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Bank of Japan

**New Frontier of Macroprudential Policy:
Addressing Financial Institutions' Low Profitability
and Intensified Competition**

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I. Introduction

Japan's financial crisis was reaching its climax 20 years ago in 1997. In November of that year, four financial institutions, including a major one, failed in succession in a single month, a period later referred to as Dark November.¹ I clearly remember that this was when Japan's financial system was on the verge of a meltdown. Since the comprehensive safety net for financial system stability was underdeveloped at that time, which is not the case today, the Bank of Japan bore the heavy load of taking measures to stabilize the financial system, including the so-called *Tokuyū* (special loans). While we barely managed to avert a financial meltdown, the Bank suffered credit losses of about 200 billion yen from the *Tokuyū*. Following this painful experience of the bursting of the bubble in the 1990s, Japan's safety net has developed greatly, and it now protects financial system stability against failures of not only deposit-taking financial institutions but also securities companies, insurance companies, and financial holding companies.

Thus, in Japan, crisis management tools have been expanded based on the lessons learned during the financial crisis. At the same time, the importance of having a policy to prevent a financial crisis from materializing by detecting the accumulation of financial imbalances became recognized. In order to maintain the stability of the financial system, it is not necessarily sufficient to adopt measures based on the microprudential perspective of identifying risks borne by individual financial institutions and encouraging improvement in their business activities. It is also important to take measures based on the macroprudential perspective of assessing risks of the whole financial system with due consideration to the interconnectedness of the real economy, financial markets, and behavior of financial institutions. Such importance of macroprudential policy became widely recognized around the globe when the global financial crisis jolted the world economy 10 years after Japan's financial crisis. Today, I will talk about macroprudential policy and its challenges while touching on the Bank's experiences thus far and the recent situation of Japanese financial institutions.

Financial crises do not always emerge in the same form. Thus, we should bear in mind that signs of financial crises will lurk in various forms depending on economic and financial

¹ In November 1997, four financial institutions -- namely, Sanyo Securities, Hokkaido Takushoku Bank, Yamaichi Securities, and Tokuyo City Bank -- went bankrupt in succession.

conditions of the time. It is important to accurately assess such potential vulnerabilities of the financial system from a macroprudential perspective and take appropriate policy measures. Even if these measures are extraordinary or unconventional based on historical standards, the Bank should take these measures when necessary to ensure financial system stability.

At present, Japan's financial system is maintaining stability, but I think that attention should be paid to the potential vulnerabilities. That is what I will talk about today; more specifically, the problem of financial institutions' low profitability and intensified competition, with a main focus on regional financial institutions. This problem is closely related to Japan's structural problems, such as a decline in population and the number of firms, and it is a phenomenon that advanced economies have never experienced before (Chart 1). In this sense, the impact of financial institutions' low profitability and intensified competition arising from the decline in population and the number of firms is a financial vulnerability that takes a totally different form from the past. Regional financial institutions need to appropriately address this issue in order to continue to play an important role in supporting the regional economy. The Bank also has to explore a new frontier of prudential policy by itself.

II. Assessment of Systemic Risk

Before going into a detailed explanation about the potential vulnerabilities of Japan's financial system, let me first talk about macroprudential policy.

If the financial cycle becomes large in magnitude or many financial institutions become more interconnected by increasing common exposure or forming mutual asset-liability arrangements, systemic risk will emerge and spread within the financial system. The objective of macroprudential policy is to strengthen the resilience of the financial system and contain systemic risk.

In order to implement macroprudential policy, we first need to assess systemic risk. Specifically, the assessment is composed of two main parts. The first is to assess the financial cycle. We examine whether the current conditions are in an expansion phase or a contraction phase of the cycle, considering the outlook. The second is to identify sources of

systemic risk, or potential financial vulnerabilities, and to diagnose the financial system's resilience to the stress. For example, we conduct stress testing to assess whether financial institutions have sufficient capital and liquidity under stress events.

Assessment of Financial Cycle and Results of Stress Testing

The Bank publishes the *Financial System Report* (FSR) semiannually, with the objective of assessing systemic risk. Regarding the financial cycle that is the first part of the assessment, on the whole no imbalances in financial and economic activities can be observed while the funding conditions for firms and households have been highly accommodative. With banks' very active lending stances, the real estate market seems overheated in some areas; however, our aggregate financial cycle indicator estimated from major financial activity indexes has shown no significant imbalances recently (Chart 2).²

Moreover, with regard to the resilience of the financial system against the stress that concerns the second part of the assessment, the results of stress testing indicate that capital adequacy ratios at financial institutions remain above the regulatory requirements on the whole even when a tail event comparable to the Lehman shock occurs. While regional financial institutions have actively stepped up their risk taking in recent years by increasing their real estate loans and investments, the adverse shocks in the real estate markets seem to exert only a limited impact on the financial system from a macroprudential perspective, partly because real estate-related markets have not boomed as much as they did during the real estate boom from 2006 through 2007.³

In other words, as the peak of the current financial cycle is not high, even if the cycle starts to contract, the trough is unlikely to be deep. Also, even when the trough is as deep as the level observed during the Lehman shock, financial institutions maintain sufficient capital to

² Looking at Chart 2 in detail, during the bubble period in the late 1980s, the financial expansion had led to the economic expansion. In the early 1990s after the burst of the bubble, the financial contraction had caused the economic downturn. Afterward, the real economy went through several business cycles with short-lived recovery phases, as the balance sheet adjustment at firms and financial institutions continued; in other words, the financial cycle remained in a stagnation phase. Since the beginning of the 2000s, the adjustment of excess debt by firms and the disposal of nonperforming loans by banks have run their course and the financial cycle has entered into a recovery phase, and thus the economic recovery has lasted a long time. Later, the real economy deteriorated significantly due to the Lehman shock but recovered relatively quickly as no significant financial imbalances were accumulated.

³ For details, see Chapter V in the April 2017 issue of the FSR.

withstand that stress. Thus, there is no concern about large-scale systemic risk at present, and it can be judged that Japan's financial system has been maintaining stability.

Warning from the Stock Market

Nonetheless, there is no guarantee that the financial system can continue to maintain stability in the future. The stock market seems to send us a critical signal on this point. The expected default frequency (EDF) for financial institutions extracted from stock price movements has been rising recently, mainly for regional banks (Chart 3).⁴ The short-term EDF has been more or less unchanged, albeit with some fluctuations such as a temporary rise following the Bank's introduction of the negative interest rate policy in early 2016. Meanwhile, the medium- to long-term EDF has been following a moderate upward trend since even before the introduction of Quantitative and Qualitative Monetary Easing (QQE) in 2013 and the negative interest rate policy.

So, will regional financial institutions give rise to systemic risk that poses threats to the stability of the financial system? In Japan, no regional financial institutions are designated as either Global Systemically Important Banks (G-SIBs) or Domestic Systemically Important Banks (D-SIBs). Although regional financial institutions are not individually systemic institutions, they can be "systemic as a herd" if many of them hold common exposure and show similar behavior. From a macroprudential perspective, it is important to look at regional financial institutions as a whole and pay attention to whether the similarity of individual financial institutions' behavior will lead to the emergence of systemic risk.

Due to Japan's financial crisis in the 1990s, almost 180 small and medium-sized financial institutions including *shinkin* banks and credit cooperatives failed. Such financial institutions were not individually systemic institutions, but they held common risk exposure through the extension of real estate loans. Thus, as a failure of one bank reminded the people of a default risk of another bank, a systemic risk associated with a chain of bank runs was recognized. To avoid the materialization of such risk, the government set forth blanket guarantees for all forms of bank liabilities including deposits. Based on this, the Bank

⁴ Moody's EDF is defined as a measure of the probability that the market value of a firm's assets will fall below its liabilities payable over a specified period of time, which is estimated based on a firm's stock price information.

provided individual financial institutions that were on brink of bankruptcy with loans to maintain the stability of the financial system (the so-called *Tokuyu*).⁵

A key issue that these experiences raised about prudential policy is whether a future stress event will result in business instability of only the specific financial institution or in simultaneous (or a chain of) business instability of many financial institutions that hold common exposure. In the former case, a financial institution with business instability can be barred from the financial system. In the latter case, however, there is a concern that the impact will spread across the entire financial system and develop into systemic risk. The stock market sends us a critical signal on this point as well. The CoVaR, which is a widely used systemic risk indicator measured based on developments in the stock market capitalization of regional banks, has shown an upward trend recently against the background of the heightened comovement between the stresses faced by individual banks (Chart 4).⁶ Thus, the indicator extracted from the stock market implies the possibility that business conditions will become unstable simultaneously at many regional financial institutions that have common exposure.

While the EDF and the systemic risk indicators have been rising, regional financial institutions have sufficient capital and liquidity at present. Thus, there are no immediate threats to the stability of the financial system. As I mentioned earlier, our stress testing also confirms this point. Then, how should we interpret the difference between the results of stress testing and market signals? The results of stress testing show that Japan's financial system has resilience to "acute" stresses comparable to the Lehman shock. However, even though financial institutions have sufficient capital at present, the stability of the financial system will not be guaranteed in the future if "chronic" stresses weigh persistently on many financial institutions' profits. If they fail to secure returns that meet their cost of capital for a

⁵ More specifically, the Bank provided troubled financial institutions with funds needed to repay deposits through the *Tokuyu*. After these financial institutions failed, the Bank received full repayment of the *Tokuyu* from funds provided by the Deposit Insurance Corporation (DIC) to these institutions in accordance with the Deposit Insurance Act amended in 1996. In principle, the *Tokuyu* is an uncollateralized loan, but under such scheme, the Bank was not exposed to credit risk in extending the *Tokuyu* to deposit-taking financial institutions. (Meanwhile, the Bank bore credit costs in providing the *Tokuyu* and capital to securities companies.)

⁶ Using stock market data, the CoVaR measures the size of stress in the financial system, which comprises the following two factors: the stress faced by individual banks and the comovement between the stresses faced by individual banks.

prolonged period due to common and chronic stresses, we cannot exclude a possibility of simultaneous (or a chain of) impairment of capital held by many of the financial institutions that hold common exposure. With a price-to-book (P/B) ratio of less than one, the stock market seems to be sending us a warning about the impact of "chronic and common" stresses (Chart 3).⁷

III. Background of Regional Financial Institutions' Low Profitability

Now, let me touch on the characteristics of the structure of financial institutions' profits before identifying "chronic and common" stresses that exert downward pressure on regional financial institutions' profits.

