiscal 2000 are counted.  
 2. Interest rate margins on loans = loan interest rate - funding rate.  
 3. Changes in operating profit ROA from core business are those between the previous year of the merger and 5 years after the merger.

Source: BOJ.

Furthermore, if lending competition remains intense after mergers take place, interest rate margins on loans could continue to narrow (Chart B4-5). In the case of mergers among *shinkin* banks that are distant from each other, it appears difficult to improve the interest rate margins on loans, since the geographic distance generates little benefit in terms of reducing the intensity of lending competition (the right-hand side of Chart B4-3). Thus, it should be noted that the effects of mergers on profitability depends on a range of factors such as the competitive environment and management strategies.

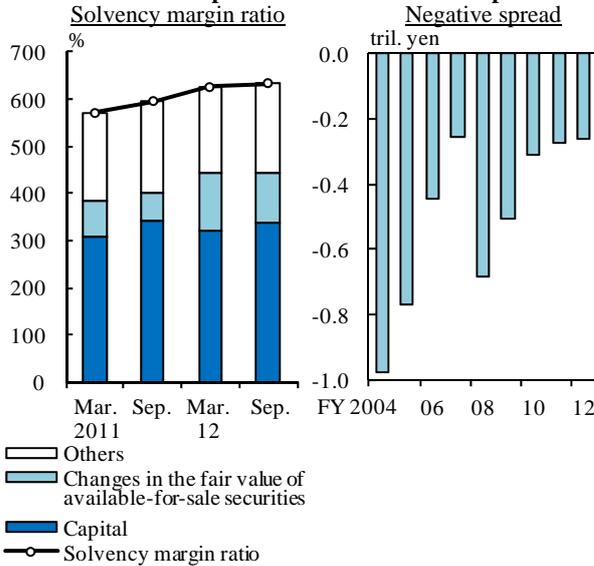
## **D. Risks borne by the financial sector other than banks and *shinkin* banks**

### **1. Insurance companies**

Insurance companies have maintained their solvency margin ratios at levels well above the regulatory standard of 200 percent (the left-hand side of Chart IV-4-1). Nevertheless, during the first half of fiscal 2012, these ratios turned out to be more or less flat due to the decrease in unrealized gains on securities holdings, mainly reflecting the fall in stock prices during the same period. Moreover, the persistent negative spreads -- in which the yield guaranteed to insurance policyholders exceeds the actual investment yield -- continue to exert downward pressure on their profits (the right-hand side of Chart IV-4-1). Meanwhile, insurance companies' investment in super-long-term JGBs has been on the rise (Chart IV-4-2). Thus, the duration mismatch -- the extent to which the duration of liabilities exceeds that of assets -- has been narrowing, although it is estimated that it remains at a notable level (Chart IV-4-3).

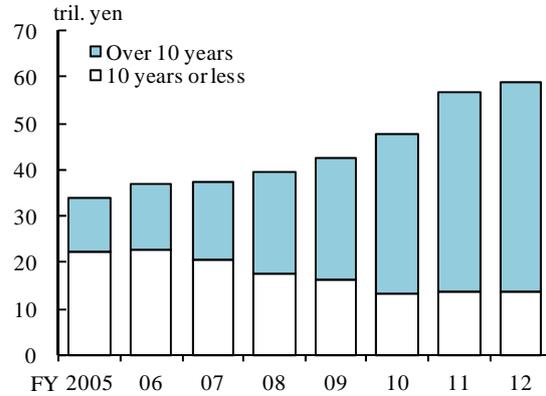
Nonlife insurance companies recorded a deficit in fiscal 2011 mainly reflecting the natural disasters in Japan and the flooding in Thailand, and marked a small surplus in the first half of fiscal 2012 (see Annex 3). Deterioration in realized gains/losses on stockholdings, reflecting the decline in stock prices during the first half of fiscal 2012, has depressed these companies' profits and lowered solvency margin ratios (the left-hand side of Chart IV-4-4). Nonlife insurance companies have been reducing their ratio of stockholdings to total securities holdings, but continue to face the management challenge of reducing their amount of stockholdings (the right-hand side of Chart IV-4-4).

**Chart IV-4-1: Solvency margin ratio and negative spread of life insurance companies<sup>1</sup>**



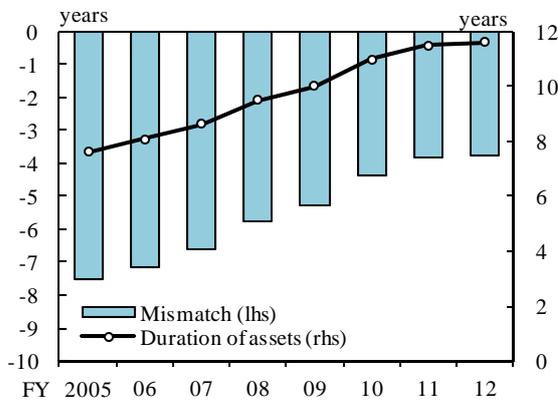
Note: 1. The nine major life insurance companies are counted. The latest data for the right chart are as of the first half of fiscal 2012 (annualized).  
Sources: Bloomberg; published accounts of each life insurance company.

**Chart IV-4-2: JGB holdings of life insurance companies<sup>1</sup>**



Note: 1. The nine major life insurance companies are counted. The latest data are as of end-September 2012.  
Sources: Published accounts of each life insurance company.

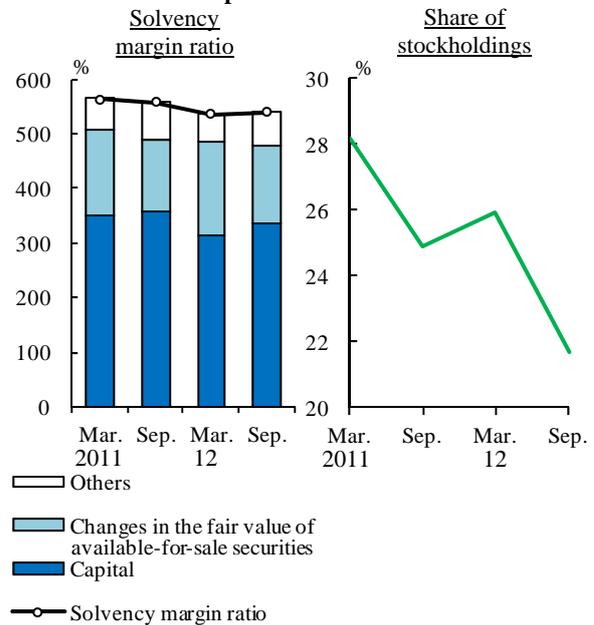
**Chart IV-4-3: Duration mismatch at life insurance companies<sup>1</sup>**



Note: 1. The nine major life insurance companies are counted. The latest data are as of end-September 2012.

Sources: Japan Institute of Life Insurance, "Life insurance survey"; Ministry of Internal Affairs and Communications, "Population census"; National Institute of Population and Social Security Research, "Population projections for Japan"; Published accounts of each life insurance company; BOJ.

**Chart IV-4-4: Solvency margin ratio and ratio of stockholdings of nonlife insurance companies<sup>1,2</sup>**



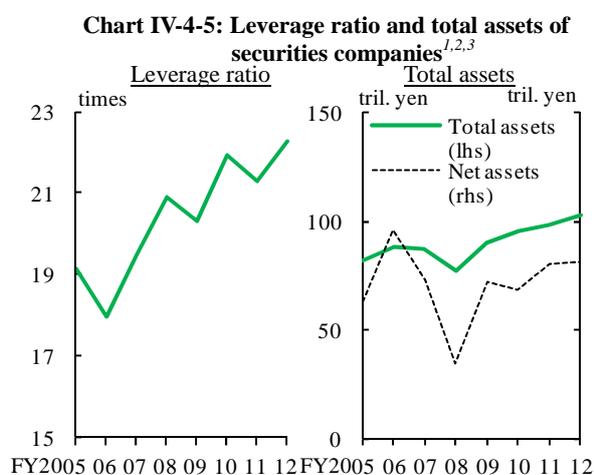
Notes: 1. In the left chart, the six major nonlife insurance companies are counted. In the right chart, the three major nonlife insurance company groups are counted.  
2. The share of stockholdings is the ratio of stockholdings to available-for-sale securities.

Sources: Published accounts of each nonlife insurance company.

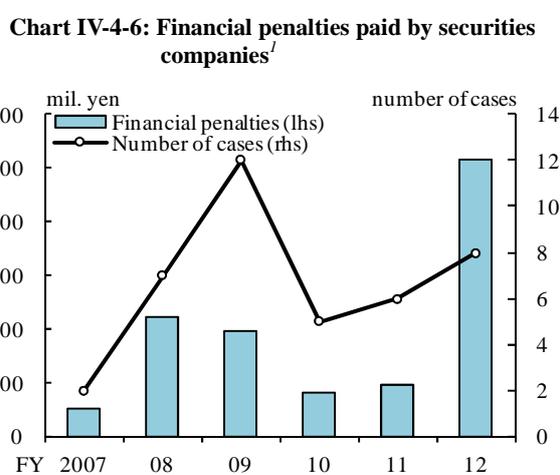
## 2. Securities companies

Major securities companies returned to net profits in the first half of fiscal 2012 as a result of increased profits from trading of bonds and other financial instruments, but their profitability remains weak (see Annex 3).<sup>39</sup> Moreover, the accumulation of retained earnings has been slow relative to growth in total assets, and thus their leverage ratios have increased gradually (Chart IV-4-5).

As for the environment for securities companies, uncertainty remains high over the European debt problem and other developments that may affect investors' risk-taking, although some improvement has recently been observed such as the recovery in stock prices and the trading volume of stocks. Securities companies need to continue to improve the profitability of their business by restructuring unprofitable divisions, for example, and conduct strict management of market risk, counterparty risk, and liquidity risk. In 2012, many cases were observed where administrative or financial penalties were imposed on securities companies for reasons such as breach of laws and regulations. This further heightened the awareness of the importance of ensuring the transparency and credibility of securities markets (Chart IV-4-6).



Notes: 1. The four major securities company groups are counted.  
 2. The leverage ratio is the ratio of total assets to net assets.  
 3. The latest data are as of the first half of fiscal 2012.  
 Sources: Published accounts of each securities company.



