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Financial System FSR report



BANK OF JAPAN

OCTOBER 2013

The total of 10 major banks, 105 regional banks, and 261 *shinkin* banks covered in this *Report* is as follows (as of September 30, 2013).

The 10 major banks comprise Mizuho Bank, The Bank of Tokyo-Mitsubishi UFJ, Sumitomo Mitsui Banking Corporation, Resona 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 September 30, 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 set out in the *Report* in planning measures to ensure stability in the financial system and in providing guidance and advice to individual financial institutions through on-site examinations and off-site monitoring. Moreover, the Bank makes use of the results in international regulatory and supervisory discussions. In relation to monetary policy, the macro assessment of financial system stability is also an important input for the Bank in assessing risks in economic and price developments from a medium- to long-term perspective.

The *Report* assesses the stability of Japan's financial system from a macroprudential perspective. The macroprudential framework is used to devise institutional designs and policy measures on analyses and assessments of risks in the financial system, together with the interconnectedness of the real economy, financial markets, and financial institutions' behavior, to ensure the stability of the financial system.

Specifically, this *Report* analyzes and assesses the following points. First, it analyzes the external environment surrounding Japan's financial system. Second, it analyzes financial intermediation in Japan such as financial conditions among firms and households and developments in financial markets and financial intermediary investment. Third, it analyzes risks observed in financial markets. Fourth, it analyzes risks borne by financial intermediaries such as banks, *shinkin* banks, and insurance companies. And fifth, it assesses risk in the financial system from a macroeconomic perspective by examining macro financial risk indicators and assessing the resilience of the financial system using macro stress testing.

Features of this Report

In this issue, in addition to the regular examination of the financial system, the analysis has been enhanced in the following areas: (1) developments in financial intermediation after the Bank's introduction of quantitative and qualitative monetary easing (QQE); and (2) assessment of effects of significant changes in economic and financial developments on financial institutions' business conditions using macro stress testing.

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

Contents

- 1 **Chapter I. Comprehensive assessment of the financial system and overview**
 - A. Comprehensive assessment of the financial system
 - B. Overview (summary of Chapters II to VI)
- 5 **Chapter II. Examination of the external environment**
 - A. Developments in the global financial system and financial and economic activity overseas
 - B. Domestic economy, financial conditions among firms and households, and fiscal conditions
- 11 **Chapter III. Examination of financial intermediation -- focusing on developments after introduction of quantitative and qualitative monetary easing**
 - A. Financial conditions among firms and households
 - B. Financial intermediation through financial markets
 1. CP and corporate bond markets
 2. Stock and real estate investment trust markets
 - C. Developments in investment by financial intermediaries
 - D. Financial institution loans and securities investment
 1. Developments in domestic loans
 2. Developments in overseas loans
 3. Developments in securities investment
- 27 **Chapter IV. Risks observed in financial markets**
 - A. Developments in financial markets
 - B. Risks implied in government bond markets
 - Box : Asymmetry in volatility in the JGB market
 - C. Risks implied in stock markets
 - D. Risks implied in foreign exchange markets

39 **Chapter V. Risks borne by financial intermediaries**

A. Banks and *shinkin* banks

1. Credit risk
2. Interest rate risk
3. Market risk associated with stockholdings
4. Funding liquidity risk
5. Bank capital and profitability

B. Financial intermediaries other than banks and *shinkin* banks

1. Life insurance companies
2. Securities companies
3. Consumer finance companies

57 **Chapter VI. Risk assessment of the financial system from a macroeconomic perspective**

A. Macro risk indicators

B. Macro stress testing

1. Assumptions for macro stress testing
2. Baseline scenario
3. Economic downturn scenario
4. Upward interest rate shift scenarios
5. Issues related to the results estimated under upward interest rate shift scenarios

C. Resilience against funding liquidity risk

76 **Annex: Glossary**

I. Comprehensive assessment of the financial system and overview

A. Comprehensive assessment of the financial system

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

Judging from developments in financial markets and financial institutions' behavior, there is no indication warning of financial imbalances such as excessively bullish expectations. Volatility increased in each market after fiscal 2013 began, but the increase in volatility remains limited compared with that seen in previous stress periods.¹

Capital bases of financial institutions such as banks and *shinkin* banks have on the whole been adequate in terms of capital adequacy ratios based on the regulatory requirements and capital relative to the amount of risk they bear. These institutions also have sufficient funding liquidity. Thus, with adequate capital bases and funding liquidity, they have generally strong resilience against various economic and financial shocks, including a significant economic downturn and a substantial rise in interest rates. Even if interest rates rose substantially without any improvement in economic activity, the stability of Japan's financial system would basically be maintained. However, attention should be paid to the possibility that the impacts of an interest rate rise will exceed those estimated under the assumptions, depending on the speed and extent of the rise in interest rates and the factors behind it. Some financial institutions have relatively weak capital bases, and are behind the curve in improving asset quality following the Lehman shock. Because their capital adequacy ratios may plunge in the wake of significant economic and financial shocks, they need to steadily strengthen their capital.

Financial intermediation has operated more smoothly than it did at the time of the previous *Report*. Specifically, financial conditions among firms and households have become more accommodative since the Bank's introduction of QQE. Financial institution lending has gradually grown, and financial intermediation through financial markets has been prevalent, as seen in the issuance of corporate bonds and equity financing.

In these circumstances, financial institutions' core profitability has remained on a downtrend, mainly due to the continued narrowing of interest rate spreads on loans. This does not immediately threaten the stability of the financial system and the functioning of financial intermediation, but the declining trend in core profitability is a

¹ In Japan, the fiscal year starts in April and ends in March of the following year.

challenge that should be resolved in the medium to long term.

B. Overview (summary of Chapters II to VI)

Chapter II: Examination of the external environment

In the global financial markets and overseas economies, concerns over the European debt problem and over the effects of U.S. fiscal austerity that heightened in the first half of 2013 subsided somewhat compared with the situation at the time of the previous *Report*. On the other hand, expectations emerged of the U.S. Federal Reserve tapering asset purchases early and heightened subsequently. Due in part to the heightened expectations, concerns intensified over a possible rise in interest rates worldwide and over an outflow of funds from financial markets in emerging countries. Positive signs are now being seen in economic activity in Japan. Against this background, financial conditions among firms have generally improved, and the employment and income situation in the household sector has also shown some improvement. In these circumstances, households slightly raised their ratio of risky assets including investment trusts. Nonetheless, the financial strength of some small and medium-sized firms remains weak.

Chapter III: Examination of financial intermediation -- focusing on developments after introduction of quantitative and qualitative monetary easing

Financial conditions among firms and households have become more accommodative than they were at the time of the previous *Report*. Financial intermediation through financial markets -- such as corporate bond issuance and equity financing -- has become prevalent. The outstanding amount of Japanese government bond (JGB) holdings has decreased at financial institutions such as banks and *shinkin* banks, as the Bank's JGB purchases under QQE expanded. On the other hand, there has been an overall expansion in the assets of financial institutions due to increases in the outstanding amount of current accounts held at the Bank, lending, and overseas assets. Lending increased, particularly to large firms, and that to small and medium-sized firms remained generally sluggish. However, some positive developments can be observed recently in lending to small and medium-sized firms. No major changes have been seen in investment of insurance companies.

Chapter IV: Risks observed in financial markets

In the Japanese government bond, stock, and foreign exchange markets, volatility temporarily increased after fiscal 2013 began. However, the increase in volatility remains limited compared with that observed in previous stress periods such as at the time of the Lehman shock. The rise in long-term interest rates in Japan since spring 2013 has been limited compared with that seen in the United States and Europe. Since June 2013 in particular, JGB yields have been notably stable while overseas yields have moved up on the whole. This has been partly due to the tightening of supply and demand conditions in the JGB market prompted by the Bank's large-scale JGB purchases as concerns over fiscal imbalances have not appeared to heighten. Stock prices have become stable, but are still subject to somewhat large fluctuations.

Chapter V: Risks borne by financial intermediaries

The capital bases of financial institutions such as banks and *shinkin* banks have on the whole been adequate in terms of capital adequacy ratios based on the regulatory requirements and capital relative to the amount of risk they bear. Their capital has been enhanced, partly due to the accumulation of retained earnings. The amount of risk borne by financial institutions has been restrained because of reduced credit and interest rate risks. The amount of interest rate risk remained on a rising trend, but has started declining since the beginning of fiscal 2013. The decline in the amount of credit risk partly reflects continued improvement in the quality of financial institutions' assets. However, some financial institutions are behind the curve in improving their asset quality. It should be noted that some financial institutions have weak capital bases relative to the amount of risk they bear, including risks other than credit and interest rate risks. Financial institutions' core profitability has remained on a downtrend. Meanwhile, they have sufficient funding liquidity.

Chapter VI: Risk assessment of the financial system from a macroeconomic perspective

Most financial risk indicators do not show any signs of overheating that should be noted from a macroeconomic perspective. The results of macro stress testing indicate that financial institutions would be able to maintain a sufficient level of capital even if a significant economic downturn occurred or interest rates rose substantially without any improvement in economic activity. Nevertheless, a rise in interest rates may cause drastic changes in, for example, financial institutions' net interest income and

investment behavior and the burden of debt repayments on firms and households, depending on the speed and extent of the rise in interest rates and the factors behind it. These changes may have greater impacts on financial institutions' profits and capital than those estimated under the macro stress testing assumptions. Furthermore, it should be noted that if significant economic and financial shocks occurred, capital adequacy ratios may plunge at financial institutions with weak capital bases relative to the amount of risk they bear. On the funding liquidity side, financial institutions have sufficient liquid assets to see themselves through stress events such as deposit outflows continuing for a certain period and a decline in the functioning of financial markets.

II. Examination of the external environment

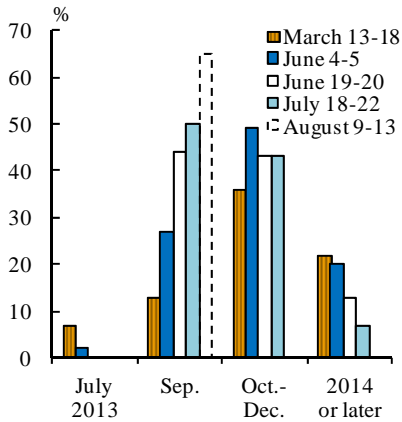
This chapter examines the external environment surrounding Japan's financial system. It summarizes developments in the global financial system and financial and economic activity overseas, and examines financial conditions among firms and households and fiscal conditions in Japan.

A. Developments in the global financial system and financial and economic activity overseas

While concerns over the European debt problem abated somewhat, financial market participants started to form expectations that the U.S. Federal Reserve would begin tapering asset purchases early, and these expectations subsequently heightened from around summer 2013 (Chart II-1-1). This has raised U.S. long-term interest rates, and has affected a wide range of asset prices. Yields in the U.S. high-yield bond markets have risen, while prices of real estate investment trusts (REITs) have declined. Furthermore, stock prices, bond prices, and exchange rates in emerging countries have been sluggish, with an outflow of funds from their markets since investors' growth expectations for these countries have grown bearish (Charts II-1-2 and II-1-3). In advanced countries, long-term interest rates have risen, particularly in Europe, while stock prices have temporarily shown some weakness (Chart II-1-4).

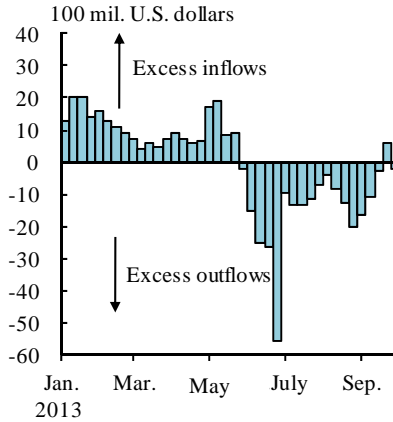
Overseas economies as a whole are gradually heading toward a pick-up, although a lackluster performance is partly seen. The U.S. economy has been on a moderate recovery trend against the backdrop of steady private demand as concerns over the effects of fiscal austerity abated somewhat after increasing in the first half of 2013. The employment situation, which had been recovering slowly, has recently been improving steadily, as indicated by the fact that the number of employees has continued to increase and the unemployment rate has declined to the range of 7.0-7.5 percent (Chart II-1-5).

Chart II-1-1: Economist expectations on Fed's taper timing



Source: Bloomberg.

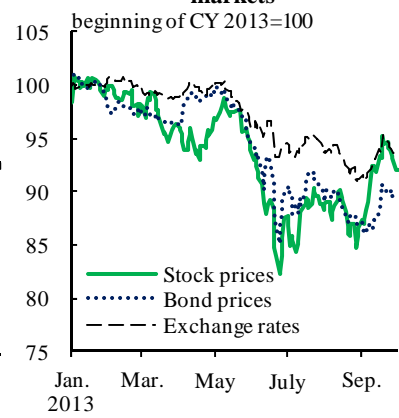
Chart II-1-2: Bond flows into emerging markets¹



Note: 1. The latest data are from September 26 to October 2, 2013.

Source: EPFR Global.

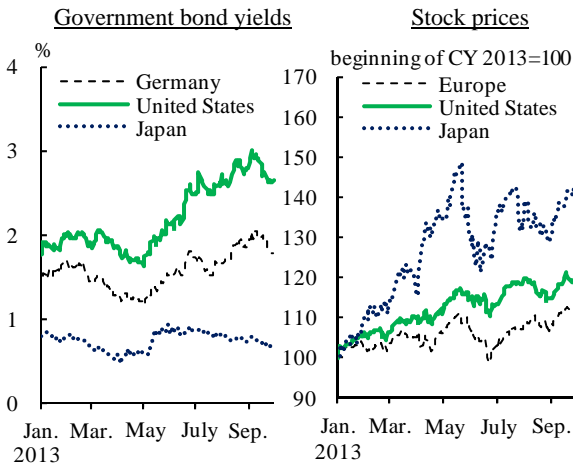
Chart II-1-3: Stock prices, bond prices, and exchange rates in emerging markets^{1,2,3}



Notes: 1. The MSCI Emerging Markets Index is used for stock prices, and price indexes of emerging markets calculated by J.P. Morgan are used for bond prices and exchange rates. 2. The higher value of exchange rates indicates appreciation of emerging economies' currencies. 3. The latest data are as of September 30.

Source: Bloomberg.

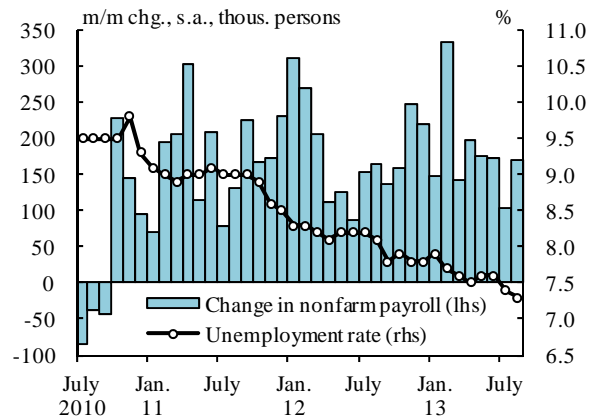
Chart II-1-4: Government bond yields and stock prices^{1,2}



Notes: 1. The latest data are as of September 30. 2. The left chart shows 10-year government bond yields. In the right chart, S&P 500 is used for the United States, STOXX Europe 600 for Europe, and TOPIX for Japan.

Source: Bloomberg.

Chart II-1-5: Nonfarm payroll employment and unemployment rate in the United States¹



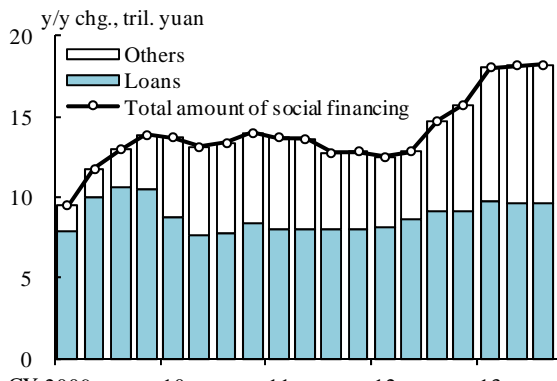
Note: 1. The latest data are as of August 2013.

Source: U.S. Bureau of Labor Statistics.

Economic activity in emerging countries has been affected by a tightening of financial conditions and cautious sentiment among economic entities. In China, financial intermediation undertaken without intermediary banks (the so-called shadow banking system) has expanded, and credit growth has accelerated as a whole (Chart II-1-6).

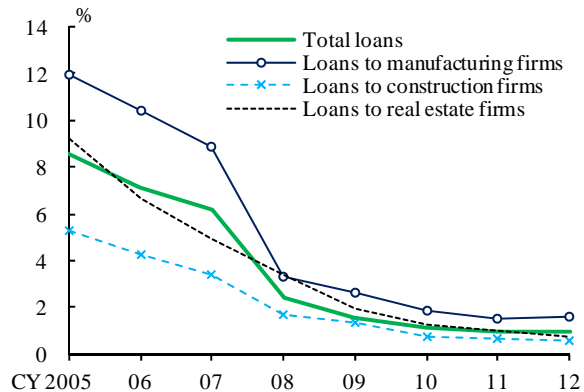
Chinese policymakers have launched policy measures to unwind the overly rapid expansion of credit under their policy stance that attaches more weight to the quality of economic growth rather than to its speed. Banks' nonperforming loan (NPL) ratios have recently been low, but close attention should continue to be paid to developments in the overall financial system including the shadow banking system and their impact on the real economy (Chart II-1-7).

Chart II-1-6: Total amount of social financing¹



Note: 1. The latest data are as of August 2013.
Source: CEIC.

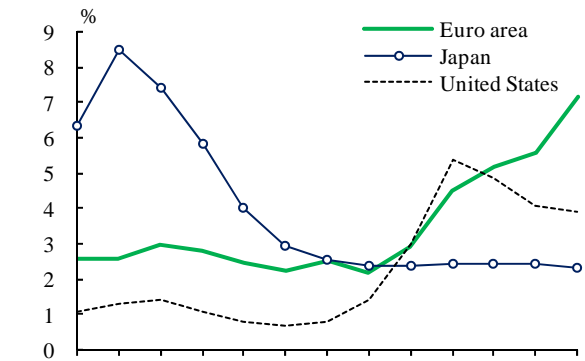
Chart II-1-7: Nonperforming-loan ratio at commercial banks in China



Source: CEIC.

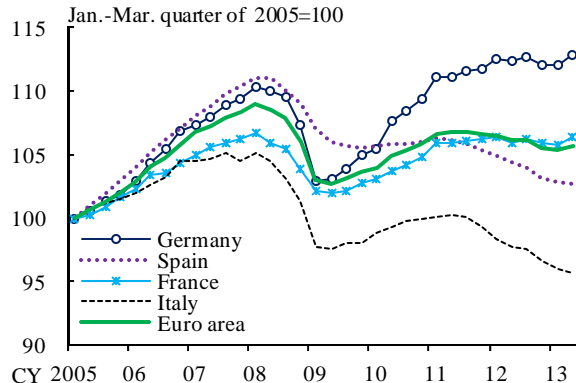
Economic activity in Europe continued to recede slowly, but has recently been bottoming out as a whole. There has also been some progress in resolving the debt problem, as seen in the agreement reached among the member states of the European Union (EU) on a framework for bank recovery and resolution. However, the NPL ratios of European banks rose further around the end of 2012 and economic disparities among the member states widened. Financial and economic activity in Europe continues to face the risk of instability (Charts II-1-8 and II-1-9).

Chart II-1-8: Nonperforming-loan ratio



Sources: World Bank; BOJ.

Chart II-1-9: Real GDP of euro area¹

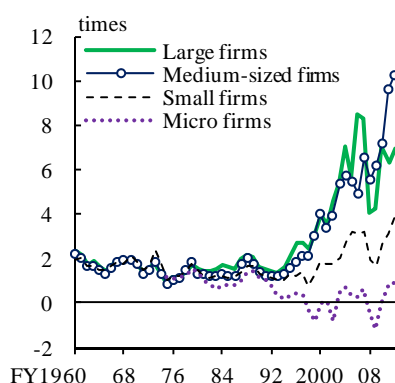


Note: 1. The latest data are as of the April-June quarter of 2013.
Source: Eurostat.

B. Domestic economy, financial conditions among firms and households, and fiscal conditions

Japan's economy is recovering moderately. Corporate profits and business sentiment have improved, and interest payment capacity and financial conditions among firms have generally improved (Charts II-2-1 to II-2-3). However, small and medium-sized firms, especially small ones, still face severe financial conditions.

Chart II-2-1: Interest coverage ratio^{1,2,3}

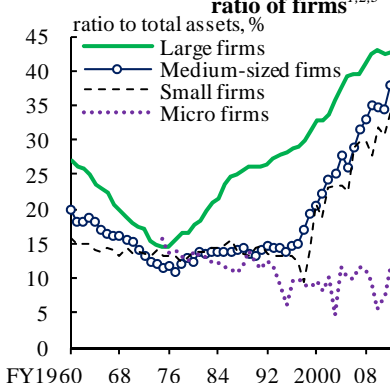


Notes: 1. The latest data are as of fiscal 2012.

2. Large firms: capital of 1 billion yen or more. Medium-sized firms: capital of 100 million yen to less than 1 billion yen. Small firms: capital of 10 million yen to less than 100 million yen. Micro firms: capital of less than 10 million yen.
3. Interest coverage ratio = operating profits / interest payments, etc.

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

Chart II-2-2: Capital adequacy ratio of firms^{1,2,3}

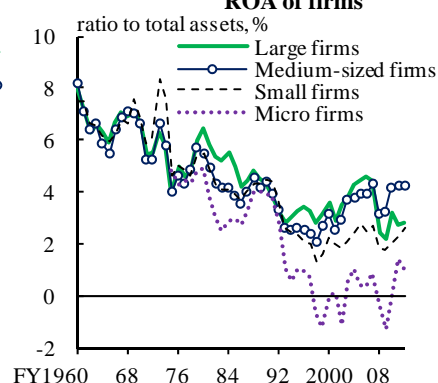


Notes: 1. The latest data are as of fiscal 2012.

2. For details on the size of firms, see Note 2 in Chart II-2-1.
3. Capital adequacy ratio = net assets / total assets.

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

Chart II-2-3: Operating profit ROA of firms^{1,2}



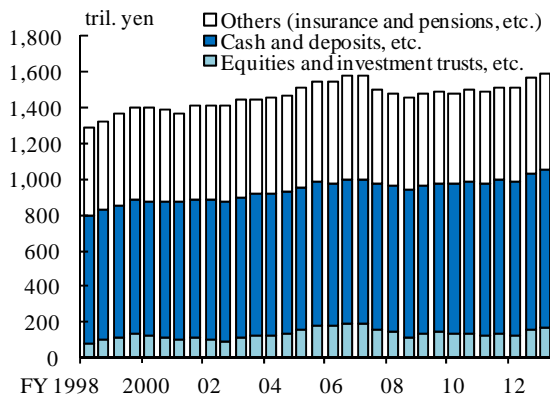
Notes: 1. The latest data are as of fiscal 2012.

2. For details on the size of firms, see Note 2 in Chart II-2-1.

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

The employment and income situation in the household sector has shown some improvement. On the household assets side, the ratio of cash and deposits to total financial assets has generally been declining since 2012, while the ratio of risky assets including investment trusts rose slightly, against the backdrop of improved business sentiment and the rise in stock prices (Charts II-2-4 to II-2-7). Furthermore, as housing investment has increased, the outstanding amount of housing loans has continued to increase, as described later. However, principal and interest repayments relative to income for households with housing loans have generally remained high (Chart II-2-8).

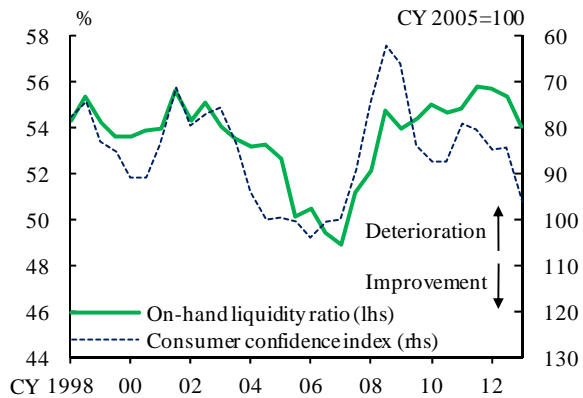
Chart II-2-4: Financial assets of households^{1,2,3}



Notes: 1. The latest data are as of end-June 2013.
 2. "Cash and deposits, etc." includes cash and deposits, JGBs and FILP (fiscal investment and loan program) bonds. "Equities and investment trusts, etc." includes equities, investment trusts, outward investment in securities, and foreign currency deposits.
 3. Changes in the outstanding amount of financial assets are partly attributable to movements in market value.

Source: BOJ, "Flow of funds accounts."

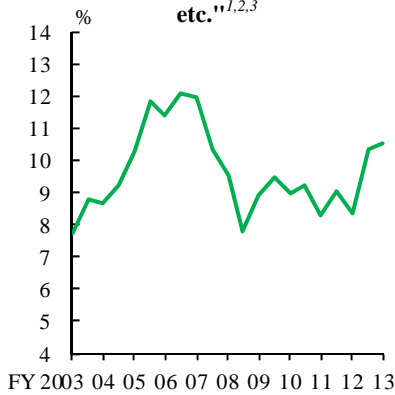
Chart II-2-5: On-hand liquidity ratio and consumer confidence index^{1,2,3}



Notes: 1. The latest data are as of end-June 2013 for the on-hand liquidity ratio and the average from January to June 2013 for the consumer confidence index.
 2. The on-hand liquidity ratio is the ratio of cash and deposits to financial assets of households.
 3. Changes in the outstanding amount of financial assets are partly attributable to movements in market value.

Sources: Cabinet Office, "Consumer confidence survey"; BOJ, "Flow of funds accounts."

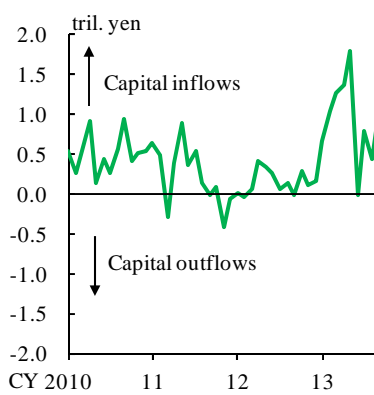
Chart II-2-6: Ratio of "equities and investment trusts, etc."^{1,2,3}



Notes: 1. The latest data are as of end-June 2013.
 2. For details, see Note 2 in Chart II-2-4. The ratio to household financial assets.
 3. Changes in the outstanding amount of financial assets are partly attributable to movements in market value.

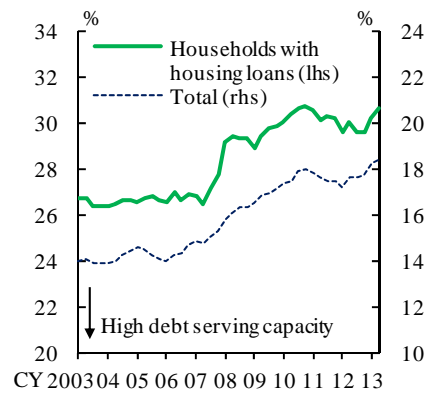
Source: BOJ, "Flow of funds accounts."

Chart II-2-7: Capital flows to investment trusts¹



Note: 1. The latest data are as of September 2013.
 Source: Investment Trusts Association, Japan.

Chart II-2-8: Household debt servicing capacity^{1,2}

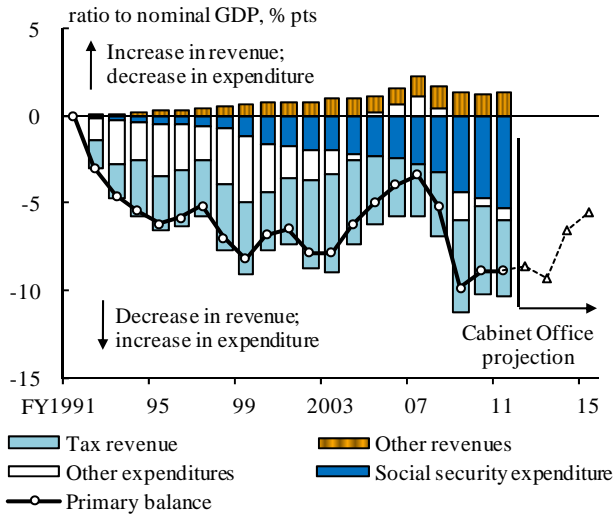


Notes: 1. The latest data are as of the April-June quarter of 2013.
 2. Ratio of principal and interest repayments to disposable income; 4-quarter moving averages.
 Source: Ministry of Internal Affairs and Communications, "Family income and expenditure survey."

Japan has continued to run fiscal deficits, and government debt has risen (Charts II-2-9 and II-2-10). In its Medium-Term Fiscal Plan, the government indicated that it would halve the fiscal 2010 national and local government primary deficit to GDP ratio by fiscal 2015. Consistent efforts to achieve fiscal consolidation in line with the plan are

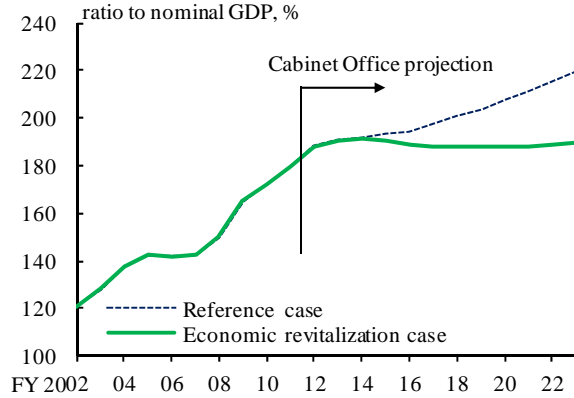
important.

Chart II-2-9: Primary balance^{1,2,3}



Notes: 1. The figures show cumulative changes from fiscal 1991. The data are for the central and local governments.
 2. 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 social security funds.
 3. Breakdown figures are the Bank of Japan's estimates. The primary balances from fiscal 2012 to fiscal 2015 are Cabinet Office estimates.
 Sources: Cabinet Office, "National accounts," "Economic and fiscal projections for medium to long term analysis"; BOJ.

Chart II-2-10: Gross debt of central and local governments^{1,2}



Notes: 1. The average real growth rate over 10 years (fiscal 2013 to fiscal 2022) is assumed to be approximately 2 percent in the economic revitalization case and approximately 1 percent in the reference case. The average nominal growth rate over 10 years is assumed to be approximately 3 percent in the former case and approximately 2 percent in the latter.
 2. Sources of revenue or expenses for post-disaster restoration and rebuilding are not included.
 Source: Cabinet Office, "Economic and fiscal projections for medium to long term analysis."

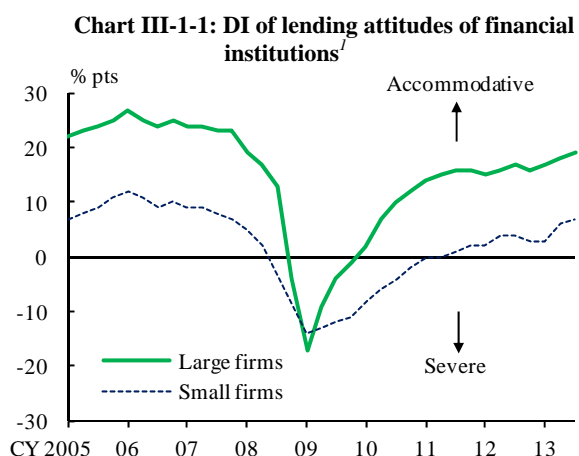
III. Examination of financial intermediation -- focusing on developments after introduction of quantitative and qualitative monetary easing

This chapter examines financial intermediation, focusing on developments after the Bank's introduction of QQE.

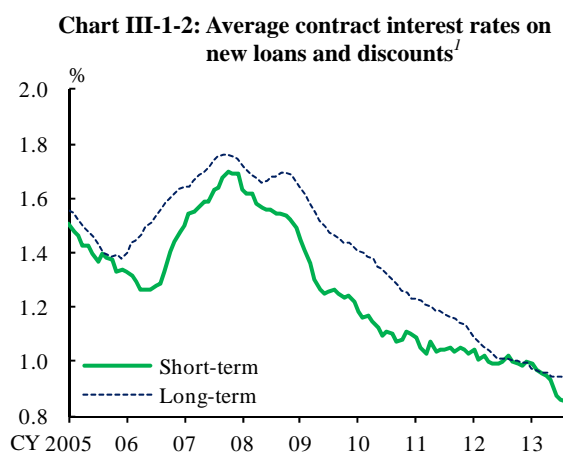
A. Financial conditions among firms and households

Financial conditions among firms and households have become more accommodative compared with those at the time of the previous *Report*. Although long-term interest rates temporarily rose to a small degree around May 2013, funding conditions for firms and households have remained accommodative.

Since the beginning of fiscal 2013, the proportion of firms perceiving financial institutions' lending attitudes as "accommodative" has exceeded that perceiving them as "severe" by a somewhat larger margin (Chart III-1-1). Firms' funding costs have continued to decline (Chart III-1-2). In this situation, the outstanding amount of funding has increased at firms (Chart III-1-3). Although interest rates on housing loans temporarily rose around May 2013 due to a slight increase in long-term interest rates, they have recently declined, and the growth rate in the outstanding amount of housing loans has remained relatively high (Charts III-1-4 and III-1-5).

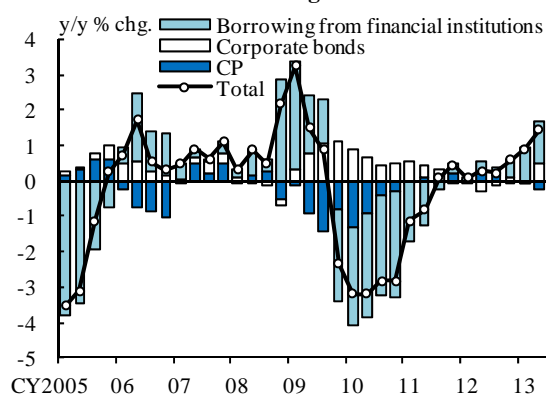


Note: 1. The latest data are as of September 2013.
Source: BOJ, "Tankan."



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

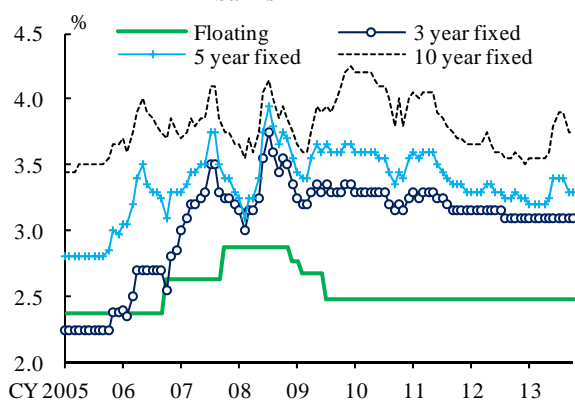
Chart III-1-3: Outstanding amount of firm funding^{1,2}



Notes: 1. The latest data are as of end-June 2013.
2. CP issued by banks is excluded. Corporate bonds issued by banks and those issued in overseas markets are included.

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

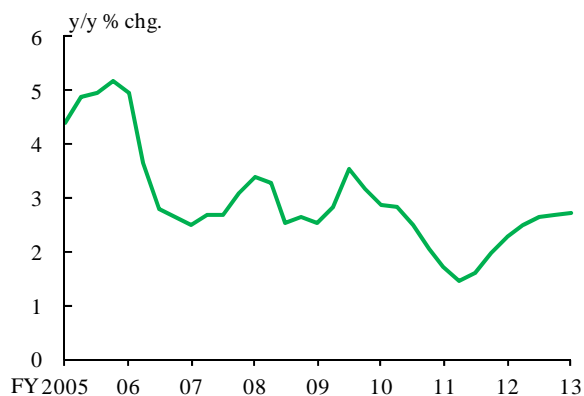
Chart III-1-4: Housing loan rates posted by city banks^{1,2}



Notes: 1. The latest data are as of October 2013.
2. Median of major city banks.

Sources: Published accounts of each bank; Housing Loan Progress Association.

Chart III-1-5: Housing loans outstanding^{1,2}



Notes: 1. Banks and *shinkin* banks are counted. The latest data are as of end-June 2013.

2. Housing loans outstanding are household loans for fixed investment for housing funds and consumer credit (with installment repayments).

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

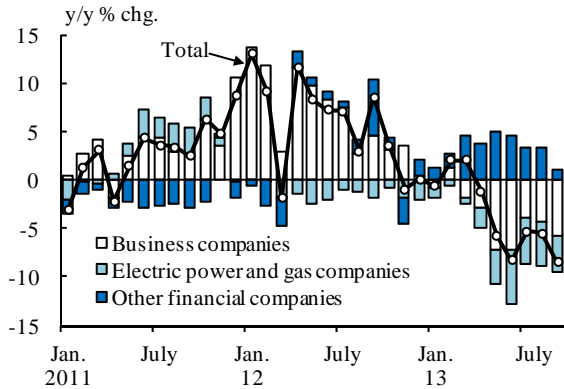
B. Financial intermediation through financial markets

1. CP and corporate bond markets

The year-on-year rate of change in the outstanding amount of CP has been negative since the beginning of fiscal 2013 (Chart III-2-1). This seems to be due to some degree to a shift in funding sources from CP to others. While issuance of CP in a wide range of industries, such as business companies (excluding electric power and gas companies and other financial companies) and electric power and gas companies, has been decreasing, these industries' bank borrowing and bond issuance have been growing. Issuing conditions for CP have remained favorable, as issuance rates on CP have been stable at

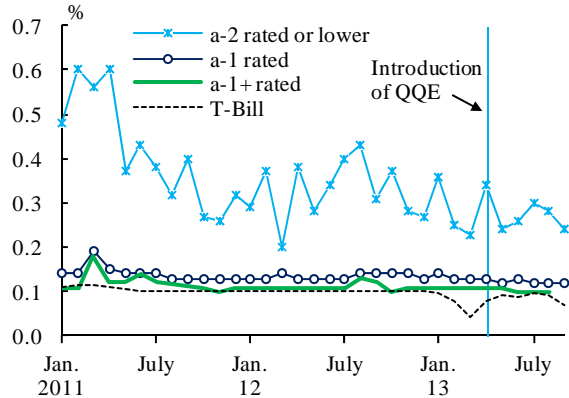
low levels (Chart III-2-2).

Chart III-2-1: Outstanding amount of CP^{1,2,3}



Notes: 1. "Business companies" excludes electric power and gas companies and other financial companies.
 2. "Other financial companies" includes leasing companies, credit card companies, consumer finance companies, and securities finance companies.
 3. The latest data are as of end-September 2013.
 Source: Japan Securities Depository Center.

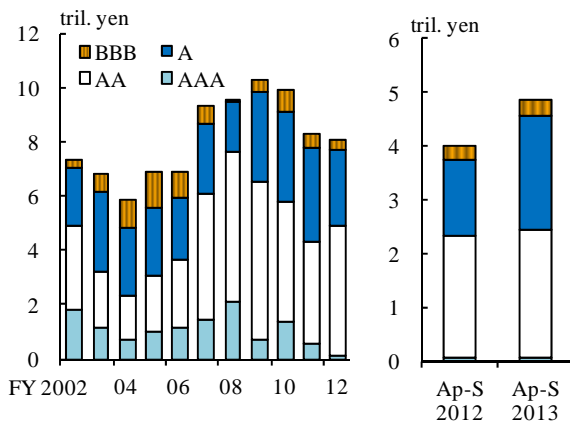
Chart III-2-2: CP issuance rates^{1,2}



Notes: 1. Monthly average 3-month rates weighted by issuance volume.
 2. The latest data are as of September 2013.
 Sources: Bloomberg; Japan Bond Trading; Japan Securities Depository Center.

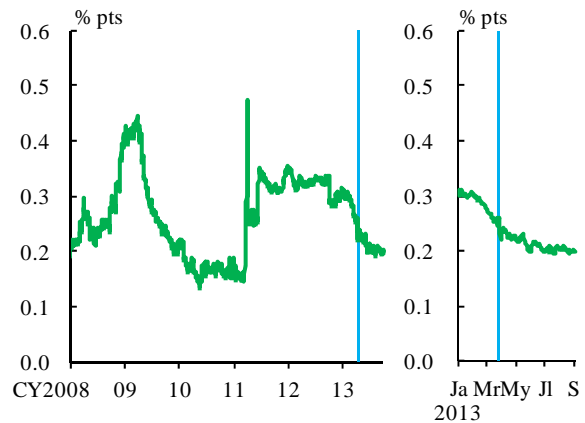
Since fiscal 2013, the amount of corporate bonds issued has been larger than in the previous year amid continued solid demand from investors (Chart III-2-3). Yield spreads between AA-rated corporate bonds and JGBs have been narrowing, albeit moderately, and issuing conditions for corporate bonds have remained favorable on the whole (Chart III-2-4).

Chart III-2-3: Amount of corporate bonds issued¹



Note: 1. Based on the launch date.
 Sources: Capital Eye; I-N Information Systems.

Chart III-2-4: Yield spreads between corporate bonds and JGBs^{1,2,3}



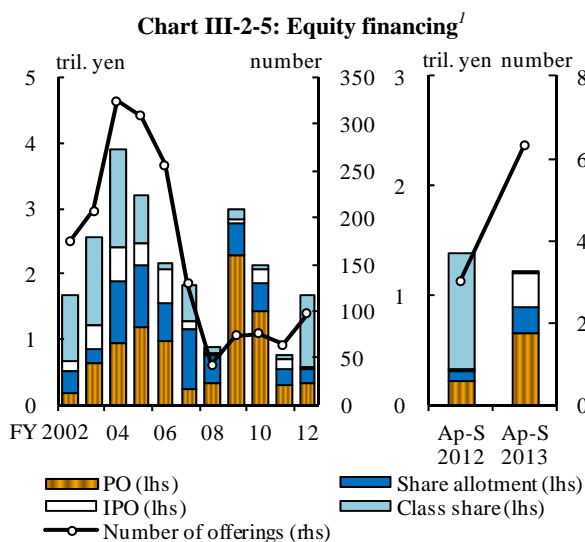
Notes: 1. Rated AA by R&I.
 2. Average yield spreads of bonds with a residual maturity of 3 years or more but less than 7 years.
 3. The latest data are as of September 30, 2013.
 Source: Japan Securities Dealers Association.

2. Stock and real estate investment trust markets

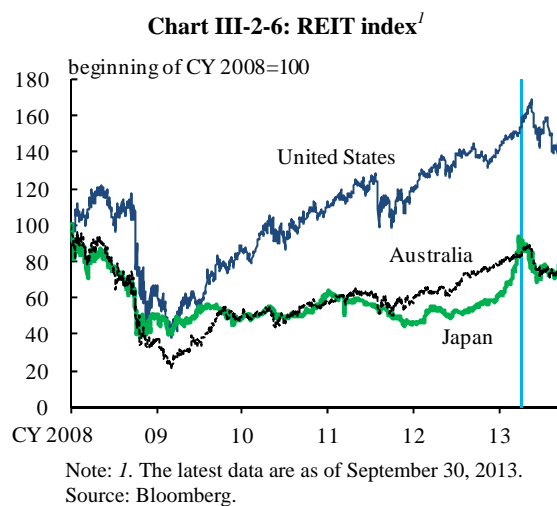
Regarding equity financing through the stock market since fiscal 2013, while the amount of funds raised has been more or less unchanged, the number has been larger than in the previous year (Chart III-2-5).

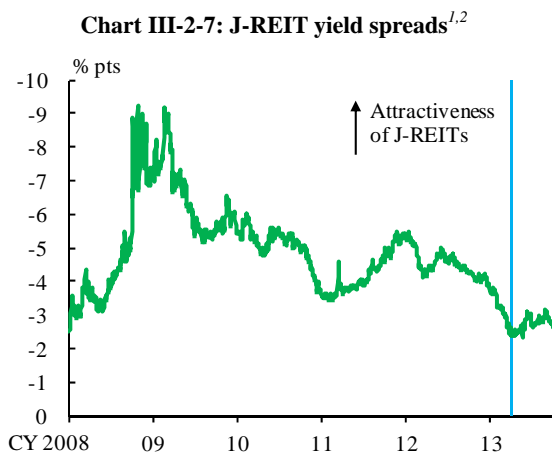
Financing by Japan real estate investment trusts (J-REITs) has been increasing. Investment unit prices for J-REITs rose significantly from autumn 2012, reflecting improved investor sentiment, which stemmed from a rise in stock prices, and expectations of improvement in the office market. After fiscal 2013 began, however, they have temporarily declined somewhat, partly due to their diminished attractiveness based on yield spreads (Charts III-2-6 and III-2-7). Nonetheless, new listings and public offerings (POs) by J-REITs have been more actively undertaken, and these amounts already represent the second-highest level on record after the historical high set in 2006 (Chart III-2-8). In addition, an international comparison of REIT markets shows that excluding the United States, which enjoys the overwhelming share of the global REIT market, Japan accounts for a certain share (Chart III-2-9).

Meanwhile, the outstanding amount of securitized products has been decreasing almost consistently since the Lehman shock (Chart III-2-10).



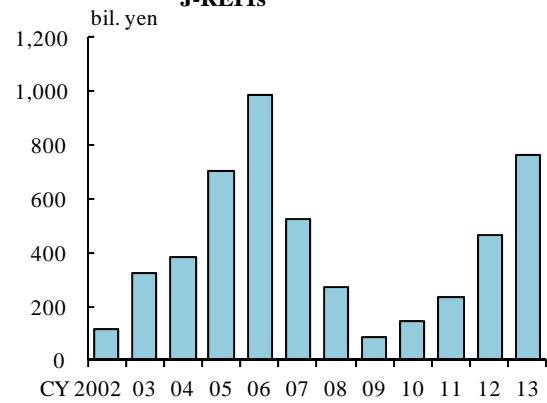
Note: 1. Based on the issuance or effective date.
 Source: I-N Information Systems.





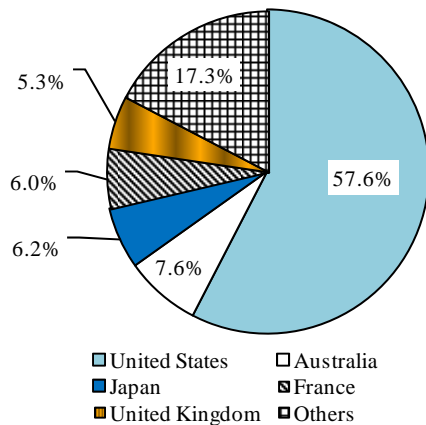
Notes: 1. 10-year JGB yields - J-REIT dividend yields.
 2. The latest data are as of September 30, 2013.
 Source: Bloomberg.

Chart III-2-8: Financing through POs and IPOs by J-REITs^{1,2}



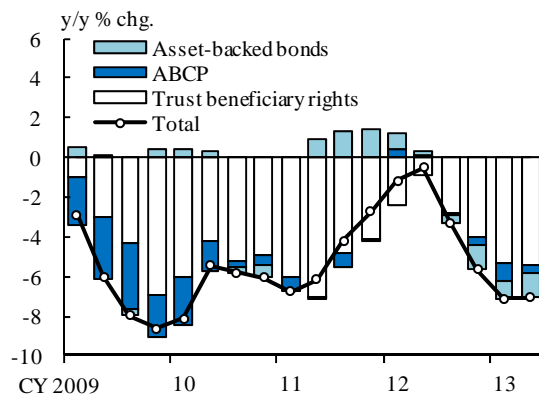
Notes: 1. Based on the issuance or effective date.
 2. The data for 2013 represent the total up to September 30.
 Source: I-N Information Systems.

Chart III-2-9: International comparison of REIT markets^{1,2,3}



Notes: 1. Market capitalization of each country's REIT market.
 2. The values are converted to U.S. dollars using foreign exchange rates on September 30, 2013.
 3. The data are as of September 30, 2013.
 Source: Bloomberg.

Chart III-2-10: Outstanding amount of securitized products^{1,2}



Notes: 1. Securitized products in the form of securities.
 2. The latest data are as of end-June 2013.
 Source: BOJ, "Flow of funds accounts."

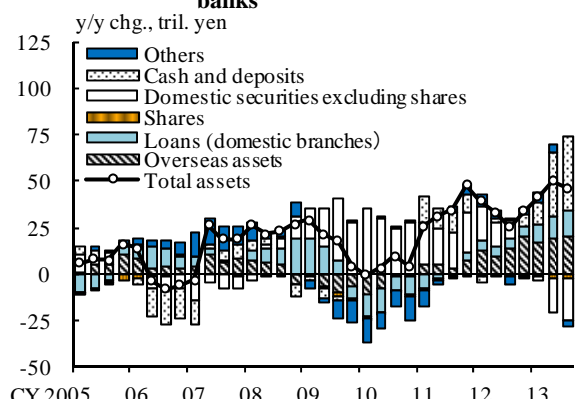
C. Developments in investment by financial intermediaries

This section outlines developments in investment of a wide range of financial intermediaries after the introduction of QQE.

Financial institutions such as banks and *shinkin* banks significantly reduced their holdings of domestic bonds, as the Bank's JGB purchases expanded (Chart III-3-1). On the other hand, cash and deposits such as current accounts held at the Bank have increased, particularly at major banks, and loans outstanding have risen (Chart III-3-2).

Under a dramatic change in investment portfolios, the outstanding amount of investment has continued to increase as a whole. This was because the decline in domestic bondholdings did not outpace the increase in cash and deposits, and other assets such as domestic loans and overseas assets increased.

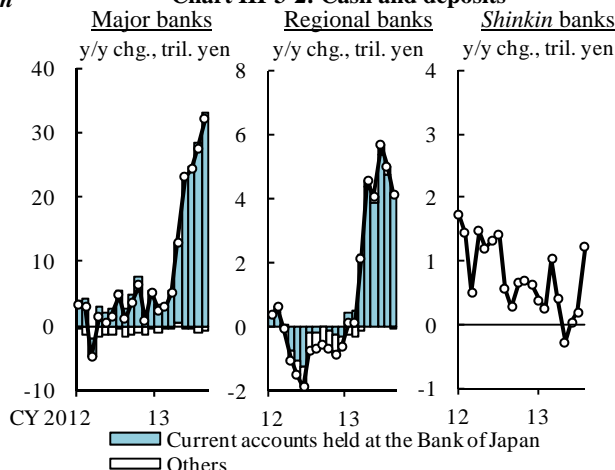
Chart III-3-1: Asset investment of banks and *shinkin* banks^{1,2,3}



Notes: 1. Banks and *shinkin* banks are counted. Both domestic and overseas branches are included.
 2. The data for domestic branches are based on an average amount outstanding. The data for overseas branches are based on an amount outstanding of end-month. The chart shows changes from the last month of each quarter of the previous year. The latest data are changes from August 2012 to August 2013.
 3. Overseas assets are the sum of foreign securities and loans of overseas branches.

Source: BOJ.

Chart III-3-2: Cash and deposits¹



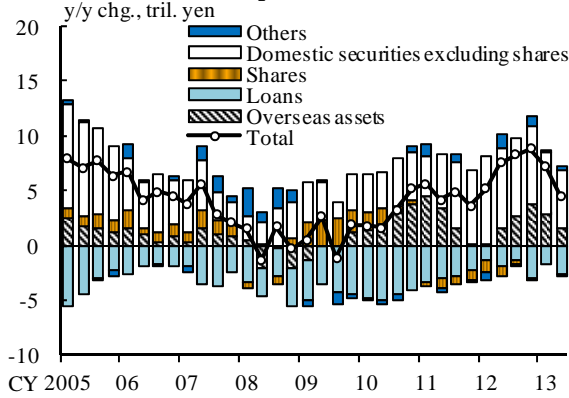
Note: 1. The latest data are as of end-August 2013.
 Source: BOJ.

Meanwhile, no major changes have been observed in investment by financial intermediaries other than financial institutions, such as institutional investors. Investment of life insurance companies in overseas assets and domestic stocks has remained the same, partly due to heightened uncertainty about future developments in overseas economies and financial markets, although the pace of increase in investment in domestic bonds slowed somewhat (Chart III-3-3). Pension funds have reduced their investment in overseas assets and domestic stocks (Chart III-3-4).

As mentioned above, developments in insurance companies and pension funds are based on the Bank's "Flow of funds accounts" available as of June 2013, but the trend in these developments has remained more or less unchanged thereafter. Looking at recent developments based on available monthly statistics, no major changes have been observed in insurance companies' trading of domestic stocks and overseas assets, as their JGB purchases have continued to outpace their bond sales (Charts III-3-5 to III-3-7). Trust banks, which are entrusted with pension assets, have recently traded small amounts of domestic stocks and overseas assets, as the rise in stock prices and yen depreciation

observed since 2012 came to a temporary halt.

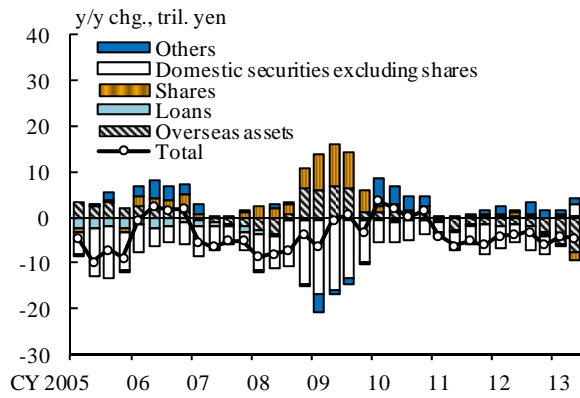
Chart III-3-3: Asset investment of life insurance companies^{1,2}



Notes: 1. The latest data are as of June 2013. The chart shows the sum of financial transactions in the last 4 quarters.
2. "Others" includes cash and deposits. "Shares" includes investment trust beneficiary certificates and other equities. "Loans" excludes repurchase agreements and securities lending transactions.

Source: BOJ, "Flow of funds accounts."

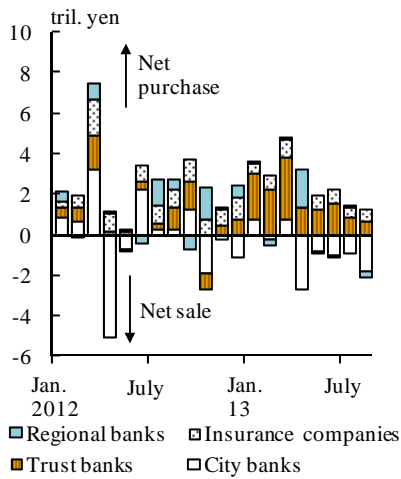
Chart III-3-4: Asset investment of pension funds^{1,2}



Notes: 1. The latest data are as of June 2013. The chart shows the sum of financial transactions in the last 4 quarters.
2. "Others" includes cash and deposits. "Shares" includes investment trust beneficiary certificates and other equities. "Loans" excludes repurchase agreements and securities lending transactions.

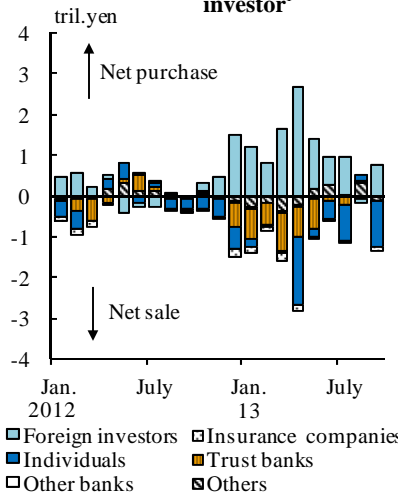
Source: BOJ, "Flow of funds accounts."

Chart III-3-5: Trading volume of government bond by type of investor¹



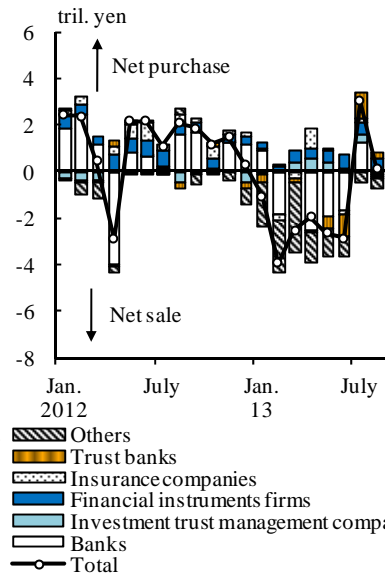
Note: 1. The latest data are as of August 2013. Short-term securities are excluded.
Source: Japan Securities Dealers Association.

Chart III-3-6: Trading volume of Japanese stocks by type of investor¹



Note: 1. The latest data are as of September 2013.
Source: Tokyo Stock Exchange.

Chart III-3-7: Outward portfolio investment by type of investor¹



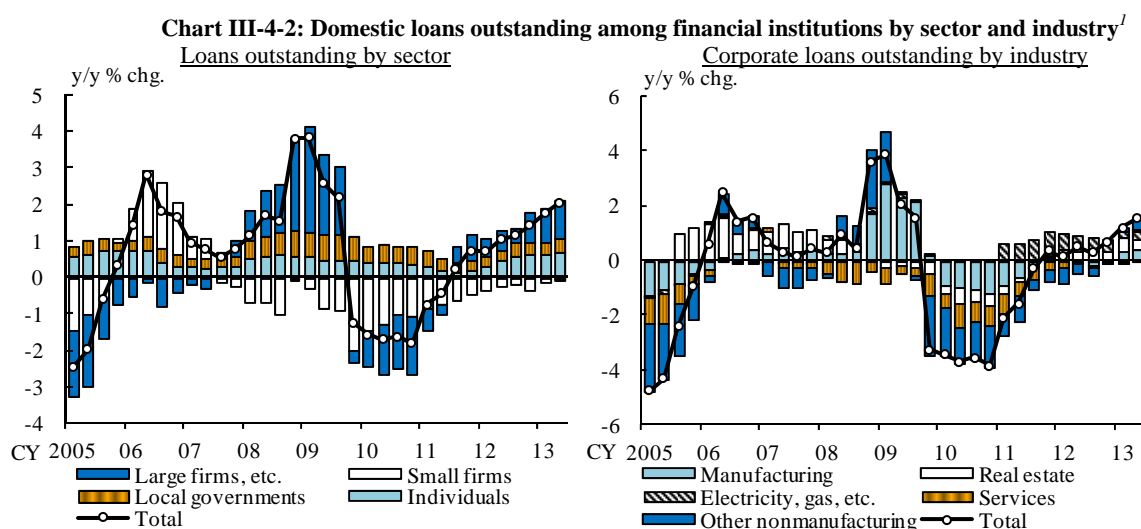
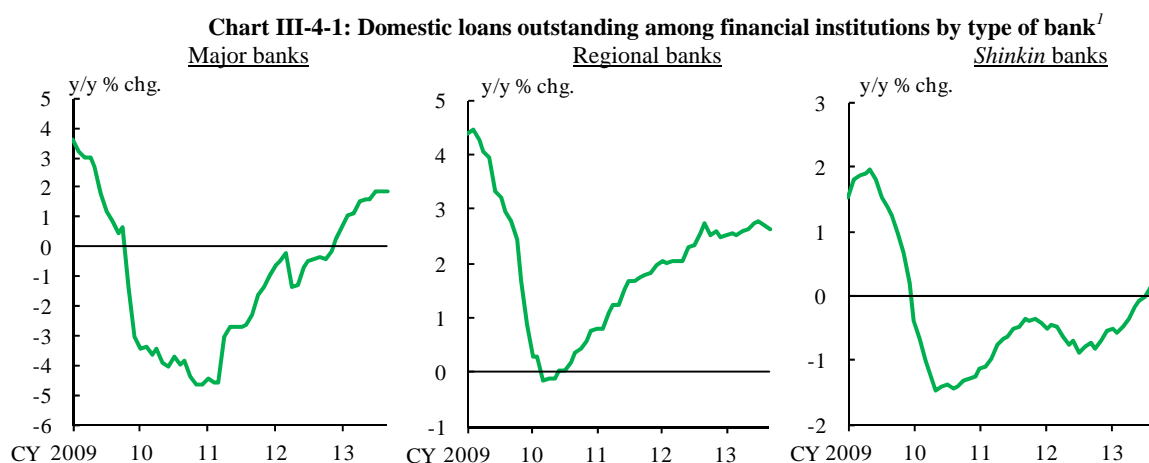
Note: 1. The latest data are as of August 2013.
Source: Ministry of Finance, "Balance of payments."

D. Financial institution loans and securities investment

We look into detailed developments in investment of financial institutions as briefly discussed above.

1. Developments in domestic loans

The amount of financial institutions' domestic loans outstanding has accelerated its growth (Chart III-4-1). Loans outstanding at *shinkin* banks as of August 2013 exceeded the previous year's level for the first time in 3 years and 8 months. The breakdown by borrower shows that loans to large firms have grown more rapidly and the rate of decline in loans to small and medium-sized firms has slowed (the left-hand side of Chart III-4-2). Growth in loans to individuals has remained relatively high.

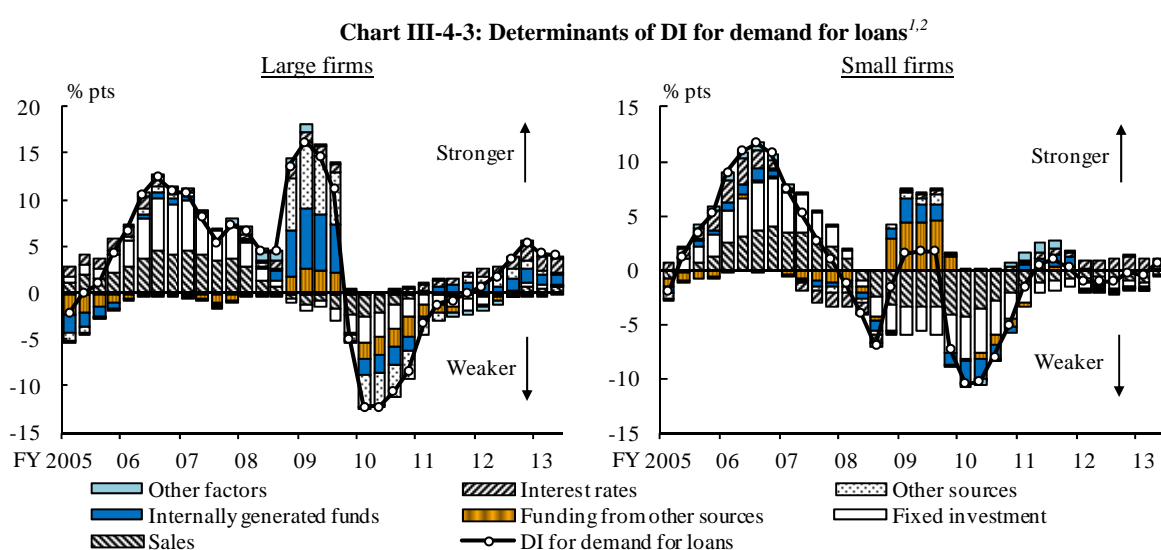


By industry, the outstanding amount of loans to electric power companies has increased since the Great East Japan Earthquake of 2011, and that of loans to real estate companies has recently grown at a faster pace (the right-hand side of Chart III-4-2). The outstanding amount of loans to firms in the medical care and welfare industry, which have high growth potential, has been trending upward, and loans related to mergers and acquisitions involving overseas firms, and to resources and energy business, have also increased.

Firms' demand for funds and financial institutions' lending attitudes

The faster rate of growth seen in financial institution loans since the beginning of fiscal 2013 is due to two factors: firms' demand for funds and financial institutions' lending attitudes.

The loan survey of financial institutions showed that many such institutions had continued to observe greater demand for funds among large firms over the past three months (Chart III-4-3). Although many institutions responded that small and medium-sized firms' demand for funds had decreased over the past three months, the number of institutions responding that such demand increased was recently almost the same as that stating such demand decreased. Demand for funds among small and medium-sized firms was relatively weak as a whole. However, demand for funds has gradually been increasing in a wide range of areas including loans to real estate companies, loans for business fixed investment at firms exhibiting better performance, and loans for business expansion to areas with growth potential including renewable energy and medical care and welfare.



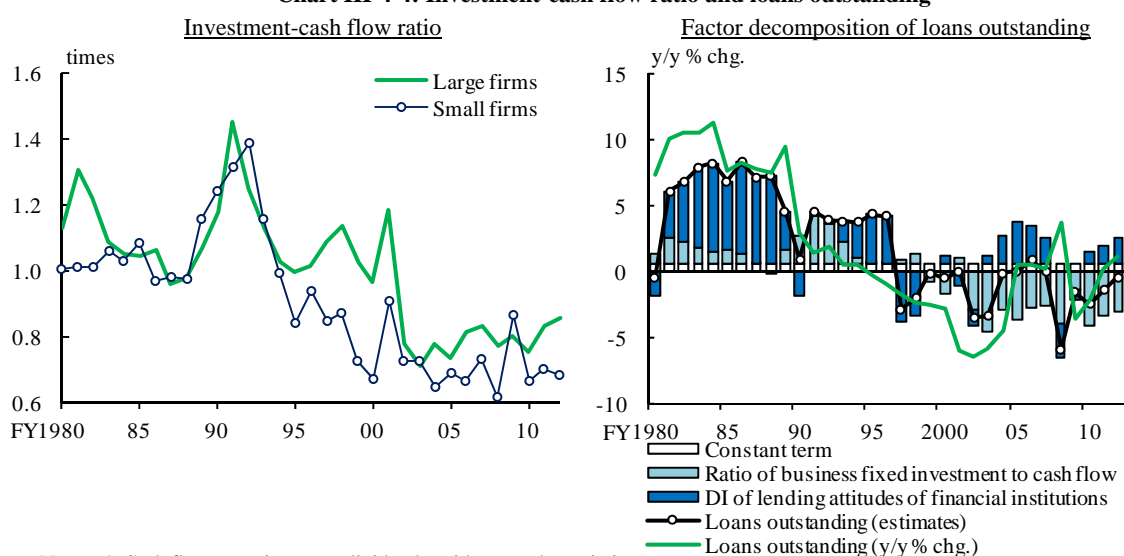
Notes: 1. The latest data are as of July 2013; 4-quarter moving averages.

2. DI for demand for loans = (percentage of respondents selecting "substantially stronger" + percentage of respondents selecting "moderately stronger" × 0.5) - (percentage of respondents selecting "substantially weaker" + percentage of respondents selecting "moderately weaker" × 0.5).

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

Firms' demand for funds has gradually been increasing as a whole, but the momentum of growth is not strong enough yet. This is because firms have continued to take a conservative financial management approach by not allowing business fixed investment to exceed their cash flow over the past decade, and this trend persists among firms (the left-hand side of Chart III-4-4). The estimated relationship between loans outstanding and business fixed investment (the business fixed investment to cash flow ratio) is consistent with the view that the low level of business fixed investment relative to that of cash flow has depressed growth in loans outstanding (the right-hand side of Chart III-4-4).² While positive signs are now being seen in economic activity in Japan, it is worth keeping an eye on how demand for funds changes in future.

Chart III-4-4: Investment-cash flow ratio and loans outstanding^{1,2}



Notes: 1. Cash flow = net income - dividends paid, etc. + depreciation expenses.

2. See Note 2 in Chart II-2-1 for the details on the size of firms.

Sources: Ministry of Finance, "Financial statement statistics of corporations by industry"; BOJ.

² The relationship between loans outstanding and business fixed investment was estimated by adopting the least squares method, using the following variables: the year-on-year rate of change in loans outstanding among banks and *shinkin* banks as a dependent variable; and a constant term, the ratio of business fixed investment to cash flow (relative to the logarithmic value), and the diffusion index (DI) of financial institutions' lending attitudes (loan supply factor) as independent variables. The source of data on loans outstanding is the Bank's "Loans and bills discounted by sector (loans to firms; all enterprises)," that of the ratio of business fixed investment to cash flow is the Ministry of Finance's "Financial statements statistics of corporations by industry (all enterprises)," and that of financial institutions' lending attitudes is the Bank's "Short-term economic survey of enterprises in Japan (all enterprises)." The data are annual data. The estimation period was from fiscal 1980 to fiscal 2012, and the number of observations was 33. The estimation results are shown in the following table. *** indicates statistical significance at the 1 percent level.

	Constant term	Ratio of business fixed investment	Financial institutions' lending attitudes	Standard deviation	R ²
Estimations (standard deviation)	0.598 (0.780)	11.22*** (3.321)	0.197*** (0.043)	3.672	0.528

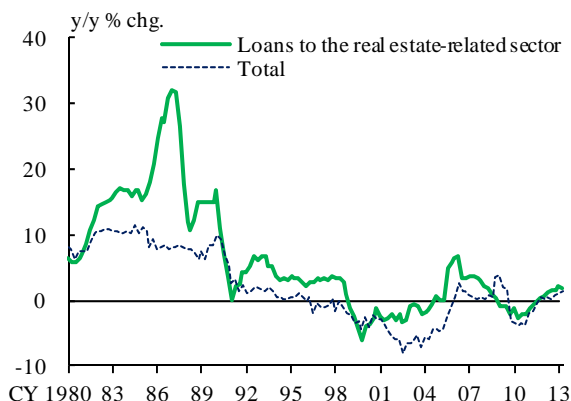
On the other hand, financial institutions' lending attitudes have become more accommodative since the beginning of fiscal 2013. Specifically, an increasing number of financial institutions have improved their risk management arrangements and have begun to focus on further expanding loans by establishing funds for reinforcing lending, introducing loan products without collateral to a wider range of borrower firms, giving branch managers greater decision-making authority, and raising credit line limits.³ Therefore, lending attitudes of financial institutions as perceived by firms have become more accommodative (Chart III-1-1).

Real estate-related loans

The outstanding amount of real estate-related loans extended by financial institutions has recently grown at a higher rate (Chart III-4-5). In the real estate industry, business conditions have continued to improve, and business sentiment is better than that in other industries because office rents in metropolitan areas are no longer declining and the condominium contracting rate has recovered (Charts III-4-6 and III-4-7). In this situation, property acquisitions by real estate companies, REITs, and funds have increased and business fixed investment has been at a high level (Chart III-4-8). Loans to individuals for the construction of rental houses have also increased. Nonetheless, growth in real estate-related loans remains generally the same as that observed in overall lending (Chart III-4-5).

³ The government has been implementing measures to promote firms' innovations and investments aimed at raising growth potential. The government has also been taking measures to promote smooth financial intermediation: a range of measures to support funding among small and medium-sized firms; and the clarification of guidelines for financial inspections in response to the expiration of the Act Concerning Temporary Measures to Facilitate Financing for Small and Medium-Sized Enterprises (SMEs), etc. -- the SME Financing Facilitation Act.

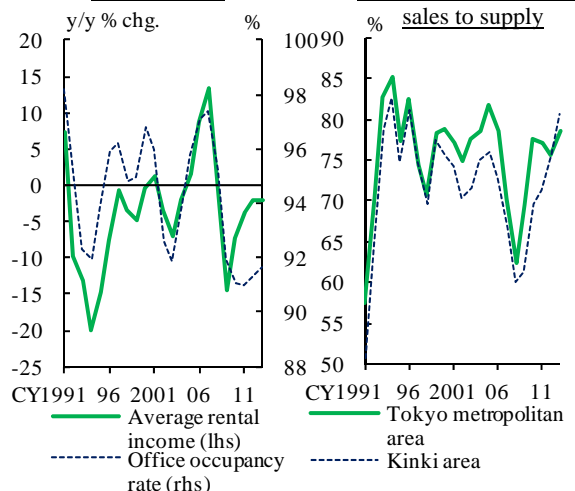
Chart III-4-5: Loans outstanding for real estate-related loans¹



Note: 1. Banks and *shinkin* banks are counted. The latest data are as of end-June 2013.

Source: BOJ.

Chart III-4-6: Real estate market conditions^{1,2}

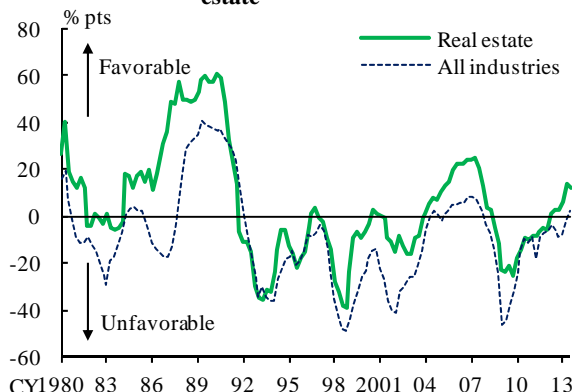


Notes: 1. In the left-hand chart, offices in the Tokyo business district (Chiyoda-City, Chuo-City, Minato-City, Shinjuku-City, and Shibuya-City in Tokyo) are counted. The latest data are the average from January to September 2013.

2. In the right-hand chart, the latest data are the average from January to August 2013.

Sources: Financial Quest; Miki Shoji Co., Ltd.

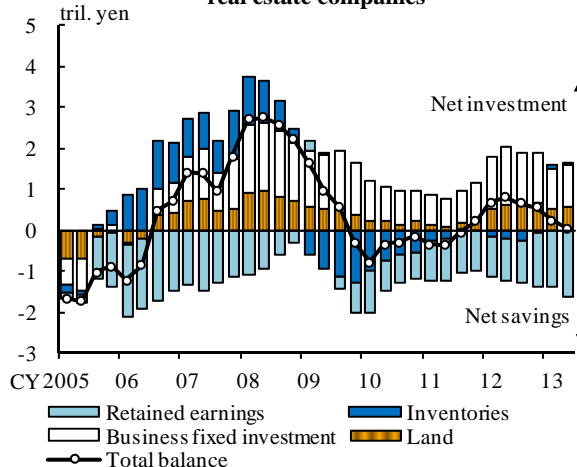
Chart III-4-7: DI of business conditions for real estate¹



Note: 1. The latest data are as of September 2013.

Source: BOJ, "Tankan."

Chart III-4-8: Investment-saving balance of large real estate companies¹



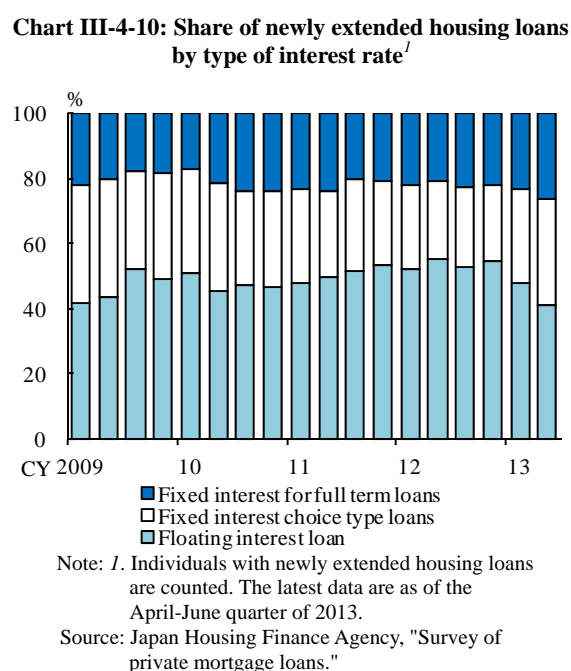
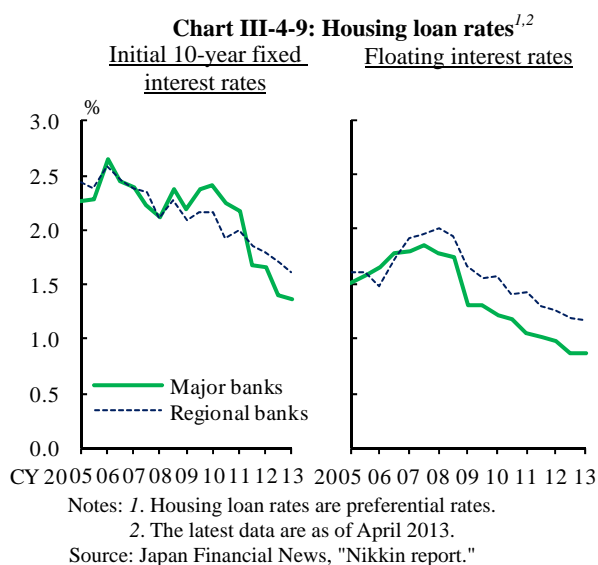
Note: 1. The latest data are as of the April-June quarter of 2013; annualized figures of 4-quarter moving averages.

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

Housing loans

The outstanding amount of housing loans extended by financial institutions has continued to increase (Chart III-1-5). This is because housing investment has increased and financial institutions have been active in increasing the volume of housing loans by expanding preferred discounts of loan interest payments. Interest rates on housing loans

have generally remained at low levels (Charts III-1-4 and III-4-9). As for interest rate preferences on housing loans, although floating interest rates had been on an uptrend in recent years, the proportion of housing loans with fixed interest rates increased somewhat, reflecting a marginal rise in long-term interest rates around May 2013 (Chart III-4-10).

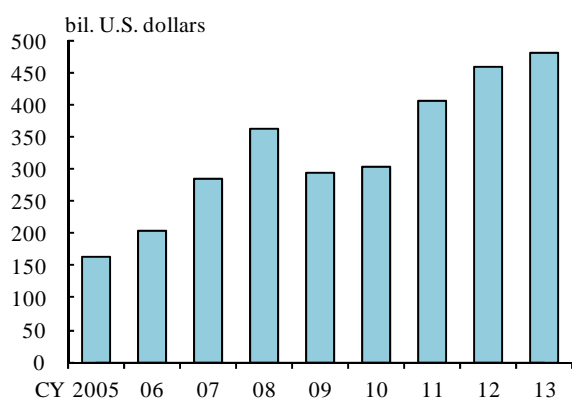


2. Developments in overseas loans

Banks, particularly major banks, have continued to actively extend overseas loans. This is because (1) it is necessary to respond to the expansion of overseas operations by Japanese firms by making a wide range of financial services available; (2) it is a good opportunity for Japan's banks to expand their customer bases overseas when overseas financial institutions are reducing their assets; and (3) banks' overseas loans are highly profitable, as seen in larger interest rate spreads and fees and commissions associated with loans such as syndicated loan facilities.⁴ Although growth in overseas loans by major banks has recently slowed somewhat due to the lackluster performance partly seen in overseas economies and a gradual leveling out in the asset reduction programs of overseas financial institutions, overseas loans have continued to increase (Charts III-4-11 and III-4-12). Some Japan's banks have directly invested in, engaged in mergers and acquisitions with, and engaged in business tie-ups with overseas financial institutions.

⁴ For details, see the April 2013 issue of the *Report*.

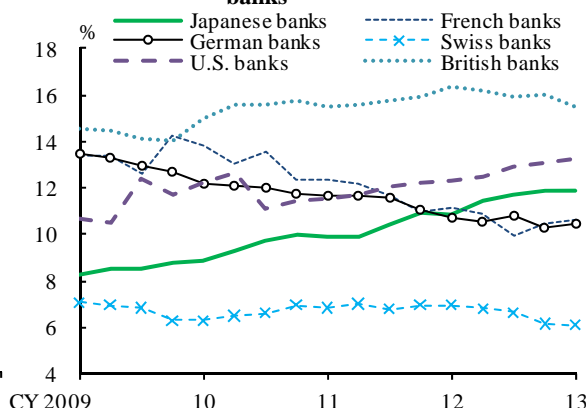
Chart III-4-11: Overseas loans of major banks¹



Note: 1. The data are as of end-December of each year, converted to U.S. dollars. For 2013, the data are as of end-August, converted to U.S. dollars. The chart shows loans outstanding at overseas branches of major banks.

Source: BOJ.

Chart III-4-12: Share in cross-border claims of banks^{1,2,3}



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

2. The share calculations are based on cross-border claims on the banking, public, and non bank private sectors on a consolidated basis. Banks' claims among overseas offices, branches, and subsidiaries are included, but inter-office activities are excluded.

3. Local claims booked by overseas entities in local currency are included.

Source: BIS, "Consolidated banking statistics."

An increased number of regional financial institutions have strengthened their arrangements to support overseas business operations conducted by local firms. Regional financial institutions have established only some overseas branches over the past few years, but they have been active in establishing overseas representative offices, especially in Asia other than China (Charts III-4-13 and III-4-14). They have also substantially increased business tie-ups with local banks in Asia. Through such initiatives, regional financial institutions appear to be steadily enhancing their capacity to give information and provide funds by loans and guarantees to firms that wish to expand their business overseas.

Chart III-4-13: Number of overseas branches of regional banks¹

	FY2000	05	10	12
Total	23	14	15	16
United States	9	4	4	4
Europe	1	1	1	1
China	12	8	9	10
Asia other than China	1	1	1	1

Note: 1. Regional banks are counted. The data are as of the end of each fiscal year.

Source: Japanese Bankers Association, "Financial statements of all banks."

Chart III-4-14: Number of overseas entities of regional banks I¹

	CY2011	12	13
Total	83	91	94
United States	10	10	9
Europe	5	5	5
China	53	54	54
Asia other than China	11	19	23
Others	4	3	3

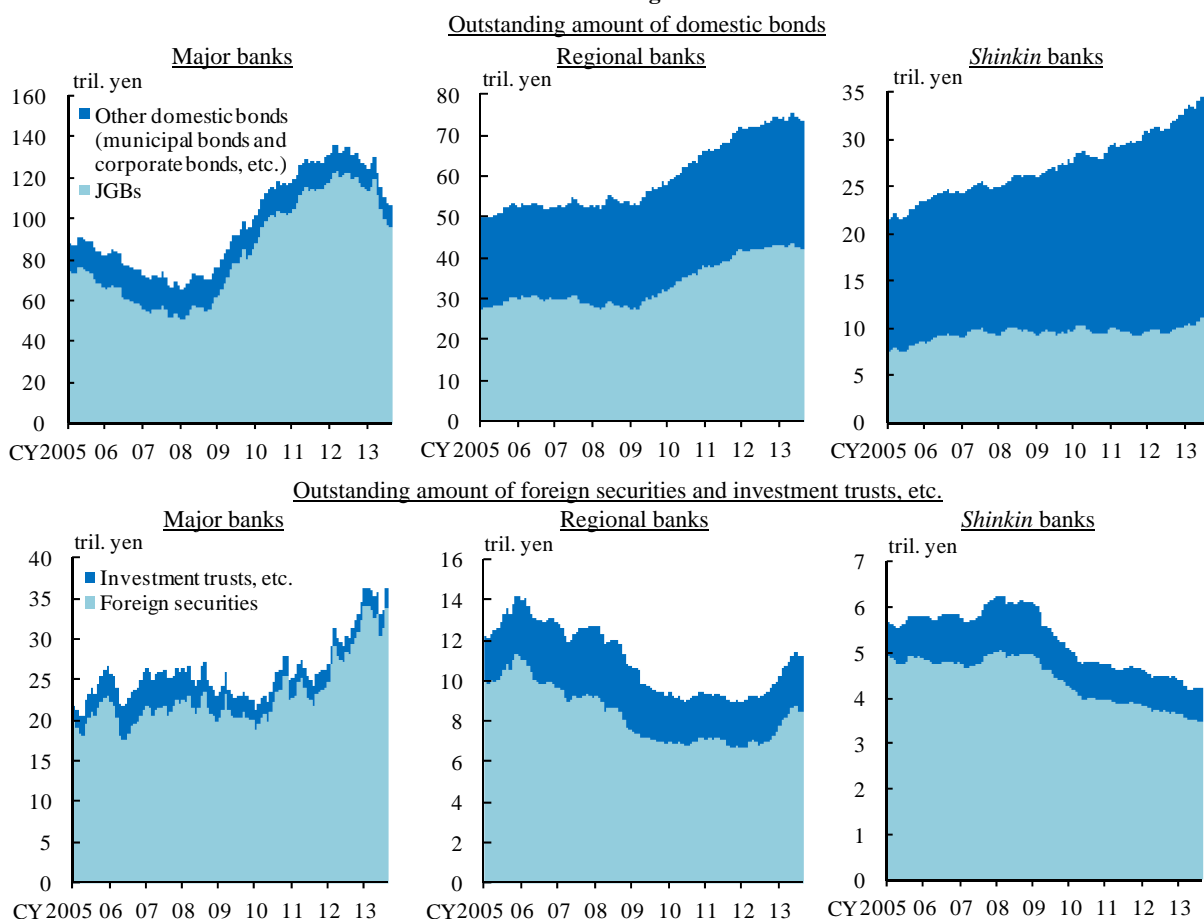
Note: 1. Regional banks I are counted. The data are as of August 1 in each year. The number of overseas entities is calculated as the sum of the numbers of overseas branches, subsidiaries and offices.

Source: Regional Banks Association of Japan, "Report on progress in region-based relationship banking by regional banks I."

3. Developments in securities investment

Financial institutions' investment in domestic bonds, particularly JGBs, continued to increase, but the outstanding amount of JGB holdings decreased at major banks after the introduction of QQE, as they became more concerned about an upward shift in yen interest rates (Chart III-4-15). Growth in the outstanding amount of JGB holdings has leveled off at regional financial institutions, given that some of them became careful over further increasing JGB holdings. The outstanding amount invested in risky assets other than yen interest rate instruments such as foreign securities and investment trusts followed a rising trend, but growth has recently been sluggish due to heightened uncertainty over developments in overseas economies and global financial markets.

Chart III-4-15: Outstanding amount of securities¹

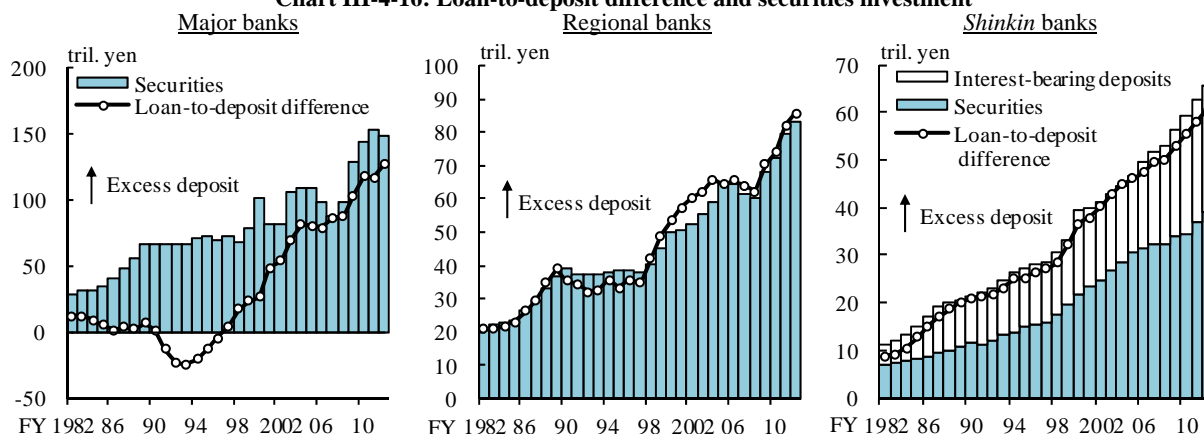


Note: 1. The latest data are as of August 2013.
Source: BOJ.

From a longer-term perspective, financial institutions' securities investment has been on an uptrend since the end of the 1990s (Chart III-4-16). This is because (1) the amount of deposits of financial institutions continued to exceed the amount of loans, i.e., a deposit

surplus, given that the household preference for safe assets and firms' excessive savings persisted; and (2) it was necessary to increase profits from securities investment to make up for reduced interest rate spreads on loans. Financial institutions have increasingly held longer duration JGBs and assets with higher yields such as municipal bonds, corporate bonds, foreign bonds, and investment trusts.

Chart III-4-16: Loan-to-deposit difference and securities investment¹



Note: 1. Domestic business sector. Loan-to-deposit difference = (deposits + CDs + bonds – checks – bills) – loans. "Interest-bearing deposits" of *shinkin* banks includes deposits with the Shinkin Central Bank. The latest data are as of fiscal 2012.
 Source: BOJ.

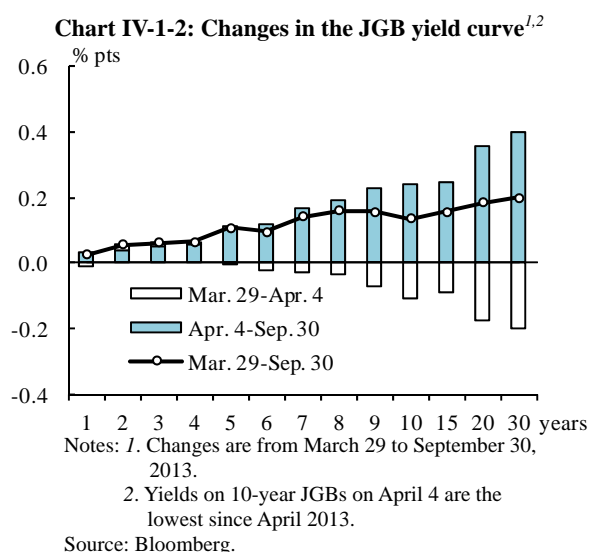
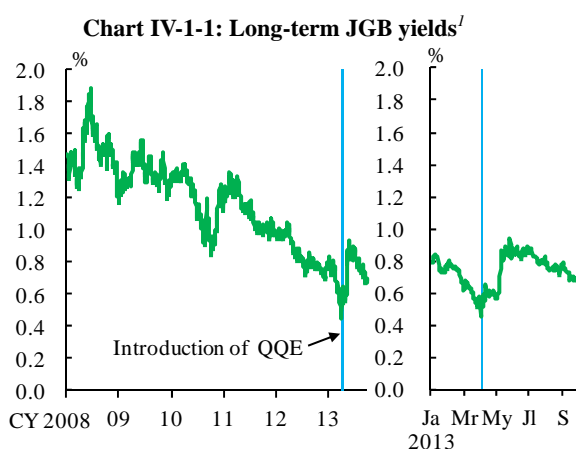
The deposit surplus at financial institutions was caused by the fact that firms and households remained risk-averse in funding and investment in view of the prolonged period of economic stagnation and deflation. Financial institutions appear to have implemented securities investment and conducted asset liability management (ALM) based on the environment described above. However, they have recently increased the amount of loans extended as positive signs have been widely observed in economic activity in Japan. In addition, as mentioned in Chapter II.B, households have slightly increased their share of risky assets including investment trusts. Although these recent changes are still small, we should monitor whether these changes become persistent or spread through Japan's economy. In these circumstances, it will be worth observing how financial institutions change their securities investment behavior in future.

IV. Risks observed in financial markets

In the Japanese government bond, stock, and foreign exchange markets, volatility temporarily increased after fiscal 2013 began, but it has since been declining moderately. This chapter reviews developments in financial markets after the introduction of QQE and examines the risks observed in the government bond, stock, and foreign exchange markets.

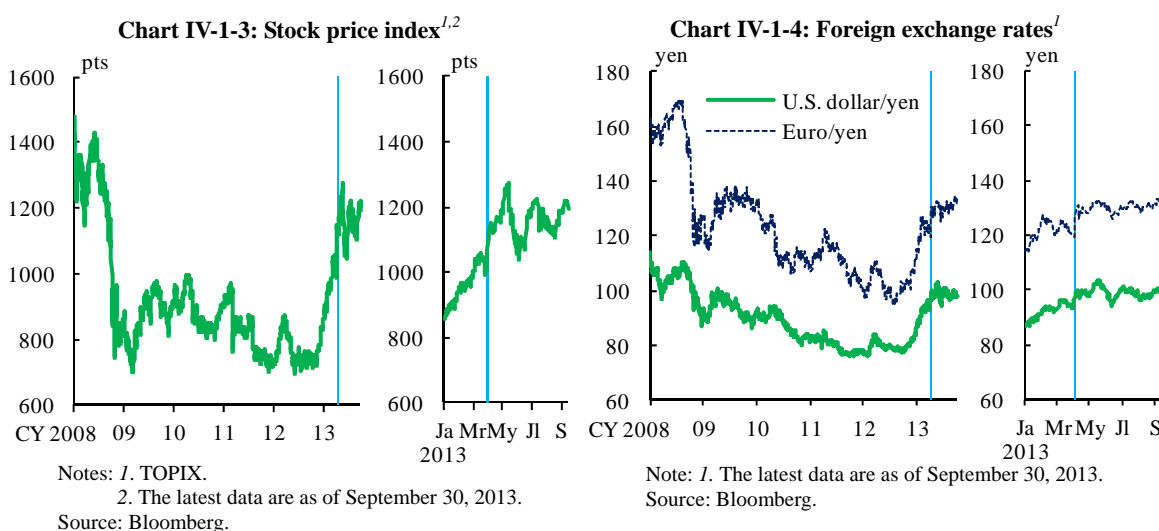
A. Developments in financial markets

Yields on 10-year JGBs dropped to a historical low of 0.3-0.4 percent (on an intraday basis) immediately after the Bank's decision to introduce QQE (Chart IV-1-1). Thereafter, however, they temporarily rose to around 1 percent in late May 2013, primarily reflecting a cautious stance on bond investment among market participants, which stemmed from heightened interest rate volatility, better-than-expected business sentiment abroad, and speculation about the direction of U.S. monetary policy. While overseas yields have moved up on the whole, JGB yields have been notably stable, staying more or less unchanged or following a moderate downtrend. As a factor behind these developments, it can be pointed out that the Bank's large-scale JGB purchases under QQE have exerted downward pressure on JGB yields from the supply and demand perspective, as concerns over fiscal imbalances have not appeared to heighten. Looking at changes in yields by maturity, long- to super-long-term yields declined with long-term yields bottoming out at the beginning of fiscal 2013, but yields across the curve -- and medium- to super-long-term yields in particular -- rose toward late May 2013 (Chart IV-1-2). Since then, however, the yield curve has flattened out somewhat.



Stock prices rose significantly toward the middle of May 2013, mainly reflecting the introduction of QQE, depreciation of the yen, and expectations for the government's growth strategy (Chart IV-1-3). They then declined temporarily, reflecting profit-taking sales in response to a rapid rise, speculation about the direction of U.S. monetary policy, and concerns over an economic slowdown in China. Stock prices have shown somewhat large fluctuations, partly due to the increased instability of financial markets in summer 2013 in some emerging countries which seem to have fragile fundamentals, and partly owing to concerns over the fiscal situation in the United States.

After depreciating following the introduction of QQE, the yen depreciated further against the U.S. dollar, mainly reflecting stronger-than-expected U.S. economic indicators. In May 2013, the yen traded at the 100 yen level against the dollar for the first time since 2009 (Chart IV-1-4). Given the adjustment in Japanese stock prices, however, the yen has appreciated somewhat and has lately been hovering in the 95-100 yen range. Meanwhile, the yen has also depreciated against the euro, trading at the 130 yen level.



B. Risks implied in government bond markets

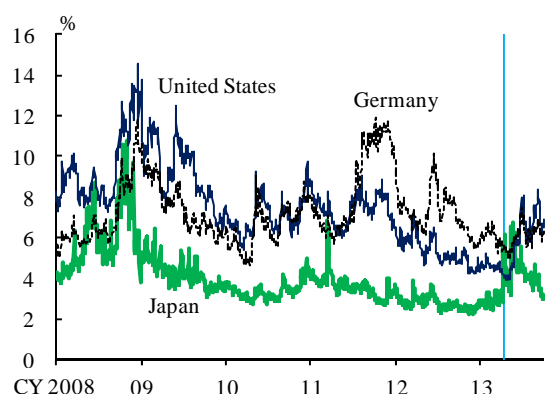
Volatility and risk reversals

The volatility (model-free implied volatility [MFIV]) of JGB prices increased in April 2013 (Chart IV-2-1).⁵ Volatility remained relatively high, but has recently declined to a

⁵ MFIVs of government bond prices are calculated by using price information from futures options

moderate extent. However, risk reversals (the difference in implied volatilities between call and put options) -- which indicate the skew of investors' recognition of future risks -- show that investors remain vigilant about a possible rise in JGB yields from April 2013 (Chart IV-2-2).

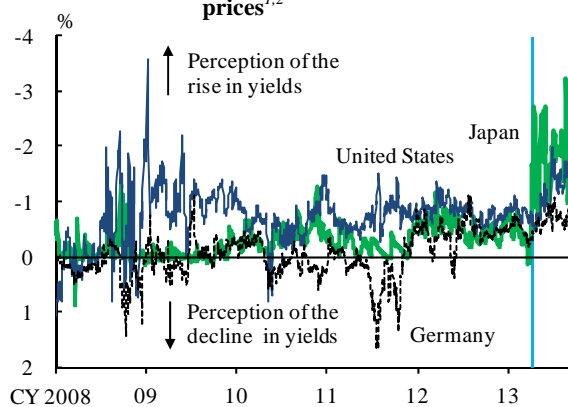
Chart IV-2-1: MFIVs of government bond prices^{1,2}



Notes: 1. Options on JGB futures traded on the Tokyo Stock Exchange for Japan; options on U.S. Treasury futures traded on the Chicago Board of Trade for the United States; options on Euro-Bund futures traded on Eurex for Germany.

2. The latest data are as of September 30, 2013.
Sources: Bloomberg; BOJ.

Chart IV-2-2: Risk reversals of government bond prices^{1,2}



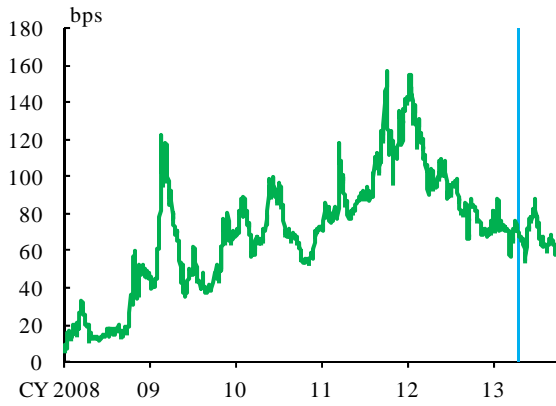
Notes: 1. See Note 1 in Chart IV-2-1.
2. The latest data are as of September 30, 2013.
Sources: Bloomberg; BOJ.

Factors behind JGB yield fluctuations

We examine a range of factors that affect long-term JGB yields. First, sovereign credit default swap (CDS) premiums, which capture interest rate risk arising from concerns over fiscal imbalances, have not shown any noticeable changes recently, and thus do not appear to indicate heightening concerns over fiscal imbalances (Chart IV-2-3). Nevertheless, the shares of JGBs held and traded by foreign investors are increasing as a trend. In order to ensure smooth JGB issuance, foreign investors are likely to play a more important role (Charts IV-2-4 and IV-2-5). Meanwhile, given that not a few foreign investors have a strong interest in Japanese fiscal conditions, attention should continue to be paid to the effects of concerns over a deterioration in fiscal conditions on JGB yields.

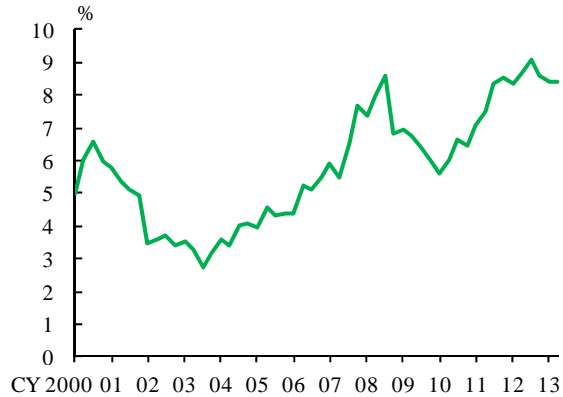
markets. The results correspond to options market participants' expected change in government bond prices for the next 3 months. Unlike standard implied volatility, MFIVs capture the recognition of tail risks.

Chart IV-2-3: Sovereign CDS premiums^{1,2}



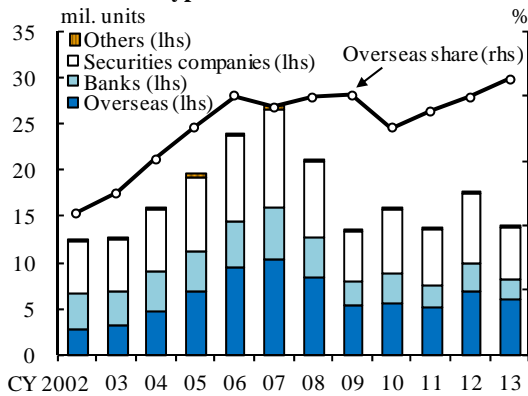
Notes: 1. 5-year CDSs.
2. The latest data are as of September 30, 2013.
Source: Bloomberg.

Chart IV-2-4: Share of JGB holdings by foreign investors¹



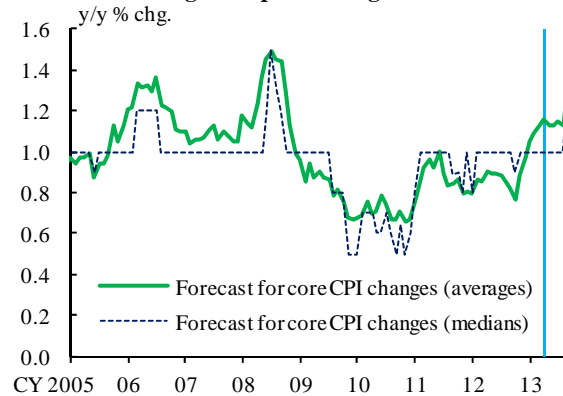
Note: 1. The latest data are as of end-June 2013.
Source: BOJ, "Flow of funds accounts."

Chart IV-2-5: Trading volume of JGB futures by type of investor^{1,2}



Notes: 1. The standard medium-, long-, and super-long-term JGB futures are counted.
2. The data for 2013 represent the total up to September 30.
Source: Tokyo Stock Exchange.

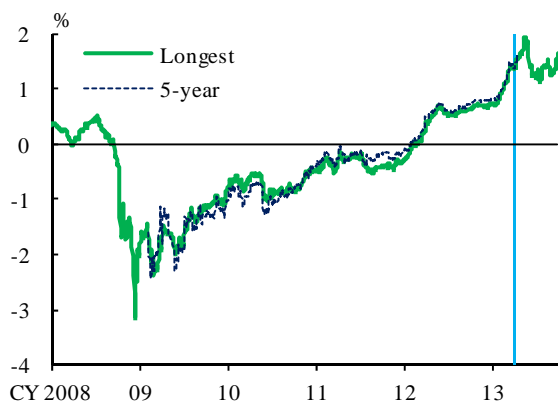
Chart IV-2-6: Market participants' expectations of long-term price changes^{1,2}



Notes: 1. Forecasts for the next 10 years.
2. The latest data are as of September 2013.
Source: QUICK, "QSS Report (Bond)."

Regarding market participants' inflation expectations based on fundamentals, both survey results and the break-even inflation (BEI) rate -- calculated as the yield spread between fixed-rate coupon-bearing bonds and inflation-indexed bonds -- show a rise in expected inflation rates on the whole (Charts IV-2-6 and IV-2-7). Nevertheless, these measures should be interpreted with some latitude given that (1) the market liquidity of inflation-indexed bonds is lower than that of fixed-rate coupon-bearing bonds, and thus a liquidity premium might be added to the BEI rate; and (2) the survey results and the BEI rate may be affected by the scheduled hike in the consumption tax rate.

Chart IV-2-7: BEI for inflation-indexed JGBs^{1,2}

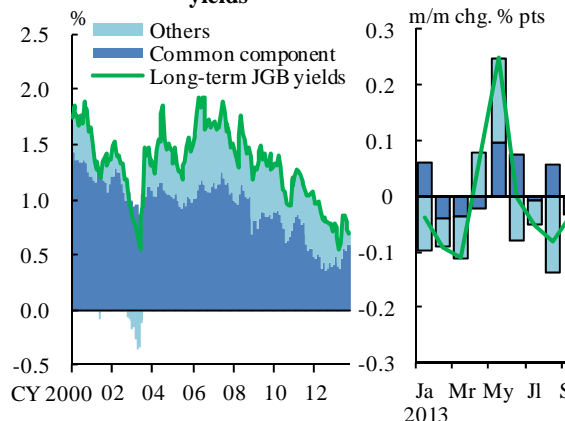


Notes: 1. Yield spreads between fixed-rate coupon-bearing JGBs and inflation-indexed JGBs. Figures for "longest" are calculated using yield data for the inflation-indexed JGBs that have the longest maturity in each period, which currently correspond to those maturing in June 2018.

2. The latest data are as of September 30, 2013.

Sources: Bloomberg; BOJ.

Chart IV-2-8: Decomposition of long-term JGB yields^{1,2,3}



Notes: 1. "Common component" is extracted from a principal component analysis and is defined as the first principal component of U.S., German, U.K., and Japanese government bond yields (the contribution ratio is 0.88).

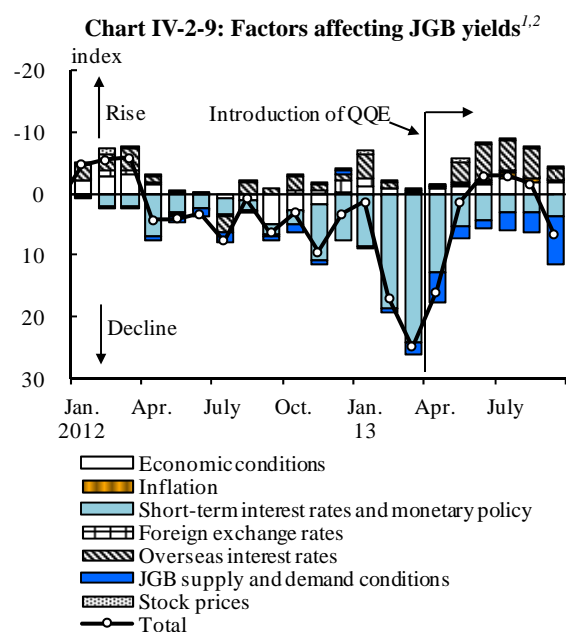
2. "Others" is the sum of the constant term and residuals from regression of JGB yields on "common component" and the constant term.

3. The estimation uses month-end data from January 2000 to September 2013.

Sources: Bloomberg; BOJ.

In connection with developments overseas, a rise in overseas long-term yields, such as U.S. government bond yields, also seems to have exerted upward pressure on JGB yields. In fact, according to a decomposition of long-term JGB yields calculated by principal component analysis, it is implied that long-term JGB yields have remained stable as "other factors" have offset the upward pressure exerted by the "global factor," which is common to Japan, the United States, Germany, and the United Kingdom (Chart IV-2-8). While as mentioned earlier, concerns over fiscal imbalances do not seem to have heightened, the recent stability in long-term yields in Japan relative to those in other countries seems to be attributable to the regained stability in volatility, partly reflecting the Bank's large-scale JGB purchases, and to the supply and demand factor arising from reduced sales of JGBs by investors.⁶ The results of the survey of investors also indicate that while the contribution of "overseas interest rates" to a rise in JGB yields has increased somewhat with a rise in overseas yields, "short-term interest rates and monetary policy" and "JGB supply and demand conditions" continue to be viewed as factors causing downward pressure on JGB yields (Chart IV-2-9).

⁶ The Bank has conducted flexible JGB purchase operations, such as making the maximum amount of such purchases per auction smaller and increasing the frequency of purchases.



Notes: 1. The calculation formula is as follows. Among valid responses, the percentage of each factor chosen by investors as the most important factor for JGB yields is multiplied by the impact of the factor on JGB yields (indexed with strong downward pressure = 100, downward pressure = 75, neutral = 50, upward pressure = 25, strong upward pressure = 0 and then subtracting 50).
2. The latest survey was conducted from September 24-26, 2013.

Sources: QUICK, "QSS Report (Bond)"; BOJ.

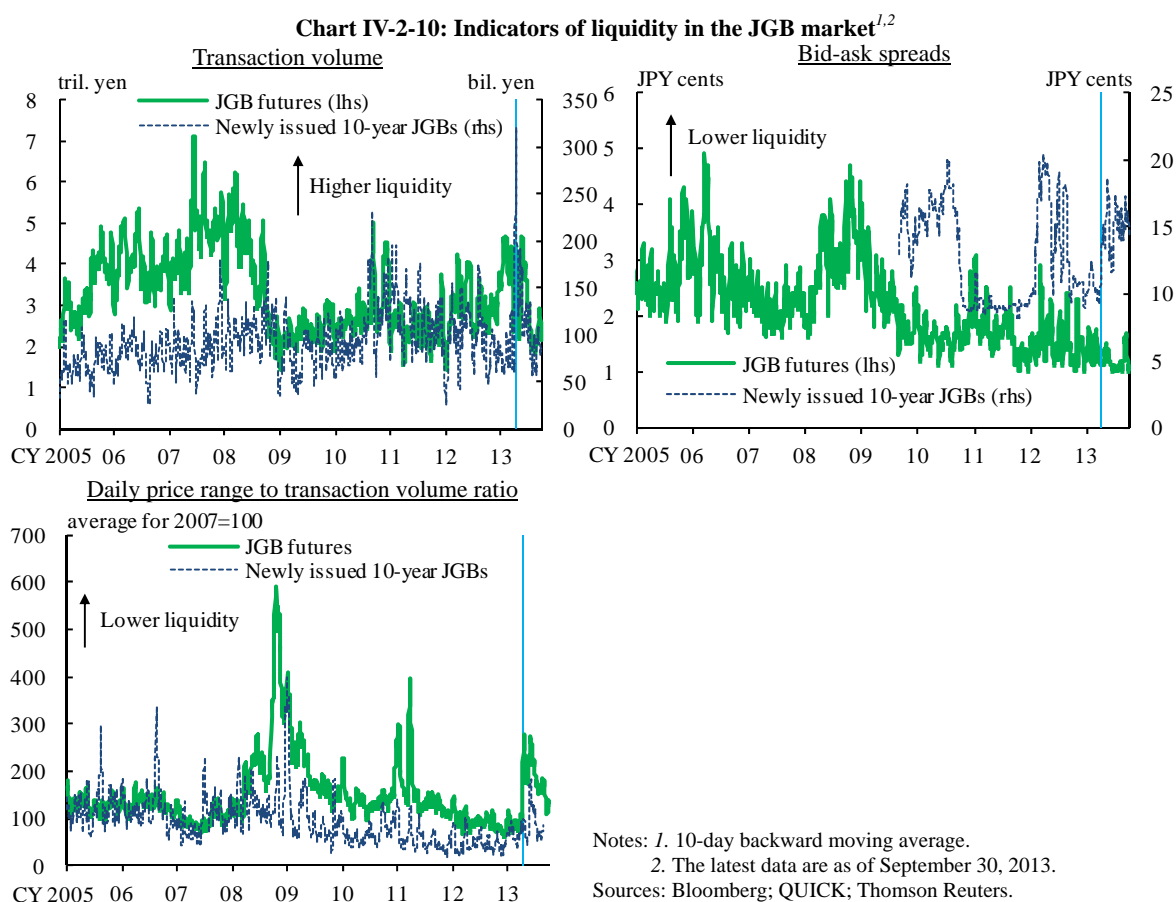
Looking at trading by type of investor in terms of supply and demand conditions, sales of JGBs by city banks -- the major investors -- were notable in April 2013, but their net sales have since been decreasing on the whole (Chart III-3-5). Purchases and sales of foreign securities by residents indicate that risk-taking activities, such as a shift from domestic bonds to foreign bonds, have been generally limited to date partly due to increasing volatility in overseas interest rates (Chart III-3-7). Such trading activities by investors might be one factor contributing to the stability in long-term JGB yields. Nevertheless, attention should be paid to the risk that once long-term yields start to rise, this could trigger a chain of events, that is, an increase in volatility, leading to bond sales and a further rise in such yields (see Box for asymmetry in volatility in the JGB market).

Liquidity in the JGB market

Finally, we examine liquidity in the JGB market. A variety of related indicators are used to assess market liquidity, but there is no sole definitive "must-watch" indicator. In this section, we discuss transaction volume, bid-ask spreads, and the daily price range to transaction volume ratio to gather clues about market liquidity (Chart IV-2-10).⁷ First,

⁷ Bid-ask spreads are the difference between the price quoted by buyers and that quoted by sellers. The daily price range to transaction volume ratio is calculated as the daily price range divided by transaction volume. For details on liquidity in the JGB market, see Kenji Nishizaki, Akira Tsuchikawa, and Tomoyuki Yagi, "Indicators Related to Liquidity in JGB Markets," Bank of Japan Review, forthcoming.

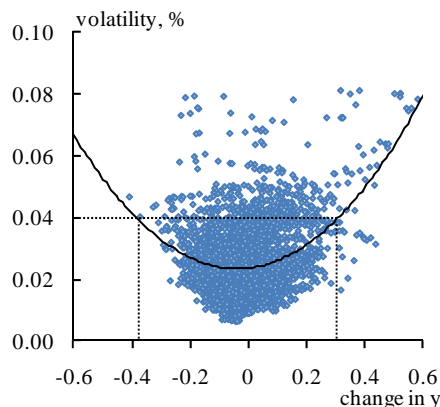
transaction volume in the JGB futures and newly issued 10-year JGB markets increased sporadically around the time of the introduction of QQE in April 2013, but it then temporarily decreased. Bid-ask spreads for JGB futures contracts did not show any noticeable changes even after the introduction of QQE, while those for newly issued 10-year JGBs seem to have widened somewhat after the introduction of QQE. Nonetheless, these spreads have not widened notably relative to past levels. The daily price range to transaction volume ratio in both the JGB futures and newly issued 10-year JGB markets temporarily rose after the introduction of QQE in April 2013, but it has since been declining moderately. Nevertheless, the ratio in the JGB futures market has not returned to the level recorded before the introduction of QQE. The earlier discussions suggest that some indicators related to liquidity in the JGB market deteriorated after the introduction of QQE in April 2013. Although many of these indicators have since shown a moderate recovery, attention should continue to be paid to future liquidity conditions in the JGB market.



Box: Asymmetry in volatility in the JGB market

It is acknowledged that the volatility of asset prices is asymmetric, as volatility tends to be higher when prices decline than when prices rise. In fact, it has been observed clearly that changes in long-term yields and volatility have an asymmetric relationship, as volatility is higher when interest rates rise, i.e., prices decrease (Chart B-1).⁸

Chart B-1: Changes in yields and volatility^{1,2,3,4}



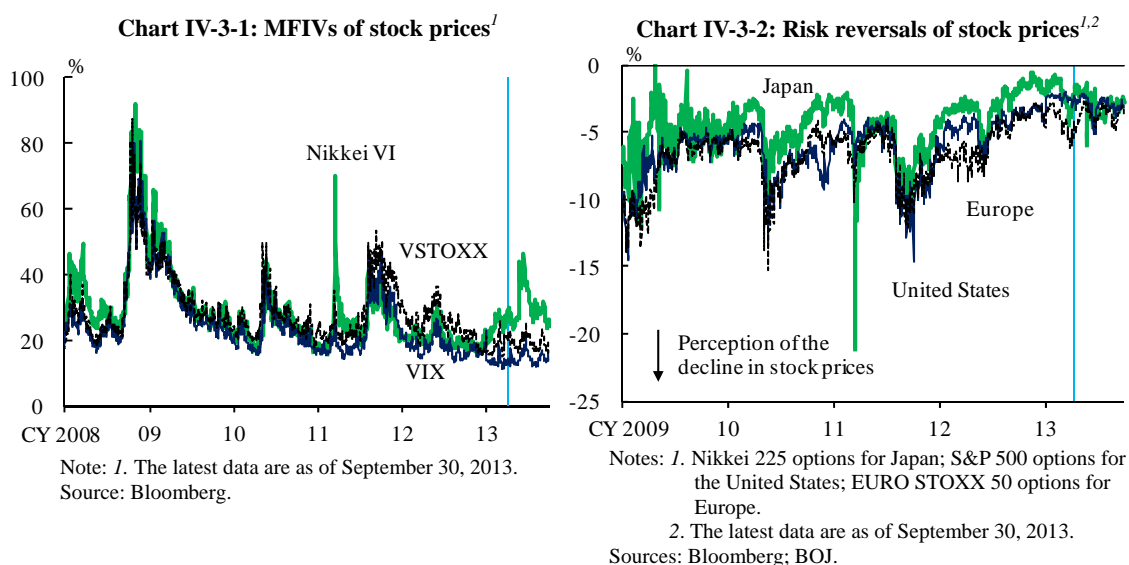
- Notes: 1. Yields on 10-year JGBs.
2. Volatility is the 20-day standard deviation of daily changes in yields, and changes in yields are differences from 20 days earlier.
3. Samples represent daily data from January 2000 to end-September 2013.
4. The solid line indicates quadratic regression.
- Source: Bloomberg.

Such asymmetry may be caused by loss aversion among investors and their risk management rules. Bond markets have both investors who hold long positions and investors who hold short positions. On a net basis, however, bond investors hold long positions. Investors who hold long positions in JGBs tend to keep holding JGBs when prices rise, but they tend to sell JGBs to avoid losses when prices fall. This results in an increase in volatility. Investors' internal risk management rules that require them to reduce positions when losses or the amount of risk exceeds a certain limit also contribute to such asymmetry. In fact, at the time of the VaR shock in 2003, large-scale sales of JGBs by some banks seemed to be triggered by a breach of their internal interest rate risk threshold. Although long-term JGB yields have remained stable recently, attention should be paid to the risk that an upward shock to interest rates will increase volatility, leading to a further rise in interest rates.

⁸ Based on the exponential generalized autoregressive conditional heteroskedasticity (EGARCH) model (a time-series model that captures asymmetry in volatility), we estimated the asymmetry parameter by using daily data for yields on 10-year JGBs from 2000 to the end of September 2013. The results show that volatility is higher when interest rates rise. For details on the EGARCH model, see Daniel B. Nelson, "Conditional Heteroskedasticity in Asset Returns: A New Approach," *Econometrica*, 59, pp. 347-370, 1991.

C. Risks implied in stock markets

The volatility (MFIV) of Japanese stock prices followed a moderate increasing trend in tandem with rising stock prices from autumn 2012 (Chart IV-3-1).⁹ It increased further when stock prices underwent adjustment in May 2013. Volatility has since decreased moderately, but has remained at a somewhat high level relative to volatility in overseas markets. This seems to reflect factors such as higher stock prices, which stemmed from depreciation of the yen since autumn 2012 and expectations for policy actions in Japan, and the adjustment after the surge in stock prices. Risk reversals also show that vigilance against a risk of declining prices has increased somewhat since the beginning of 2013 as stock prices rose (Chart IV-3-2).

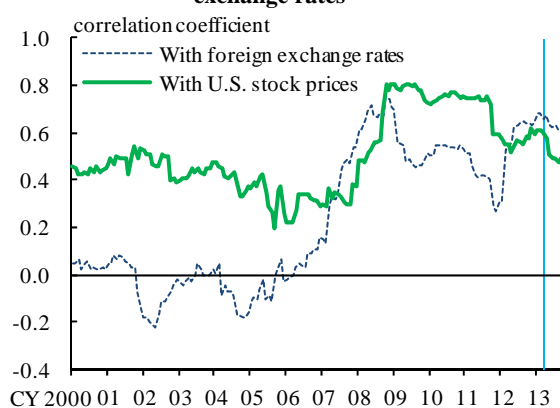


Recent developments in the volatility of Japanese stock prices seem to have become less correlated with those in overseas markets. Looking at a longer time horizon, however, Japanese stock prices remain susceptible to developments in other financial markets such as foreign stock markets and foreign exchange markets (Chart IV-3-3). Such increased correlation with overseas markets and foreign exchange markets is often explained by the stronger international relationship among economic activities and by risk-on/risk-off behavior among investors. In addition, there has recently been an increasing trend toward simultaneous correlation between stock prices and the U.S.

⁹ The volatility index (VIX) of the Chicago Board Options Exchange, the VSTOXX of Eurex, and the Nikkei Stock Average Volatility Index (VI) of Nikkei Inc. are MFIVs calculated by using 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.

dollar/yen rate (Chart IV-3-4). One factor behind this is currency hedging for investment in Japanese stocks by foreign investors, who have been major buyers of Japanese stocks since stock prices started to rise in autumn 2012.¹⁰ Moreover, there is a possibility that investors such as high-frequency traders and systematic funds are focusing on such behavior among foreign investors and the correlation observed between Japanese stock prices and the U.S. dollar/yen rate, and are conducting simultaneous purchases and sales in stock and foreign exchange markets (Chart III-3-6).¹¹

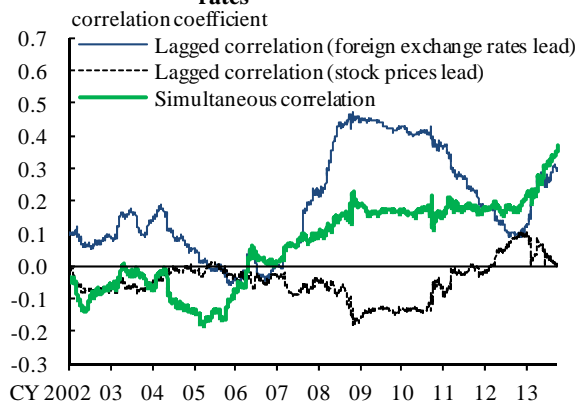
Chart IV-3-3: Correlation of Japanese stock prices with U.S. stock prices and foreign exchange rates^{1,2,3}



Notes: 1. 3-year rolling correlation of monthly rate of price change.
2. TOPIX for Japanese stock prices; S&P 500 for U.S. stock prices; U.S. dollar/yen for foreign exchange rates.
3. The latest data are as of September 2013.

Source: Bloomberg.

Chart IV-3-4: Lagged correlation between Japanese stock prices and foreign exchange rates^{1,2,3,4}



Notes: 1. 500-day rolling correlation of daily rate of price change.
2. Lagged correlation is calculated with 1-window (1-day) lag.
3. TOPIX for stock prices; U.S. dollar/yen for foreign exchange rates.
4. The latest data are as of September 30, 2013.

Source: Bloomberg.

D. Risks implied in foreign exchange markets

In foreign exchange markets, volatility (MFIV) in the U.S. dollar/yen rate rose, reflecting a depreciation of the yen from autumn 2012 (Chart IV-4-1).¹² As the spot rate

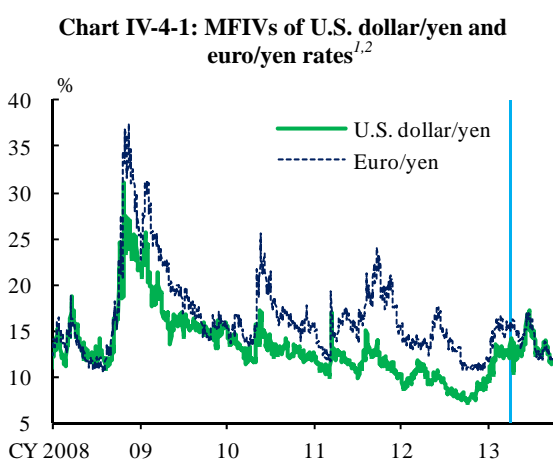
¹⁰ When foreign investors invest in Japanese stocks and employ currency hedging, they buy Japanese stocks while at the same time taking short positions in the yen in the foreign exchange market. In any such case, when Japanese stock prices rise (fall), they need to increase (reduce) their short yen positions to keep the hedging ratio at a certain level, leading to the co-movement of stock prices and foreign exchange rates.

¹¹ High-frequency trading (HFT) is a high-speed, high-frequency trading method based on algorithms used in computer programming.

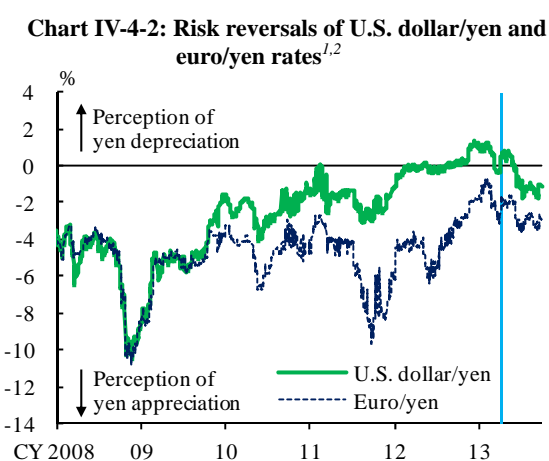
¹² MFIVs for the U.S. dollar/yen rate and the euro/yen rate are calculated by using data on 3-month over-the-counter option prices. The results correspond to options market participants' expected change in foreign exchange rates for the next 3 months.

fluctuated due to speculation about the direction of U.S. monetary policy, volatility remained at a high level, but has recently seen a gradual decline. Volatility in the euro/yen rate also increased with depreciation of the yen, but has recently been gradually decreasing to the level seen at the beginning of 2013.

In autumn 2012, U.S. dollar/yen risk reversals skewed toward dollar calls, albeit only marginally, implying concerns over dollar appreciation and yen depreciation (Chart IV-4-2). Thereafter, however, mainly reflecting a decline in Japanese stock prices, dollar/yen risk reversals have skewed toward dollar puts, indicating reduced concerns over a depreciation of the yen. Euro/yen risk reversals continued to skew toward euro puts, implying persistent concerns over yen appreciation.

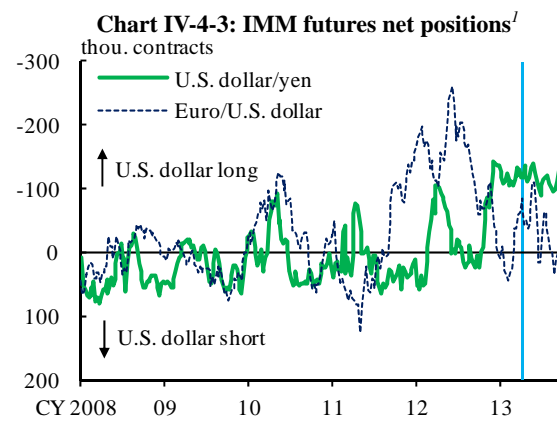


Notes: 1. MFIVs are calculated by using data on 3-month over-the-counter option prices.
2. The latest data are as of September 30, 2013.
Sources: Bloomberg; BOJ.



Notes: 1. 1-year risk reversals.
2. The latest data are as of September 30, 2013.
Source: Bloomberg.

In addition, International Monetary Market (IMM) futures net positions, which are seen as likely to reflect speculators' positions, showed that market participants had rapidly increased their long positions in the U.S. dollar against the yen since autumn 2012, when the yen depreciated against the dollar (Chart IV-4-3). They have since continued to hold long positions in the dollar against the yen. Regarding euro/dollar, market participants had continued to take long positions in the dollar against the euro since the middle of 2011 while concerns grew over the situation in Europe. Given that these concerns have abated somewhat, however, market participants have reduced their long positions in the dollar against the euro, recently shifting somewhat toward short positions in the dollar against the euro.



Note: 1. The latest data are as of September 24, 2013.
 Source: Bloomberg.

V. Risks borne by financial intermediaries

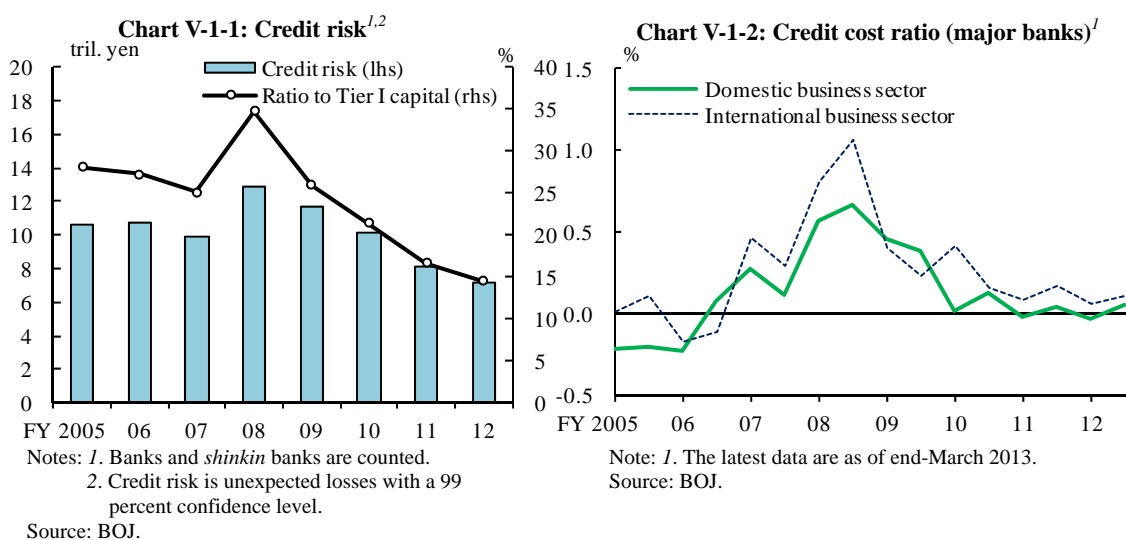
This chapter examines the risks inherent in the balance sheets of financial intermediaries such as banks, *shinkin* banks, and other financial intermediaries.

A. Banks and *shinkin* banks

1. Credit risk

Credit costs and the quality of loans

Credit risk (unexpected losses) at financial institutions such as banks and *shinkin* banks declined relative to capital in fiscal 2012 (Chart V-1-1).¹³ This was because financial institutions' quality of assets continued to improve and their support of firms with sluggish business performance restrained the occurrence of default, although the outstanding amount of loans was higher than in the previous year. The credit cost ratios remained at low levels in fiscal 2012 (Charts V-1-2 and V-1-3). NPL ratios are stable at low levels among major and regional banks, while the NPL ratio has increased somewhat at *shinkin* banks since fiscal 2008 (Chart V-1-4).



¹³ Unexpected losses were estimated by deducting the average amount of losses from the maximum amount of losses with 99 percent probability of occurrence. We used default probability, calculated based on data on borrower classification of bank loans, and the rate of recovery of bank loans when losses occurred.

Chart V-1-3: Credit cost ratio (regional financial institutions)

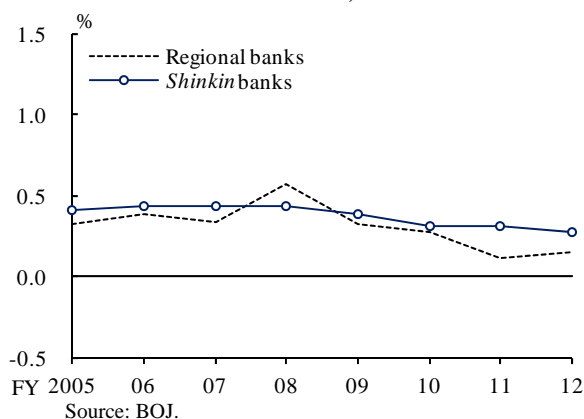
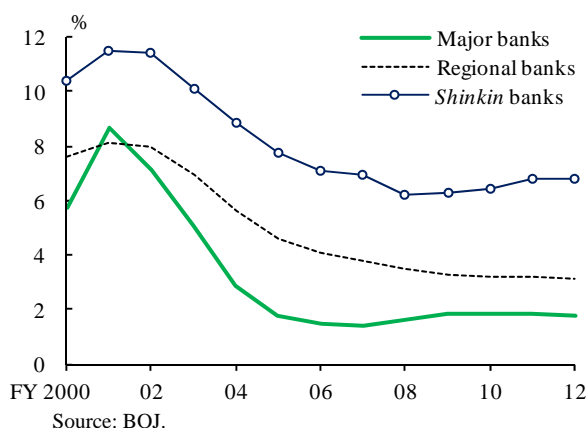
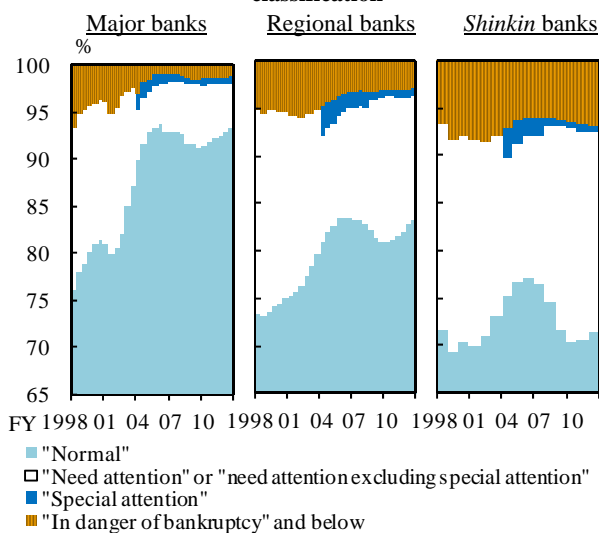


Chart V-1-4: Nonperforming-loan ratio



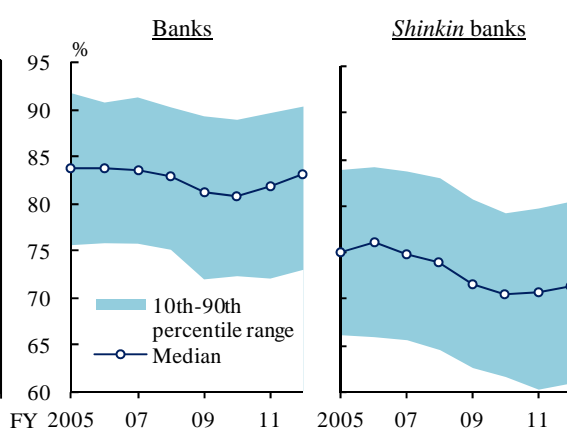
Nevertheless, the quality of loans among financial institutions varies. The borrower classification of corporate loans shows that normal loan to total loan ratios of major and regional banks have recently recovered to the level observed before the Lehman shock (Chart V-1-5). On the other hand, the same ratio has also started to increase at *shinkin* banks, but at a moderate pace. There is a large degree of disparity in individual institutions' normal loan ratios, and some banks and *shinkin* banks have not yet successfully increased their normal loan ratios (Chart V-1-6).

Chart V-1-5: Loans outstanding by borrower classification^{1,2}



Notes: 1. The latest data are as of end-March 2013.
 2. "Need attention" or "need attention excluding special attention" indicates "need attention" until fiscal 2003 and "need attention excluding special attention" from fiscal 2004.
 Source: BOJ.

Chart V-1-6: Ratio of "normal" loans outstanding^{1,2}

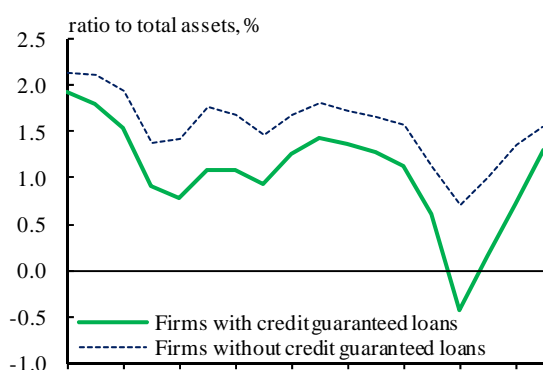


Notes: 1. In the left-hand chart, major banks and regional banks are counted.
 2. The latest data are as of end-March 2013.
 Source: BOJ.

The disparity in loan quality can be explained by the fact that some small and medium-sized firms remain in severe financial conditions. After the Lehman shock, the

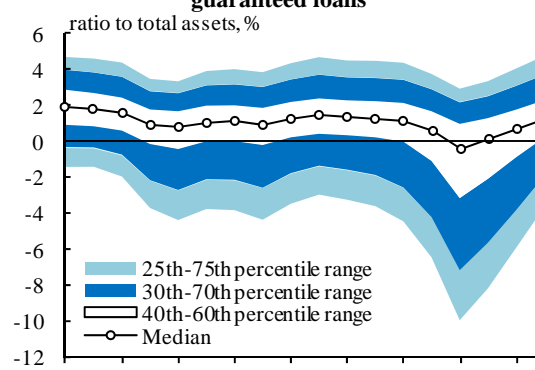
government implemented various policy measures to support the funding of small and medium-sized firms, such as the SME Financing Facilitation Act and the emergency guarantee program launched by credit guarantee corporations. These measures enabled many small and medium-sized firms to continue their business, although they temporarily faced a serious deterioration of business conditions. Recently, business conditions have improved at many of these firms supported by the policy measures, and fiscal 2012 profits have recovered at firms that have received guarantees from credit guarantee corporations (Chart V-1-7). Nonetheless, business conditions remain severe at some firms, and many firms' performance is still sluggish (Chart V-1-8).

Chart V-1-7: Operating profit ROA of firms with credit guaranteed loans¹



FY 1995 97 99 2001 03 05 07 09 11
 Note: 1. Median. The latest data are as of fiscal 2012.
 Source: CRD.

Chart V-1-8: Distribution of operating profit ROA of firms with credit guaranteed loans¹



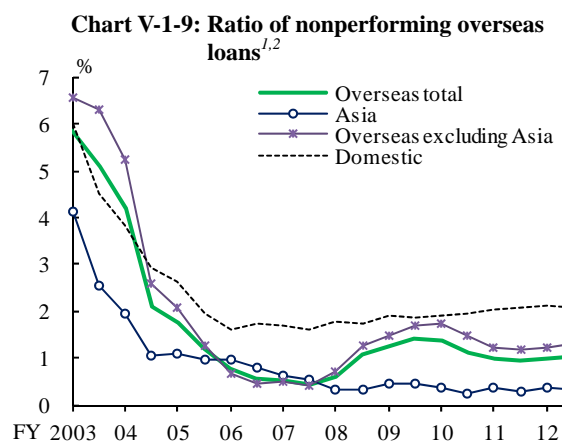
FY 1995 97 99 2001 03 05 07 09 11
 Note: 1. The latest data are as of fiscal 2012.
 Source: CRD.

Given this situation, financial institutions have made steady progress in their efforts to help borrowing firms improve their business performance. They have provided a wide range of support such as formulating business reconstruction programs, financial support, support of overseas business expansion plans as mentioned earlier, business matching services, and business succession services. In addition, a growing number of financial institutions have cooperated with outside professionals such as Small and Medium-sized Enterprise Revitalization Support Councils, and have set up funds to support firms' business reconstruction. It is still important for financial institutions to further enhance the effectiveness of their efforts.

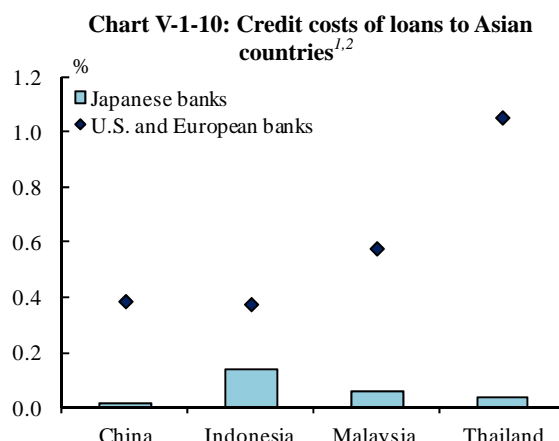
Credit risk associated with overseas loans

The credit cost ratio in the international business sector of Japan's banks has continued to trend downward, although overseas loans have increased substantially, especially among major banks (Chart V-1-2). NPL ratios at the three major financial groups are at

low levels in each region (Chart V-1-9). The credit cost ratio of loans to Asia, where Japan's banks have actively expanded loans in recent years, is also at a low level in each country, and is below that of European and U.S. financial institutions (Chart V-1-10). This suggests that Japan's banks have been relatively circumspect in extending overseas loans.¹⁴ However, banks need to monitor increasing signs of a deceleration in economic activity in some countries and regions.



Notes: 1. The three major financial groups are counted on a non-consolidated basis. The latest data are as of end-March 2013.
 2. The data for UFJ group are excluded from the figures until fiscal 2004.
 Sources: Published accounts of each group.



Notes: 1. For Japanese banks, overseas subsidiaries and branches in Asia for which financial information is available are counted. For U.S. and European banks, overseas subsidiaries and branches in four countries where those Japanese banks' subsidiaries and branches are located are counted.
 2. Figures are averages from fiscal 2008 to 2012.
 Source: Bureau Van Dijk, "Bankscope."

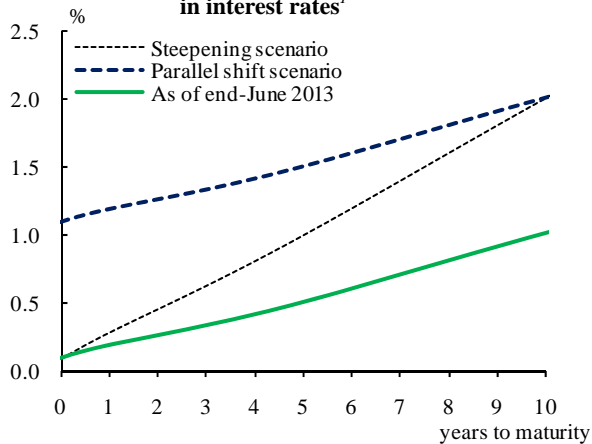
2. Interest rate risk

Amount of interest rate risk (100 basis point value)

We use the 100 basis point value as a proxy for the amount of interest rate risk. This measure estimates losses in economic value (market value) associated with all assets and liabilities, under a parallel shift in the yield curve in which interest rates for all maturities increase by 1 percentage point (Chart V-1-11). When the average remaining maturity of assets is longer than that of liabilities, a greater maturity mismatch (the difference between the remaining maturity of assets and liabilities) leads to an increase in the amount of interest rate risk.

¹⁴ For details on overseas lending attitudes among Japan's banks, see the April 2012 and October 2012 issues of the *Report*.

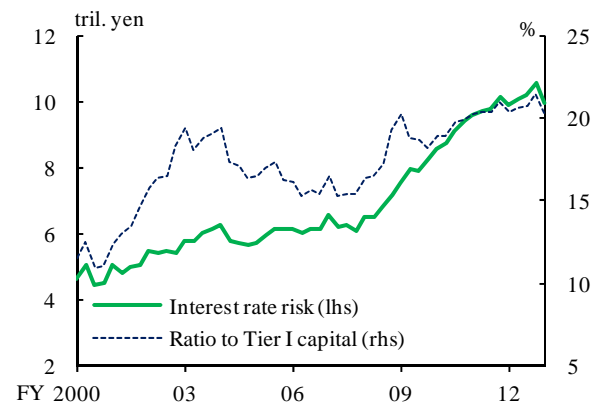
Chart V-1-11: Assumptions for yield curve of rises in interest rates¹



Note: 1. A parallel shift scenario represents the situation in which yields on all maturities shift upward from the baseline by 1 percentage point. A steepening scenario represents the situation in which the 10-year rate shifts upward from the baseline by 1 percentage point.

Sources: Bloomberg; BOJ.

Chart V-1-12: Interest rate risk^{1,2,3}



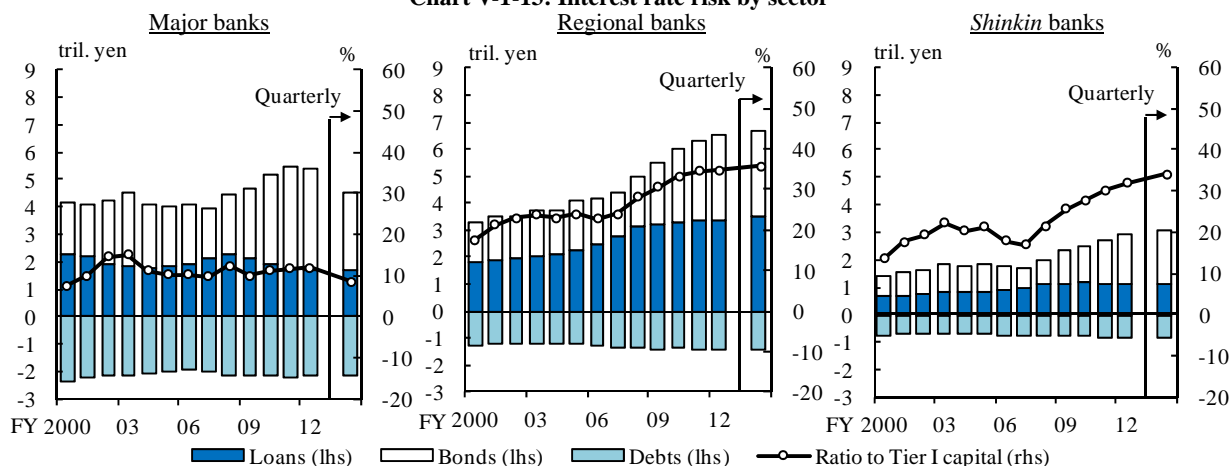
Notes: 1. Banks and *shinkin* banks are counted.
2. The latest data for interest rate risk are as of end-June 2013, and those for Tier I capital are assumed to be unchanged from end-March 2013.
3. The 100 basis point value in the banking book. Off-balance-sheet transactions are excluded.

Source: BOJ.

The amount of interest rate risk associated with all financial institutions' assets and liabilities, such as bond investment, deposits, and loans, started declining after fiscal 2013 began (Chart V-1-12).¹⁵ The extent of the decline observed from the end of March 2013 through the end of June 2013 has been as large as that observed about 13 years ago. While the amount of interest rate risk decreased at major banks, it has continued to increase at regional financial institutions (Chart V-1-13). This basically reflected developments in bond investment made by each financial institution, as described in Chapter III.D. While the amount invested in bonds has remained more or less unchanged, the amount of loans with longer maturities, such as those to local governments, has increased at regional financial institutions (Chart V-1-14). As a result, the amount of interest rate risk associated with the extension of loans increased slightly.

¹⁵ The 100 basis point value is calculated only for interest rate risk associated with holding yen-denominated assets (loans and bonds) and liabilities, and does not reflect risk associated with holding foreign currency-denominated assets and liabilities.

Chart V-1-13: Interest rate risk by sector^{1,2}

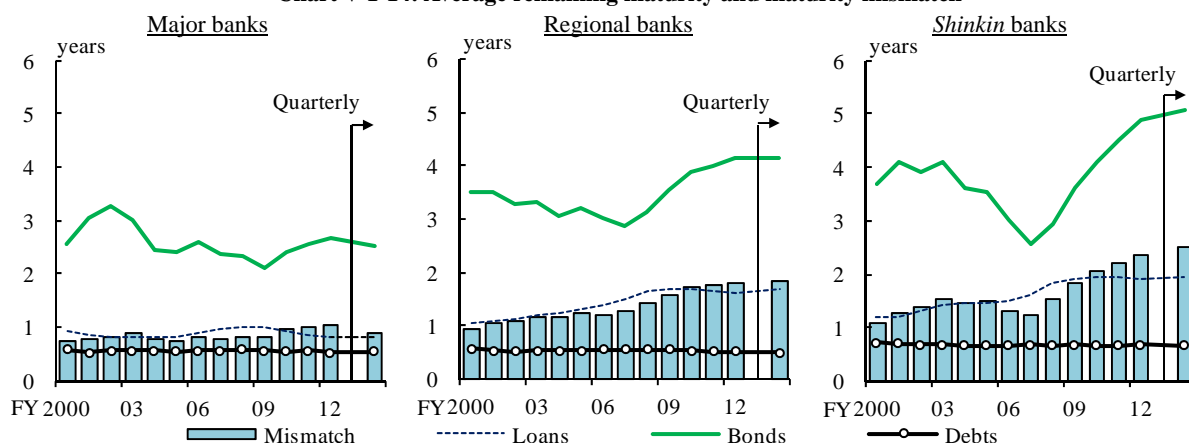


Notes: 1. The latest data for interest rate risk are as of end-June 2013, and those for Tier I capital are assumed to be unchanged from end-March 2013.

2. The 100 basis point value in the banking book. Off-balance-sheet transactions are excluded.

Source: BOJ.

Chart V-1-14: Average remaining maturity and maturity mismatch^{1,2}



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

2. 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.

Source: BOJ

Unrealized capital losses on bondholdings following a rise in interest rates

As mentioned earlier, a wide range of financial institutions' assets and liabilities bear interest rate risk. Unrealized capital losses on bondholdings affect the disclosure of information on financial results, the amount of distributable profits, and the calculation of capital adequacy ratios (in the case of internationally active banks).¹⁶ Taking these factors into account, the amount of interest rate risk associated with bondholdings at financial institutions as a whole decreased substantially after fiscal 2013 began. The

¹⁶ For details on the accounting standards for financial institutions' bondholdings, see Box 9 in the October 2012 issue of the *Report*.

recent 100 basis point value is 2.9 trillion yen for major banks, 3.2 trillion yen for regional banks, and 1.9 trillion yen for *shinkin* banks (Chart V-1-15).¹⁷ Under a steepening scenario in which long-term interest rates (10-year rates) rise by 1 percentage point and short-term interest rates do not rise significantly, the value was 1.4 trillion yen for major banks, 2.1 trillion yen for regional banks, and 1.5 trillion yen for *shinkin* banks (Charts V-1-11 and V-1-15). The large difference between the above two scenarios at major banks arises because of their relatively short duration, which is due to the fact that they mainly hold bonds with short- to medium-term maturities.

Chart V-1-15: Effects of a rise in interest rates on capital losses on bondholdings

tril. yen		Upward shift					
		end-March 2013			end-June 2013		
		1 % pt	2 % pts	3 % pts	1 % pt	2 % pts	3 % pts
Banks	Steepening scenario	▲4.1	▲7.1	▲10.2	▲3.5	▲5.9	▲8.5
	Parallel shift scenario	▲6.9	▲12.3	▲17.7	▲6.0	▲10.6	▲15.3
Major banks	Steepening scenario	▲1.9	▲3.4	▲4.9	▲1.4	▲2.4	▲3.5
	Parallel shift scenario	▲3.7	▲6.7	▲9.7	▲2.9	▲5.2	▲7.5
Regional banks	Steepening scenario	▲2.1	▲3.7	▲5.3	▲2.1	▲3.5	▲5.0
	Parallel shift scenario	▲3.2	▲5.6	▲8.0	▲3.2	▲5.5	▲7.8
<i>Shinkin</i> banks	Steepening scenario	▲1.3	▲2.3	▲3.2	▲1.5	▲2.4	▲3.4
	Parallel shift scenario	▲1.8	▲3.1	▲4.4	▲1.9	▲3.2	▲4.6

Source: BOJ.

Asset-liability maturity structure and the amount of interest rate risk

The assumptions we make on the asset-liability maturity structure are key in estimating the amount of interest rate risk. Financial institutions have many assets and liabilities with indefinite maturities, and hold financial products that can be canceled before maturity. Thus, it is necessary to assume appropriate duration for these assets and liabilities, especially for demand deposits. The above 100 basis point value assumes that all demand deposits are short-term funding instruments with maturities of 3 months or less. Nevertheless, a large proportion of demand deposits remain at financial institutions for a prolonged period, and interest rates on these deposits fluctuate to a lesser extent than do market interest rates.

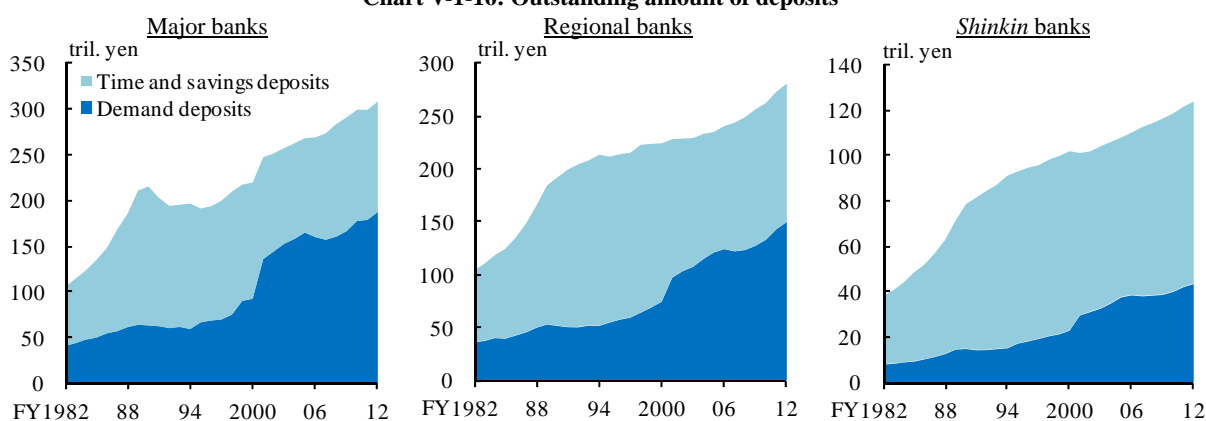
In view of this, there is a concept of "core deposits," in which a proportion of demand deposits is regarded as long-term funding.¹⁸ Many financial institutions use the concept

¹⁷ In Chart V-1-15, we did not take account of the effects of off-balance-sheet transactions in estimating changes in the market value of bond prices.

¹⁸ Under Basel II requirements, financial institutions must estimate interest rate risk based on the second pillar, i.e., banks' internal capital assessment and supervisory review process, rather than based on the first pillar, i.e., minimum capital requirements. In Japan, the guidelines established by the Financial Services Agency (FSA) require financial institutions to report the interest rate risk to

of "core deposits" to manage risk, as demand deposits are increasing (Chart V-1-16). Under this concept, the estimated amount of interest rate risk declines, because lengthening the duration of liabilities narrows the maturity mismatch between assets and liabilities. Given that the proportion of demand deposits is large in Japan, it is reasonable to take account of the effects of core deposits duration. However, financial institutions need to carefully monitor the interest rate environment and developments in deposits, and should manage risk appropriately, as the duration of core deposits may change depending on financial and economic developments.

Chart V-1-16: Outstanding amount of deposits^{1,2}



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

2. "Time and savings deposits" includes time deposits and installment savings. "Demand deposits" includes current deposits, ordinary deposits, savings deposits, deposits at notice, special deposits, and deposits for tax payments.

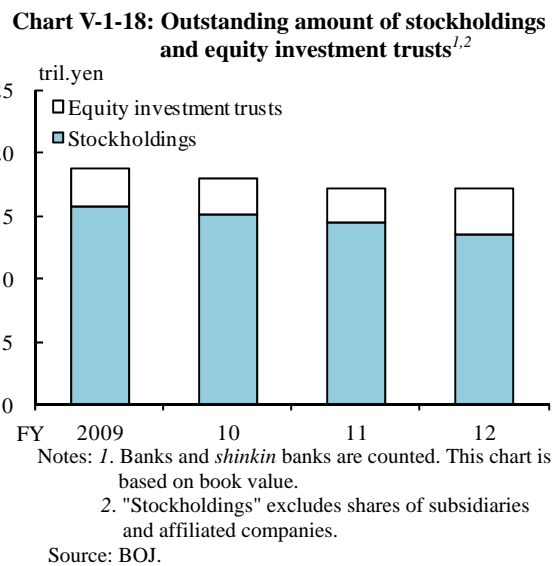
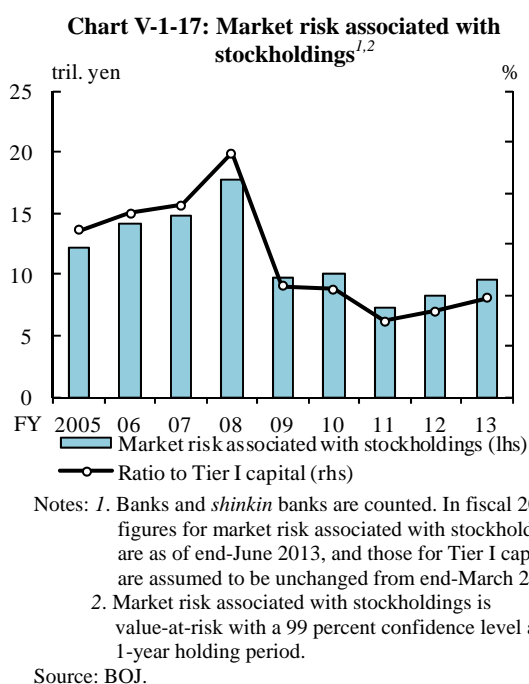
Source: BOJ.

3. Market risk associated with stockholdings

The amount of market risk associated with stockholdings has increased slightly at financial institutions (Chart V-1-17). As many institutions continued to reduce their stockholdings with the aim of maintaining business ties with firms (strategic stockholdings), their outstanding amount of stockholdings decreased on a book value basis (Chart V-1-18). Although financial institutions' investment in stock investment trusts for the purpose of earning investment gains has increased somewhat, their total

capital ratio (the outlier ratio). A supervisory response is made when this ratio exceeds a certain level. Financial institutions can take account of core deposits when calculating the outlier ratio. Financial institutions can select the method they use for estimating the outstanding amount and maturities of core deposits: either the standardized approach set by the FSA's guidelines or the internal modeling approach. The standardized approach requires them to set 50 percent of demand deposits as core deposits and the average maturity of 2.5 years or less (5 years maximum), on the condition that no significant changes in the amount of deposits have been observed during the past 5 years. On the other hand, the internal modeling approach requires them to set core deposits duration according to their internal modeling estimation results (with no limits on the outstanding amount and maturities of core deposits).

outstanding amount of stockholdings including stock investment trusts remains more or less unchanged. The amount of market risk associated with stockholdings increased because the outstanding amount of stockholdings rose on a market value basis and stock price volatility increased, reflecting the substantial rise in stock prices around the end of March 2013.



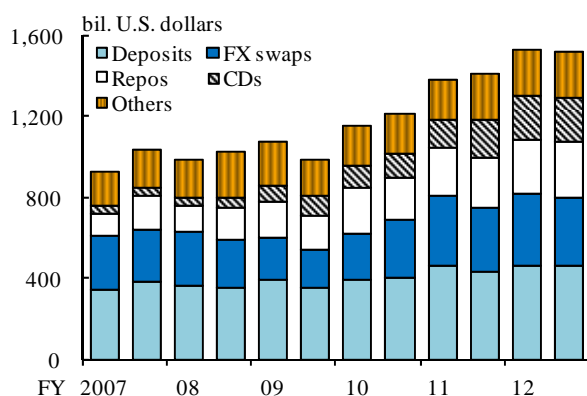
4. Funding liquidity risk

Funding liquidity risk associated with yen funds has been restrained, as the surplus of deposits has remained large and financial institutions have mainly invested in highly liquid securities. The recent funding environment indicates that deposits continue to be on a rising trend, and market funding conditions -- in terms of banks' corporate bonds and CP -- have remained favorable.

Foreign-currency funding depends to a large extent on market funding instruments such as repos, certificates of deposit (CDs), and foreign exchange swaps and currency swaps, while foreign-currency investment is concentrated in investment in foreign bonds with longer maturities and overseas loans (Chart V-1-19). Thus, gauging market funding conditions is vital in assessing funding liquidity risk. In this regard, foreign-currency funding conditions for Japan's banks have generally been stable, as their creditworthiness is high relative to foreign financial institutions. The stability in funding

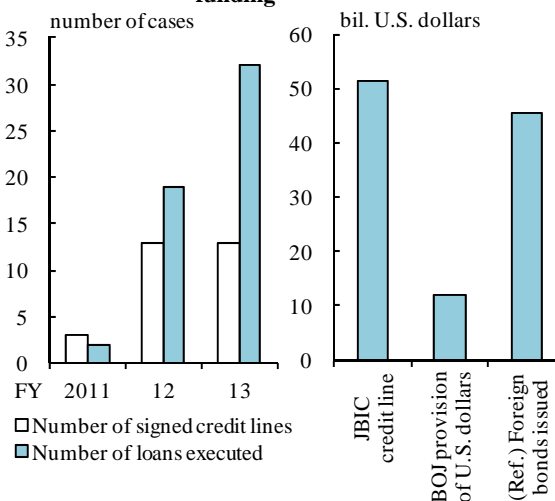
of foreign currencies has also been enhanced by the fact that major banks have actively issued foreign currency-denominated corporate bonds and have lengthened the maturities of foreign-currency funding instruments, mainly in the foreign exchange swap and currency swap markets. Financial institutions have utilized a U.S. dollar funds-supplying operation provided by the Japan Bank for International Cooperation (JBIC) and the Bank of Japan's fund-provisioning measure to support strengthening the foundations for economic growth, enabling the Bank to provide a credit line of 12 billion U.S. dollars (Chart V-1-20).^{19,20}

Chart V-1-19: Outstanding amount of foreign currency funding¹



Note: 1. Major banks and regional banks are counted. The latest data are as of end-March 2013.
Source: BOJ.

Chart V-1-20: Public authority support for stabilization of foreign currency funding^{1,2}



Notes: 1. In the left-hand chart, "number of signed credit lines" is the aggregate number of credit lines signed between JBIC and major banks or regional banks by the end of each fiscal year. "Number of loans executed" is the aggregate number of loans executed within the above JBIC credit line limit. The data for fiscal 2013 are as of end-September 2013.

2. In the right-hand chart, the data are as of end-March 2013. Major banks and regional banks are counted for "foreign bonds issued."

Sources: JBIC; BOJ.

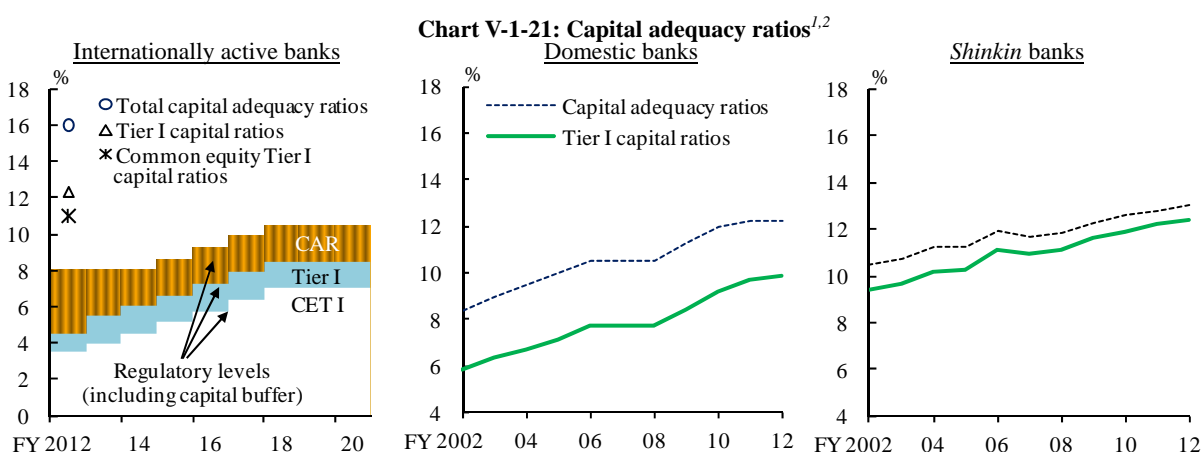
¹⁹ JBIC has a facility for providing a line of credit to financial institutions in foreign currencies when these institutions extend loans to Japanese firms that plan to undertake mergers and acquisitions overseas and fulfill certain conditions. In the left-hand side of Chart V-1-20, three types of credit lines are counted: investment credit lines and credit lines signed as part of JBIC's emergency facility to respond to the yen's appreciation, i.e., mergers and acquisitions credit lines and overseas business stabilization support credit lines for small and medium-sized firms.

²⁰ The Bank had already provided 6.6 billion U.S. dollars through its credit line shown in the right-hand side of Chart V-1-20 as of October 18, 2013.

5. Bank capital and profitability

Bank capital adequacy ratios based on regulatory requirements

Total capital adequacy ratios, Tier I capital ratios, and common equity Tier I capital ratios under the Basel III requirements have continued to significantly exceed the regulatory levels at internationally active banks (Chart V-1-21).²¹ At domestic banks, capital adequacy ratios and Tier I capital ratios have been increasing.²²



Notes: 1. CAR indicates total capital adequacy ratios. "Domestic banks" excludes *shinkin* banks. Data for banks are on a consolidated basis.

2. Figures of internationally active banks and domestic banks are based on the Basel III requirements (taking grandfathering measures into consideration) and the Basel II requirements, respectively.

Source: BOJ.

Bank capital adequacy relative to the amount of risk borne by financial institutions

Financial institutions' capital temporarily declined following the Lehman shock due to a range of losses being realized, but has since been enhanced, reflecting the subsequent increase in capital and the accumulation of retained earnings. The amount of risk borne by financial institutions has been restrained overall (Chart V-1-22).²³ The amount of net

²¹ For an outline of the Basel III requirements, see the October 2012 issue of the *Report*.

²² The new requirements will be applied to domestic banks from the end of March 2014. Under the new requirements, the minimum capital adequacy ratio remains unchanged at 4 percent, whereas regulatory capital is redefined as "core capital," which mainly consists of common equities and retained earnings. Subordinated loans and some other capital instruments are not included in core capital. Nevertheless, some measures are being taken to promote the smooth functioning of financial intermediation. For example, the limit on the amount of general loan-loss provisions included in capital has been 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. In principle, there will be a transitional period of 10 years.

²³ Starting from this issue of the *Report*, we are taking account of some foreign currency-denominated assets and liabilities in calculating the amount of risk borne by major banks in Chart V-1-22.

assets relative to financial institutions' total assets has been at historically high levels (Chart V-1-23). The number of financial institutions increasing dividends and conducting stock buybacks with the aim of returning profits to shareholders has been growing (Charts V-1-24 and V-1-25).

Given such circumstances, the ability of financial institutions to absorb losses and take on risks has increased, as their capital bases have been adequate as a whole. Nevertheless, as mentioned earlier, some financial institutions are behind the curve in improving loan quality with their relatively weak capital bases (Chart V-1-6). It is necessary for these institutions to steadily strengthen their capital.

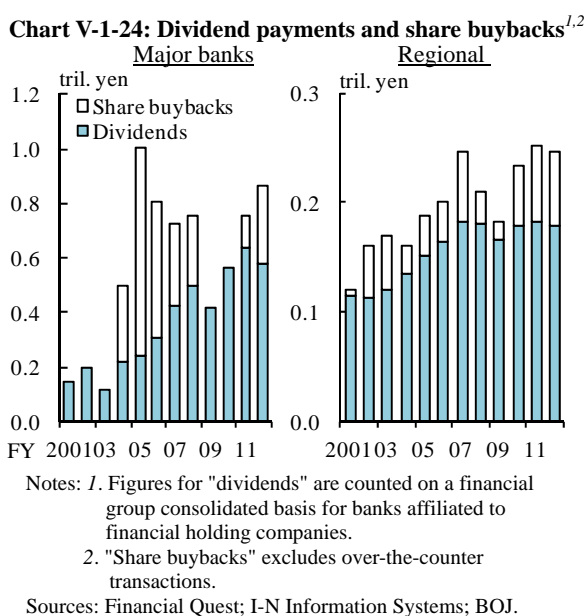
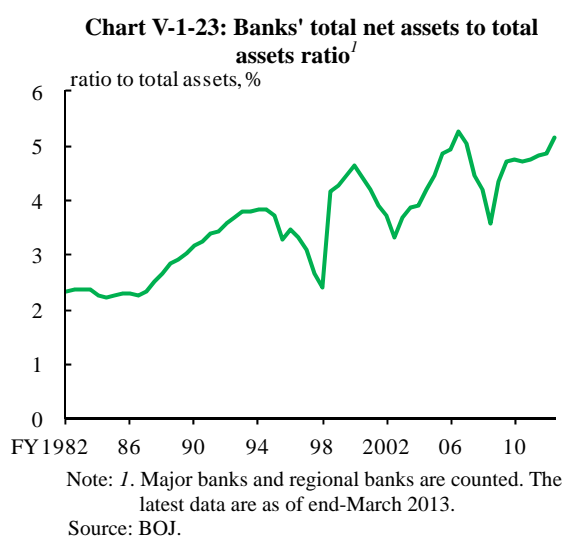
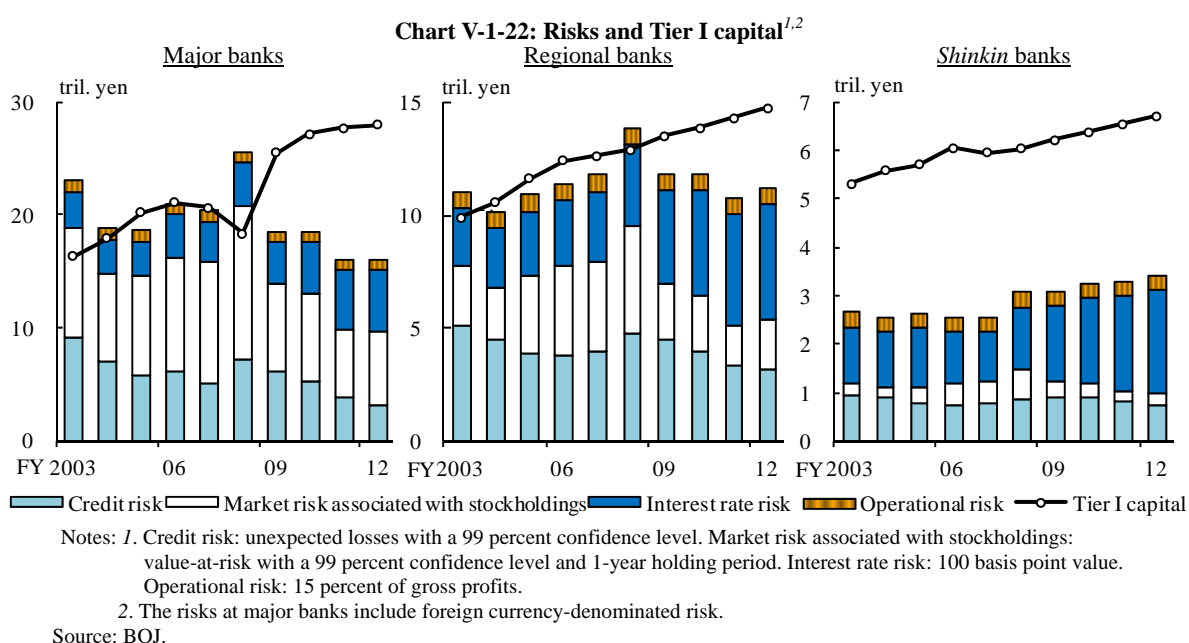


Chart V-1-25: Number of banks increasing or decreasing dividend payments^{1,2}

number of banks		FY2008	09	10	11	12
Major banks	Increase in dividend payments	0	3	5	1	5
	Decrease in dividend payments	7	3	3	0	0
	Number of institutions counted	12	12	12	10	11
Regional banks	Increase in dividend payments	13	28	23	22	27
	Decrease in dividend payments	28	9	14	6	7
	Number of institutions counted	107	102	102	106	102

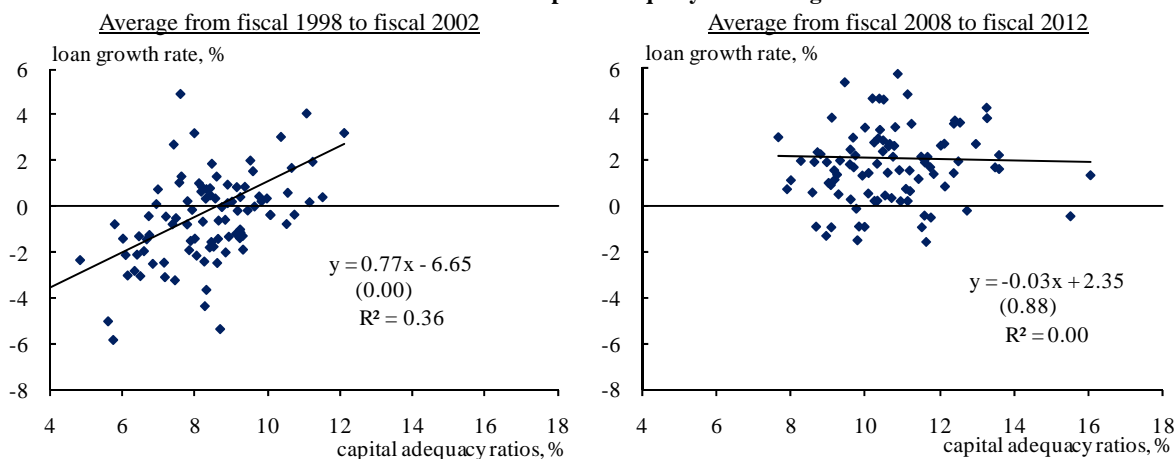
Notes: 1. The figures show the number of banks that increased or decreased their dividends per share from those paid in the previous year. For banks affiliated to holding companies, increases or decreases in dividends are assumed to follow those of their holding companies.

2. Banks that have merged with other banks or are newly affiliated to holding companies are excluded from the number only in the year concerned.

Source: Financial Quest.

Because financial institutions' capital bases are adequate overall, their level of capital does not currently impose any constraints on the extension of loans, unlike during the period when there were concerns about the soundness of financial institutions, when lending was restrained due to capital constraints. In fact, from the latter half of the 1990s to the earlier period of the 2000s, regional banks faced a relationship between their capital adequacy ratios and loans -- the lower the capital adequacy ratio, the higher the rate of reduction in bank loans -- but no such relationship has been observed recently (Chart V-1-26).

Chart V-1-26: Loans and capital adequacy ratio of regional banks^{1,2,3,4}



Notes: 1. Regional banks that are domestic banks are counted.

2. The vertical axes show annualized growth rates from fiscal 1998 to fiscal 2002 in the left-hand chart and from fiscal 2008 to fiscal 2012 in the right-hand chart.

3. The horizontal axes show averages from fiscal 1998 to fiscal 2002 in the left-hand chart and from fiscal 2008 to fiscal 2012 in the right-hand chart.

4. Figures in parentheses are p-value.

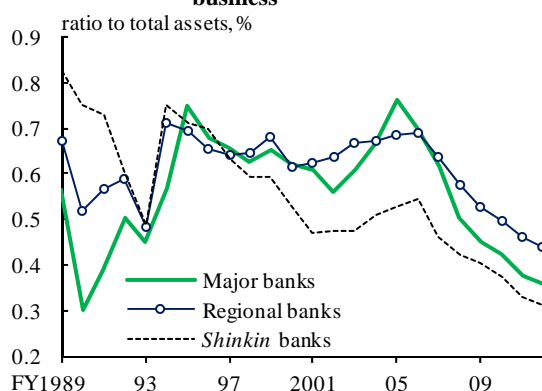
Source: BOJ.

Developments in bank profitability

In fiscal 2012, financial institutions' profits increased by around 30 percent at major

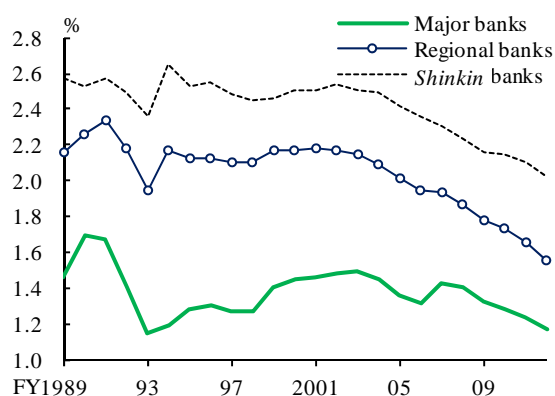
banks and around 10 percent at regional banks relative to fiscal 2011 because realized gains on bondholdings were recorded and tax-related expenses decreased.²⁴ Profits have also increased at *shinkin* banks by more than 50 percent relative to fiscal 2011, mainly due to an increase in realized gains on bondholdings and a reduction in credit costs. However, the core profitability (the ratio of operating profits from core business to total assets) of banks and *shinkin* banks has remained on a downtrend, reflecting the narrowing of interest rate spreads on loans and the expansion of the deposit surplus (Charts V-1-27 to V-1-29).

Chart V-1-27: Operating profit ROA from core business¹



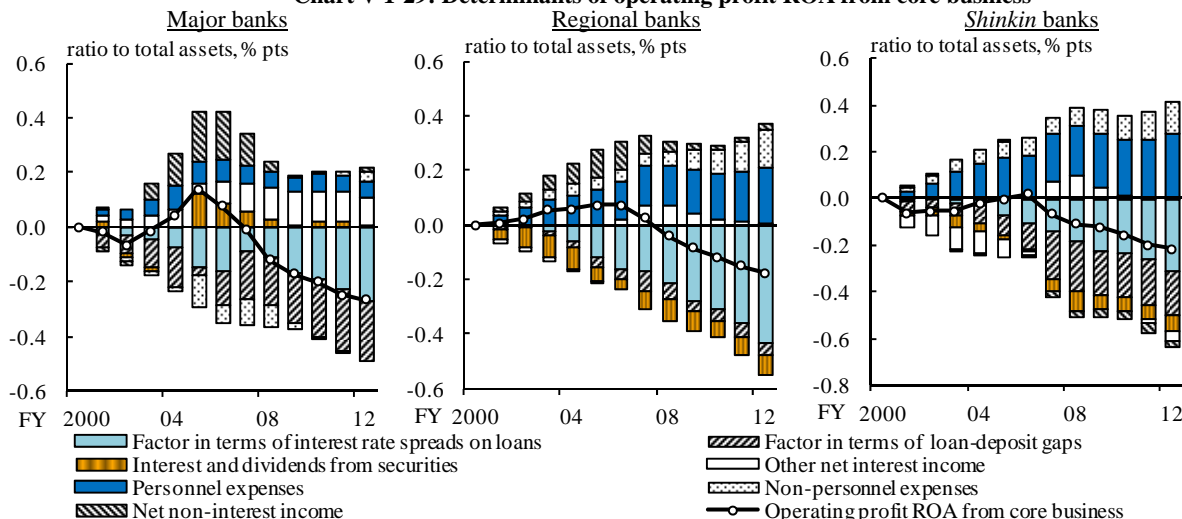
Note: 1. Domestic business sector. The latest data are as of fiscal 2012.
Source: BOJ.

Chart V-1-28: Interest rate spreads on loans¹



Note: 1. Domestic business sector. The latest data are as of fiscal 2012.
Source: BOJ.

Chart V-1-29: Determinants of operating profit ROA from core business¹



Note: 1. Figures show cumulative changes from fiscal 2000. Domestic business sector.
Source: BOJ.

A decline in core profitability does not immediately affect the stability of the financial

²⁴ For details, see Financial System and Bank Examination Department of Bank of Japan, "Financial Results of Japan's Banks for Fiscal 2012," BOJ Reports & Research Papers, July 2013.

system or the functioning of financial intermediation. However, a prolonged decline in core profitability over the medium to long term may restrain financial institutions' ability to absorb losses and impair their resilience against various economic and financial shocks. It is therefore necessary for financial institutions to continue to work on enhancing their profitability.

Individual financial institutions should basically tackle the challenge of enhancing their profitability by adopting a broad perspective, given their operational bases and features. For example, they can actively develop their business operations, take on risks, and improve their cost and financial structure. Nonetheless, the decline in core profitability has been observed for nearly a decade among a wide range of financial institutions, and it largely reflects the trend of an increasing surplus of deposits and decreasing interest rate spreads on loans, as mentioned in Chapter III.D. Thus, it is necessary to boost the dynamism of Japan's economy and of the corporate sector as a whole in order to dramatically enhance financial institutions' profitability. From this viewpoint, financial institutions need to tap potential demand for funds in areas with, for example, potential growth, and enhance the effectiveness of borrower firms' efforts in improving business conditions and business reconstruction.²⁵

B. Financial intermediaries other than banks and *shinkin* banks

1. Life insurance companies

Life insurance companies have maintained their solvency margin ratios at levels well above 200 percent, the level they need to exceed to avoid prompt corrective action being taken by the FSA (Chart V-2-1). In fiscal 2012, solvency margin ratios rose further, mainly due to an increase in unrealized gains on securities holdings, reflecting a rise in stock prices and a decline in interest rates. In addition, a negative spread narrowed because the promised return on liabilities declined, partly due to the accumulation of policy reserves (Chart V-2-2). Life insurance companies' investment in super-long-term JGBs has been on the rise, and the duration mismatch -- the extent to which the duration of liabilities exceeds that of assets -- has narrowed (Chart V-2-3).

²⁵ For details on the efforts made by financial institutions in 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, January 2013.

Chart V-2-1: Solvency margin ratio of life insurance companies¹

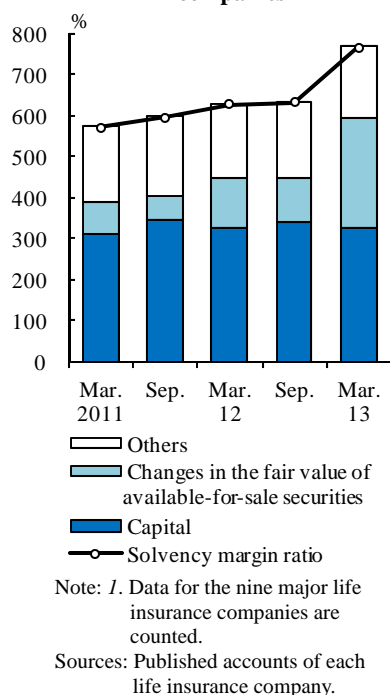


Chart V-2-2: Negative rate spread of life insurance companies¹

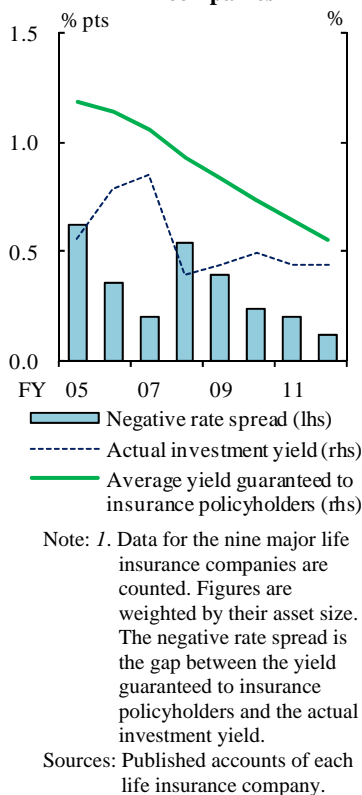
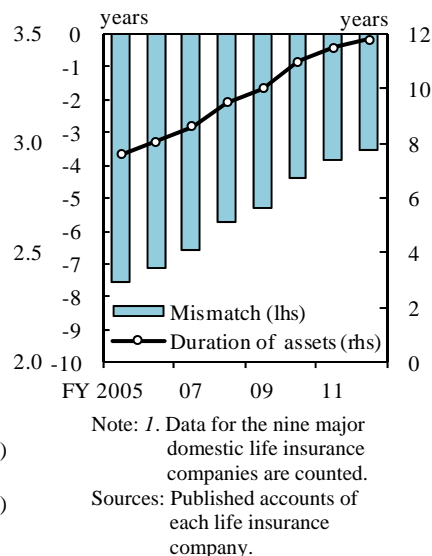


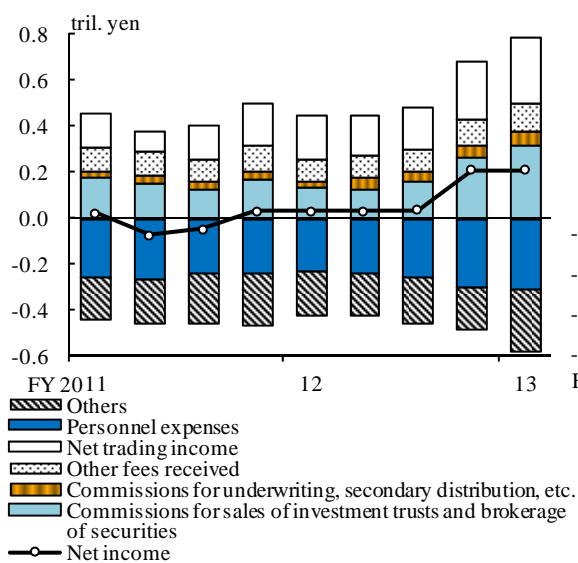
Chart V-2-3: Duration mismatch at life insurance companies¹



2. Securities companies

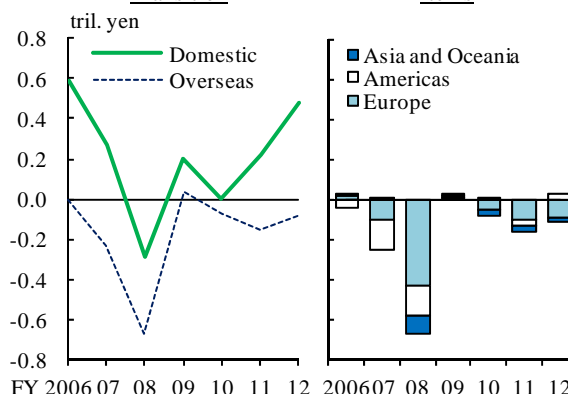
In fiscal 2012, the profits of major securities companies increased substantially from the previous year, mainly because commissions for sales of investment trusts and brokerage of securities expanded, reflecting the upturn in the stock market in the second half of fiscal 2012 (Chart V-2-4). The situation remained unchanged in the April-June quarter of 2013, with profits increasing significantly from the previous year. Securities companies have made some progress in restructuring unprofitable overseas divisions following the Lehman shock. Nevertheless, business conditions remain sluggish, particularly in Europe, where financial and economic activity remains weak, and this has continued to depress overall profits among securities companies (Chart V-2-5).

Chart V-2-4: Profits of securities companies¹



Note: 1. Data for the five major securities companies are counted on a consolidated basis.
Sources: Published accounts of each securities company.

Chart V-2-5: Revenue from overseas subsidiaries^{1,2}



Notes: 1. Data for the three major securities company groups are counted.
2. The data are based on segment information in annual reports.

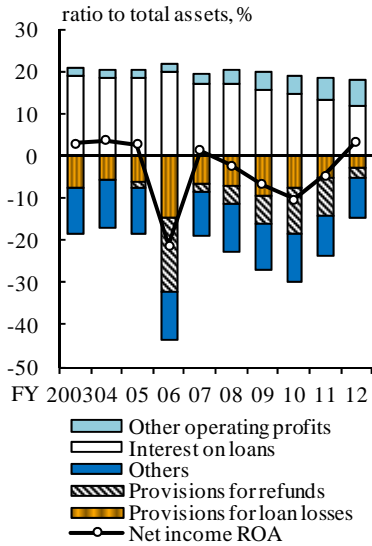
Sources: Published accounts of each securities company.

3. Consumer finance companies

Major consumer finance companies returned to net profits for the first time in 5 years in fiscal 2012 (Chart V-2-6).²⁶ This was because of a decline in borrowers' claims for refunds on overpaid interest and a decrease in provisions for loan losses reflecting the decline in the NPL ratio. However, interest income from loans extended declined because of the sluggish growth in new loan extension and the declining trend in loan yields (Chart V-2-7). In view of these circumstances, consumer finance companies have worked on strengthening their profitability by providing credit guarantees on consumer loans and expanding their overseas business operations (Chart V-2-8).

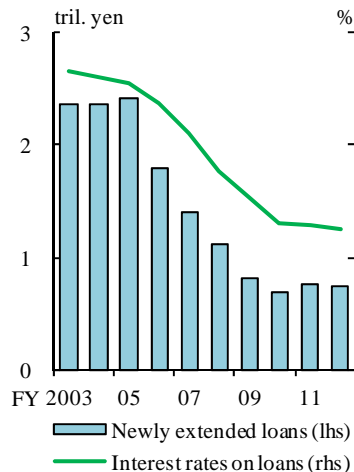
²⁶ The NPL ratio for major consumer finance companies declined to 11.7 percent in fiscal 2012 from its recent peak of 14.8 percent in fiscal 2010.

Chart V-2-6: Net income ROA of consumer finance companies^{1,2}



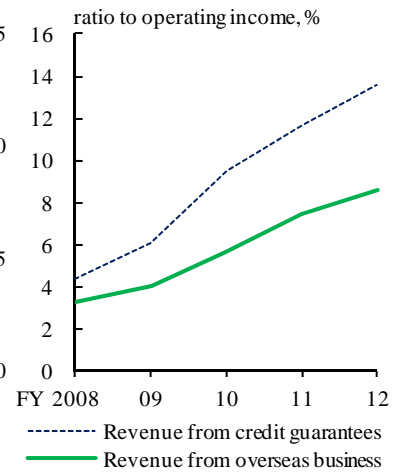
Notes: 1. Data for the three major companies are counted.
2. The latest data are as of end-March 2013.
Sources: Published accounts of each consumer finance company.

Chart V-2-7: Loan amounts and loan interest rates of consumer finance companies^{1,2}



Notes: 1. Data for the three major companies are counted.
2. The latest data are as of end-March 2013.
Sources: Published accounts of each consumer finance company.

Chart V-2-8: Revenue from loan guarantees and overseas business of consumer finance companies^{1,2}



Notes: 1. Data for the three major companies are counted.
2. The latest data are as of end-March 2013.
Sources: Published accounts of each consumer finance company.

VI. Risk assessment of the financial system from a macroeconomic perspective

This chapter outlines an assessment of macro risk factors associated with the financial system by using macro risk indicators and macro stress testing. Macro risk indicators show overheating, overcooling, or instability in financial activity. In this chapter, we assess macro risk factors by examining several macro risk indicators. Macro stress testing models the interrelationship between the financial system, financial markets, and the real economy, and simulates the extent of the impact on financial system stability of negative shocks that hit the economy and financial markets. For example, to a certain extent, we can quantitatively assess a feedback loop between the financial system and the real economy in which a deterioration in economic conditions reduces financial institutions' capital adequacy ratios through a decline in stock prices, further dampening economic activity.²⁷

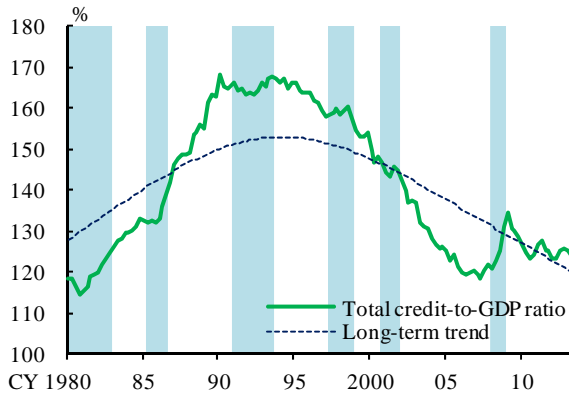
It should be noted that the scenario assumed in the macro stress testing in this chapter is not the most likely scenario for Japan's economy and asset prices. Rather, it seeks to clarify the characteristics of risks financial institutions face and assess the resilience of the financial system. The stress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

A. Macro risk indicators

Total credit from financial institutions to firms and households relative to GDP has recently been hovering around its long-term trend (Chart VI-1-1). Firms' investment spending relative to profits and households' investment spending relative to income have been more or less unchanged (Chart VI-1-2). As described in Chapter II.B, households have increased housing investment and their holdings of risky assets, but a comparison of investment spending and income does not suggest intensification of excessive risk taking among firms and households.

²⁷ In general, macro stress testing is conducted under "exceptional but plausible" scenarios in order to assess the resilience of the financial system.

Chart VI-1-1: Total credit-to-GDP ratio¹



Note: 1. The latest data are as of the April-June quarter of 2013. Shaded areas indicate recession periods.

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

Chart VI-1-2: Ratio of investment spending to operating profits or disposable income^{1,2,3}



Notes: 1. The latest data are as of fiscal 2012.

2. The indicator for firms is the ratio of corporate investment spending (business fixed investment, securities investment, and inventory investment) to operating profits.

3. The indicator for households is the ratio of household investment spending (housing investment and durable goods consumption) to disposable income.

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

The Financial Activity Indexes (FAIXs) gauge overheating of financial activity by examining the degree of deviation from the historical trend. Among 10 FAIXs, most indexes do not show any signs of overheating (Chart VI-1-3).²⁸ The Financial Cycle Indexes, which indicate 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 VI-1-4).²⁹

²⁸ The FAIXs consist of 10 financial indicators and judge whether financial activity is overheating or overcooling, based on how far individual indicators deviate from their historical trend. Shaded areas in Chart VI-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 toward 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 toward 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 FAIXs, 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.

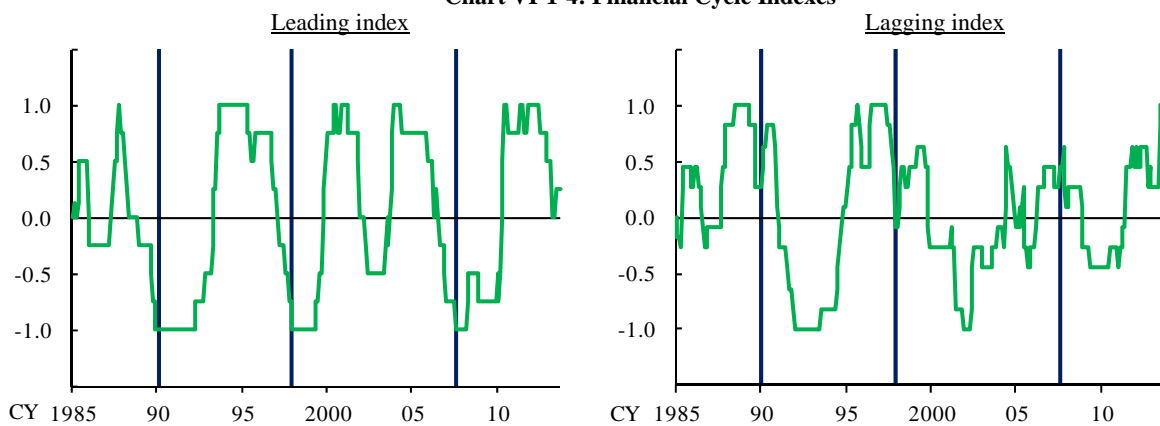
²⁹ The Financial Cycle Indexes are DIs used to identify signs of future instability in the financial system. A change in the leading index from a positive figure to a negative one indicates that the financial system may become unstable in the near future. The same movement in the lagging index indicates 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 VI-1-3: Heat map of Financial Activity Indexes¹

	CY	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13		
DI of lending attitudes of financial institutions																																					
Total credit to GDP ratio																																					
Equity weighting in institutional investors' portfolios																																					
Money multiplier (ratio of M2 to the monetary base)																																					
Gross rent multiplier (ratio of land prices to rent)																																					
Stock prices																																					
Spread between expected equity yields and government bond yields																																					
Ratio of business investment to operating profits																																					
Ratio of firms' CP outstanding to their liabilities																																					
Households' debt-to-cash ratio																																					

Note: 1. The latest data for DI of lending attitudes of financial institutions, stock prices and spreads between expected equity yields and government bond yields are as of the July-September 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 as of the July-August of 2013 and the January-March quarter of 2013, respectively. Those for other indicators are as of the April-June quarter of 2013.
 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,"; 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."

Chart VI-1-4: Financial Cycle Indexes¹



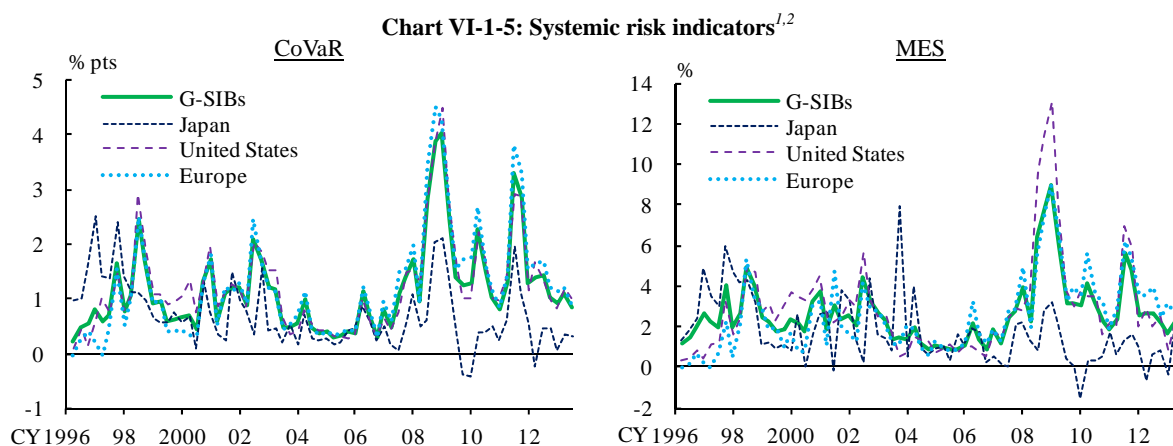
Note: 1. The latest data are as of September 2013. The left-hand, middle, and right-hand vertical lines indicate the collapse of Japan's asset price bubble, the default of Sanyo Securities, and the outbreak of the U.S. subprime problem, respectively.
 Source: BOJ.

The correlation between stock prices of individual financial institutions and aggregate financial stock prices does not show any signs of an increase in systemic risk in the financial sector (Chart VI-1-5). Conditional value-at-risk (CoVaR), which measures the degree to which stresses occurring at individual financial institutions propagate through the entire financial sector, has been at an extremely low level for Japan's banks relative to U.S. and European banks.³⁰ The marginal expected shortfall (MES), which measures the

³⁰ As CoVaR increases, the propagation of stresses occurring at individual financial institutions to

extent to which stresses in the entire financial sector have adverse effects on the corporate value of individual financial institutions, increased somewhat in May 2013 when the stock prices of domestic and foreign financial institutions dropped, but has declined recently.³¹

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



Notes: 1. The latest data are as of September 30, 2013.

2. G-SIBs are counted.

Sources: Bloomberg; BOJ.

B. Macro stress testing

1. Assumptions for macro stress testing

As in the previous *Report*, a baseline scenario and two stress scenarios are set as assumptions for macro stress testing. One stress scenario assume 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 assume that market interest rates in Japan rise significantly (an upward interest rate shift scenario).

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] as of November 2012). For details, see Tobias Adrian and Markus K. Brunnermeier, "CoVaR," Federal Reserve Bank of New York Staff Report, No. 348, September 2011.

³¹ 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 the market value of the stocks on the day 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 as of November 2012). 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.

The magnitude of stresses under each scenario is assessed by comparing them with the baseline scenario.

The test takes account of the adverse feedback loop between the financial system and the real economy using the Financial Macro-econometric Model (FMM).³² We assume that stresses occur from the October-December quarter of 2013, and changes through the end of fiscal 2015 are estimated.³³ The subjects of macro stress testing are banks and *shinkin* banks.³⁴ The capital adequacy ratios are calculated based on the Basel III requirements for internationally active banks and on the Basel II requirements for domestic banks including *shinkin* banks.³⁵ However, under the new capital adequacy ratio requirements to be applied to domestic banks from the end of March 2014, the flexible treatment of capital adequacy requirements regarding the capital calculation method -- which was in effect as an exceptional measure -- has become permanent.³⁶ Accordingly, unrealized gains/losses on securities holdings are not included in capital in the estimates for domestic banks' capital adequacy ratio presented in this chapter.

2. Baseline scenario

Assumptions made for the baseline scenario are as follows. The overseas real GDP growth rate would rise moderately from 3.0-3.5 percent in 2012 to about 4.5 percent through 2015 (the left-hand side of Chart VI-2-1).³⁷ Stock prices (TOPIX) and 10-year JGB yields would remain unchanged from the level observed at the end of March 2013.³⁸ The domestic nominal GDP growth rate would rise from around 0.5 percent in fiscal 2012

³² 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.

³³ Financial institutions' financial results are available until the end of March 2013 (i.e., the end of fiscal 2012). In this analysis, banks' financial results are estimated until the end of September 2013 using the FMM. Macro stress testing is conducted starting from the end of September 2013.

³⁴ Starting from this issue of the *Report*, we included *shinkin* banks in macro stress testing.

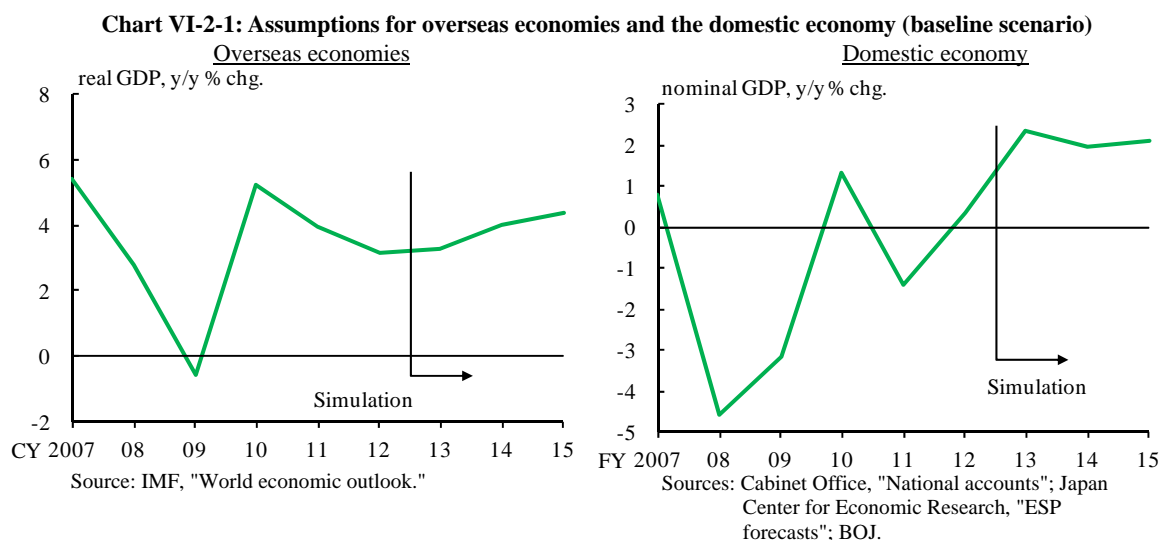
³⁵ In calculating capital adequacy ratios based on the Basel III requirements, the grandfathering measures accompanying the shift from the Basel II requirements are taken into account.

³⁶ For details on new capital adequacy ratio requirements to be applied to domestic banks, see Footnote 22 in Chapter V.A.

³⁷ This assumption is based on the long-term forecasts made by the International Monetary Fund (IMF) as of April 2013.

³⁸ Specifically, it is assumed that the TOPIX stands at 1,035 points and 10-year JGB yields at 0.55 percent.

to 2.3 percent in fiscal 2013 and hover at around 2.0 percent through fiscal 2015 (the right-hand side of Chart VI-2-1).³⁹

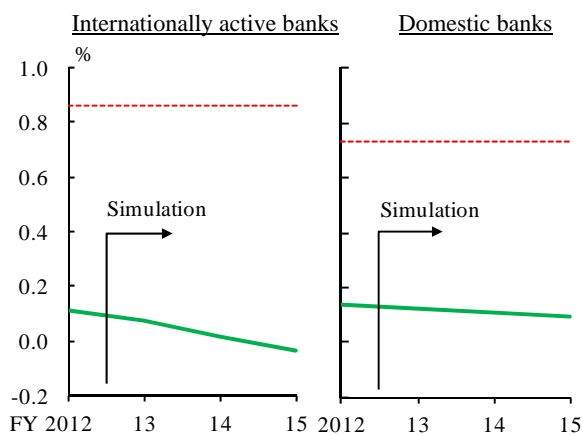


Under these assumptions, the simulation results are as follows. Credit cost ratios would decline moderately through fiscal 2015 as the domestic economic growth rate rise from the beginning of the estimation period (Chart VI-2-2).⁴⁰ As a result, the common equity Tier I capital ratios (CET I capital ratios) and Tier I capital ratios would rise moderately from fiscal 2013 (Chart VI-2-3).

³⁹ This assumption is based on private-sector forecasts made in August 2013.

⁴⁰ The credit cost ratios of internationally active banks are estimated to become slightly negative in fiscal 2015. As mentioned in Chapter V.A, financial institutions' credit cost ratios have recently been low. This is because (1) financial institutions' asset quality continued to improve; and (2) financial institutions' support for firms with sluggish business performance restrained the occurrence of default. We assumed in the baseline scenario that this trend would continue in future. Specifically, a large number of borrower firms' credit ratings would be upgraded because the domestic economic growth rate would remain high during the beginning of the estimation period. On the other hand, based on the assumption that financial institutions' support for firms with sluggish business performance continues, the number of downgraded borrower firms would be limited. As a result, the credit cost ratios of internationally active banks would turn negative in fiscal 2015, as reversals of provisions for loan losses are recorded.

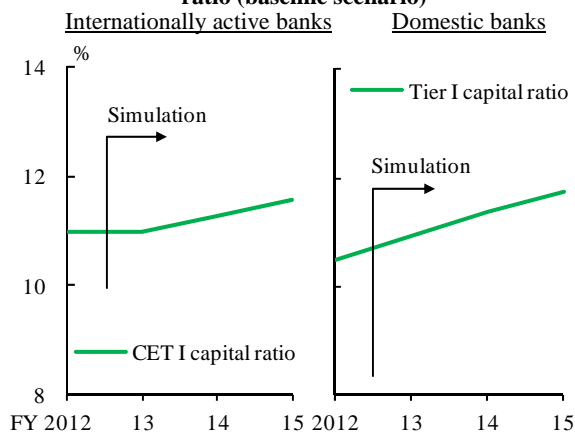
Chart VI-2-2: Credit cost ratio (baseline scenario)¹



Note: 1. Banks and *shinkin* banks are counted. The horizontal dashed lines indicate the break-even points in fiscal 2012.

Source: BOJ.

Chart VI-2-3: CET I capital ratio and Tier I capital ratio (baseline scenario)^{1,2}



Notes: 1. Banks and *shinkin* banks are counted.

2. The CET I capital ratio of internationally active banks is based on the Basel III requirements (taking grandfathering measures into consideration).

Source: BOJ.

3. Economic downturn scenario

Assumptions made for the economic downturn scenario are as follows. The stress equivalent to the Lehman shock in 2008 would arise in overseas economies and global financial markets in the second half of fiscal 2013. The overseas economic growth rate would plunge to about 0 percent through 2014 and recover to about 3 percent in 2015 (the left-hand side of Chart VI-2-4). Stock prices (TOPIX) would fall by 55 percent between the end of September 2013 and the end of September 2014, and 10-year JGB yields would decline by about 0.4 percentage point during the same period. Through the end of fiscal 2015, stock prices and 10-year JGB yields would remain more or less unchanged. Under these assumptions, the domestic economic growth rate would drop to around minus 2.0 percent in fiscal 2014, and would then return to the baseline scenario level in fiscal 2015 (the right-hand side of Chart VI-2-4).⁴¹

The simulation results of financial institutions' balance sheets and profits are similar to the estimation results presented in the previous *Report*. The credit cost ratio would increase considerably from the current level of around 0.1 percent to around 1.0 percent in fiscal 2014, but would subsequently fall to around 0 percent as the economy recovers (Chart VI-2-5). Although the capital adequacy ratios would fall significantly from the baseline scenario from fiscal 2014, these ratios would on average continue to exceed

⁴¹ Such developments in the domestic economic growth rate reflect external shocks including a downturn in overseas economies and the simulation results of the effects of an adverse feedback loop between the financial system and the real economy.

regulatory levels (Chart VI-2-6). The CET I capital ratio for internationally active banks would be 9.7 percent in fiscal 2014, falling by 1.5 percentage points from the baseline scenario of 11.2 percent. The decline in CET I capital ratios at internationally active banks would be caused by unrealized losses on securities resulting from falling stock prices and increased credit costs due to an economic downturn (the left-hand side of Chart VI-2-7). On the other hand, the Tier I capital ratio for domestic banks would be 10.6 percent at the end of fiscal 2014, falling by 0.7 percentage point from the baseline scenario of 11.3 percent (the right-hand side of Chart VI-2-7). The distribution of individual bank Tier I capital ratios shows that some domestic banks' Tier I capital ratios would remain at low levels, indicating that the extent of the impact of an economic downturn differs among banks (Chart VI-2-8).

Chart VI-2-4: Overseas economies and the domestic economy (economic downturn scenario)

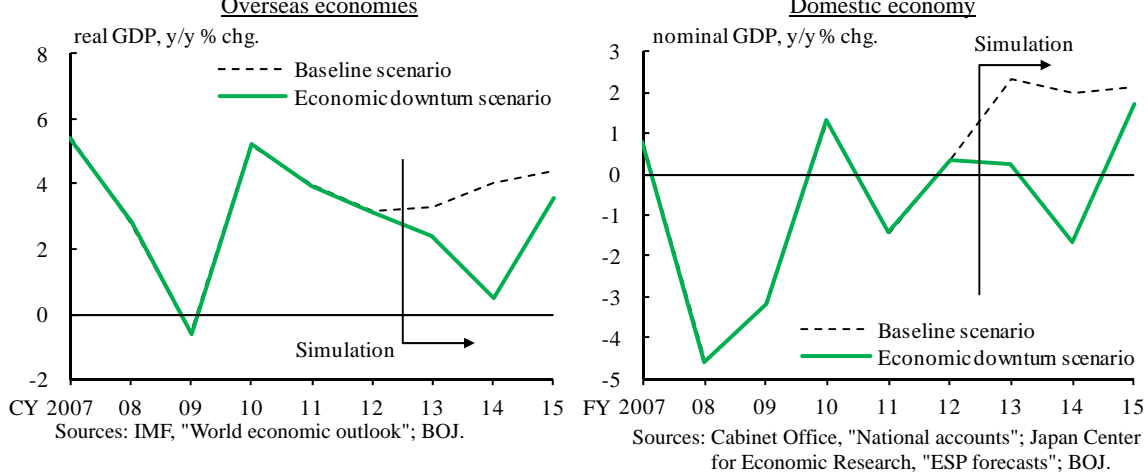
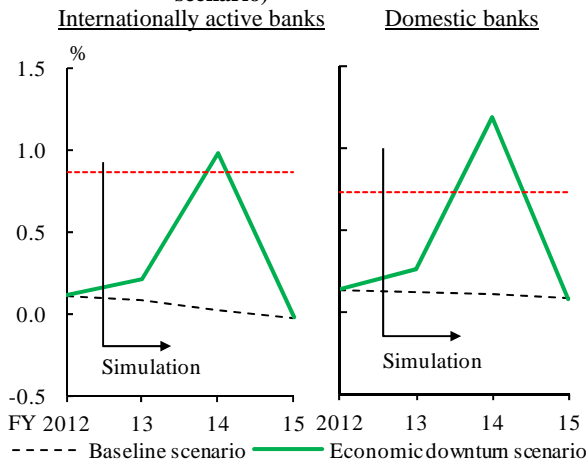
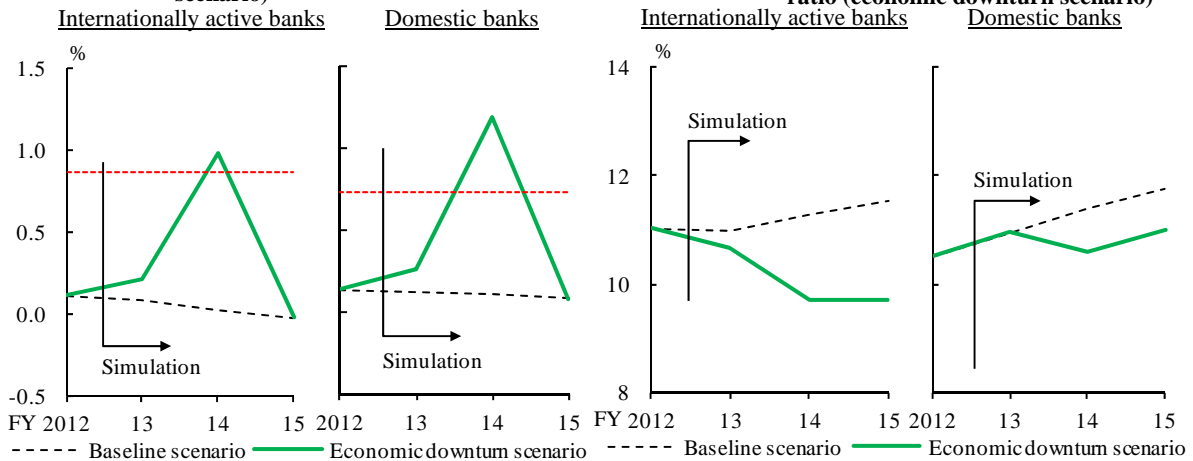


Chart VI-2-5: Credit cost ratio (economic downturn scenario)¹



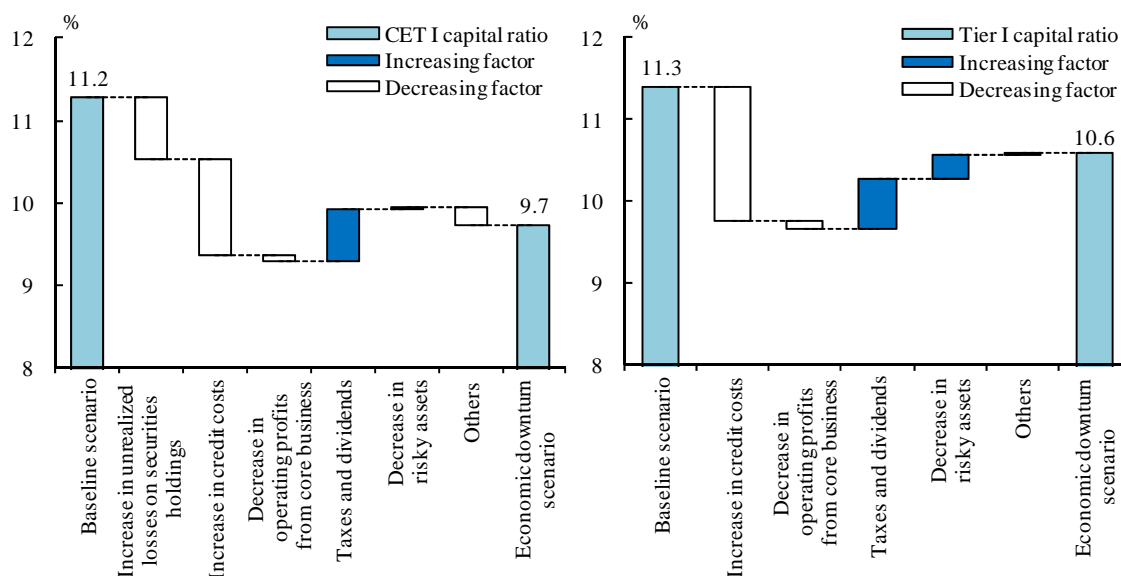
Note: 1. Banks and *shinkin* banks are counted. The horizontal dashed lines indicate the break-even points in fiscal 2012.
Source: BOJ.

Chart VI-2-6: CET I capital ratio and Tier I capital ratio (economic downturn scenario)^{1,2,3}



Notes: 1. Banks and *shinkin* banks are counted.
2. The left-hand chart shows the CET I capital ratio of internationally active banks. The right-hand chart shows the Tier I capital ratio of domestic banks.
3. The CET I capital ratio of internationally active banks is based on the Basel III requirements (taking grandfathering measures into consideration).
Source: BOJ.

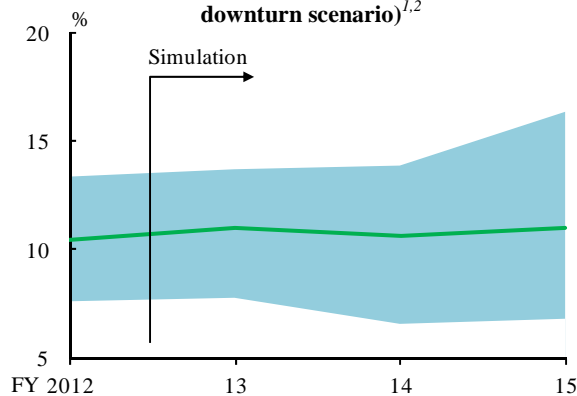
Chart VI-2-7: Factor decomposition in the CET I capital ratio and the Tier I capital ratio (economic downturn scenario)^{1,2,3}
Internationally active banks Domestic banks



Notes: 1. Banks and *shinkin* banks are counted. "Increase in unrealized losses on securities holdings" is calculated by taking account of tax effects. The data are as of end-March 2015.
 2. The left-hand chart shows the CET I capital ratio of internationally active banks. The right-hand chart shows the Tier I capital ratio of domestic banks.
 3. The CET I capital ratio of internationally active banks is based on the Basel III requirements (taking grandfathering measures into consideration).

Source: BOJ.

Chart VI-2-8: Domestic banks' distribution of Tier I capital ratio (economic downturn scenario)^{1,2}



Notes: 1. Banks and *shinkin* banks are counted.
 2. The shaded area indicates the 10th-90th percentile range measured by each bank's share of loans.

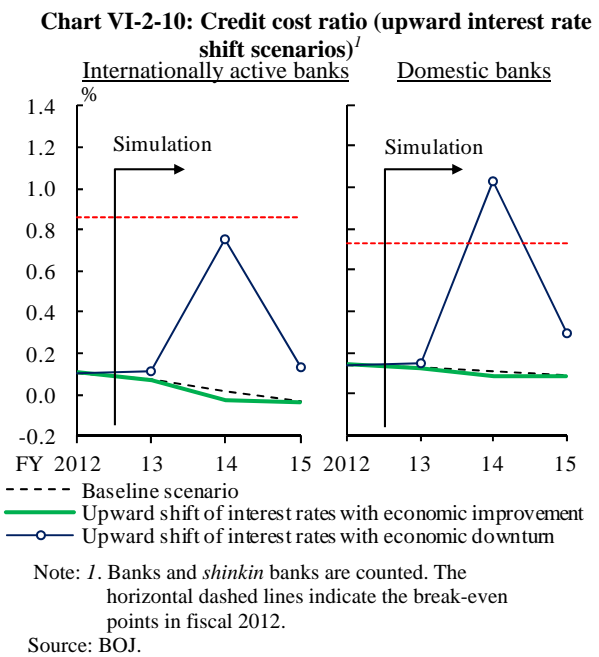
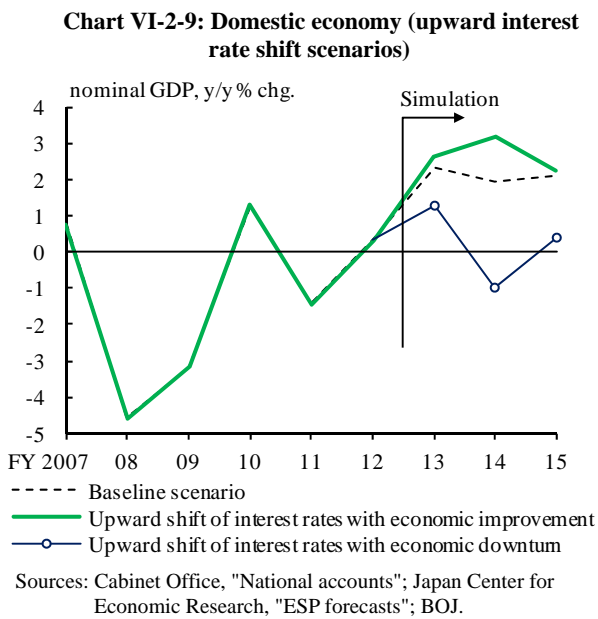
Source: BOJ.

4. Upward interest rate shift scenarios

Macro stress testing assumes the following two rising interest rate cases: a case in which interest rates rise in line with economic improvement; and a case in which interest rates rise with an economic downturn.

A rise in interest rates in line with economic improvement

The first case assumes that long-term interest rates would gradually rise as demand for funds increase in line with an economic recovery and a rise in stock prices. We assume a steepening scenario under which market interest rates for instruments with longer maturities would gradually rise, while those for instruments with shorter maturities would not rise significantly. The assumptions in more detail are as follows. Market interest rates for instruments with a 10-year maturity would deviate upward from the baseline scenario by 2.0 percentage points for 1 year from the end of September 2013 and remain unchanged through the end of fiscal 2015. Interest rates for instruments with shorter maturities would not rise significantly. The nominal GDP growth rate would deviate upward from the baseline scenario in tandem with an interest rate rise: it would rise to the 3.0-3.5 percent range in fiscal 2014 and remain at around the baseline scenario level in fiscal 2015 (Chart VI-2-9).⁴² Stock prices would rise by 80 percent during the year, and remain unchanged through the end of fiscal 2015. Assumptions for overseas economies are the same as the baseline scenario.

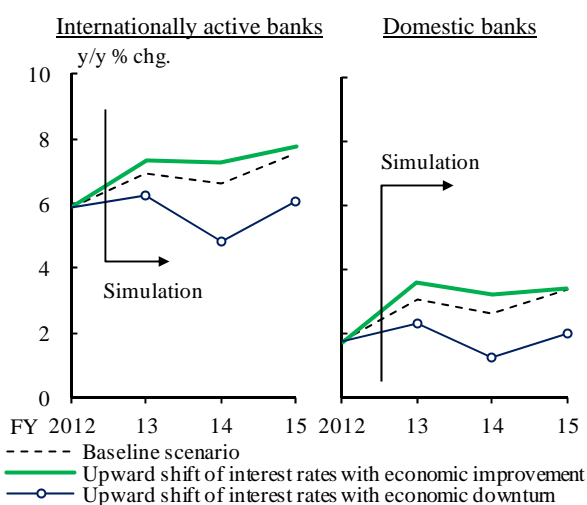


The simulation results of financial institutions' balance sheets and profits show that financial institutions will incur unrealized capital losses on bondholdings as market interest rates rise. However, they will also face unrealized gains on stockholdings due to

⁴² Similar to the economic downturn scenario results, developments in the domestic economic growth rate reflect the simulation results of the effects of an adverse feedback loop between the financial system and the real economy.

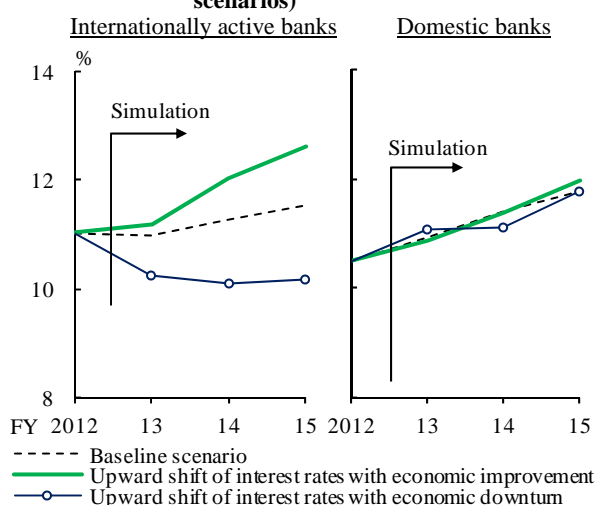
the rise in stock prices. As economic activity deviates upward from the baseline scenario, the credit cost ratio would fall slightly from the baseline scenario, while core profits (operating profits from core business) would deviate upward from the baseline scenario due to improved interest rate spreads on loans and increased lending (Charts VI-2-10 and VI-2-11).

Chart VI-2-11: Loans outstanding (upward interest rate shift scenarios)¹



Note: 1. Banks and *shinkin* banks are counted.
Source: BOJ.

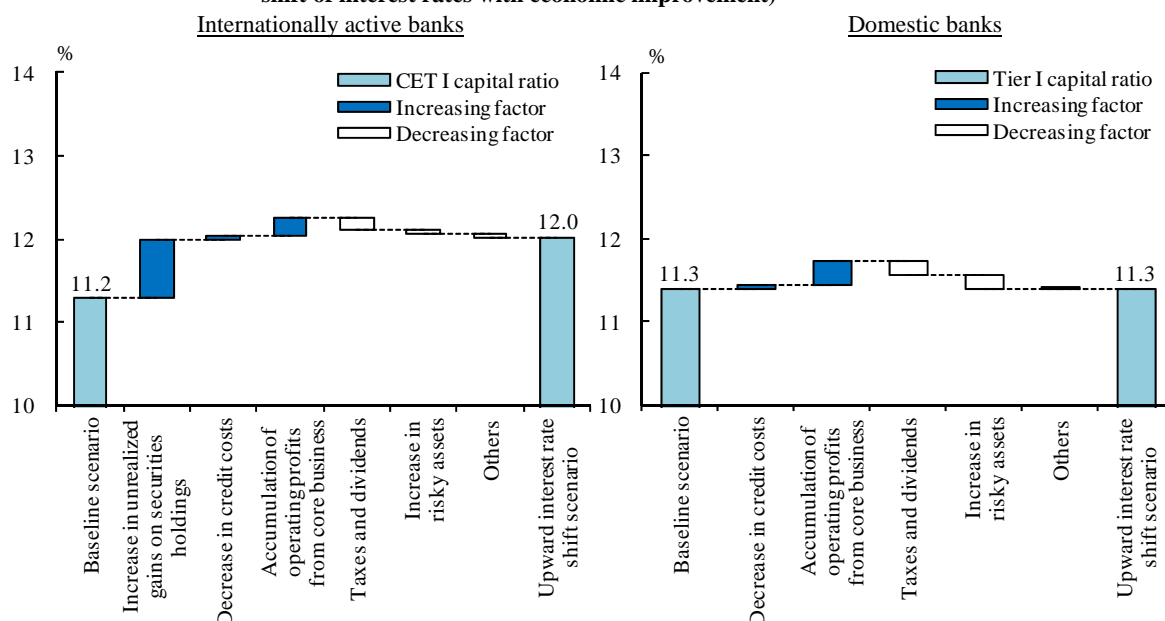
Chart VI-2-12: CET I capital ratio and Tier I capital ratio (upward interest rate shift scenarios)^{1,2,3}



Notes: 1. Banks and *shinkin* banks are counted.
2. The left-hand chart shows the CET I capital ratio of internationally active banks. The right-hand chart shows the Tier I capital ratio of domestic banks.
3. The CET I capital ratio of internationally active banks is based on the Basel III requirements (taking grandfathering measures into consideration).
Source: BOJ.

In these circumstances, the CET I capital ratio would rise at internationally active banks (Chart VI-2-12). This is because increases in core profits and unrealized gains on stockholdings would exceed the increase in unrealized capital losses on bondholdings due to the rise in long-term interest rates (the left-hand side of Chart VI-2-13). At domestic banks, whose unrealized gains/losses on securities holdings are not taken into account in calculating their Tier I capital ratios, these ratios would remain more or less at the baseline scenario level because the increase in lending would raise the amount of their risky assets, although operating profits from core business would improve (the right-hand side of Chart VI-2-13).

Chart VI-2-13: Factor decomposition in the CET I capital ratio and the Tier I capital ratio (upward shift of interest rates with economic improvement)^{1,2,3}



Notes: 1. Banks and *shinkin* banks are counted. "Increase in unrealized gains on securities holdings" is calculated by taking account of tax effects. The data are as of end-March 2015.
 2. The left-hand chart shows the CET I capital ratio of internationally active banks. The right-hand chart shows the Tier I capital ratio of domestic banks.
 3. The CET I capital ratio of internationally active banks is based on the Basel III requirements (taking grandfathering measures into consideration).

Source: BOJ.

A rise in interest rates with an economic downturn

The assumptions for the second case are as follows. The interest rate yield curve would steepen immediately after the start of the estimation period. Specifically, 10-year rates would rise by 2 percentage points from the baseline scenario at the beginning of the October-December quarter of 2013 and remain at the same level through the end of fiscal 2015. Stock prices, after falling by 34 percent during the quarter with a simultaneous rise in interest rates, would remain unchanged through the end of fiscal 2015.⁴³ With respect to the real economy, the nominal GDP growth rate would gradually deviate downward from the baseline scenario after the start of the estimation period, would decline to about minus 1 percent in fiscal 2014, and would remain in the 0.0-0.5 percent range in fiscal 2015 (Chart VI-2-9).⁴⁴

⁴³ The rate of decline in stock prices has been calculated using the elasticity of stock prices to JGB yields observed from April to October 1991, when a negative correlation between stock prices and JGB yields was the strongest since 1990.

⁴⁴ Similar to the economic downturn scenario results, developments in the domestic economic growth rate reflect the simulation results of the effects of an adverse feedback loop between the financial system and the real economy.

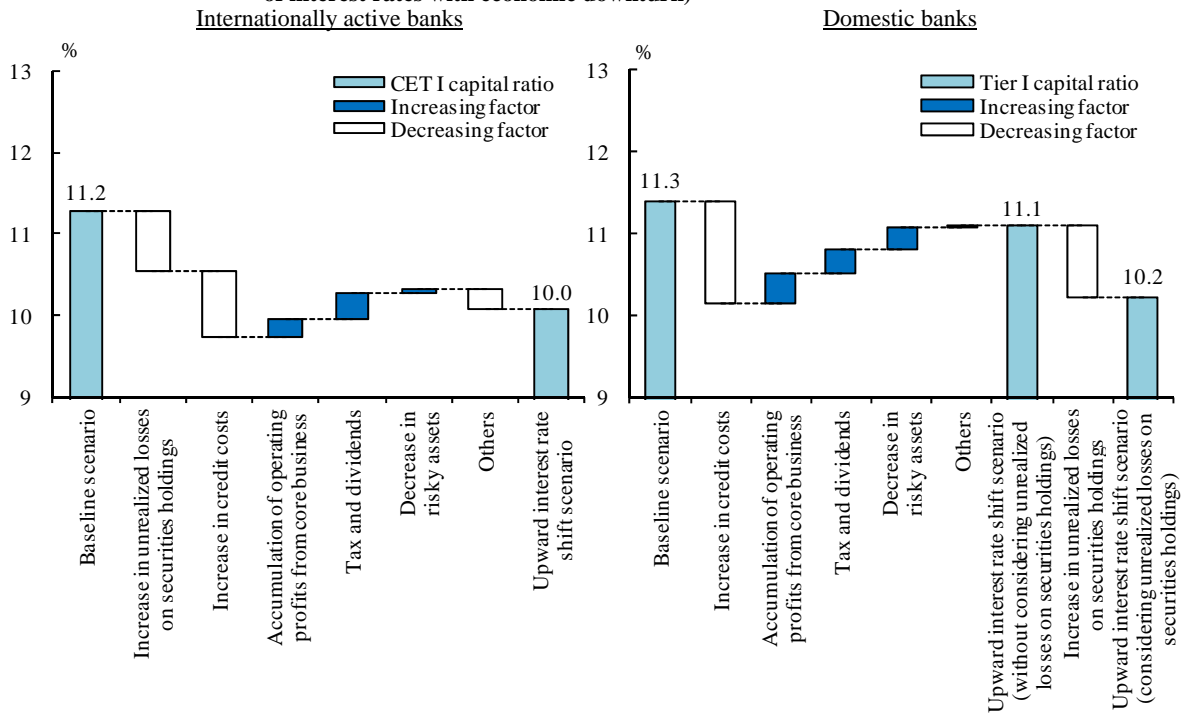
The simulation results of financial institutions' balance sheets and profits show that a rise in market interest rates combined with a simultaneous decline in stock prices would cause unrealized losses on both bondholdings and stockholdings at financial institutions. At the same time, the rise in lending rates -- reflecting higher market interest rates -- and the fall in stock prices would exert downward pressure on the real economy. This would raise credit costs to above the baseline scenario level (Chart VI-2-10). The emergence of unrealized losses on securities holdings and credit costs would induce financial institutions to adopt cautious lending attitudes. This would cause the outstanding loan growth rate to deviate downward from the baseline scenario by 1.6 percentage points in fiscal 2014 (Chart VI-2-11).

In these circumstances, the CET I capital ratio for internationally active banks would stand at 10.0 percent at the end of fiscal 2014, falling by 1.2 percentage points from the baseline scenario of 11.2 percent because of the emergence of unrealized losses on securities holdings and credit costs (the left-hand side of Chart VI-2-14). Although the CET I capital ratio would remain significantly below that in the baseline scenario, it would still exceed the regulatory level on average. On the other hand, the Tier I capital ratio for domestic banks would remain more or less at the baseline scenario level because their capital does not reflect unrealized losses on securities holdings (the right-hand side of Chart VI-2-14). Nevertheless, if we assume that unrealized losses on securities holdings become realized losses due to sales of bonds and stocks, the Tier I capital ratio for domestic banks would be 10.2 percent, below the baseline scenario of 11.3 percent (the right-hand side of Chart VI-2-14 and Chart VI-2-15). The magnitude of the impact of realized losses on securities holdings differs among individual financial institutions. Similar to the economic downturn scenario results, the Tier I capital ratios of some institutions would be relatively low (Chart VI-2-16).

In the previous *Report*, we assumed scenarios in which a slow rise in interest rates -- by 2 percentage points in 1 year (a parallel shift or steepening) -- gradually influenced the real economy and stock prices. This *Report* assumed a scenario involving stronger downward pressure on capital, in that an interest rate rise and the subsequent effects on the real economy occurred at an early stage. However, even under such severe assumptions, we confirmed that the capital adequacy ratio would exceed the regulatory level on average.⁴⁵

⁴⁵ Based on the same assumptions under a steepening scenario as discussed in the previous *Report*, the Tier I capital ratio for internationally active banks (1 year after the occurrence of a shock) would deviate downward from the baseline scenario by about 0.3 percentage point, which is almost the same as the estimate of about 0.1 percentage point presented in the previous *Report*. The Tier I

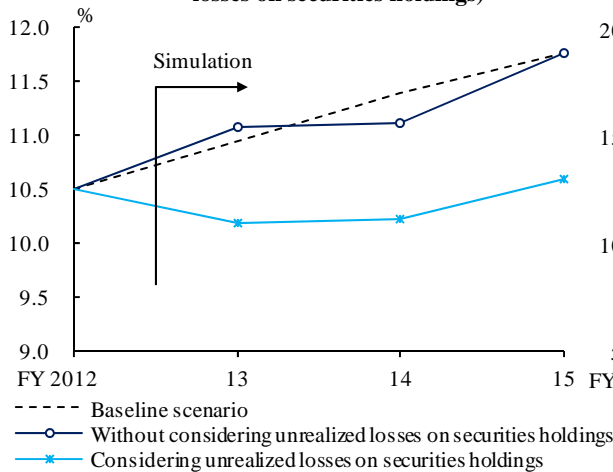
Chart VI-2-14: Factor decomposition in the CET I capital ratio and the Tier I capital ratio (upward shift of interest rates with economic downturn)^{1,2,3}



Notes: 1. Banks and *shinkin* banks are counted. "Increase in unrealized losses on securities holdings" is calculated by taking account of tax effects. The data are as of end-March 2015.
 2. The left-hand chart shows the CET I capital ratio of internationally active banks. The right-hand chart shows the Tier I capital ratio of domestic banks.
 3. The CET I capital ratio of internationally active banks is based on the Basel III requirements (taking grandfathering measures into consideration).

Source: BOJ.

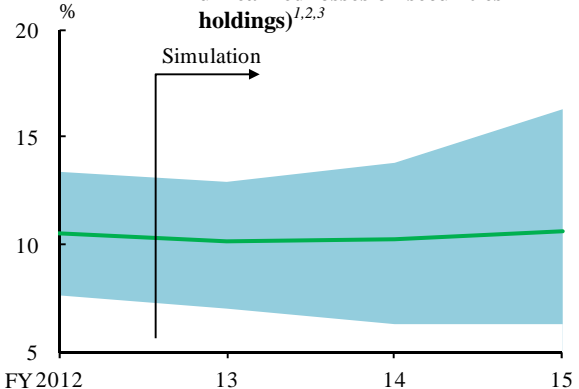
Chart VI-2-15: Tier I capital ratio of domestic banks (considering unrealized losses on securities holdings)^{1,2}



Notes: 1. Banks and *shinkin* banks are counted.
 2. The stress scenario is an upward interest rate shift scenario with economic downturn.

Source: BOJ.

Chart VI-2-16: Domestic banks' distribution of Tier I capital ratio (considering unrealized losses on securities holdings)^{1,2,3}



Notes: 1. Banks and *shinkin* banks are counted.
 2. The shaded area indicates the 10th-90th percentile range measured by each bank's share of loans.
 3. The stress scenario is an upward interest rate shift scenario with economic downturn.

Source: BOJ.

capital ratio for domestic banks, whose capital does not reflect unrealized losses on securities holdings, would remain more or less unchanged from the baseline scenario, as stated in the previous Report.

5. Issues related to the results estimated under upward interest rate shift scenarios

The above estimation results should be interpreted with some degree of latitude from a range of perspectives. Specifically, the results are estimates calculated using the FMM based on certain assumptions. Because the FMM mainly uses data collected during a period of declining interest rates, it may not precisely gauge the effects of an interest rate rise. Furthermore, the impacts of an interest rate rise may exceed those under the assumptions made in the FMM, depending on the speed and extent of the rise in interest rates and the factors behind it. We discuss these issues by providing specific examples below.

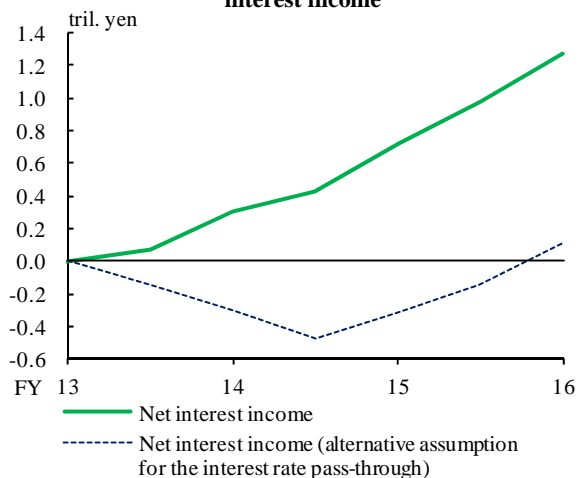
Pass-through of loan interest rates and deposit interest rates

We assumed in the above estimation that the pass-through of loan interest rates (the extent to which loan interest rates would rise in response to a rise in market interest rates) exceeds the pass-through of deposit interest rates. Therefore, interest rate spreads on loans would expand after a rise in interest rates, and the net interest income of banks would increase (Chart VI-2-17).⁴⁶ The pass-through assumption is based on data collected during periods of interest rate declines in the past. However, if market interest rates rise within a relatively short period without any improvement in economic activity, banks may not be able to raise their loan interest rates to an adequate extent. If the pass-through of loan interest rates is lower than expected and that of deposit interest rates is higher than expected, an improvement in interest rate spreads on loans after the rise in market rates would be delayed and net interest income would be sluggish. Furthermore, the pass-through experience differs according to the circumstances of individual banks' borrower firms and the degree of competitiveness. Based on the estimation, some banks' net interest income would be lower than in the baseline scenario even when 3 years have passed since an interest rate rise (Chart VI-2-18).⁴⁷

⁴⁶ In Chart VI-2-17, we assumed as the baseline scenario that, from the end of September 2013, interest rates would follow the path implied in the market yield curve observed at the end of March 2013. We assumed an upward parallel shift scenario in which the yield curve shifts upward from the baseline scenario by 2 percentage points during the year from the end of September 2013. We assumed that banks' investment-funding balance remains constant from the end of March 2013 during the estimation period.

⁴⁷ We used the data for individual banks' balance sheets and the pass-through estimated for each bank. We estimated the pass-through for each bank by employing the dynamic panel model, and began the sample period from fiscal 1994. The dependent variable was long-term/short-term loan interest rates or interest rates on time deposits by maturity. The independent variables were as follows: (1) the features of individual banks' asset and liability composition (the size of total assets, the liquidity asset ratio, the capital adequacy ratio, and the ratio of long-term loans); (2) market

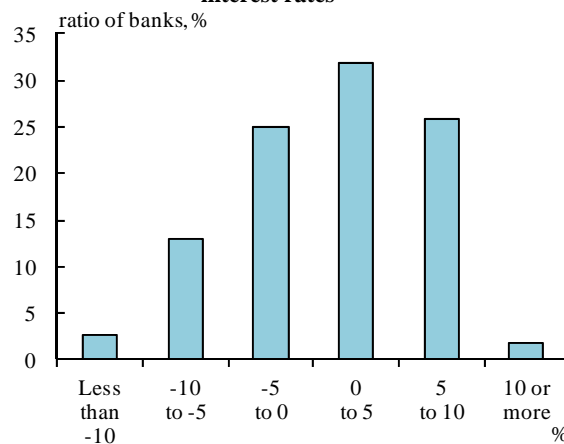
Chart VI-2-17: Assumptions for the interest rate pass-through and changes in net interest income^{1,2,3,4}



- Notes: 1. Major banks and regional banks are counted.
 2. A 2 percentage point parallel shift in interest rates is assumed.
 3. The vertical axis shows the difference in net interest income between the baseline scenario and the parallel shift scenario.
 4. The alternative assumption is a case in which the loan interest rate pass-through is lower by about 0.2 and the funding interest rate pass-through is higher by about 0.1 compared to the estimated value using the historical data.

Source: BOJ.

Chart VI-2-18: Changes in individual banks' net interest income due to a rise in interest rates^{1,2,3}



- Notes: 1. Major banks and regional banks are counted.
 2. A 2 percentage point parallel shift in interest rates is assumed.
 3. The horizontal axis indicates the ratio of banks' annual net interest income to Tier I capital. Annual net interest income is calculated as the deviation from the baseline scenario 2 years after the upward shift in interest rates. The vertical axis indicates the share of banks.

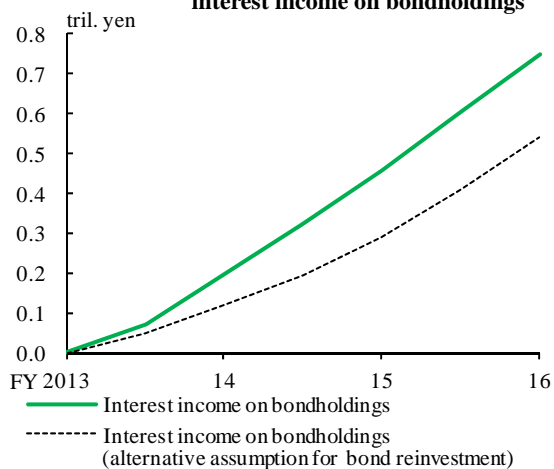
Source: BOJ.

Reinvestment behavior among financial institutions

We assumed in the above estimation that financial institutions would reinvest all of their redemption money into bonds with the same maturities without changing their bond portfolios. However, in actual business operations, banks may flexibly change the maturity structure of their portfolios based on the outlook for interest rates, such as by shortening duration in order to reduce interest rate risk. If we change the assumption that banks reinvest all of their redemption money into short-term securities, their security interest income would plunge (Chart VI-2-19).

interest rates (the London interbank offered rate [Libor] and the swap interest rate); and (3) macroeconomic variables (the GDP growth rate, market volatility, etc.). The formulation of this estimation is based on the study of Leonardo Gambacorta, "How Do Banks Set Interest Rates?," *European Economic Review*, 52, pp. 792-819, 2008.

Chart VI-2-19: Assumptions for reinvestment and interest income on bondholdings^{1,2,3,4}



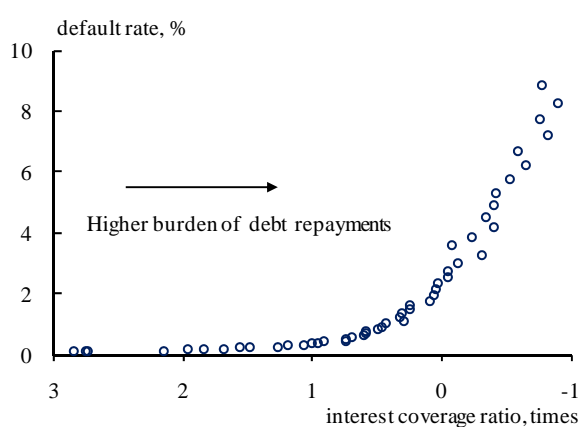
Notes: 1. Major banks and regional banks are counted.
 2. A 2 percentage point steepening in interest rates is assumed.
 3. The vertical axis shows the difference in interest income on bondholdings between the baseline scenario and the steepening scenario.
 4. The alternative assumption for bond reinvestment is assumed, as bonds are all reinvested in 3-month bonds at the end of their terms.

Source: BOJ.

Burden of debt repayments on firms and households from a rise in interest rates

If borrowing interest rates rise, the default rate may increase due to the heavier burden of debt repayments on firms and households. In fact, a non-linear relationship is observed, in which the default rate surges when the burden of debt repayments on small and medium-sized firms and households (measured by the ratio of interest payments to operating profits for small and medium-sized firms and the ratio of principal and interest repayments to income for households) exceeds a certain threshold (Charts VI-2-20 and VI-2-21). However, the FMM, which describes the relationship between the burden on debt repayments and the default rate from a macroeconomic perspective, does not sufficiently capture such a non-linear relationship. Thus, the default rate and credit costs may rise substantially, depending on the extent of the rise in interest rates and deterioration in corporate profits and household income. If the pass-through of loan interest rates mentioned earlier declines, the extent of the rise in loan interest rates would be restrained. It is therefore necessary to assess these factors comprehensively.

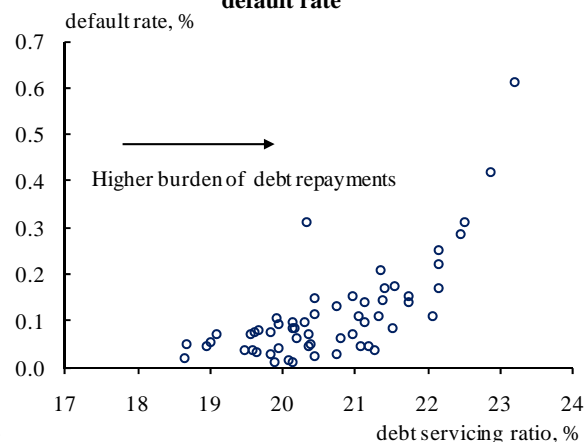
Chart VI-2-20: SME interest coverage ratio and default rate^{1,2,3,4}



- Notes: 1. The data are as of 2012.
 2. Defaults are defined as loans delinquent for 3 months or more, downgraded to de facto bankrupt or bankrupt, or subrogated by credit guarantee corporations.
 3. Interest coverage ratio = operating profits / interest payments.
 4. "SMEs" stands for small and medium-sized enterprises.

Source: CRD.

Chart VI-2-21: Household debt servicing ratio and default rate^{1,2,3}



- Notes: 1. The data are from March 2001 to August 2008.
 2. Defaults are defined as loans delinquent for 6 months or more.
 3. Debt servicing ratio = repayments / average annual income.

Source: Japan Housing Finance Agency.

C. Resilience against funding liquidity risk

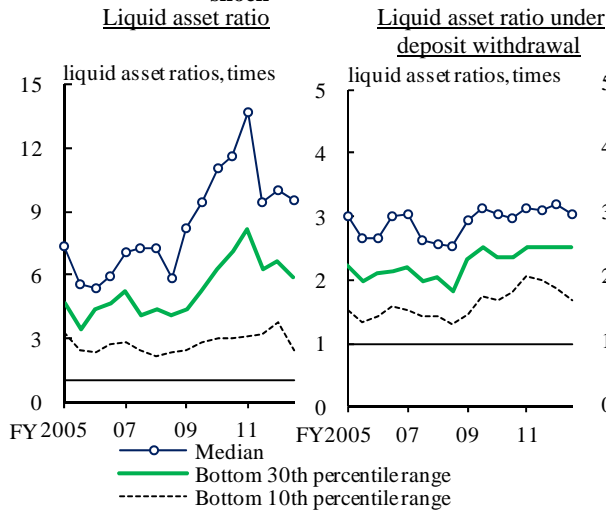
This section examines whether Japan's banks hold sufficient liquidity buffers under scenarios in which the yen funding market and foreign currency funding markets come under stress.

Regarding funding in yen, under an assumption in which market funding in yen comes to a complete stop for 3 months, many banks would have sufficient liquid assets to satisfy their short-term funding needs, i.e., their liquid asset ratios would be greater than 1 with the amount of assets and liabilities set at the levels seen at the end of March 2013 (the left-hand side of Chart VI-3-1). Furthermore, even if we assume a more severe shock in which 10 percent of deposits with a term until renewal of the deposit rate of 3 months or less are withdrawn, many banks would have sufficient liquid assets to meet their funding needs (the right-hand side of Chart VI-3-1). In this regard, financial institutions' resilience against liquidity risk associated with funding in yen seems to be very strong.

As for foreign currency funding markets, we assume a scenario under which one of the major sources of foreign currency funding for financial institutions -- the foreign exchange swap market, the repo market, and the CD and CP markets -- becomes unavailable for 1 month with the amount of assets and liabilities set at the levels prevailing at the end of March 2013. Under this assumption, Japan's banks would still

have adequate foreign currency liquidity buffers to cover funding shortages that may occur in any of the markets, i.e., their foreign currency liquidity to funding shortage ratios would be greater than 1 (Chart VI-3-2).⁴⁸ Even under an extremely severe stress scenario in which all of the aforementioned markets become unavailable for 1 month, banks' current foreign currency liquidity buffers would cover their funding shortages. In this regard, financial institutions' resilience against liquidity risk associated with funding in foreign currencies also seems to be strong.

Chart VI-3-1: Stress testing against yen liquidity shock^{1,2,3}



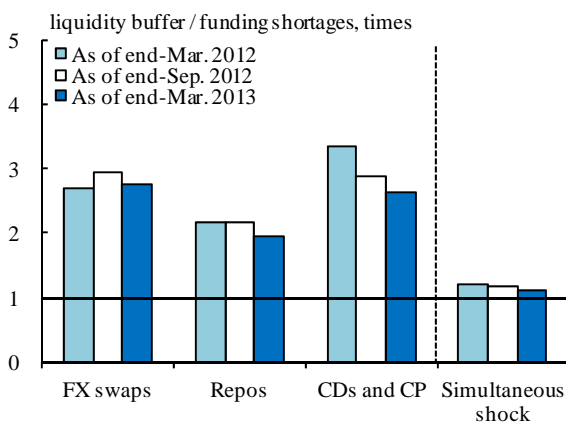
Notes: 1. Major banks (excluding trust banks) and regional banks are counted. Banks whose market investment exceeds their market funding are excluded. The latest data are as of end-March 2013.

2. Liquid asset ratio = (current accounts held at the Bank of Japan + cash + government bonds) / (net market funding maturing within 3 months + expected withdrawing of deposits with a term until renewal of the deposit rate of 3 months or less).

3. In the left-hand chart, it is assumed that 0 percent of deposits are withdrawn. In the right-hand chart, it is assumed that 10 percent of deposits with a term until renewal of the deposit rate of 3 months or less are withdrawn.

Source: BOJ.

Chart VI-3-2: Stress testing against foreign currency liquidity shock^{1,2}



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

2. The duration of funding shortages in each market is 1 month.

Sources: Published accounts of U.S. MMFs; BOJ.

⁴⁸ 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 at the end of March 2013. Funding shortages are calculated based on the maturity structure estimated as follows: the amount of foreign exchange swaps, CDs, and CP to be redeemed within a month is estimated based on transaction balance data, 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 provided by such 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 their securities. In each scenario, we do not consider securities borrowed in repo transactions as liquidity buffers.

Annex: 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

Capital adequacy ratios of internationally active banks based on the Basel III requirements

Common equity Tier I (CET I) capital ratio = CET I capital / risky assets

CET I capital comprises common equities and retained earnings.

Risky assets are financial institutions' risk-weighted assets.

Tier I capital ratio = Tier I capital / risky assets

Tier I capital includes CET I capital and equities such as preferred equities that meet certain conditions.

Total capital adequacy ratio = Total capital / risky assets

Total capital includes Tier I capital and subordinated bonds that meet certain conditions.

Capital adequacy ratios of domestic banks based on the Basel II requirements

Tier I capital ratio = Tier I capital / risky assets

Tier I capital is the key element of capital including common equities and retained earnings.

Risky assets are financial institutions' risk-weighted assets.