International Comparison of Financial Institutions' Profitability

The recent decline in financial institutions' profits is a phenomenon that can be observed not only in Japan but commonly in advanced economies, where the low interest rate environment has prevailed. However, even in this situation, the low profitability of Japanese financial institutions is striking from an international perspective (Chart 5). Regional financial institutions in particular have lower gross operating profits per employee than U.S. and European financial institutions of a similar size. Such low profitability is due not only to Japanese financial institutions' low net interest income that is susceptible to interest rate developments but also to low net non-interest income that is not susceptible to these developments.⁸

Since the 2000s, Japanese financial institutions have been making efforts to expand their fee and commission-based business with the aim of diversifying their profit sources, but the share of net non-interest income in gross operating profits (the net non-interest income

⁷ Based on a stock yield model, the equation "P/B ratio = ROE (return on equity) / COE (cost of equity)" can be obtained after simplification. A P/B ratio of less than one implies that stock market participants expect that banks will not be able to make returns higher than their cost of capital.

⁸ Net interest income is interest income such as loan interest income and security interest income net of interest expenses such as deposit interest expenses. Net non-interest income is mainly composed of the fees and commissions for services provided by banks such as funds transfer services, deposit-taking and lending services, and securities sales net of the fees and commissions paid to other banks (net fees and commissions).

ratio) nevertheless is generally small from an international perspective (Chart 6). By size, whereas the net non-interest income ratio of major financial groups is on par with that of their U.S. counterparts, regional financial institutions' net non-interest income ratio is only around 10 percent, which is much lower than that of U.S. and European financial institutions of the similar size.

For U.S. and European financial institutions, net non-interest income represents an important profit source as they increase opportunities to obtain various fees and commissions by meticulously setting the content of services based on characteristics and preferences of their clients. For example, in Europe, financial institutions secure a profit source by charging a reasonable fee for the issuance and use of debit and credit cards and providing bespoke solutions for high net worth individuals. Moreover, due to the spread of Internet banking, they also have started to impose fees for services such as paper-based balance statements. In the United States, fund management services that meet firms' outsourcing needs have been established as paid-for services. On the other hand, in Japan, there are more than a few examples where financial institutions do not impose any fees on financial services that incur a reasonable amount of costs, such as services related to account maintenance and management.

These differences in the stance regarding the setting of fees and commissions for financial services in Japan and abroad also show up clearly in the composition of household consumption expenditure. The item composition of the consumer price index (CPI) in various countries shows that the weight of financial services in Japan is much lower than in the United States and Europe (Chart 7). Furthermore, in contrast to the United States and Europe, where the prices of financial services have been rising at an annual rate of about 2 percent, in Japan, the prices of financial services have for a long time essentially remained unchanged. These facts mean that whereas for financial institutions in the United States and Europe, fee and commission income from households forms a stable source of profits, Japanese financial institutions lack such profit source.

Intensified Competition among Banks

I have pointed out that financial institutions in Japan have lower gross operating profits per employee than their U.S. and European peers, and the breakdown showed that not only their

net interest income but also their net non-interest income, which is not susceptible to interest rate developments, is low (Chart 5). These observations suggest that Japanese financial institutions' low profitability is due not only to persistent low interest rates but also to other structural factors. Specifically, one likely factor is that competition among financial institutions has continued to intensify for a long time. Looking at an international comparison of the number of financial institutions' branches that actually provide financial services, the number of financial institutions' branches per capita in Japan appears relatively low; however, if the number of post office branches, which provide bank agency services, is included, the figure is about the same as that in some European countries, which are regarded as being overbanked (Chart 8).⁹ Additionally, the number of financial institutions' branches per habitable land area is conspicuously large in Japan. Of course, this is also due to the high population density of Japan. But if financial institutions' branches are densely crowded in a small area, depositors and firms will have a number of branches to choose from. Thus, the state of competition among them will intensify.¹⁰

In particular, in terms of attracting deposits, financial institutions in Japan were competing intensely with each other, as well as with the postal savings system, from before World War II until recent years. Because deposit and lending margins were sufficiently large when interest rates were regulated, opening branches and collecting as much deposits as possible was rational behavior which would directly lead to profit growth for private financial institutions. For this reason, and partly due to competition from the postal savings system, it was difficult for private financial institutions to adopt a strategy of charging deposit-related fees. Even after deposit and lending margins narrowed against the backdrop of interest rate liberalization and the low interest rate environment, the fierce competition among financial institutions continued. Banks were fully aware that if only they started charging fees, it was highly likely that deposits would flow out to other banks or the post office. Under these circumstances, a business model premised on not charging deposit-related fees seems to become entrenched at financial institutions. Thus, as financial institutions have little net non-interest income and greatly depend on net interest income for profits, a decline in population and the number of firms spurs lending competition among financial institutions,

⁹ With regard to overbanking in Europe, see European Systemic Risk Board, "Is Europe Overbanked?" June 2014.

¹⁰ For details, see Chapter VI in the October 2017 issue of the FSR.

pushing down net interest income in a structural manner.

To sum up, the true identity of "chronic and common" stress that exerts downward pressure on regional financial institutions' profits is a persistent decline in population and the number of firms observed in almost all regions of Japan under the fierce competition among financial institutions (Chart 1). Our estimation results show that structural factors such as population decline, in addition to a decline in market interest rates due to monetary easing, have largely contributed to the shrinkage of deposit and lending margins of regional financial institutions over the past decade (Chart 9).¹¹ While the forecast over the next 10 years will change depending on the future path of market rates, chronic stresses such as population decline are expected to continue to exert downward pressure on deposit and lending margins. That is, even if market rates rise and funding costs increase, loan interest rates will not be raised sufficiently due to intensified competition caused by chronic stresses. Thus, there is a possibility that deposit and lending margins will not improve very much.

IV. Competition among Banks and Macroprudential Policy

Going forward, the problem of financial institutions' low profitability is expected to be exacerbated, given the structural changes to the business environment, such as the shrinking regional population and business base. Next, I will go over how this will affect the financial system.

Impact on Financial System Stability

The decline in population and the number of firms, which is a structural factor underlying the intensified competition among financial institutions, is not an idiosyncratic shock occurring in certain areas, but a common shock occurring across Japan (Chart 1). Moreover, this common shock is not a temporary one but is expected to remain in the future. If such chronic stresses continue to exert downward pressure on regional institutions' profits, it becomes highly likely that financial institutions will engage in excessive risk taking. For

¹¹ Not only the effects of monetary easing but also a decline in the natural rate of interest associated with changes in demographic profile has contributed to a decline in market interest rates. Given this point, chronic stresses such as population decline may more significantly affect the long-term downward trend of financial institutions' deposit and lending margins.

example, they may take on market risk associated with securities investment without proper risk management, or they may take on excessive credit risks in lending -- that is, extend loans at an interest rate that is not high enough to cover credit costs.

At present, regional financial institutions do not take on excessive market and credit risks relative to their capital.¹² However, the point is on how chronic stresses will have an effect in the future, and a warning from the stock market seems to address this point. In particular, because Japanese regional financial institutions' provision of non-interest services accompanying lending transactions is limited compared to their U.S. and European counterparts and Japanese major banks, the degree of differentiation in lending transactions is low, and they tend to engage in interest rate competition (Chart 6). In fact, financial institutions' lending stances have been as active recently as during the bubble period, while their lending margins tend to be narrower than planned under intensified competition among financial institutions (Chart 10). In other words, as demand for loans has been sluggish under the chronic stress of a decline in population and the number of firms, financial institutions have increased common exposure; namely, a decline in net interest income resulting from lending competition among financial institutions.

I mentioned earlier that the CoVaR, a systemic risk indicator of regional banks, has been rising recently due to an increase in the comovement between the stresses (Chart 4). This seems to reflect the effects of an increase in common exposure caused by intensified competition.¹³ Many regional financial institutions are not necessarily individually systemic institutions. Nonetheless, there are more than 500 regional banks, *shinkin* banks, and credit cooperatives in total, and these institutions face the chronic and common shock of a decline in population and the number of firms, and they hold common exposure of a decline in net interest income resulting from intensified competition. Therefore, regional financial institutions taken as a whole are systemic as a herd, and chronic stresses that they share in common could greatly affect the stability of the financial system through intensification of competition.

¹² For details, see Chapter IV in the October 2017 issue of the FSR.

¹³ The FSR released in October 2017 empirically shows that intensified competition among regional financial institutions raises systemic risk. For details, see Box 3 in the October 2017 issue of the FSR.

Impact on Financial System Efficiency

Chronic stresses may affect not only the stability but also the efficiency of the financial system. The intensified competition among financial institutions amid the decrease in the number of firms has started to have an effect on the business relationships between financial institutions and firms. The average number of financial institutions that each firm transacts with across branches has been on an uptrend (Chart 11). As the number of firms within business areas is decreasing, financial institutions' efforts to look for new transaction opportunities and boost their corporate business seem to have led to an increase in the number of financial institutions that each firm transacts with.

For firms, this means that they have been able to obtain more favorable loan conditions by increasing the number of financial institutions that each of them transacts with. However, if it becomes common for firms to choose the financial institution offering the lowest loan interest rate among a number of financial institutions when taking out a loan, regardless of whether the financial institutions have any transaction history or capacity to support businesses, business relationships between firms and their main bank will weaken. This may lower the efficiency of financial intermediation.

Under relationship banking, financial institutions accumulate soft information that is difficult to quantify, such as a manager's talent and a project's future business value, by monitoring client firms through long-term business relationship. Based on this soft information, they can provide financial services including lending business. The following two advantages have been pointed out with regard to such relationship banking. First, by accurately assessing the future value of firms, financial institutions can encourage firms to engage in profitable investment projects while keeping firms away from inefficient ones. Second, if firms face funding difficulties due to external shocks, financial institutions that are well aware of the firms' future value can provide liquidity assistance. That is, for firms, they purchase liquidity insurance by paying a reasonable amount of loan interest rates. These two advantages contribute to the efficient allocation of funds across the entire economy. However, as lending margins narrow significantly due to intensified competition among financial institutions, they eventually will lose their incentives to engage in information production activities that are costly, such as the assessment of a manager's talent and a project's future business value. If financial institutions do not have sufficient

information about their client firms, extended funds may be used for inefficient investment activities. Financial institutions may also become cautious about extending loans at their own risk to firms that face stresses. If financial institutions lose their information production capacity, they may try to obtain guarantee by credit guarantee corporations to loans to small and medium-sized firms, and may increase their incentive to shift their credit risks to the public sector.¹⁴

On the other hand, firms may prefer to transact with financial institutions that offer lower loan interest rates in normal times while they may depend more on emergency measures by the government or public finance in times of stress. This would generate a moral hazard. In the end, in the case of public finance with solid support, excessive lending competition among banks could undermine firms' incentives to raise their productivity. This could result in inefficient resource allocation across the entire economy, or hamper the economic natural selection mechanism.

At present, firm-bank relationships have not weakened to this extent. However, if the competition among banks continues to intensify due to chronic stresses, how this will affect the efficiency of the financial system going forward warrants attention.

V. Macprudential Approach to Chronic Stresses

I have explained that the chronic and common stress of a decline in population and the number of firms has exerted downward pressure on financial institutions' profits, adversely affecting both the stability and efficiency of the financial system by creating a highly competitive environment. This is a serious problem from a macroprudential perspective. How should we tackle this problem?

¹⁴ This problem can be understood in the context of "market failure." Asymmetric information between a firm as a borrower and a bank as a lender can be resolved by long-term relationship and banks' information production capacity. However, if banks' loan interest rates decline to a level that cannot compensate for their information production costs, firm-bank relationships will weaken. In other words, the poor functioning of the loan market will leave the market failure arising from asymmetric information unresolved. On the other hand, if a bank ultimately can transfer a firm's credit risk to the public sector, the bank may be able to continue extending loans. In this case, however, taxpayer money will be used to bear the firm's credit cost in the end. Therefore, lending by banks that do not engage in information production activities entails negative externalities. This situation also causes a market failure.

Unfortunately, it is difficult to solve this problem by utilizing the traditional macroprudential policy tools. If further bullish expectations of firms and households and banks' risk-taking operated in tandem and a higher degree of overheating was observed in the financial cycle, capital regulation such as the countercyclical capital buffer (CCyB) and credit regulation such as the loan to value (LTV) limit would be effective.¹⁵ However, as I have already mentioned, we do not face such a situation at this moment (Chart 2). In addition, in the case where financial institutions' low profitability is caused by chronic and common stresses, capital regulation that requires banks to accumulate capital is not an appropriate prescription. As accumulation of capital under such measures is expected to further reduce the profitability (ROE), it seems difficult for financial institutions with low profitability to increase their capital in the financial market.¹⁶

Microprudential Approach that Incorporates a Macroprudential Perspective

In order to contain systemic risk among regional financial institutions, enhancing off-site monitoring and on-site examinations is the first important step. Off-site monitoring and on-site examinations are primarily regarded as a microprudential measure. By carrying them out from a macroprudential perspective in an industry-wide and collective manner, however, they are capable of producing effects as a form of macroprudential policy.¹⁷

¹⁵ The CCyB indicates a variable capital surcharge, one of the Basel III capital adequacy requirements. Capital reserves are required for materialization of potential losses in the banking sector, when risks in the financial system are expected to increase due to excessive credit extension. On the other hand, the restriction on the LTV ratio is concerned with the ratio of loans to the collateral market value in extending real estate loans. When risks in the real estate industry are expected to increase, lowering the LTV ratio would contain further credit expansion.

¹⁶ When the tighter capital adequacy ratio is applied, banks have the following two options: (1) increasing their capital (an action affecting the numerator) and/or (2) reducing their risky assets (an action affecting the denominator). If it is difficult to increase their capital, financial institutions will refrain from extending loans. Thus, there is a possibility that competition among them will become less intense. Depending on how much the capital adequacy ratio will be added, however, this measure can be a "powerful drug" that forces financial institutions with relatively weak capital bases to leave, and this does not seem a realistic option -- at least, this is not suitable for the first line of defense.

¹⁷ In this regard, the Federal Reserve seems to have a similar awareness of the issues. Members of the Financial Stability Subcommittee of the Conference of Presidents (COP) of the Federal Reserve Banks conducted a macroprudential tabletop exercise in June 2015. The results of the exercise indicated that supervisory guidance and stress testing are more effective than capital regulation (such as leverage ratios and CCyB), liquidity regulation (such as liquidity coverage ratio and net stable funding ratio), and credit regulation (such as caps on LTV ratio). For details, see Tobias Adrian, et al., "Macroprudential Policy: Case Study from a Tabletop Exercise," *Federal Reserve Bank of New York Staff Reports*, No. 742 (2015).

For example, a medium- to long-term simulation of financial institutions' profits is a valuable tool for communication with financial institutions. Based on line sheet review, the Bank specifically ascertains the actual situation of regional economies and changes in behaviors of financial institutions and then estimates the future prospects of profits while taking account of how much chronic stresses the future decline in population and the number of firms will exert in each business area.¹⁸ Stress testing is certainly important, but as many regional financial institutions currently have sufficient capital, most of their capital adequacy ratios are above the regulatory requirements even under the acute stress. What is significant to avoid systemic risk arising from chronic stress is not regional financial institutions' "current" solvency, but rather their "future" solvency. Therefore, in the case where a medium- to long-term forecast of profits based on the current business model shows a difficulty in maintaining highly sustainable profits and an adverse effect on future solvency and loss-absorbing capacity, even if financial institutions currently have enough capital, it seems relevant to ask them to enhance their business performances toward improving their profitability.

To earn profits in a sustainable manner under a highly competitive environment, financial institutions need to differentiate the financial intermediation services they offer and make efforts to utilize their core competence. When formulating their business plans, it is important for them to (1) accurately analyze and identify the needs for financial services of the customers within their business areas and (2) develop and offer services that meticulously address customers' needs. Moreover, (3) another option to provide such services could be through the review of the efficiency of their branch configuration and allocation of employees, as well as the thorough management of profitability including fair price setting.

Toward an Appropriately Competitive Environment

Many regional financial institutions seem to have already recognized the importance of

¹⁸ Specifically, during the line sheet review, the Bank ascertains and confirms business environments for borrowers such as developments in regional economies and industries, as well as credit exposure managements by conducting face-to-face meetings with branch managers based on the documents ("line sheets") that contain information about the selected individual borrowers, including changes in financial situations, changes in borrowing and repayment, their future prospects, financial institutions' self-assessment results, and policies for lending.

enhancing business performances, but under the highly competitive environment, some have pointed out the difficulty in making efforts to steadily improve business performances. If competition among financial institutions leads to a decline in each other's profits, financial institutions are thought to be caught in the "prisoner's dilemma." Many of them mention that, if they mutually avoided the "excessive" interest rate competition, then they could maintain their profits. On the other hand, if only one institution left the competition, the customers would go to other institutions, resulting in the institution being an only loser. In such a situation, it becomes more difficult to leave the interest rate competition. Regarding the relationship between competition among banks and their business stability, "moderate" competition will lead to their business stability. However, if competition becomes fierce beyond a certain threshold, bank business will become rather unstable (Chart 12).¹⁹ In Japan, many regional financial institutions seem to have already been caught in the prisoner's dilemma.

How should we address the prisoner's dilemma caused by fierce competition among banks? One effective option is consolidation and reorganization among financial institutions. As the number of firms and population continue to decline, the highly competitive environment will not relax unless there are changes in supply capacity, such as a decline in the number of financial institutions, their branches, and their employees. From a macroprudential perspective, Japanese financial institutions have overcapacity relative to financial service demand, which is determined by population and the number of firms. Consolidation and reorganization that could lead to the improvement of such a situation seem effective in enhancing the stability and efficiency of the financial system.²⁰

¹⁹ There are two views with regard to the relationship between the competitive environment that financial institutions face and their business stability. The first is the "competition-stability view," which holds that competition among banks increases their business stability. The second is the "competition-fragility view," which holds that competition among banks lowers their business stability. The former argues that, as banks compete with each other and loan interest rates fall, borrowing firms' probability of default declines, raising banks' business stability. Conversely, the latter argues that, as competition intensifies and banks' profit margins continue to tighten, their capacity to absorb losses due to external shocks, such as an increase in credit costs, decreases and/or they take more risks, so that banks' business becomes unstable. For details, see Box 6 in the April 2017 issue of the FSR.

²⁰ In the non-financial private sector, competition policy mainly focuses on efficiency (competitive pricing). Meanwhile, in the banking sector, competition policy focuses on not only efficiency but also stability (prevention of systemic risk). For details, see International Monetary Fund, "Key Aspects of Macroprudential Policy -- Background Paper" (2013).

Nevertheless, I think that it is most important for individual financial institutions to make the time horizon of maximizing their profits longer.²¹ Financial institutions' pursuit of profit in a myopic manner would lead to excessive interest rate competition. This would not only exert downward pressure on profits of individual financial institutions but also undermine the stability and efficiency of the financial system, adversely affecting both regional and nationwide economies in Japan. Consolidation and reorganization are indeed one of the options to improve future profits, but this is not all. Even if individual financial institutions did not choose consolidation and reorganization but instead focused on maintaining medium- to long-term profits in the future, they would find it more desirable to enhance information production capacity about client firms and construct a business model that differentiates the financial intermediation services they offer, rather than continue to engage in excessive interest rate competition. Such behavior of financial institutions will contribute to the improvement of both the stability and efficiency of the financial system and positively affect the economy over the long run.²²

It is important to secure profits for each fiscal year. However, what is needed as a response to chronic stresses is tireless efforts to improve future profits, such as differentiation of financial services. Individual financial institutions should work for a business model that makes the time horizon of maximizing their profits longer. The Bank attaches great importance to the medium- to long-term forecast of profits in its off-site monitoring and on-site examinations, because a competitive environment and the time horizon to maximize financial institutions' profits are closely related. By carrying out off-site monitoring and on-site examinations in an industry-wide and collective manner, the Bank would like to encourage financial institutions to appropriately recognize their competitive environment and establish their business plans and models over a longer time horizon to maximize their profits. We consider this to be a new type of macroprudential policy.

²¹ In game theory, if each player's discount factor is large enough -- that is, he/she focuses not only on this term's profits but also on future profits -- repeated games resolve the prisoner's dilemma.

²² Long-term forecast in Chart 9 assumes that estimation parameters will remain unchanged from the ones estimated based on the past data. However, the parameters would change if the competition environment changed due to the progress in differentiation of financial services provided by financial institutions and consolidation and reorganization among them. In this case, even if the outlook for explanatory variables was unchanged, the impact of chronic stresses such as a decline in population on deposit and lending margins would diminish.

How to Deal with the Social Norm for Services in Japan

In order to avoid systemic risk arising from financial institutions' low profitability, there is one more issue that needs to be resolved, in addition to establishing an appropriately competitive environment. That is, to obtain the understanding of clients about fair compensation for the financial intermediation services. Presumably, many Japanese do not recognize that Japanese financial institutions continue to provide settlement services without obtaining an appropriate amount of compensation.

Banks provide their depositors with financial intermediation services including settlement services, and in return they receive implicit fees in the form of deposit spreads (market interest rates - deposit interest rates). It is interpreted in standard economics that, instead of investing in government bonds and other assets in the financial markets, households and firms purchase settlement services from the banks by making a deposit with lower interest rates and paying opportunity cost of deposit spreads to the banks. Setting the fair price of settlement services by combining these deposit spreads with explicit fees such as account maintenance and funds transfer fees is the banks' standard business model.

In Japan, however, deposit spreads fell to almost zero in the mid-1990s due to a decline in market interest rates after the bubble burst and the liberalization of deposit interest rates (Chart 13). This happened about 20 years before the introduction of the Bank's QQE and the negative interest rate policy. In other words, Japanese financial institutions that do not impose any account maintenance fees have provided settlement services for almost free over the last 20 years.

They had an option to charge account maintenance fees when deposit spreads reached zero, but it was impossible in reality. There were two reasons. As I mentioned earlier, one was competition among financial institutions including the postal savings system. The other was the social norm for services in Japan.²³

I think that the Japanese social norm for services has developed in a unique way compared to other countries. For example, when we look up the word "service" in a Japanese

²³ The another possible reason was that financial institutions were short of capital as a result of the disposal of nonperforming loans after the bubble burst, and they received public funds. In this situation, it was not socially acceptable to receive more fees from the Japanese people.

dictionary, we find explanations such as "dedication," "discount," and "a free gift." For Japanese people, an expression like "family service," where the word "service" in Japanese is used as a synonym of family "duties" in English, sounds very familiar. "Overtime service" -- meaning volunteer overtime work -- and "we offer you some services!" -- meaning that we offer customers services at a discount -- also sound familiar in Japan. As is evident from these examples, the Japanese word "service" implies the concept of "free of charge." On the contrary, no such meaning can be found in an English dictionary.

As represented by the Japanese word *omotenashi*, which can be roughly summed up as "the spirit of selfless hospitality," offering services without requiring any pecuniary compensation in return is considered a Japanese virtue. The low productivity of the Japanese service sector including the financial sector by international standards does not seem to be unrelated to the social norm for services that is peculiar to Japan. The weight of financial services in household consumption expenditure is extremely low in Japan from an international perspective (Chart 7). On the flip side of the coin, Japanese financial institutions' net non-interest income ratio is also low (Chart 6). I think that these cannot be explained solely by competition among financial institutions.

Currently, there are about 1.1 billion personal accounts at financial institutions across Japan. The number of bank accounts per capita amounts to about 10, and this is quite a large number on the basis of an international comparison (Chart 14). The reason the number of bank accounts is high seems to be largely because account maintenance fee is free in Japan. Banks incur massive costs to maintain such a large number of bank accounts. They even have to manage accounts that have no transactions for 10 years from the last transaction was made. As the system maintenance burden for these accounts incurs fixed costs, banks that are capital-intensive industry eventually fall into a vicious cycle where competition intensifies to achieve economies of scale.

Maintaining bank accounts that do not contribute to economic transactions with heavy cost is socially inefficient. Moreover, it is likely to become more difficult for banks to continue providing settlement services without asking for fair compensation to maintain bank

accounts.²⁴ Probably, the social norm in Japan is something along the lines of "there is no way that fees are charged on hard-earned money deposited in a bank," but I think the time has come for the Japanese people to discuss fair compensation for financial intermediation services.

Many of you may wonder why the assessment of fair compensation for services is related to macroprudential policy. However, the people's understanding regarding fair compensation for financial intermediation services is essential in order to ensure the stability of the financial system in the future. This is because (1) there is a risk that the vicious compounding of banks' low profitability and excessive competition among banks will destabilize the financial system, (2) banks' low profitability is partly due to their low net non-interest income, and (3) this is related to the social norm for services. Raising such an issue is unconventional from a macroprudential perspective, but I believe that this is an inevitable challenge to address.

It should be noted, however, that we need to make various efforts to promote a discussion at the national level about fair compensation for financial intermediation services. First, the financial sector as a whole, including the Bank of Japan, needs to fully explain and gain the people's understanding of the fact that costs to provide settlement services are not balanced with profits. Second, needless to say, individual financial institutions need to conduct reforms to improve their profits. If there was room for cutting costs and making profits, the public would not fully recognize the need for fair compensation. In this regard, regional financial institutions need to reduce overcapacity by appropriately allocating business resources through Business Process Reengineering. Moreover, if financial institutions provide excessive services that do not necessarily match clients' needs, they may need to review the content of their services.²⁵ And third, financial institutions need to gain better understanding from the people by providing new value-added in financial intermediation services based on the new technological environment, including FinTech. If financial

²⁴ Even if the number of bank accounts per capita is appropriate, the provision of settlement services entails costs. Settlement in demand deposits incurs costs to develop and maintain a stable and efficient system. Teller windows at branches involve indirect costs associated with identification and payment/receipt of cash. Moreover, issuance of a bankbook also exerts upward pressure on costs.

²⁵ In addition, if the profitability of similar services is different depending on supply channels, it will be necessary to build a fee structure that encourages clients' transactions to shift from a unprofitable channel to a profitable one; for example, to shift from bankbook- or paper-based transactions to Internet banking.

institutions could further improve the efficiency and safety of financial services and receive compensation that meets clients' satisfaction, their productivity and profitability would increase. Conversely, if they did not engage in such efforts and only charged more compensation, there would be disintermediation amid an increased presence of FinTech firms. Thus, this point warrants careful vigilance.

VI. Concluding Remarks

Today, I have explained the prudential policy approach to financial vulnerabilities arising from chronic stresses. As advanced economies have never before been confronted with the chronic stress of a persistent decline in population and the number of firms, how to overcome this stress is a considerable challenge. However, I believe that the wisdom and foresight of those in the financial institutions' top management who have overcome various challenges surely will find a breakthrough. At the same time, we at the Bank of Japan, which is responsible for the stability of the financial system, have to explore a new frontier of prudential policy by ourselves.

Nonetheless, no matter how hard we try to explore a new frontier, there is a limit to achieving financial stability by utilizing prudential policy alone. Chronic stress in the financial system can be regarded as a decline in Japan's growth potential or the natural rate of interest.²⁶ Banks have been unable to receive fair compensation for the provision of settlement services due to the narrowing of deposit spreads. The underlying reason behind this seems to be a decline in the natural rate of interest that has caused a significant decline in nominal interest rates (Chart 13). Among the banks' two main businesses of settlement services and lending services, banks have been able to gain profits only from the latter business and have engaged in more intense interest rate competition. As market interest

²⁶ The natural rate of interest is an interest rate that balances savings and investment. It refers to the real interest rate that can be achieved when the real economy grows at its potential growth rate. Looking back at the saving-investment balance, excess saving in the household sector has narrowed, reflecting the aging population, while saving has been exceeding investment in the corporate sector since around the end of the 1990s. This seems to be because a persistent decline in the number of firms has led to a reduction in investment in the corporate sector as a whole, and a decline in population has restrained investment through a decline in the expected growth rate. The natural rate of interest declined toward the mid-1990s and has not recovered from a low level since then. This is due to a change in the saving-investment balance that has led to chronic stress and affected the financial system.

rates have remained at low levels since the mid-1990s, the shrinkage of lending margins as a trend has been significantly affected by a decline in the natural rate on interest under such intensified competition.

Based on such thinking, it is important to minimize the size of chronic stresses in order to maintain financial stability. Of course, it is essential to mitigate the impact of chronic stresses on the financial system by utilizing prudential policy. However, if chronic stresses remained severe, prudential policy would not easily take effect. The measures to minimize the size of chronic stresses, or the government's growth strategy to raise the potential growth rate and the natural rate of interest, play a vital role in fostering financial stability.

Lastly, let me briefly touch on the effects of monetary policy on the stability of the financial system. The continued monetary easing, in addition to the chronic stress of a decline in population and the number of firms, is one of the factors that have intensified competition among financial institutions and exerted downward pressure on their profits. At the same time, monetary easing so far has encouraged the banks' more active lending and contributed to the improvement of firms' business performances.²⁷ This has manifested as an improvement in economic conditions, contributing to financial institutions' profits; for example, as seen in a decline in credit costs and an increase in returns on securities investment. The financial system constitutes a transmission channel of monetary policy, and its stability forms the basis for the sustainable economic growth. It is necessary that the Bank continue to conduct monetary policy in an appropriate manner, taking account of developments in economic activity and prices as well as financial conditions.²⁸

Looking back, both monetary policy and prudential policy have made great progress in the past 20 years.²⁹ When the Bank was responding to Japan's financial crisis in the 1990s, I felt despondent even about the next day, but we roused ourselves with the slogan "never cause a financial contagion from Japan." Japan's safety net has gone through a long

²⁷ For details, see Box 2 in the April 2017 issue of the FSR.

²⁸ For details regarding how to incorporate a macroprudential perspective into the conduct of monetary policy, see Hiroshi Nakaso, "Challenges toward Financial Stability and the Policy Frontier: Unconventional Monetary Policy, Macroprudence, and Financial Institutions' Low Profitability," speech at the IVA-JSPS Seminar in Stockholm (March 21, 2016).

²⁹ For details regarding how the Bank's monetary policy has evolved, see Hiroshi Nakaso, "Evolving Monetary Policy: The Bank of Japan's Experience," speech at the Central Banking Seminar hosted by the Federal Reserve Bank of New York (October 18, 2017).

challenging period and improved dramatically since the day when the word "macroprudence" did not exist and we lacked the experience of and tools for crisis management. As I have talked about today, knowledge regarding macroprudential policy has been accumulated and the remaining issues to be tackled have become clearer. We really have come a long way. It might be a little late, but I would like to express my deepest appreciation to all colleagues and friends who have devoted all of their knowledge and efforts toward achieving the stability of the financial system during the difficult times. Today marks 20 years since Dark November. On this day, I would like to conclude my speech by reiterating the Bank's unwavering determination as a central bank to guard the stability of Japan's financial system. Thank you very much for your attention.

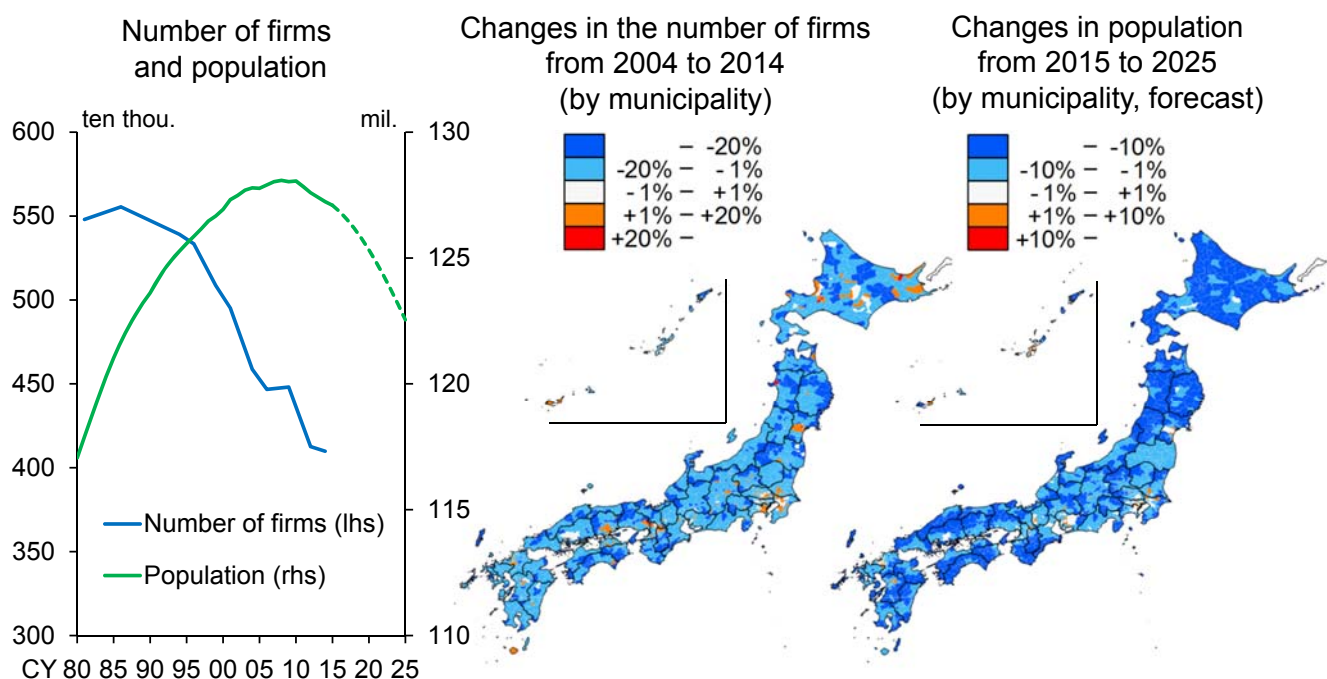
New Frontier of Macroprudential Policy: Addressing Financial Institutions' Low Profitability and Intensified Competition

November 29, 2017

*Speech at the Kin'yu Konwa Kai (Financial Discussion Meeting)
Hosted by the Jiji Press*

Hiroshi Nakaso
Deputy Governor of the Bank of Japan

Chart 1 Decline in population and the number of firms



Note: 1. The number of firms is that of privately owned establishments, which cover single-unit establishments and head offices (headquarters and main offices). The "Establishment and enterprise census" is used in and before 2006, and the "Economic census for business frame and business activity" in and after 2009.

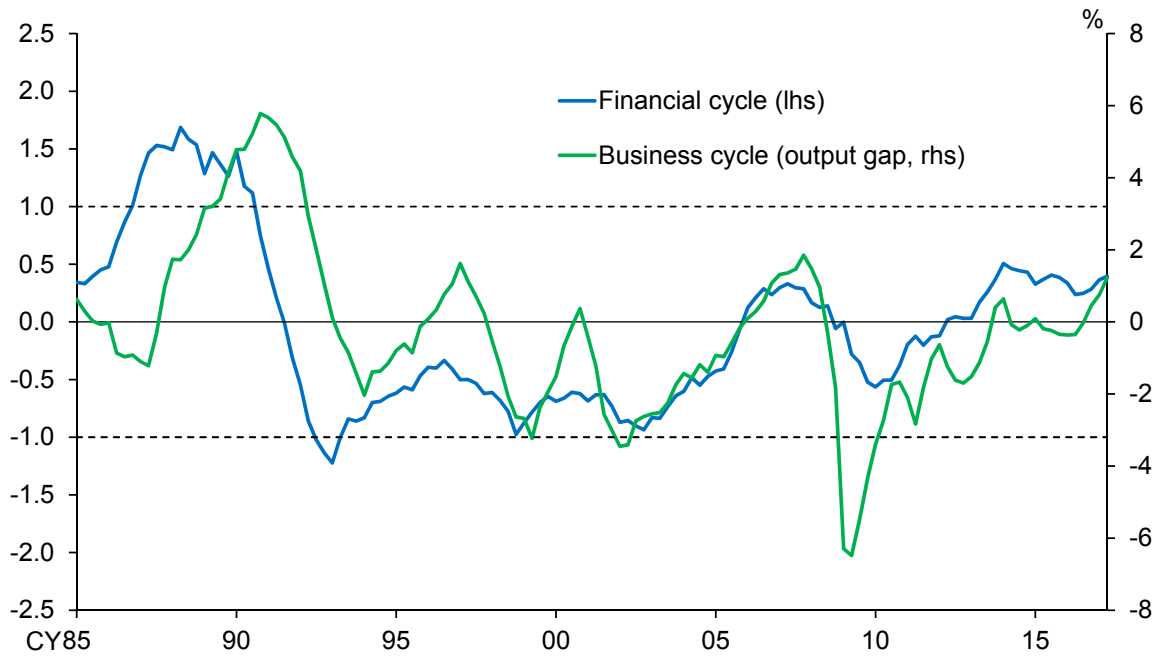
2. The dashed line in the left-hand chart represents forecasts.

3. The rates of change in population for municipalities in Fukushima Prefecture are substituted by the average rate of change in population for the prefecture.

Source: Ministry of Internal Affairs and Communications; Ministry of Land, Infrastructure, Transport and Tourism; National Institute of Population and Social Security Research.

Chart 2

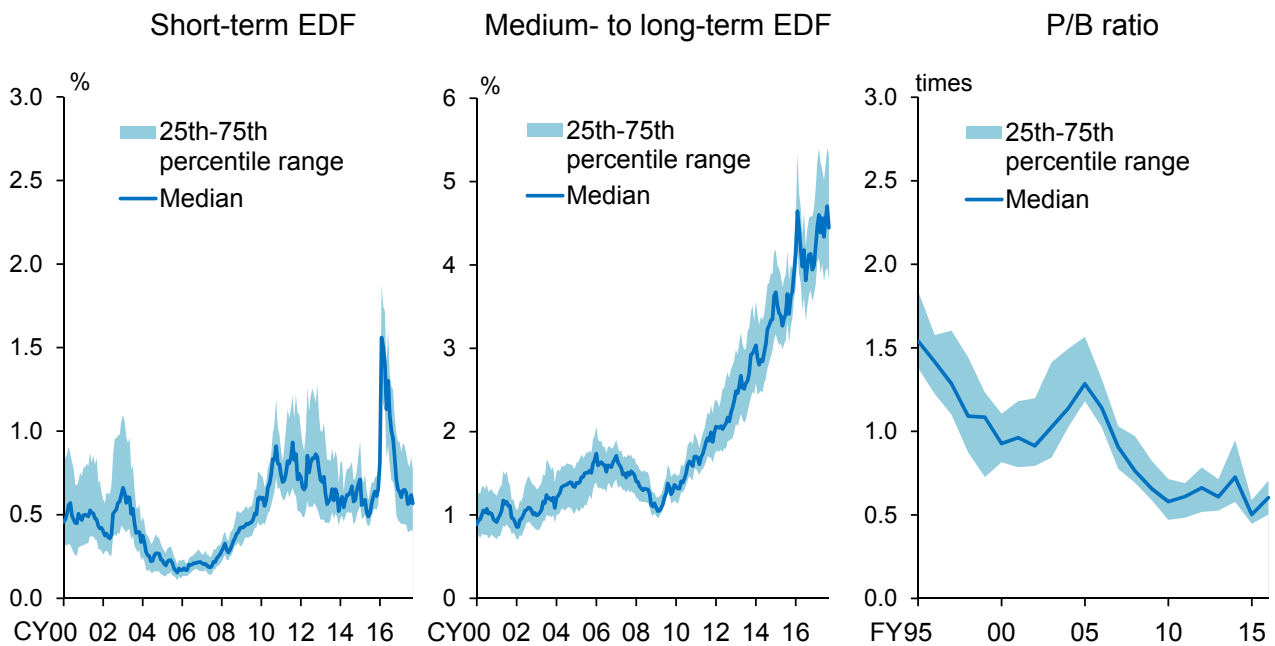
Financial cycle



Note: Financial cycle is an indicator that aggregates 14 Financial Activity Indexes (FAIXs) shown in the *Financial System Report*, using time-varying weights that take the cross-correlation between these indexes into account. The indicator approaching +1 is a sign of "financial overheating" and approaching -1 is a sign of "financial contraction." Latest data as at the April-June quarter of 2017.
 Source: BOJ.

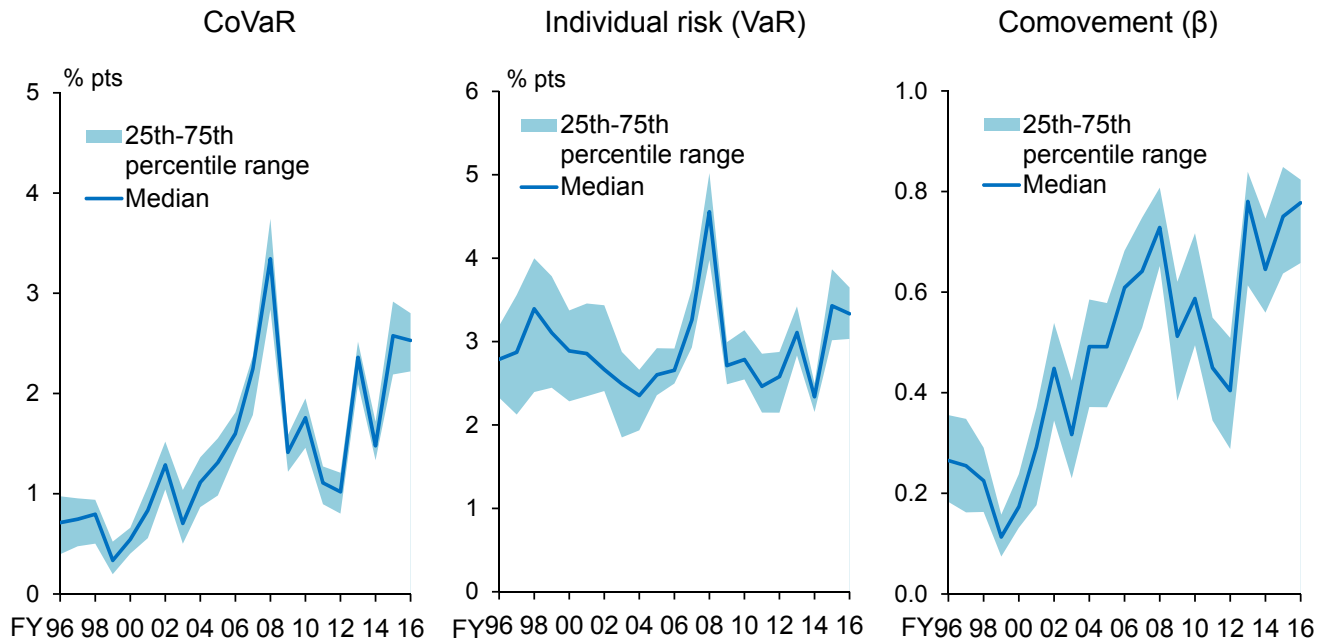
Chart 3

EDF and P/B ratio of regional banks



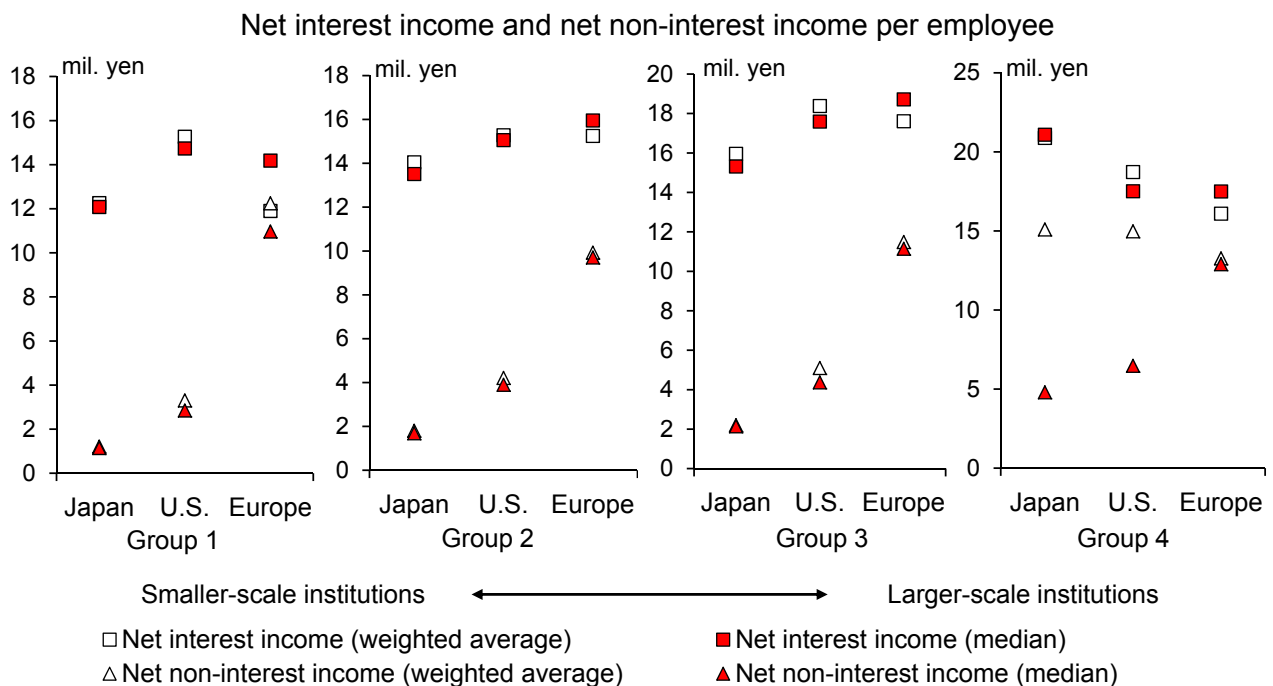
Note: 1. The expected default frequency (EDF) and price-to-book (P/B) ratio cover 56 and 35 regional banks, respectively.
 2. The short-term EDF is 1-year EDF, and the medium- to long-term EDF is 5-year forward EDF. Latest data as at end-September 2017.
 3. Latest data as at end-fiscal 2016 for P/B ratio.
 Source: Bloomberg; Moody's; BOJ.

Chart 4 Systemic risk indicators of regional banks: CoVaR



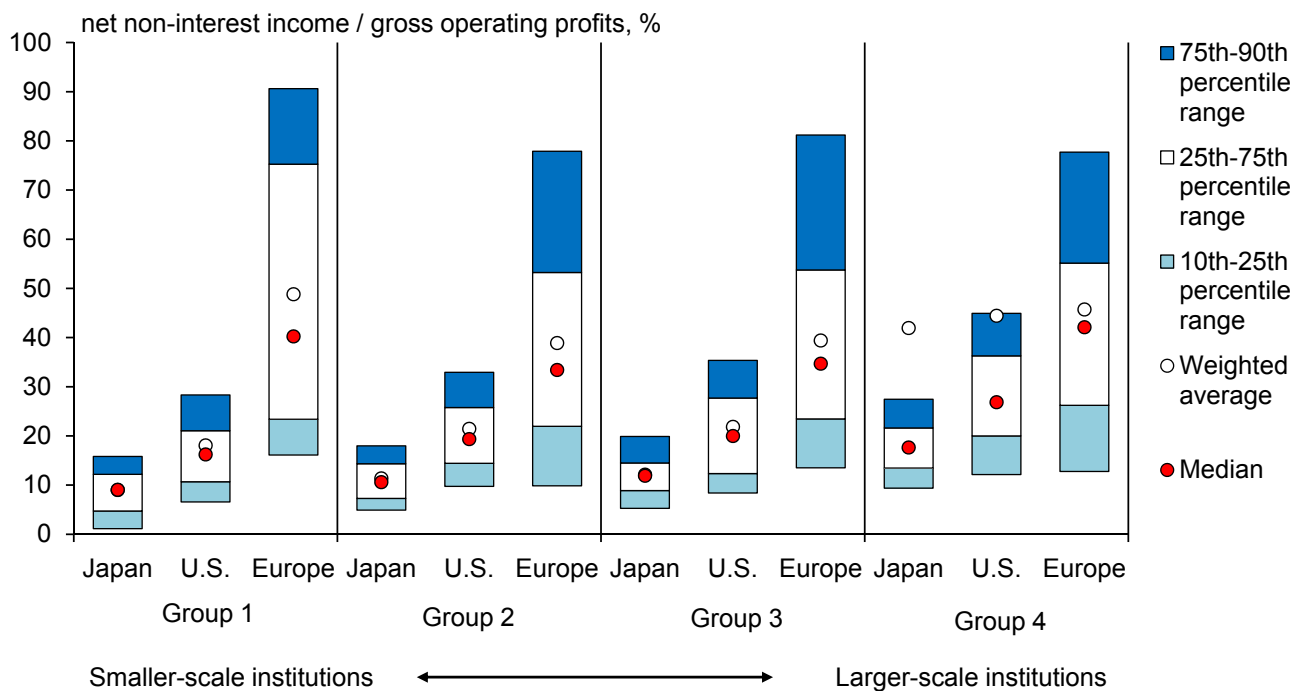
Note: 1. Using stock market data, Conditional Value at Risk (CoVaR) measures the size of stress in the financial system, which comprises the following two factors: the stress faced by individual banks (VaR) and the comovement between the stresses faced by individual banks (β). The following relation holds among the indicators: $\text{CoVaR} = \beta \times \text{VaR}$.
 2. Covers 56 regional banks. Latest data as at fiscal 2016.
 Source: Bloomberg.

Chart 5 International comparison of FI's profits



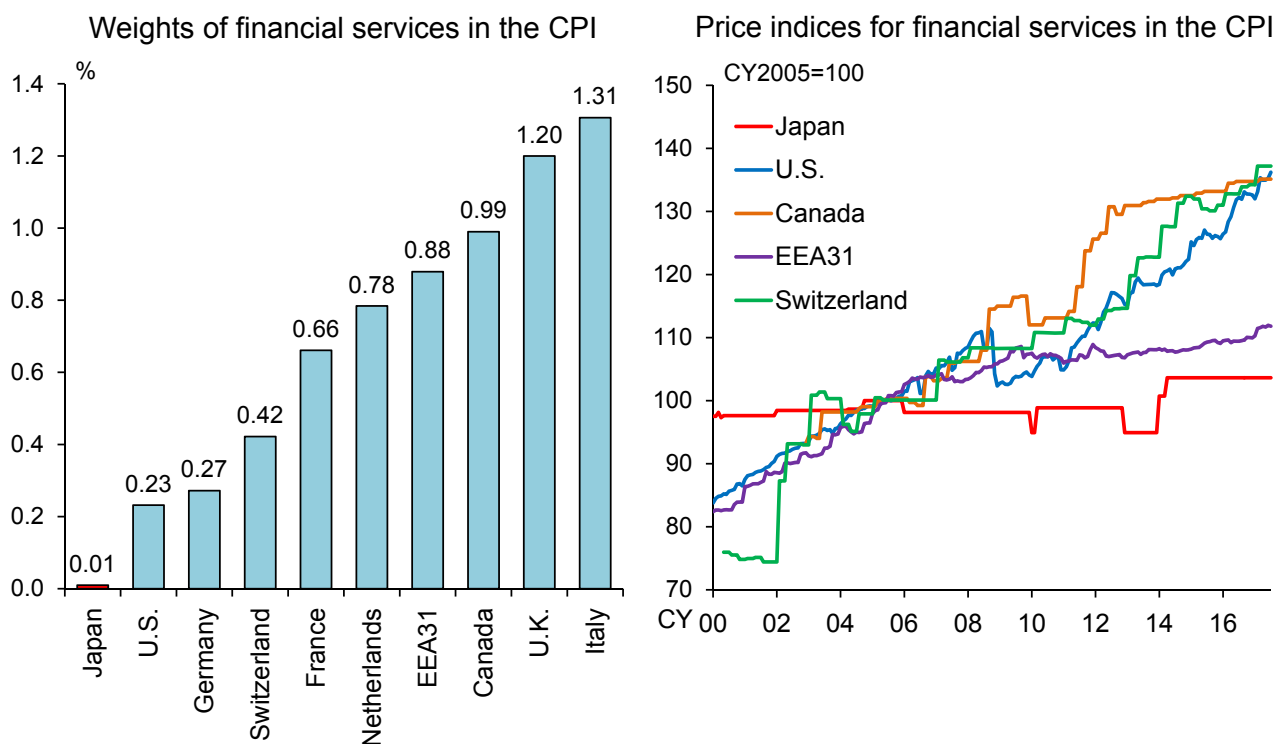
Note: 1. Covers 370 Japanese financial institutions (consisting of major banks, regional banks, and *shinkin* banks), 686 U.S. financial institutions, and 491 European financial institutions from the euro area, the United Kingdom, and Switzerland. Data are basically on a consolidated basis. Financial institutions in each region are classified into 4 groups based on quartiles of gross operating profits of Japanese financial institutions. For details, see the October 2017 issue of the *Financial System Report*.
 2. The figures are the averages for the period from fiscal 2014 to fiscal 2016. The figures for U.S. and European financial institutions were converted into yen using purchasing power parity exchange rates (obtained from the OECD) for the period.
 Source: OECD; published accounts of each bank; S&P Global Market Intelligence; BOJ.

Chart 6 International comparison of net non-interest income ratios



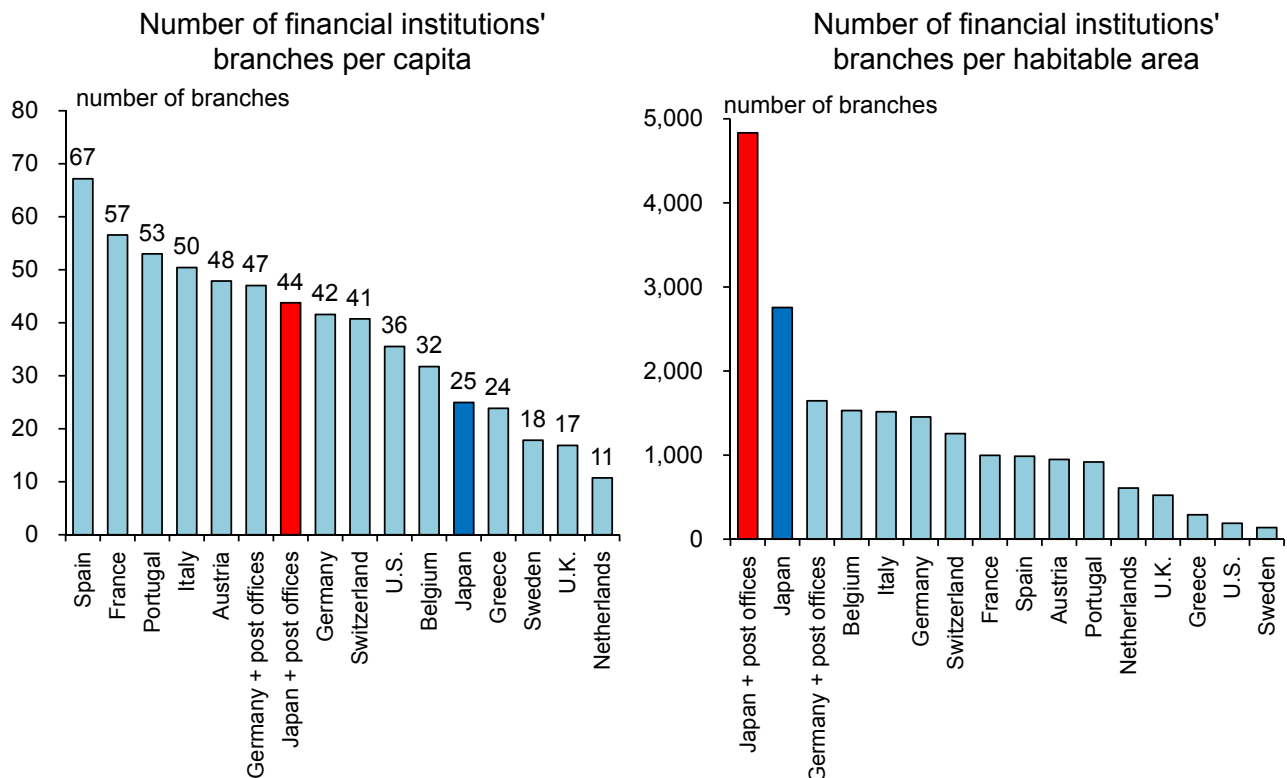
Note: The figures are the averages for the period from fiscal 2014 to fiscal 2016.
Source: OECD; S&P Global Market Intelligence; BOJ.

Chart 7 Share of financial services in household expenditure



Note: 1. Weights in the CPI are on a 2015 basis. The latest data in the right-hand chart are as at July 2017.
2. EEA31 refers to the European Economic Area member countries, which cover 28 EU member states, Iceland, Liechtenstein, and Norway.
Source: Haver Analytics; Ministry of Internal Affairs and Communications.

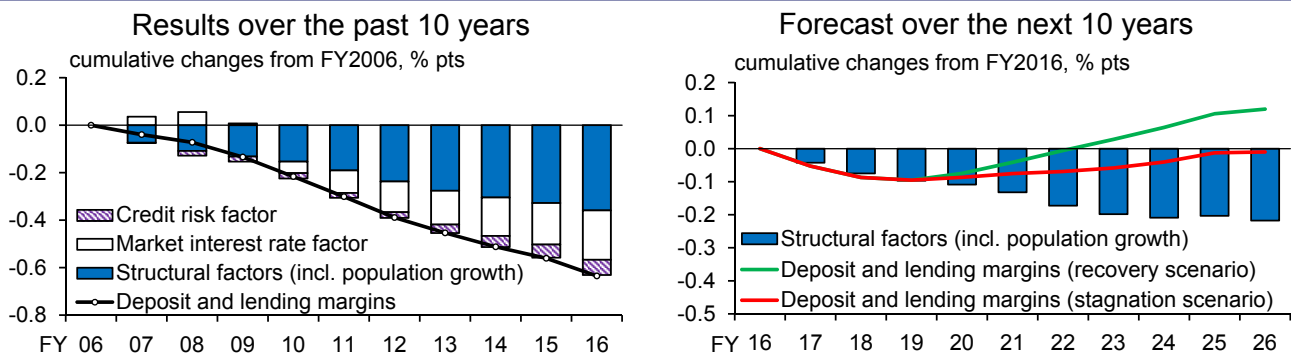
Chart 8 International comparison of the number of FIs' branches



Note: The number of branches is per 100,000 population in the left-hand chart and per 10,000 km² habitable area in the right-hand chart. Basically, data as at end-2015 (data for Japan as at end-fiscal 2015).

Source: CUNA; ECB; Eurostat; FAOSTAT; FDIC; FSA; Ministry of Internal Affairs and Communications; published accounts of each entity; SNB; U.S. Census Bureau; BOJ.

Chart 9 Regional FIs' deposit and lending margins



Methodology for decomposing and forecasting deposit and lending margins

A panel estimation is conducted from fiscal 2001 to 2016 for regional financial institutions (FIs, covering 105 regional banks and 255 *shinkin* banks), regressing deposit and lending margins on the following explanatory variables:

Market interest rate: Due to the zero lower bound on deposit interest rates, a decline in the market interest rate leads to the narrowing of deposit and lending margins. Moreover, when government bond yields decline, FIs further compete on loan interest rates to increase their loans. We use 5-year JGB yields, taking into account the average maturity of bondholdings by regional FIs. 3-year backward moving average is taken for the market interest rate to match the fact that both the deposit interest rate and the loan interest rate are calculated based on the amount outstanding.

Population growth in business areas of each FI: When the population declines, sales of and loan demand from small enterprises (especially non-manufacturing ones) are expected to decline, which exerts downward pressure on the loan interest rate.

Population aging in business areas of each FI: In areas where the population is aging, deposits tend to increase while the demand for housing loans decreases. This leads to the intensification of competition among FIs, lowering the loan interest rate.

Number of branches in business areas of each FI: The higher the number of branches in the business area, the lower the deposit and lending margins.

Nonperforming loan ratio of each FI: FIs with high nonperforming loan ratios tend to offer higher loan interest rates, reflecting their higher credit costs.

Two different scenarios of the future market interest rate

Market interest rate (5-year JGB yields) is regressed on the nominal GDP growth rate, and using the estimated results, we assume that the market interest rate is 1.6% when the nominal growth rate is 2%, and 0.8% when the nominal growth rate is 1%.

Recovery scenario: The economy follows a sustainable growth path with a nominal growth rate of 2% from fiscal 2019, and the market interest rate gradually rises to 1.6%.

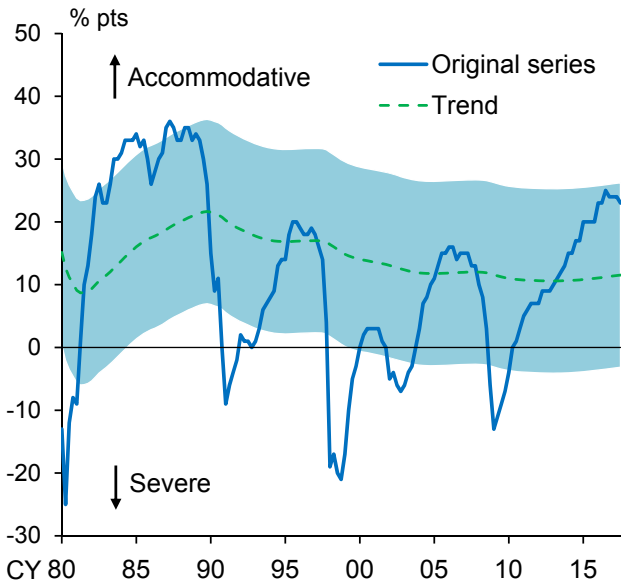
Stagnation scenario: The nominal growth rate remains lackluster at around 1%, and the market interest rate rises only to 0.8%.

Note: 1. Contributions of population growth effect, population aging effect, and number of branches effect are put together as "structural factors."
2. As for population growth and population aging, forecasts by the National Institute of Population and Social Security Research are used. It is assumed that the nonperforming loan ratio and number of branches in business areas are constant throughout the forecast period.

Chart 10

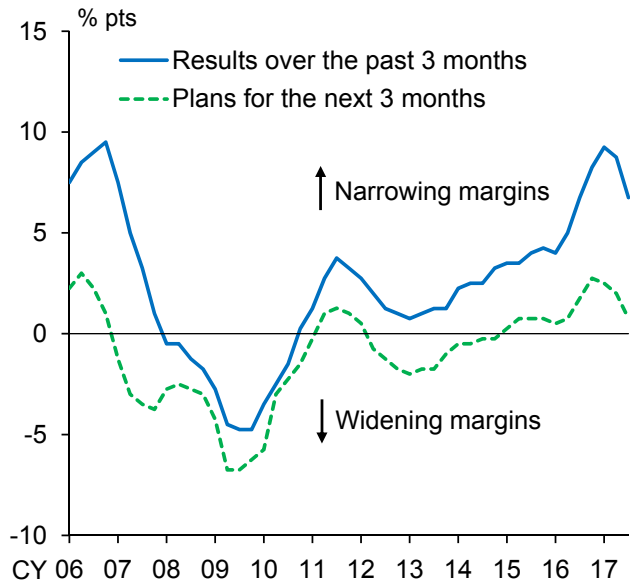
Lending attitudes of FIs

DI of lending attitudes of financial institutions



Note: 1. Covers all firm sizes and all industries. Latest data as at the July-September quarter of 2017.
 2. The trend is calculated from the historical average. Shaded areas indicate the root mean square of the deviation from the trend.
 Source: BOJ, "Tankan."

DI for lending margins: plans and results (Loans to small firms)

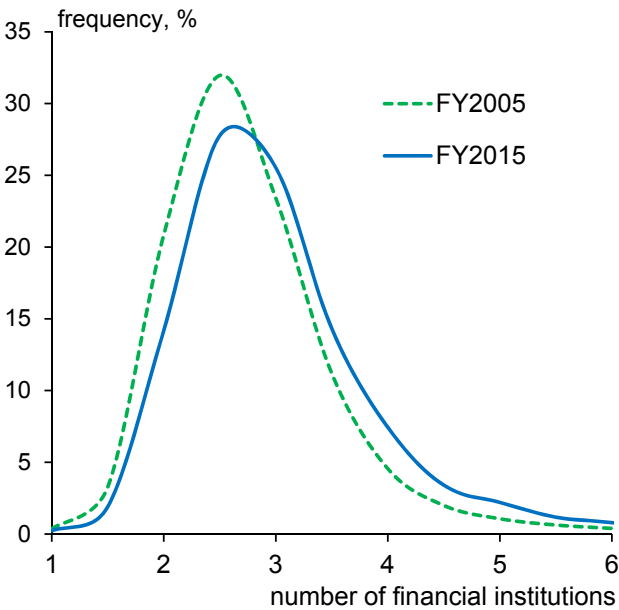


Note: 1. Latest data as at July 2017. 4-quarter backward moving averages.
 2. Based on the proportion of responding financial institutions selecting each given choice, the DI is calculated as follows:
 $DI = \text{"narrowing considerably"} + 0.5 \times \text{"narrowing somewhat"} - 0.5 \times \text{"widening somewhat"} - \text{"widening considerably."}$
 Source: BOJ, "Senior loan officer opinion survey on bank lending practices at large Japanese banks."

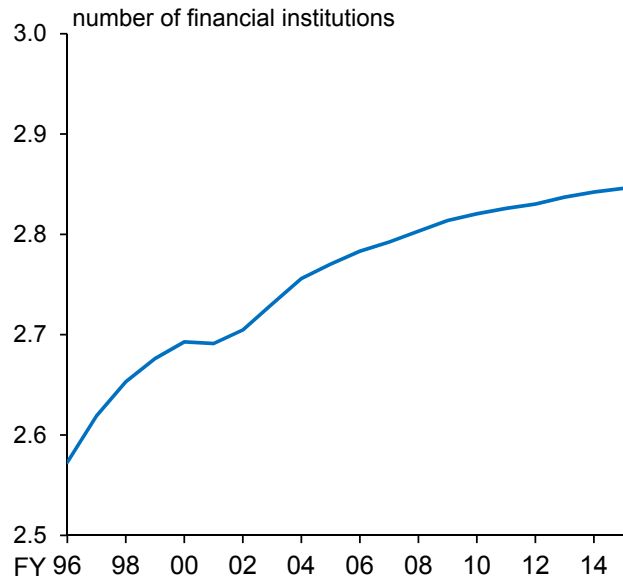
Chart 11

Number of FIs that each firm transacts with

Distribution of the number of financial institutions that each firm transacts with

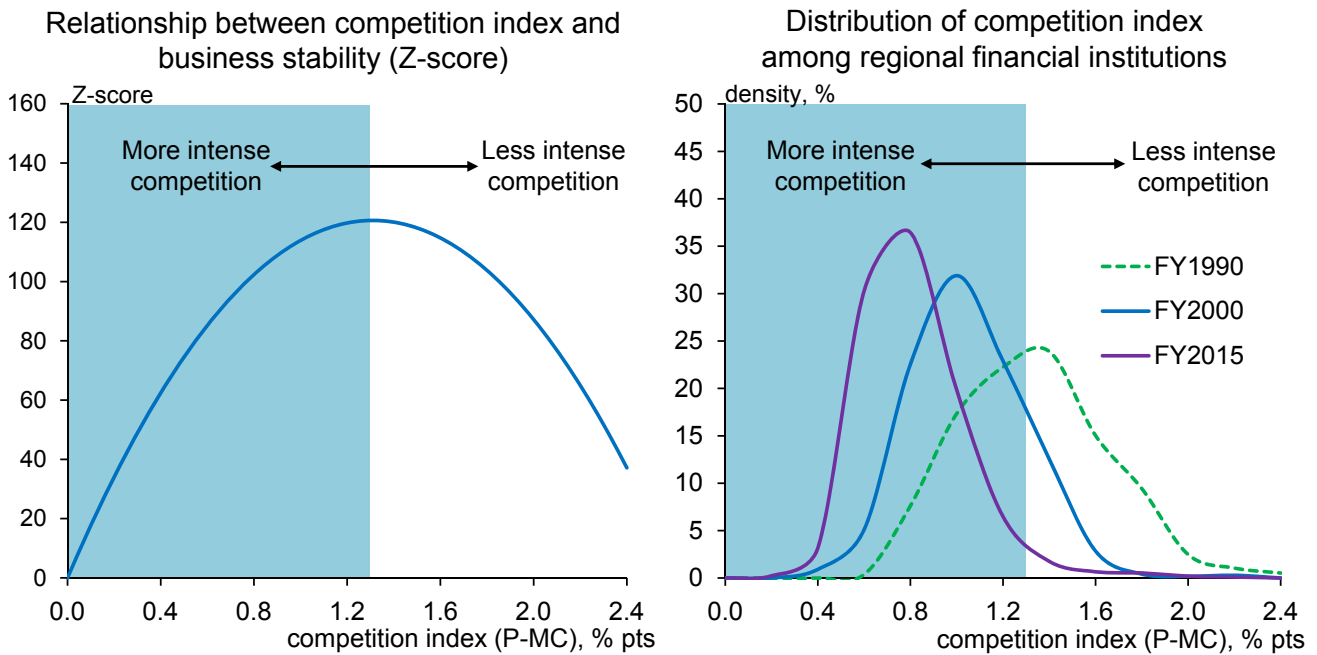


Average number of financial institutions that each firm transacts with



Note: The left-hand chart covers approximately 700,000 firms for which data for the entire observation period are available from fiscal 2005, and the right-hand chart covers approximately 450,000 firms for which data for the entire observation period are available from fiscal 1996. The latest data in the right-hand chart are as at fiscal 2015.
 Source: Teikoku Databank.

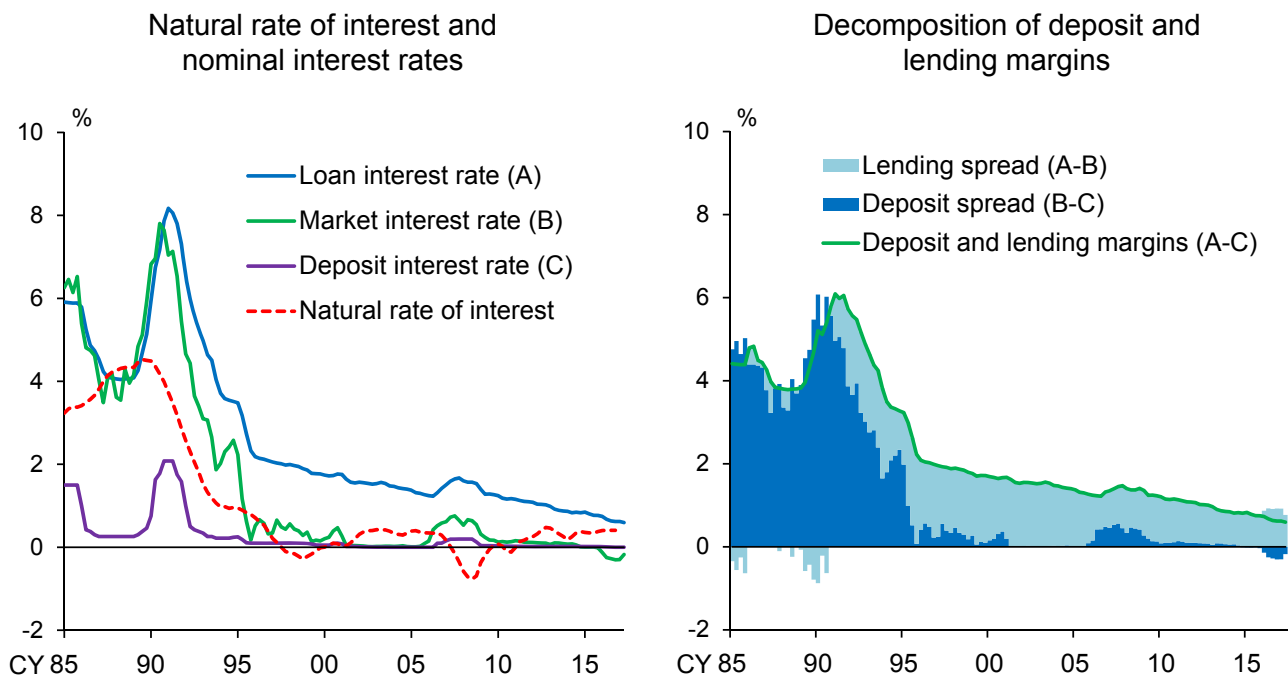
Chart 12 Competition among FIs and their business stability



- Note: 1. Z-score is an indicator that measures a financial institution's business stability and is defined as the ratio of a financial institution's loss-absorbing capacity to the volatility of profits.
2. The left-hand chart shows the cumulative effects of markup (P-MC) changes on the Z-score, by using the following estimated equation:

$$Z\text{-score} = (30.18 \times (P\text{-}MC) - 11.52 \times (P\text{-}MC)^2) / (1 - 0.84).$$
3. The shaded area indicates the range over which a decline in the competition index (P-MC), suggesting more intense competition among financial institutions, leads to a decline in the Z-score and hence lowers a financial institution's business stability.
4. Density in the right-hand chart is estimated by using the Gaussian kernel function.
5. For details, see the April 2017 issue of the *Financial System Report*.

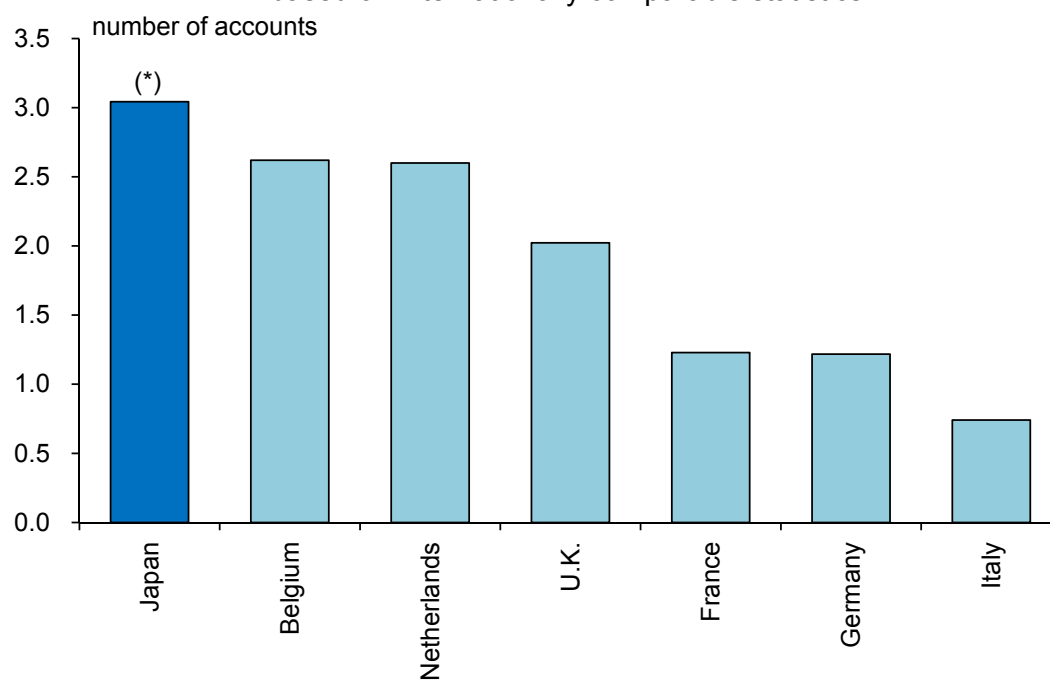
Chart 13 Natural rate of interest and deposit and lending margins



- Note: 1. