BOJ Reports & Research Papers

Financial System Report

BANK OF JAPAN

APRIL 2015

The total of 10 major banks, 105 regional banks, and 258 *shinkin* banks covered in this *Report* is as follows (as of March 31, 2015).

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 258 *shinkin* banks are the *shinkin* banks that hold current accounts at the Bank of Japan.

This *Report* basically uses data available as of March 31, 2015.

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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 *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 based on analyses and assessments of risks in the financial system as a whole, together with the interconnectedness of the real economy, financial markets, and financial institutions' behavior, to ensure the stability of the overall financial system.

The Bank uses the results of the analysis set out in the *Report* in planning measures to ensure stability in the financial system and for providing guidance and advice to individual financial institutions through off-site monitoring and on-site examinations. 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.

Features of this Report

This issue of the *Report* provides analyses and assessments of financial intermediary activities and risks by further utilizing findings the Bank has obtained through its off-site monitoring and on-site examinations. Taking into account these analyses and assessments, Chapter IV, entitled "Risks borne by financial institutions," presents tasks and challenges for financial institutions regarding their risk management. Furthermore, the "On-Site Examination Policy for Fiscal 2015" reflects the analyses and assessments set out in this *Report*.

On the analytical front, analyses related to structural changes in the financial system have been expanded. Specifically, the propagation of risks throughout the financial system and its connection with overseas markets have been enhanced, mainly through analyses on (1) the interconnectedness of financial institutions (network analysis) and (2) financial institutions' exposure to Asia. And new analyses have been introduced on (3) the decline in profitability among domestic deposit-taking and lending activities -- with the current environment surrounding regional financial institutions in mind -- and (4) the profitability of housing loans and risks in the event of interest rate rises.

Contents

I. Executive Summary: Comprehensive assessment of the financial system

Japan's financial system has been maintaining stability. Financial intermediation has operated more smoothly than before.

Functioning of the financial system

Financial institutions have continued to adopt more proactive lending attitudes both at home and abroad. In Japan, they are now geared toward taking more risks in their business operations, and are increasingly engaged in the fostering of growing businesses and the revitalization of firms. In this situation, financial institutions' domestic loans have continued to increase moderately, particularly loans to firms, and the increase in the outstanding amount of lending is gradually spreading out across various firm sizes, industries, and regions. The rate of increase in overseas loans has remained high, as financial institutions have been demonstrating a strong interest in expanding overseas lending with a view to supporting the global expansion of Japanese firms and capturing the financial needs of Asian or other countries with high growth potential. As for securities investment, financial institutions have gradually been enhancing their risk-taking stance by diversifying their asset investments, such as foreign bonds and investment trusts, while maintaining a high level of yen-denominated bond investment. Meanwhile, major institutional investors, having invested mainly in domestic long-term bonds, are also increasing their share of investment in risky assets. Regarding financial intermediation through financial markets, favorable issuing conditions have been maintained, as evidenced by sustained high levels of equity financing. Under these circumstances, financial conditions among firms and households have become more accommodative. Meanwhile, deposits have been central to household financial assets. Recently, however, the share of risky assets in household financial assets has gradually been increasing, as seen particularly in the continued net inflow to investment trusts.

Stability of the financial system

Regarding developments in the above-mentioned financial intermediation, signs of financial imbalances such as indications of overheating or excessively bullish expectations have not been observed.

Financial bases of financial institutions have been adequate on the whole. Their capital adequacy ratios are sufficiently above regulatory levels. The amount of risk that financial institutions bear has decreased somewhat since the time of the previous *Report*,

mainly reflecting the fall in the amount of credit risk, and financial institutions have achieved higher levels of capital mainly due to their accumulation of profits. Under these circumstances, a fine balance has been kept between macro risks to which financial institutions are exposed and their financial bases, and the financial system generally has strong resilience against various stresses. However, careful attention should be paid to the possibility that economic or financial shocks will affect the stability of the financial system, depending on their speed and extent, as well as the factors behind them. In terms of funding liquidity, financial institutions have sufficient funding liquidity in yen funds. As for foreign currency-based funding, they have funding structures with a large proportion of market funding, but hold a liquidity buffer that can cover funding shortages even if market funding becomes difficult for a certain period.

Meanwhile, commodity prices declined substantially, and volatility in global financial markets has risen across a wide range of instruments. The rise in market volatility has spilled over into the domestic markets to some extent.

Toward ensuring financial stability in the future

Japan's financial system has been maintaining stability. In order to ensure the stability in the future, continued efforts are necessary to keep the fine balance between macro risks to which financial institutions are exposed and their financial bases, while steadily responding to structural changes in risks that might become the source of future fragility for the system.

Points to which attention should be paid in view of the accumulation of macro risks are: (1) the expansion of international operations among financial institutions, an increase in overseas exposure; and (2) the increased importance of market investment in asset-liability management (ALM), an increase in market exposure. Points to focus on in view of structural changes in risks are: (3) the increased systemic importance of large financial institutions; and (4) the decline in profitability with regard to domestic deposit-taking and lending operations, especially for regional financial institutions. In addition, attention needs to be paid to developments in (5) changes in households' asset portfolio choices; and (6) the implementation of international financial regulations, as they may influence the stability of the financial system.

Based on the above considerations, points that can be raised as key management tasks and challenges for individual financial institutions are: (1) strengthening their ability to respond to risks in areas in which financial institutions are actively enhancing their

risk-taking stance, overseas operations and investment in markets in particular; (2) appropriately dealing with the systemic importance of large financial institutions; and (3) responding to the decline in core profitability among regional financial institutions.

The Bank of Japan will continue to grasp facts and to analyze the situation surrounding the financial system, including the accumulation of macro risks and structural changes among them, as well as examine resilience against stresses. Based on these activities, it will work to share a common understanding and to hold discussions with a wide range of stakeholders in the financial system, presenting specifics on matters including where risks lie and what issues to tackle, thereby responding appropriately to given circumstances. Alongside these efforts, while following a broad range of proactive financial intermediary activities that utilize the accommodative conditions brought about by QQE, the Bank will exchange views with financial institutions while strengthening its grasp of the actual situation regarding the following points, particularly from the perspective of responding to the aforementioned tasks: (1) international operations; (2) ALM and investment in markets; (3) large financial institutions' systemic-risk characteristics and their business management; (4) regional financial institutions' profitability; (5) financial institutions' efforts to increase industrial strength and those toward enhancing the vitality of their client firms; and (6) market-related businesses conducted by financial institutions and securities firms as well as developments in sales of financial products.

II. Examination of the external environment

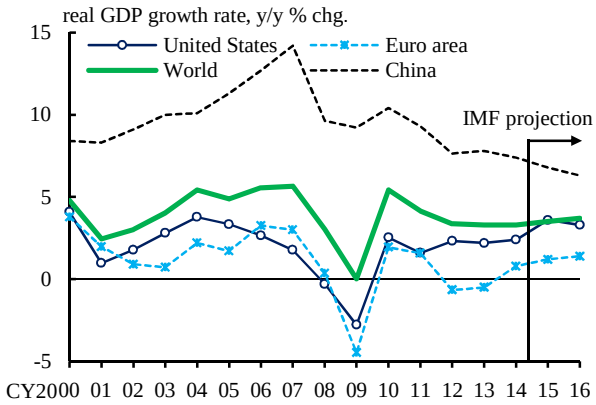
This chapter examines the external environment surrounding Japan's financial system, mainly during the second half of fiscal 2014. It summarizes developments in overseas economies, global financial markets, Japan's economy, and fiscal conditions in Japan.

A. Developments in overseas economies and global financial markets

Overseas economies -- mainly advanced economies -- have been recovering, albeit with a lackluster performance still seen in part (Chart II-1-1). **On the monetary policy front, while the United States has begun to take steps toward normalization, additional monetary easing has been implemented in the euro area and some other European countries, as well as in emerging economies.**

Chart II-1-1: Overseas economies[1,2]

Real GDP growth rate



Projections for major economies

y/y % chg.

	2013	2014	2015 Projection	2016 Projection
World	3.3	3.3	3.5 (-0.3)	3.7 (-0.3)
United States	2.2	2.4	3.6 (0.5)	3.3 (0.3)
Euro area	-0.5	0.8	1.2 (-0.2)	1.4 (-0.3)
Emerging market and developing economies	4.7	4.4	4.3 (-0.6)	4.7 (-0.5)
China	7.8	7.4	6.8 (-0.3)	6.3 (-0.5)

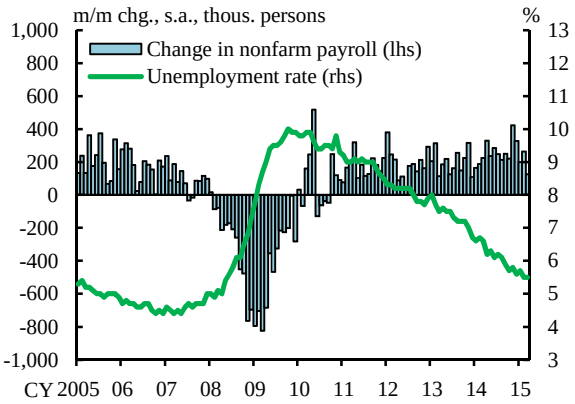
Notes: *1*. The post-2015 data are based on the January 2015 WEO projections.
2. Figures in parentheses are differences from October 2014 WEO projections.
Source: IMF, "World economic outlook."

Looking at movements by major region, the U.S. economy has continued to recover solidly, since the firmness in the household sector has been feeding through to the corporate sector (Chart II-1-2). The Federal Reserve Board (FRB) concluded its asset purchase program in October 2014, and began its dialogue with the market in preparation for the normalization of monetary policy.

With regard to the European economy, a moderate recovery has continued with the slowdown in growth momentum coming to a halt. The economy is also beset with downside risks such as the uncertain course of its debt problem, including the situation in Greece, as well as deceleration of the Russian economy, in a situation in which low

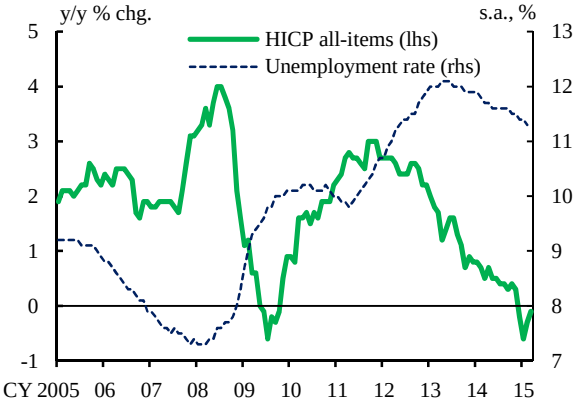
inflation has persisted somewhat (Chart II-1-3). Spurred on by developments including unexpectedly weak price trends, the European Central Bank (ECB) in January 2015 decided to introduce a public asset purchase program by expanding its purchases to include assets such as government bonds. Shortly before and after this additional easing by the ECB, such non-euro area countries as Switzerland, Denmark, and Sweden also took monetary easing policy actions.

Chart II-1-2: Employment situation in the United States[1]



Note: *1*. The latest data are as of March 2015.
Source: U.S. Bureau of Labor Statistics.

Chart II-1-3: Unemployment rate and inflation rate in the euro area[1,2,3]

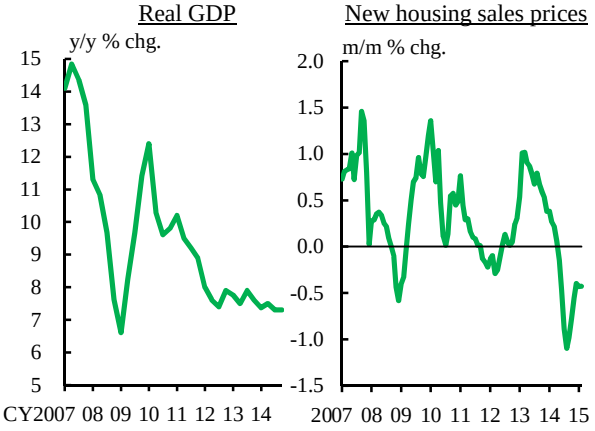


Notes: *1*. Regarding the euro area, the inflation rate is based on the area's composition in each period, and the unemployment rate comprises 18 countries.
2. The unemployment rate excludes conscripts on compulsory military duty.
3. The latest data for the inflation rate are as of March 2015, and those for the unemployment rate are as of February 2015.
Source: Eurostat.

As for the Chinese economy, stable growth has continued as a trend; recently, however, growth momentum has slowed with downward pressure from an overhang in the manufacturing sector and adjustments in the real estate market (Chart II-1-4). Meanwhile, other emerging economies as a whole have remained lackluster in terms of growth.

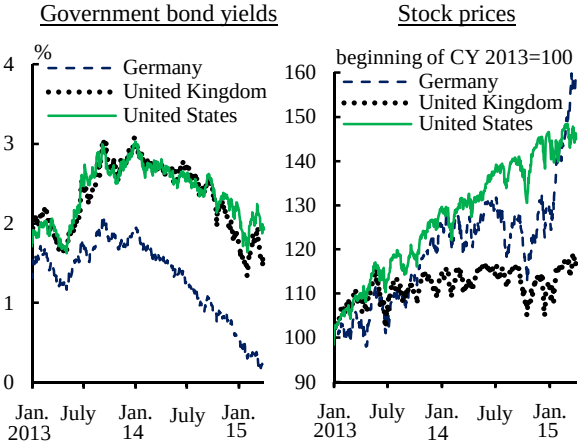
Under this macroeconomic environment, volatility in global financial markets has risen. That is, price volatility across a wide range of instruments -- including bond, stock, and foreign exchange markets -- has risen, spreads on high-yield bonds and other instruments have widened, and stock price growth in advanced countries has temporarily been sluggish. Meanwhile, long-term interest rates in advanced countries have continued to decline (Chart II-1-5).

Chart II-1-4: Real GDP and housing prices in China[1,2]



Notes: *1*. In the left-hand chart, the latest data are as of the October-December quarter of 2014.
2. In the right-hand chart, 70 major cities are counted. The latest data are as of February 2015. Figures show simple averages of month-to-month changes in each city.
Source: CEIC.

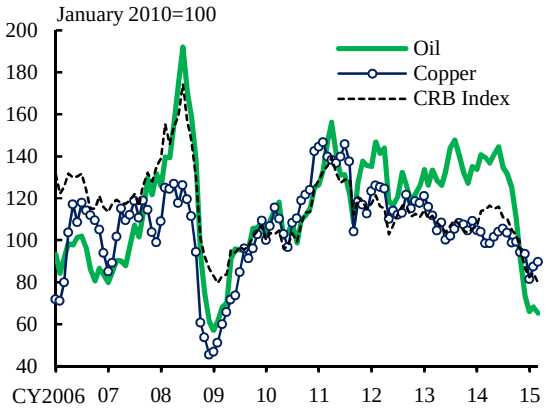
Chart II-1-5: Government bond yields and stock prices in advanced countries[1,2]



Notes: *1*. The latest data are as of March 31, 2015.
2. The left-hand chart shows 10-year government bond yields. In the right-hand chart, the DAX for Germany, the FTSE for the United Kingdom, and the S&P 500 is used for the United States.
Source: Bloomberg.

International commodity prices have generally been weak. After having declined sharply in the summer of 2014 in light of the slack in supply and demand conditions worldwide, crude oil prices have been low. Prices of nonferrous metals and other commodities have also remained weak (Chart II-1-6).

Chart II-1-6: Commodity prices[1,2]



Notes: *1*. The latest data are as of end-March 2015.
2. The CRB index is a commodity price index including energy, metals, and agricultural products.
Source: Bloomberg.

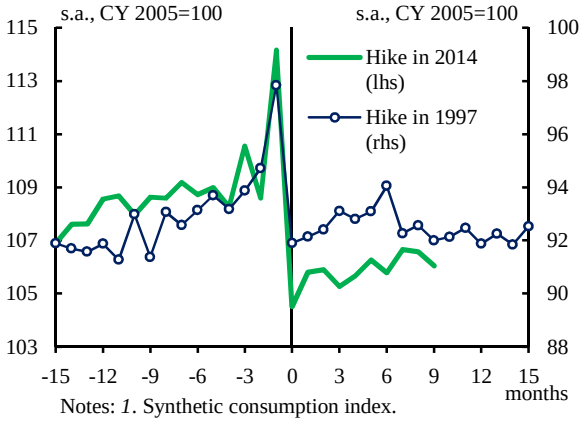
B. Domestic economy and fiscal conditions

Japan's economy has continued its moderate recovery trend. Private consumption as a whole has remained resilient against the background of steady improvement in the employment and income situation, although recovery in some areas has been sluggish (Chart II-2-1). The year-on-year rate of increase in consumer prices (all items less fresh

food), excluding the direct effects of the consumption tax hike, is about 0 percent. The Bank of Japan expanded its quantitative and qualitative monetary easing (QQE) in October 2014 to pre-empt manifestation of a risk that conversion of deflationary mindset, which has so far been progressing steadily, might be delayed, and to maintain the improving momentum of expectation formation.

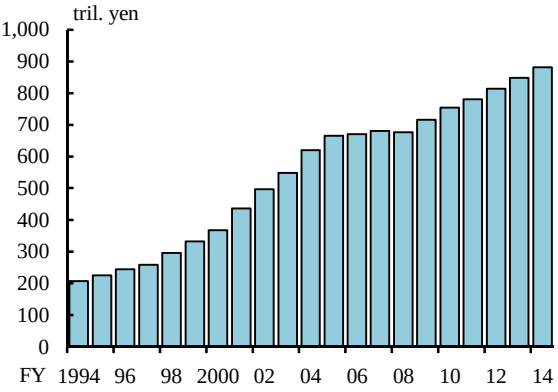
Regarding fiscal conditions, government debt has continued to increase as a trend due to the primary balance deficit and the increase in national debt service expenditure (the sum of redemption fees and interest payments) (Chart II-2-2).

Chart II-2-1: Developments in domestic consumption[1,2,3]



Notes: *1*. Synthetic consumption index.
2. The latest data are as of January 2015.
3. Month 0 indicates April 1997/2014, concurrent with the rise in the consumption tax rate.
Source: Cabinet Office, "Synthetic consumption index."

Chart II-2-2: Government bond outstanding[1,2]



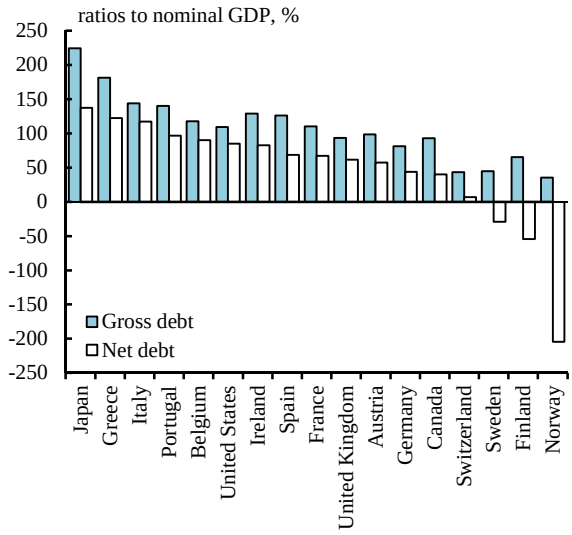
Notes: *1*. The data are final results until fiscal 2013 and initial budget figures for fiscal 2014.
2. The data include FILP bonds.
Source: Ministry of Finance.

Japan's government debt to gross domestic product (GDP) ratio is the highest among the member states of the Organization for Economic Cooperation and Development (OECD) on both a net and a gross basis (Chart II-2-3). Under these severe fiscal conditions, the government has been working to achieve sustained economic growth and fiscal consolidation simultaneously, while setting numerical targets. Consequently, the primary balance has narrowed. The latest government calculation suggests that it will achieve the target of halving its primary balance deficit relative to GDP by fiscal 2015 from the level seen in fiscal 2010, at 3.3 percent. Nevertheless, further improvement in the fiscal balance is likely to be necessary in order to achieve the goal of fiscal consolidation generating a surplus in the primary balance by fiscal 2020 (Chart II-2-4).

Meanwhile, national debt service expenditure continues to increase. A government calculation shows that assuming annual economic growth of 3 percent, debt service expenditure will increase from 23.3 trillion yen in fiscal 2014 to 32.7 trillion yen in

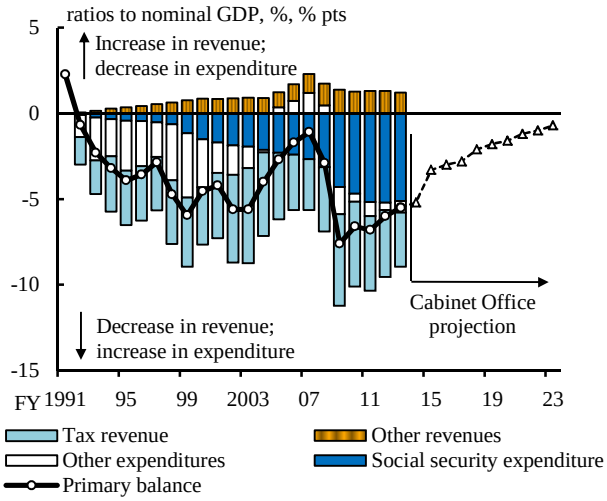
fiscal 2020. If interest rates were to rise by an additional 2 percentage points, national debt service expenditure would climb to 45.5 trillion yen in fiscal 2020, almost twice the level seen in fiscal 2014 (Chart II-2-5).[1]

Chart II-2-3: General government debt to GDP ratio[1]



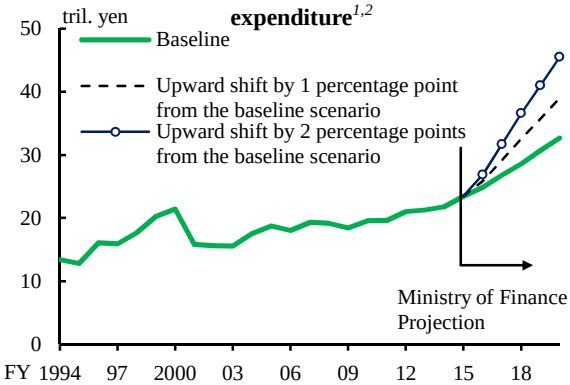
Note: *1*. The data are as of 2013.
Source: OECD.

Chart II-2-4: Primary balance[1,2,3]



Notes: *1*. The primary balance figures are ratios to nominal GDP. Breakdown 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. The primary balances from fiscal 2014 to fiscal 2023 are Cabinet Office estimates (Economic revitalization case, sources of revenue or expenses for post-disaster restoration and rebuilding are not included). Breakdown figures are the Bank of Japan's estimates.
Sources: Cabinet Office, "Economic and fiscal projections for medium to long term analysis," "National accounts"; BOJ.

Chart II-2-5: National debt service expenditure[1,2]



Notes: *1*. Impacts of upward interest rate shifts from fiscal 2016.
2. The data are final results until fiscal 2013, revised budget figures for fiscal 2014, and initial budget figures for fiscal 2015.
Source: Ministry of Finance.

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

III. Examination of financial intermediation

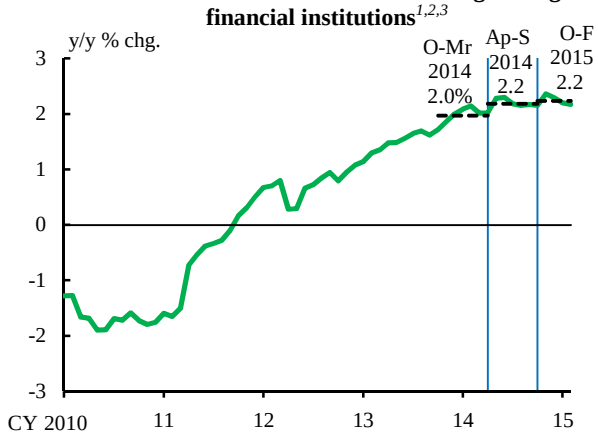
This chapter examines the functioning of the financial system, mainly based on financial information for the second half of fiscal 2014. First, we highlight developments in financial intermediation among financial institutions such as banks and *shinkin* banks, and in investment by institutional investors. We then look at financial intermediation through financial markets, before summarizing financial conditions among firms and households, as well as developments in their investment activities.

A. Financial intermediation by financial institutions

1. Domestic loans

The amount of financial institutions' domestic loans outstanding continues to grow in the range of 2.0-2.5 percent (Chart III-1-1).

Chart III-1-1: Domestic loans outstanding among financial institutions[1,2,3]

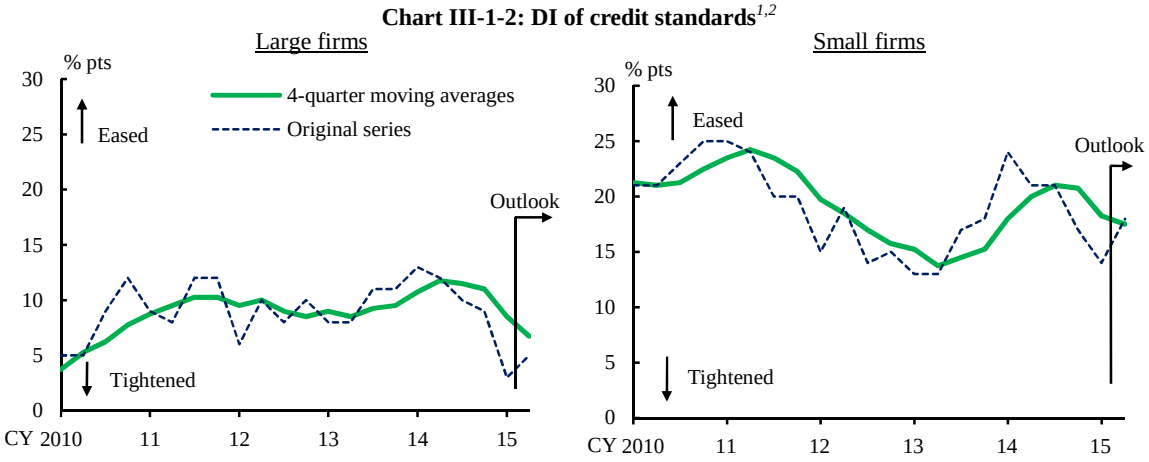


Notes: *1*. Banks and *shinkin* banks are counted. The latest data are as of February 2015.
2. The horizontal dashed lines indicate semiannual averages. The vertical lines indicate end-March 2014 and end-September 2014.
3. Bank loans are average amounts outstanding after adjusting for special items which are composed of adjustment for exchange rate changes, adjustment for loan write-offs and related items, and adjustment for securitization of loans.
Source: BOJ, "Principal figures of financial institutions."

Lending stances of financial institutions and demand for funds

Financial institutions' lending stances have remained eased. Figures for their DI of credit standards indicate that the number of financial institutions that have "eased" their lending standards continues to exceed the number of those that have "tightened" their lending standards, as the latter has not been observed to date (Chart III-1-2).

Chart III-1-2: DI of credit standards[1,2]



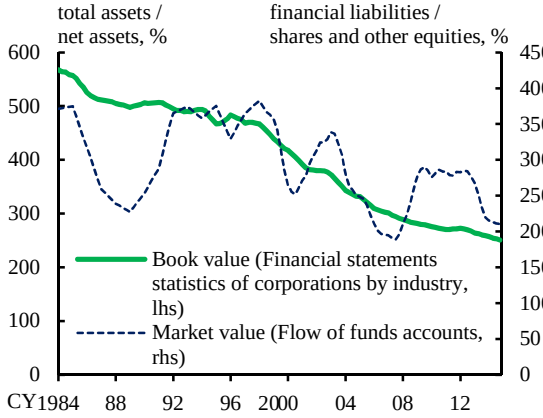
Notes: *1*. The latest data are as of January 2015.
2. DI of credit standards = (percentage of respondents selecting "eased considerably" + percentage of respondents selecting "eased somewhat" * 0.5) - (percentage of respondents selecting "tightened considerably" + percentage of respondents selecting "tightened somewhat" * 0.5).
Source: BOJ, "Senior loan officer opinion survey on bank lending practices at large Japanese banks."

Looking at financial institutions' lending business, for corporate loans, (1) the launching or expansion of low-yield medium- to long-term funds aimed at supporting fixed investments and growing business areas has continued to be observed. Multiple regional banks have worked closely to establish unique low-yield funds targeted at business areas including medical and nursing care and agriculture, and have increasingly made efforts -- in collaboration with governmental financial institutions -- to support areas including new business startups, new business line operations, the revitalization of firms, overseas expansion of Japanese firms, and agribusiness. In addition, (2) the extension of the target of loan increase to borrowers with low credit ratings in "normal" loans or those in "need attention" loans has become increasingly widespread. With regard to business operations, (3) major banks in particular have sought to strengthen ties with their group companies with a view to broadly capturing major business opportunities, such as mergers and acquisitions, while regional financial institutions have been expanding their business sites. With regard to loans for individuals, some financial institutions have made efforts to enhance supplementary services other than those related to interest rates, such as group credit life insurance with medical coverage, in a situation in which interest rate spreads on housing loans have narrowed. Meanwhile, others have strengthened their efforts in areas such as credit card loans, on which interest rate spreads are relatively wide.

On the other hand, demand for funds has increased moderately, mainly in the corporate sector. While the situation -- whereby the corporate sector is maintaining a large cash buffer -- has not changed, demand for funds has continued to follow a moderately increasing trend against the background of economic recovery and easier

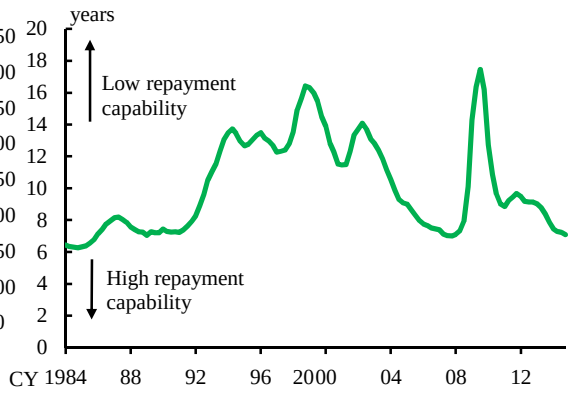
lending stances of financial institutions (Charts III-1-3 to III-1-5). In contrast, demand for funds in the household sector -- housing loans in particular -- has not yet recovered significantly, although housing investment, which continued to decline following the front-loaded increase, appears to have recently started bottoming out (Chart III-1-6).

Chart III-1-3: Firms' leverage ratio[1,2,3]



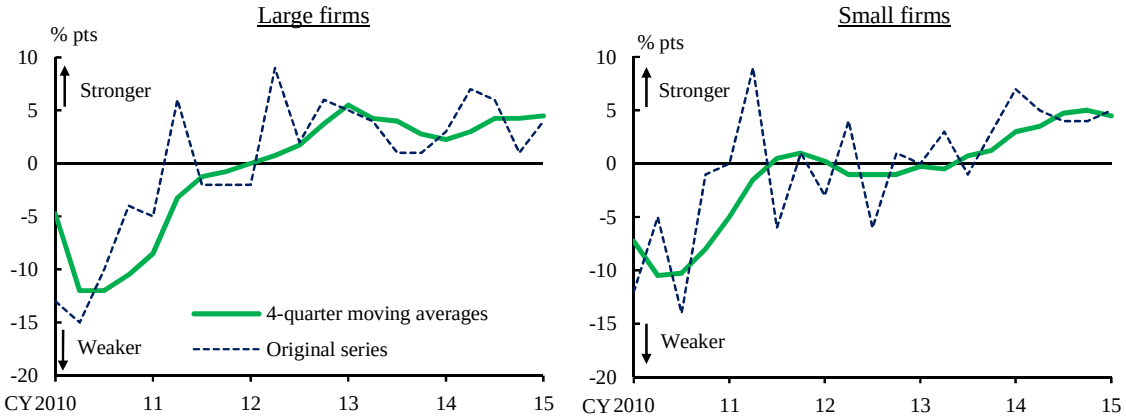
Notes: *1*. Data based on book value = total assets / net assets. Data based on market value = financial liabilities /shares and other equities.
2. Book value data are based on non-financial firms with capital of more than 10 million yen. Market value data from the January-March quarter of 1984 to the July-September quarter of 1997 are calculated by applying year-on-year rates of changes on the old basis data in those periods.
3. The latest data are as of end-December 2014; 4-quarter moving averages.
Sources: Ministry of Finance, "Financial statements statistics of corporations by industry"; BOJ, "Flow of funds accounts."

Chart III-1-4: Firms' debt / cash flow[1,2]



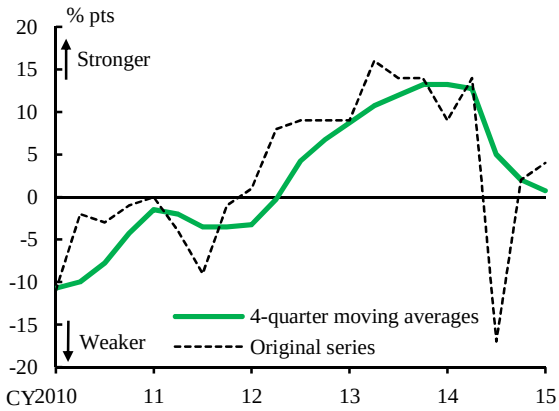
Notes: *1*. The data are based on non-financial firms with capital of more than 10 million yen. The latest data are as of the October-December quarter of 2014; 4-quarter moving averages.
2. Repayment capability = interest-bearing liabilities/ (operating profits + interest and dividends received, etc.).
Source: Ministry of Finance, "Financial statements statistics of corporations by industry."

Chart III-1-5: DI of firms' demand for loans as perceived by financial institutions (large firms and small firms)[1,2]



Notes: *1*. The latest data are as of January 2015.
2. DI of firms' 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."

Chart III-1-6: DI of demand for housing loans as perceived by financial institutions[1,2]

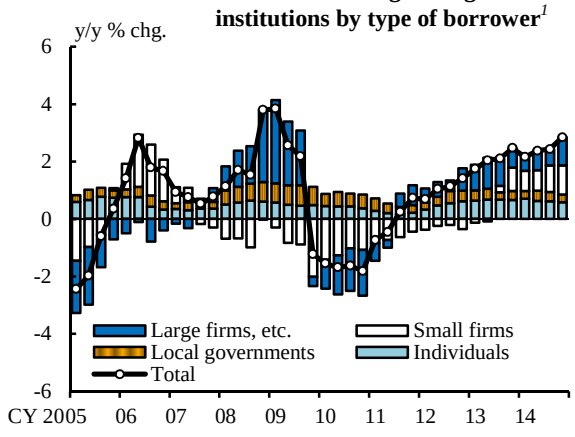


Notes: *1*. The latest data are as of January 2015.
2. DI of demand for housing loans = (percentage of respondents selecting "substantially stronger" + percentage of respondents selecting "moderately stronger" * 0.5) - (percentage of respondents selecting "substantially weaker" + percentage of respondents selecting "moderately weaker" * 0.5).
Source: BOJ, "Senior loan officer opinion survey on bank lending practices at large Japanese banks."

Developments in loans by borrower classification

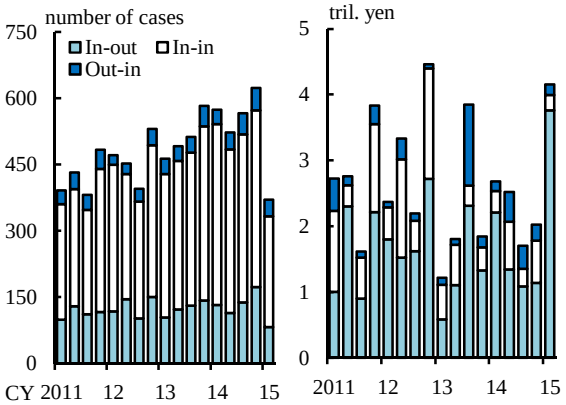
Loan growth among financial institutions has been led by loans to firms. Looking at loan growth since the second half of fiscal 2014 by borrower classification, growth in loans to individuals, such as housing loans, as well as loans to local governments, have slowed (Chart III-1-7). On the other hand, with regard to loans to firms, the increase in the outstanding amount of lending is gradually spreading out across various firm sizes, industries, and regions.

Chart III-1-7: Loans outstanding among financial institutions by type of borrower[1]



Note: *1*. Banks and *shinkin* banks are counted. The latest data are as of end-December 2014.
Source: BOJ.

Chart III-1-8: M&A among Japanese companies[1,2]



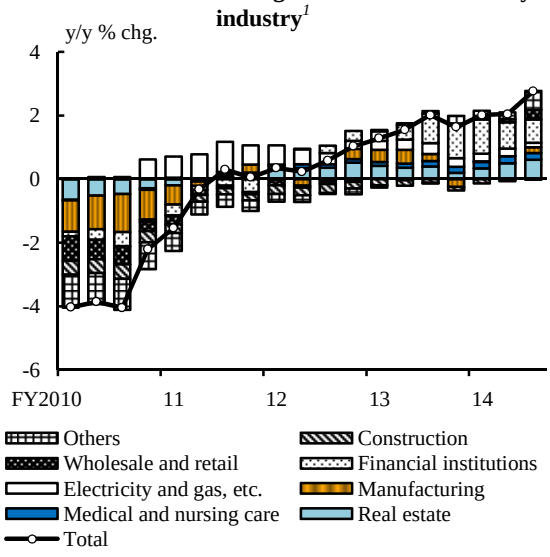
Notes: *1*. The latest data are as of January-February 2015.
2. "In-out" means the acquirer is a Japanese company and the target company is a foreign company. "In-in" means the acquirer is a Japanese company and the target company is a Japanese company. "Out-in" means the acquirer is a foreign company and the target company is a Japanese company.
Source: RECOF.

By firm size, loans to both large firms and small firms have been increasing at a moderately faster pace (Chart III-1-7). As for loans to large firms, growth has remained firm as a trend, albeit with monthly fluctuations, particularly in loans related to mergers

and acquisitions, as well as in foreign currency-denominated impact loans targeted at firms' overseas activities.[2] Merger and acquisition activity among Japanese firms has continued to be active, as suggested by the number of cases, although fluctuations in transaction amounts have been observed (Chart III-1-8). Toward the end of 2014, demand for funds related to tax and bonus payments, reflecting favorable corporate performance, also contributed to the rise in the growth rate. Growth in loans to small firms has also increased in terms of both business fixed investment funds and working capital. Although some financial institutions, with a view to supporting small firm financing, have been providing loans as a countermeasure to cope with the yen's depreciation, the uses of such loans are limited.

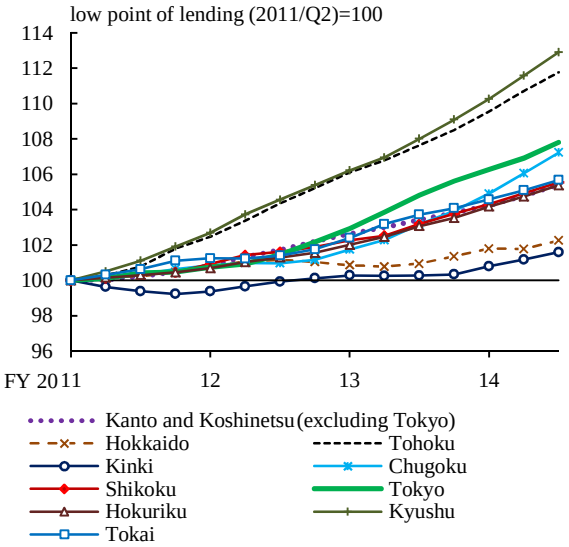
By industry, loans to a wide range of sectors, such as manufacturing, wholesale and retail, real estate, and those categorized as "others" including telecommunications and leasing, have increasingly contributed to the growth in loans compared with the first half of fiscal 2014 (Chart III-1-9). By region, loans have been growing in a wide range of regions, even faster than in Tokyo in some cases (Chart III-1-10). For regional banks, both loans in Tokyo and those to firms in other regions -- particularly local firms -- have been growing at a faster pace (Chart III-1-11).

Chart III-1-9: Corporate loans outstanding among financial institutions by industry[1]



Note: *1*. Banks and *shinkin* banks are counted. The latest data are as of end-December 2014. Overseas yen loans, and domestic loans transferred overseas are excluded.
Source: BOJ.

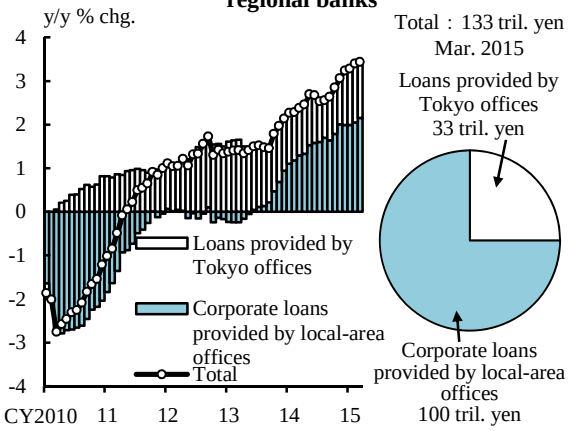
Chart III-1-10: Regional loans among banks[1]



Note: *1*. Major banks and regional banks are counted. The latest data are as of end-December 2014; 4-quarter moving averages.
Source: BOJ.

[2] Another factor contributing to the acceleration in the growth of loans to large firms in the second half of fiscal 2014 is the continued significant depreciation of the yen and the subsequent rise in the growth rate of the yen-based value of foreign currency-denominated impact loans.

Chart III-1-11: Corporate loans provided by regional banks[1]

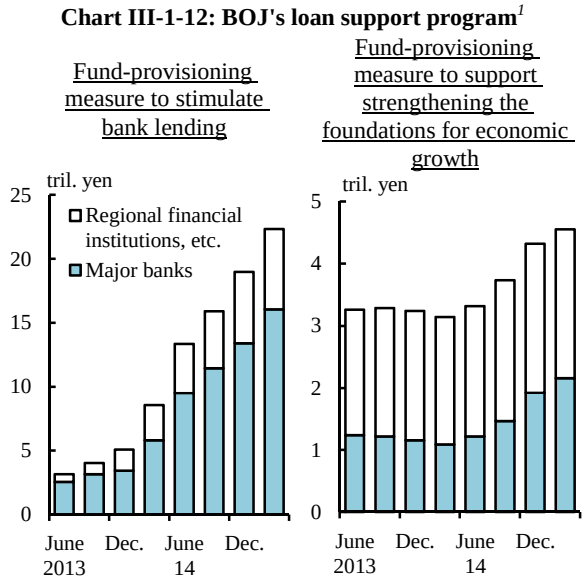


Note: *1*. The latest data are as of March 2015.
Source: BOJ.

Loans by financial institutions utilizing the Bank of Japan's Stimulating Bank Lending Facility have continued to increase (Chart III-1-12). The Bank has decided to enhance its Stimulating Bank Lending Facility, starting with its fund provisioning for fiscal 2014.[3] Looking at utilization of the Bank's Growth-Supporting Funding Facility, the measure has been utilized in particular for loans extended to business areas such as environment and energy, medical and nursing care, social infrastructure, and business deployment in Asia (Chart III-1-13).

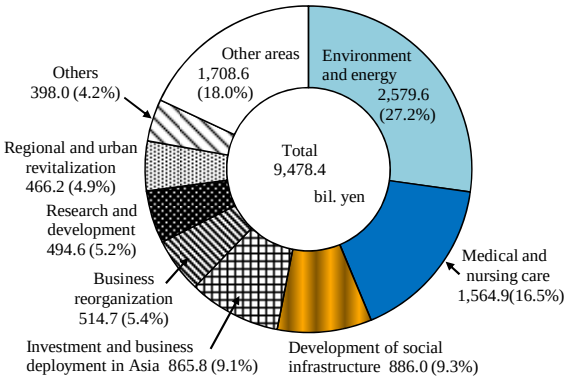
[3] At the Monetary Policy Meeting (MPM) held in February 2014, the Policy Board of the Bank of Japan decided to double the scale of the Stimulating Bank Lending Facility and the Growth-Supporting Funding Facility, and to extend the application period for these facilities by one year. Specifically, (1) under the Stimulating Bank Lending Facility, financial institutions would be able to borrow funds from the Bank up to an amount that was twice as much as the net increase in their lending; (2) as for the Growth-Supporting Funding Facility, the maximum amount of the Bank's fund-provisioning under the main rules would be doubled from 3.5 trillion yen to 7 trillion yen; and (3) under these facilities, financial institutions would be able to borrow funds at a fixed rate of 0.1 percent per annum for 4 years instead of 1-3 years preceding the enhancement.

Chart III-1-12: BOJ's loan support program[1]



Note: *1*. The latest data are as of March 2015. The data for fund-provisioning measure to support strengthening the foundations for economic growth are based on the main rules.
Source: BOJ.

Chart III-1-13: BOJ's loan disbursements under the fund-provisioning measure to support strengthening the foundations for economic growth by area[1]

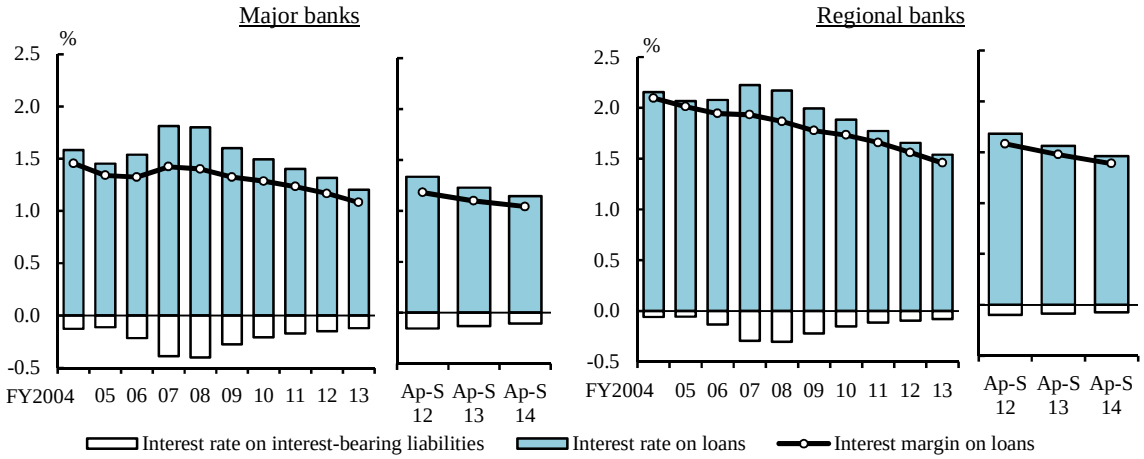


Note: *1*. Distribution of individual investment or lending in April 2010 - December 2014 by area for strengthening the foundations for economic growth. Main rules are counted.
Source: BOJ.

Interest rate spreads on loans

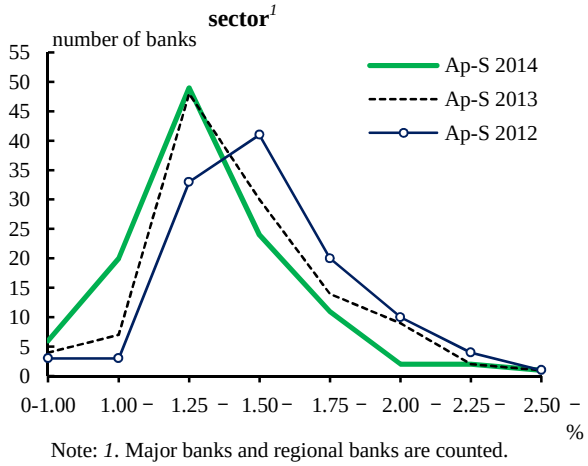
The narrowing trend in financial institutions' interest rate spreads on domestic loans has continued (Chart III-1-14). This is because pressure exerted by the supply of funds remains stronger than that exerted by demand, mainly due to further easing of lending stances of financial institutions, although demand for funds has been increasing moderately. The distribution of interest rate spreads on loans also indicates an overall downward shift (Chart III-1-15). Interest rates on new loans and discounts have been following a moderately declining trend, mainly against the background of more intense competition among financial institutions, improvement in firms' financial conditions and business performance alongside economic recovery (an upgrade in internal credit ratings among financial institutions), and declines in base rates including TIBOR rates (Chart III-1-16). Looking at developments in loans outstanding by lending rate over the past 3 years, those with lending rates below 0.5 percent have been increasing (Chart III-1-17).

Chart III-1-14: Interest margin on loans in the domestic business sector by type of bank[1]



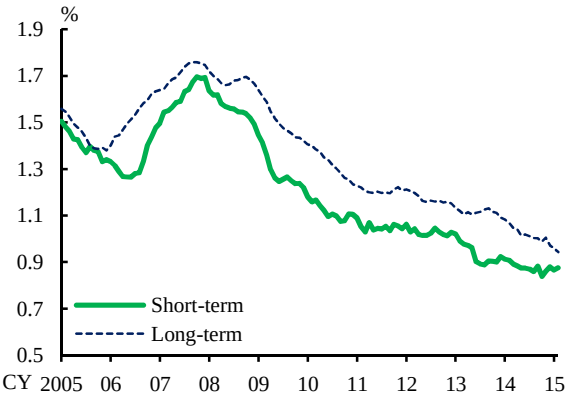
Note: *1.* Interest rate swaps are subtracted from funding costs. Domestic business sector.
Source: BOJ.

Chart III-1-15: Distribution of interest margin on loans in the domestic business sector[1]



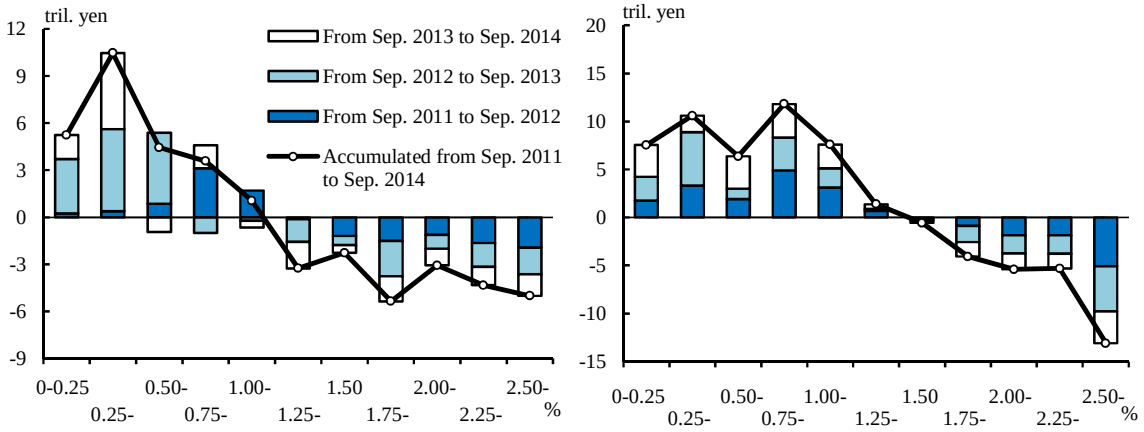
Note: *1.* Major banks and regional banks are counted. Domestic business sector.
Source: BOJ.

Chart III-1-16: Average contract interest rates on new loans and discounts[1]



Note: *1.* Domestically licensed banks are counted. The latest data are as of February 2015; 6-month moving averages.
Source: BOJ, "Average contract interest rates on loans and discounts."

Chart III-1-17: Changes in loans outstanding by interest rate on loans among banks[1]

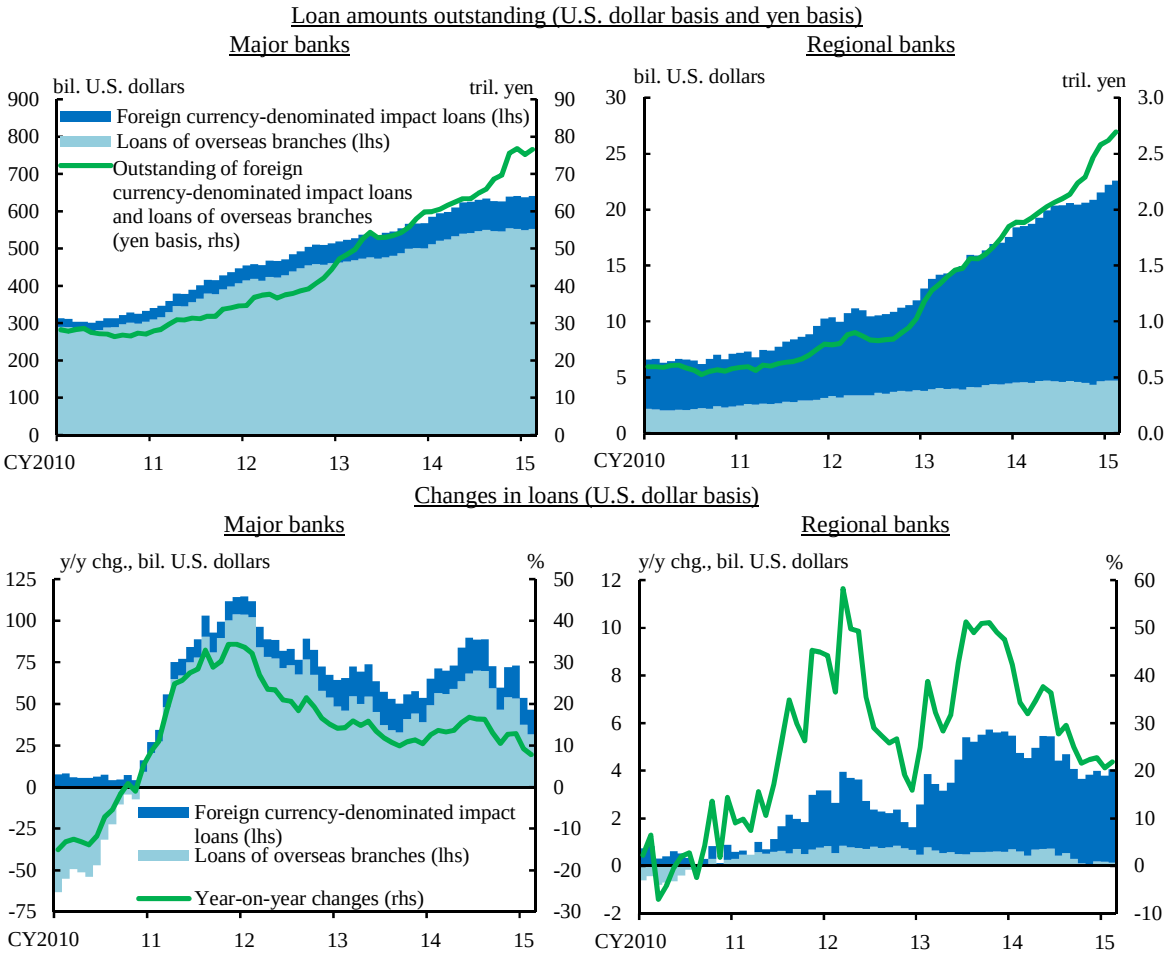


Note: *1.* Yen loans in the domestic business sector. Calculated on a month-end basis. Figures exclude loans to the finance and insurance industries.
Source: BOJ.

2. Overseas loans

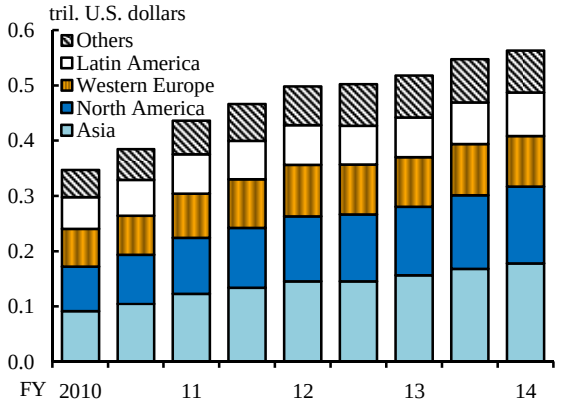
Banks' overseas loans have continued to show high growth (Chart III-1-18). U.S. dollar-based loans continue to show relatively high growth, with those at major banks increasing by around 10 percent and those of regional banks by around 20 percent on a year-on-year basis, although the pace of overall growth has slowed somewhat. The approximate amount of the annual increase has been over 50 billion U.S. dollars for major banks and over 4 billion U.S. dollars for regional banks. Looking at major banks' loans by region, those in Europe have been relatively weak, while growth in loans has remained firm in Asia and North America (Chart III-1-19).

Chart III-1-18: Banks' foreign currency-denominated loans and loans of overseas branches[1,2,3,4]



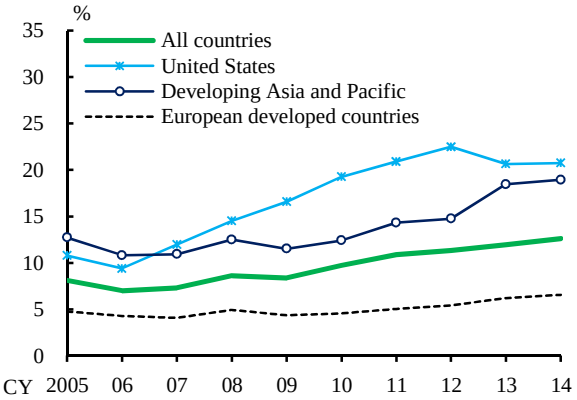
Notes: *1*. The latest data are as of February 2015.
2. Loans of overseas branches partly include foreign currency-denominated impact loans in accounts held overseas.
3. Foreign currency-denominated impact loans indicate banks' foreign currency-denominated loans for residence.
4. Year-on-year changes represent the growth rate of loans made by overseas branches and foreign currency-denominated impact loans.
Source: BOJ.

Chart III-1-19: Overseas loans outstanding of three major banks by region[1]



Note: *1*. The latest data are as of the first half of fiscal 2014.
Sources: Published accounts of each bank.

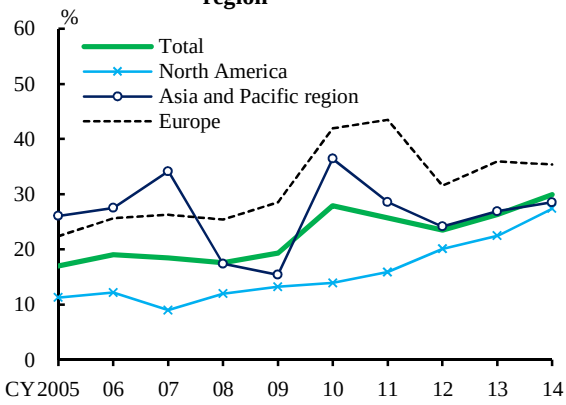
Chart III-1-20: Foreign claims share among Japanese banks by region[1,2]



Notes: *1*. The data are based on end-December figures for each year. The latest data are as of end-September 2014.
2. This chart is based on foreign claims in the non-bank private sector (ultimate risk basis).
Sources: BIS, "Consolidated banking statistics"; BOJ, "The results of BIS international consolidated banking statistics in Japan."

Under these circumstances, the presence of Japanese banks in terms of international claims has continued to grow (Chart III-1-20). The share of three major Japanese financial groups in the syndicated loan market has also continued to increase, particularly in resource development and infrastructure-related sectors (Chart III-1-21). Competition has recently strengthened, partly reflecting some pick-up in the presence of European financial institutions once again.

Chart III-1-21: Syndicated loans share of three major Japanese financial groups by region[1]



Note: *1*. The figures represent syndicated loans for which the lead managers are three major financial groups as a share of all syndicated loans issued by foreign companies whose head offices are located in each area.
Source: Thomson Reuters Markets.

Banks have maintained their strong interest in expanding overseas lending. They have made efforts to increase lending to support the global expansion of Japanese firms and to capture the financial needs of Asian or other countries with high growth potential. Banks have also worked to expand their overseas networks and to bolster their supply of

financial services in local areas by acquiring and investing in foreign banks and other financial institutions, particularly in Asia (Chart III-1-22).

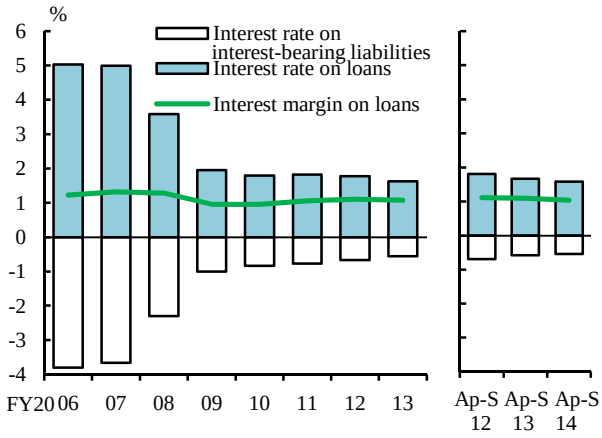
Chart III-1-22: Recent major overseas acquisitions and opening of new branches by major banks

	Announcement	Country	Outline
Mizuho Bank	Nov. 2013	India	Opening of Chennai Branch
	Oct. 2014	Myanmar	Approval for Opening a Branch in Yangon
	Jan. 2015	Austria	Approval for Opening a Branch in Vienna
	Feb. 2015	United States	Acquisition of North American Asset Portfolio from RBS
The Bank of Tokyo-Mitsubishi UFJ	July 2013	Thailand	Share Purchase of Bank of Ayudhya. Integration of Bangkok Branch with Bank of Ayudhya.
	Feb. 2014	United States	Integration of BTMU's U.S. branch banking operations with Union Bank
	Apr. 2014	India	Opening of Bangalore Branch
	June 2014	China	Opening of Suzhou Branch
	Oct. 2014	Myanmar	Approval for Opening a Branch in Yangon
Sumitomo Mitsui Banking Corporation	Mar. 2013	India	Opening of New Delhi Branch
	May 2013	Indonesia	Share Purchase in PT Bank Tabungan Pensiunan Nasional Tbk (BTPN)
	Jan. 2014	Ireland	Opening of Dublin Branch
	June 2014	Czech	Opening of Prague Branch
	Aug. 2014	Cambodia	Share Purchase of ACLEDA Bank
	Oct. 2014	Myanmar	Approval for Opening a Branch in Yangon
	Dec. 2014	Spain	Opening of Madrid Branch
Sumitomo Mitsui Trust Bank	Aug. 2013	Hong Kong	Opening of Hong Kong Branch
	May 2014	Thailand	Approval to Establish a Bank Subsidiary in Thailand (Planning to start operations in fiscal 2015)
	Dec. 2014	India	Share Purchase of Reliance Capital

Sources: Disclosures of each bank.

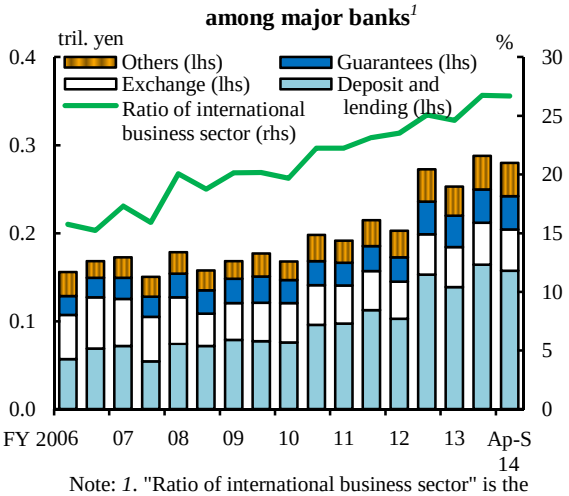
Interest rate spreads on overseas loans have recently declined somewhat as competition to acquire top-rated borrowers has strengthened (Chart III-1-23). Moreover, securing stable funding in U.S. dollars and local currencies has become important in increasing overseas loans. In this situation, major banks, alongside efforts to increase their range of customers -- particularly non-Japanese firms -- while aiming for stable foreign currency funding, have been working to increase their fee and commission income through cooperation with group securities companies and other firms (Chart III-1-24).

Chart III-1-23: Interest margin on loans in the international business sector among major banks



Source: BOJ.

Chart III-1-24: Fee and commission income in the international business sector among major banks[1]



Note: *1*. "Ratio of international business sector" is the ratio of net fees and commissions in the international business sector as a percentage of total net fees and commissions.
Source: BOJ.

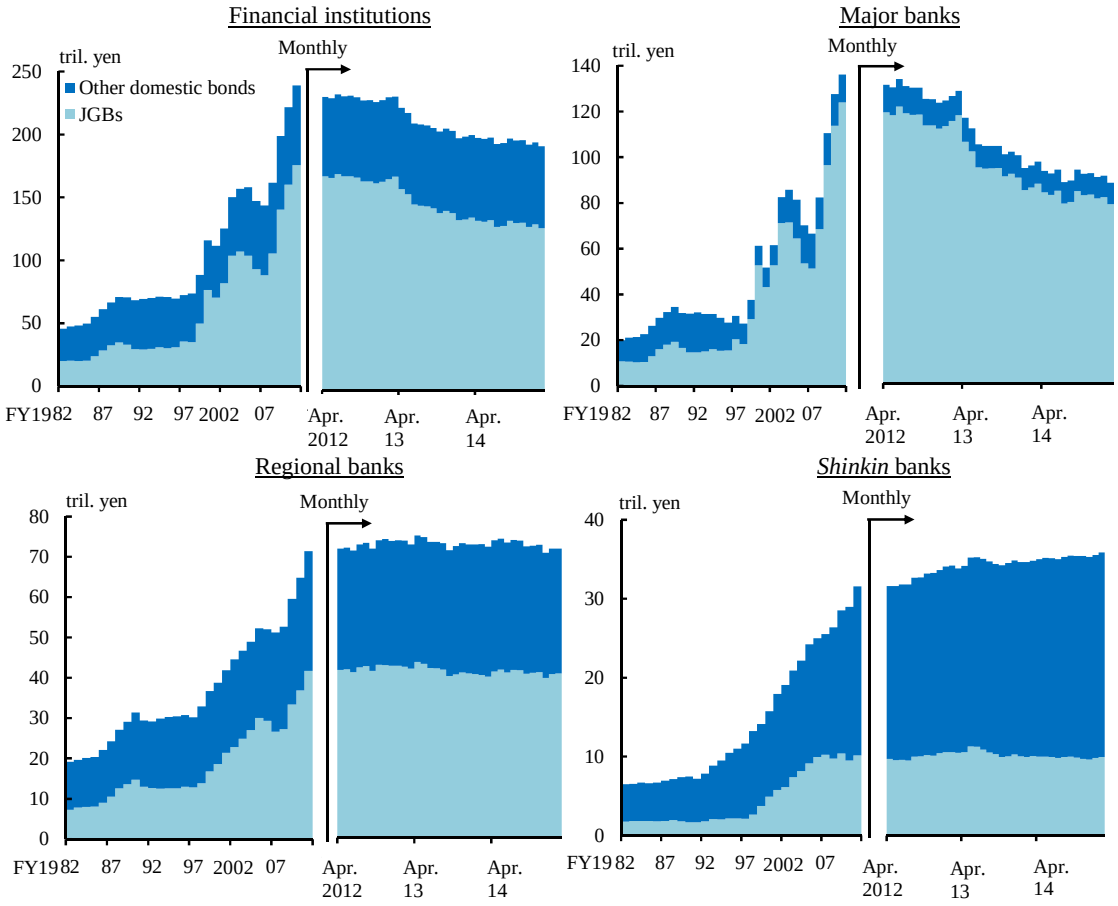
3. Securities investment

Financial institutions have gradually been enhancing their risk-taking stance by diversifying their asset investments, such as foreign bonds and investment trusts, while maintaining a high level of yen-denominated bond investment.

The outstanding amount of yen-denominated bonds -- including JGBs, municipal bonds, and corporate bonds -- is still at a high level compared with the past, although it continues to be on a moderate declining trend (Chart III-1-25). A breakdown of yen-denominated bondholdings by type of financial institution shows that major banks substantially reduced their outstanding amount of such bonds immediately following the introduction of QQE, and have continued to reduce the amount moderately, albeit with fluctuations. The outstanding amount of yen-denominated bondholdings by regional banks and *shinkin* banks has generally been unchanged, since an increasing trend in their accumulation of bondholdings -- as was the case prior to the introduction of QQE -- has been halted. However, the amount of interest rate risk has recently been increasing moderately, as some -- among major banks and *shinkin* banks in particular -- have accumulated super-long-term bonds, i.e., bonds with a maturity of greater than 10 years, with a view to securing fixed-income revenues amid a further decline in interest rates (see Chapter IV.B). Since the beginning of 2015, an increase in bondholdings has generally been observed when interest rates have risen, although a considerable number of financial institutions took conservative investment strategies as interest rate volatility

increased. Not a few financial institutions still exhibit a strong appetite for securing fixed-income revenues through investment in yen-denominated bonds.

Chart III-1-25: Outstanding amount of domestic bonds among financial institutions[1,2]

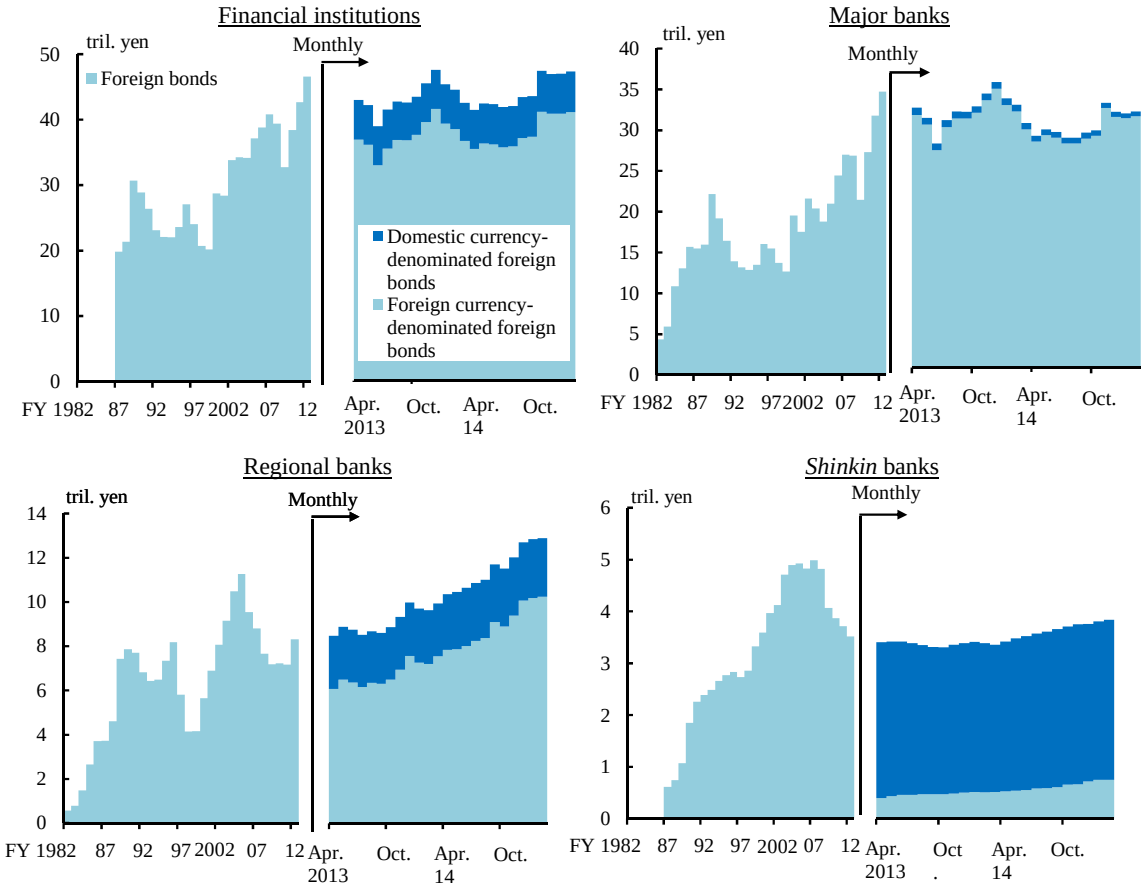


Notes: *1*. The latest data are as of end-February 2015.
2. The data are the sums of figures for domestic and overseas branches. The data for major banks from April 2012 are the sums of figures for domestic branches. The data are based on the amount outstanding at month-end.
Source: BOJ.

The outstanding amount of foreign bonds, when converted into yen, has been on a moderate increasing trend (Chart III-1-26). A breakdown by type of financial institution shows that major banks have generally maintained their outstanding amount of foreign bonds at a relatively high level. However, they actively shifted their portfolios by flexibly reducing their outstanding amount of U.S. bonds amid expectations of a continued reversal of the Fed's monetary policy stance and by accumulating euro-denominated bonds with projections that low interest rates would persist in the euro area. Bond investment for regional banks has been on a moderately increasing trend, although the outstanding amount is insignificant. The majority of foreign bond investment for *shinkin* banks has remained yen-denominated, as investment in foreign

currency-denominated foreign bonds has been increasing gradually, but is still limited in scale. While yen-denominated foreign bonds include structured products, most have relatively straightforward risk profiles -- as is the case with credit-linked notes -- compared to bonds such as power reverse dual currency bonds that have complex risk profiles and were popular before the Lehman shock.

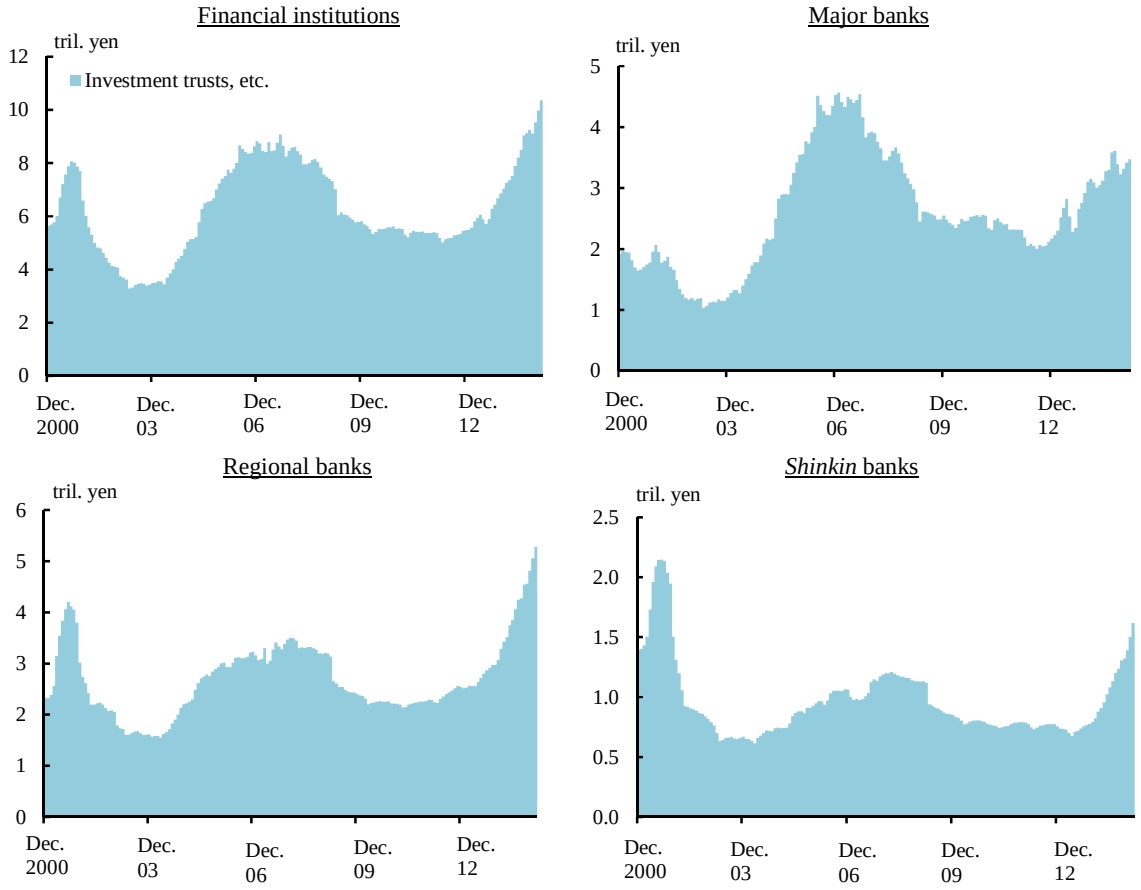
Chart III-1-26: Outstanding amount of foreign bonds among financial instituitons[1,2,3]



Notes: *1*. The latest data are as of end-February 2015.
2. The data are the sums of figures for foreign currency-denominated and domestic currency-denominated foreign bonds.
3. The data are the sums of figures for domestic and overseas branches. The data are based on the amount outstanding at month-end.
Source: BOJ.

Investment trusts and other assets have been clearly increasing for all types of banks. Banks continue to engage themselves in various forms of risk taking through investment in, for example, stock investment trusts, real estate investment trusts (REITs), and bond ladder funds both at home and abroad, although the major source of investment varies depending on the type of bank (Chart III-1-27).

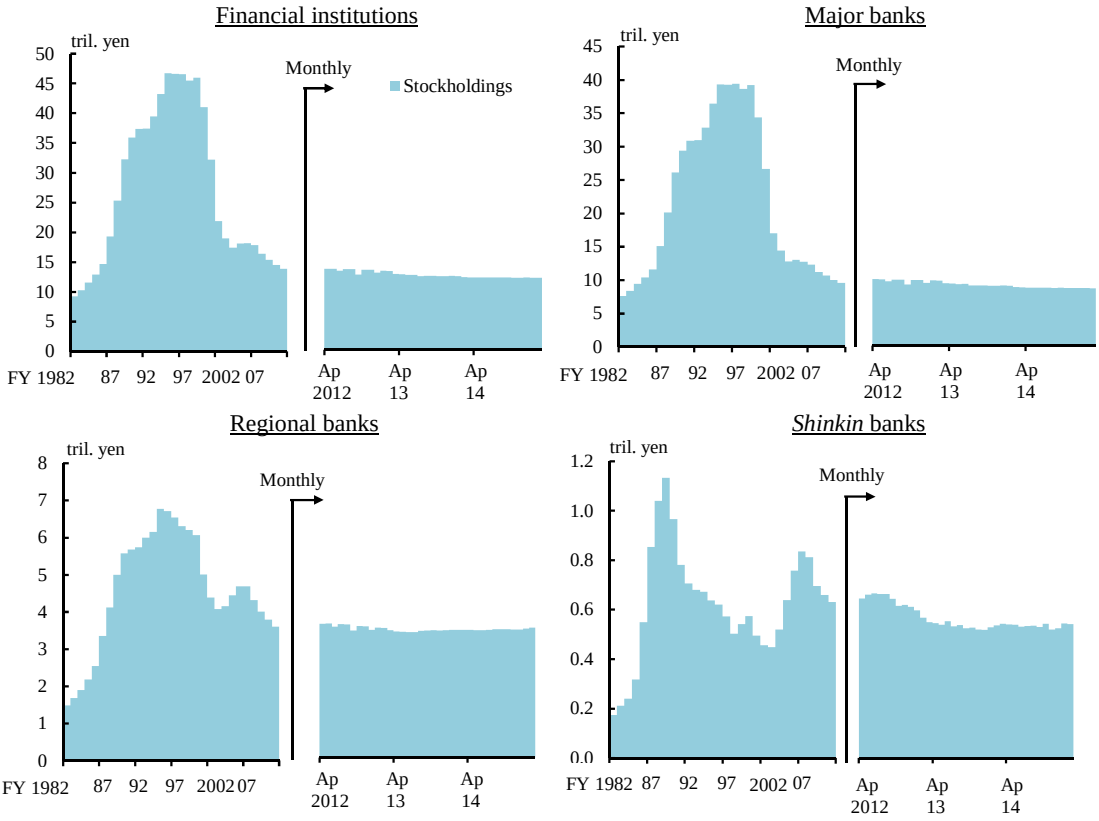
Chart III-1-27: Outstanding amount of investment trusts, etc. among financial institutions[1,2]



Notes: *1*. The latest data are as of end-February 2015.
2. The data are the sums of figures for domestic and overseas branches. The data for domestic branches are based on the average amount outstanding. The data for overseas branches are based on the amount outstanding at month-end.
Source: BOJ.

Meanwhile, financial institutions' stockholdings are on a quite moderate downward trend, as they continue to reduce their stockholdings with the aim of maintaining business ties with firms (strategic stockholdings, Chart III-1-28).

Chart III-1-28: Outstanding amount of stockholdings among financial institutions[1,2,3,4]



Notes: *1*. The latest data are as of end-February 2015.
2. These charts are based on book value.
3. The data are the sums of figures for domestic and overseas branches. The data for major banks from April 2012 are the sums of figures for domestic branches. The data are based on the amount outstanding at month-end.
4. The data exclude foreign stockholdings.
Source: BOJ.

4. Financial institutions' balance sheet changes since the implementation of QQE

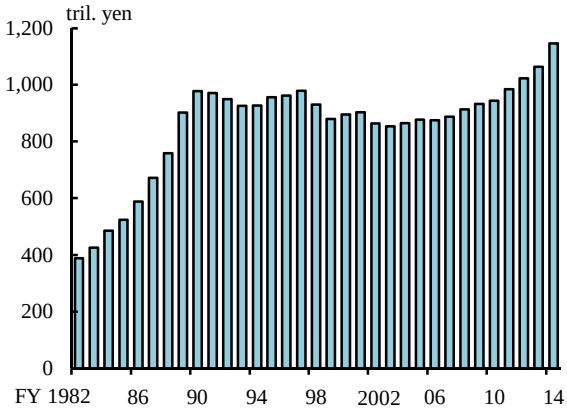
Based on the developments in loans and securities investment examined above, **financial institutions have proceeded with a shift from JGBs to other types of risky assets as they expanded their balance sheets**.

After starting to increase in fiscal 2007, total assets and liabilities of financial institutions have increased at a faster pace while experiencing the introduction of QQE in April 2013, followed by its expansion at the end of October 2014 (Chart III-1-29). Most recently, as of December 2014, total assets and liabilities increased by 124 trillion yen compared with December 2012, prior to the introduction of QQE. The first year following the introduction of QQE saw an increase of 61 trillion yen, and the second year 64 trillion yen.

A breakdown of the increase (124 trillion yen) over the past 2 years shows that on the

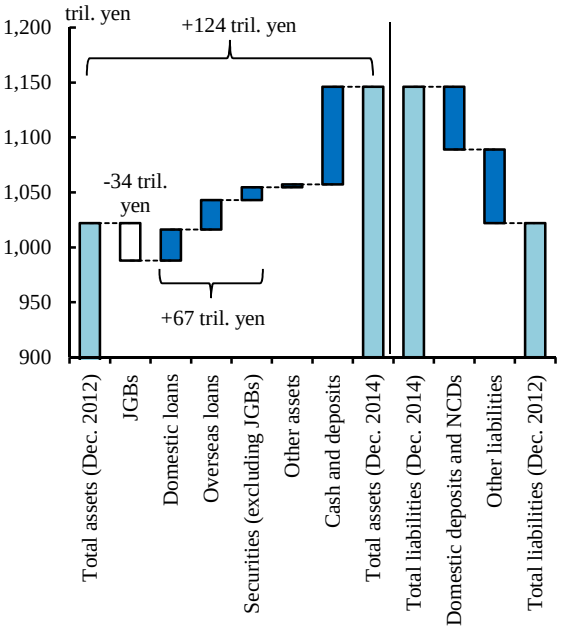
asset side, cash and deposits (including BOJ current account deposits) increased by 89 trillion yen, which reflects the Bank of Japan's monetary actions aimed at increasing the monetary base. For the other asset classes, JGB holdings decreased by 34 trillion yen, reflecting the Bank's JGB purchases, while domestic loans, overseas loans, and securities investment excluding JGBs increased by 28 trillion yen, 27 trillion yen, and 12 trillion yen, respectively (Chart III-1-30). These increases exceed the reduction in JGB holdings, suggesting that a shift from JGBs (yen interest rate risk) to other types of risky assets, including credit, stock-related, and overseas interest rate risk, has proceeded. Meanwhile, on the liability side, domestic deposits including negotiable certificate of deposits (NCD) increased by 57 trillion yen and other liabilities by 67 trillion yen.

Chart III-1-29: Assets outstanding among financial institutions[1,2]



Notes: *1*. Banks and *shinkin* banks are counted.
2. The latest data are as of December 2014. The data for domestic branches are based on the average amount outstanding. The latest data for overseas branches are based on the amount outstanding at month-end.
Source: BOJ.

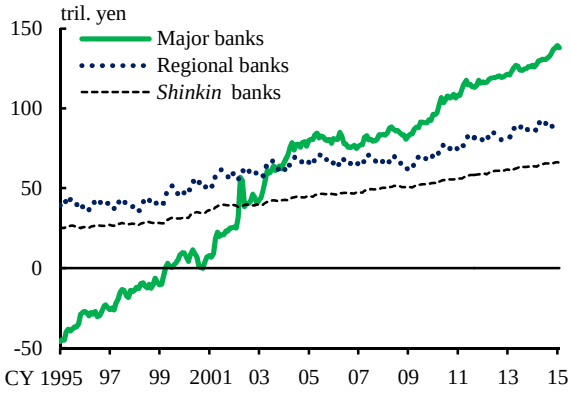
Chart III-1-30: Changes in assets and liabilities among financial institutions[1,2]



Notes: *1*. Banks and *shinkin* banks are counted.
2. The data are the sums of domestic and overseas branches. The data for domestic branches are based on the average amount outstanding. The data for overseas branches are based on the amount outstanding at month-end.
Source: BOJ.

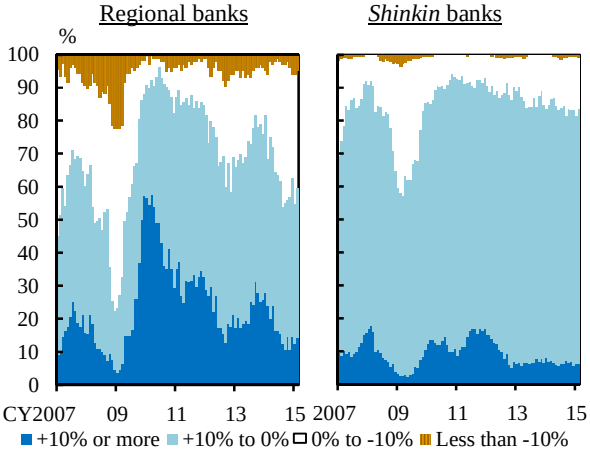
No significant change has been observed in the trend of a widening gap in financial institutions' domestic loans and deposits, despite increases in their lending and in the inflow of funds to risky assets held by individuals (Chart III-1-31). At individual bank level, however, there has been a gradual increase in the number of regional financial institutions with a narrowing gap (Chart III-1-32).

Chart III-1-31: Domestic loan-to-deposit gap among financial institutions[1,2,3]



Notes: *1*. The latest data are as of February 2015.
2. Loan-to-deposit gap = deposits and NCDs – loans.
3. The data for domestic branches are based on the average amount outstanding.
Source: BOJ.

Chart III-1-32: Changes in loan-to-deposit gap in the domestic business sector[1,2]



Notes: *1*. The latest data are as of February 2015.
2. These figures are composed of four groups separated by the growth rate of the deposit surplus (regional financial institutions which are integrated or merged within one year are not counted).
Source: BOJ.

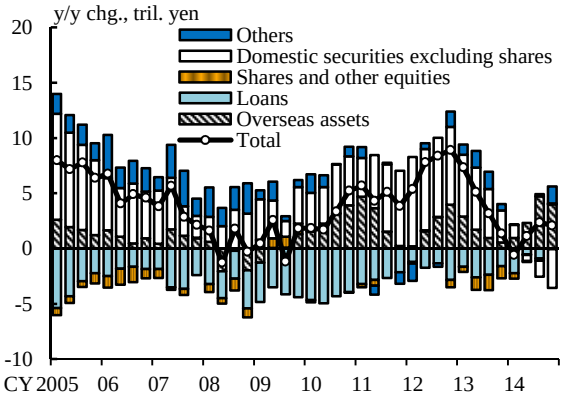
B. Developments in investment by institutional investors

Major institutional investors such as life insurance companies and pension funds, having invested mainly in domestic long-term bonds, also increased their share of investment in risky assets. While restraining to some extent their investment in the super-long-term bonds, in response to a further decline in long-term interest rates, institutional investors have gradually increased their holdings of assets including foreign bonds and stocks in their portfolios with a view to strengthening their search for yield activity.

Life insurance companies were active in purchases of the super-long-term bonds, in order to narrow their duration mismatch in their assets and liabilities, but have recently subdued their purchases in response to a further decline in long-term interest rates (Charts III-2-1 and III-2-2). At the same time, they have been increasing their investment in overseas assets, such as foreign bonds, and have been more actively investing in areas in which relatively high growth is expected (through fund investment and other investments), pursuing higher returns against the background of continued low interest rates, stock price rises, and yen depreciation. On the whole, life insurance companies have gradually been enhancing their risk-taking appetite, although some foreign bonds are being sold in the event of a decline in overseas interest rates (Chart

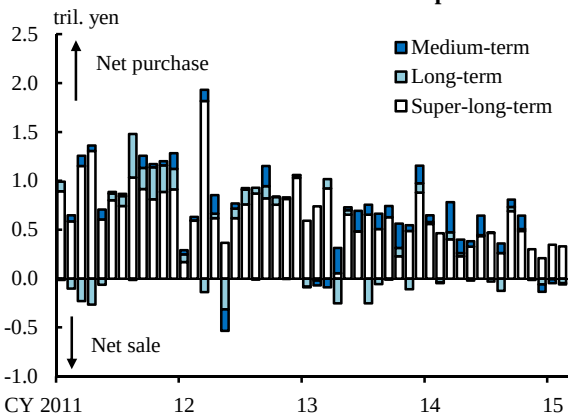
III-2-3). Furthermore, some moves to restrain sales of insurance products akin to saving products in their profiles have been observed. Attention should therefore be paid to the possibility that developments in insurance premiums, a source of investment, will exert effects on investment activities among insurance companies.

Chart III-2-1: Asset investments among life insurance companies[1,2]



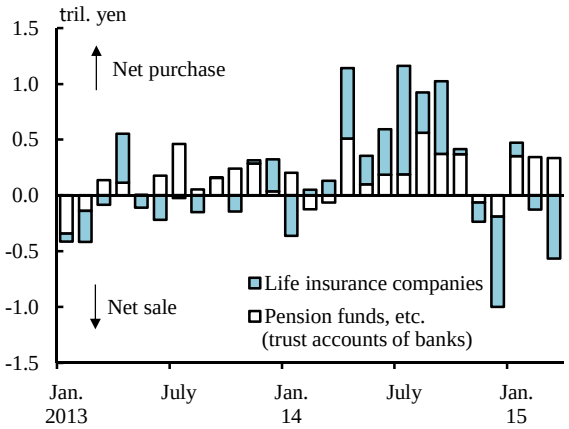
Notes: *1*. The latest data are as of December 2014. This chart shows the sum of financial transactions in the last 4 quarters.
2. "Others" includes cash and deposits. "Loans" excludes repurchase agreements and securities lending transactions.
Source: BOJ, "Flow of funds accounts."

Chart III-2-2: JGB investment among life and non-life insurance companies[1]



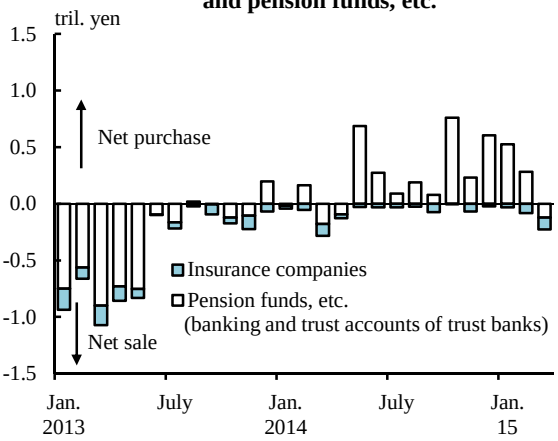
Note: *1*. The latest data are as of February 2015.
Source: Japan Securities Dealers Association.

Chart III-2-3: Outward investment among insurance companies and pension funds, etc. (medium- and long-term bonds)[1]



Note: *1*. "Pension funds, etc." indicates trust accounts of banks and trust banks. The latest data are as of March 2015.
Source: Ministry of Finance.

Chart III-2-4: Trading volume in Japanese stocks by insurance companies and pension funds, etc.[1]



Note: *1*. The latest data are as of March 2015.
Source: Tokyo Stock Exchange.

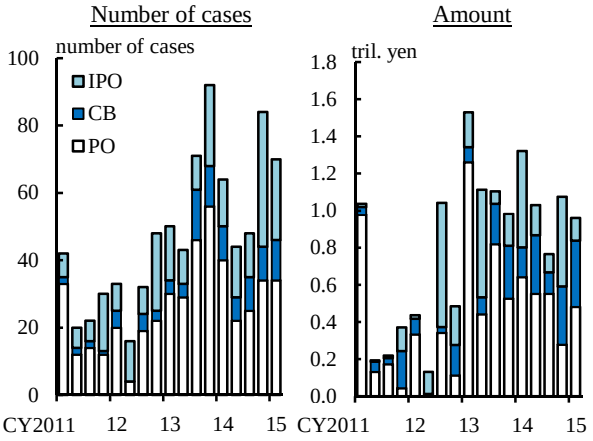
Looking at developments in pension funds, public pension funds, including the Government Pension Investment Fund (GPIF) -- which revised its medium-term plan regarding portfolio management strategies in October 2014 -- continue to increase weights on domestic and overseas stocks in their portfolios while reducing weights on

domestic bonds (Chart III-2-4).[4] In addition, corporate pension funds have been adopting a somewhat more active investment stance toward risky assets compared with the past, as seen in the more widespread increase in weights on alternative assets including fund investment.

C. Financial intermediation through financial markets

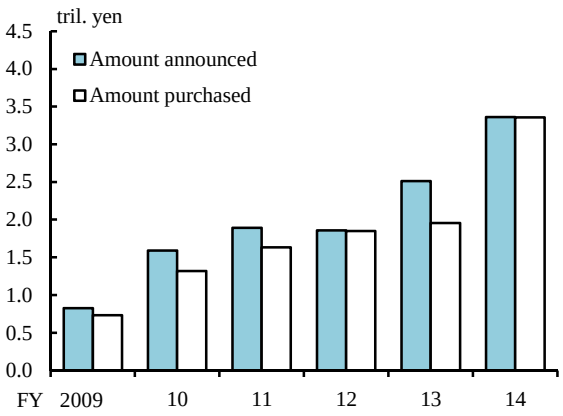
Equity financing through the stock market remains at a high level (Chart III-3-1). A breakdown shows that the contributions of initial public offerings (IPOs) and convertible bonds (CBs) are large. The increase in IPOs is attributable to the fundraising across a wide range of industries against the background of improving business conditions and a rise in stock prices. The fundamental reason for the increase in CB issuance -- in contrast to the decrease in public offerings (POs) -- is considered to be an increased preference for issuance of CBs that can be financed at low rates, taking into account capital efficiency for the immediate future amid firms' heightened awareness of the increase in return on equities (ROE) and of shareholder returns. Against this background, firms' stock buybacks, both announced and executed, as well as recapitalized CB issuance, have increased significantly (Charts III-3-2 and III-3-3).

Chart III-3-1: Equity financing[1]



Note: *1*. The latest data are as of the January-March quarter of 2015.
Source: I-N Information Systems.

Chart III-3-2: Amount of stock buybacks[1]



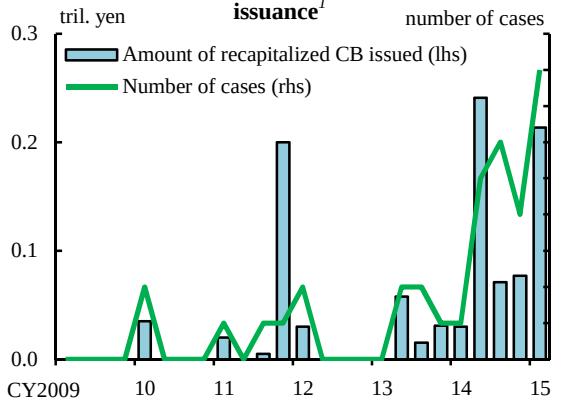
Note: *1*. Stocks listed on the First Section of the Tokyo Stock Exchange. Based on the announcement date.
Source: I-N Information Systems.

[4] In the new medium-term plan, the following revisions were made to the share of each asset. Domestic bonds: 60 percent to 35 percent; domestic stocks: 12 percent to 25 percent; international bonds: 11 percent to 15 percent; international stocks: 12 percent to 25 percent. In addition, details on alternative investment (infrastructure, private equities, real estates, and other assets) were mentioned for the first time with a view to reducing risks and proceeding with investments more efficiently through diversification of investment (maximum of 5 percent of total portfolio).

By industry, public offerings and IPOs of J-REITs have remained at high levels, and equity financing has been actively undertaken on the whole in a wide range of industries including manufacturing and insurance.

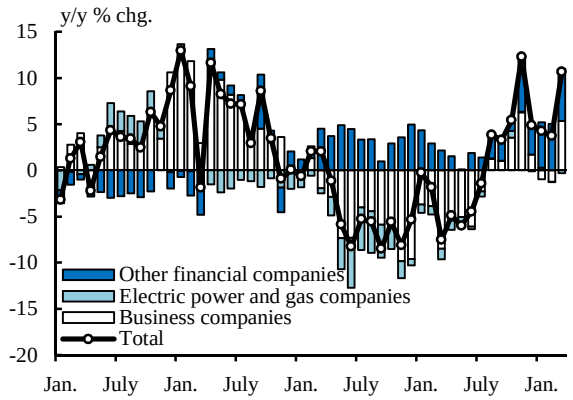
Issuing conditions for CP and corporate bonds have continued to be favorable. The year-on-year rate of change in the amount outstanding of CP has been positive, mainly against the background of an increase in lease demand and funding needs for bonus payments, and issuance rates are stable at low levels (Charts III-3-4 and III-3-5). On the other hand, corporate bond issuance has been decreasing somewhat compared with the first half of fiscal 2014 (Chart III-3-6). New bond issues by some firms have been deferred in view of the widening of spreads, mainly reflecting that corporate bond yields have been declining moderately to a level that may induce a drop in investor demand and that the volatility of JGB yields -- the base rate -- has been rising somewhat (Chart III-3-7).[5]

Chart III-3-3: Recapitalized CB issuance[1]



Note: *1*. The latest data are as of the January-March quarter of 2015.
Source: I-N Information Systems.

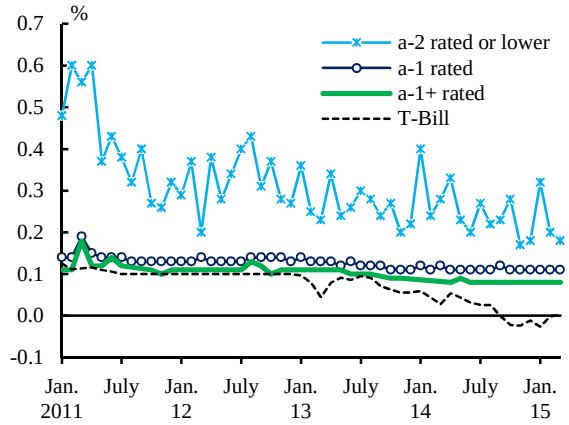
Chart III-3-4: Outstanding amount of CP[1,2,3]



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-March 2015.
Source: Japan Securities Depository Center.

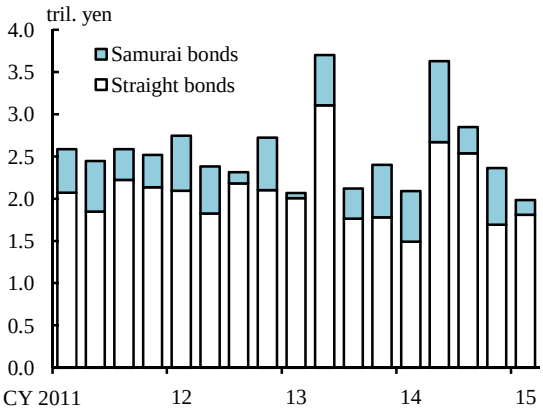
[5] Financial institutions, particularly regional banks and *shinkin* banks, have taken a passive stance on investment in corporate bonds with a rate below the interest rate applied to the Bank's complementary deposit facility (0.1 percent). In this situation, issuers that were passive about the widening of spreads took a wait-and-see stance with regard to new issuance of bonds, although a lower threshold exceeding the interest rate applied to the Bank's complementary deposit facility was applied to some corporate bond issues.

Chart III-3-5: CP issuance rates[1,2]



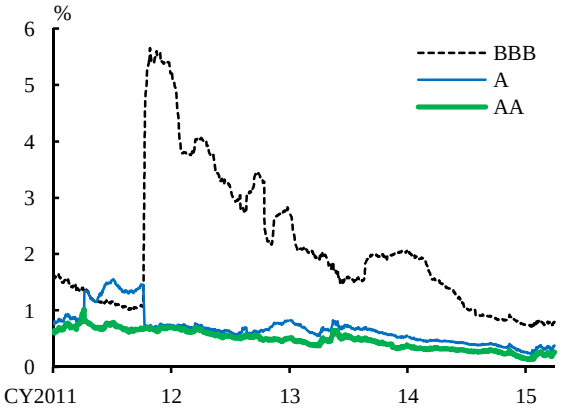
Notes: *1*. Monthly average 3-month rates weighted by issuance volume.
2. The latest data are as of March 2015.
Sources: Japan Bond Trading; Japan Securities Depository Center.

Chart III-3-6: Amount of corporate bonds issued[1]



Note: *1*. The latest data are as of the January-March quarter of 2015.
Source: I-N Information Systems.

Chart III-3-7: Yield on corporate bonds[1,2]



Notes: *1*. Reference statistical prices. Rated by R&I. Average yield on corporate bonds with a residual maturity of between 3 years and 7 years.
2. The latest data are as of March 31, 2015.
Sources: Bloomberg; Japan Securities Dealers Association.

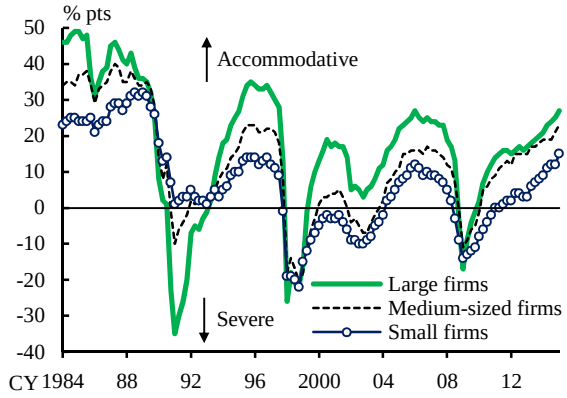
D. Financial conditions among firms and households and developments in their investment activities

Financial conditions among firms and households have become more accommodative against the backdrop of financial intermediary activities stated above. Funding costs for firms and households, including the average contract interest rates on new loans and discounts as well as those on mortgage rates, have continued to exhibit a downward trend (Chart III-1-16).

Lending attitudes of financial institutions as perceived by firms have become more accommodative, and firms' financial positions have continued to improve, regardless of firm size (Charts III-4-1 and III-4-2). The amount of firms' funding has been increasing

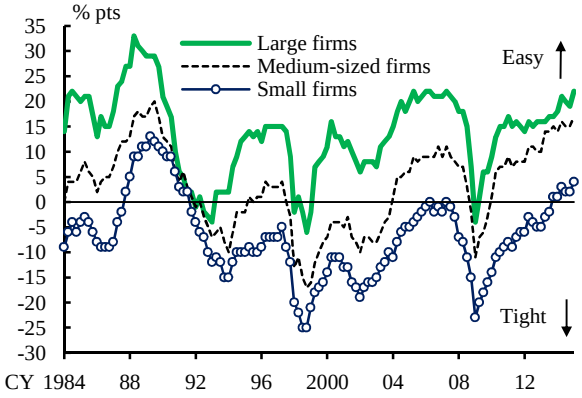
at a faster pace in the second half of fiscal 2014 than in the first half, as bank borrowing, CP, and equity financing have increased (Chart III-4-3). Meanwhile, the amount of housing loans relative to household disposable income has been at a high level (Chart III-4-4).

Chart III-4-1: DI of lending attitudes of financial institutions as perceived by firms[1]



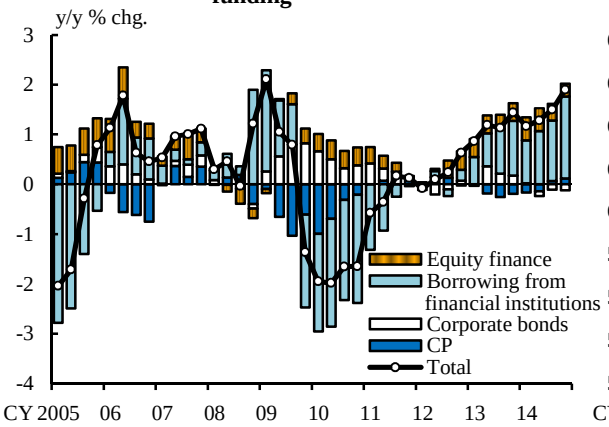
Note: *1*. The latest data are as of March 2015.
Source: BOJ, "*Tankan*."

Chart III-4-2: DI of financial positions of firms[1]



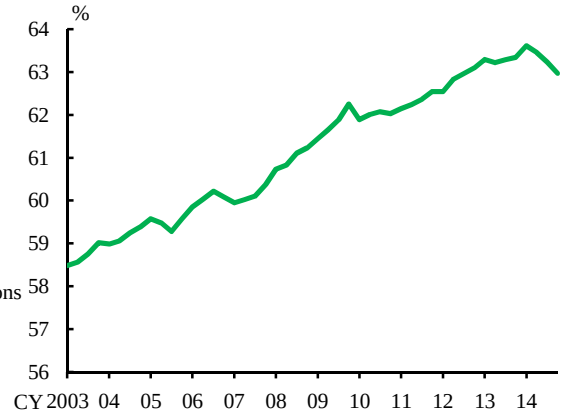
Note: *1*. The latest data are as of March 2015.
Source: BOJ, "*Tankan*."

Chart III-4-3: Total outstanding amount of firm funding[1,2,3]



Notes: *1*. The latest data are as of end-December 2014.
2. "CP" issued by banks is excluded. "Corporate bonds" issued by banks and those issued in overseas markets are included. "Borrowing from financial institutions" excludes borrowing from banks, financial institutions for cooperative organizations, and insurance companies.
3. "Equity finance" is shares and other equities of private nonfinancial corporations based on book value.
Sources: I-N Information Systems; Japan Securities Dealers Association; Japan Securities Depository Center; BOJ, "Flow of funds accounts," "Loans and bills discounted by sector."

Chart III-4-4: Household debt / disposable income[1,2]

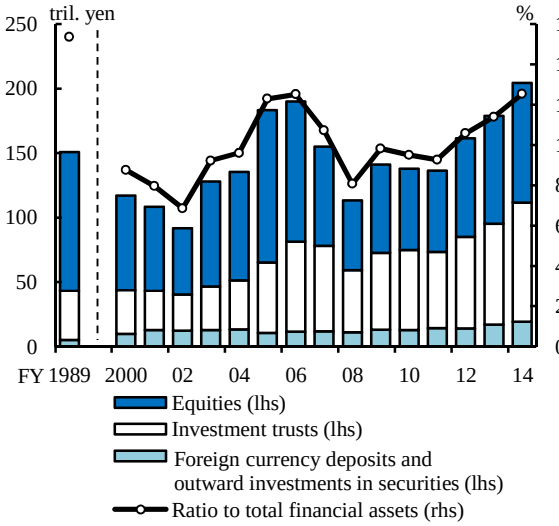


Notes: *1*. The latest data are as of the October-December quarter of 2014; 4-quarter moving averages.
2. The data are housing loans to disposable income ratios; disposable income from the April-June quarter of 2014 to the October-December quarter of 2014 are calculated by applying year-on-year rates of changes of compensation of employee in those periods.
Sources: Cabinet Office, "National accounts"; BOJ, "Flow of funds accounts."

Deposits have been central to household financial assets. Recently, however, the share of risky assets in household financial assets has gradually been increasing, as

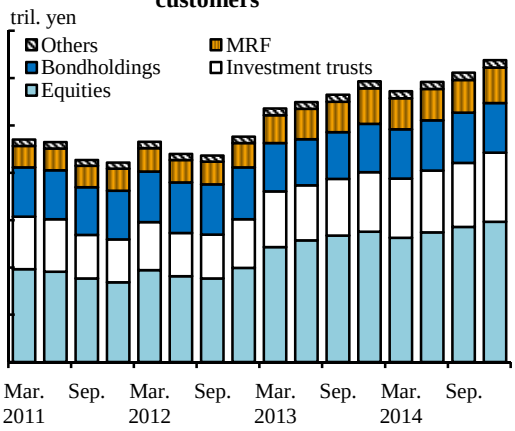
seen particularly in the continued net inflow to investment trusts (Chart III-4-5). The outstanding amount of client assets held by securities companies has been increasing gradually, particularly among stocks and investment trusts (Chart III-4-6). The underlying factors include a rise in the market value of financial assets, mainly due to a rise in stock prices. Even when excluding this effect, the net inflow of individuals' funds to risky financial products continues. Regarding securities companies, net inflow of capital from individual customers turned positive in 2014, especially among investment trusts and fund wrap accounts (Charts III-4-7 and III-4-8).

Chart III-4-5: Risky assets held by households[1,2]



Notes: *1*. The latest data are as of end-December 2014.
2. This chart is based on market value.
Source: BOJ, "Flow of funds accounts."

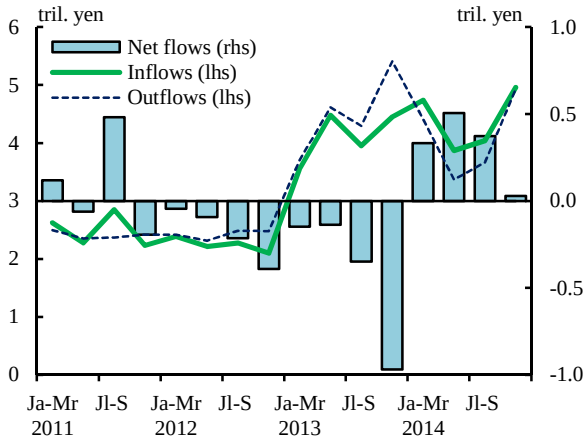
Chart III-4-6: Assets in custody held by major securities companies for retail customers[1,2,3]



Notes: *1*. The latest data are as of end-December 2014.
2. Data for 15 major securities companies that hold current accounts at the BOJ are counted.
3. "Investment trusts" indicates the sum of stock investment trusts and wrap products. "MRF" includes public and corporate bond investment trusts.
Source: BOJ.

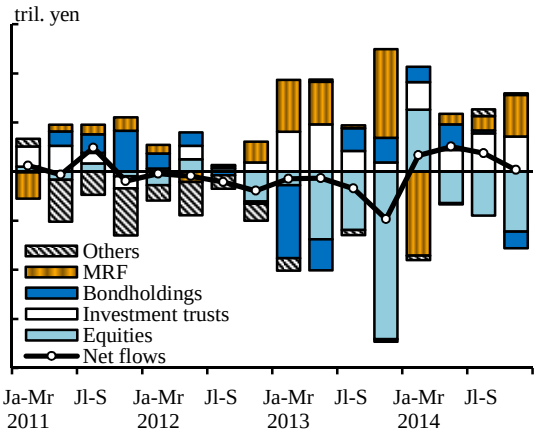
Behind these developments is the fact that households have gradually been enhancing their risk-taking stance amid stock price rises, the yen's depreciation, and low interest rates. The introduction of Nippon Individual Savings Accounts (NISAs), as well as financial institutions' greater efforts to expand their customer bases and client assets, appear to be encouraging such a trend (Charts III-4-9 and III-4-10). Among financial institutions, efforts to expand variety of investment trusts from which customers can choose, as well as to improve the quality of their services including wrap accounts, while increasing the contribution of customer-base expansion in performance reviews of their salespersons, have been widely observed. With regard to large financial institutions, efforts are increasingly being made to expand client assets for their group as a whole by further promoting personnel exchanges and via the introduction and intermediation of customers among banks and securities companies within the group.

Chart III-4-7: Capital flows held by securities companies for retail customers[1,2]



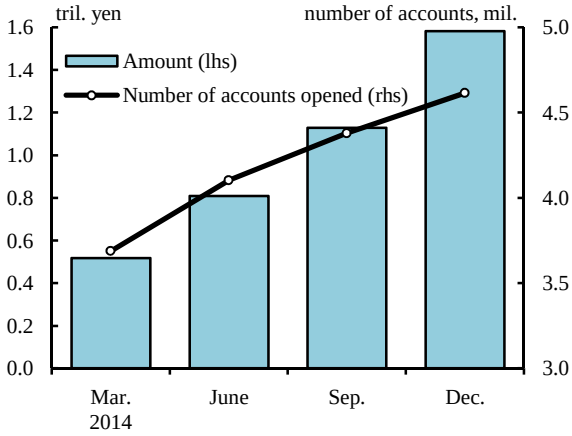
Notes: *1*. The latest data are as of the October-December quarter of 2014.
2. Data for 15 major securities companies that hold current accounts at the BOJ are counted.
Source: BOJ.

Chart III-4-8: Capital flows by product held by major securities companies for retail customers[1,2,3]



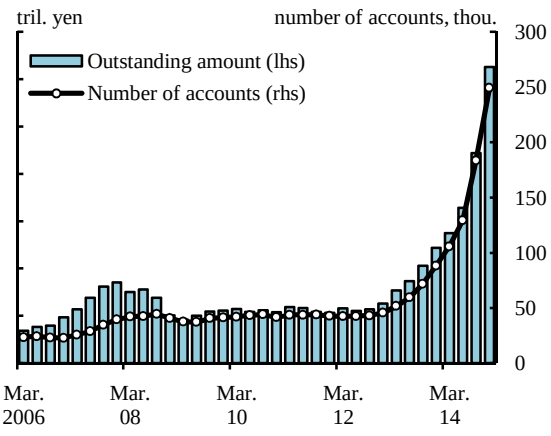
Notes: *1*. The latest data are as of the October-December quarter of 2014.
2. Data for 15 major securities companies that hold current accounts at the BOJ are counted.
3. "Investment trusts" indicates the sum of stock investment trusts and wrap products. "MRF" includes public and corporate bond investment trusts.
Source: BOJ.

Chart III-4-9: Purchases through NISA accounts and the number of NISA accounts opened[1]



Note: *1*. Data for 9 major banks and 15 securities companies are counted.
Source: BOJ.

Chart III-4-10: Assets under management in wrap accounts[1]



Note: *1*. The latest data are as of end-December 2014.
Source: Japan Investment Advisers Association.

IV. Risks borne by financial institutions

In this chapter, we examine the extent to which financial institutions, such as banks and *shinkin* banks, have accumulated risks and how they have changed their risk profiles through the process of financial intermediation described in Chapter III. It should be noted that most data used in our analysis -- the sections on credit risk and bank capital in particular -- are as of the end of September 2014. Regarding market risk and liquidity risk, however, data for the subsequent period are used where possible.

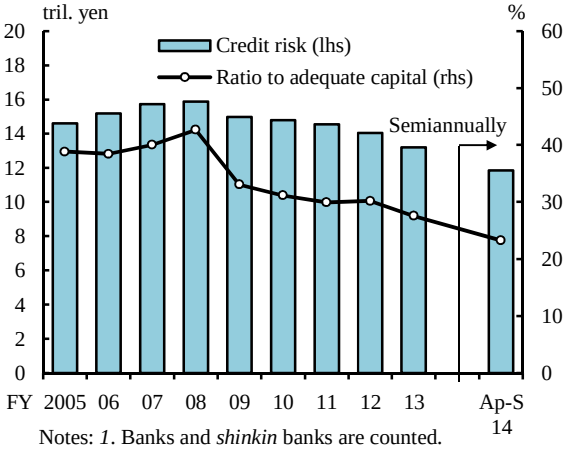
A. Credit risk

Financial institutions' credit risk has declined against the background of their improved asset quality since publication of the previous *Report* (Chart IV-1-1).[6] From this *Report*, the probability of default used for estimating the amount of credit risk has been changed from a measure based on monetary value to one based on the number of counterparties (see Box 1 for details). Looking at each type of bank, the declining trend in credit risk has continued to hold in recent times (Chart IV-1-2).

While financial institutions are increasing their lending both at home and abroad, the amount of credit risk has declined. This is primarily due to improvement in the quality of assets, reflecting the economic recovery and improved financial conditions among firms. The number of corporate bankruptcies has remained at a low level and the use of subrogation by credit guarantee corporations has been decreasing (Charts IV-1-3 and IV-1-4).

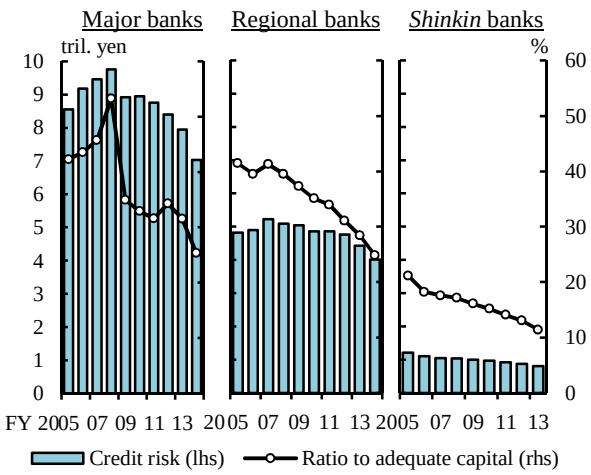
[6] Credit risk as defined here corresponds to unexpected losses. Unexpected losses are estimated by deducting the average amount of losses in 1 year (expected losses) from the maximum amount of losses with a 99 percent probability of occurrence in 1 year. We use default probability, calculated based on data on borrower classification of bank loans, and the rate of recovery of bank loans when losses occur.

Chart IV-1-1: Credit risk among financial institutions[1,2,3,4,5]



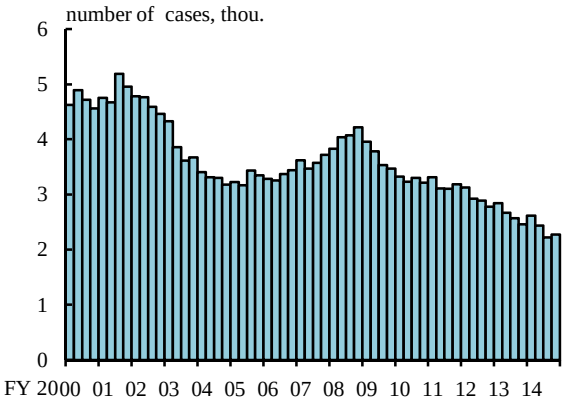
Notes: *1*. Banks and *shinkin* banks are counted.
2. Credit risk is unexpected losses with a 99 percent confidence level.
3. Credit risk includes foreign currency-denominated assets.
4. Adequate capital for internationally active banks from fiscal 2012 is CET I. Adequate capital for domestic banks from fiscal 2013 is core capital. The data do not take account of the phase-in arrangements. Adequate capital preceding the respective periods is Tier I.
5. For *shinkin* banks, figures for adequate capital and credit risk in the first half of fiscal 2014 are assumed to be unchanged from the end of fiscal 2013.
Source: BOJ.

Chart IV-1-2: Credit risk by type of bank[1,2,3]



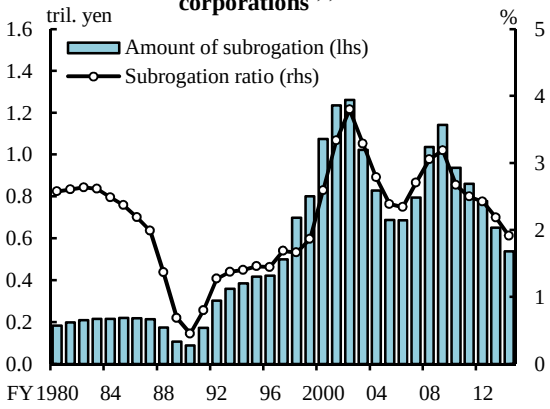
Notes: *1*. The latest data for banks are as of the first half of fiscal 2014 (annualized), and those for *shinkin* banks are as of fiscal 2013.
2. Credit risk is unexpected losses with a 99 percent confidence level.
3. Credit risk includes foreign currency-denominated assets.
Source: BOJ.

Chart IV-1-3: Corporate bankruptcies[1]



Note: *1*. The latest data are as of the January-March quarter of 2015.
Source: Tokyo Shoko Research Ltd.

Chart IV-1-4: Subrogation by credit guarantee corporations[1,2,3]



Notes: *1*. The latest data for the amount of subrogation are as of the April-December period 2014 (annualized), and those for outstanding guaranteed liabilities are as of December 2014.
2. Subrogation is a legal doctrine whereby a credit guarantee corporation pays an insured financial institution for losses due to the borrower's bankruptcy.
3. Subrogation ratio = amount of subrogation / outstanding guaranteed liabilities.
Sources: National Federation of Credit Guarantee Corporations; BOJ.

Box 1: Estimation of the amount of credit risk

In this *Report*, the amount of credit risk (unexpected losses) is calculated using Equation (1), which is based on the internal rating(s)-based approach of the Basel capital requirements for credit risks.

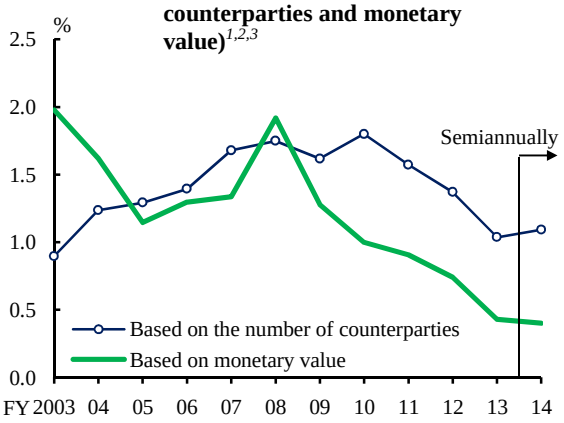
Amount of credit risk (unexpected losses) =

Exposure at default × loss given default ×

(Probability of Default<PD> under stresses – PD at normal times) . . . (1)

PDs can be calculated in two ways: (1) based on monetary value; and (2) based on the number of counterparties. In the default of a large borrower, monetary value-based PD increases more sharply than that based on the number of counterparties. In fact, when a high number of large borrower defaults occurred in the early 2000s and in 2008, monetary value-based PD rose very sharply (Chart B1-1). Therefore, past issues of this *Report* used PD based on monetary value in order to capture the impact of the default of large borrowers.[7]

Chart B1-1: Default rate comparison (based respectively on the number of counterparties and monetary value)[1,2,3]



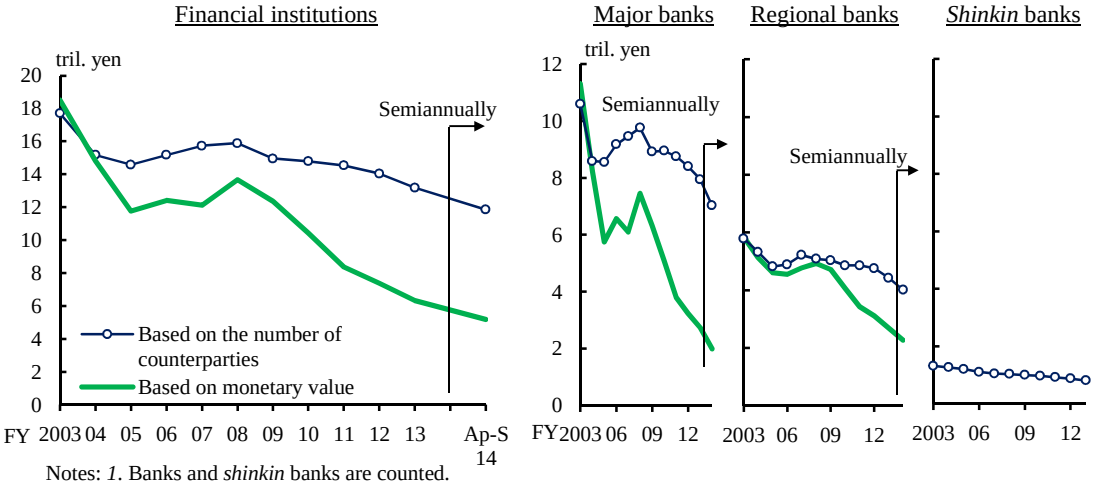
Notes: *1*. Major banks and regional banks are counted.
2. The latest data are as of the first half of fiscal 2014 (annualized).
3. Credit risk includes foreign currency-denominated assets.
Source: BOJ.

Reflecting the recent fall in the number of defaults among large borrowers, however, monetary value-based PD now stands below that based on the number of counterparties, and its decline is sharper than that of the latter (Chart B1-1). As a result, the estimated amount of credit risk, which is based on monetary value, is smaller than that obtained by using the number of counterparties (Chart B1-2). At the same time, reflecting the decline in PD for large borrowers, the estimated value based on monetary value has fallen by a relatively large margin. Under these circumstances, the definition of PD used for estimating the amount of credit risk has been changed from that based on monetary

[7] Due to the limited availability of data for *shinkin* banks, only calculations based on the number of counterparties can be undertaken for these banks.

value to one based on the number of counterparties.

Chart B1-2: Credit risk comparison (using default rate based respectively on the number of counterparties and monetary value)[1,2,3,4,5]



Notes: *1*. Banks and *shinkin* banks are counted.
2. The latest data for banks are as of the first half of fiscal 2014 (annualized); those for *shinkin* banks are as of fiscal 2013.
3. Credit risk is unexpected losses with a 99 percent confidence level.
4. For *shinkin* banks, credit risk is calculated using a default rate based on the number of counterparties.
5. Credit risk includes foreign currency-denominated assets.
Source: BOJ.

Moreover, in estimating PD, the measurement time horizon also matters. As has previously been the case, this issue of the *Report* estimates PD using the incidence of default during the preceding 3 years. However, it is worth noting that when the measurement period is extended to 5 years in order to reflect the impact of shocks that occurred from 5 to 3 years ago, it is found that the declining trend in the amount of credit risk proved to be more moderate (Chart B1-3).

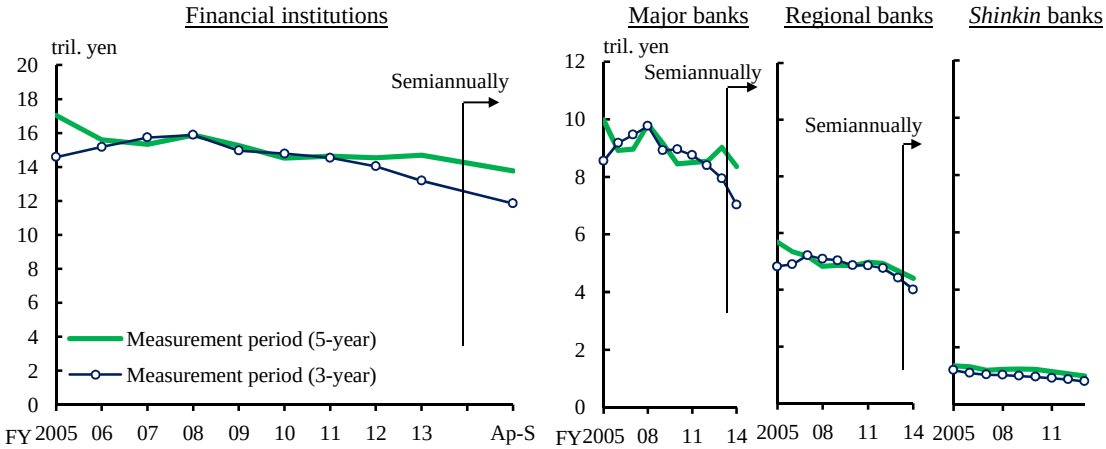
The internal rating(s)-based approach of the Basel capital requirements for credit risk assumes a portfolio consisting of fully diversified loans, i.e., infinitely small loans. Therefore, when actual credit has some degree of concentration to large exposures, the application of this equation results in under-estimation of the amount of credit risk.[8] In fact, when Monte Carlo simulations are conducted on a bank's realistic but hypothetical portfolio which includes concentrated loans, it is found that the amount of credit risk estimated is nearly 10 percent greater than that estimated using the internal rating(s)-based approach (Chart B1-4).

Given the evidence above, it is necessary to assess credit risk appropriately to manage it properly by taking account of the following factors: (1) the amount of credit risk can

[8] For this reason, under the Basel requirements, the risk borne by a bank as a result of the default of a large borrower is covered not by their minimum capital requirements (the first pillar) but by "corporate governance and oversight (supervisory review process)" (the second pillar).

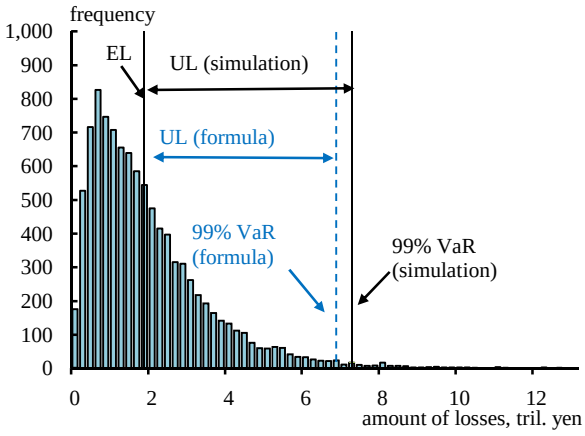
vary depending on the data or calculation method used; and (2) the possibility that the large-exposure credit risk to materialize.

Chart B1-3: Credit risk comparison (with measurement periods of 3 years and 5 years)[1,2,3,4,5]



Notes: *1*. Banks and *shinkin* banks are counted.
2. The latest data for banks are as of the first half of fiscal 2014 (annualized); those for *shinkin* banks are as of fiscal 2013.
3. Credit risk is unexpected losses with a 99 percent confidence level.
4. Credit risk is calculated using a default rate based on the number of counterparties.
5. Credit risk includes foreign currency-denominated assets.
Source: BOJ.

Chart B1-4: Simulation results[1]

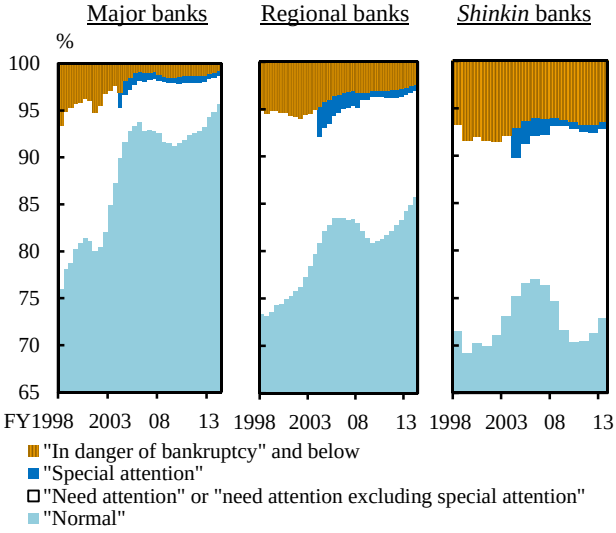


Note: *1*. Results of a Monte Carlo simulation based on the Merton model, using the borrowing data of approximately 95,000 firms.
Source: Teikoku Databank.

Quality of loans and credit costs

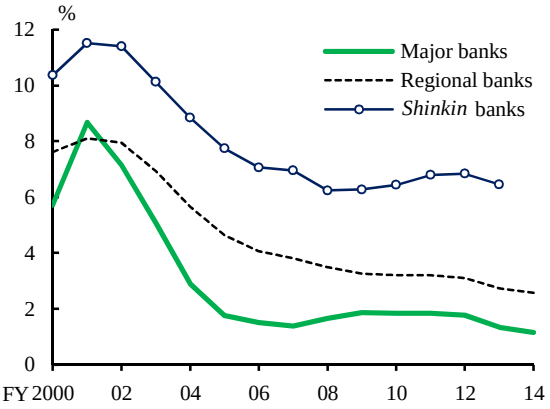
The quality of loans of financial institutions has continued to improve. The amount of loans outstanding by borrower classification shows that the ratio of normal loans to total loans has risen further for each type of bank (Chart IV-1-5). The NPL ratio for each type of bank has declined (Chart IV-1-6).

Chart IV-1-5: Composition of claims by borrower classification[1,2]



Notes: *1*. The latest data for banks are as of end-September 2014, and those for *shinkin* banks are as of end-March 2014.
2. "Need attention" or "need attention excluding special attention" indicates "need attention" through fiscal 2003 and "need attention excluding special attention" from fiscal 2004.
Source: BOJ.

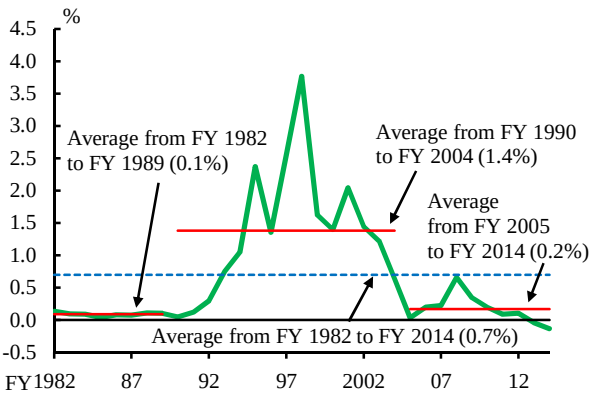
Chart IV-1-6: NPL ratios[1]



Note: *1*. The latest data for banks are as of end-September 2014, and those for *shinkin* banks are as of end-March 2014.
Source: BOJ.

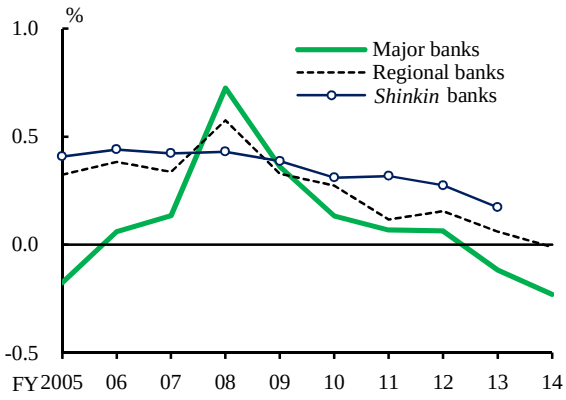
The credit cost ratio of financial institutions has continued to decline, and is at an extremely low level from a long-term perspective. Regarding the credit cost ratio (the ratio of costs incurred by credit extension to loans outstanding) for the first half of fiscal 2014, major banks recorded a historical high for their net reversals -- as far as can be confirmed from the time-series data -- while regional banks posted their first net reversals (Charts IV-1-7 and IV-1-8). The loan-loss provision ratio (the ratio of loan-loss provisions to loans outstanding) has also continued to decline (Chart IV-1-9). Changes in the amount of general loan-loss provisions are attributable to both upward revisions in borrower classification and declines in the provision ratio (Chart IV-1-10).

Chart IV-1-7: Credit cost ratio of banks[1]



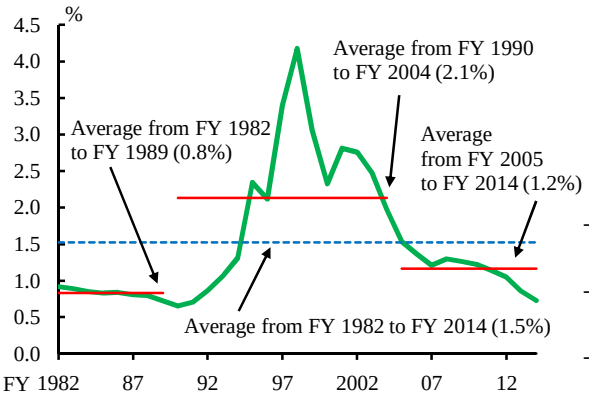
Note: *1*. Major banks and regional banks are counted. The latest data are as of the first half of fiscal 2014 (annualized).
Source: BOJ.

Chart IV-1-8: Credit cost ratio by type of bank[1]



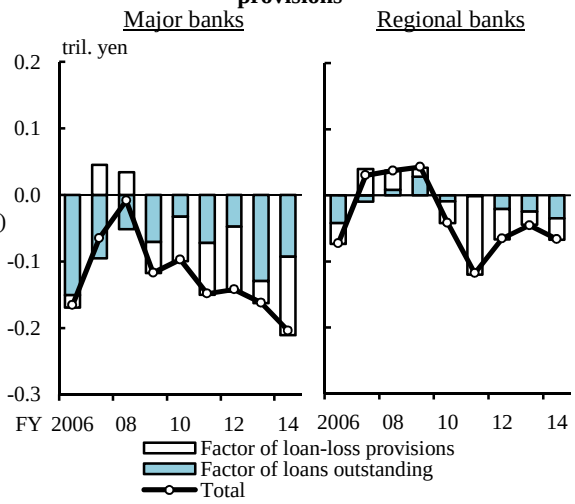
Note: *1*. The latest data for major banks and regional banks are as of the first half of fiscal 2014 (annualized), and those for *shinkin* banks are as of fiscal 2013.
Source: BOJ.

Chart IV-1-9: Loan-loss ratio of banks[1,2]



Notes: *1*. Major banks and regional banks are counted. The latest data are as of end-September 2014.
2. Loan-loss ratio = total loan-loss provisions / total loans outstanding.
Source: BOJ.

Chart IV-1-10: Changes in general loan-loss provisions[1]

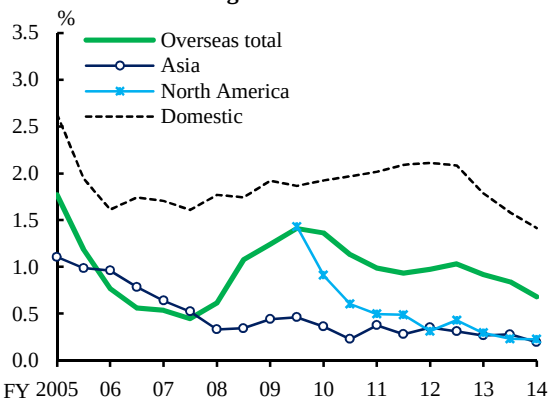


Note: *1*. Changes in the first half of each fiscal year. Loan-loss provisions and loans outstanding are aggregated for each borrower classification.
Source: BOJ.

Credit risk associated with overseas loans

Credit risk associated with overseas loans has remained subdued to date.[9] Major banks' NPL ratios in major borrowing regions such as North America and Asia have been lower than those for domestic loans (Chart IV-1-11).

Chart IV-1-11: NPL ratio of major banks by region[1]



Note: *1*. The three major financial groups are counted on a non-consolidated basis. The latest data are as of end-September 2014.
Sources: Published accounts of each group.

Tasks and challenges regarding credit risk management

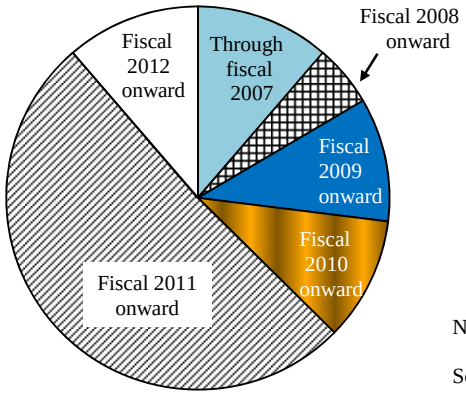
First, it is necessary to continuously examine the adequacy of how the amount of credit risk is estimated and provisions are calculated, taking into account

[9] The analyses of credit risks, loans outstanding by borrower classification, and credit cost ratios presented above include overseas loans, but the analysis here picks up overseas loans.

expectations for future developments. Recent figures for credit costs, the provision ratio, and the amount of credit risk utilized for capital allocations are at particularly low levels from a long-term perspective. This is due to the fact that the evidence used for calculations is past data, which results in pro-cyclicality, i.e., the tendency to move in accordance with business cycles. However, it should be noted that risk management action and provisioning are, by nature, preparations for the future. Therefore, in principle, financial institutions should appropriately factor in expected effects on future developments that are not reflected in past figures and smooth out the effects of business cycles. In particular, as financial institutions work on enhancing industrial capabilities and vitalizing local economies, careful attention should be paid to the possibility that the credit risks and costs they face will undergo structural changes due to such factors as the materialization of business risks in new and growing business areas, the provision of financial support for business revitalization or reconstruction, and industrial restructuring.

Under these circumstances, some financial institutions -- while taking into account the relevant regulations and tax rules -- have made amendments to their provisioning practices in preparation for future developments. Specifically, they have (1) reviewed the estimation period for the actual loan-loss ratio monitored in calculating the provision ratio; (2) increased the granularity of groupings in calculating the amount of provisions in accordance with the situation regarding the borrower's risks; and (3) extended the range of borrowers to whom the discounted cash flow (DCF) method is applied so that borrowers' future business opportunities are reflected (Charts IV-1-12 and IV-1-13).

Chart IV-1-12: Measurement period for actual loan-loss ratio (need attention excluding special attention)[1]



Note: *1.* Major banks and regional banks are counted. The data are in the first half of fiscal 2014.
Source: BOJ.

Chart IV-1-13: Amendments to the loan-loss provisions method by financial institutions subject to the Bank of Japan's on-site examinations in fiscal 2014[1,2]

	69 banks and *shinkin* banks	Extension of measurement period	More granular bucketing of borrower classification in accordance with credit risk	Reduction of the threshold subject to the DCF method	Implementation of the cash flow deduction method	Setting mininum loan-loss provision rates
General loan-loss provisions	35	26	6	8	0	2
Special loan-loss provisions	57	22	13	12	11	10

Notes: *1*. Banks and *shinkin* banks subject to the Bank of Japan's on-site examinations in fiscal 2014 are in the sample.
2. Amendments to the loan-loss provisions method among the examined financial institutions include the following schemes: extension of the measurement period for the calculation of expected losses to 4 years or more; more granular bucketing of borrower classification in accordance with the degree of credit risks; reduction of the threshold (to less than 10 billion yen) subject to the DCF (discount cash flow) method for loans classified as needing special attention or in danger of bankruptcy; and implementation of the cash-flow deduction method (i.e., calculating expected losses as a reminder after the amount collectible from rationally estimated cash flow is deducted from the outstanding amount of loans to borrowers in danger of bankruptcy, classified as category III). The Inspection Manual for Deposit-Taking Institutions states that "in calculating expected loss amounts, use average default rates and/or bankruptcy probabilities for at least the last three calculation periods (three year average of cumulative default rates and/or bankruptcy probabilities for a set period in the past corresponding to a set period in the future) to calculate past default rates". The Manual also states that "it is desirable to apply the DCF method for large borrowers (whose credit amount for the time being is 10 billion yen or more) " classified as needs special attention or in danger of bankruptcy.
Source: BOJ.

Second, it is necessary for financial institutions to improve their credit management capabilities in such areas as overseas lending and lending to growing domestic business areas, where active engagements have been observed. Overseas lending, among other areas, has recently been posting the highest growth. As mentioned earlier, associated credit risks have been stable to date. Nevertheless, as described in Chapter II, overseas economies have been exposed to downside risks including the decline in commodity prices, developments in Russia and Greece, and the sluggishness in emerging economies. In particular, lending for natural resource development and to Japanese and non-Japanese firms in emerging economies, such as in Asia, along with project financing and sovereign loans are among the areas on which Japanese banks have maintained a special focus in recent years. Appropriate monitoring and credit management are necessary in extending loans (see Box 2 for the fall in commodity prices and credit management).

Box 2: The fall in commodity prices and credit management

Developments in commodity prices show that in addition to the sharp fall in crude oil prices seen since the autumn of 2014, iron ore and copper prices have continued to follow a declining trend since around 2011. At present, they are comparable to the levels that prevailed from the mid-2000s through the second half of the 2000s, except for the period during which they temporarily plunged in the wake of the Lehman shock (Chart

II-1-6).

The impact of the fall in commodity prices on financial institutions' loan portfolios is not always the same. For firms and individuals, who are the ultimate users, it can have broadly positive effects through cost reductions, but in terms of improving their creditworthiness as borrowers, its impact is broad and thin. On the other hand, for companies engaged in the development of natural resources or those involved in related activities (e.g., through exploration, drilling, or engineering), it is liable to have a direct, negative impact due to reduced profitability or through lower development activity. For those in between (e.g., oil refiners and sellers), the impact is thought to be basically neutral in the medium term, but can result in appraisal losses on inventories in the short term (Chart B2-1). In the financial results for the October-December quarter of fiscal 2014, some companies posted impairment accounting procedures or appraisal losses on inventories associated with their interests and rights in the development of natural resources.

Chart B2-1: Effects of the fall in commodity prices

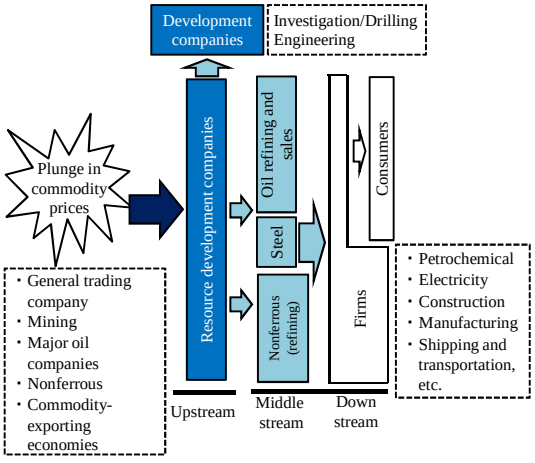
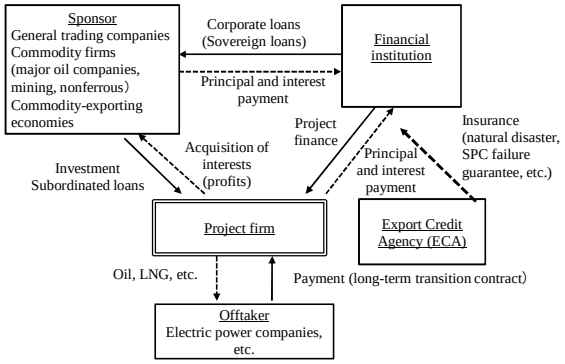


Chart B2-2: Related parties of resource development and financial institutions



In addition to corporate loans, financial institutions' resource-related credit includes project finance, which is direct lending to individual development projects (Chart B2-2). In project finance, financial institutions bear the risk associated with individual development projects. However, the risk burden is generally partly shared by (1) off-takers (through long-term resource purchase agreements), such as electric power companies; (2) resource development companies or other sponsors (through the obligation to make additional equity investments addressed in financial covenants, or capital impairment); or (3) export credit organizations for natural disasters or guarantees in the event of the failure of special purpose companies (SPCs). Consequently, risk characteristics vary from project to project depending on the agreement or scheme

which binds it, and thus are complex.

To date, the fall in commodity prices is thought to have had only a limited impact on Japanese banks' credit costs in both corporate loans and project finance. However, the impact may become more significant, depending on future price movements. Thus, financial institutions need to take further steps in augmenting their stress testing, in analyzing cash flows of relevant firms, and in reviewing the complex risk characteristics of each project.

As for lending to growing business areas at home, examples of such business areas include renewable energy-related business such as solar power generation, medical and welfare-related business, agribusiness, and other lending related to start-ups. Lending to these growing business areas have characteristics that differ from those of existing industries as well as area-specific risks, including their cash flow characteristics and institutional environment. In addition, loans in these areas tend to have long maturities. In making such loans, financial institutions need to develop more sophisticated risk management practices, including a proper assessment of borrowers' resilience against their stresses and improved information infrastructure, including data management capacity (see Box 3 for details). From a similar viewpoint, sound risk management is necessary for lending to the house and room leasing business, which has recently continued to exhibit high growth.

Box 3: Loans for long-term projects (including solar power generation) and credit management

Since the implementation of the Feed-in Tariff Scheme for Renewable Energy, capital investments in solar power generation equipment and facilities have rapidly increased, partly due to favorable conditions in fixed purchase prices under the scheme and the tax incentives available (Chart B3-1). As solar power producers can expect 20 years of stable income from solar power sales under the scheme, financial institutions have also been actively providing long-term loans to producers to finance solar power investments. This is especially true for regional financial institutions, as they have been expanding their lending to solar power producers as rapidly as they have to the healthcare and welfare and real estate (including house and room leasing) sectors.

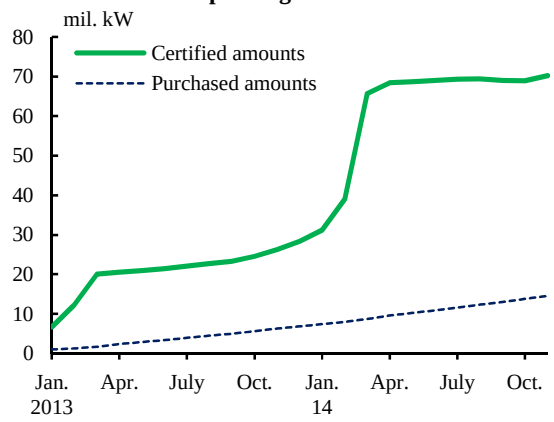
To date, there have generally been no major problems in terms of loan credit quality, partly because the scheme is at an early stage. Nevertheless, though small in number, there have been some cases in which power generation capacity fell short of planned capacity, or in which cash flow estimates including future maintenance and

administrative expenses were not sufficient.

As for the framework, purchase prices have been gradually reduced as prescribed in the scheme, while in some regions, purchase procedures have been reviewed in order to guarantee a stable power supply due to the rapid increase in the introduction of solar power generation equipment. In the second half of fiscal 2014, six electric power companies were chosen as designated electric power companies, allowing them to require solar power producers to curb output, without compensation, for an unlimited number of days. Depending on how this new provision is implemented by the power companies, income stability and profitability from power sales for solar power producers are expected to change substantially.

Loans for the healthcare and welfare and real estate (including house and room leasing) sectors, in addition to loans for solar power generation, are mainly long-term. Therefore, it is essential to assess future cash flows and risks appropriately based on the characteristics of these businesses, including the impacts of the institutional framework and tax provisions.

Chart B3-1: Developments in certified amounts for solar power generation facilities[1,2,3,4]



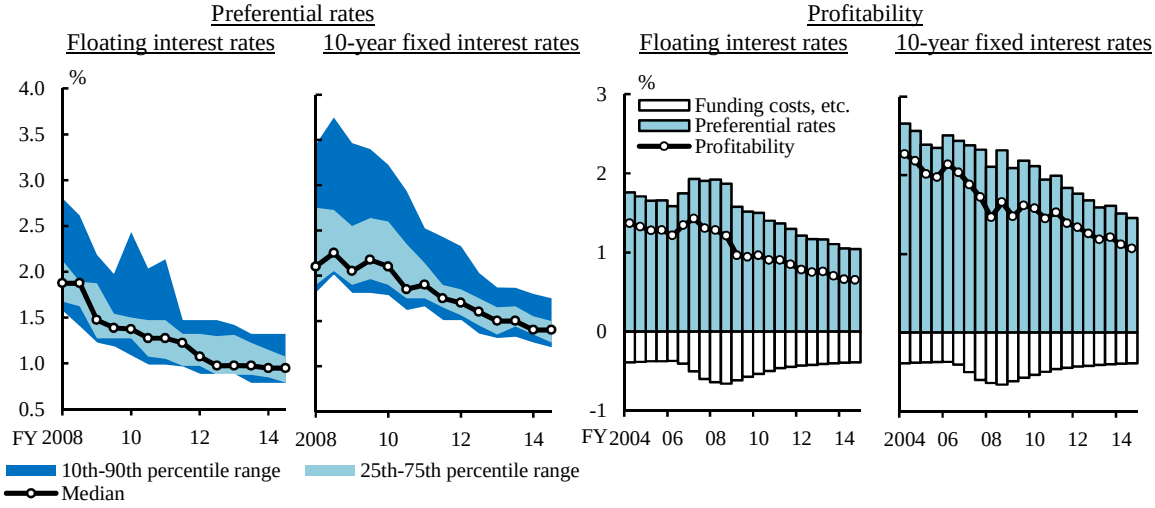
Notes: *1.* The latest date are as of November 2014.
2. The data are aggregated amounts for solar power generation facilities resulting from the feed-in tariff scheme for renewable energy.
3. Certified amounts are the amounts of electric generation capacity for power plants, including plants yet to be constructed, which are newly certified under the feed-in tariff scheme for renewable capacity.
4. Purchased amounts are the amounts of electric generation capacity for power plants that have already started to operate under the feed-in tariff scheme for renewable capacity.
Source: Ministry of Economy, Trade and Industry.

Third, the assessment of risk and return in loans has become important as interest rate spreads on loans have continuously narrowed. In particular, lending spreads on housing loans have recently been declining at a pace exceeding that seen in credit costs. Although the concept of profitability of housing loans may not be uniform depending on the time horizon of assessments or the concept of total profitability, financial institutions need to make appropriate assessments of profitability based on their respective business plans.

Profitability, credit costs, and burden of debt repayments associated with housing loans

Financial institutions have increased discounts for their preferential rates on housing loans, and the profitability of these loans has continued to decline (Chart IV-1-14).

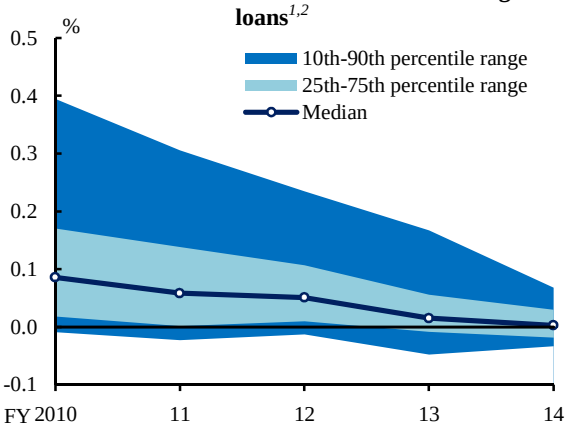
Chart IV-1-14: Preferential rates and profitability of housing loans[1,2]



Notes: *1*. Major banks and regional banks are counted. The latest data are as of October 2014. Profitability is assessed at the time of extension.
2. "Funding costs, etc." are the sum of the funding rate and the group credit life insurance premium (assumed to be 0.3 percent).
Sources: Japan Financial News, "Nikkin report"; BOJ.

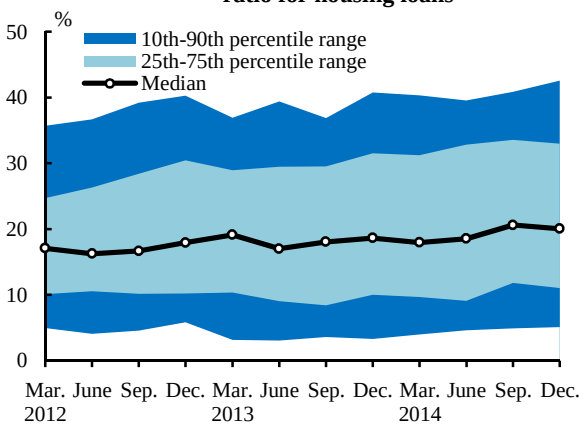
Meanwhile, credit costs associated with housing loans have declined (Chart IV-1-15).

Chart IV-1-15: Credit cost ratio of housing loans[1,2]



Notes: *1*. Major banks and regional banks are counted. The latest data are as of the first half of fiscal 2014.
2. Credit cost ratio = (credit cost on a non-consolidated basis + credit cost on affiliated housing loan guarantee corporations) / (outstanding amount of housing loans without guarantees + outstanding amount of guaranteed loans on affiliated housing loan guarantee corporations).
Source: BOJ.

Chart IV-1-16: Distribution of debt-to-income ratio for housing loans[1,2]



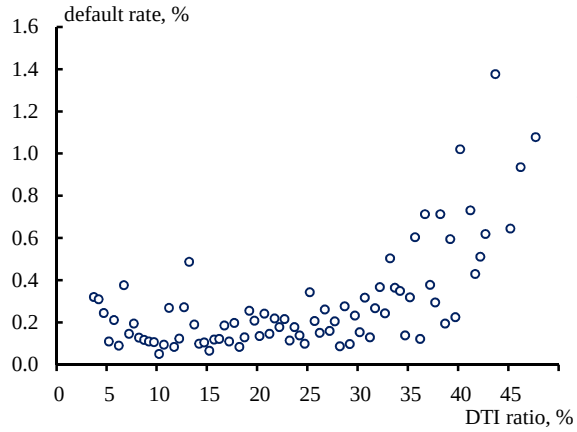
Notes: *1*. Regional banks are counted. The latest data are as of December 2014.
2. Distribution of new housing loans at a debt-to-income (DTI) ratio of over 30 percent among total new housing loans. DTI = yearly repayment / yearly income.
Source: BOJ.

The fall in credit costs has not kept pace with the decline in profitability, however. While banks' credit cost ratio declined by 8 basis points (median) from fiscal 2010 to

the first half of fiscal 2014, profitability declined by 28 basis points for loans extended at floating interest rates and by 40 basis points for 10-year fixed rates. At the same time, the creditworthiness of borrowers has recently been declining, albeit moderately. Looking at the debt-to-income (DTI) ratio (the ratio of principal and interest payments on loans to the borrower's income) for new housing loans, at the time of lending, the percentage of housing loans with high DTI ratios has been rising, albeit moderately (Chart IV-1-16).

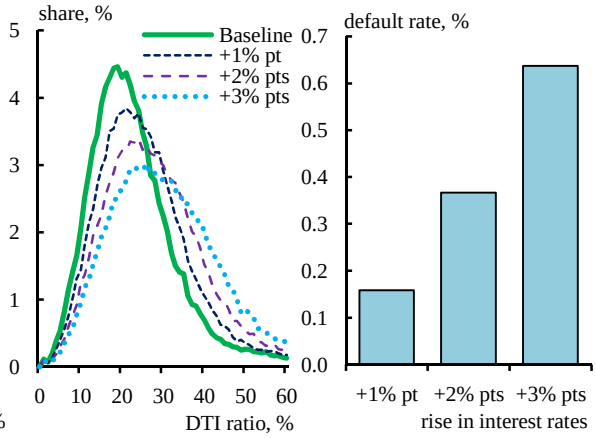
This issue of the *Report* is the first to utilize individual borrowers' data on housing loans to examine the relationship between the DTI ratio when loans are made and the subsequent default rate. The results of this examination show that when the DTI ratio exceeded 30 percent, the default rate soared in a non-linear fashion (Chart IV-1-17).[10]

Chart IV-1-17: DTI ratio and default rate[1,2,3]



Notes: *1*. The estimation period is from April 2006 through March 2014. Rollover loans are excluded.
2. The debt-to-income (DTI) ratio is measured at the time of extension. In the estimation process, seasonal effects are excluded.
3. Defaults are defined as loans in delinquency process for 6 months or more, in deferment for 6 months or more, or subrogated.
Source: CRD.

Chart IV-1-18: Simulation on impacts of upward interest rate shifts[1,2]



Notes: *1*. Simulation of impacts of upward shifts in contract interest rates.
2. Defaults are defined as loans in delinquency for 6 months or more, in deferment for 6 months or more, or subrogated.
Sources: CRD; BOJ.

When this relationship is applied to portfolio data to make preliminary estimates of the impact of future interest rate rises on the default rate, the results indicate that as the number of borrowers with higher DTI ratios increased, the default rate rose in a non-linear fashion (Chart IV-1-18).[11] This analysis suggests the importance of

[10] For a similar portfolio-level analysis, see the October 2011 issue of the *Report*.

[11] This estimation ignores some institutional factors, such as the impact of tax cuts for housing loans, affecting the DTI ratio. Because the aim here is to present a framework analyzing the relationship between fluctuations in macroeconomic variables and changes in portfolio default rates, the numerical conclusion itself should be considered with a degree of latitude.

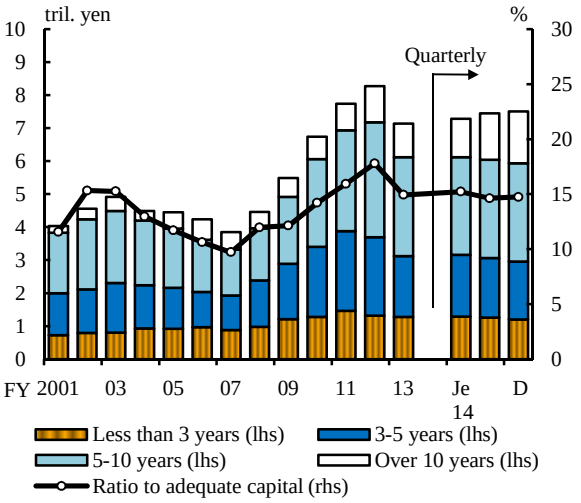
analyzing the profitability of housing loans and the quality of future portfolios under a number of scenarios for future macroeconomic conditions.

B. Interest rate risk

Amount of interest rate risk associated with yen-denominated bond investment

The amount of interest rate risk on yen-denominated bonds held by financial institutions has increased somewhat from the level observed in the previous *Report*.[12] The amount of risk at the end of December 2014 -- 7.5 trillion yen -- represents a 3.2 percent increase from the 7.3 trillion yen recorded at the end of June 2014 (Charts IV-2-1 to IV-2-3).[13,14] As mentioned earlier, this increase is attributable to the accumulation of super-long-term bonds, i.e., bonds with a maturity of greater than 10 years, observed among major banks and *shinkin* banks (Charts IV-2-4 and IV-2-5).

Chart IV-2-1: Interest rate risk associated with bondholdings among financial institutions[1,2,3,4]



Notes: *1*. Banks and *shinkin* banks are counted.
2. Interest rate risk: 100 basis point value in the banking book.
3. Convexity and higher order terms are taken into account.
4. Interest rate risk excludes risk associated with foreign currency-denominated bondholdings.
Source: BOJ.

[12] The analysis here uses capital losses on bondholdings in the case of a "parallel shift" of (100 bpv) -- in which interest rates for all maturities rise by 1 percentage point -- as an indicator of interest rate risk.

[13] The results of this estimation differ slightly from those of the previous *Report*, as data including more detailed classifications have now become readily available, and because the precision and accuracy of the estimation have been increased, taking into account convexity and higher-order terms. However, these differences are not significant enough to affect the overall assessments.

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

Chart IV-2-2: Effects of a rise in interest rates on capital losses on bondholdings[1,2]

Upward shift by 1 percentage point

tril. yen

	Parallel shift scenario			Steepening scenario		
	End-June 2014	End-Sep. 2014	End-Dec. 2014	End-June 2014	End-Sep. 2014	End-Dec. 2014
Financial institutions	-7.3	-7.5	-7.5	-4.4	-4.6	-4.8
Banks	-5.4	-5.5	-5.5	-3.0	-3.2	-3.3
Major banks	-2.5	-2.6	-2.7	-1.2	-1.4	-1.6
Regional banks	-2.9	-2.9	-2.8	-1.8	-1.8	-1.8
Shinkin banks	-1.9	-1.9	-2.0	-1.4	-1.4	-1.5

Upward shift by 2 percentage points

tril. yen

	Parallel shift scenario			Steepening scenario		
	End-June 2014	End-Sep. 2014	End-Dec. 2014	End-June 2014	End-Sep. 2014	End-Dec. 2014
Financial institutions	-14.0	-14.3	-14.4	-8.5	-8.8	-9.1
Banks	-10.4	-10.6	-10.6	-5.8	-6.1	-6.3
Major banks	-4.8	-5.1	-5.2	-2.4	-2.7	-3.0
Regional banks	-5.6	-5.5	-5.5	-3.4	-3.4	-3.4
Shinkin banks	-3.6	-3.7	-3.7	-2.6	-2.7	-2.8

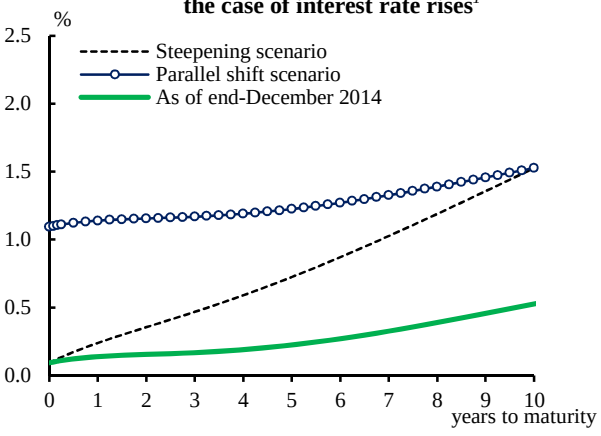
Upward shift by 3 percentage points

tril. yen

	Parallel shift scenario			Steepening scenario		
	End-June 2014	End-Sep. 2014	End-Dec. 2014	End-June 2014	End-Sep. 2014	End-Dec. 2014
Financial institutions	-20.2	-20.6	-20.7	-12.2	-12.7	-13.1
Banks	-15.1	-15.3	-15.3	-8.4	-8.8	-9.1
Major banks	-7.0	-7.3	-7.5	-3.5	-3.9	-4.2
Regional banks	-8.1	-7.9	-7.9	-5.0	-4.9	-4.9
Shinkin banks	-5.2	-5.3	-5.4	-3.8	-3.9	-4.0

Notes: *1*. Convexity and higher order terms are taken into account.
2. The data exclude foreign currency-denominated bondholdings.
Source: BOJ.

Chart IV-2-3: Assumptions for the yield curve in the case of interest rate rises[1]

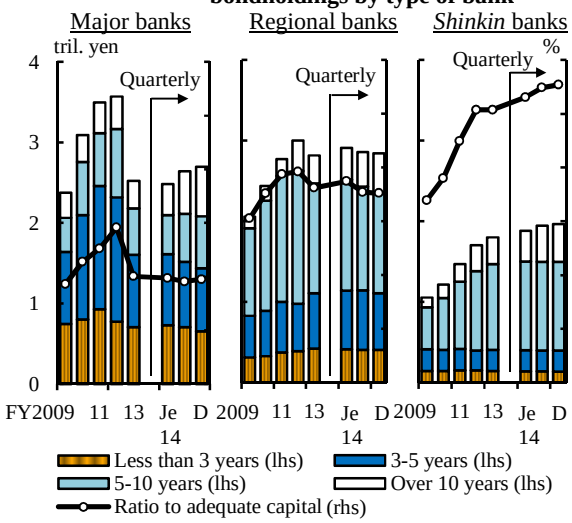


Note: *1*. A parallel shift scenario represents a situation in which yields on all maturities shift upward from the baseline by 1 percentage point. A steepening scenario represents a situation in which the 10-year interest rate shifts upward from the baseline by 1 percentage point.
Sources: Bloomberg;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

Although the amount of risk has recently been at a level approximately 10 percent below the latest peak of 8.3 trillion yen reached at the end of March 2013, it is still

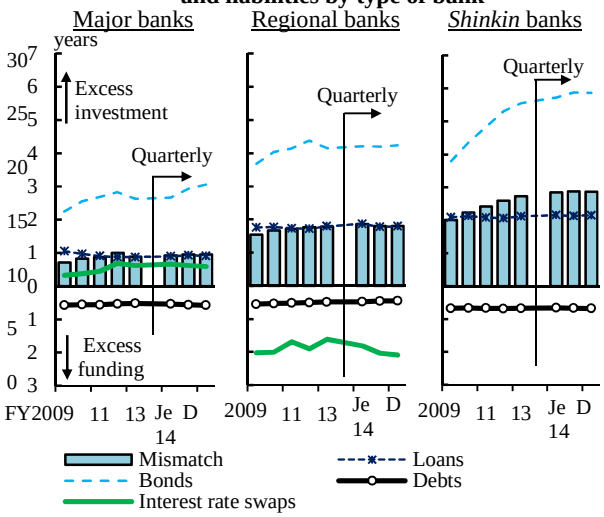
relatively high from a long-term perspective. Under these circumstances, financial institutions are once again enhancing their risk-taking stance with regard to yen interest rates -- albeit gradually -- with a view to securing their fixed-income revenues.

Chart IV-2-4: Interest rate risk associated with bondholdings by type of bank[1,2,3]



Notes: *1*. Interest rate risk: 100 basis point value in the banking book.
2. Convexity and higher order terms are taken into account.
3. Interest rate risk excludes risk associated with foreign currency-denominated bondholdings.
Source: BOJ.

Chart IV-2-5: Average remaining maturity of assets and liabilities by type of bank[1,2]



Notes: *1*. 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, bonds, and interest rate swaps with interest receipts. The average remaining maturity of liabilities is the weighted average of debts and interest rate swaps with interest payments. The average remaining maturity of interest rate swaps is the difference between interest rate swaps with interest receipts and those with interest payments.
2. The data exclude foreign currency-denominated assets and liabilities.
Source: BOJ.

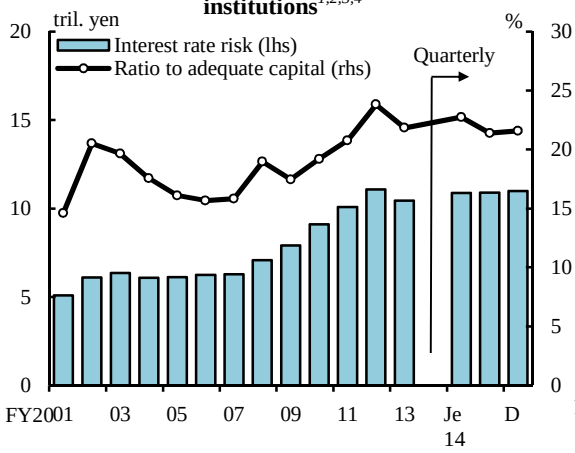
Amount of yen interest rate risk on balance sheets as a whole

The amount of yen interest rate risk on financial institutions' balance sheets as a whole, including bond investments as well as loans and deposits, has increased somewhat since the previous *Report* (Charts IV-2-6 and IV-2-7).[15] This is mainly attributable to the

[15] The 100 basis point value estimates losses in economic 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. When the average remaining maturity of assets is longer than that of liabilities, a widening of maturity mismatch (the difference between the average remaining maturities of assets and liabilities) leads to a greater amount of interest rate risk. Nevertheless, the 100 basis point value is calculated only for the interest rate risk associated with yen-denominated assets (loans and bonds), yen-denominated liabilities, and yen interest rate swaps (only banks are counted). It does not reflect the risk associated with foreign currency-denominated assets and liabilities and off-balance-sheet transactions other than yen interest rate swaps. Yen interest rate swaps are covered only for banks. We set the remaining maturity of demand deposits within 3 months in calculating the 100 basis point

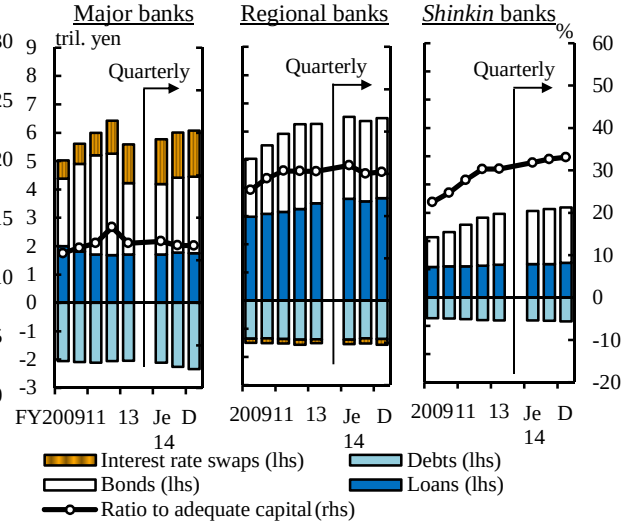
aforementioned increase in the amount of interest rate risk on bondholdings.

Chart IV-2-6: Interest rate risk among financial institutions[1,2,3,4]



Notes: *1*. Banks and *shinkin* banks are counted.
2. Interest rate risk: 100 basis point value in the banking book. For banks, off-balance-sheet transactions (interest rate swaps) are included.
3. Convexity and higher order terms are taken into account.
4. Interest rate risk excludes risk associated with foreign currency-denominated assets and liabilities.
Source: BOJ.

Chart IV-2-7: Interest rate risk by type of bank[1,2,3]



Notes: *1*. Interest rate risk: 100 basis point value in the banking book. For banks, off-balance-sheet transactions (interest rate swaps) are included.
2. Convexity and higher order terms are taken into account.
3. Interest rate risk excludes risk associated with foreign currency-denominated assets and liabilities.
Source: BOJ.

Foreign currency interest rate risk

The amount of interest rate risk associated with foreign currency-denominated bond investment has clearly increased since the previous *Report*. At 1.8 trillion yen, the amount of the abovementioned interest rate risk at the end of September 2014 was almost 20 percent above the 1.5 trillion yen recorded at the end of March 2014 (Charts IV-2-8 and IV-2-9). As seen in Chapter III, duration has been prolonged, mainly due to the increased accumulation of euro-denominated bonds with long maturities. This has boosted the amount of interest rate risk on foreign currency-denominated bonds at major banks to a level somewhat comparable to that for JGBs, making it necessary to pay close attention to such developments alongside those in yen interest rates. The amount of interest rate risk on foreign currency-denominated bonds at regional financial institutions has been on an increasing trend, although to a much smaller extent compared with yen interest rate risk on bondholdings.

As for overseas loans, the amount of associated interest rate risk is considered to be

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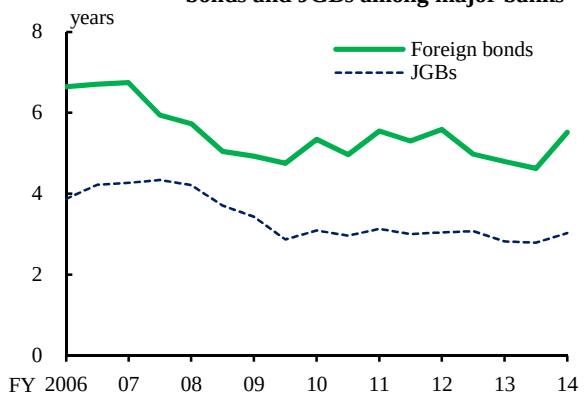
value of liabilities and do not take into account core deposits. The effects of core deposits on the amount of interest rate risk will be discussed later in this *Report*.

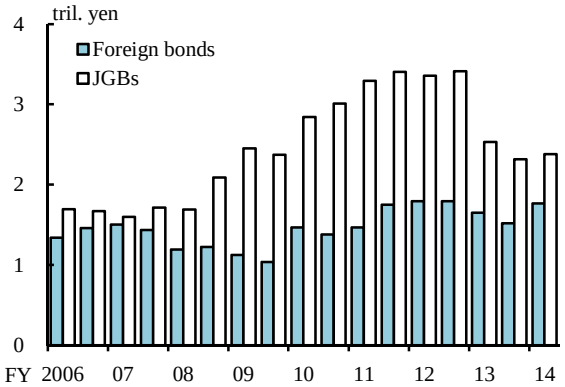
relatively small, as these loans are mostly extended at floating interest rates, although long-term loans are not minimal either (Charts IV-2-10 and IV-2-11).

Chart IV-2-8: Average remaining maturity of foreign bonds and JGBs among major banks[1,2]



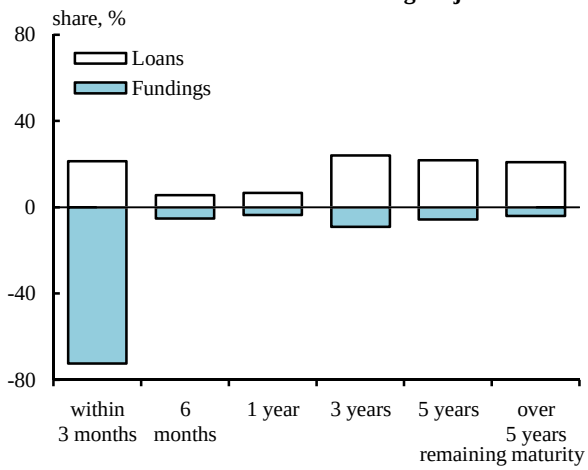
Notes: *1*. The latest data are as of end-September 2014.
2. Maturity basis.
Sources: Published accounts of each group.

Chart IV-2-9: Interest rate risk on foreign bonds and JGBs among major banks[1,2,3]



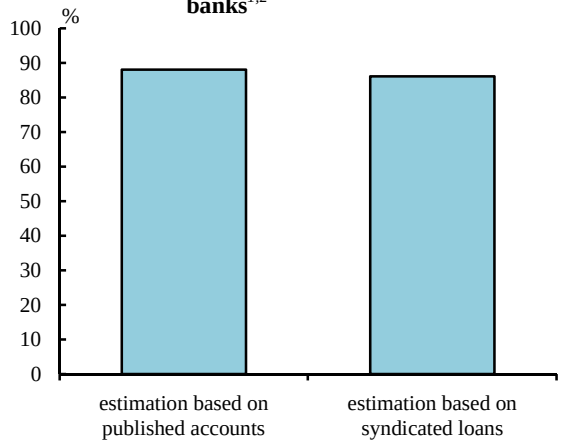
Notes: *1*. The latest data are as of end-September 2014.
2. Interest rate risk: 100 basis point value. Maturity basis.
3. For JGBs, convexity and higher order terms are taken into account. For foreign bonds, only duration is taken into account.
Sources: Published accounts of each group.

Chart IV-2-10: Structure of remaining maturity of overseas loans among major banks[1,2]



Notes: *1*. The data are as of end-December 2014.
2. Maturity basis.
Source: BOJ.

Chart IV-2-11: Floating rate loans as a share of total overseas loans among major banks[1,2]



Notes: *1*. The three major banks are counted in the estimation based on published accounts. Syndicated loans for which the managers are major banks are counted in the estimation based on syndicated loans.
2. The estimation based on published accounts is as of end-September 2014. The estimation based on syndicated loans is as of fiscal 2013.
Sources: Thomson Reuters Markets; published accounts of each bank; BOJ.

Diversification of risk taking in securities investment

As seen in Chapter III, financial institutions have been diversifying their form of risk

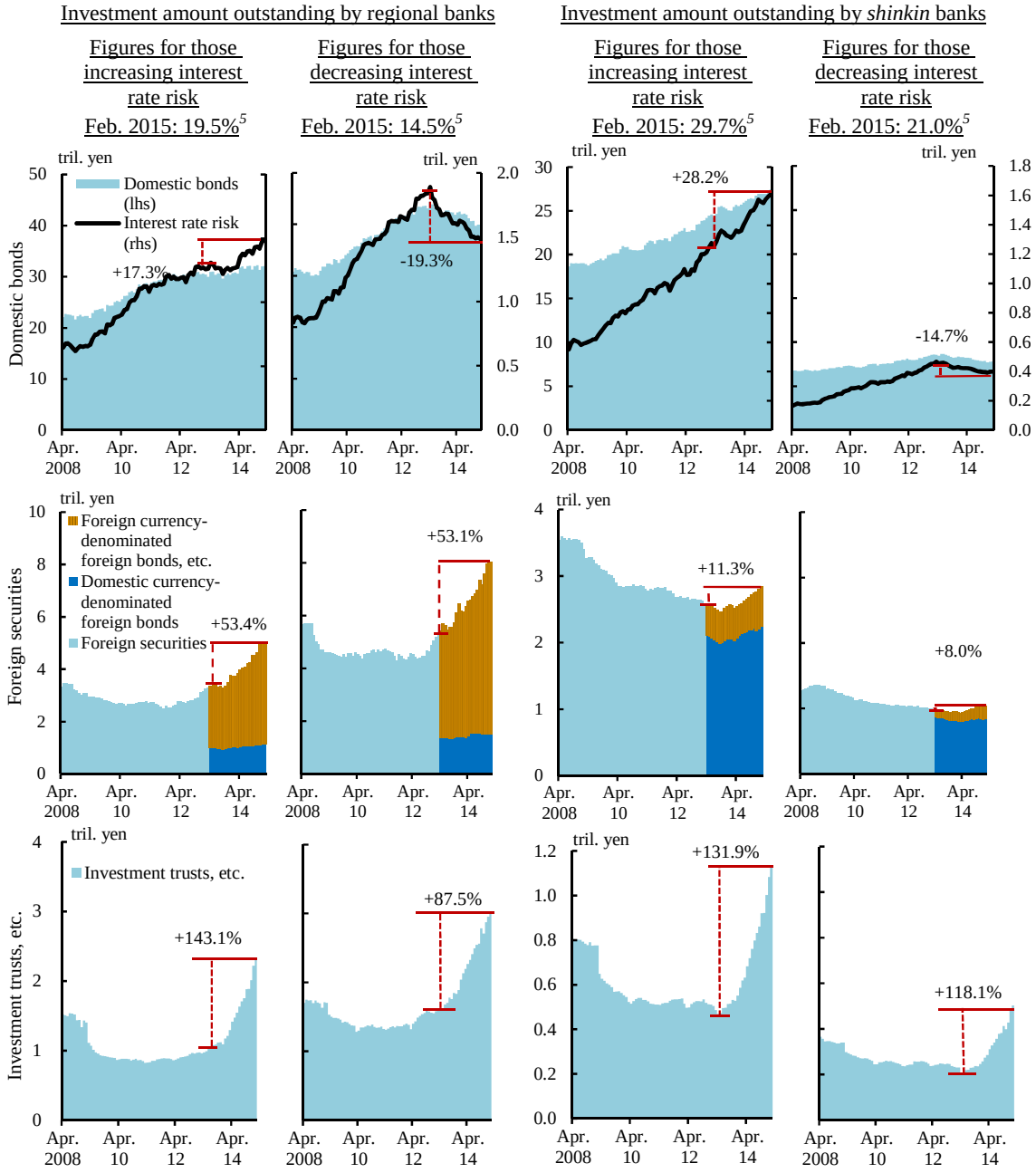
taking in terms of asset investment, such as in foreign bonds and investment trusts, while maintaining a high level of yen interest rate risk. With regard to regional financial institutions, looking at developments in investment in other securities -- by those with an increase in the amount of yen interest rate risk and those with a decrease -- these financial institutions generally seem to be proceeding with diversification in terms of their risk taking (see Box 4 for details).

Box 4: Heterogeneity in regional financial institutions' risk-taking stances toward securities investment

At the macro level, regional financial institutions' outstanding investment in yen-denominated bonds and the amount of yen-currency interest rate risk they bear have remained more or less unchanged since the introduction of QQE. However, individually, while some regional banks have continued to increase the amount of risk they bear, others have reduced the amount of risk.

When regional banks and *shinkin* banks are divided into groups depending upon their stance toward yen-denominated bond investments, and trends in their investment behavior including that in other securities (such as foreign securities and investment trusts) are examined, the following characteristics stand out (Chart B4-1). First, banks increasing their yen-currency interest rate risk and those reducing such risk have both increased their investment in foreign securities and investment trusts. As examined in Chapter III, investment trust portfolios include a diverse range of risky instruments. As such, recent trends suggest that regional banks are, on the whole, taking increasingly diverse risks. Second, *shinkin* banks' investments in foreign securities are predominantly in yen-denominated foreign bonds and are therefore de facto investments in domestic credit instruments (*shinkin* banks' investments in domestic bonds are also predominantly in local government bonds and corporate bonds). *Shinkin* banks appear to be taking foreign-currency interest rate risks through foreign-currency denominated ladder funds and other instruments in the "investment trusts and others" portfolios they hold.

Chart B4-1: Developments in securities investment by regional financial institutions[1,2,3,4]



Notes: *1*. The latest date are as of end-February 2015.
2. Interest rate risk: 100 basis point value in domestic bonds.
3. Adequate capital for internationally active banks is CET I. Adequate capital for domestic banks is core capital.
4. Increasing (decreasing) interest rate risk represents banks and *shinkin* banks whose interest rate risk as of end-February 2015 is more (less) than those as of end-March 2013.
5. The figures are the ratio of interest rate risk to adequate capital.
Source: BOJ.

Tasks and challenges regarding interest rate risk management

First, financial institutions need to take and manage risks appropriately under clear asset-liability management (ALM) strategy that takes into account assessments of their interest rate risk. Overall interest rate risk among financial

institutions is still at a relatively high level when viewed from a long-term perspective. There is considerable heterogeneity in risk taking among individual financial institutions, with some cases in which the amount of risk is actually relatively large compared with in the past as can be inferred from an aggregate viewpoint (see Box 4). As described in Chapters II and V, volatility in global financial markets has risen across a wide range of instruments, and some of the effects have been spreading to Japanese markets.

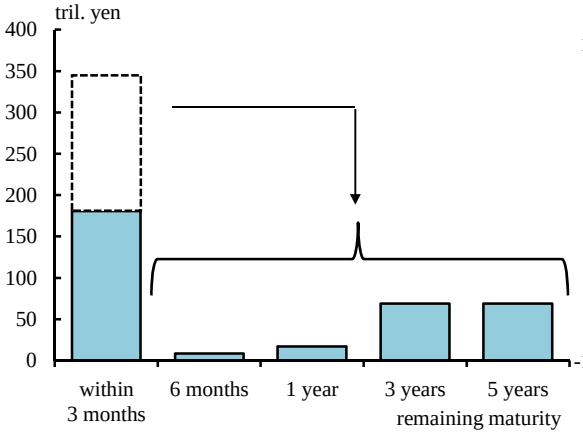
Financial institutions should appropriately assess their own interest rate risk profiles. In doing so, multidimensional analysis is necessary, such that it takes into account risks of periodic changes in fixed-income revenues, in addition to market-based risk assessments such as 100bpv and value-at-risk (VaR). An orderly response to changes in market conditions becomes possible once the impact on profitability and capital strength as well as management actions under various scenarios are assessed through simulations and stress testing. As mentioned above, financial institutions have been diversifying their form of risk taking in areas other than interest rates. Given this, the dynamic analysis mentioned above will be useful in obtaining a comprehensive understanding of the relevant risks. It would also be useful to examine the ALM over a longer horizon from a broad perspective, e.g., the outstanding amounts of loans and deposits, their composition and interest rates, and the absorption of funds by financial products other than deposits.

Second, financial institutions should formulate coherent policies on how to recognize their "core deposits" in interest rate risk management. The analysis presented in this *Report* assumes the remaining period until maturity of all liquid deposits to be 3 months or less. However, because the pass-through rate for liquid deposit interest rates (the extent to which liquid deposit interest rates rise in response to a rise in market interest rates) is actually low, it has the effect of mitigating the risk associated with interest rate rises, as is the case with long-term funding.[16] Of liquid deposits, the portion regarded as *de facto* long-term funding constitutes core deposits when calculating the amount of interest rate risk. There are variations among financial institutions in terms of what they regard as core deposits. When the interest rate rise is very moderate, much of the liquid deposits will stay put. When the rise is substantial, however, funds will be shifted to time deposits or other financial products, having the effect of inducing a rise in pass-through rates for overall deposits. As Japan has

[16] See also the October 2013 issue of the *Report*.

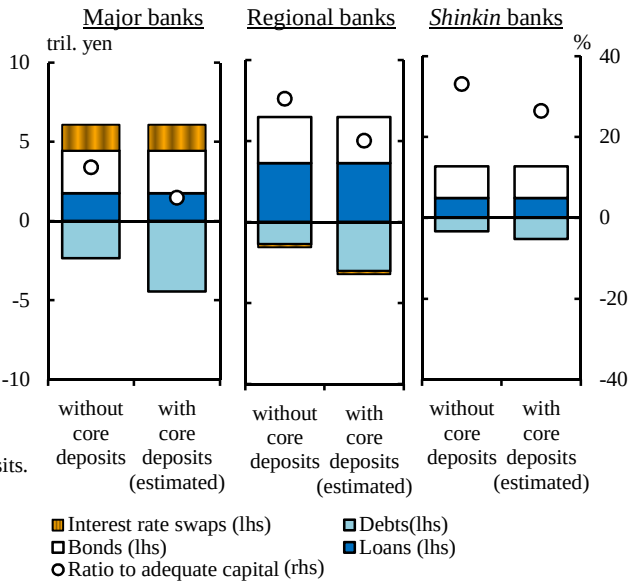
experienced only a limited number of interest rate rises since the full liberalization of liquid deposit interest rates in October 1994, a standard and plausible methodology for the core deposit model has not necessarily been established. Therefore, it is important for financial institutions to continue examining the plausibility of their treatment of core deposits (e.g., the appropriateness of internal models and parameters), taking into account changes in the financial and economic environment (Charts IV-2-12 and IV-2-13).

Chart IV-2-12: An example of core deposits among banks[1]



Note: *1*. An example of remaining maturity of demand deposits.
Source: BOJ.

Chart IV-2-13: Interest rate risk with core deposits taken into account[1,2,3,4,5]



Notes: *1*. The data are as of end-December 2014.
2. Interest rate risk: 100 basis point value in the banking book. For banks, off-balance-sheet transactions (interest rate swaps) are included.
3. Convexity and higher order terms are taken into account.
4. Interest rate risk excludes risk associated with foreign currency-denominated assets and liabilities.
5. Core deposits are estimated by setting the remaining maturity of 50 percent of demand deposits as 2.5-year.
Source: BOJ.

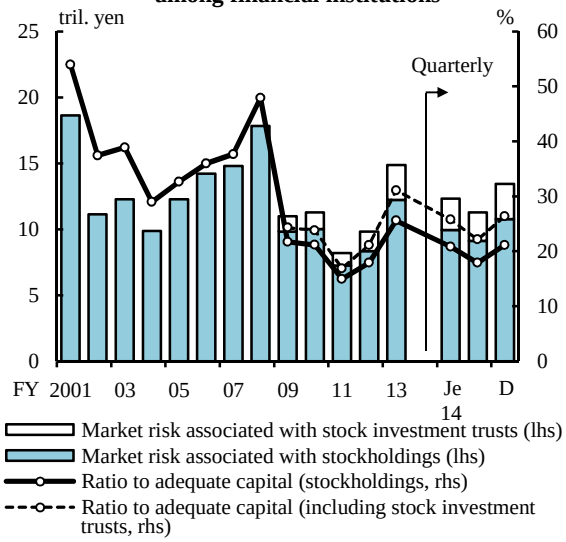
C. Market risk associated with stockholdings

The amount of market risk associated with stockholdings at financial institutions has increased somewhat since the previous *Report*. Compared with the 12.3 trillion yen recorded as of the end of June 2014, the amount had increased by 9.1 percent to 13.4 trillion yen at the end of December 2014 (Charts IV-3-1 and IV-3-2).[17] This

[17] The market risk associated with stockholdings presented here is estimated using a VaR with a 99

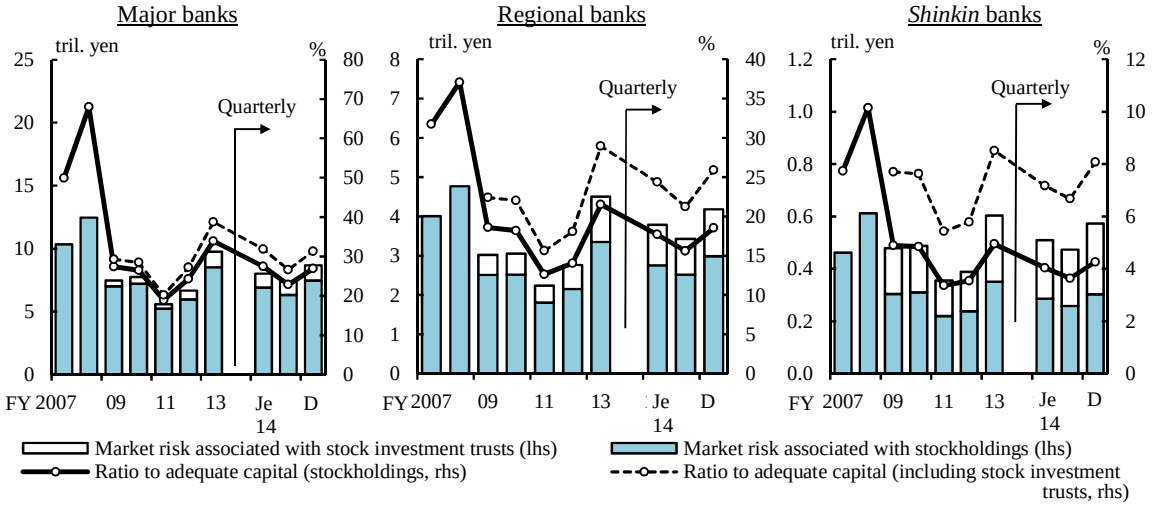
increase is basically due to the rise in the market value of total stocks held by these institutions. This is also a reflection of the fact that financial institutions have increased their pure investment through stock investment trusts (Chart III-1-27).

Chart IV-3-1: Market risk associated with stockholdings among financial institutions[1,2,3]



Notes: *1*. Banks and *shinkin* banks are counted.
2. Market risk associated with stockholdings and stock investment trusts: value-at-risk with a 99 percent confidence level and a 1-year holding period.
3. Market risk associated with stockholdings and stock investment trusts excludes risk associated with foreign currency-denominated stockholdings and stock investment trusts. Pre-fiscal 2008 data for stock investment trusts are excluded from the figures.
Source: BOJ.

Chart IV-3-2: Market risk associated with stockholdings by type of bank[1,2]



Notes: *1*. Market risk associated with stockholdings and stock investment trusts: value-at-risk with a 99 percent confidence level and a 1-year holding period.
2. Market risk associated with stockholdings and stock investment trusts excludes risk associated with foreign currency-denominated stockholdings and stock investment trusts. Pre-fiscal 2008 data for stock investment trusts are excluded from the figures.
Source: BOJ.

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percent confidence level and 1-year holding period. It includes the risk associated with stock investment trusts.

Tasks and challenges regarding management of market risk associated with stockholdings

Banks are required to appropriately assess the purpose of strategic stockholdings and thereby continue their efforts to reduce the related risk.[18] The amount of market risk associated with stockholdings has substantially decreased compared with past levels. Its volatility is still high, however, and market risk could therefore have considerable effects on banks' capital strength or profitability. A large proportion of market risk associated with stockholdings is those of strategic stockholdings by banks, which are different from pure stock investment in the sense that the former are difficult to be sold flexibly. The Corporate Governance Code, recently put together by the Tokyo Stock Exchange, requires companies holding listed shares as strategic holdings to examine their medium- to long-term economic rationality and outlook based on factors including expected return and risk, and to provide a reasoned explanation regarding the aim of such strategic stockholdings and their rationale.

D. Funding liquidity risk

In this section, we analyze funding liquidity risk in yen and then foreign currencies from two perspectives: (1) the stability of the structure of investment and funding; and (2) resilience against short-term stress.[19] Starting with this *Report*, monthly data rather than semi-annual data are used to allow for more timely assessments. This change has led to some revisions in data definitions and coverage. The focus of the analysis is on major banks.

Financial institutions have sufficient funding liquidity in yen funds.

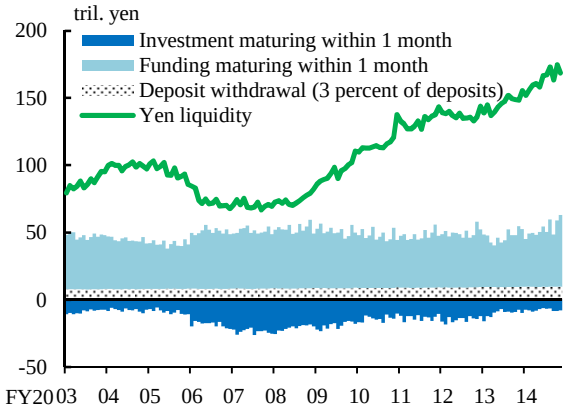
With respect to the structure of investment and funding of the yen, stability is quite high, mainly because the majority of funding is sourced from stable retail deposits, the

[18] Some banks have hedged price volatility risks of strategic stockholdings by using derivatives.
[19] The turbulence in global financial markets in and after the summer of 2007 as well as the subsequent financial crisis have left an important lesson that the tightening of liquidity conditions could well shake the foundation for financial institutions' business conditions. The central banks of advanced countries took extraordinary measures to jointly counter the increase in foreign currency liquidity risk when faced with a significant impairment of the functioning of foreign exchange swap markets. Based on these lessons, the Basel III includes new regulations to enhance liquidity risk management by financial institutions in terms of both (1) the stability of the structure of the investment-funding balance (the net stable funding ratio, NSFR) and (2) resilience against a short-term stress situation (the liquidity coverage ratio, LCR). Of these, the LCR has been applied to internationally active banks starting end-March 2015.

outstanding amount of deposits is far larger than total loans outstanding, and a large part of the loan-to-deposit difference is invested in highly liquid securities such as JGBs or current account deposits at the Bank of Japan.

As for the resilience of yen-based funding against short-term stress, it is assessed that financial institutions hold liquid assets worth far more than the expected fund outflows under stress situations, and that they have a sufficiently high level of resilience (Chart IV-4-1).[20]

Chart IV-4-1: Resilience to yen liquidity among major banks[1,2,3]



Notes: *1*. Major banks are counted. The latest data are as of end-February 2015.
2. It is assumed that 3 percent of deposits are withdrawn.
3. Yen liquidity = cash and deposits + JGBs.
Source: BOJ.

As for foreign currency-based funding, they have funding structures with a large proportion of market funding, but hold a liquidity buffer that can cover funding shortages even if market funding becomes difficult for a certain period.

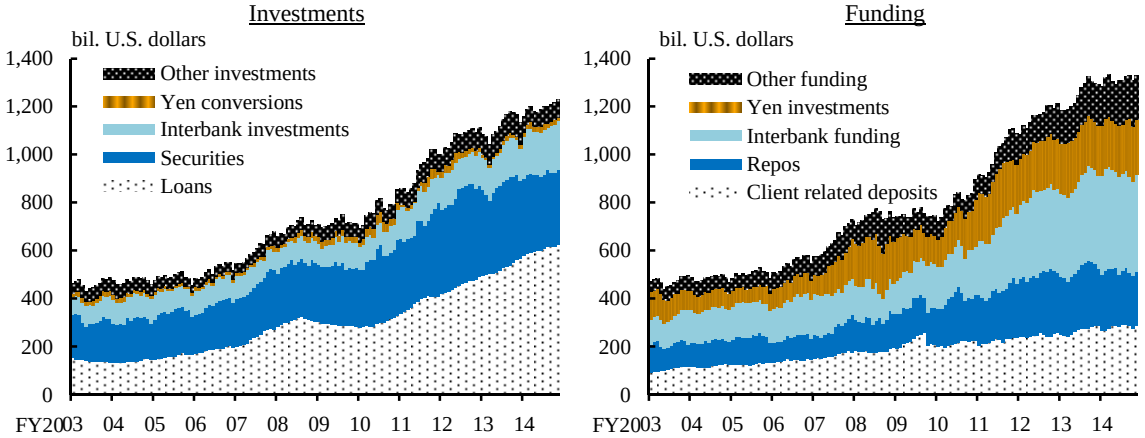
With respect to the structure of investment and funding of foreign currencies, a large proportion of foreign currencies is invested in loans with relatively long maturities and in foreign bonds, and a large share of funding is raised by short-term market funding, such as repos, foreign exchange swaps, and interbank borrowings (Chart IV-4-2).

However, the majority of securities are highly liquid assets, such as U.S. government bonds, which can be liquidated through repo borrowings or sales even in the event of market stress. Consequently, in assessing the stability of the investment and funding structure of foreign currencies, it is useful to monitor the gap between the amount (the "stability gap") of illiquid loans and stable funding through, for example, customer deposits, medium- to long-term foreign exchange swaps, and corporate bonds (Chart

[20] In accordance with the concept of the LCR, here we assume an outflow of market funding with a maturity of 1 month or less and amounting to 3 percent of total deposits. In calculating the LCR, more complex stress situations than the one used here are assumed, such as the withdrawal of the lines of credit committed to customers, downgrading of credit, and outflow of collateral for margin calls. Thus, it should be noted that the assumption does not match the definition used here.

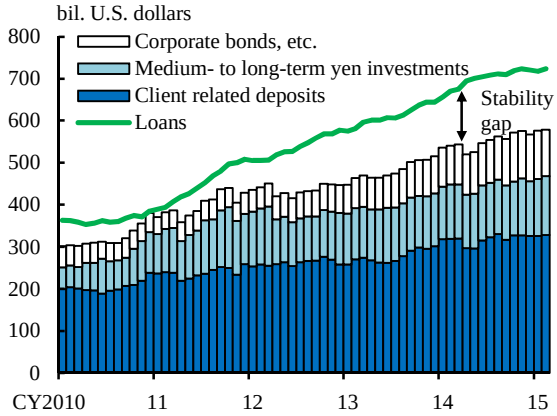
IV-4-3). Since 2011, the stability gap had continued to widen, but there has been no further widening since mid-2014. This is likely to be attributable to continued efforts on the part of financial institutions to enhance their stable funding sources through increasing customer deposits, medium- to long-term foreign currency swap funding, and corporate bond issuance.

Chart IV-4-2: Structure of foreign currency funding and investment among major banks[1]



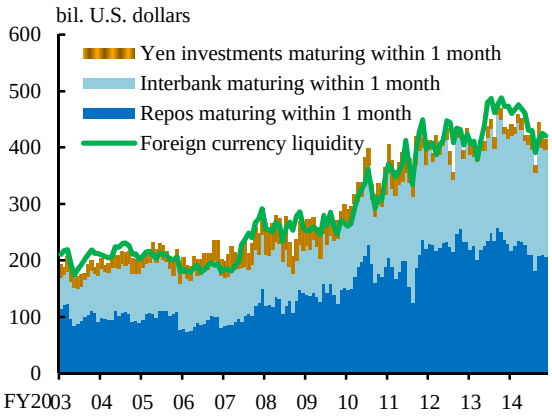
Note: *1*. Major bases of major banks are counted. Total investments and total funding are not equal due to data availability. The latest data are as of end-February 2015.
Source: BOJ.

Chart IV-4-3: Stability gap among major banks[1,2]



Notes: *1*. Internationally active banks (major banks) are counted. Major bases are counted. The latest data are as of end-February 2015.
2. "Corporate bonds, etc." and "Medium- to long-term yen investments" indicate funding maturing in over 3-months until March 2012 and funding maturing in over 1-year from April 2012.
Source: BOJ.

Chart IV-4-4: Resilience to foreign currency liquidity among major banks[1,2]



Notes: *1*. Major bases of major banks are counted. The latest data are as of end-February 2015.
2. Foreign currency liquidity = cash and deposits + unencumbered U.S. treasuries + repos maturing within 1 month.
Source: BOJ.

Given the above, as for the resilience of foreign currency-based funding against short-term stress, financial institutions hold liquid assets to cover the outflow of funds expected under the stress in which market funding comes to a halt for about 1 month

(Chart IV-4-4).[21] In addition, because the Bank of Japan currently conducts weekly dollar funds-supplying operations, foreign currencies can be obtained by using JGBs as collateral, and such a measure is considered to work as a backstop under stress situations.[22]

Tasks and challenges regarding funding liquidity risk management

Given the large weight of market funding and the likelihood of a continued expansion in assets, the following two tasks and challenges should be noted in terms of management of foreign currency liquidity risk.

First, financial institutions need to continue with efforts to secure stable foreign currency funding bases and strengthen their ability to respond to potential market stresses.

At present, no significant changes are observed in liquidity conditions in markets such as the foreign exchange and currency swaps markets, and Japanese financial institutions' financial conditions are favorable on the whole. Nevertheless, in response to the successive implementation of various international financial regulations -- such as leverage regulations, derivatives regulations, and the Volcker Rule in the United States -- major U.S. and European banks, which are key counterparties of Japanese banks, are reviewing and making substantial changes to their businesses, including the downsizing of their market divisions. Under these circumstances, the cost of dollar funding through the swap markets has recently been on a moderately rising trend (Chart IV-4-5). In addition, when credit ratings of JGBs and some major Japanese banks were downgraded in December 2014, lenders including some institutional investors took a wait-and-see stance with regard to transactions, reduced their trading amounts, or took similar actions, albeit temporarily (Chart IV-4-6). Particularly in the foreign exchange and currency swap markets, lenders of U.S. dollars have tended to be concentrated among a small number of large institutions. It is therefore necessary to be aware of the risks associated with the concentration of U.S. dollar lending among these large institutions.

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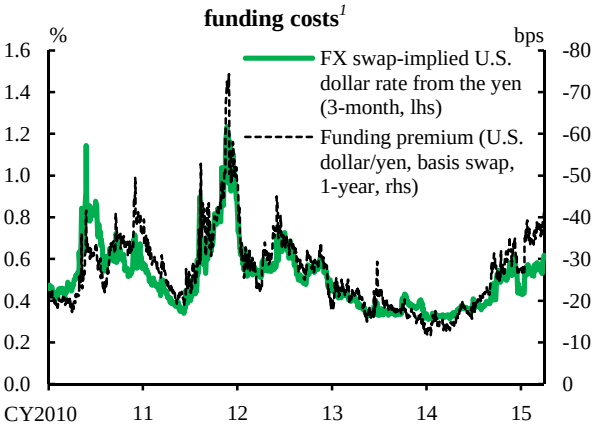
[21] We include repo borrowings with remaining maturities of 1 month or less as liquid assets, by assuming that the collateral being used is of high quality and that the total amount of funding with a maturity of 1 month or less can be rolled over using the same collateral. Compared with the previous *Report*, more conservative assessments of resilience against stresses have been made by expanding the coverage of funds expected to constitute an outflow of funds to overall interbank borrowing.

[22] U.S. dollar funds-supplying operations allow for the extension of U.S. dollar-denominated loans at a fixed interest rate and for an unlimited amount within the amount of eligible collateral provided.

Bearing these points in mind, financial institutions need to continuously assess liquidity conditions in foreign currency funding markets as well as their own funding ability in markets, and to engage in efforts to diversify their funding measures and counterparties and conduct stress testing in order to set policies on practical responses.

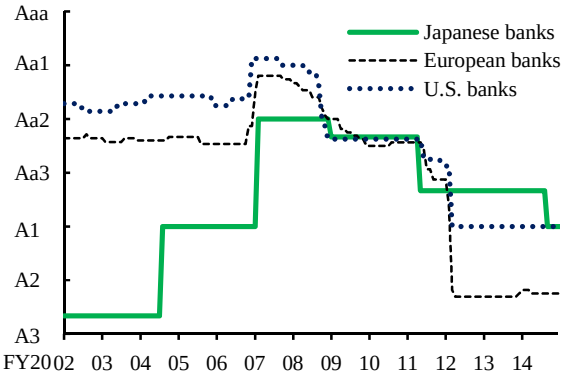
Second, liquidity risk management of local currencies other than the U.S. dollar, such as Asian or European currencies, is gaining importance. Although these markets are still smaller than the U.S. dollar market, some currencies, including the Australian dollar, exhibit relatively large stability gaps. Japanese banks are also making active efforts with respect to these local currencies in order to strengthen their transaction banking, obtain more customer deposits through promotional activities, and increase their number of counterparties for foreign exchange swaps. As they are aiming to continue expanding their operations in Asia, Japanese banks also need to strengthen their liquidity risk management for local currencies.

Chart IV-4-5: Short-to medium-term dollar funding costs[1]



Note: *1*. The latest data are as of March 31, 2015.
Source: Bloomberg.

Chart IV-4-6: Long-term debt ratings of large banks[1]



Note: *1*. G-SIBs are counted. The latest data are as of end-March 2015.
Source: Moody's.

V. Risks observed in financial markets

This chapter examines the risks observed in financial markets at home and abroad, mainly during the second half of fiscal 2014.

A. Global financial markets

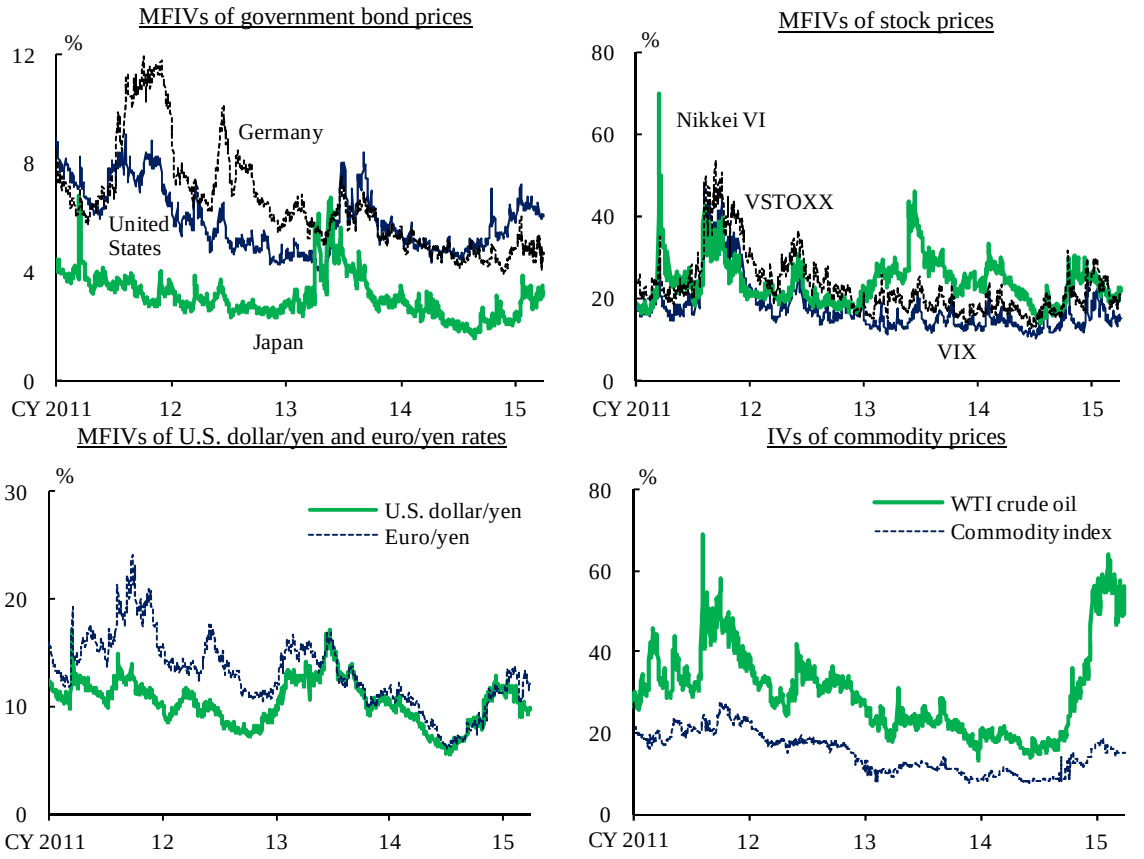
Looking at global financial markets, long-term bond yields declined and stock prices rose in advanced economies, mainly against the background of a substantial decline in crude oil prices seen until the beginning of 2015. In addition, a rise in volatility was seen in a wide range of financial markets (Chart V-1-1).[23] Meanwhile, credit spreads on high-yield bonds and some emerging market bonds widened (Chart V-1-2).

Regarding global fund flows, while capital continued to flow into equities and high-rated bonds in advanced economies, capital flowed more or less out of emerging market and high-yield bond funds -- which had previously shown a considerable amount of inflow in line with investors' search for yields -- toward the beginning of 2015 (Chart V-1-3). However, the extent of the associated rise in volatility and credit spreads generally remained small, and capital outflows have recently come to a halt.

As for the outlook, attention should continue to be paid to the risk that volatility in global financial markets will rise, reflecting factors such as market participants' views on the outlook for the global economy and on the monetary policy stance of major advanced countries, as well as geopolitical risks. In this connection, market participants are paying particular attention to the following three points.

[23] Model-free implied volatility (MFIV) is calculated by using price information from various futures options. Unlike standard implied volatility, MFIVs capture the recognition of tail risks. MFIVs of government bond prices and foreign exchange rates (U.S. dollar/yen and euro/yen rates) correspond to options market participants' expected change in government bond prices and foreign exchange rates for the next 3 months. 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 that correspond to options market participants' expected rate of change in stock prices for the next month.

Chart V-1-1: Volatility in global financial markets[1,2,3,4]



Notes: *1*. MFIVs of government bond prices are calculated by using the following data: options on JGB futures traded on the Tokyo Stock Exchange before March 24, 2014 and on the Osaka Exchange from March 24, 2014 for Japan; options on U.S. Treasury futures traded on the Chicago Board of Trade for the United States; and options on Euro-Bund futures traded on Eurex for Germany. The results correspond to changes in government bond prices for the next 3 months.

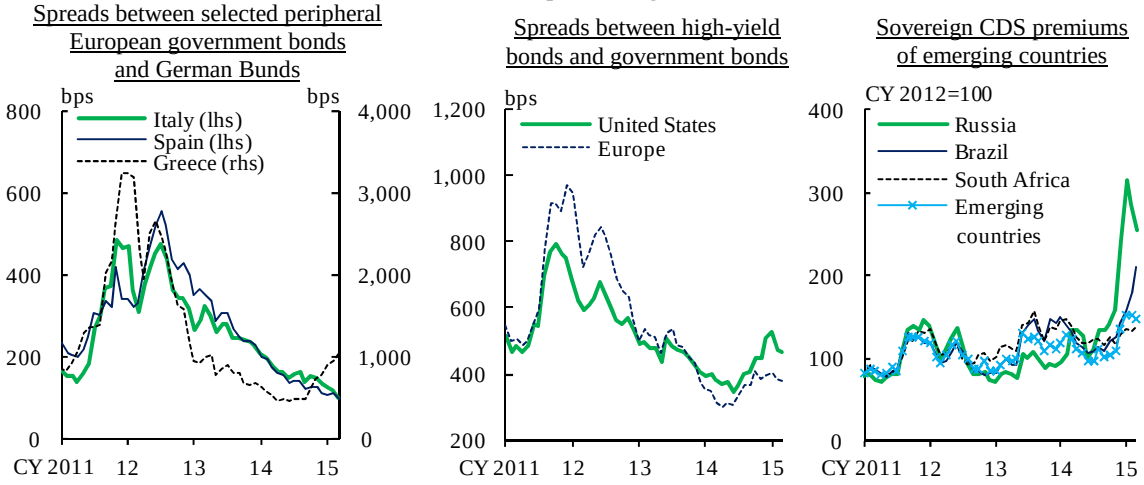
2. MFIVs of foreign exchange rates are calculated by using data on 3-month over-the-counter option prices.

3. IV of commodity index is volatility index calculated by Bank of America Merrill Lynch. IV of crude oil is calculated by using options on WTI crude oil futures.

4. The latest data are as of March 31, 2015.

Sources: Bloomberg; BOJ.

Chart V-1-2: Credit spreads in global financial markets[1,2]

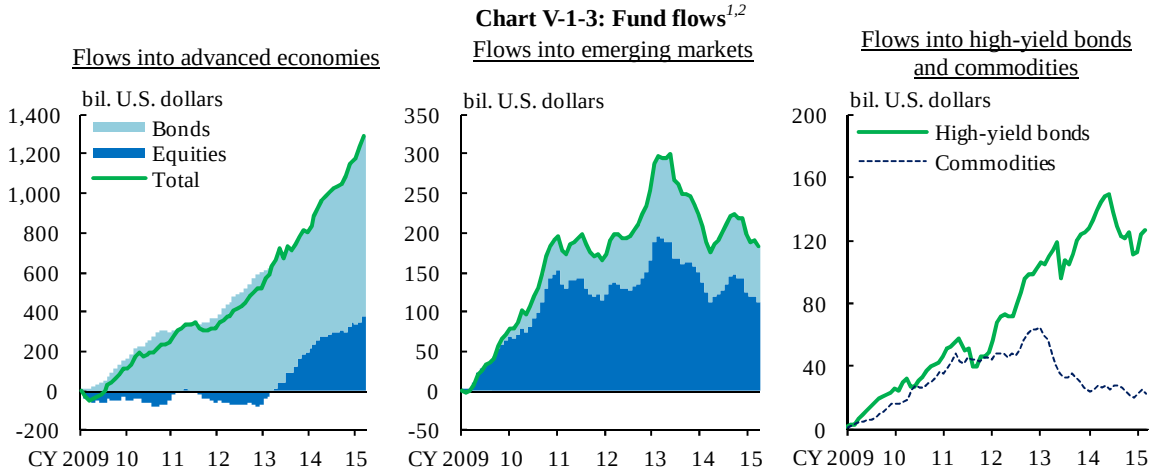


Notes: *1*. Spreads on high-yield bonds are calculated by Bank of America Merrill Lynch. In the right-hand chart, the Markit CDX emerging markets index is used for "emerging countries."

2. Monthly average. The latest data are as of March 2015.

Source: Bloomberg.

Chart V-1-3: Fund flows[1,2]

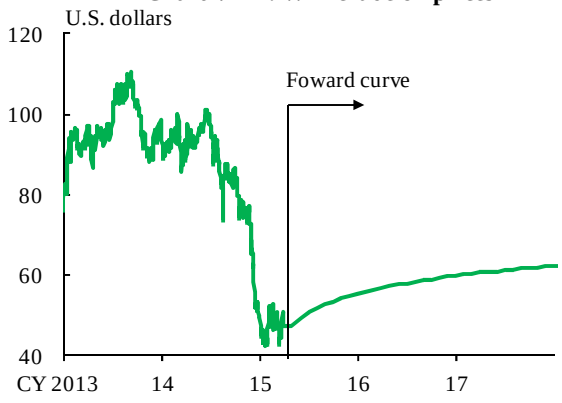


Notes: *1*. Cumulative changes from the beginning of CY 2009.
2. The latest data are as of March 25, 2015.
Source: EPFR Global.

Outlook for developments in crude oil prices and their effects

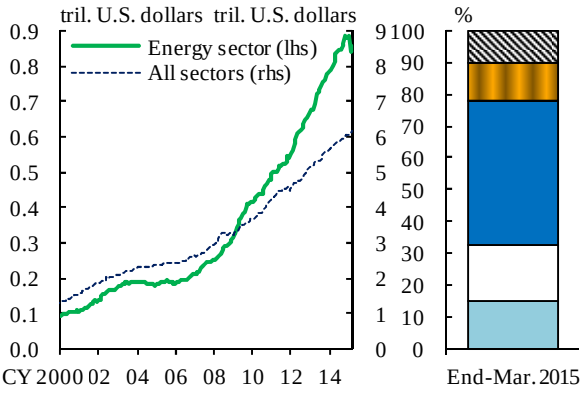
Crude oil prices declined substantially from the second half of 2014 toward the beginning of 2015, and have subsequently remained more or less unchanged. While oil futures prices are expected to rise moderately, the implied volatility of futures prices has been at a high level. The possibility of crude oil prices fluctuating significantly in either direction therefore continues to warrant careful attention (Charts V-1-1 and V-1-4).

Chart V-1-4: WTI crude oil prices[1]



Note: *1*. The data until March 31, 2015 are WTI crude oil spot prices, and those from April 1 are futures prices on March 31.
Source: Bloomberg.

Chart V-1-5: Outstanding amount of U.S. corporate bonds[1,2]



Notes: *1*. The left-hand chart shows the face values of corporate bonds indexes calculated by Bank of America Merrill Lynch. The latest data are as of end-March 2015.
2. The right-hand chart indicates the breakdown of the outstanding amount of U.S. energy sector corporate bonds by credit rating.
Source: Bloomberg.

Declines in crude oil prices to date as a whole are expected to boost the global economy by, for example, increasing the real income of oil-importing countries.[24] However, there is a possibility that a decline in crude oil prices will generate strong negative effects on oil-exporting countries and the commodity-related sector in the short term, which could in turn become an uncertainty factor in global financial markets. Specifically, negative effects may be exerted on countries where geopolitical risks are also being considered, such as on Russia and on some oil-producing countries in Africa. In the United States, because a significant amount of corporate bonds with low credit ratings were issued by shale oil companies, a decline in crude oil prices may lead to unfavorable developments including a heightening of such credit risks (Chart V-1-5). Moreover, in the event that market participants become strongly aware of demand factors -- such as the sluggish recovery in emerging economies -- as the key factors behind the decline in crude oil prices, their risk appetite may consequently be affected.

On the other hand, bearing in mind that the low level of crude oil prices is one of the main reasons for market participants' view -- that accommodative financial conditions are likely to continue worldwide -- market volatility could rise in accordance with a shift in market expectations if crude oil prices rise significantly. Taking these possibilities into account, developments in crude oil prices should continue to be observed carefully.

Outlook for U.S. monetary policy and its effects

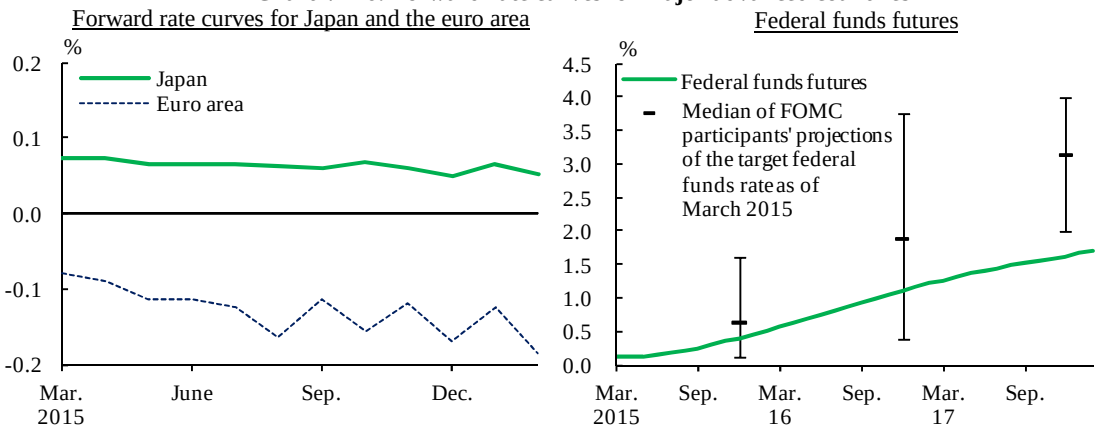
According to the forward rate curves for major advanced countries, short-term interest rates for Japan and the euro area are expected to remain at extremely low levels. On the other hand, a moderate rise in short-term interest rates is expected in the United States. It should be noted, however, that the pace of interest rate rise according to market expectations is moderate compared with that of the federal funds rate as projected by the Federal Open Market Committee (FOMC) (Chart V-1-6).

As such, while minimized compared to a while ago, there still seems to be a considerable amount of divergence in the outlook for U.S. monetary policy between the authorities and the market. However, the implied volatility of short-term interest rates has remained at relatively low levels, even when compared with the past (Chart V-1-7). In this situation, in the event that (1) market participants, without having sufficiently

[24] For example, the IMF points out that a decline in crude oil prices driven by changes in the supply side will boost global economic growth, and that the magnitude of the impact will depend on the extent and duration of such changes (IMF, *World Economic Outlook Update*, January 2015).

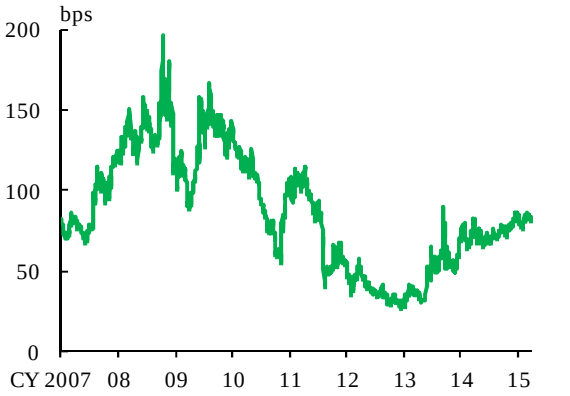
factored in the pace of rise in the federal funds rate, further raise their awareness of possible rate hikes, possibly through the authorities' communications; or by contrast, (2) the market view -- that the U.S. economic recovery is firm enough to be capable of sufficiently justifying future moderate rate hikes -- wavers, there is a risk that global financial markets will be affected through the following channels.

Chart V-1-6: Forward rate curves for major advanced countries[1,2]



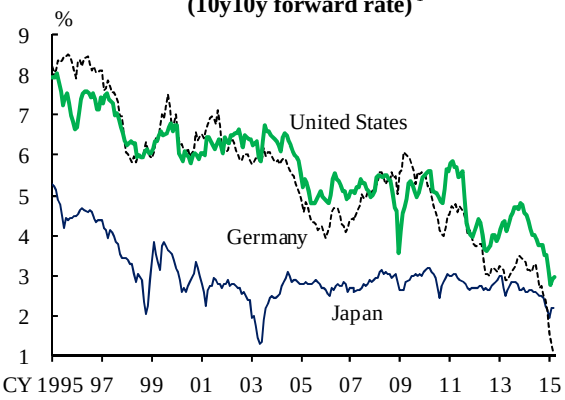
Notes: *1*. In the left-hand chart, the data are derived from 1-month OIS forward rates. In the right-hand chart, the vertical bars indicate the range of the uppermost and lowest projections.
2. The data are as of March 31, 2015.
Sources: Bloomberg; FRB.

Chart V-1-7: IV of U.S. short-term interest rates[1,2]



Notes: *1*. Implied volatility is calculated from the option on 2 year interest rate swaps expiring in 1 year.
2. The latest data are as of March 31, 2015.
Source: Bloomberg.

Chart V-1-8: Super-long-term government bond yields for major advanced countries (10y10y forward rate) [1]



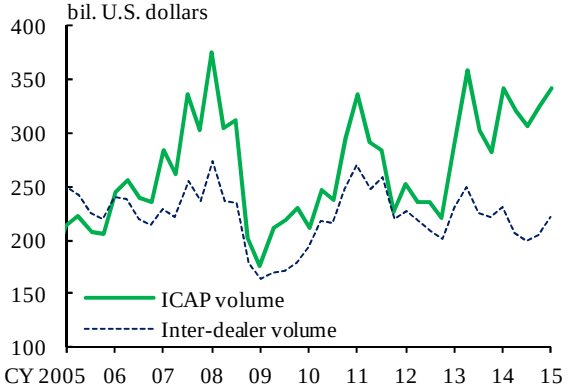
Note: *1*. The latest data are as of March 2015. 2. The figures for "United States" are calculated using the method of Gürkaynak et al. (2007).
Sources: Bloomberg; Gürkaynak, R. S., B. Sack, and J. Wright, "The U.S. Treasury Yield Curve: 1961 to the Present," Journal of Monetary Economics, 54, pp. 2291-2304, 2007; BOJ.

The first channel involves effects on long-term government bond yields for advanced countries, which are currently at extremely low levels. In many advanced countries, yields, including those of super-long-term bonds, have been declining somewhat significantly since spring 2014, mainly against the background of large-scale monetary

easing by major central banks and the aforementioned decline in crude oil prices (Chart V-1-8). If the market becomes strongly aware of the possibility of future rate hikes by the FRB, this may produce certain effects on such a situation in the bond market.

Some market participants have pointed to a structural change in the U.S. Treasury market. Specifically, trading volumes of traditional primary dealers have been decreasing, while those of algorithmic trading using electronic platforms have been increasing (Chart V-1-9). The effects that these structural changes in the market may have -- including those on market liquidity in a stress situation -- also warrant attention, considering it has been pointed out that such changes in the government bond market are already linked to developments including the rise in U.S. government bond price volatility.

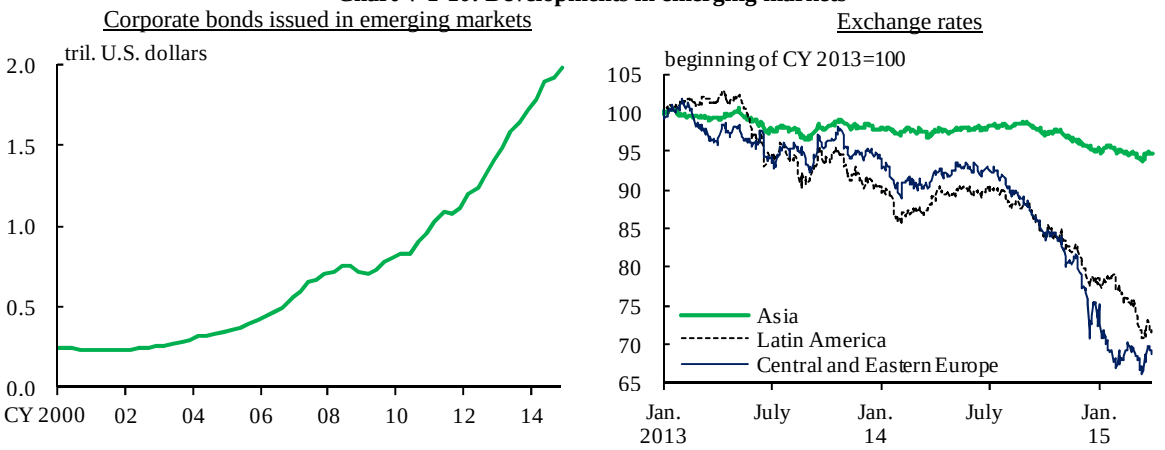
Chart V-1-9: U.S. Treasury transaction volume[1,2]



Notes: *1*. "ICAP volume" shows daily ICAP-brokered U.S. Treasury transaction volume, and "inter-dealer volume" shows daily U.S. Treasury transaction volume among primary dealers.
2. The latest data are as of the January-March quarter of 2015.
Sources: Bloomberg; New York Fed.

The second channel involves effects on emerging markets. In the market functioning recovery process since the global financial crisis in 2008, corporate bond issuance by firms in emerging economies has been increasing rapidly in the global financial markets (Chart V-1-10). It has also been pointed out that if the U.S. federal funds rate is raised, leading to an overall rise in U.S. market interest rates, there may be a reversal in the inflow of funds to emerging economy corporate bonds and other assets, which would consequently affect these emerging economies, particularly their currencies and long-term interest rates. In addition, if currencies of emerging economies largely devaluate, increase in the effective burden of foreign currency-denominated debts may exert downward pressure on emerging economies.

Chart V-1-10: Developments in emerging markets[1,2,3,4]



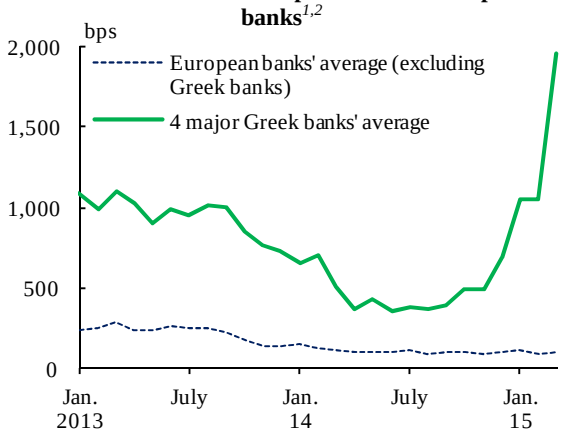
Notes: *1*. In the left-hand chart, the figures are outstanding amount of offshore corporate bond issuance in emerging markets (ultimate risk basis).
2. Exchange rates are indexed against the U.S. dollar.
3. The exchange rate for Central and Eastern Europe is calculated based on Central and Eastern European countries' exchange rates.
4. The latest data in the left-hand chart are as of end-December 2014, and those in the right-hand charts are as of March 31, 2015.
Sources: BIS, "Debt securities statistics"; Bloomberg.

The Greek debt problem and prospects for long-term interest rates in Europe

In Europe, in response to developments including the political situation in Greece, yields on Greek government bonds rose and credit default swap (CDS) premiums of Greek banks widened rapidly (Charts V-1-2 and V-1-11). To date, the spillover of the situation in Greece to other peripheral European countries has been limited. However, the outlook for developments in negotiations between Greece and other European countries remain strongly uncertain, and the outcome of the Greek problem therefore continues to warrant attention.

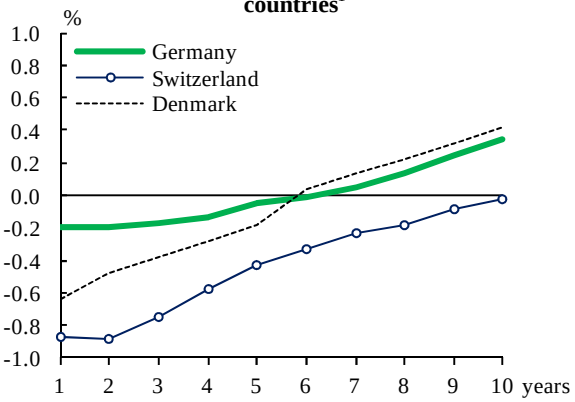
Yields on many government bonds issued by core European countries -- such as Germany -- and by some countries with high credit ratings -- such as Switzerland and Denmark -- have entered negative territory even for the longer-term maturity zones, mainly against the background of monetary easing conducted by the ECB and other central banks (Chart V-1-12). Moreover, yields on some highly rated corporate bonds in these countries have also turned negative. Under such circumstances, attention should be paid to the risk that the search for yields by investors will become increasingly notable, consequently affecting global markets.

Chart V-1-11: CDS premiums of European banks[1,2]



Notes: *1*. The figures calculated for "4 major Greek banks' average" are simple averages of 5-year CDS premiums for 4 major Greek banks (Alpha Bank, Eurobank Ergasias, National Bank of Greece, and Piraeus Bank). The sample for "European banks' average (excluding Greek banks)" includes the components of the STOXX 600 Banks index. Banks for which 5-year CDS premiums are not quoted are excluded.
2. The latest data are as of end-March 2015.
Source: Bloomberg.

Chart V-1-12: Yield curves for European countries[1]



Note: *1*. The average of January-March 2015.
Source: Bloomberg.

B. Japanese financial markets

Taking account of the foregoing discussion on developments in global financial markets, this section summarizes notable developments in the government bond, credit, stock, and foreign exchange markets in Japan, and examines the risks observed in these markets.

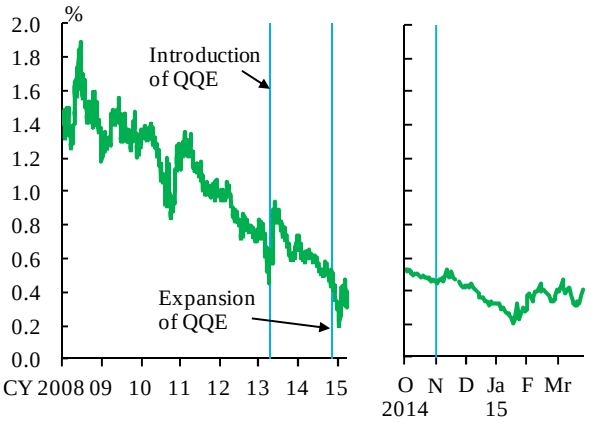
1. Government bond markets

After the expansion of QQE, long-term JGB yields declined toward the middle of January 2015 and subsequently rose toward the middle of February. They have since remained more or less unchanged. The volatility of government bond prices has been rising since the middle of January.

After the expansion of QQE on October 31, 2014, yields on 10-year JGBs temporarily declined to around 0.2 percent toward the middle of January 2015. However, they began to rise toward the middle of February, mainly against the background of the leveling out of crude oil prices and the rise in U.S. long-term yields. They have since been more or

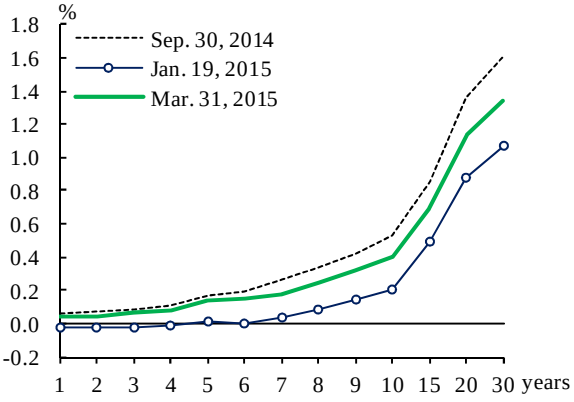
less unchanged, albeit with fluctuations (Chart V-2-1).[25] Yield curves fell significantly for a moment toward the middle of January, particularly for the super-long-term maturity zone, and have rebounded since (Chart V-2-2).

Chart V-2-1: Long-term JGB yields[1]



Note: *1*. The latest data are as of March 31, 2015.
Source: Bloomberg.

Chart V-2-2: Changes in the JGB yield curve



Source: Bloomberg.

Factors affecting long-term JGB yields

Regarding market participants' inflation expectations, survey-based long-term inflation expectations have recently been declining somewhat, due to the decline in short-term inflation expectations reflecting factors such as the decrease in crude oil prices (Chart V-2-3). On the other hand, the break-even inflation (BEI) rate -- calculated as the yield spread between fixed-rate coupon-bearing bonds and inflation-indexed bonds -- declined toward the middle of January in tandem with the global downtrend, and subsequently increased toward the end of March (Chart V-2-4).[26]

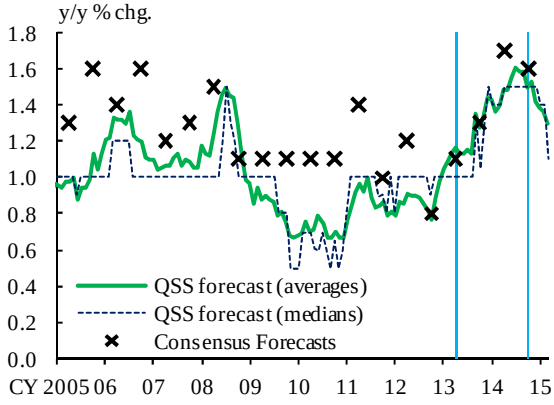
According to the results of the survey conducted on market participants regarding factors affecting JGB yields, market participants have become somewhat more aware of "short-term interest rates/monetary policy" and "demand and supply of bonds" as factors exerting downward pressure on JGB yields, while paying less attention to "price trends" and "economic trends" (Chart V-2-5). As for factors behind market participants' views that tight supply and demand conditions in the JGB market will continue, net purchases

[25] In this section, the vertical lines in the charts indicate the introduction of QQE (April 4, 2013) and the expansion of QQE (October 31, 2014).

[26] Yields on newly issued 10-year inflation-indexed JGBs from June to July 2014 are pushed up by about 0.2 percentage points (the BEI rate is pushed down by about 0.2 percentage points) due to the change in the indexation coefficient reflecting application of the CPI for April. Changes in the BEI rate should be interpreted with some latitude given that the market liquidity of inflation-indexed bonds is lower than that of fixed-rate coupon-bearing bonds.

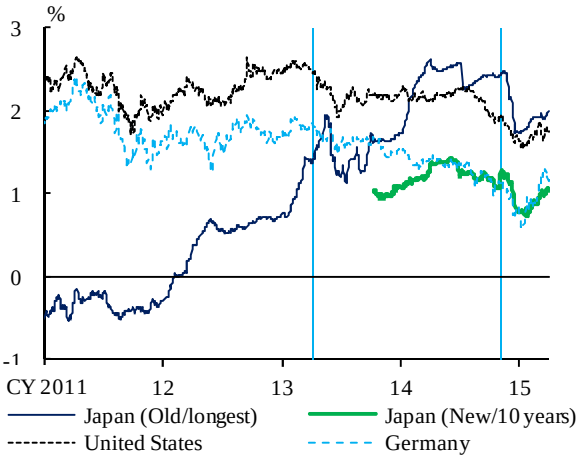
of JGBs by foreign investors reaching high levels, in addition to the Bank's massive purchases of JGBs, can be raised (Chart V-2-6).

Chart V-2-3: Market participants' expectations of long-term price changes[1,2]



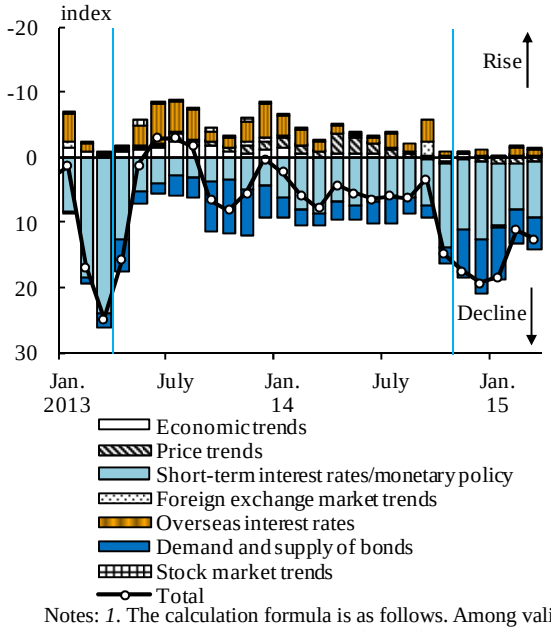
Notes: *1*. "QSS forecast" indicates the forecast for core CPI changes for the next 10 years. "Consensus Forecasts" indicates inflation expectations for 6 to 10 years ahead.
2. The latest data for "QSS forecast" are as of March 2015, and those for "Consensus Forecasts" are as of October 2014.
Sources: Consensus Economics Inc., "Consensus Forecasts"; QUICK, "QUICK Monthly Market Survey <Bonds>."

Chart V-2-4: BEI for inflation-indexed government bonds[1,2]



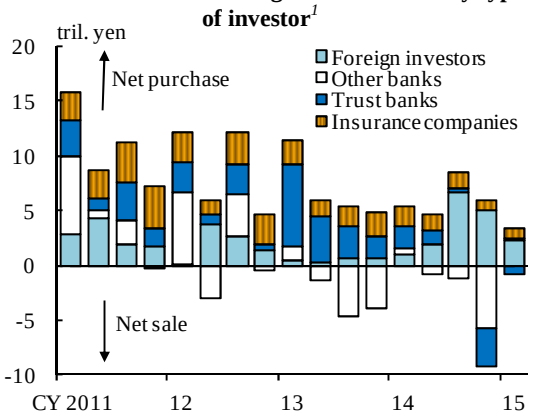
Notes: *1*. Figures for "Japan" are yield spreads between fixed-rate coupon-bearing JGBs and inflation-indexed JGBs. Inflation-indexed JGBs issued since October 2013 are designated as "new," while the rest are designated as "old." Figures for "Japan (old/longest)" are calculated using yield data for issue No. 16 of the inflation-indexed JGBs, which matures in June 2018.
2. The latest data are as of March 31, 2015.
Sources: Bloomberg; FRB.

Chart V-2-5: Factors affecting JGB yields[1,2]



Notes: *1*. The calculation formula is as follows. Among valid responses, the percentage of each factor chosen by market participants 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, then subtracting 50, which is "neutral").
2. The latest survey was conducted from March 24-26, 2015.
Sources: QUICK, "QUICK Monthly Market Survey <Bonds>"; BOJ.

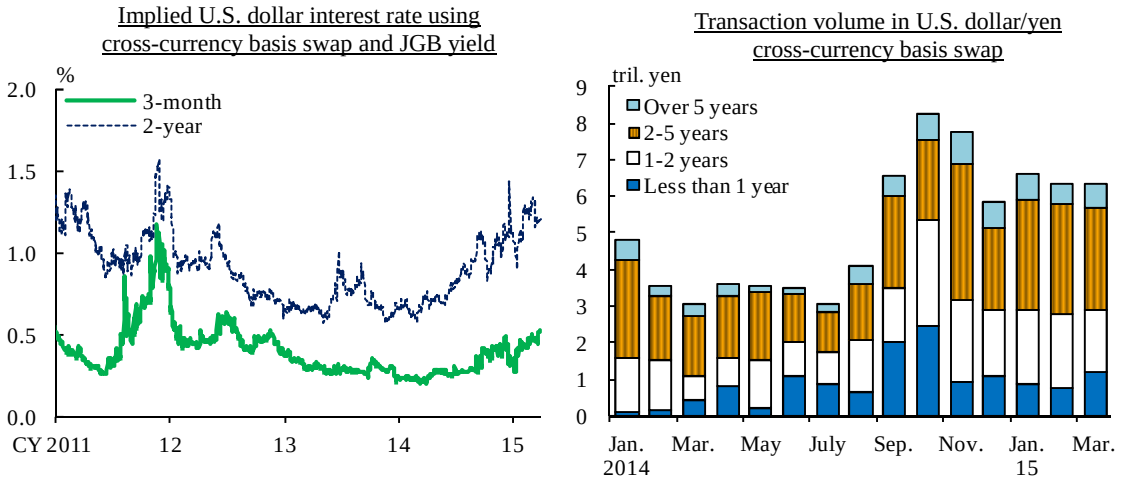
Chart V-2-6: Trading volume of JGB by type of investor[1]



Note: *1*. The latest data are as of January-February 2015 (converted into quarterly amount).
Source: Japan Securities Dealers Association.

Two factors underlying the aforementioned increase in foreign investors' investment in JGBs can be cited: (1) the declining trend in U.S. and European long-term government yields; and (2) the fact that JGB yields with currency-hedging -- in terms of the implied U.S. dollar -- had reached a profitable level for foreign investors, reflecting the widening of U.S. dollar funding premiums in the U.S. dollar/yen cross-currency basis swap market. The relatively large increase in U.S. dollar/yen cross-currency basis swap transaction volume also suggests the existence of such a flow of funds (Chart V-2-7).

Chart V-2-7: JGB investments with currency-hedging[1,2,3]



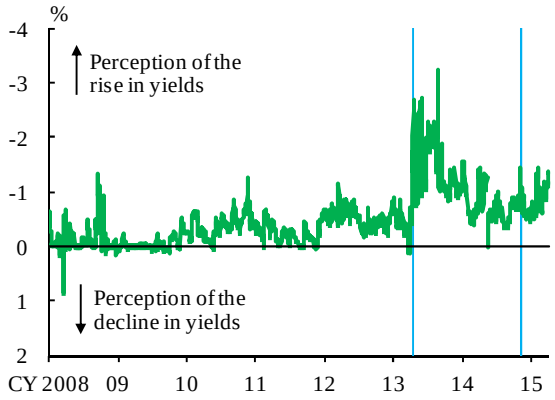
Notes: *1*. In the left-hand chart, the implied U.S. dollar interest rate is calculated by using data on forward premiums.
2. In the right-hand chart, the data compromise information stored in DTCC. Only newly initiated transactions are counted.
3. The latest data in the left-hand chart are as of March 31, 2015, and those in the right-hand charts are as of March 2015.
Source: Bloomberg.

Volatility and implied distribution

The implied volatility of JGB futures rose somewhat significantly from the middle of January 2015, as long-term JGB yields rebounded, partly reflecting events such as lackluster government bond auctions (Chart V-1-1). However, volatility has been close to that seen around 2011, below the level observed at the beginning of spring 2013.

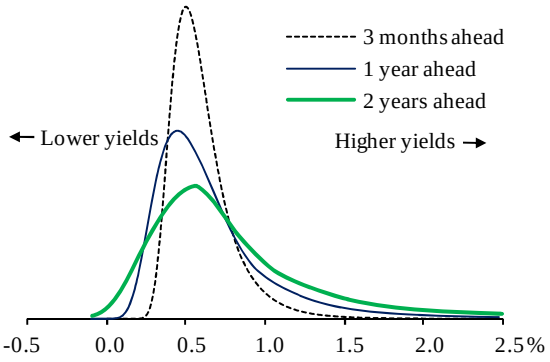
Risk reversals (the difference in implied volatilities between call and put options) -- which indicate the skew of market participants' recognition of future risks -- show that market participants remain vigilant to interest rate rise risks, as long-term interest rates have stayed at an extremely low level (Chart V-2-8). The implied distribution of 10-year swap rates for 1 to 2 years ahead has been fat-tailed for higher yields (Chart V-2-9). Meanwhile, the sovereign CDS premium for Japan temporarily widened toward the end of 2014, partly reflecting the downgrading of JGBs, but has since narrowed (Chart V-2-10).

Chart V-2-8: Risk reversals of JGB futures[1,2]



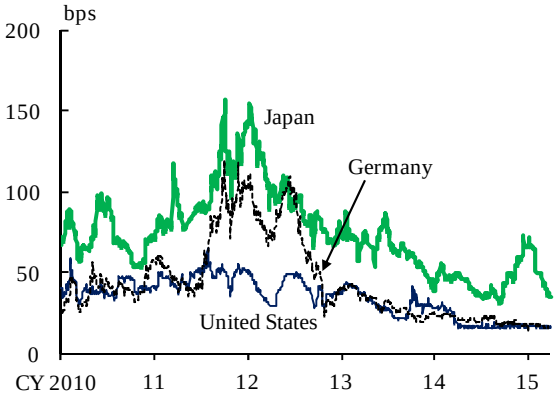
Notes: *1*. For details on option prices used for calculation, see Note 1 in Chart V-1-1.
2. The latest data are as of March 31, 2015.
Sources: Bloomberg; BOJ.

Chart V-2-9: Implied distribution of 10-year swap rate[1]



Note: *1*. The data are as of March 31, 2015.
Sources: Bloomberg; BOJ.

Chart V-2-10: Sovereign CDS premiums[1]



Note: *1*. The latest data are as of March 31, 2015.
Source: Bloomberg.

Indicators of liquidity in the JGB market

Next, we will examine liquidity in the JGB market from four angles: volume, tightness (the spread between the selling price and the buying price), depth, and resiliency (Chart V-2-11).[27]

Throughout the second half of fiscal 2014, bid-ask spreads (the spread between the selling price and the buying price) for the JGB futures market remained extremely tight, and transaction volume was maintained at a relatively high level (Chart V-2-12). On the other hand, market depth, when examined in terms of the number of orders at the best ask price, has become fairly thin since the beginning of autumn 2014. In addition,

[27] For details on indicators of liquidity in the JGB market, see Tetsuo Kurosaki, Yusuke Kumano, Kota Okabe, and Teppei Nagano, "Liquidity in the JGB Markets: Evaluation from Transaction Data," Bank of Japan Working Paper, forthcoming.

looking at market resiliency from the extent to which a certain amount of transaction will change the price, while the daily price range to transaction volume ratio has been at low levels, the price impact calculated from high frequency data has been rising moderately since the middle of 2014, although its level is still low compared with that seen in the middle of 2013 immediately following the introduction of QQE (Chart V-2-13). As such, while there seems to be no large problem occurring in the execution of transaction in the JGB futures market, a slight decline in market depth and resiliency can be observed.

Chart V-2-11: Indicators related to market liquidity

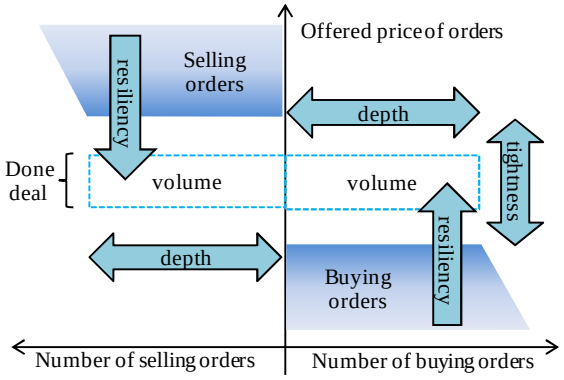
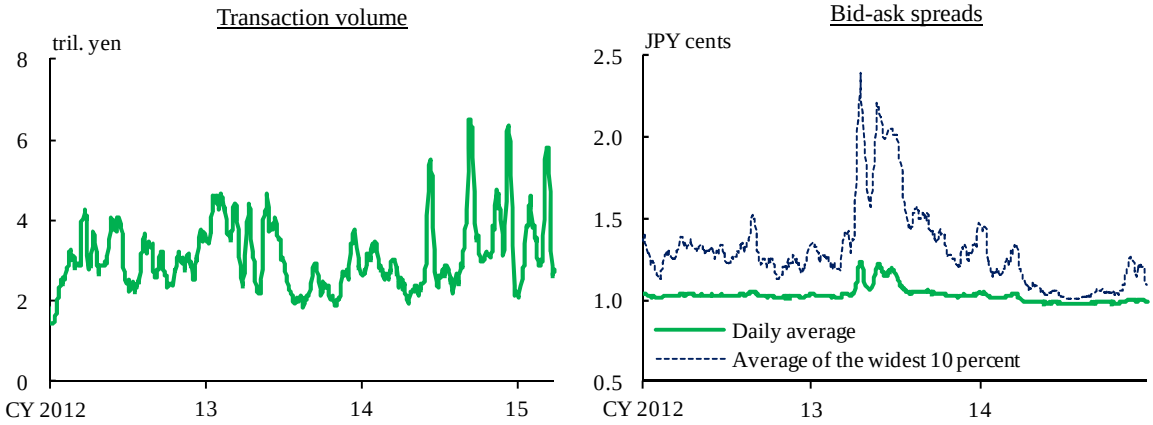
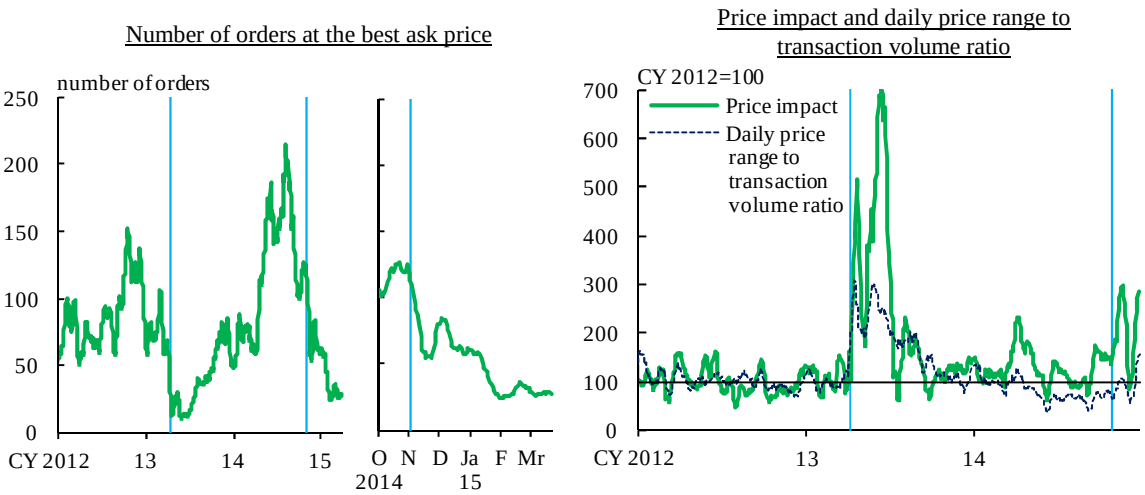


Chart V-2-12: Liquidity indicators in the JGB market: volume and tightness[1,2,3]



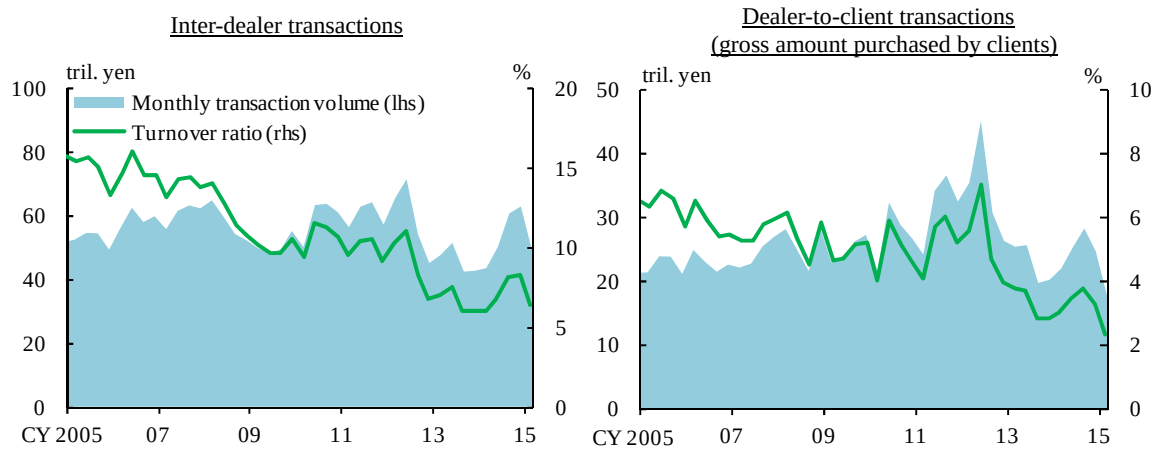
Notes: *1*. 10-day backward moving average.
2. In the right-hand chart, figures are calculated by using the bid-ask spread data with a 1-minute frequency. "Average of the widest 10 percent" is calculated by averaging only the wider 10th percent of these data.
3. The latest data in the left-hand chart are as of March 31, 2015, and those in the right-hand chart are as of end-December 2014.
Sources: Nikkei NEEDS; QUICK; BOJ.

Chart V-2-13: Liquidity indicators in the JGB market: depth and resiliency[1,2]



Notes: *1*. In the left-hand chart, figures are calculated by taking the median of the number of orders at the best ask price with a 1-minute frequency. The latest data are as of March 31, 2015.
2. In the right-hand chart, price impact is a measurement of how much impact a unit volume of transaction gives to the price. In concrete terms, using Kalman filtering, we calculate the impact of net transaction volume, which is the difference between buyer-initiated and seller-initiated volume at 5-minute frequency, on the 5-minute price changes. Buyer-initiated (seller-initiated) transactions are those executed at bid (ask) price immediately before the transaction. 10-day backward moving average. The latest data are as of end-December, 2014.
Sources: Bloomberg; Nikkei NEEDS; BOJ.

Chart V-2-14: JGB transaction volume[1,2,3]



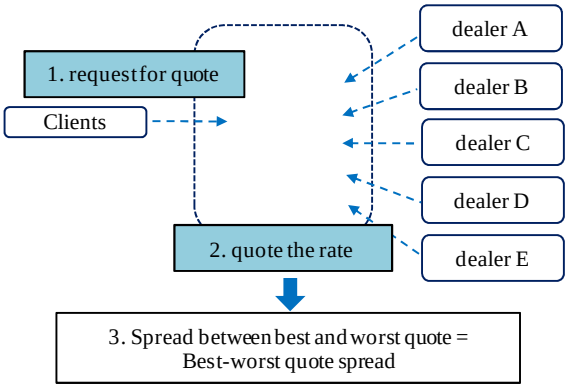
Notes: *1*. Clients exclude government entities, Japan Post Bank, Japan Post Insurance, BOJ, etc.
2. Turnover ratio is defined as transaction volume divided by outstanding amount.
3. The latest data are as of January-February 2015.
Sources: Japan Securities Dealers Association, Ministry of Finance.

Regarding volume in the cash JGB market, dealer-to-client transactions decreased, while inter-dealer transactions as a whole were maintained at a relatively high level (Chart V-2-14). Moreover, the spread between best and worst rate quoted by dealers to their clients (market depth) has been widening somewhat since autumn 2014, although it remains at a fairly low level. This suggests that uncertainty in carrying out transactions with dealers at the estimated price and quantity has grown slightly among

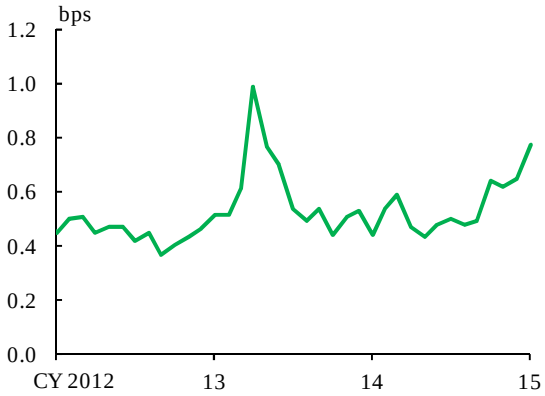
clients (Chart V-2-15).[28]

Chart V-2-15: Quote spread in multi-dealer to client markets[1]

Depth indicator in multi-dealer to client markets



Best-worst quote spread (average)



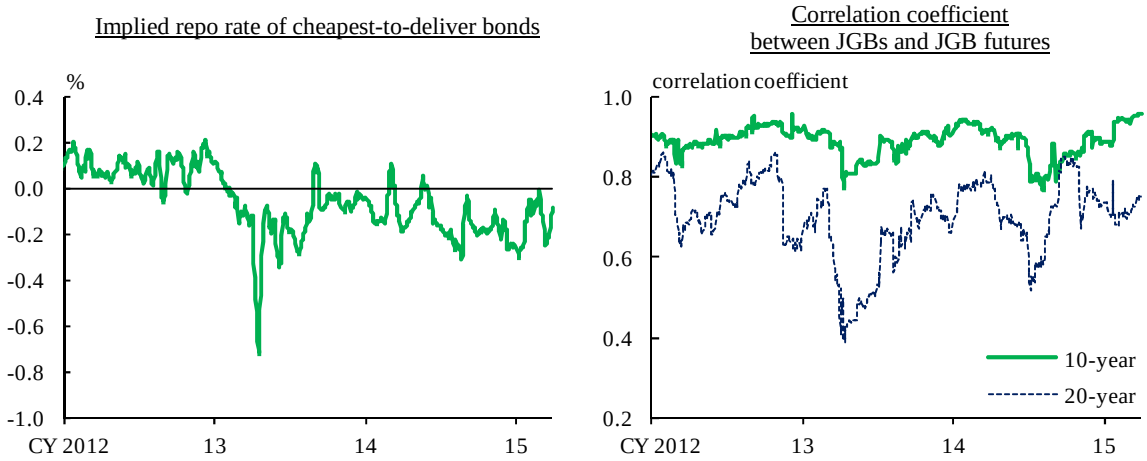
Note: *1*. In the right-hand chart, a portion of spread values which are higher than 10 bps are excluded from the calculation. The latest data are as of January 2015.
Sources: Yensai.com Co.,Ltd; BOJ.

Meanwhile, examining developments in the SC repo markets from the viewpoint of whether dealers are readily able to conduct market-making in JGBs, SC repo rates as a whole have been declining into negative territory as a trend, indicating an increase in costs to borrow specific issues of JGBs. The implied repo rate -- calculated from prices in cash JGBs and JGB futures markets -- has been declining, albeit with fluctuations, confirming that cash JGBs have been overrated as a trend. At present, however, the correlation between cash JGBs and JGB futures has been maintained at a high level, suggesting that it is unlikely that the functioning of hedging in the futures market is declining (Chart V-2-16).

As such, there are no significant problems in executing transactions or hedging positions and thus the liquidity and functioning of the JGB market do not seem to be necessarily deteriorating to a great extent, although some aspects of market liquidity, for example market depth, may be declining slightly as suggested by the intraday transaction data. This point can also be confirmed by the survey conducted on bond market participants (Chart V-2-17). Nevertheless, it is necessary to closely monitor JGB market liquidity and functioning as the Bank continues with its large-scale JGB purchases.

[28] Tightness in spreads between the best and worst rates suggests that a large number of securities companies are capable of carrying out transactions at around the best ask price at a given moment. This can be interpreted as the market having significant depth, in the sense that there are multiple potential counterparties at around the best ask price.

Chart V-2-16: JGBs and JGB futures market[1,2,3]



Notes: *1*. In the left-hand chart, figures are estimated from the closing price of the Japan Bond Trading. 10-day backward moving average.
2. In the right-hand chart, correlation coefficients are calculated with a 60-day rolling window of day-to-day change rates.
3. The latest data are as of March 31, 2015.
Sources: Bloomberg; BOJ.

Chart V-2-17: Bond market survey[1,2]

Current situation (%)

	Percentage
High	5.0
Not very high	65.0
Low	30.0

Change from three months ago (%)

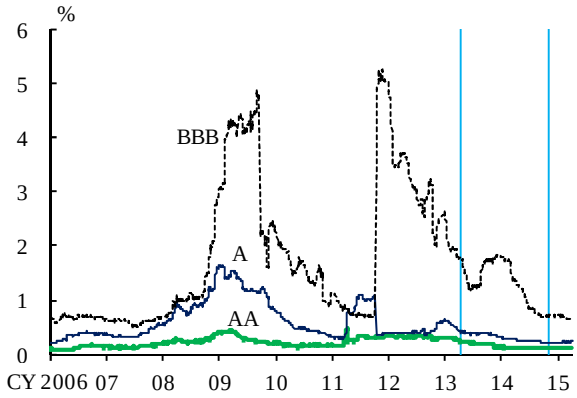
	Percentage
Has improved	2.5
Hasn't really improved	22.5
Has decreased	75.0

Notes: *1*. The degree of bond market functioning from surveyed company's viewpoint.
2. The latest survey was conducted from February 18-25, 2015.
Source: BOJ.

2. Credit markets

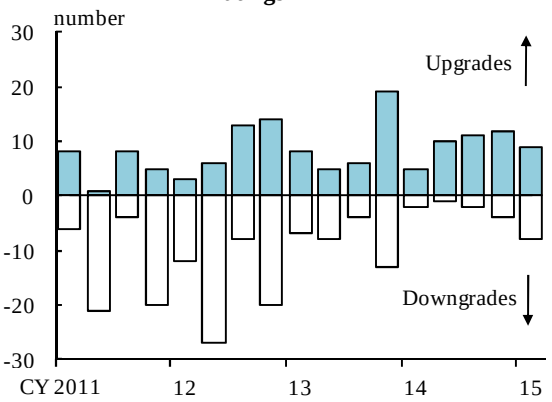
Credit spreads on corporate bonds have remained at low levels (Chart V-2-18). Developments in long-term credit ratings confirm that financial conditions among firms and the market assessment of such conditions have improved further, as the number of upgrades has exceeded that of downgrades (Chart V-2-19).

Chart V-2-18: Yield spreads between corporate bonds and JGBs[1,2]



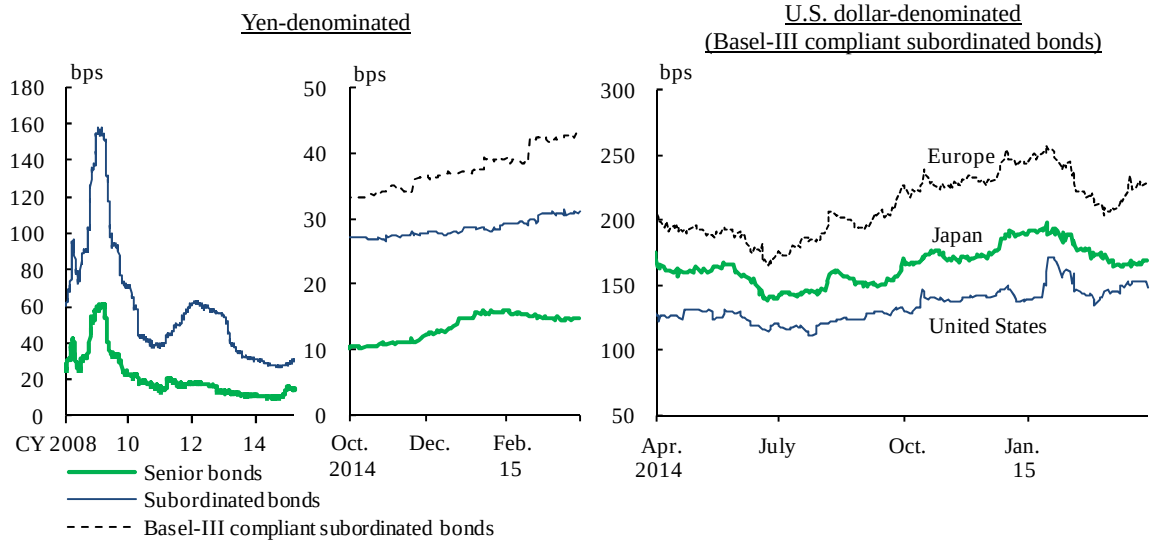
Notes: *1*. Average yield spreads of bonds with a residual maturity of between 3 years and 7 years. Rated by R&I.
2. The latest data are as of March 31, 2015.
Source: Japan Securities Dealers Association.

Chart V-2-19: Developments in long-term credit ratings[1]



Note: *1*. Rated by R&I.
Source: Bloomberg.

Chart V-2-20: Yield spreads between bank corporate bonds and government bonds[1,2,3]



Notes: *1*. In the left-hand chart, three major banks are counted. Yield spreads on "Basel-III compliant subordinated bonds" are calculated by QUICK.
2. In the right-hand chart, figures calculated for Japan, the United States, and Europe are simple averages of Basel-III compliant subordinated bonds with residual maturity of more than 8 years and less than 11 years for 2 major banks (Mizuho Bank and Sumitomo Mitsui Banking Corporation), 4 financial institutions (Bank of America, First Merit, Northern Trust, and Wells Fargo), and 6 financial institutions (Banco Santander Central Hispano, Barclays, BNP Paribas, BPCE, Lloyds Banking Group, and Societe Generale), respectively.
3. The latest data are as of March 31, 2015.
Sources: Bloomberg; Japan Securities Dealers Association; QUICK.

Credit spreads on both senior bonds and subordinated bonds have remained at low levels at major banks (Chart V-2-20). Looking at developments in the second half of fiscal 2014, yield spreads on senior bonds, relative to JGB yields, widened somewhat toward the beginning of 2015, affected by the decline in JGB yields amid increased awareness that senior bond yields were practically hovering around their lower bound. Yield spreads on yen-denominated Basel-III compliant subordinated bonds, which were

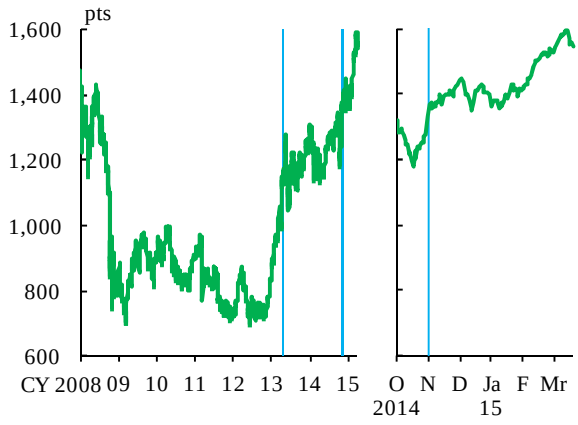
first issued in June 2014, widened somewhat compared to the extremely low levels seen in the first half of fiscal 2014, amid an increase in the number of banks issuing these bonds.

3. Stock markets

Japanese stock prices followed a rising trend throughout the second half of fiscal 2014. The volatility of stock prices rose temporarily toward the end of 2014, but has since been declining moderately (Chart V-1-1).

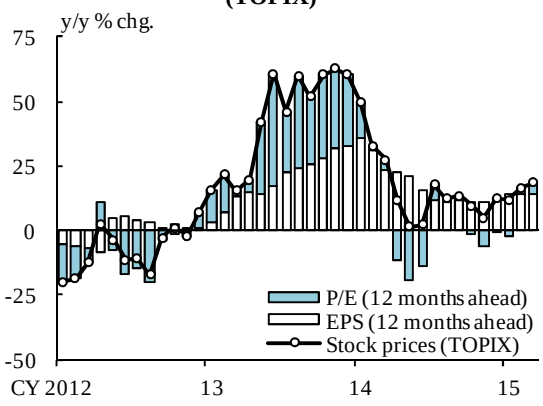
Japanese stock prices rose toward the end of 2014 due to the expansion of QQE and a change in investment policy by some investors, in addition to the rise in U.S. stock prices and continued depreciation of the yen. Thereafter, a global weakening of investors' risk-taking stance -- mainly due to vigilance over a sharp decline in crude oil prices -- temporarily weighed on stock prices. However, amid continuation of a weak yen and a low interest rate environment, stock prices followed a rising trend again toward the end of March 2015, mainly reflecting expectations of favorable corporate results among Japanese firms (Chart V-2-21).

Chart V-2-21: Stock prices (TOPIX)[1]



Note: *1*. The latest data are as of March 31, 2015.
Source: Bloomberg.

Chart V-2-22: Breakdown of stock prices (TOPIX)[1]

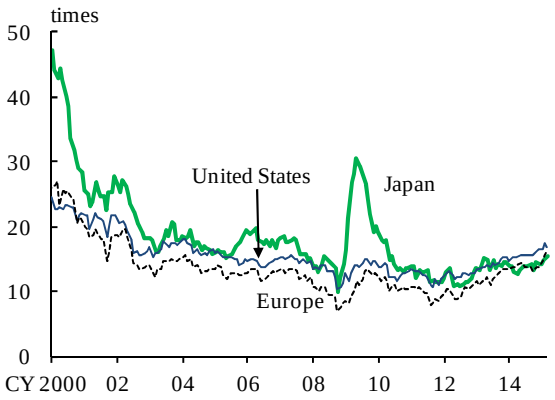


Note: *1*. The latest data are as of March 2015.
Sources: Bloomberg; Thomson Reuters Markets.

Breaking down the changes in Japanese stock prices into price earnings (P/E) ratios and earnings per share (EPS), a lot of the recent rises in stock prices can be explained by the expansion of EPS (Chart V-2-22). The P/E ratio for Japanese stocks does not necessarily seem to be overvalued, even when compared with past levels or with P/E ratios for overseas stocks (Chart V-2-23). During this time, risk reversals confirm that market participants have not been very vigilant to the risk of declining stock prices (Chart V-2-24). However, taking a somewhat longer-term perspective, Japanese stock prices

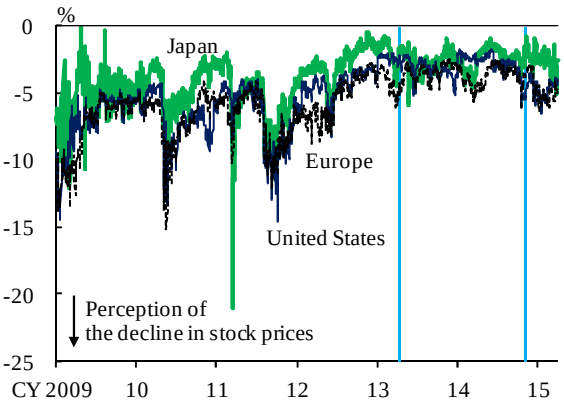
remain highly correlated with U.S. and European stock prices, as well as with foreign exchange rates. Attention should therefore be paid to the possibility that Japanese stock prices will be adversely affected in the event of changes including shifts in market participants' views on the outlook for the global economy and on the monetary policy stance of major advanced economies (Chart V-2-25).

Chart V-2-23: P/E ratios [1,2]



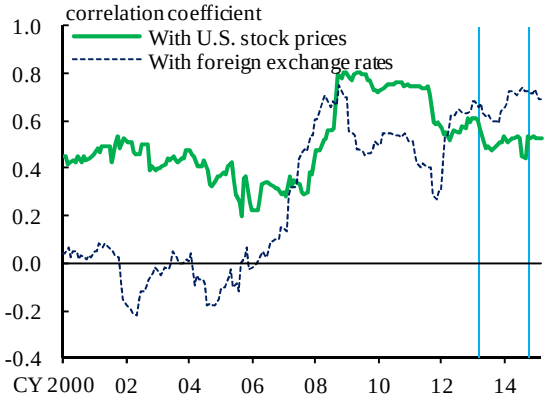
Notes: *1*. TOPIX for Japan; S&P 500 for the United States; EURO STOXX for Europe. P/E ratios are calculated using the expected EPS for the next 12 months.
2. The latest data are as of March 2015.
Source: Thomson Reuters Markets.

Chart V-2-24: Risk reversals of stock prices [1,2]



Notes: *1*. Nikkei 225 options for Japan; S&P 500 options for the United States; EURO STOXX 50 options for Europe.
2. The latest data are as of March 31, 2015.
Sources: Bloomberg; BOJ.

Chart V-2-25: 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 March 2015.
Source: Bloomberg.

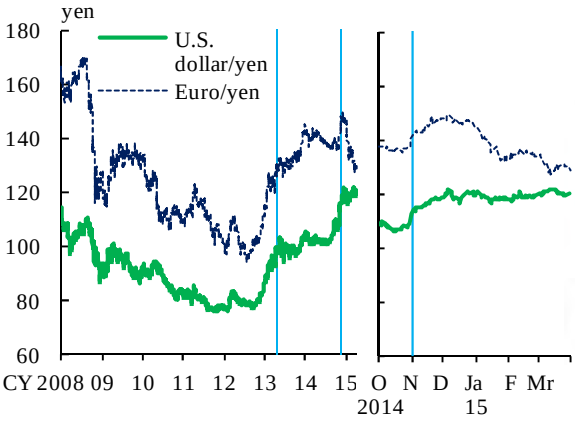
4. Foreign exchange markets

The yen depreciated against the U.S. dollar toward the end of 2014, but has since been more or less unchanged. The volatility of the yen's exchange rates rose somewhat toward the end of 2014 and has remained at a relatively high level (Chart V-1-1).

In foreign exchange markets, the yen depreciated against the U.S. dollar toward the end of 2014 mainly due to the expansion of QQE, but has been more or less unchanged since the beginning of 2015 (Chart V-2-26). As for euro/yen rates, although they had generally moved in tandem with dollar/yen rates toward the end of 2014, the yen appreciated against the euro from the beginning of 2015 as the euro continued to depreciate at a rapid pace, mainly reflecting the situation in Greece and additional monetary easing by the ECB.

Meanwhile, risk reversals indicate some concern among market participants over the yen's depreciation against the dollar, while anxiety over the yen's appreciation against the euro has heightened somewhat (Chart V-2-27).

Chart V-2-26: Foreign exchange rates[1]



Note: *1*. The latest data are as of March 31, 2015.
Source: Bloomberg.

Chart V-2-27: Risk reversals of U.S. dollar/yen and euro/yen rates[1]

Note: *1*. 1-year risk reversals. The latest data are as of March 31, 2015.
Source: Bloomberg.

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

In order to assess the stability of the financial system, in addition to examinations of member financial institutions in terms of the adequacy of their financial bases and the soundness of their risk management, investigations from a macroprudential perspective are necessary. This chapter presents an assessment of stability based on three perspectives: "macro risk indicators;" "financial institutions' capital adequacy;" and "macro stress testing."

A. Macro risk indicators

Macro risk indicators are used to detect signs of overheating in financial intermediation or instability in the financial system. In this section, we use three indicators: the Financial Activity Indexes (FAIXs), the Financial Cycle Indexes, and systemic risk indicators.

Financial Activity Indexes

The Financial Activity Indexes (FAIXs) are indicators used to gauge overheating in various financial activities. In the *Report*, we identify signs of overheating by selecting as FAIXs 14 indicators that are appropriate in assessing whether financial imbalances similar to those observed during Japan's bubble period have arisen and examining the deviation of individual indicators from their trends.[29] The FAIXs include the total credit-to-GDP ratio, a representative indicator used worldwide for showing financial imbalances.[30,31]

According to the FAIXs, there is no overheating in financial intermediation (Chart VI-1-1).[32]

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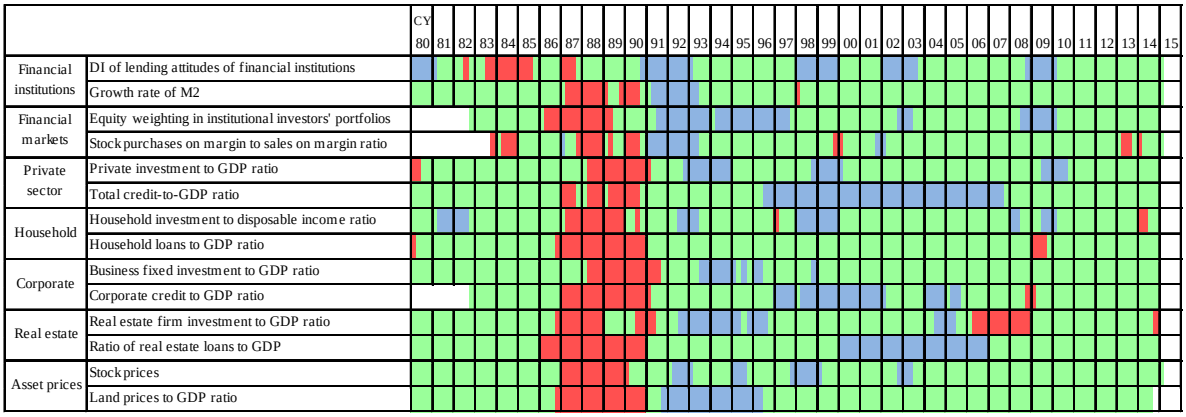
[29] For details on the FAIXs, see Yuichiro Ito, Tomiyuki Kitamura, Koji Nakamura, and Takashi Nakazawa, "New Financial Activity Indexes: Early Warning System for Financial Imbalances in Japan," Bank of Japan Working Paper, No. 14-E-7, April 2014, and Koji Nakamura and Yuichiro Ito, "Detecting Financial Imbalances: Monitoring Financial Imbalances through the Financial Activity Indexes (FAIXs)," Bank of Japan Research Laboratory, No. 15-E-1, March 2015.

[30] The total credit-to-GDP ratio is regarded as one of the key indicators that should be referred to by authorities worldwide in setting the level of the countercyclical capital buffer, which will be introduced under the Basel III requirements.

[31] Total credit includes loans extended by financial intermediaries and funding from capital markets such as corporate bonds. Borrowers of funds include households and firms.

[32] Whether financial activity is overheating or overcooling is measured based on how far individual

Chart VI-1-1: Heat map of Financial Activity Indexes[1]



Note: *1.* The latest data for the DI of lending attitudes of financial institutions and stock prices are as of the January-March quarter of 2015. Those for the growth rate of M2 and the stock purchases on margin to sales on margin ratio are as of the January-February of 2015. Those for the land prices to GDP ratio are as of the July-September quarter of 2014. Those for other indicators are as of the October-December quarter of 2014.

Sources: Bloomberg; Cabinet Office, "National accounts"; Japan Real Estate Institute, "Urban land price index"; Ministry of Finance, "Financial statements statistics of corporations by industry"; Tokyo Stock Exchange, "Outstanding margin trading"; BOJ, "Flow of funds accounts," "Loans and bills discounted by sector," "Money stock," "*Tankan*."

The total credit-to-GDP ratio has generally remained near the long-term trend (Charts VI-1-2 and VI-1-3).[33]

Compared with the findings presented in the previous *Report*, one of the indicators has tilted toward overheating and the other toward stabilization. Specifically, the real estate firm investment to GDP ratio changed from "green" in the previous *Report* to "red" in this *Report*, indicating a shift toward overheating. This reflects increased investment by real estate companies compared with that noted in the previous *Report* issued 6 months ago, mainly against the backdrop of an improvement in real estate markets (Charts VI-1-4 and VI-1-5).[34] On the other hand, the real estate loans to GDP ratio, the other

---

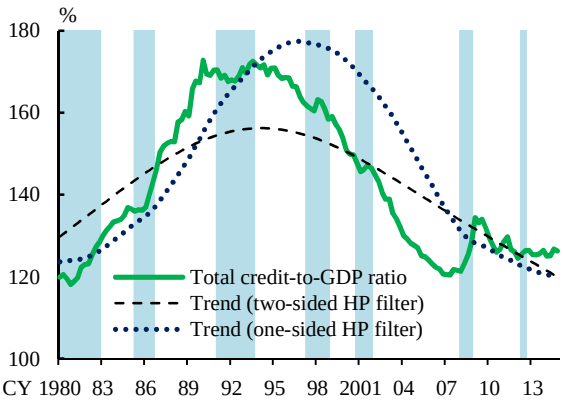
indicators deviate from their historical trends. Shaded areas in Chart VI-1-1 represent the following: (1) areas shaded in red (the darkest shaded areas) show that an indicator has risen above the upper threshold, that is, it is tilted toward overheating; (2) areas shaded in blue (the second darkest shaded areas) show that an indicator has declined below the lower threshold, that is, it is tilted toward overcooling; (3) areas shaded in green (the most lightly shaded areas) show everything in between; and (4) areas shaded in white show the periods without data.

[33] When gauging overheating or overcooling of individual financial indicators selected as FAIXs, it is necessary to examine how far the actual figure deviates from its long-term trend. Nevertheless, because there are various issues regarding methods used for estimating the long-term trend, the estimation results should be interpreted with some latitude regardless of which method is used. In this section, we use two methods commonly employed for estimating the trend: (1) the "two-sided HP filter," in which the Hodrick-Prescott (HP) filter is applied to data for the whole period; and (2) the "one-sided HP filter," in which the HP filter is applied to individual sets of data leading up to the beginning of each period and most recently filtered value is plotted. We then show the deviation of the actual figure from the long-term trend estimated by these two methods. In both estimation methods, we set the smoothing parameter of the HP filter (i.e., λ) at 400,000.

[34] The FAIXs use as real estate investment data the sums of figures for investments in business

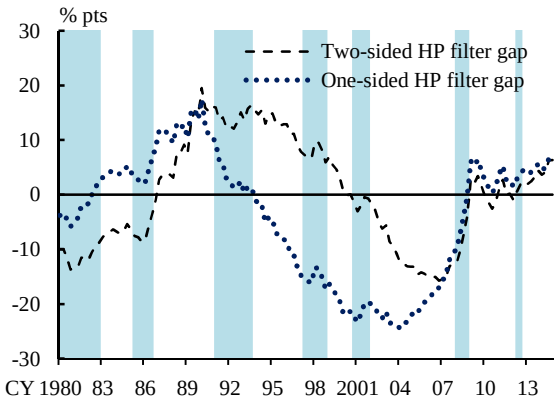
indicator of the real estate industry, remains "green." Developments in related indicators continue to warrant attention, although a comprehensive look at a wide spectrum of information -- including real estate transactions and price developments -- suggests that the real estate market currently shows no signs of overheating (see Box 5 for the situation in the real estate market). Meanwhile, the household investment to disposable income ratio has shifted back from "red" in the previous *Report* to "green." This is due to the waning of a temporary factor, namely, the rapid increase in housing investment and durable goods consumption -- included in the numerator of the ratio -- in January-March 2014, due to the front-loaded increase in demand prior to the consumption tax hike.

Chart VI-1-2: Total credit-to-GDP ratio[1,2]



Notes: *1*. Shaded areas indicate economic recession periods. The latest data are as of the October-December quarter of 2014.
2. The two-sided HP filter is a method for extracting a trend from all available data using the Hodrick Prescott filter. The one-sided HP filter is a method for extracting a trend from the data available for a time period using the Hodrick Prescott filter.
Sources: Cabinet Office, "National accounts"; BOJ, "Flow of funds accounts."

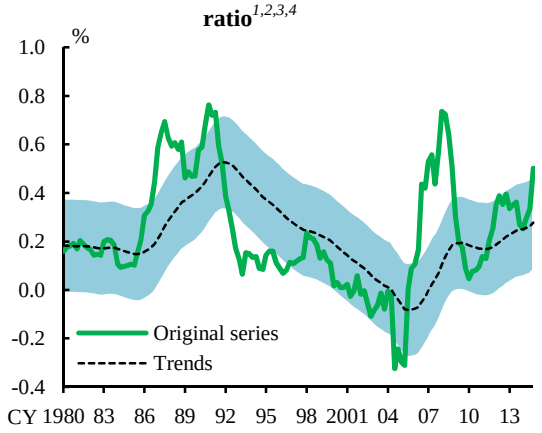
Chart VI-1-3: Total credit-to-GDP gap[1,2]



Notes: *1*. Shaded areas indicate economic recession periods. The latest data are as of the October-December quarter of 2014.
2. The total credit-to-GDP gap is the deviation from each trend of the total credit-to-GDP ratio.
Sources: Cabinet Office, "National accounts"; BOJ, "Flow of funds accounts."

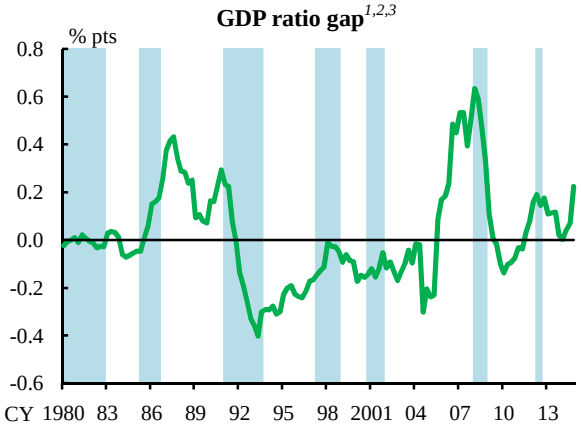
equipment, land, and inventories by large firms in the real estate industry as reported in the "Financial Statements Statistics of Corporations by Industry" published by the Ministry of Finance.

Chart VI-1-4: Real estate firm investment to GDP ratio[1,2,3,4]



Notes: *1*. Large firms of real estate are counted. The latest data are as of the October-December quarter of 2014.
2. Original series = (business fixed investment + land investment + inventory investment) / nominal GDP.
3. Trends are calculated using the one-sided HP filter.
4. Shaded areas indicate the root mean square of deviation from trends.
Sources: Cabinet Office, "National accounts"; Ministry of Finance, "Financial statements statistics of corporations by industry."

Chart VI-1-5: Real estate firm investment to GDP ratio gap[1,2,3]



Notes: *1*. Shaded areas indicate economic recession periods. The latest data are as of the October-December quarter of 2014.
2. The real estate firm investment to GDP ratio gap measures the degree of deviation from real estate firm investment to GDP ratio trends.
3. Trends are calculated using the one-sided HP filter.
Sources: Cabinet Office, "National accounts"; Ministry of Finance, "Financial statements statistics of corporations by industry."

Box 5: The situation in the real estate market

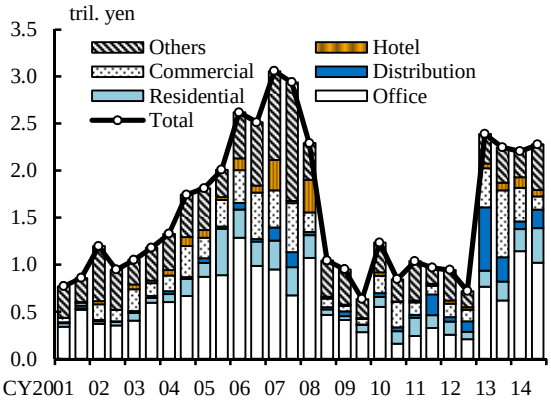
In this *Report*, one of the indicators comprising the Financial Activity Indexes that is associated with real estate market conditions signaled "overheating." Past experience in Japan suggests that developments in the real estate market provide information that is important for detecting financial imbalances. Taking the above into account, in this box, we examine recent developments in the real estate market from a broad perspective, which includes real estate transactions, real estate prices, and real estate finance.[35]

With respect to real estate transactions, the value of transactions has recently been at a high level (Chart B5-1). By type of property, transactions for offices have increased significantly since the beginning of 2014. Transactions by type of entity show that in recent years, the major trend has been for private offering funds to sell to J-REITs real estate properties they acquired before the financial crisis. However, most recently, some changes are being observed in the type of purchaser. J-REITs' on-balance buying decreased slightly, while "others," including overseas and institutional investors

[35] For details on the data used in this box, see Yuichiro Ito, Ichiro Muto, and Yasutaka Takizuka, "Data Analysis for Monitoring Japan's Real Estate Market," Bank of Japan Review, 15-E-2, March 2015.

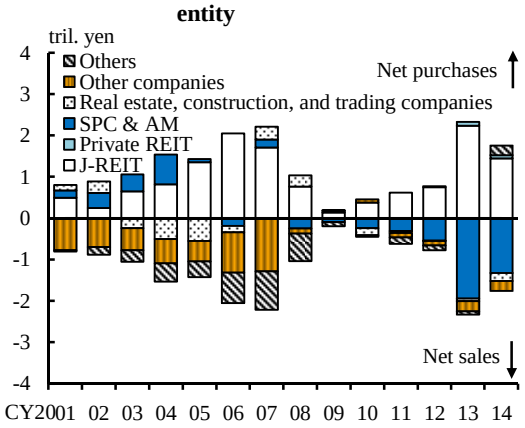
focusing on investment yields, began holding long positions (Chart B5-2).[36]

Chart B5-1: Value of real estate transactions[1]



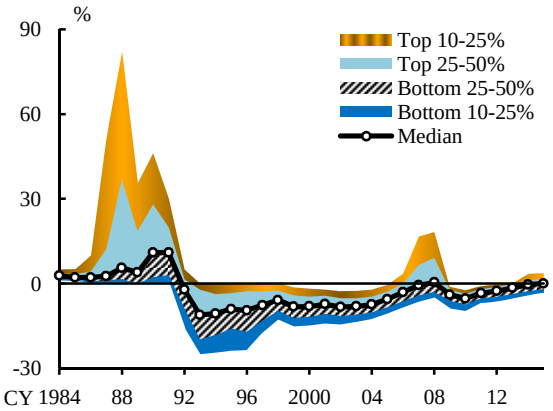
Note: *1*. The latest data are as of the second half of 2014.
Source: Japan Real Estate Institute.

Chart B5-2: Real estate transactions by type of entity



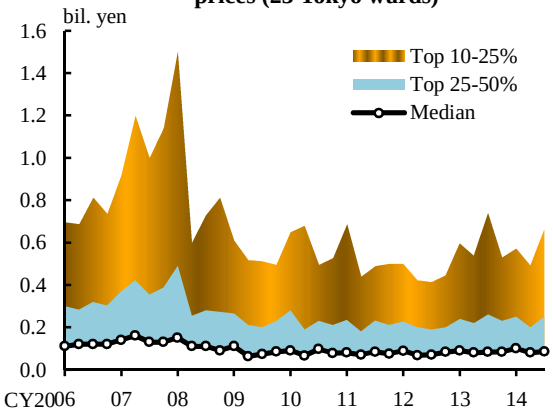
Source: Japan Real Estate Institute.

Chart B5-3: Distribution of year-on-year rates of change in commercial land prices[1,2]



Notes: *1*. The latest data are as of January 2015.
2. Year-on-year rates of change in individual land prices in commercial areas.
Source: Ministry of Land, Infrastructure, Transport and Tourism, "Land market value publication."

Chart B5-4: Distribution of individual commercial property transaction prices (23 Tokyo wards)[1]



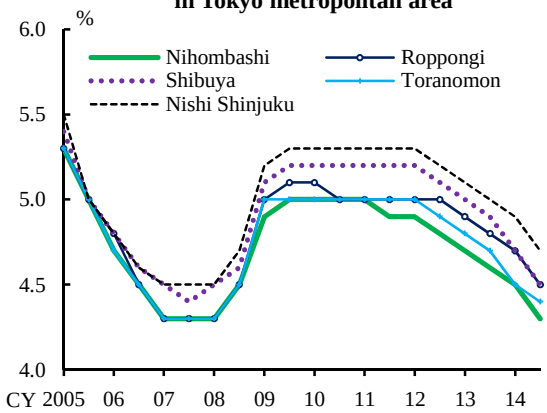
Note: *1*. The latest data are as of the July-September quarter of 2014.
Source: Ministry of Land, Infrastructure, Transport and Tourism, "Real estate transaction-price information."

With respect to real estate prices, the distribution of rates of increase in commercial land prices (appraisal values) at individual locations shows that while the median value has approached the level that prevailed during the real estate boom in the mid-2000s, an upward expansion of the distribution, akin to those seen in past real estate booms, had not been observed as of the beginning of 2015 (Chart B5-3). Looking at actual transaction prices of real estate properties (land or land and buildings) in the 23 wards of Tokyo, no such phenomenon had occurred, even as of the July-September quarter of 2014 (Chart B5-4). Nevertheless, it is also true that some transactions in high-end

[36] In the chart, "Special-purpose companies (SPC) and asset management (AM)" include mainly private offering funds.

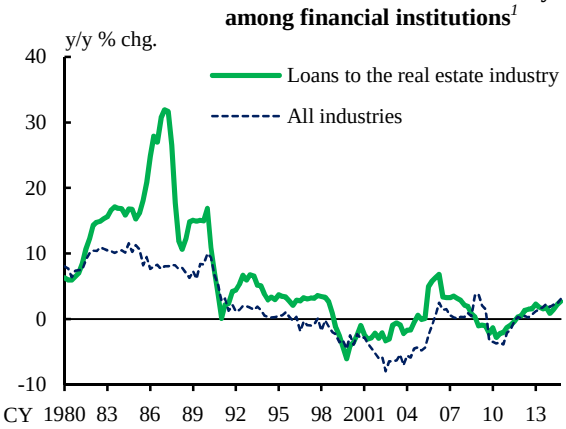
properties, including office buildings, are being observed in the Tokyo metropolitan area. The expected capitalization rate has clearly declined recently due to the increase in property prices, which is the denominator of the expected capitalization rate. This indicates that investors are taking a positive stance toward purchasing real estate properties (Chart B5-5). In non-metropolitan areas, however, such developments have been limited to only part of the market and have not become widespread to date.

Chart B5-5: Capitalization rate of office buildings in Tokyo metropolitan area[1]



Note: *1*. The latest data are as of October 2014.
Source: Japan Real Estate Institute, "The Japanese real estate investor survey."

Chart B5-6: Loans to the real estate industry among financial institutions[1]

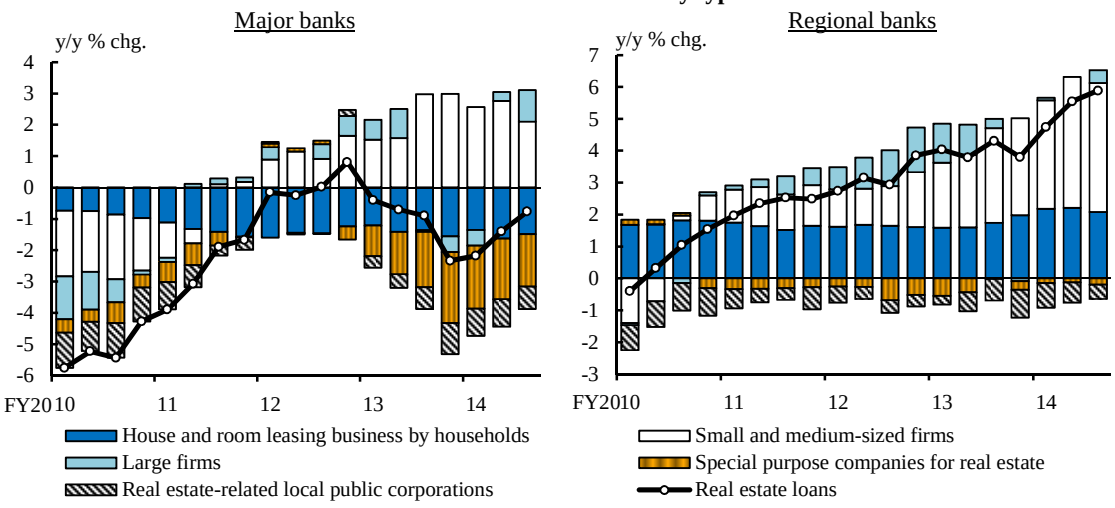


Note: *1*. Banks and *shinkin* banks are counted. The latest data are as of end-December 2014.
Source: BOJ.

We now examine recent developments in real estate finance. The growth rate of bank loans to the real estate industry has increased slightly compared with the first half of fiscal 2014, but is still moderate compared with the previous phase of increased lending around 2006 (Chart B5-6). By type of financial institution, loans by major banks are still below the year-ago level, but the pace of decrease has been slowing as loans to large real estate developers have started to increase (Chart B5-7). Among regional banks, loans to the house and room leasing business by asset management companies, which are owned by households, and loans to small and medium-sized real estate companies are growing at a faster pace. By region, growth in loans to the real estate industry has been increasing in both regional areas and three major cities (Southern Kanto, Tokai, and Kinki regions) (Chart B5-8). As for funding by listed real estate companies, J-REITs have recently increased their financing significantly, in terms of both bank borrowing and equity financing, to a level exceeding the peak reached in the second half of 2006 (Chart B5-9). Meanwhile, reflecting the increase in demand for J-REITs among investors, investment prices have continued to follow a rising trend (Chart B5-10). Listed real estate companies other than J-REITs have also increased their funding, but the amount of funding is relatively small and borrowing is limited compared with the real estate boom around 2007 (Chart B5-11). An examination of the

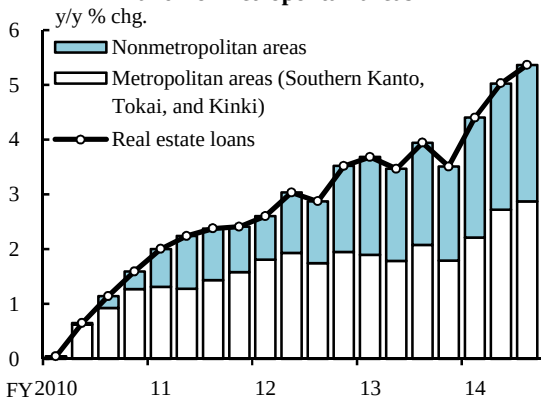
distribution of growth in the outstanding balance of interest-bearing liabilities (on a year-on-year basis) among small and medium-sized real estate companies with low creditworthiness, including unlisted businesses, shows that the distribution has been expanding slightly upward very recently, although this is limited in scale relative to the real estate boom around 2007 (Chart B5-12). The default rate among real estate companies rose rapidly following the financial crisis. This should be partly attributable to increases in funding to low-credit borrowers prior to the financial crisis (Chart B5-13). Given that a large proportion of small and medium-sized real estate firms depend heavily on bank borrowing, it is necessary to keep a close watch on these firms.

Chart B5-7: Real estate loans by type of bank[1]



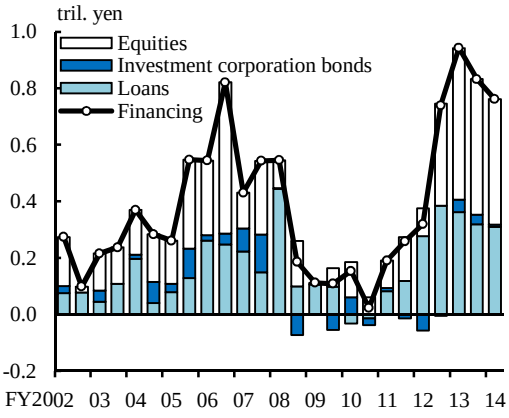
Note: *1*. The latest data are as of end-December 2014.
Source: BOJ.

Chart B5-8: Real estate loans among regional financial institutions in metropolitan and nonmetropolitan areas[1,2]



Notes: *1*. Regional banks and *shinkin* banks are counted. The latest data are as of end-December 2014.
2. For metropolitan areas, banks with head offices located in the Southern Kanto region, the Tokai region, and the Kinki region are counted, and for nonmetropolitan areas, banks with head offices located in other areas are counted.
Source: BOJ.

Chart B5-9: Financing by J-REITs[1,2,3]

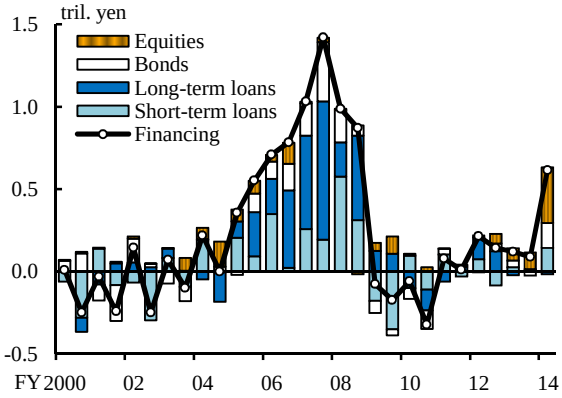


Notes: *1*. The latest data are as of the first half of fiscal 2014.
2. Financing is the sum of loans, investment corporation bonds, and equities.
3. The amount of financing for each firm is aggregated for the month during which its account is published. This chart indicates the total volume of funds raised by firms on a semiannual basis.
Source: Nikkei Needs.

Chart B5-10: Tokyo Stock Exchange REIT Index[1]

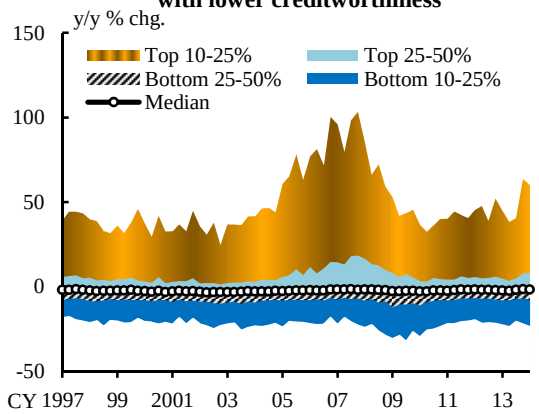
Note: *1*. The latest data are as of end-March 2015.
Source: Bloomberg.

Chart B5-11: Financing by real estate companies other than J-REITs[1,2,3]



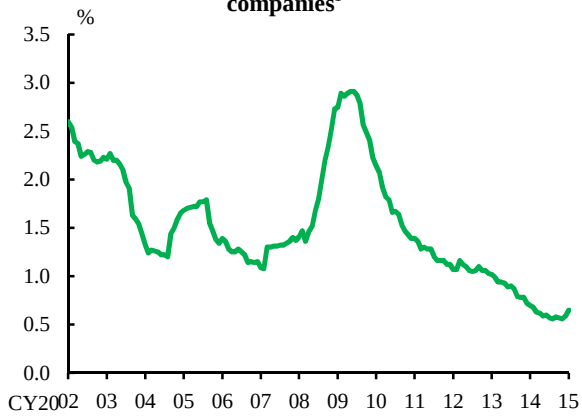
Notes: *1*. The latest data are as of the first half of fiscal 2014.
2. Financing is the sum of loans, bonds, and equities.
3. The amount of financing for each firm is aggregated for the month during which its account is published. This chart indicates the total volume of funds raised by firms on a semiannual basis.
Source: Nikkei Needs.

Chart B5-12: Debt financing by real estate companies with lower creditworthiness[1,2]



Notes: *1*. The latest data are as of the January-March quarter of 2014.
2. Percentage changes from the previous year in long- and short-term borrowings of real estate companies are aggregated in their account-closing month and compiled on a quarterly basis.
Source: CRD.

Chart B5-13: Default rate among real estate companies[1]



Note: *1*. The latest data are as of January 2015.
Source: Risk Data Bank of Japan, Ltd., "RDB enterprise default ratio."

The above evidence indicates that in the real estate market, transactions and financial activities have gradually been increasing in recent times, mainly reflecting the economic recovery. Overall, real estate prices currently show no signs of overheating, unlike in previous real estate booms. Nevertheless, careful attention should be paid to future developments in the real estate market in view of the following factors: (1) the current relatively high transaction values, especially for office properties; (2) a rise in J-REIT

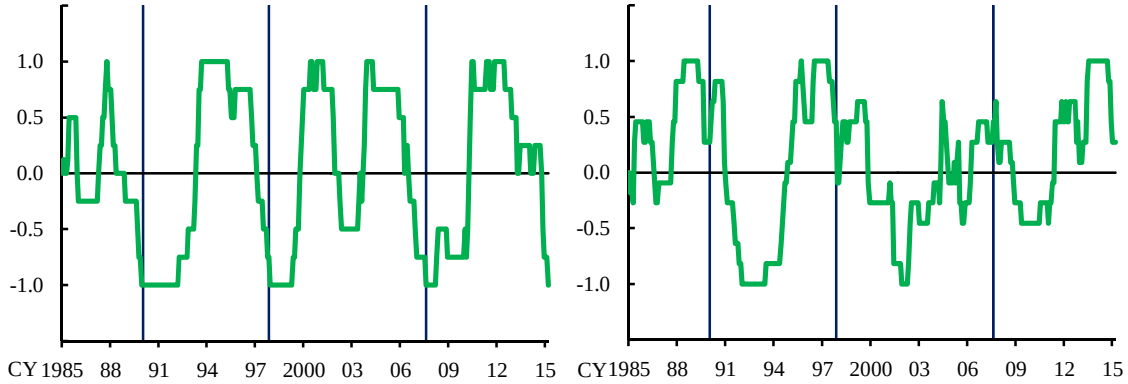
prices reflecting the increasingly positive stance toward real estate investment among investors, including foreign investors; and (3) an increasing trend in funding among real estate companies with low creditworthiness against the backdrop of a gradual increase in the growth of loans to the real estate sector.

Financial Cycle Indexes

The Financial Cycle Indexes are diffusion indexes used to identify signs of future instability in the financial system, and are constructed based on a method similar to that employed for the Cabinet Office's "Indexes of Business Conditions."[37] A change in the leading index from a positive figure to a negative one indicates that the financial system might become unstable in the near future. The same movement in the lagging index indicates that the financial system may have already become unstable.

The leading Financial Cycle Index turned negative, but this is considered to be a temporary development taking into account the current economic outlook. The lagging index remains in a positive range. As for the leading index, all eight of the component indicators became negative (Chart VI-1-6).

Chart VI-1-6: Financial Cycle Indexes[1,2,3]

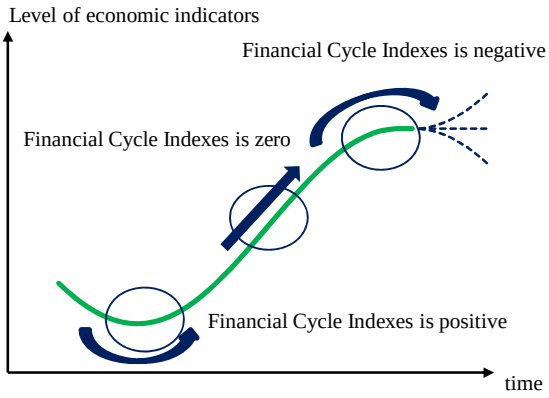


Notes: *1*. The latest data are as of March 2015.
2. The left-hand, middle, and right-hand vertical lines respectively indicate the following "financial crisis" events according to Kamada and Nasu (2011): the collapse of Japan's asset price bubble (January 1990) ; the default of Sanyo Securities (November 1997) ; and the outbreak of the U.S. subprime problem (August 2007).
3. The leading index includes the following eight series: stock prices in the banking, real estate, and construction sectors; the financial positions of firms; the lending attitude of financial institutions; current profit levels of firms; housing loans; and commodity prices.
Source: BOJ.

[37] 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. 11-E-1, April 2011. Financial Cycle Indexes are indicators for which priority is placed on detecting cyclical changes of financial system conditions. In contrast, with regard to the FAIXs, priority is placed on detecting instability in the financial system originating from large-scale financial cycles such as an economic bubble, which typically occurs only once every few decades.

Individual indicators selected as part of the leading index have been "negative," basically due to a slowdown in the pace of improvement. Past patterns of change in the indicators show that their measures often declined following a slowdown in the pace of improvement, after which the financial system tended to destabilize (Chart VI-1-7). On the other hand, if these indicators retained their present levels without deterioration, or if their pace of improvement picked up again, the negative signal of the index did not persist and the financial system did not destabilize.

Chart VI-1-7: Leading index and original indicators

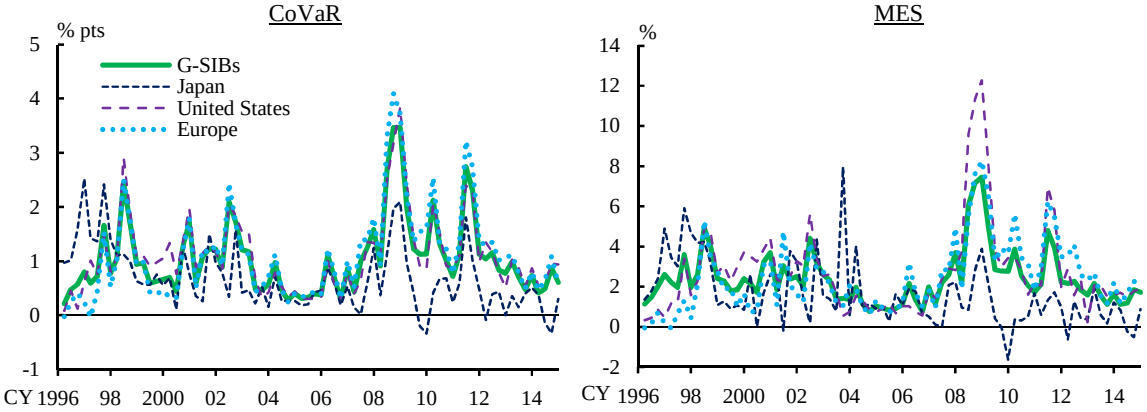


Taking into account the current economic outlook, many of the indicators adopted for the leading index are expected to regain their pace of improvement, thus making it likely that negative figures will not persist. On this basis, careful attention should be paid to future developments in the Financial Cycle Indexes, including their implications.

Systemic risk indicators

Systemic risk indicators are used to gauge the possibility of systemic risks materializing, based on factors such as the correlation between stock prices of individual financial institutions and aggregate financial stock prices. This section examines conditional value-at-risk (CoVaR) and marginal expected shortfall (MES) (Chart VI-1-8).

Chart VI-1-8: Systemic risk indicators[1]



Note: *1*. G-SIBs are counted. The latest data are as of end-March 2015.
Sources: Bloomberg; BOJ.

No solid evidence of instability in the financial system is currently observed in systemic risk indicators. CoVaR measures the degree to which stresses occurring at individual financial institutions propagate through the entire financial sector.[38] It has been at a low level for Japan's banks relative to U.S. and European financial institutions. On the other hand, MES measures the extent to which stresses in the entire financial sector have adverse effects on the corporate value of individual financial institutions.[39] It has also been at a low level for Japan's banks relative to U.S. and European financial institutions.

B. Financial institutions' capital adequacy

This section examines whether banks' capital adequacy ratios fulfill regulatory requirements, and further, whether they have secured sufficient capital bases relative to the amount of various risks -- outlined in Chapter IV -- they bear.

Capital adequacy ratios

Financial institutions' capital adequacy ratios are sufficiently above regulatory levels.

At internationally active banks, total capital adequacy ratios, Tier I capital ratios, and common equity Tier I capital ratios (CET I capital ratios) as of the end of the first half of fiscal 2014 significantly exceeded regulatory levels (Chart VI-2-1). The same applies to the core capital ratios of domestic banks.

Looking ahead, the phase-in arrangements are scheduled to gradually come to an end, and internationally active banks are expected to gradually increase their holdings of additional capital buffers as required.[40] Meanwhile, based on the Basel III requirements,

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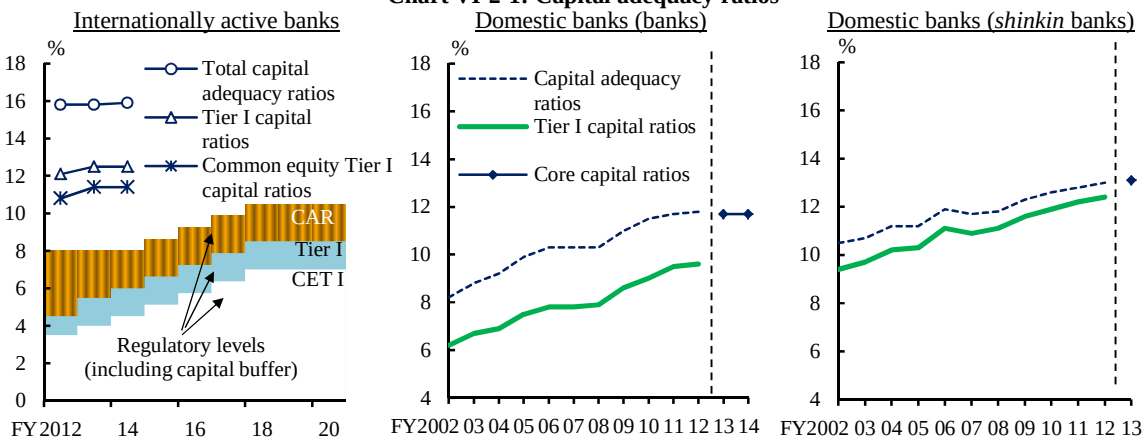
[38] As CoVaR increases, the propagation of stresses occurring at individual financial institutions to the entire financial sector becomes stronger. CoVaR is estimated based on the VaR of stocks of 30 major banks around the world (i.e., G-SIBs as of November 2014). For details, see Tobias Adrian and Markus K. Brunnermeier, "CoVaR," Federal Reserve Bank of New York Staff Reports, No. 348, September 2011.

[39] The MES (Marginal Expected Shortfall) 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 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 30 major banks around the world (G-SIBs as of November 2014). 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.

[40] For example, the minimum regulatory level of the CET I capital ratio for internationally active

work is underway to review various methods used for calculating the magnitude of risks, including the standard credit risk measurement method. As for banks' capital adequacy ratios on a consolidated basis, the regulation has been revised and applied since the term ending March 2014 so that fluctuations in the market values of pension assets held off of financial institutions' balance sheets under retirement benefits systems would have a direct bearing on these ratios (Charts VI-2-2 to VI-2-4).[41] Each financial institution needs to appropriately manage its capital level by efficiently utilizing capital while responding to regulations and frameworks.

Chart VI-2-1: Capital adequacy ratios[1,2,3,4]

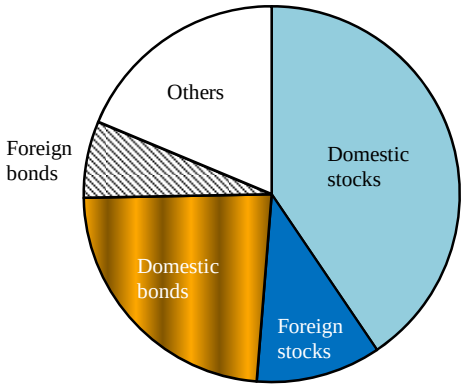


Notes: *1*. CAR indicates total capital adequacy ratios. The latest data for banks are as of end-September 2014, and those for *shinkin* banks are as of end-March 2014.
2. Internationally active banks and domestic banks are classified as of end-September 2014.
3. Data for banks are calculated on a consolidated basis.
4. The data take account of the phase-in arrangements.
Source: BOJ.

banks was raised to 4.5 percent at the end of March 2015. In addition, from 2016 under the Basel III requirements, (1) the capital conservation buffer is scheduled to be raised gradually from 0.625 percent in 2016 to 2.5 percent in 2019; (2) the countercyclical capital buffer is scheduled to be imposed within a range of 0-2.5 percent; and (3) the surcharge for global systemically important banks (G-SIBs) is scheduled to be increased by 1-2.5 percent in accordance with the size and other elements of financial institutions. As for domestic banks, they are currently allowed to include all or a proportion of certain instruments, such as non-convertible preferred stocks and subordinated bonds, as an element of new core capital through the phase-in arrangements, but the percentage of these instruments included will gradually be reduced in the future. In addition, they will be required to gradually deduct certain assets from core capital based on phase-in arrangements, and these assets will be subject to full deduction by the end of March 2019.

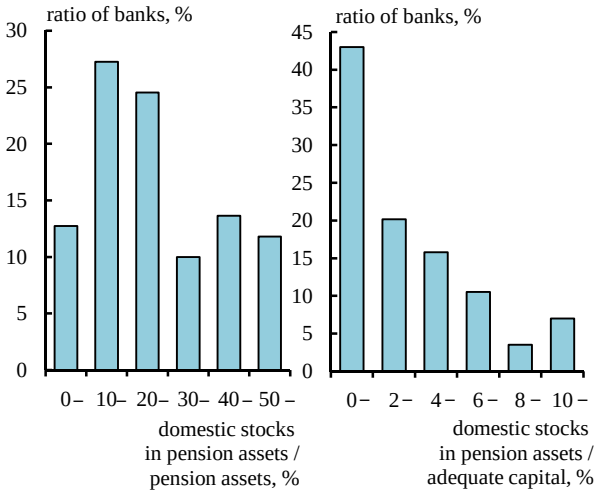
[41] With regard to consolidated financial statements under the accounting standard for retirement benefits adopted since the term ending March 2014, amendments were made to details including the treatment of differentials in unrecognized mathematical calculations (among differentials between the expected investment earnings and actual investment earnings of pension assets, the portion not reflected in the balance sheet) in consolidated results was revised. As a result, when retirement benefits accounting shows a fund shortfall, the unrecognized differentials are to be reflected in required capital adequacy ratios through a reduction in "the cumulative amount of other comprehensive income." On the other hand, in the case of excess savings, the portion amounting to an excess is to be deducted from required capital in its full amount, and is not to be treated as a factor in increasing capital (i.e., the impacts of excesses and shortfalls are to be asymmetrical).

Chart VI-2-2: Banks' portfolios of pension assets[1,2]



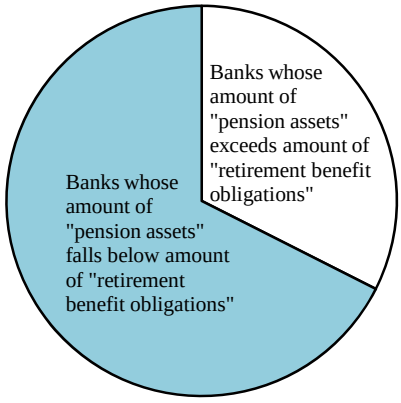
Notes: *1*. Major banks and regional banks are counted. The data are as of end-March 2014.
2. Data are basically counted on a consolidated basis.
Source: BOJ.

Chart VI-2-3: Domestic stocks as a share of banks' pension assets[1,2,3]



Notes: *1*. Major banks and regional banks are counted. The data are as of end-March 2014.
2. Data are basically counted on a consolidated basis.
3. Adequate capital for internationally active banks is CET I. Adequate capital for domestic banks is core capital. The data take account of the phase-in arrangements.
Source: BOJ.

Chart VI-2-4: Funding status of banks' pension assets[1,2]



Notes: *1*. Major banks and regional banks are counted. The data are as of end-March 2014.
2. Data are basically counted on a consolidated basis.
Source: BOJ.

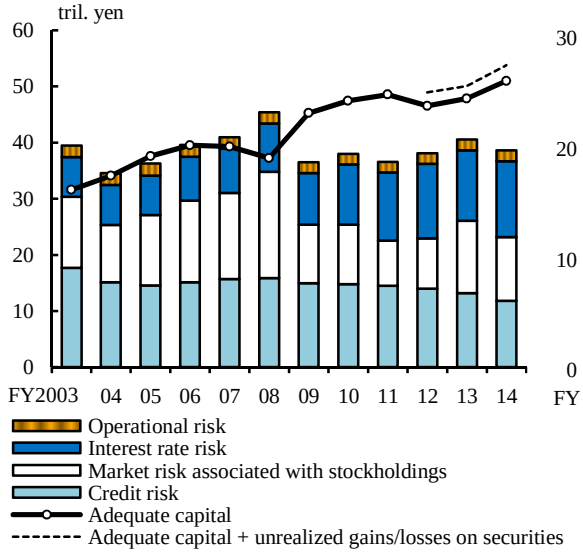
Capital adequacy relative to the amount of risk borne by financial institutions

Financial institutions' capital has generally been at an adequate level relative to the amount of risk (Charts VI-2-5 and VI-2-6).[42] Capital held by these institutions has

[42] Common methods and parameters (such as the confidence level and the holding period) are used in calculating the amount of risk borne by all financial institutions. Thus, the amount of risk calculated here does not necessarily match the internal calculations made by financial institutions as part of their comprehensive risk management. For the calculation methods used for each type of risk, see the Notes in Charts IV-1-1, IV-2-6, and IV-3-1. The amount of operational risk corresponds to 15 percent of gross profits.

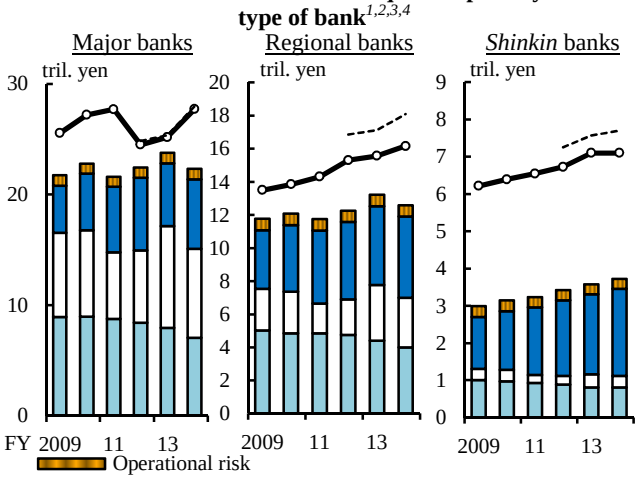
continued to increase, mainly due to the accumulation of retained earnings. Moreover, owing to a rise in stock prices during this period, banks' current unrealized gains on securities holdings -- which are not counted when calculating capital for domestic banks -- have also risen. Consequently, buffers against changes in the market value of securities have also increased. At the same time, the amount of risk that financial institutions bear has decreased somewhat since the end of fiscal 2013, mainly reflecting the fall in the amount of credit risk. Taking the above into account, the ability of financial institutions to absorb losses and take on risks generally seems to have remained at high levels for all types of banks, increasing from the levels observed in the previous *Report*.

Chart VI-2-5: Risks and adequate capital among financial institutions[1,2,3,4]



Notes: *1*. Banks and *shinkin* banks are counted. The latest data for market risk associated with stockholdings (JPY-denominated) and interest rate risk (JPY-denominated) are as of end-December 2014, and those for other data are as of end-September 2014.
2. Market risk associated with equity investment trusts is excluded from that associated with stockholdings. Credit risk includes foreign currency-denominated risk. Market risk associated with stockholdings, and interest risk (on-balance-sheet transactions) at major banks include foreign currency-denominated risk.
3. "Adequate capital + unrealized gains/losses on securities" is the sum of adequate capital and unrealized gains/losses on securities (tax effects taken into account) for domestic banks.
4. For *shinkin* banks, figures for adequate capital, credit risk, and operational risk in fiscal 2014 are assumed to be unchanged from end-March 2014 levels.
Source: BOJ.

Chart VI-2-6: Risks and adequate capital by type of bank[1,2,3,4]



Notes: *1*. The latest data for market risk associated with stockholdings (JPY-denominated) and interest rate risk (JPY-denominated) are as of end-December 2014, and those for other data are as of end-September 2014.
2. Market risk associated with equity investment trusts is excluded from that associated with stockholdings. Credit risk includes foreign currency-denominated risk. Market risk associated with stockholdings, and interest risk (on-balance-sheet transactions) at major banks include foreign currency-denominated risk.
3. "Adequate capital + unrealized gains/losses on securities" is the sum of adequate capital and unrealized gains/losses on securities (tax effects taken into account) for domestic banks.
4. For *shinkin* banks, figures for adequate capital, credit risk, and operational risk in fiscal 2014 are assumed to be unchanged from end-March 2014 levels.
Source: BOJ.

C. Macro stress testing

Macro stress testing models the interrelationship between the financial system 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. While bank capital adequacy as discussed in the previous section is a static comparison of banks' capital and the amount of risk they bear at a certain point in time, macro stress testing is a dynamic and forward-looking examination of the adequacy of capital held by financial institutions, taking into account changes in their behavior under certain stressful conditions.[43]

According to the results of macro stress testing, the financial system is considered to have generally strong resilience against various economic and financial shocks at home and abroad. The last few issues of this *Report* discussed macro stress testing under two stress scenarios: (1) an economic downturn of approximately the same magnitude as that observed at the time of the Lehman shock; and (2) an approximately 2 percentage point rise in long-term interest rates with an economic downturn, and confirmed that Japan's financial system has generally strong resilience against such stresses. As seen in the previous section, the ability of financial institutions to absorb losses has increased from that noted in the previous *Report*, and this conclusion will remain the same as long as we conduct macro stress testing based on the same scenario. Therefore, this *Report* assumes a scenario involving relatively large fluctuations particularly in interest rates at home and abroad as well as in stock prices, taking into account recent changes in financial institutions' risk profiles, namely, progress being made in the diversification of their securities investments. Consequently, it is found that even under this stress scenario, financial institutions' capital adequacy ratios have been maintained above regulatory levels on the whole. In the following, we look in detail at the assumptions for and results of macro stress testing.

1. Overview of macro stress testing

According to the stress scenario set as the assumption for this test, financial market volatility rises substantially when triggered by a certain event, which raises long-term interest rates at home and abroad by around 2 percentage points -- coupled with the yen's

[43] It should be noted that the scenarios assumed in the macro stress testing described in this section are not used to present the most likely projection for Japan's economy and asset prices. Rather, they are aimed at clarifying the characteristics of risks financial institutions face and assessing the resilience of the financial system. The stress testing results outlined in this section should be interpreted with some degree of latitude, as they are calculated based on certain assumptions and omit some elements.

appreciation and a decline in stock prices -- which in turn brings about an economic downturn. This assumption takes into account developments over the past year or so, including the decline in government bond yields of advanced countries -- particularly U.S. and European yields -- to historically low levels, and the decline in yields for a wide range of assets reflecting the strengthening of investors' search for yield activity in a low market volatility environment (Chart II-1-5). As discussed in Chapter V, a rise in volatility has been widely observed in global financial markets since the previous *Report*. Confirming the financial system's resilience against such stresses assumed under this scenario is thus considered useful.

The Financial Macro-econometric Model (FMM), the model utilized in this test, is capable of taking account of the adverse feedback loop between the financial system and the real economy.[44] The FMM used in this *Report* is basically the same as that employed in the previous *Report* in terms of its specifications. However, the previous issue assumed that foreign exchange rates would remain unchanged, whereas this test assumes that funds flow out of emerging economies and the yen appreciates due to a global unwinding of the low interest rate/low volatility environment.[45]

Regarding the period of stress, we assume that stresses occur from the April-June quarter of 2015, and changes through the end of fiscal 2017 are estimated.[46] The subjects of macro testing are banks and *shinkin* banks. Capital adequacy ratios are calculated based on the Basel III requirements for internationally active banks. As for domestic banks including *shinkin* banks, these ratios are calculated in line with the new requirements

[44] Regarding the framework for macro stress testing including the FMM, see Tomiyuki Kitamura, Satoko Kojima, Koji Nakamura, Kojiro Takahashi, and Ikuo Takei, "Macro Stress Testing at the Bank of Japan," BOJ Reports & Research Papers, October 2014.

[45] Under the FMM, the yen's appreciation would adversely affect Japan's financial system on the whole. Specifically, it would affect financial institutions' capital adequacy ratios via the following three channels in particular: (1) a stronger yen depresses nominal GDP and corporate profits through a decline in net exports, which raises credit costs in Japan, thereby pushing down banks' capital adequacy ratios; (2) a decline in corporate profits due to the yen's appreciation in turn depresses stock prices. The decline in stock prices lowers the capital adequacy ratios of internationally active banks through a decrease in unrealized gains on stockholdings. The negative wealth effects due to declining stock prices also depress nominal GDP, which in turn increases credit costs, thereby reducing banks' capital adequacy ratios; and (3) appreciation of the yen reduces the yen-based value of banks' outstanding overseas loans, which in turn reduces the credit risk assets included in the denominator of the capital adequacy ratio, consequently boosting banks' capital adequacy ratios.

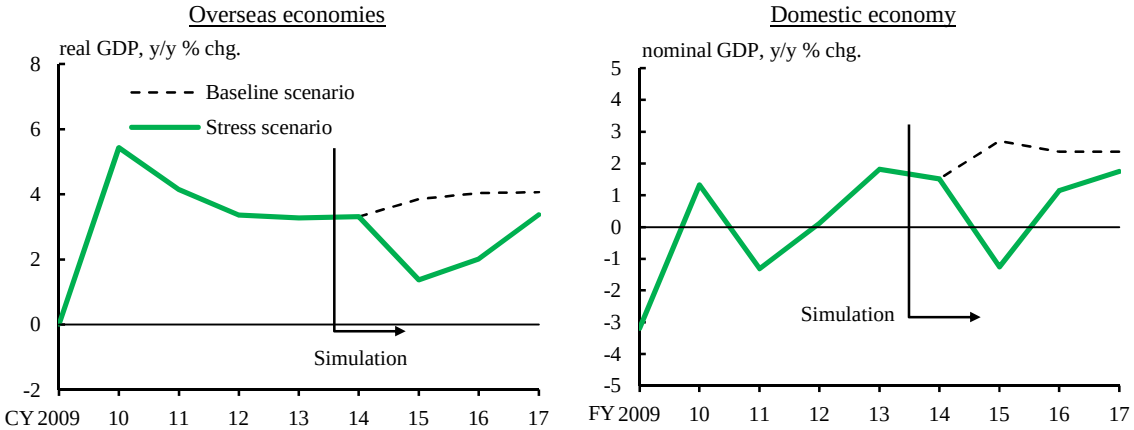
[46] Financial results of banks and *shinkin* banks are available until the end of September 2014 and the end of March 2014, respectively. In this analysis, financial results are estimated until the end of March 2015 using the FMM. Macro stress testing starts from the end of March 2015.

introduced at the end of fiscal 2013.[47]

2. Baseline scenario

Specific assumptions made for the baseline scenario are as follows. The overseas real GDP growth rate would rise moderately from 3.3 percent in 2014 to 4.1 percent toward 2017 (the left-hand side of Chart VI-3-1).[48] The domestic nominal GDP growth rate would rise from 1.5 percent in fiscal 2014 to 2.7 percent in fiscal 2015 and hover at 2.0-2.5 percent through fiscal 2016 and fiscal 2017 (the right-hand side of Chart VI-3-1).[49] 10-year government bond yields in Japan, the United States, and Europe, stock prices, and the exchange rate (the yen's nominal rate against the U.S. dollar) would remain unchanged from the levels observed at the end of September 2014.[50]

Chart VI-3-1: Overseas economies and the domestic economy



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

Under these assumptions, the simulation results are as follows. Because Japan's economy would continue to exhibit relatively high growth from the beginning of the simulation period, firms' financial conditions would continue to improve, which in turn would keep

[47] In calculating capital adequacy ratios based on the Basel III requirements, the phase-in arrangements accompanying the shift from the Basel II requirements are taken into account. Upon implementation of the new requirements for domestic banks, unrealized gains/losses on securities holdings of domestic banks are not reflected in the estimation of these banks' core capital ratios, and the same applies to this section.

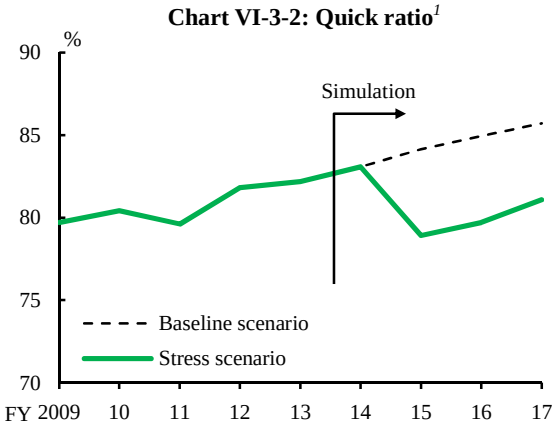
[48] This assumption is based on long-term forecasts made by the International Monetary Fund (IMF) as of October 2014.

[49] This assumption is based on private sector forecasts made in February 2015.

[50] Specifically, it is assumed that 10-year JGB yields stand at 0.53 percent, the TOPIX at 1,326 points, and the exchange rate (the yen's nominal rate against the U.S. dollar) at 109.42 yen/dollar.

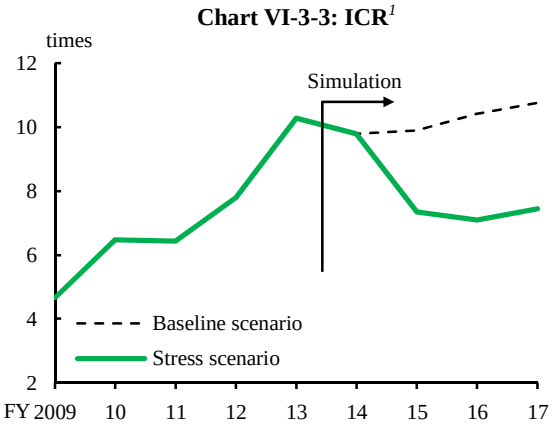
their quick ratios and interest coverage ratios (ICRs) at relatively high levels (Charts VI-3-2 and VI-3-3).[51] The amount of loans outstanding would continue to increase at a relatively fast pace at internationally active banks and moderately at domestic banks (Chart VI-3-4). In this situation, net interest income for both internationally active and domestic banks would continue to increase moderately, while credit costs would remain at low levels (Charts VI-3-5 and VI-3-6). As a result, CET I capital ratios at internationally active banks would rise moderately through fiscal 2017 (Chart VI-3-7). On the other hand, partly because the phase-in arrangements being implemented until completion of the shift to the new regulatory requirements are scheduled to gradually come to an end, domestic banks' core capital ratios would generally remain unchanged. On the whole, however, even in fiscal 2017, they would still stand well above regulatory levels.

Chart VI-3-2: Quick ratio[1]



Note: *1*. Quick ratio = (cash and deposits + bills and accounts receivable + securities) / liquid liabilities.
Sources: Ministry of Finance, "Financial statements statistics of corporations by industry"; BOJ.

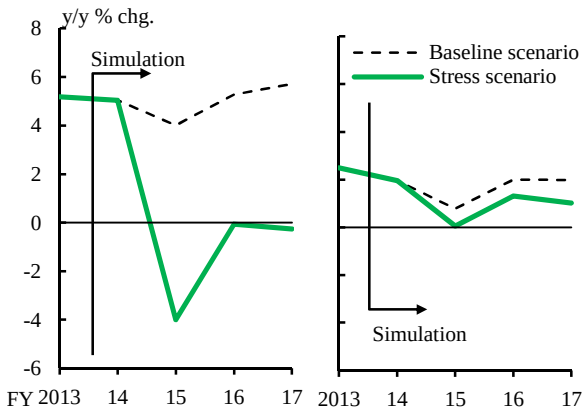
Chart VI-3-3: ICR[1]



Note: *1*. ICR = (operating profits + interest and dividends received, etc.) / interest payments, etc.
Sources: Ministry of Finance, "Financial statements statistics of corporations by industry"; BOJ.

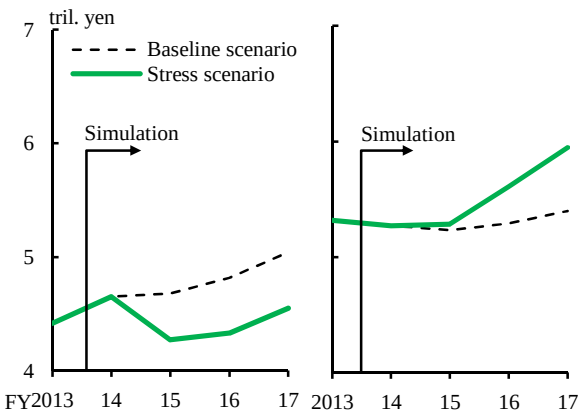
[51] The quick ratio is the ratio of quick assets (cash and deposits, bills and accounts receivable, and securities) to liquid liabilities. The ICR is the ratio of the sum of operating profits and interest and dividends received, etc., to interest payments, etc.

Chart VI-3-4: Loans outstanding[1]



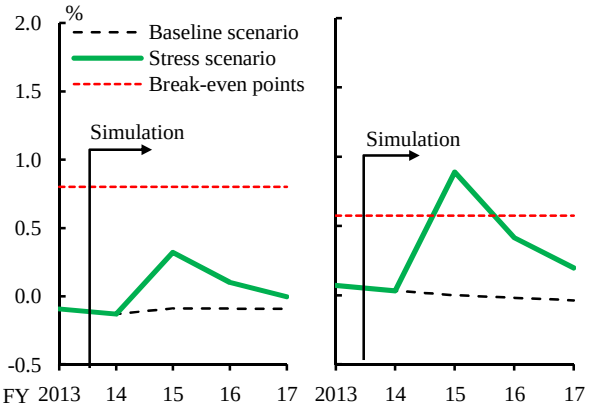
Note: *1*. Banks and *shinkin* banks are counted.
Source: BOJ.

Chart VI-3-5: Net interest income[1]



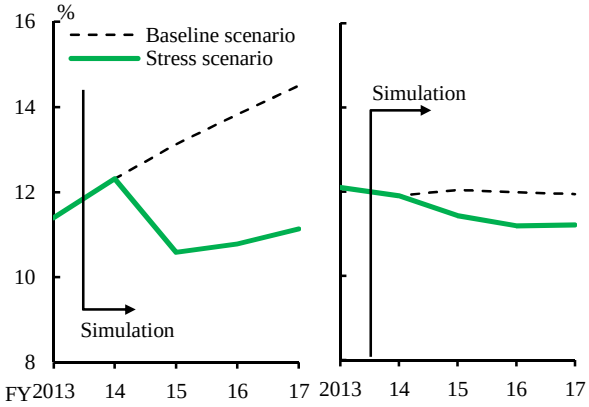
Note: *1*. Banks and *shinkin* banks are counted.
Source: BOJ.

Chart VI-3-6: Credit cost ratio[1]



Note: *1*. Banks and *shinkin* banks are counted. Break-even points are in the first half of fiscal 2014. For *shinkin* banks, they are assumed to be unchanged from fiscal 2013.
Source: BOJ.

Chart VI-3-7: CET I capital ratio and core capital ratio[1,2]



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 core capital ratio of domestic banks. These are taking the phase-in arrangements into consideration.
Source: BOJ.

3. Stress scenario

More details of assumptions made for the stress scenario are as follows. The interest rate yield curve would steepen immediately after the start of fiscal 2015 in Japan, the United States, and Europe. Long-term interest rates on 10-year instruments rise to 2.0 percentage points above the baseline scenario at the beginning of the April-June quarter of 2015, after which they remain unchanged toward the end of fiscal 2017. The exchange rate (the yen's nominal rate against the U.S. dollar) appreciates to 87.8 yen/dollar at the beginning of fiscal 2015, then remains unchanged thereafter. The

growth rate of overseas economies slows from 3.3 percent in 2014 to 1.4 percent in 2015 (the left-hand side of Chart VI-3-1). Meanwhile, the growth rate of the domestic economy slows from 1.5 percent in fiscal 2014 to minus 1.3 percent in fiscal 2015 (the right-hand side of Chart VI-3-1). The downturn in the domestic economy would be greater than that in overseas economies -- given interest rate rises of approximately the same size -- because the domestic economy would be exposed to additional downside risks, namely, the effects of the decline in net exports due to the yen's appreciation, as well as those of the adverse feedback loop between the financial system and the real economy, in addition to the downturn in overseas economies. Stock prices at home and abroad both decline by about 40 percent at the beginning of fiscal 2015 and remain around their respective levels thereafter.[52] Furthermore, we assume a situation in which the deterioration in economic conditions would make it more difficult for financial institutions to raise their loan interest rates than in normal times. We also assume that as market interest rates rise, the correlation between financial institutions' deposit interest rates and market interest rates would become stronger than when interest rates are stable at low levels.[53]

The simulation results based on these assumptions are as follows. Financial institutions would incur unrealized losses on securities holdings due to the decline in bond and stock prices at home and abroad. As firms' profits would decline significantly owing to the economic downturn, firms' financial indicators such as quick ratios and ICRs would deteriorate from fiscal 2015 onward (Charts VI-3-2 and VI-3-3). Thereafter, although firms' profits would pick up and firms' financial indicators would improve in line with the recovery in the domestic economic growth rate, firms' profits and financial indicators would decline from the baseline scenario levels throughout the simulation period. As a result, credit cost ratios would increase in fiscal 2015. Despite a subsequent decline, credit cost ratios would continue to be higher than those in the baseline scenario throughout the simulation period (Chart VI-3-6).

The year-on-year rate of change in loans outstanding at internationally active banks would decline substantially, falling from 5.0 percent in fiscal 2014 to minus 4.0 percent in

[52] The margin of decline in stock prices was set based on the correlation between the exchange rate and stock prices since 2005.

[53] Specifically, for both internationally active banks and domestic banks, we assume 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) would be smaller, while the pass-through of funding interest rates would be larger than the estimation results based on past data. The extent of downward and upward deviations is calculated by adjusting the estimated coefficients of each pass-through rate by about two standard errors.

fiscal 2015 (Chart VI-3-4). At domestic banks, the rate would decline from 2.0 percent in fiscal 2014 to 0.1 percent in fiscal 2015, the rate of decline being lower compared with that for internationally active banks. The higher rate of decline at internationally active banks is attributable to overseas lending representing a greater share of their total lending. Under such conditions, the impact of the deterioration in overseas economic conditions, as well as the shrinking of the yen-based value of overseas loans stemming from the yen's appreciation, would increase, especially with regard to internationally active banks. Meanwhile, while net interest income would fall from the baseline scenario level at internationally active banks, that at domestic banks would increase (Chart VI-3-5). This is because in addition to the steeper decline in outstanding loans at internationally active banks, the outstanding amount of bondholdings representing a greater share of assets on the balance sheets of domestic banks would significantly increase their interest income from bondholdings due to interest rate rises.

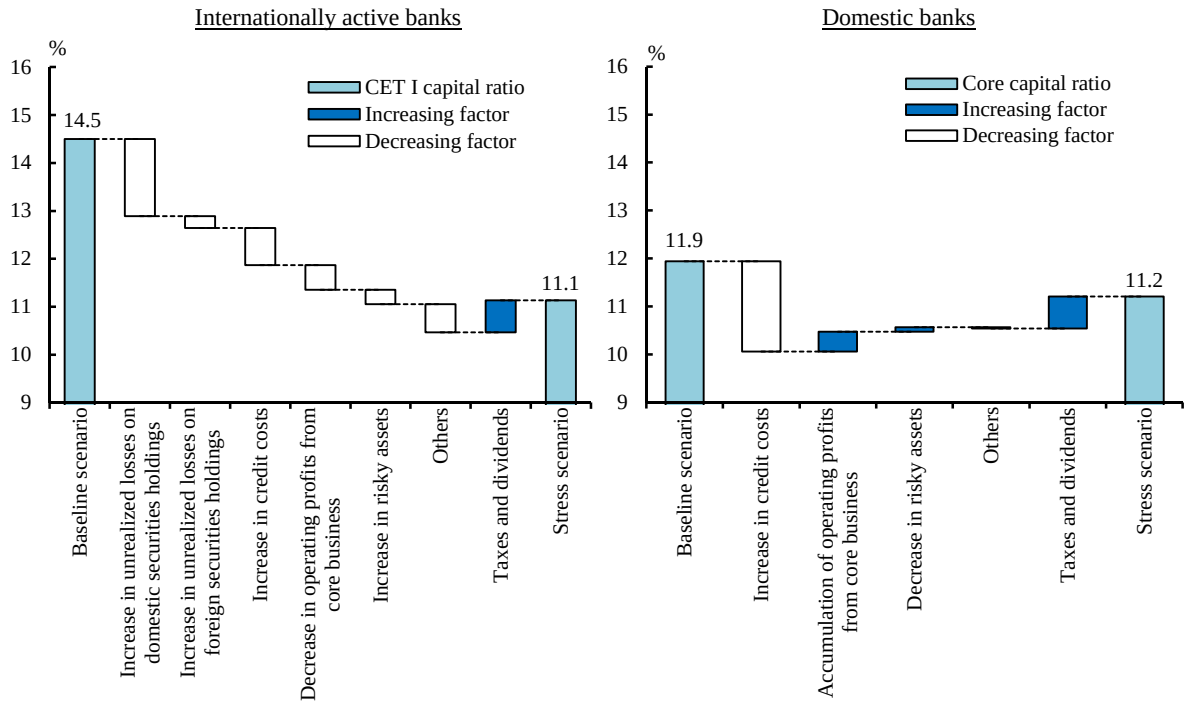
Consequently, the CET I capital ratio for internationally active banks would be 11.1 percent in fiscal 2017, falling by 3.4 percentage points from the baseline scenario of 14.5 percent (the left-hand side of Chart VI-3-8). This change is largely attributable to unrealized losses on securities holdings resulting from declines in bond and stock prices. When comparing unrealized losses on domestic securities with those on foreign securities, the effects of the former are greater than the latter. The occurrence of credit costs due to an economic downturn and the decline in operating profits from core business also play a part in the downward pressure, but their impact is smaller when compared with that of unrealized losses on securities.[54] The finding that capital adequacy ratios would be maintained at considerably high levels -- even under the stress scenario assumed in this *Report* -- is attributable to financial institutions' further enhanced ability to absorb losses, thanks to the accumulation of retained earnings through profits and to an increase in unrealized profits on securities mainly reflecting a rise in stock prices, both of which have taken place since the previous *Report.*

On the other hand, the core capital ratio for domestic banks would be 11.2 percent at the end of fiscal 2017, falling by 0.7 percentage points from the baseline scenario of 11.9 percent. The decline in the core capital ratio for these banks would be mainly caused by the occurrence of credit costs due to an economic downturn. The extent of the contribution of this factor to the decline in the capital adequacy ratios of these banks is

[54] Risk-weighted assets, a component of the denominator of the CET I capital ratio, have increased, partly due to an increase in their risk weighting resulting from a deterioration in loan quality, contributing to a decline in the CET I capital ratio. For details of the FMM's internal mechanism for determining credit risk assets, see Box 4 in the October 2014 issue of the *Report*.

greater than that for internationally active banks (the right-hand side of Chart VI-3-8). However, the extent of the decline in the core capital ratios of domestic banks would be limited, as unrealized losses on securities holdings are not counted in calculating domestic banks' capital, and because an increase in net interest income resulting from an interest rate rise adds to operating profits from core business.

Chart VI-3-8: Decompositions of the CET I capital ratio and the core capital ratio[1,2]



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 2018.
2. The left-hand chart shows the CET I capital ratio of internationally active banks. The right-hand chart shows the core capital ratio of domestic banks. These are taking the phase-in arrangements into consideration.
Source: BOJ.

The above findings indicate that, both at home and abroad, even if long-term interest rates rise by about 2 percentage points and this leads to a decline in stock prices and an economic downturn, financial institutions' capital adequacy ratios on average would be maintained above regulatory levels. Under a stress scenario like the one assumed in this *Report*, the impact of market risks -- such as declines in bond and stock prices -- materializing is greater than that of an increase in credit costs resulting from economic downturns at home and abroad. This is why the negative impact is greater at internationally active banks, for which the regulations require that changes in market prices are directly reflected in their capital calculations.

4. Issues in interpreting the results of macro stress testing

The above results suggest that Japan's financial system generally has strong resilience against various stresses. However, the following three issues should be noted in interpreting the test results.

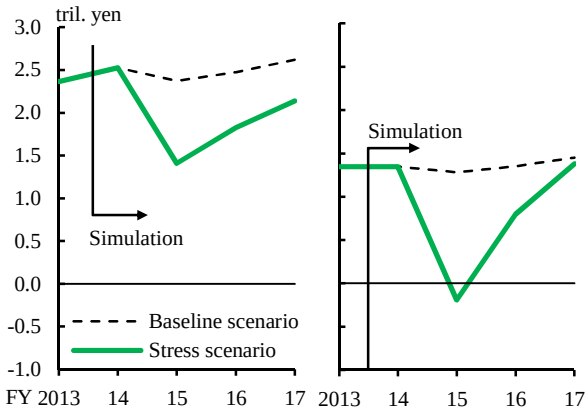
First, it is possible that economic or financial shocks affect the stability of the financial system, depending on their speed and extent, as well as the factors behind them. Specifically, if the pace of a rise in interest rates, or the extent of a decline in stock prices or of an economic downturn, is greater than that assumed under the stress scenario, or if these conditions are prolonged, the negative effects would become more pronounced than those reflected in the findings of this *Report*.

Second, it is possible that the negative effects would be greater than those indicated by this test in the event of a dramatic decline in market liquidity, the concentration of unwinding of risks, or credit contraction among financial institutions. All of these are important elements in assessing the stability of the financial system from a macroprudential perspective. However, the FMM used in this test does not incorporate these mechanisms. Possible future directions to take in incorporating this kind of mechanism include explicit modeling of the propagation of shocks among financial institutions, as well as network simulation analysis. Meanwhile, if market participants including institutional investors behave differently from banks and *shinkin* banks in their risk taking, it is possible that their behavior would mitigate the negative effects described above and contribute to stabilizing the financial system.

Third, even if financial institutions' capital adequacy ratios are above regulatory levels, when stresses intensify, it is possible for financial institutions' risk-taking stance to weaken or for the financial intermediation function to decline to an extent beyond that assumed under this model, mainly as a result of banks recording net losses in their financial statements or financial institutions incurring unrealized losses on securities. The stress testing presented in this *Report* assumes that the functioning of financial intermediation will not be constrained as long as capital adequacy ratios exceed regulatory levels. Nevertheless, financial institutions' net profits under this stress scenario indicate that the number of banks recording net losses would increase, particularly in fiscal 2015 when stresses would intensify (Charts VI-3-9 and VI-3-10). Moreover, although unrealized losses on securities are currently treated in such a way that they do not affect capital adequacy ratios at domestic banks, the losses such banks would incur under this stress scenario are considerable (Chart VI-3-11). Attention needs to be paid to the possibility that an increase in unrealized losses will affect financial

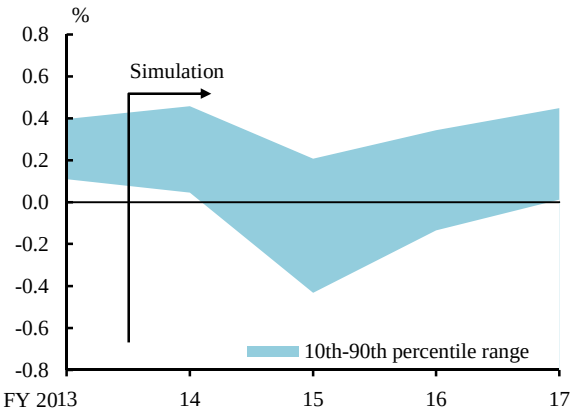
institutions' risk-taking stance, even in the case of domestic banks, as unrealized losses are disclosed in financial results and elsewhere and affect banks' returns to shareholders.

Chart VI-3-9: Net income[1]



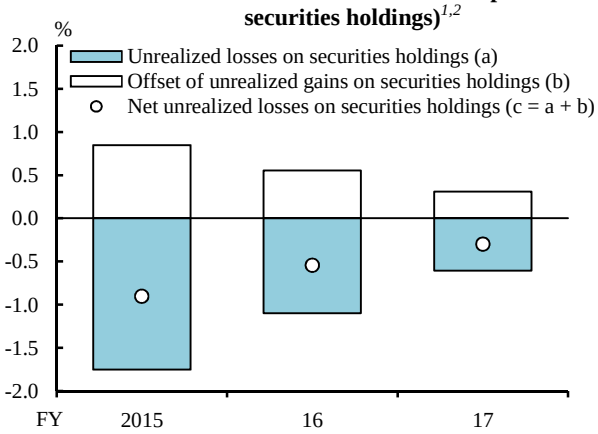
Note: *1*. Banks and *shinkin* banks are counted.
Source: BOJ.

Chart VI-3-10: Net income ROA distribution[1,2]



Notes: *1*. Banks and *shinkin* banks are counted.
2. The vertical axis shows net income ROA.
Source: BOJ.

Chart VI-3-11: Domestic banks' core capital ratio (assuming realizing of unrealized losses on securities holdings)[1,2]



Core capital ratio	FY 2015	16	17
Stress scenario (d)	11.4	11.2	11.2
Assuming realizing of unrealized losses on securities holdings (e)	10.5	10.6	10.9
Net unrealized losses on securities holdings (c = e - d)	-0.9	-0.5	-0.3

Notes: *1*. Banks and *shinkin* banks which hold net losses on securities holdings assuming unrealized gains on securities holdings are counted.
2. Core capital ratios assuming realizing of unrealized losses on securities holdings are calculated in each fiscal year. "Unrealized gains or losses on securities holdings" are calculated without taking account of tax effects.
Source: BOJ.

VII. Toward ensuring financial stability in the future

Changes from the previous Report

With regard to financial intermediary activities, (1) financial institutions enhanced their risk-taking stance in terms of domestic and overseas lending as well as securities investment; (2) households and institutional investors gradually proceeded with a shift from safe assets to other types of risky assets regarding their asset portfolio choices and investments, respectively; and (3) domestic stock prices have clearly risen, and real estate transactions have been actively undertaken, albeit with regional differences. **Financial intermediation as a whole has operated more smoothly than before, although signs of financial imbalances such as indications of overheating or excessively bullish expectations have not been observed.**

Regarding financial institutions' financial bases (i.e., capital, funding liquidity), (4) financial institutions continued to accumulate capital, mainly due to the increase in retained earnings, and unrealized gains on securities increased, due primarily to a rise in stock prices. The macro risks to which financial institutions are exposed and their financial bases are well balanced. Therefore, **Japan's financial system generally has strong resilience, measured by its loss absorption capacity and liquidity buffers, against stresses.**

Nevertheless, (5) commodity prices declined substantially, and **volatility** in global financial markets **has risen across a wide range of instruments**. The rise in market volatility has spilled over into the domestic markets to some extent.

Challenges from a macroprudential perspective

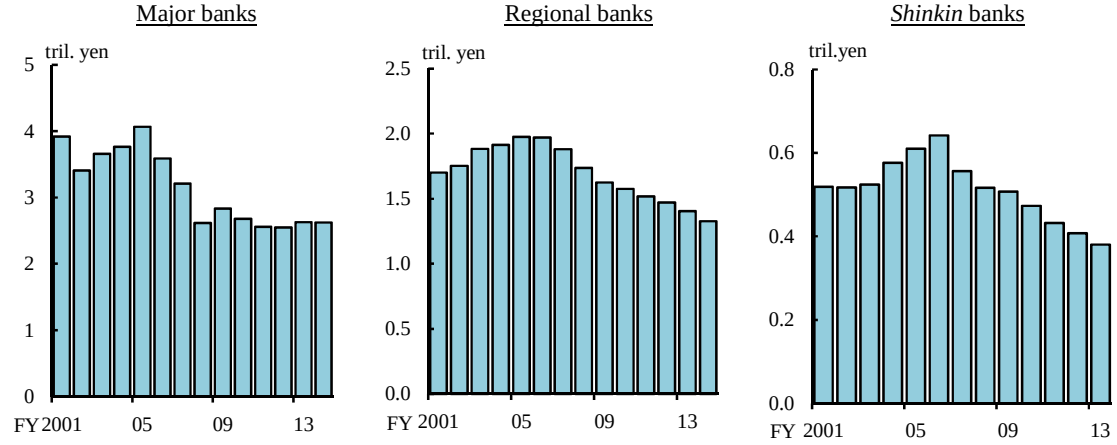
Japan's financial system has been maintaining stability. In order to ensure the stability in the future, continued efforts are necessary to keep the fine balance between macro risks to which financial institutions are exposed and their financial bases, while steadily responding to structural changes in risks that might become the source of future fragility for the system.

Points to which attention should be paid in view of the accumulation of macro risks are: (1) the strengthened connection between Japan's financial system and overseas markets due to the expansion of international operations among financial institutions (i.e., an increase in overseas exposure); (2) the increased importance of market investment in

ALM (i.e., an increase in market exposure). To date, financial institutions have reined in these risks, together with other risks, to an appropriate degree relative to their financial bases. Nevertheless, these developments reflect a decline in profitability and an expansion of the loan-deposit gap for domestic operations and this trend is likely to continue. The accumulation of macro risks may enhance the negative effect when the unwinding of such accumulated risks becomes concentrated or feedback from the real economy kicks in. Therefore, from a macroprudential perspective, a focus should be kept on maintaining a balance between financial institutions' risks and their financial bases.

Points to focus on in view of structural changes in risks are: (3) the increased systemic importance of large financial institutions; and (4) the decline in profitability with regard to domestic deposit-taking and lending activities, especially for regional financial institutions (Chart VII-1-1).

Chart VII-1-1: Profits from core business by type of bank[1,2]



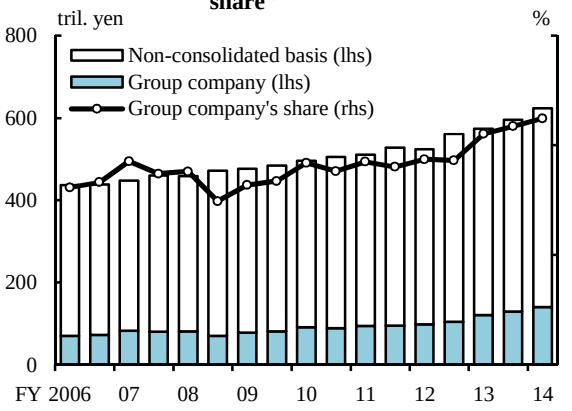
Notes: *1*. The latest data for banks are as of the first half of fiscal 2014 (annualized); those for *shinkin* banks are as of fiscal 2013.
2. Profits from core business after fiscal 2012 are calculated without profits due to cancellations of investment trusts.
Source: BOJ.

At large financial institutions, growth in firm size and the diversification of operations, profit sources, and risks have proceeded in a situation whereby they have promoted active financial strategies among group companies, including mergers and acquisitions overseas. At the same time, the interconnectedness of large financial institutions both at home and abroad and the routes by which risks propagate have grown in complexity, mainly through derivatives and funding transactions (Charts VII-1-2 to VII-1-5, see Box 6).[55] In light of their large role in both financial intermediation and the markets, stable

[55] In this context, "large financial institutions" are not limited to "Global Systemically Important Banks (G-SIBs)"; rather, they include so-called major banks, as well as securities companies that have expanded their international operations to a considerable extent.

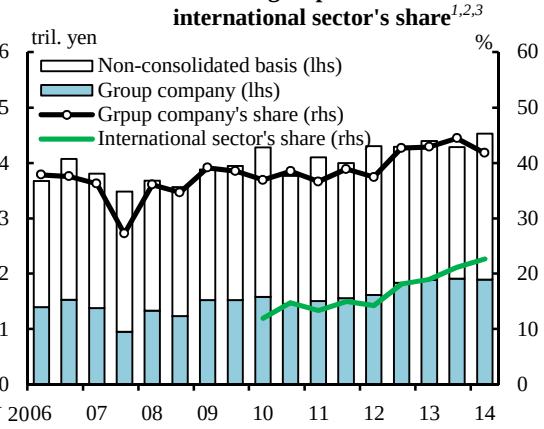
business management practices among large financial institutions are also crucial for achieving stability in the financial system and the economy. Thus, from a macroprudential perspective, gaining an accurate grasp of and forming appropriate responses to the aforementioned risk characteristics, in addition to the steady implementation of international financial regulations, become important tasks.

Chart VII-1-2: Assets of three major financial groups and group company's share[1,2]



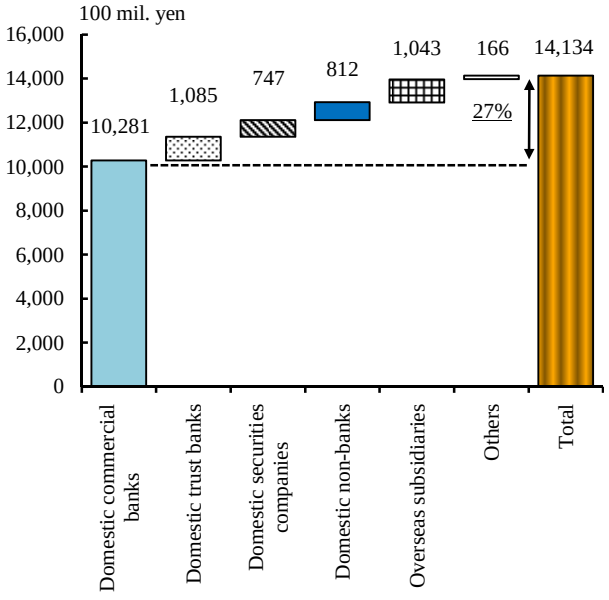
Notes: *1.* Three major financial groups are counted. The latest data are as of the first half of fiscal 2014.
2. "Group company" figures are differences between whole group companies and non-consolidated basis figures.
Source: BOJ.

Chart VII-1-3: Gross profits of three major financial groups and international sector's share[1,2,3]



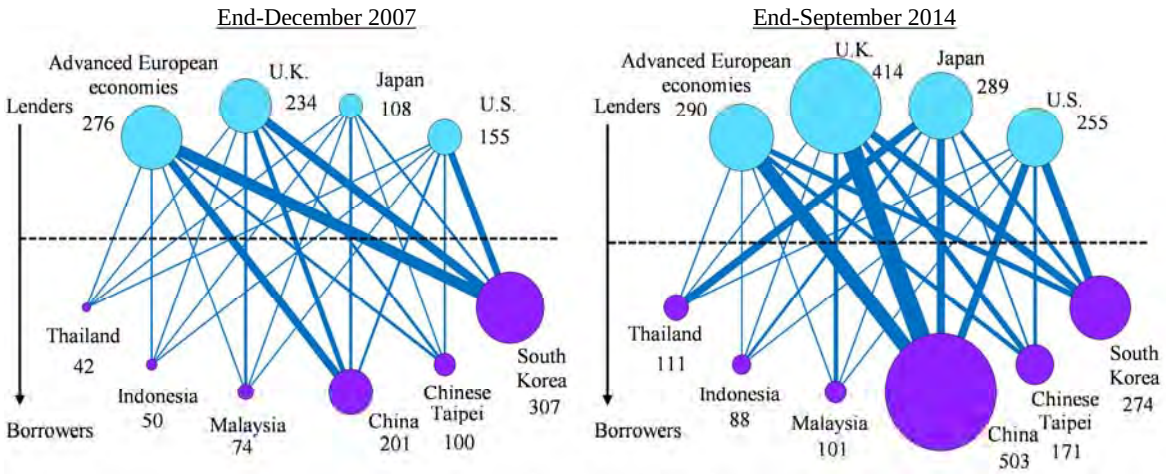
Notes: *1.* Three major financial groups are counted. The latest data are as of the first half of fiscal 2014.
2. "Group company" figures are differences between whole group companies and non-consolidated basis figures.
3. Figures for the international sector are aggregated for each company's gross profits from the customer division. Figures for MUFG is based on financial groups consolidated basis. Figures for SMFG is based on consolidated banking basis. Figures for Mizuho FG is based on non-consolidated basis.
Sources: Published accounts of each group; BOJ.

Chart VII-1-4: Consolidated and non-consolidated net profit differences for three major financial groups[1]



Note: *1.* The data are as of the first half of fiscal 2014.
Sources: Published accounts of each group.

Chart VII-1-5: Interconnectedness of Asian economies and the banking sectors of advanced economies[1,2]



Notes: *1*. The circles in the upper part of the charts stand for banking sectors of lenders' economies ("Advanced European economies" is comprised of Germany, France, the Netherlands, and Switzerland), and the circles in the lower part of the charts stand for borrowers' economies. The size of each circle for banking sectors of lenders' economies reflects the amount of loans to Asian economies in the lower part, and the size of each circle for borrowers' economies reflects the amount of borrowing from banking sectors of advanced economies in the upper part. The thickness of a line is proportional to the amount extended from a banking sector of a lender's economy to an Asian economy. Some data for the U.K. as of end-December 2007 are those of end-March 2008. This chart is based on foreign claims (immediate borrower basis).

2. Figures in the chart indicate the amount of lending by each banking sector or the amount of borrowing by each economy, respectively (bil. U.S. dollars).

Source: BIS, "Consolidated banking statistics."

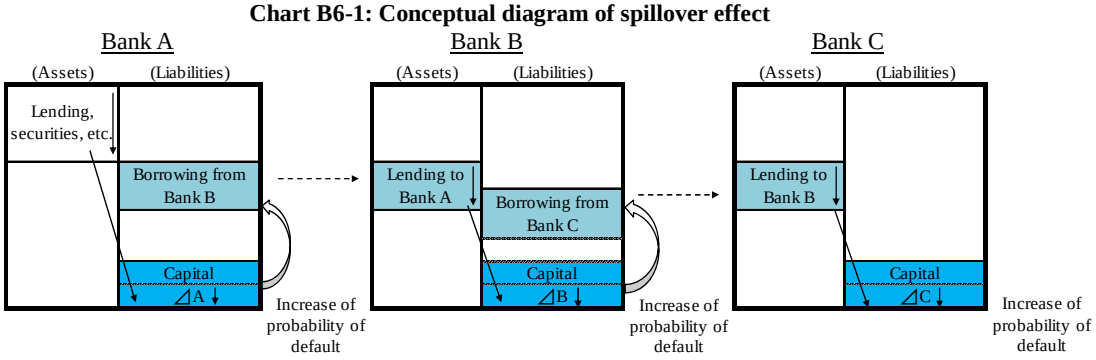
Box 6: Network simulation analysis

In general, financial and economic shocks -- declines in stock prices, for example -- have a negative impact on individual financial institutions' balance sheets through losses they incur (the first round effect), and this impact is sometimes amplified through transactions among financial institutions (the second round effect). There are various channels and mechanisms related to amplification effects. For instance, when a liquidity problem occurs at a particular financial institution, it can spread to other financial institutions in a relatively short time. Alternatively, when a loss incurred by a particular financial institution is substantial and thus brings about a review of the institution's creditworthiness -- such as downgrading of its credit rating -- risk premiums on interbank credit extension may rise and cause secondary losses to other financial institutions: a possible channel through which the first round effect may be amplified. In the following discussion, focusing on the latter case, a financial system model reflecting actual trading relationships associated with interbank lending among Japanese banks is built, and a network simulation analysis is conducted using the model to measure the extent to which losses will actually spread.

The trading relationships considered in the model are briefly described as follows (Chart B6-1). The financial system consists of Banks A, B, and C, and it is assumed that the assets of Bank A deteriorate due to an exogenous factor (e.g., the occurrence of an

unrealized loss on the bank's securities holdings). When the trading relationship associated with interbank lending is not taken into account, the loss in the financial system will be ΔA, which is the amount by which Bank A's capital is impaired. However, the decline in Bank A's capital raises the probability of the bank defaulting, which increases the risk premium, which in turn reduces the market value of credit extended to Bank A. This means that if Bank B is extending credit to Bank A, the market value of its capital falls by ΔB. Moreover, if Bank C is extending credit to Bank B, its capital is also impaired by ΔC in the same fashion. Thus, when trading relationships are taken into account, the impact of the deterioration of assets at Bank A on the financial system is the sum of ΔA, ΔB, and ΔC.

Chart B6-1: Conceptual diagram of spillover effect



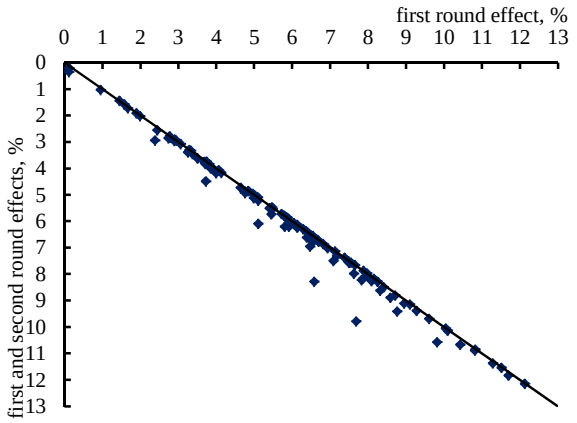
In the stress scenario, it is assumed that a rise in yen interest rates causes a financial institution to incur an unrealized loss on its bondholdings. A simulation is conducted to analyze not only the direct impact on the financial institution's financial soundness (the first round effect) in the wake of a rise in interest rates, which operates through unrealized losses on its bondholdings, but also the extent to which the first round effect spreads to other financial institutions through trading relationships associated with interbank lending (the second round effect).[56] The presence or absence of trading relationships and the magnitude of such relationships among the financial institutions are set so that they are consistent with trading data for Japan's interbank markets.[57]

[56] Based on the analytical method adopted by the Bank for International Settlements (BIS) and others in 2013 in their assessment of the impact of regulations on over-the-counter (OTC) derivatives, this model measures the knock-on effects of the stress event through changes in the number of defaults and probabilities of default among financial institutions. However, there are many methods of network analysis, some of which limit the impact transmission channels they take into account, and thereby ignore knock-on effects through changes in the probability of default. For the BIS study, see BIS, "Macroeconomic Impact Assessment of OTC Derivatives Regulatory Reforms," a report prepared by the Macroeconomic Assessment Group on Derivatives, August 2013. For details of the analytical method, see Tomohiro Ota, "Marginal Contagion: New Approach to Systemic Credit Risk," mimeo, 2014.

[57] This simulation covers both internationally active banks and domestic banks. For domestic banks, the current regulations stipulate that unrealized losses on bondholdings are not to be reflected in their

The horizontal axis in Chart B6-2 shows the extent of unrealized losses on bondholdings caused by a 3 percentage point upward shift in yen interest rates (on risk assets, the first round effect). The vertical axis, on the other hand, shows the total loss (the first round effect + the second round effect), which is the first round effect plus additional knock-on effects which spread through trading relationships (the second round effect). This means that the lower the position in the chart, the larger the second round effect. The chart shows that for some financial institutions, the second round effects on total losses are too large to be ignored. This means that the total loss across the financial system as a whole will increase to the extent to which the second round effect is present.

Chart B6-2: Results of analytical network simulation[1,2,3]



Notes: *1*. Major banks and regional banks are counted.
2. Financial information for each financial institution and the network structure of transactions are as of fiscal 2012.
3. In the chart, the horizontal axis indicates each financial institution's capital losses on bondholdings standardized by the amount of risk weighted asset of each financial institution in the case of a 3 percentage point rise in interest rates, and the vertical axis indicates each financial institution's spillover effects added to capital losses on bondholdings standardized by the amount of risk weighted asset of each financial institution in the case of a 3 percentage point rise in interest rates.
Source: BOJ.

This analysis uses recent trading data for Japan's interbank markets to show the degree of connectivity among financial institutions. However, interbank transactions have generally been lackluster in recent years when viewed from a long-term perspective. Therefore, in some phases of the economic environment, knock-on effects exerted through the interbank markets may prove to be greater than those found in this study. In addition, this analysis covers only transactions involving Japanese banks and not those involving foreign financial institutions or Japanese securities companies. Furthermore, in addition to Japan's interbank markets, there are reciprocal credit-extension relationships that exist through various overseas funding markets, stockholdings, bond investments, and derivatives transactions. At present, the availability of usable data is limited, but if the various relevant data are brought together in the future, more comprehensive studies will be possible.

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capital. In order to assess the negative impact on the financial system on the high side, however, unrealized losses on bondholdings included in the capital of these banks are computed on an economic value basis.

On the other hand, while the current low interest rate environment is an important factor underlying the decline in profitability among domestic deposit-taking and lending activities, structural factors such as the reduced economic vitality of Japan and its regions against the background of population decline also play a role (see Box 7 for details). In particular, considering that regional financial institutions generally remain heavily dependent on domestic activities for which deposit-taking and lending are a source of their profits, a prolongation of such reduced economic vitality might restrain their capacity to absorb losses and take risks. It is therefore an important challenge for financial institutions to continue and enhance their efforts to steadily support the vitality of industries and firms.

Box 7: The profitability of domestic deposit-taking and lending activities

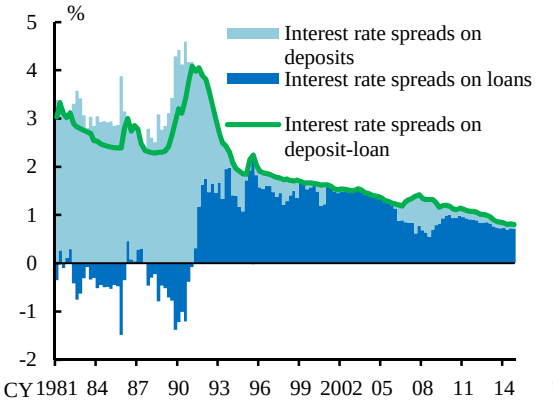
Interest rate spreads on domestic deposits and loans of financial institutions have continued shrinking since the collapse of Japan's economic bubble. When interest rate spreads between domestic short-term deposits and loans are divided into "deposit spreads," or "the profit margin on funds taken as deposits and invested in the markets," and "loan spreads," or "income from funds raised in the markets and applied to making loans," the following characteristics emerge. (1) Against the backdrop of the lifting of deposit interest rate regulations coupled with persistently low interest rates, deposit spreads have been near zero since the 1990s; (2) subsequently, the fluctuations in interest rate spreads between deposits and loans have moved in parallel with those on loan spreads, other than during a period in which market interest rates temporarily rose in the mid-2000s (Chart B7-1).

When fluctuations in loan spreads are broken down into a secular (permanent) component and a cyclical component by applying a structural VAR time-series method with long-run restrictions, it reveals that a substantial part of the decline since the mid-2000s can be attributed to the secular component (Charts B7-2 and B7-3).[58] Although the analysis does not allow for the causes of this development to be identified, it may well be that the secular decline in loan demand and the shrinking of risk premiums due to improvements in the financial bases of borrower firms are responsible for this finding. In addition, the decline in credit costs resulting from the recent

[58] Cyclical factors include, for example, an increase in credit costs during an economic downturn and a decrease in such costs during an economic upturn. On the other hand, other shocks that explain the stochastic trend in spreads constitute the secular component. For details of the analytical method, see Hitoshi Mio, "*Saikin no kashidashi supureddo shukusyo no haikei wo meguru bunseki –jikeiretsu bunseki ni motozuku yoin bunkai* (A time series analysis for the recent shrinking of loan spreads – an SVAR approach)," Bank of Japan Review, No. 07-J-6, 2007.

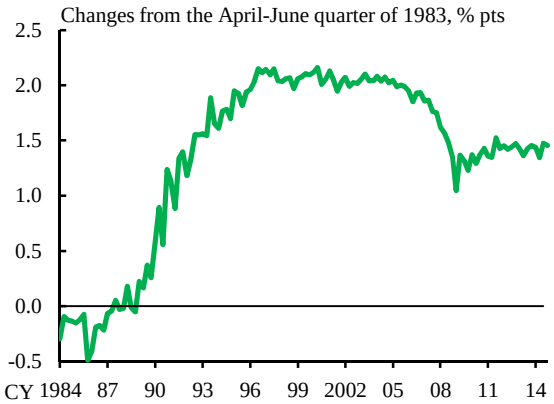
economic upturn may be playing some role in the current decline in loan spreads as a cyclical factor.

Chart B7-1: Decomposition of interest rate spreads on short-term deposit-loans[1,2]



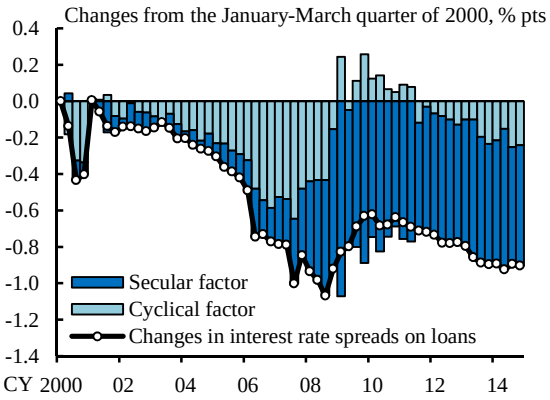
Notes: *1*. Domestically licensed banks are counted. The latest data are as of the October-December quarter of 2014.
2. Interest rates on loans are average contract interest rates on short-term loans and discounts (stock basis). Deposit rates are 3-month interest rates on deposits and savings. Market rates are 3-month interest rates of NCDs until March 1990, and, are 3-month interest rates on Euroyen LIBOR after that period.
Sources: Bloomberg; BOJ.

Chart B7-2: Secular component of interest rate spreads on loans[1]



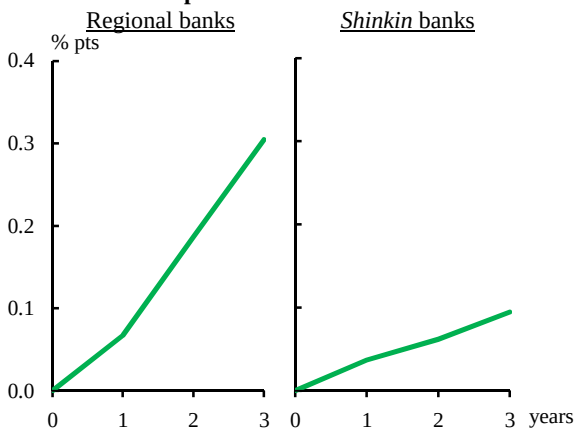
Note: *1*. The latest data are as of the October-December quarter of 2014.
Sources: Bloomberg; BOJ.

Chart B7-3: Decomposition of changes in interest rate spreads on loans[1]



Note: *1*. The latest data are as of the October-December quarter of 2014.
Sources: Bloomberg; BOJ.

Chart B7-4: Net profits on loans for upward interest rates shift with economic improvement[1,2]



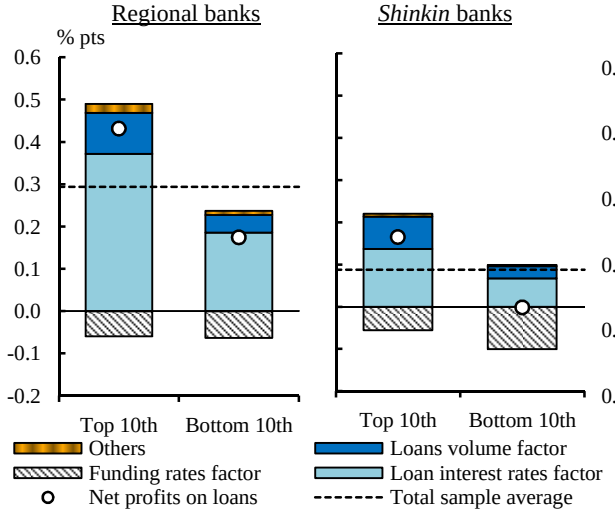
Notes: *1*. The vertical axes show deviations of net profits on loans standardized by total assets from the baseline. The data are projected using the Financial Macro-econometric Model.
2. A 2 percentage point steepening in interest rates with economic improvement for the first year is assumed.
Source: BOJ.

As for the future, as the Japanese economy overcomes deflation and the yield curve

gradually steepens, it is reasonable to expect (1) an increase in interest income from bond investment accompanied by (2) a gradual improvement in deposit spreads and long-term loan spreads (Chart B7-4).

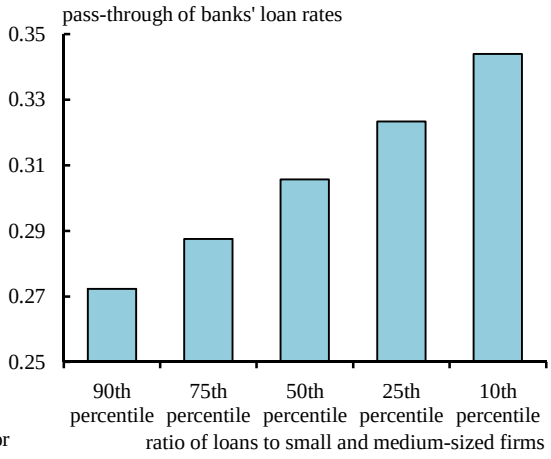
Nevertheless, even if the above scenario is realized, it may be that among financial institutions at which small- and medium-sized enterprises represent a large share of their loan portfolios, the profit improvements will remain moderate, as they find it difficult to pass increases in market interest rates on to loan interest rates. Therefore, heterogeneous improvements in regional financial institutions' profits are expected (Charts B7-5 and B7-6).

Chart B7-5: Differences in improvements in net profits on loans[1,2,3]



Notes: *1*. The vertical axes show deviations of net profits on loans standardized by total assets from the baseline. The data are projected using the Financial Macro-econometric Model.
2. A 2 percentage point steepening in interest rates with economic improvement for the first year is assumed.
3. In the left-hand chart, the top 10th and bottom 10th are composed of regional banks with deviations in net profits on loans standardized by total assets in the top 10th percentile range and the bottom 10th percentile range among regional banks in the third year, respectively. In the right-hand chart, the top 10th and bottom 10th are composed of *shinkin* banks in the same area as regional banks.
Source: BOJ.

Chart B7-6: Pass-through of banks' loan rates and loans to small and medium-sized firms ratio[1,2,3]



Notes: *1*. Major banks and regional banks are counted.
2. The vertical axis indicates the pass-through of long-term loan rates (a year after the market rate rise).
3. The horizontal axis shows the pass-through estimated by adjusting the loans to small and medium-sized firms ratio, other things being equal.
Source: BOJ.

In addition, attention needs to be paid to developments in (5) changes in households' asset portfolio choices; and (6) the implementation of international financial regulations, as they may influence the stability of the financial system.

Changes in households' asset portfolio choices -- for example, the gradual shift from

deposits to risky assets that has recently developed -- will affect financial institutions' loan-deposit balance, as well as their risks and profits structure from a longer-term perspective. Moreover, revised international financial regulations are in the process of implementation. As they basically enhance the robustness of the international financial system, steady adaptation to these regulations is a requirement. During the implementation and transition process over the next few years, however, the functioning of the financial system and financial markets might be affected through the following channels: (1) major revisions to the organizational structures and business strategies of internationally active financial institutions; and (2) changes in the financial intermediary activities of domestic financial institutions, reflecting domestic implementation of the aforementioned revisions.

Management tasks and challenges for financial institutions

Based on the above macroprudential challenges, the following three points can be raised as key management tasks and challenges for individual financial institutions.

First, financial institutions need to strengthen their ability to respond to risks in areas in which financial institutions are actively enhancing their risk-taking stance. Chapter IV discussed the situation surrounding risks from a macroprudential perspective and management tasks and challenges. Financial institutions need to respond appropriately to these tasks and challenges in accordance with their risk profiles.

Regarding overseas operations in particular, the securing of a stable foreign-currency funding base and the strengthening of credit risk management in response to an expansion of foreign assets are matters of notable importance. As for investment in markets, the execution of appropriate risk taking and management practices following crystallized ALM policies is necessary as risk diversification has continued, with interest rate risk being maintained at high levels from a long-run time-series perspective. In addition to the aforementioned wide-ranging effects of international financial regulations, financial institutions need to appropriately consider factors such as the rise in volatility and the decline in commodity prices recently observed in global financial markets, as well as downside risks in emerging economies.

Second, large financial institutions need to appropriately deal with their systemic importance. While steadily complying with international financial regulations, large financial institutions are required to engage in efforts to achieve the following: (1)

gaining and maintaining an accurate grasp of global, complex risks in a timely manner, and strengthening the ability to utilize the findings in business management; (2) establishing a robust capital base and securing funding liquidity, both of which are capable of ensuring stability in business management even under various stressful conditions. Furthermore, with a view to increasing Japan's industrial strength, (3) working to achieve corporate mergers and acquisitions and business restructuring, and assistance programs such as those for the reconstruction of poorly performing firms, through a wide range of corporate finance-related businesses are also important matters.

Third, regional financial institutions need to respond to the decline in core profitability. Devising more specific measures to enhance medium- to long-term profitability, including those contributing to a heightening of growth potential among regional economies, becomes the key issue. Specifically, it is necessary to strive to address the following issues: (1) accurate analysis of the current situation regarding and the outlook for their own customer bases and profitability, thereby establishing management and business strategies; and (2) enhancement of the financial intermediation function -- including investments and loans in growing businesses, business reconstruction and spurring of industrial restructuring, and financing of public-private partnerships (PPP) -- and the strengthening of financial tools as well as risk management to make this possible.

Actions by the Bank of Japan

The Bank will continue to grasp facts and to analyze the situation surrounding the financial system, including the accumulation of macro risks and structural changes among them, as well as to examine resilience against stresses. Based on these activities, it will work to share a common understanding and to hold discussions with a wide range of stakeholders in the financial system, presenting specifics on matters including where risks lie and what issues to tackle, thereby responding appropriately to given circumstances. With regard to research and analysis, the Bank will deepen its analysis regarding issues including the feedback loop between the real and financial economies and the interconnectedness of financial institutions, while obtaining data for this purpose.

Through its off-site monitoring and on-site examinations, the Bank, with a view to securing the soundness of financial institutions, will gain an accurate understanding of the situation surrounding a wide range of business operations and assets, share a

common understanding of existing management challenges with financial institutions, and encourage the necessary responses. Alongside these efforts, while following a broad range of proactive financial intermediary activities that utilize the accommodative conditions brought about by QQE, the Bank will exchange views with financial institutions while strengthening its grasp of the actual situation regarding the following points, particularly from the perspective of responding to the tasks raised in this *Report*.

(1) financial institutions' international operations: overseas business strategies by country, region, and currency; loan portfolios; investment and funding structure, etc.;

(2) financial institutions' ALM and investment in markets: understanding various risks in a timely manner; risk management, including the utilization of dynamic methods such as scenario analysis, etc.;

(3) large financial institutions' systemic-risk characteristics and their business management: the advancement of business management methods; developments in management information systems; the utilization of stress testing; improving and enhancing various contingency and recovery plans, etc.;

(4) regional financial institutions' profitability: the current situation regarding and the outlook for their customer bases and profitability; responses from the management side taking these factors into account, etc.;

(5) financial institutions' efforts to increase industrial strength; efforts toward enhancing the vitality of their client firms, etc.;

(6) market-related businesses conducted by financial institutions and securities firms (e.g., market making, intermediary activities and management of related risks); developments in sales of financial products.

Furthermore, the Bank will promote the sharing of awareness of issues and know-how by holding seminars and other events on themes that contribute to enhancing the functioning of financial intermediation and of business and risk management. For the time being, the Bank will take up issues including assistance programs to enhance the vitality of firms, such as the financing of PPPs and support for start-up businesses, the advancement of financial businesses through IT development, methods for forming financial institutions' medium-term profit outlooks, and corporate governance. With regard to international financial regulations, the Bank will contribute to the process of

establishing standards and implementing them, taking into account the current situation in Japan's financial system and macroeconomic effects induced by such regulations. The Bank will also work to strengthen its ties with overseas central banks and other organizations, in order to gain a deeper understanding of regulatory developments in each country and how financial institutions conduct their global business operations.

Annex: Glossary

Financial statements of financial institutions

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

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

Core capital ratio = core capital / risky assets

Core capital includes common equities and retained earnings as well as equities such as preferred equities that meet certain conditions.

Risky assets are financial institutions' risk-weighted assets.