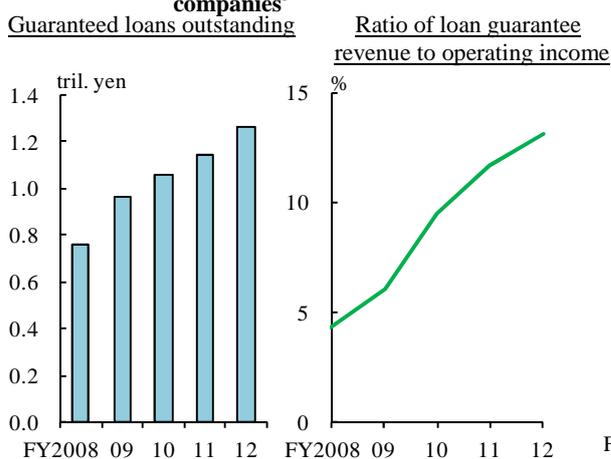
Note: 1. The latest data are as of end-March 2013.  
 Source: Japan Securities Dealers Association.

<sup>39</sup> Major securities companies include Nomura Holdings, the Daiwa Securities Group, Mitsubishi UFJ Securities Holdings, and Mizuho Securities.

### 3. Consumer finance companies

Consumer finance companies have faced severe business conditions since the amendment of the Money Lending Business Act in 2006, but major consumer finance companies returned to net profits in the first half of fiscal 2012 (see Annex 3). This was mainly because the amount of provisions for borrowers' claims for refunds on overpaid interest decreased after such claims declined. Recently, consumer finance companies have been expanding the provision of credit guarantees on banks' consumer loans, and this has underpinned profits of these companies (Chart IV-4-7). With the number of small-scale money lenders shrinking rapidly, major consumer finance companies have increased their share in the loan market. Attention should continue to be paid to whether these companies can establish a stable profit base, as major finance companies are consolidated subsidiaries or large-lot borrowers of major banks (Chart IV-4-8).

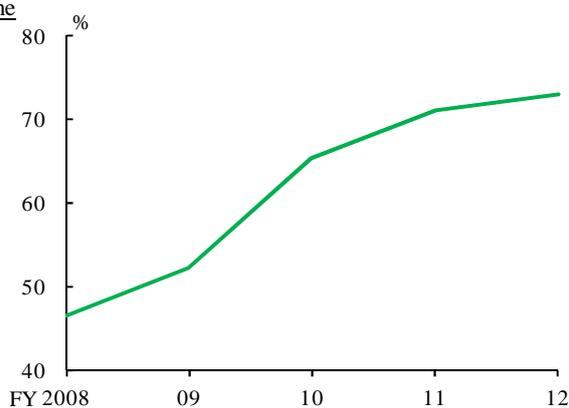
**Chart IV-4-7: Guaranteed loans outstanding and the ratio of loan guarantee revenue to operating income of consumer finance companies<sup>1</sup>**



Note: 1. The three major companies are counted. The latest data in the left chart are as of end-September 2012. The latest data in the right chart are as of the first half of fiscal 2012.

Sources: Published accounts of each consumer finance company.

**Chart IV-4-8: Share of three major consumer finance companies in loans outstanding<sup>1</sup>**



Note: 1. The three major consumer finance companies are counted. The share is calculated by dividing unsecured loans outstanding of the three major companies by those of all consumer finance companies. The latest data are as of end-September 2012.

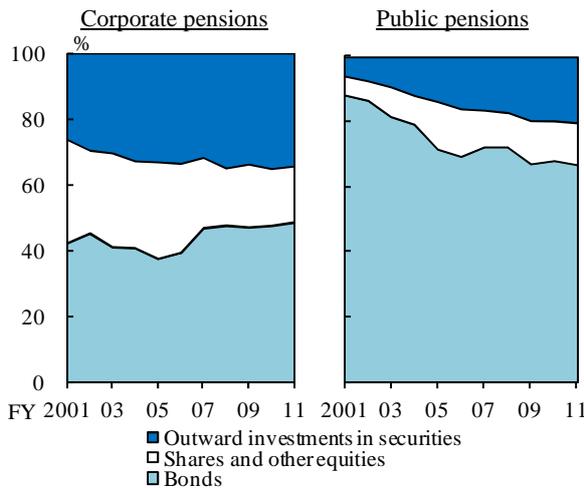
Sources: Japan Financial Services Association; Published accounts of each consumer finance company.

### 4. Pension funds

The share of JGB investment remains high in the portfolios of public pension funds, but that of foreign securities investment has been rising gradually (Chart IV-4-9). Corporate pension funds have worked to improve investment yields by increasing the share of investment in foreign securities, but the yields remain sluggish (Chart IV-4-10).

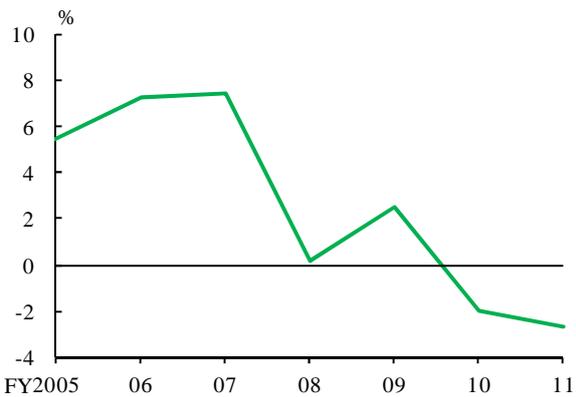
Reflecting this, pension liabilities (future payments of lump-sum retirement benefits and pensions) have continued to surpass pension assets at corporate pension funds. Since pension funds are large-lot investors, changes in their investment stance can affect financial markets. In addition, deterioration in investment performance of corporate pension funds can undermine the financial conditions of umbrella firms (see Box 5 for the impact of pension liabilities on umbrella firms).

**Chart IV-4-9: Portfolio of corporate pensions and public pensions**



Source: BOJ, "Flow of funds accounts."

**Chart IV-4-10: Yields on investment at corporate pensions<sup>1</sup>**



Note: 1. Figures indicate the average of total returns of the Welfare Pension Fund and that of Pension Fund Association, weighted by their asset size. The figure is the average of the recent 5 years.

Sources: Pension Fund Association, "Basic data on new corporate pensions"; BOJ.

### Box 5: Impact of pension liabilities on umbrella firms

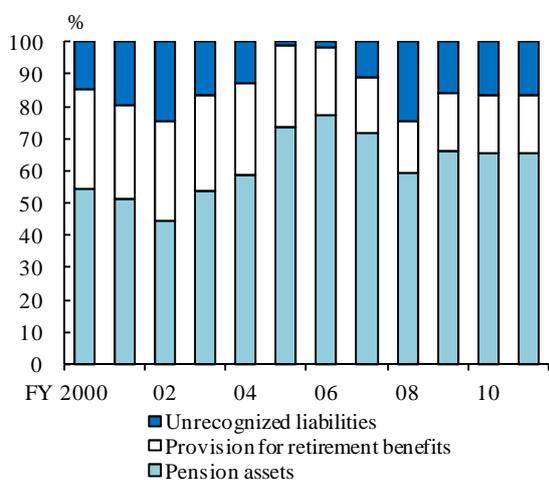
The amount of excess pension liabilities at about 3,000 listed firms (the difference between pension liabilities and pension assets) gradually diminished from fiscal 2000, when pension accounting was adopted, but increased again after the Lehman shock due to the decline in investment yields (Chart B5-1). A portion of the excess pension liabilities is recorded in the liabilities of umbrella firms as provision for retirement benefits. At some firms, the provision for retirement benefits has exceeded 20 percent of their capital, putting a heavy debt burden on them (Chart B5-2).<sup>40</sup> Moreover, an

<sup>40</sup> In the accounting for pensions, retirement benefit obligations are calculated as the amount of the future payment for employees' pension and retirement benefits. A pension becomes unfunded when the provision for retirement benefits is less than the amount of excess pension liabilities. According to the current accounting standards, firms are allowed to take several years in eliminating the unfunded portion by accumulating provision, and the remaining unfunded portion is recorded not on the balance sheets but in the notes to the balance sheets as unrecognized liabilities. However, firms will be required to record these unrecognized liabilities on the liability side of their consolidated balance sheets starting from the accounting period ending in March 2014.

unexpected decline in the investment yield generated unrecognized liabilities (pension liabilities in excess of the sum of pension assets and provision for retirement benefits). They amounted to about 15 percent of pension liabilities in fiscal 2011.

Starting from the accounting period ending in March 2014, firms will be required to record these unrecognized liabilities on the liability side of their balance sheets. This accounting change is expected to have a limited impact on listed firms as a whole, increasing their liabilities only by about 1 percent of their capital. Nevertheless, the impact on some firms may be large.

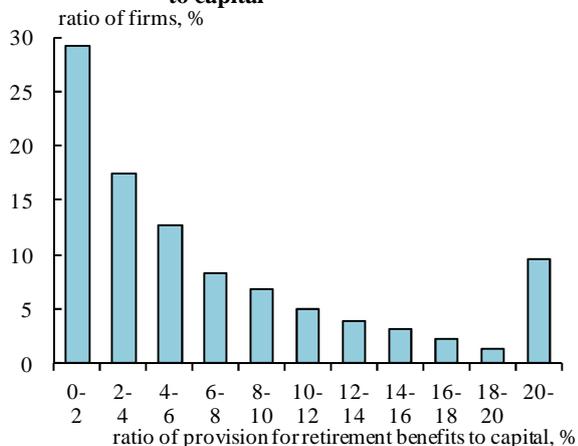
**Chart B5-1: Reserve ratio for pension liabilities<sup>1</sup>**



Note: 1. Figures indicate the ratio to retirement benefit obligations. About 3,000 listed firms are counted. Prepaid pension costs are subtracted from the provision for retirement benefits.

Sources: Pension Fund Association, "Basic data on new corporate pensions"; BOJ.

**Chart B5-2: Ratio of provision for retirement benefits to capital<sup>1,2</sup>**



Notes: 1. About 1,500 firms listed on the First Section of the Tokyo Stock Exchange are counted. The data are as of the end of fiscal 2011.

2. Capital is net assets.

Sources: Bloomberg; BOJ.

## V. Resilience of the financial system

This chapter conducts macro stress testing under scenarios where negative shocks hit the economy and financial markets.<sup>41</sup> In this way, the resilience of the financial system and the possible future consequences on financial intermediation are assessed.

It should be noted that the macro stress testing conducted in this chapter does not show the most likely scenario for Japan's economy and asset prices. Rather, it seeks to clarify the characteristics of risks banks face and assess the resilience of the financial system. The results of stress testing in this chapter should be interpreted with some latitude, since they are calculated based on certain assumptions and omit some elements.

### A. Resilience against shocks in the economy and financial markets

#### 1. Assumptions for macro stress testing

As assumptions for macro stress testing, a baseline scenario -- the starting point of analysis -- and two stress scenarios are set. One stress scenario assumes that severe stresses equivalent to the Lehman shock in 2008 occur in overseas economies and financial markets (an economic downturn scenario), and the other stress scenario assumes that market interest rates in Japan rise (an upward shift scenario of interest rates). The testing takes into account the adverse feedback loop between the financial system and the real economy using the Financial Macro-econometric Model (FMM).<sup>42</sup> These scenarios set the end of fiscal 2012 as the base point and estimate changes basically over the next 3 years.<sup>43</sup>

The subjects of macro stress testing are banks, and their capital adequacy ratios are calculated based on the Basel II requirements. However, under the new requirements on capital adequacy ratios to be applied to domestic banks from the end of March 2014, the flexible treatment of the capital adequacy requirements regarding the method of

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<sup>41</sup> In general, macro stress testing is conducted under "exceptional but plausible" scenarios in order to assess the resilience of the financial system.

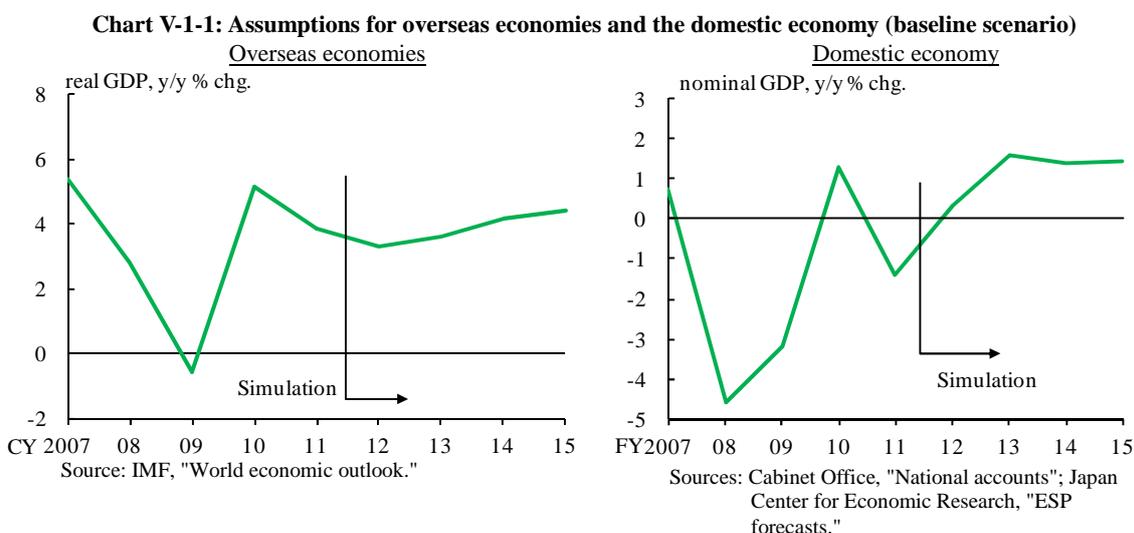
<sup>42</sup> See Annex 4 for the framework of macro stress testing. For details on the FMM, see Atsushi Ishikawa, Koichiro Kamada, Yoshiyuki Kurachi, Kentaro Nasu, and Yuki Teranishi, "Introduction to the Financial Macro-econometric Model," Bank of Japan Working Paper, No. 2012-E-1, January 2012, and Hiroshi Kawata, Yoshiyuki Kurachi, Koji Nakamura, and Yuki Teranishi, "Impact of Macroprudential Policy Measures on Economic Dynamics," Bank of Japan Working Paper, No. 2013-E-3, February 2013.

<sup>43</sup> Banks' financial results are available until the end of September 2012. In this analysis, banks' financial results are estimated until the end of March 2013 (i.e., the end of fiscal 2012) using the FMM. The macro stress testing is conducted starting from the end of March 2013.

calculation of capital -- which has been in effect to date as an exceptional measure -- has become permanent. Accordingly, unrealized gains/losses on holdings of "other securities" are not included in capital in the estimations in this chapter on capital adequacy ratios of domestic banks.

## 2. Baseline scenario

The baseline scenario assumes that the overseas real GDP growth rate would recover moderately from 3.0-3.5 percent in 2012 to about 4.5 percent through 2015 (the left-hand side of Chart V-1-1).<sup>44</sup> It assumes that stock prices (TOPIX) and 10-year JGB yields would remain unchanged from the level observed in the July-September quarter of 2012.<sup>45</sup> The domestic nominal GDP growth rate is also assumed to rise from around 0.5 percent in fiscal 2012 to 1.6 percent in fiscal 2013 and hover at around 1.5 percent through fiscal 2015 (the right-hand side of Chart V-1-1).<sup>46</sup> Meanwhile, loan interest rates would remain more or less unchanged in and after fiscal 2013, and real estate prices would be on a moderate downtrend (minus 0.4 percent per annum).<sup>47</sup>



Under these assumptions, the credit cost ratios would be around 0.3-0.5 percent from fiscal 2013 to fiscal 2015 for both internationally active banks and domestic banks,

<sup>44</sup> This assumption is based on the long-term forecasts made by the International Monetary Fund (IMF) as of October 2012.

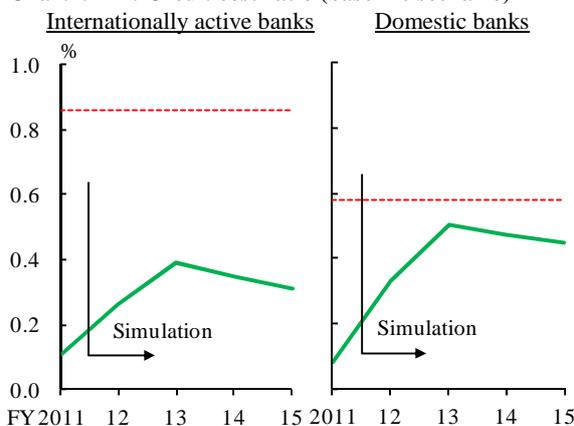
<sup>45</sup> Specifically, it is assumed that the TOPIX is 746 points and 10-year JGB yields are at 0.79 percent.

<sup>46</sup> This assumption is based on private-sector forecasts made as of February 2013.

<sup>47</sup> A fall in real estate prices induces an increase in credit costs through a decline in the collateral value of bank loans.

remaining within the range of profits (Chart V-1-2). As a result, Tier I capital ratios would remain more or less unchanged in and after fiscal 2013 (Chart V-1-3).

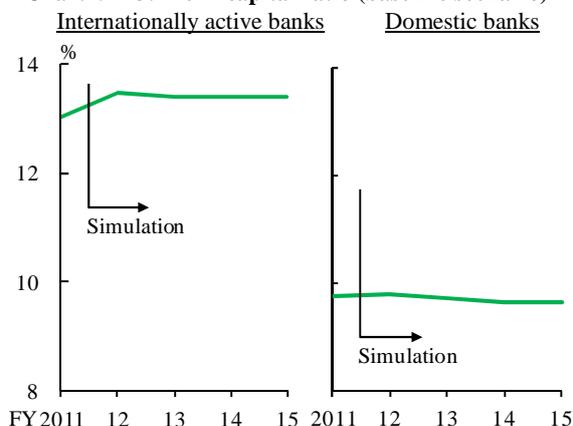
**Chart V-1-2: Credit cost ratio (baseline scenario)<sup>1</sup>**



Note: 1. Major banks and regional banks are counted. The horizontal lines indicate the break-even points in the first half of fiscal 2012.

Source: BOJ.

**Chart V-1-3: Tier I capital ratio (baseline scenario)<sup>1</sup>**



Note: 1. Major banks and regional banks are counted.

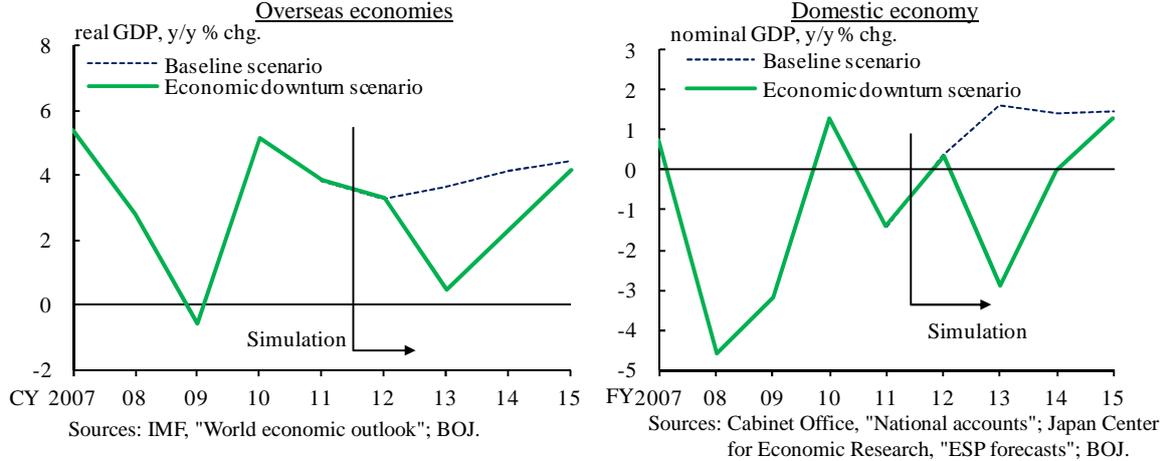
Source: BOJ.

### 3. Economic downturn scenario

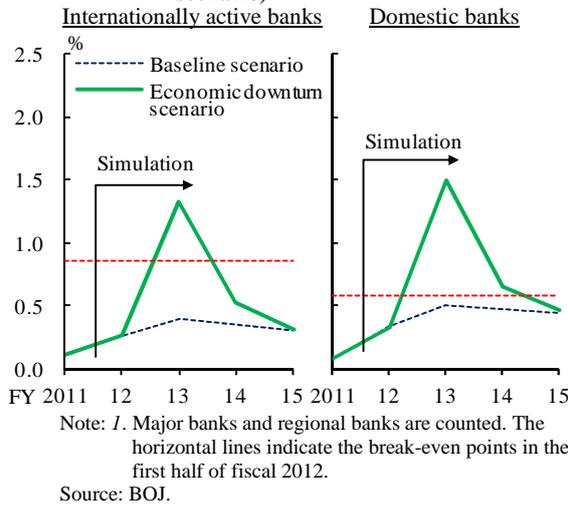
The economic downturn scenario assumes that the stress equivalent to the Lehman shock would arise in overseas economies and global financial markets. It assumes that the overseas economic growth rate would plunge from 3.0-3.5 percent in 2012 to 0.5 percent in 2013 and recover to the level close to the baseline scenario through 2015 (the left-hand side of Chart V-1-4). It also assumes that stock prices (TOPIX) would fall by 53 percent in 1 year from the end of fiscal 2012 to the end of fiscal 2013, and the 10-year JGB yields would decline toward the end of fiscal 2015 by about 0.2 percentage point. Under these assumptions, the domestic economic growth rate would exhibit negative growth and register minus 2.9 percent in fiscal 2013, and would then return to the level of the baseline scenario through fiscal 2015 (the right-hand side of Chart V-1-4). Toward the end of fiscal 2015, loan interest rates would decline by around 0.3 percentage point, and real estate prices would also decline by about 3.2 percent per annum.

Under the economic downturn scenario, the credit cost ratio would increase considerably to about 1.5 percent in fiscal 2013, but fall afterward to the level of the baseline scenario as the economy recovers (Chart V-1-5). Although the Tier I capital ratio of banks would decrease as the credit costs would exceed operating profits from core business, the ratio would continue to exceed the regulatory level on average (Charts V-1-6 and V-1-7).

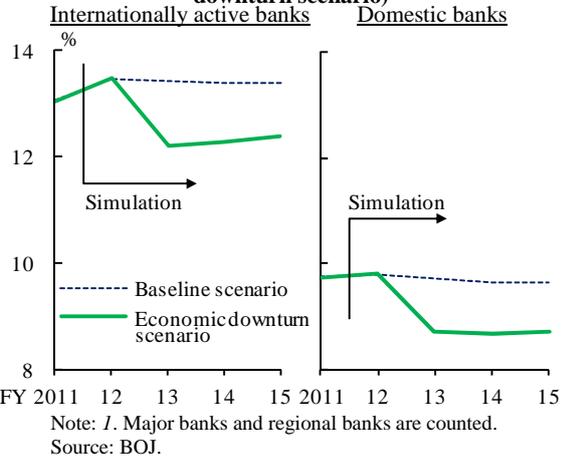
**Chart V-1-4: Assumptions for overseas economies and the domestic economy (economic downturn scenario)**



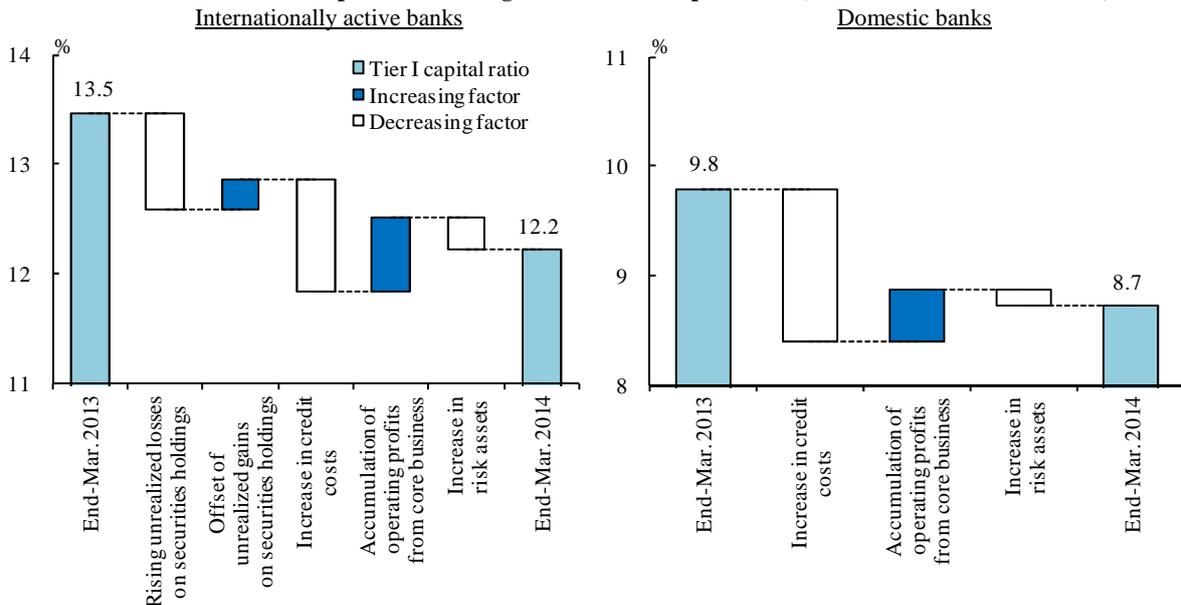
**Chart V-1-5: Credit cost ratio (economic downturn scenario)<sup>1</sup>**



**Chart V-1-6: Tier I capital ratio (economic downturn scenario)<sup>1</sup>**



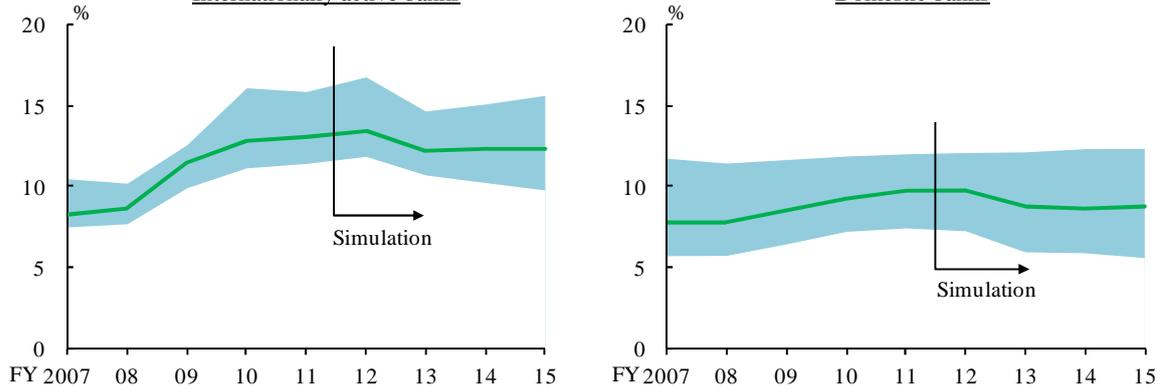
**Chart V-1-7: Factor decomposition of changes in the Tier I capital ratio (economic downturn scenario)<sup>1</sup>**



Note: 1. Major banks and regional banks are counted. The increase in unrealized losses on securities holdings takes into account the tax effects. Source: BOJ.

Nevertheless, the distribution of Tier I capital ratios shows that some financial institutions' Tier I capital ratios would not rise and would remain at low levels (Chart V-1-8). Attention should also be paid to the result that the decline in the Tier I capital ratios tends to be large for banks whose core profitability or quality of loans is low (Chart V-1-9).

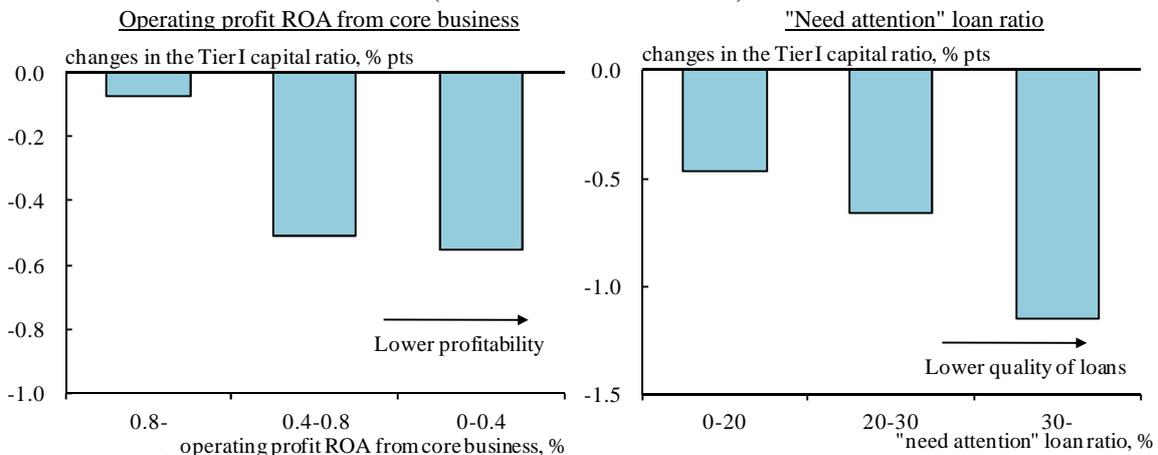
**Chart V-1-8: Distributions of Tier I capital ratio (economic downturn scenario)<sup>1</sup>**  
Internationally active banks                      Domestic banks



Note: 1. Major banks and regional banks are counted. The shaded area indicates the 10th-90th percentile range under the economic downturn scenario.

Source: BOJ.

**Chart V-1-9: Changes in the Tier I capital ratio and operating profit ROA from core business/"need attention" loan ratio (economic downturn scenario)<sup>1,2</sup>**



Notes: 1. Regional banks are counted.

2. The horizontal axis in the left chart shows the operating profit ROA from core business, and that in the right chart shows the share of "need attention" loans in the total amount outstanding of loans. The vertical axis shows the average of each bank's difference between the Tier I capital ratio under the economic downturn scenario and that under the baseline scenario as of the end-March 2014.

Source: BOJ.

#### 4. Upward shift scenarios of interest rates

##### *Effects on capital of fluctuations in unrealized capital losses on bondholdings and net interest income amid a rise in interest rates*

This section estimates fluctuations in unrealized capital losses on bondholdings and net

interest income and their effects on capital caused by a rise in interest rates, disregarding the feedback loop between them and the real economy. Two types of scenarios of an upward shift in the yield curve are considered: (1) a parallel shift scenario in which interest rates for all maturities shift upward uniformly; and (2) a steepening scenario in which the 10-year rate shifts upward.

As banks invest mostly in short- to medium-term bonds, unrealized capital losses on their bondholdings would be large under the parallel shift scenario, in which a rise in interest rates on these bonds would be large (Chart V-1-10).<sup>48</sup> In contrast, under the steepening scenario, in which a rise in short- to medium-term interest rates would be small, unrealized capital losses on bondholdings would be relatively small.

**Chart V-1-10: Effects of a rise in interest rates on capital losses on bondholdings<sup>1</sup>**

tril. yen

		Upward shift		
		1 % pt	2 % pts	3% pts
Internationally active banks	Steepening scenario	-1.7	-2.1	-3.6
	Parallel shift scenario	-3.2	-6.2	-8.0
Domestic banks	Steepening scenario	-1.9	-2.8	-4.2
	Parallel shift scenario	-3.4	-6.3	-8.6

Note: 1. Major banks and regional banks are counted.  
Source: BOJ.

Next, assuming that such rises in interest rates would occur during the year between the end of fiscal 2012 and the end of fiscal 2013, banks' net interest income is estimated to be larger both in the parallel shift and steepening scenarios than in the baseline scenario (Charts V-1-11 and V-1-12).<sup>49</sup> This is because the investment yields rise faster than the funding rates in reaction to the rise in market interest rates.<sup>50</sup> However, since domestic

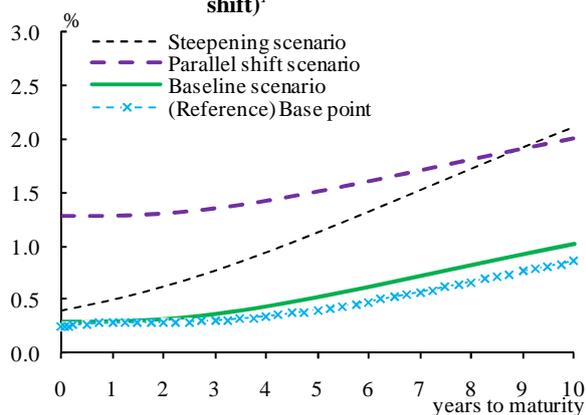
<sup>48</sup> The unrealized capital losses on bondholdings in Chart V-1-10 indicate the instantaneous unrealized capital losses due to a rise in interest rates. Thus, the losses in the 1 percentage point parallel shift scenario correspond to the 100 basis point value in Chapter IV.C.

<sup>49</sup> In each scenario, an upward shift in the yield curve is added to the level of the baseline scenario. The baseline scenario assumes that, during the year between the base point at the end of fiscal 2012 and the end of fiscal 2013, interest rates follow the path implied in the market yield curve observed at the end of September 2012.

<sup>50</sup> The extent to which loan interest rates and funding rates would rise in response to a rise in market interest rates is called pricing beta. Based on historical data, pricing betas of loan interest rates (a year after the market rate rise) are estimated to be about 0.6 for internationally active banks and about 0.5 for domestic banks. Pricing beta of funding rates (a year after the market rate rise) is estimated to be about 0.5 for both internationally active banks and domestic banks. Since banks hold bonds in addition to extending loans, the yields on investment follow the market interest rates more closely than the funding rates.

banks consist mainly of regional banks that tend to hold bonds and extend loans with long maturities, their investment yields tend to rise relatively slowly after the market rates rise, and as a result, the increase in net interest income of domestic banks is smaller than that of internationally active banks. It should also be noted that if the funding rates were to rise faster than the investment yields, net interest income would be lower than that in the baseline scenario (Chart V-1-13).<sup>51</sup>

**Chart V-1-11: Upward shift scenarios of interest rates (1 percentage point upward shift)<sup>1</sup>**



Note: 1. 1-year-later predicted spot rate curves from the base point.

Sources: Bloomberg; BOJ.

**Chart V-1-12: Effects of a rise in interest rates on net interest income<sup>1,2</sup>**

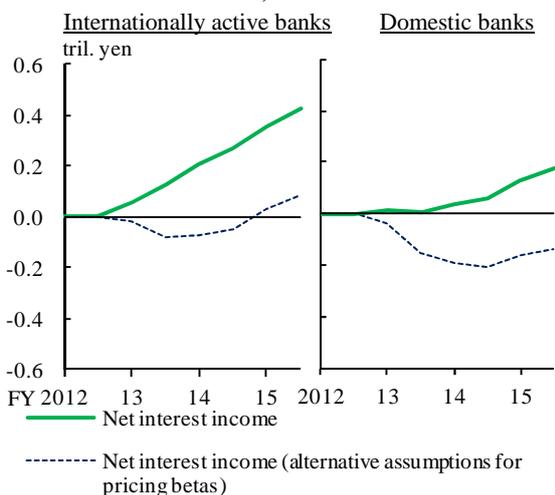
		Baseline	Upward shift		
			1 % pt	2 % pts	3 % pts
Internationally active banks	Steepening scenario	3.8	3.9	4.0	4.2
	Parallel shift scenario		3.9	4.1	4.5
Domestic banks	Steepening scenario	3.4	3.5	3.6	3.7
	Parallel shift scenario		3.4	3.4	3.6

Notes: 1. Major banks and regional banks are counted.

2. Figures indicate net interest income under each scenario during the 1-year period starting from the base point (end-March 2013).

Source: BOJ.

**Chart V-1-13: Net interest income (1 percentage point parallel shift in interest rates)<sup>1,2,3</sup>**



Notes: 1. Major banks and regional banks are counted.

2. The vertical axis shows deviations of net interest income under each parallel shift scenario from that under the baseline scenario.

3. See Footnote 51 for details on alternative assumptions for pricing betas.

Source: BOJ.

<sup>51</sup> The historical data for pricing betas are mostly taken from periods during which interest rates were declining. Thus, it may be inappropriate to use such data in making assumptions for pricing beta with respect to a rise in market rates. Chart V-1-13 considers a case in which the pricing beta for loan interest rates is lower by 0.2 and the pricing beta for funding rates is higher by 0.1 compared to the assumptions in Chart V-1-12. This corresponds to a situation where 99th percentile values of the estimates of the pricing beta materialize. The scenario considered is a 1 percentage point parallel shift in market rates.

Building on the above considerations, the effects of fluctuations in unrealized capital losses on bondholdings and net interest income on the Tier I capital ratios of internationally active banks are estimated to be trivial in the case of the steepening scenario (Chart V-1-14).<sup>52</sup> Under this scenario, even when interest rates shift upward sharply by 3 percentage points, the profits and unrealized gains on securities holdings would act as buffers and absorb most of the unrealized capital losses on bondholdings.<sup>53</sup> Under the parallel shift scenario, if the size of the rise in interest rates is 1 percentage point, the effects on the Tier I capital ratio of unrealized capital losses on bondholdings would be small. If interest rates rise by 2 percentage points, unrealized capital losses on bondholdings would exceed the buffers such as the profits and unrealized gains on securities holdings, and depress the Tier I capital ratio by 0.7 percentage point. Furthermore, a rise in interest rates of 3 percentage points would expand the decline in the Tier I capital ratio to 1.1 percentage points. However, even in this case, the Tier I capital ratios of the internationally active banks would generally exceed the regulatory level.

**Chart V-1-14: Effects of a rise in interest rates on internationally active banks' Tier I capital ratio<sup>1,2</sup>**

		Base point	Baseline	Upward shift		
				1 % pt	2 % pts	3 % pts
Steepening scenario	Tier I capital ratio (%)	13.4	14.1	13.9	13.9	13.5
	Changes (% pts)	—	0.7	0.5	0.5	0.0
Parallel shift scenario	Tier I capital ratio (%)	13.4	14.1	13.6	12.7	12.4
	Changes (% pts)	—	0.7	0.1	-0.7	-1.1

Notes: 1. Changes indicate the Tier I capital ratio at end-March 2014 under each scenario minus that at the base point (end-March 2013).

2. For the estimate of the Tier I capital ratio, profits, unrealized gains on securities holdings, and the tax effects are taken into account.

Source: BOJ.

Thus, even with a sharp rise in interest rates, it is estimated that the capital bases of internationally active banks would not be impaired significantly by unrealized capital

<sup>52</sup> For the estimate of the Tier I capital ratio, the profits, the capital gains/losses on all securities holdings, and the tax effects are taken into account. The profits are defined as operating profits from core business minus credit costs and corporate tax. Net interest income is estimated assuming that banks' investment-funding balance remains constant from the end of September 2012 and that the pricing beta of yields on investment and funding to market interest rates stays at a level close to the past average. Net non-interest income, general and administrative expenses, and credit costs are assumed to remain unchanged from the end of September 2012. In the stress testing, at the end of fiscal 2013, for which the Tier I capital ratios are calculated, 1 year will have passed since the base point and the remaining maturities of bonds would shorten accordingly. As a result, the unrealized capital losses on bondholdings would be smaller than the instantaneous unrealized capital losses shown in Chart V-1-10 due to the roll-down effect.

<sup>53</sup> An upward shift of interest rates of 3 percentage points corresponds to the increase in the yield spreads of long-term government bonds issued by Spain and Italy over German long-term government bonds during the year from the summer of 2011, when the European debt problem worsened.

losses on bondholdings. Nonetheless, attention should be paid to the possibility that a rise in interest rates will affect banks' business conditions through not only unrealized capital losses on bondholdings but also a variety of channels such as the real economic channel, as will be described in the following section.

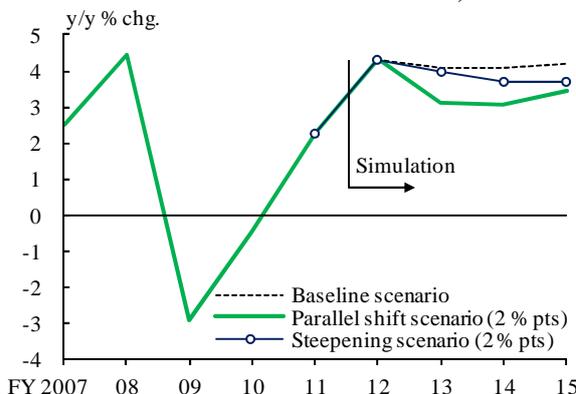
#### *Feedback loop between a rise in interest rates and the real economy*

A sharp rise in interest rates could impair banks' capital through losses on bondholdings and restrain their financial intermediation, mainly among internationally active banks. This restraint could adversely affect the real economy and exert stronger downward pressure on the business conditions of Japan's banks, including domestic banks. This section estimates how the banks' behavior and the real economy affect each other reflecting an upward shock to interest rates using the FMM. The results shown below, however, should be interpreted with some latitude, since they are calculated based on a range of assumptions.

Under the steepening scenario in which the 10-year rate shifts upward by 2 percentage points in fiscal 2013, the decline in the outstanding amount of loans from the baseline scenario would be limited, although the internationally active banks would incur unrealized capital losses on bondholdings and their capital would slightly decrease during the year (Chart V-1-15). However, following the rise in lending interest rates, the real economy would gradually be under downward pressure and the nominal GDP growth rate would deviate downward from the baseline scenario by about 0.1-0.8 percentage point (Chart V-1-16). As a result, credit costs would increase moderately, but such effects on capital would be small (Charts V-1-17 and V-1-18).

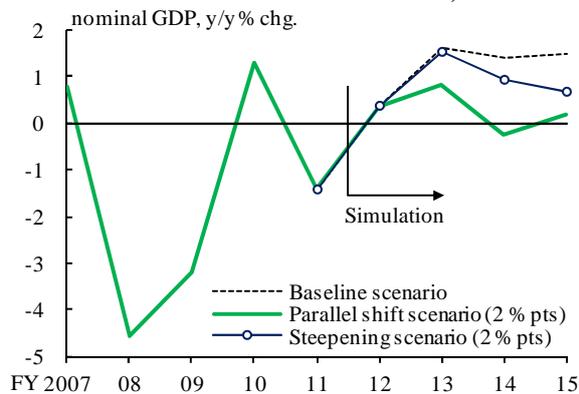
On the other hand, under the 2 percentage point parallel shift scenario, the Tier I capital ratios of internationally active banks would decline notably reflecting the unrealized capital losses on bondholdings in fiscal 2013 (Chart V-1-18). This would induce these banks to restrain their lending, and bank loans outstanding in fiscal 2013 would deviate downward from the baseline scenario by 1.0 percentage point (Chart V-1-15). The nominal GDP growth rate would deviate downward from the baseline scenario by 1.7 percentage points at the maximum, mainly due to the impact of restrained lending and the rise in the loan interest rates (Chart V-1-16). As a result, from fiscal 2014 onward, the credit cost ratios would deviate upward from the baseline scenario by 0.2 percentage point (Chart V-1-17).

**Chart V-1-15: Loans outstanding (upward shift scenarios of interest rates)<sup>1</sup>**



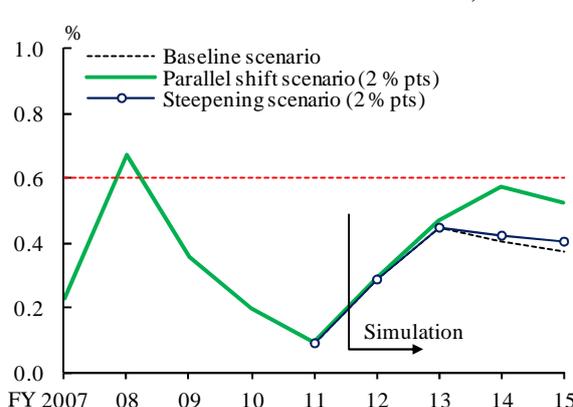
Note: 1. Major banks and regional banks are counted.  
Source: BOJ.

**Chart V-1-16: Domestic economy (upward shift scenarios of interest rates)**



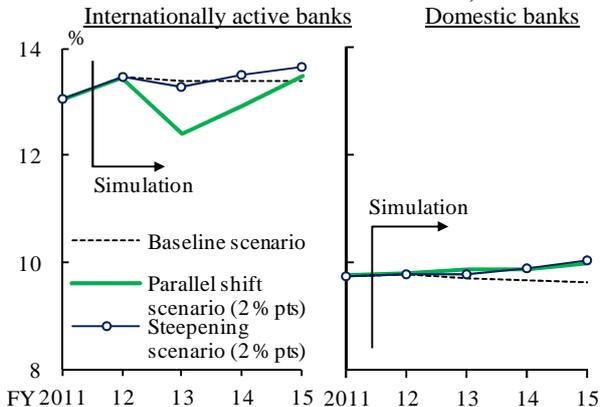
Sources: Cabinet Office, "National accounts"; Japan Center for Economic Research, "ESP forecasts"; BOJ.

**Chart V-1-17: Credit cost ratio (upward shift scenarios of interest rates)<sup>1</sup>**



Note: 1. Major banks and regional banks are counted. The horizontal line indicates the break-even point in the first half of fiscal 2012.  
Source: BOJ.

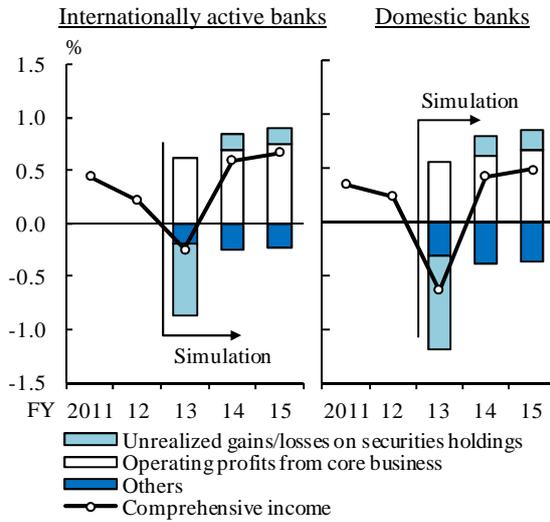
**Chart V-1-18: Tier I capital ratio (upward shift scenarios of interest rates)<sup>1</sup>**



Note: 1. Major banks and regional banks are counted.  
Source: BOJ.

Looking at domestic banks' profits on the basis of comprehensive income including changes in unrealized gains/losses on securities holdings (applied to the consolidated financial results of listed firms), their profits would deteriorate in fiscal 2013, registering a significant deficit mainly because of unrealized capital losses on bondholdings and an increase in credit costs (Chart V-1-19). The Tier I capital ratios of domestic banks would not be affected substantially by a rise in interest rates, as unrealized capital losses on bondholdings caused by the rise in interest rates would not be included in their capital (Chart V-1-18). However, unrealized capital losses on bondholdings due to the rise in interest rates could materialize even at domestic banks through, for example, losses from sales of bonds. In addition, as mentioned earlier, net interest income can decline more than expected due to the rise in interest rates, depending on how the investment yields and the funding rates react to changes in market rates.

**Chart V-1-19: Comprehensive income (upward shift scenarios of interest rates)<sup>1,2,3,4</sup>**



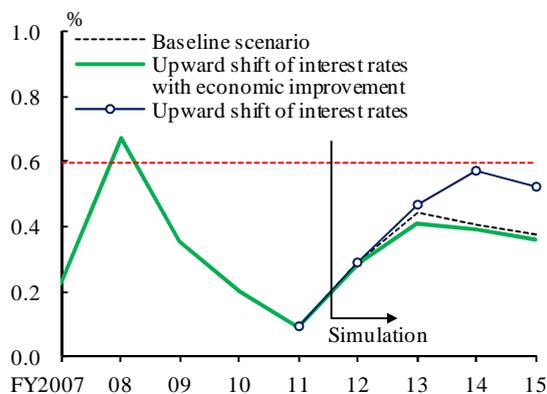
Notes: 1. A 2 percentage point parallel shift in interest rates is assumed. Major banks and regional banks are counted.  
 2. Comprehensive income ROA is depicted.  
 3. Unrealized gains/losses on securities holdings take into account the tax effects.  
 4. Comprehensive income in fiscal 2012 is that in the first half of fiscal 2012 (annualized).

Source: BOJ.

The results imply that, if JGB yields rise substantially without any improvement in economic activity due to, for example, concern about fiscal sustainability, this could affect the resilience of the financial system and the real economy through the adverse feedback loop between the two.

On the other hand, if the parallel shift scenario is accompanied by improvement in economic activity, the outcome could differ. For example, if the parallel shift scenario of 2 percentage points accompanies increases of 1 percentage point in the nominal GDP growth rate and about 80 percent in stock prices in fiscal 2013, the credit cost ratios would deviate slightly downward from the baseline scenario (Chart V-1-20). In addition, unrealized gains on securities holdings would increase reflecting a rise in stock prices. As a result, the amount of losses in domestic banks' comprehensive income in fiscal 2013 would be limited (Chart V-1-21).

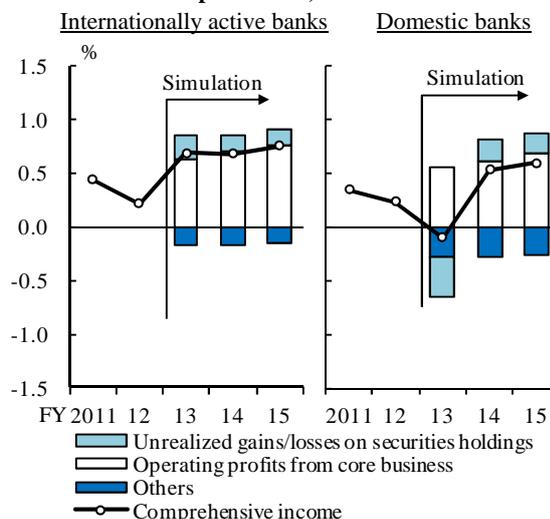
**Chart V-1-20: Credit cost ratio (upward shift of interest rates with economic improvement)<sup>1,2</sup>**



Notes: 1. Major banks and regional banks are counted. The horizontal line indicates the break-even point in the first half of fiscal 2012.  
2. "Upward shift scenario of interest rates" is a duplication of a parallel shift scenario (2 percentage points) in Chart V-1-17.

Source: BOJ.

**Chart V-1-21: Comprehensive income (upward shift of interest rates with economic improvement)<sup>1,2,3,4</sup>**



Notes: 1. A 2 percentage point parallel shift in interest rates is assumed. Major banks and regional banks are counted.  
2. Comprehensive income ROA is depicted.  
3. Unrealized gains/losses on securities holdings take into account the tax effects.  
4. Comprehensive income in fiscal 2012 is that in the first half of fiscal 2012 (annualized).

Source: BOJ.

## B. Resilience against funding liquidity risk

### *Resilience against liquidity risk in yen funding*

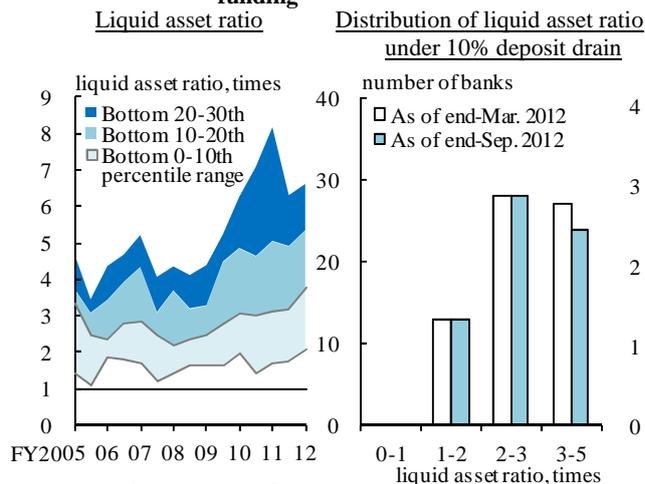
Vigilance persists against counterparty risk of European banks. If concern over the creditworthiness of European banks triggers turmoil in global financial markets, the functioning of the domestic and foreign currency funding markets could deteriorate. With these cases in mind, the resilience of Japan's banks against funding liquidity risk is examined as follows.

This section evaluates the adequacy of liquidity buffers for funding in yen at Japan's banks under a stress scenario in which the yen funding market becomes dysfunctional for a certain period.

Even under an assumption of a shock in which market funding in yen comes to a complete stop for 3 months and based on the amount of assets and liabilities as of the end of September 2012, all banks would have sufficient liquid assets to satisfy short-term funding demand, as was the case with the results of the previous issues of the

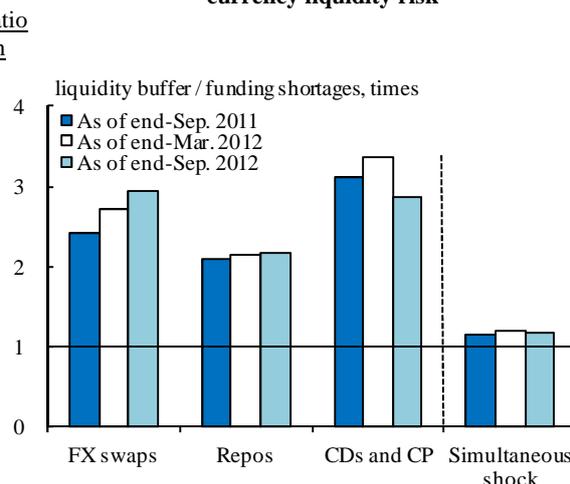
*Report* (until the end of March 2012; the left-hand side of Chart V-2-1).<sup>54</sup> Furthermore, even if a more severe shock is assumed in which 10 percent are drained out of deposits whose term until the renewal of the deposit rate is 3 months or less, all banks would have sufficient liquid assets necessary for funding, as was the case with the results of the previous *Report* (as of the end of March 2012; the right-hand side of Chart V-2-1).

**Chart V-2-1: Stress testing against liquidity risk in yen funding<sup>1,2</sup>**



Notes: 1. See Footnote 54.  
2. The latest data of the left chart are as of the end-September 2012.  
Source: BOJ.

**Chart V-2-2: Stress testing against foreign currency liquidity risk<sup>1,2</sup>**



Notes: 1. Major banks and regional banks are counted.  
2. The duration of funding shortages in each market is assumed to be 1 month.  
Sources: Published accounts of U.S. MMFs; BOJ.

### *Resilience against foreign currency liquidity risk*

This section evaluates the adequacy of foreign currency liquidity buffers at Japan's banks against funding shortages under a stress scenario in which the foreign currency funding markets become dysfunctional for a certain period.

The stress scenario assumes that one of the major sources of foreign currency funding for Japan's banks -- the foreign exchange swap market, the repo market, and the CD and CP markets -- becomes dysfunctional for 1 month with the amount of assets and liabilities set at the levels as of the end of September 2012. Even under this assumption, Japan's banks would still have an adequate amount of foreign currency liquidity buffers to cover funding shortages that may occur in any of the markets, and their resilience

<sup>54</sup> In Chart V-2-1, major banks (excluding trust banks) and regional banks are counted. However, banks whose market borrowing is less than market lending are excluded. The "bottom 0 to 10th percentile" in the left chart indicates the distribution of liquid asset ratios of banks with the lowest liquidity asset ratio and those with the ratios in the bottom 10th percentile. The right chart indicates distributions of liquidity asset ratios under the assumption that the deposit drain occurred at the end of September 2012, and does not show banks with liquid asset ratios over five times. See Annex 2 for the definition of liquid asset ratios.

would remain at the same level as the results in the previous *Report* (as of the end of March 2012; Chart V-2-2).<sup>55</sup> This indicates that if banks' funding of foreign currencies from any of these markets suddenly grows difficult, banks could retain foreign currency liquidity by selling their foreign currency-denominated securities and using their foreign currency deposits.

However, under an extremely severe stress scenario in which all of the aforementioned markets become dysfunctional for 1 month, funding shortages would amount to almost the same level as the current foreign currency liquidity buffers. Japan's banks have been promoting overseas lending and foreign bond investment, while they depend heavily on short-term markets for foreign currency funding. If overseas short-term markets remain dysfunctional for a long time, Japan's banks may need to find alternative funding sources.

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<sup>55</sup> Funding shortages due to the disruption of each market comprise the amount of debt due within a month. Foreign currency liquidity buffers include foreign currency-denominated securities (excluding held-to-maturity securities and securities used as collateral in repo transactions) and foreign currency deposits. The estimate is based on the amount of foreign currency-denominated assets and liabilities as of the end of September 2012. Funding shortages are calculated based on the maturity structure estimated as follows: the amount of foreign exchange swaps as well as CDs and CP to be redeemed within a month is estimated based on the data on the transaction balance, while all repo transactions are presumed to be redeemed within a month. If the foreign exchange swap market and the CD and CP markets are put under stress, banks are assumed to retain foreign currencies by using their foreign currency deposits and selling foreign currency-denominated securities or financing against the collateral of the securities. On the other hand, if the repo market is put under stress, banks are assumed to retain foreign currencies by using their foreign currency deposits and selling the securities. In each scenario, the outstanding amount of funds investment or securities borrowing in repo transactions is excluded from liquidity buffers.

## **VI. Assessment and challenges regarding the financial system**

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

### **A. Assessment of the financial system stability**

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

Judging from the results of the examination of indicators of macro financial risk, thus far there is no indication that warns of financial imbalances stemming from bullish expectations. Due attention should be paid, however, to the fact that the amount outstanding of JGBs held by financial institutions remains large.

The amount of risks banks and *shinkin* banks bear as a whole has been decreasing relative to their capital, and the resilience of financial institutions is generally strong. Banks' capital bases as a whole would be able to avoid significant impairment, even if a significant negative shock occurred such as the economic downturn similar to that observed after the Lehman shock. Nevertheless, capital adequacy ratios may plunge at banks whose core profitability or quality of loans is low. It appears that banks as a whole hold a sufficient amount of funding liquidity both in the domestic and foreign currencies.

### **B. Management challenges for Japan's financial institutions**

Given these circumstances, in order for financial institutions to maintain smooth financial intermediation, they need to address the following major management challenges.

First, financial institutions need to raise their profitability. Regional financial institutions, whose source of earnings is mostly domestic business, have faced particularly severe business conditions. It is important for financial institutions to tap potential demand for financial services by enhancing the effectiveness of their support for client firms that are reconstructing their business or that are engaged in growing business areas. They can enhance the effectiveness of such support by, for example, strengthening their expertise to identify projects' growth potential and risks or devising ways to effectively utilize a range of financial instruments. Tapping potential demand is important not only for

banks and *shinkin* banks, but also for a wide range of financial intermediaries that develop and sell financial products or conduct investments and loans. In addition, one potential option for financial institutions seeking to raise their profitability is to improve their business efficiency or expand their customer networks through mergers.

Second, financial institutions need to strengthen their capital bases. It is indispensable for them to enhance their capital to continue financial intermediation in areas with high risk and return through investments and loans to growing business areas at home and abroad. In addition, internationally active banks have become subject to the Basel III capital requirements, and domestic banks will also be subject to new requirements from 2014. It is necessary for financial institutions to steadily strengthen their capital bases both in terms of the quantity and quality.

Third, financial institutions need to continue to enhance the effectiveness of risk management.<sup>56</sup> As for credit risk, it is still important for them to enhance the effectiveness of their support for firms' reconstruction, such as providing support to ailing firms to improve their business. In addition, as the extension of overseas loans and large-lot loans has increased, it is vital for major and regional banks to restrain concentration risk associated with loan portfolios at home and abroad and strengthen their risk management of large-lot loans. As for market risk, it is important for them to grasp a range of risks associated with bondholdings since they have tended to accumulate an amount of interest rate risk, particularly among regional financial institutions. They also need to continue to manage market risk associated with stockholdings appropriately, since developments in stock prices still have large effects on profits, for example, particularly among major banks.

In view of these challenges, the Bank of Japan will continue to conduct on-site examinations and off-site monitoring, hold seminars at the Bank's Center for Advanced Financial Technology, and participate in international discussions.

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<sup>56</sup> For details on financial institutions' challenges regarding risk management, see the Bank's "On-Site Examination Policy for Fiscal 2013," March 2013.

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## Annex 2: Glossary

### *Financial statements of financial institutions*

Comprehensive income = net income + other comprehensive income (such as changes in unrealized gains/losses on stockholdings and bondholdings)

Net income = operating profits from core business + realized gains/losses on stockholdings + realized gains/losses on bondholdings – credit costs ± others (such as extraordinary gains/losses)

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 bondholdings

Overall gains/losses on stockholdings = realized gains/losses on stockholdings  
+ changes in unrealized gains/losses on stockholdings

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

Overall gains/losses on bondholdings = realized gains/losses on bondholdings  
+ changes in unrealized gains/losses on bondholdings

Realized gains/losses on bondholdings = 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 + losses on credit sales – recoveries of write-offs

Credit cost ratio = credit costs / total loans outstanding

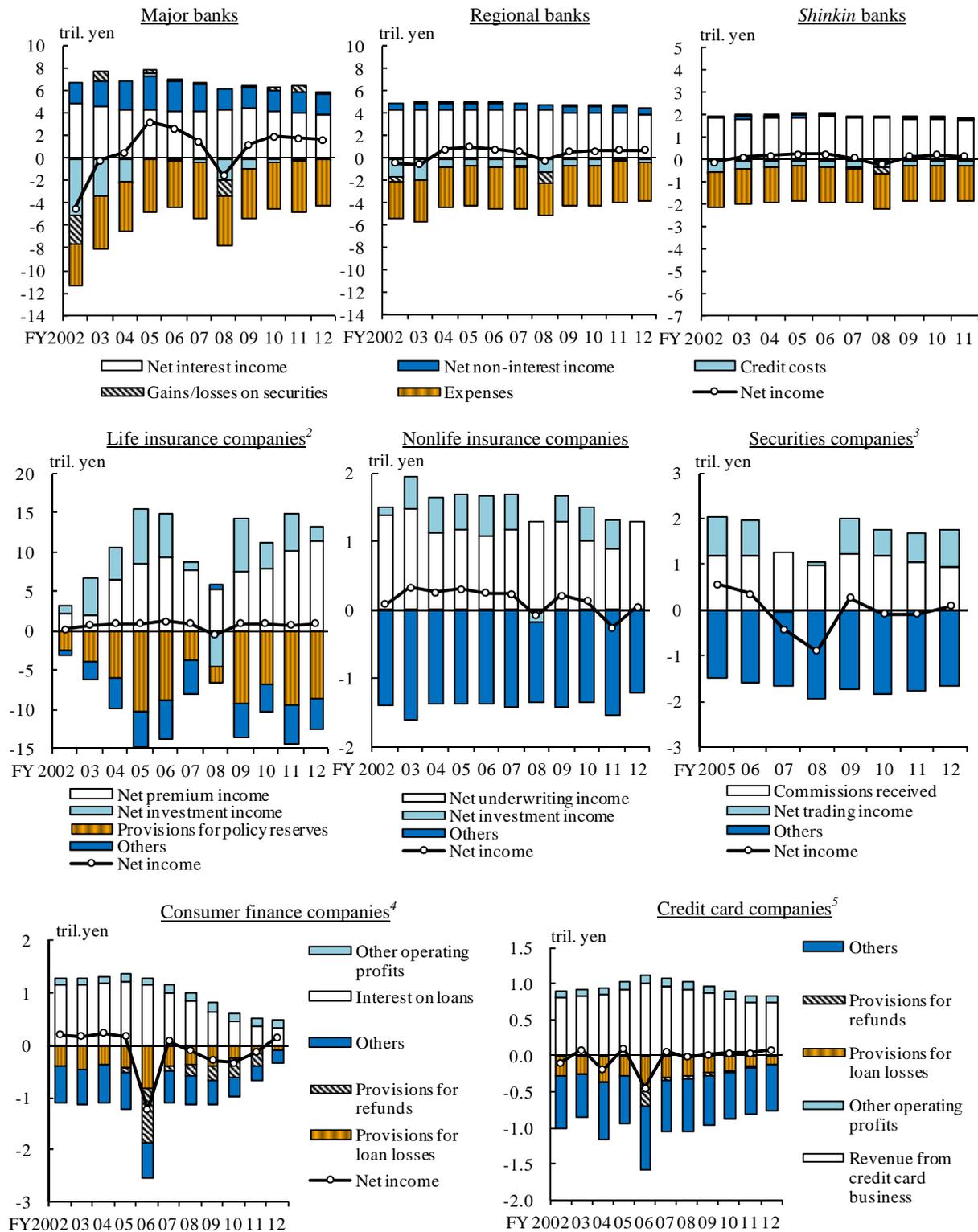
Tier I capital ratio = Tier I capital / risk assets

Tier I capital is the core capital including common equities and retained earnings.

Risk assets are financial institutions' risk-weighted assets.

Liquid asset ratio = (current accounts at the Bank of Japan + cash + government bonds) / (net market funding maturing within 3 months + drain of deposits whose term until the renewal of the deposit rate is 3 months or less)

## Annex 3: Financial results of Japan's financial institutions<sup>1</sup>



Notes: 1. The latest data for *shinkin* banks are as of the end of fiscal 2011. Those for other financial institutions are as of the first half of fiscal 2012.

2. Net premium income = premium income and others - insurance benefits paid. Net investment income = investment income - investment expenses.

3. The four major companies are counted for securities companies.

4. The three major companies are counted for consumer finance companies.

5. The six major companies are counted for credit card companies.

Sources: Published accounts of securities companies, consumer finance companies, and credit card companies; The Life Insurance Association of Japan, "Summary of life insurance business"; General Insurance Association of Japan, "Business result."

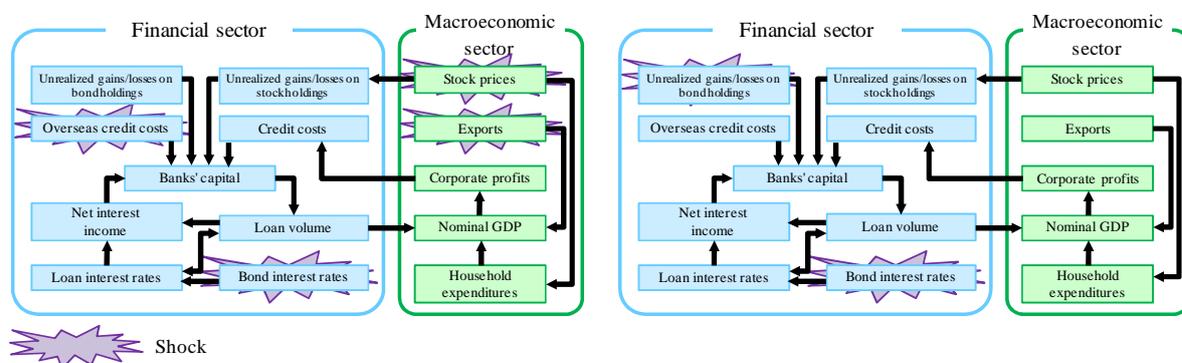
## Annex 4: Framework of macro stress testing

In this *Report*, macro stress testing is conducted to gauge possible negative effects on Japan's financial system of changes in the external environment such as a slowdown in overseas economies. In conducting the testing, the Financial Macro-econometric Model (FMM) is used to take into account an adverse feedback loop between the financial system and the real economy that amplifies the negative effects of the changes in the external environment. Since the FMM includes variables and equations for individual banks' activities, it can capture effects of the changes in the external environment on individual banks' business conditions.

The economic downturn scenario assumes that severe stresses equivalent to the Lehman shock occur in overseas economies and global financial markets (Chart A-1). In this case, a slowdown in overseas economies would affect Japan's economy through a decline in exports and in turn increase banks' credit costs. In addition, a shock that occurred in global financial markets would decrease domestic stock prices, thereby deteriorating banks' unrealized gains/losses on stockholdings. The stress testing in this *Report* includes an adverse feedback loop, in which such losses depress the real economy through tightening of banks' lending attitudes, deteriorating banks' business conditions.

In the upward shift scenario of interest rates, a rise in interest rates would lead to changes in banks' unrealized gains/losses on bondholdings and net interest income (Chart A-2). The stress testing in this *Report* includes a channel in which the effect of these changes on banks' lending attitudes induces fluctuations in economic activity and stock prices, and this outcome in turn affects banks' business conditions.

**Chart A-1: Economic downturn scenario** (assessment of resilience against macroeconomic shocks)      **Chart A-2: Upward shift scenario of interest rates** (assessment of resilience against financial market fluctuations)



## Annex 5: Major events in the financial system (since October 2012)

Oct. 2, 2012	Europe: The European Commission released its report on reforming the structure of the EU banking sector.
Oct. 8	Europe: The European Stability Mechanism (ESM) was launched and held its inaugural meeting.
Oct. 9	U.S.: The FRB published final rules with stress testing requirements based on the Dodd-Frank Wall Street Reform and Consumer Protection Act.
Oct. 11	The Basel Committee on Banking Supervision (BCBS) issued its framework for dealing with domestic systemically important banks.
Oct. 17	U.K.: The government accepted recommendations for reforming the submission and administration of the Libor benchmark from "The Wheatley Review of LIBOR."
Oct. 19	Europe: The European Council agreed to proceed with work on legislative proposals on the Single Supervisory Mechanism (SSM) with the objective of agreeing on the legislative framework by January 1, 2013.
Oct. 30	Japan: The Bank of Japan decided to enhance monetary easing and establish a framework for the fund-provisioning measure to stimulate bank lending (the Stimulating Bank Lending Facility).
Nov. 13	U.S.: The Financial Stability Oversight Council released proposed recommendations for structural reforms of money market mutual funds (MMFs).
Dec. 3	The Committee on the Global Financial System (CGFS) released "Operationalising the Selection and Application of Macroprudential Instruments."
Dec. 5	Europe: The President of the European Council released "Towards a Genuine Economic and Monetary Union."
Dec. 12	Japan: The Financial Services Agency announced a draft for partial revision to the notice on capital adequacy ratio regulations for domestic banks. ----- Europe: The Economic and Financial Affairs Council (ECOFIN) agreed on proposals aimed at establishing the SSM and on the schedule for the ECB's commencement of supervisory tasks within the SSM.
Dec. 13	Europe: The Eurogroup approved the second disbursement under the second economic adjustment programme for Greece.
Dec. 14	U.S.: The FRB proposed rules to strengthen the oversight of the U.S. operations of foreign banks. ----- The Committee on Payment and Settlement System (CPSS) and the Board of the International Organization of Securities Commissions (IOSCO) released "Principles for Financial Market Infrastructures: Disclosure Framework and Assessment Methodology."
Dec. 20	Japan: The Bank of Japan decided to enhance monetary easing.
Dec. 21	U.S.: The Commodity Futures Trading Commission approved the final exemptive order on cross-border application of the swaps provisions of the Dodd-Frank Act.
Dec. 26	Japan: The second Shinzo Abe Cabinet was established.
Jan. 6, 2013	The Group of Governors and Heads of Supervision agreed on the BCBS's amendments to the liquidity coverage ratio as a minimum standard.
Jan. 16	Europe: The European Parliament agreed on new rules to regulate credit rating agencies.
Jan. 22	Japan: The Bank of Japan decided to introduce the "price stability target" and released a joint statement with the government to strengthen their policy coordination.
Jan. 28	Japan: The Financial System Council's "Working Group on Method of Regulations on Banks which Contribute to Stability of the Financial System, etc." published its final report.
Feb. 14	Europe: The European Commission proposed a financial transaction tax to be applied by the eleven member states.
Feb. 15	The BCBS released "Supervisory Guidance for Managing Risks Associated with the Settlement of Foreign Exchange Transactions." ----- The BCBS and the IOSCO released a second consultative paper that represented a near-final proposal on margin requirements for non-centrally-cleared derivatives.
Feb. 25	Europe: The center-left parties and the center parties failed to gain a majority in the Senate in the Italian general election.
Mar. 7	U.S.: The FRB announced results of bank stress tests of the 18 largest bank holding companies.
Mar. 16	Europe: The Eurogroup agreed to grant financial assistance to Cyprus.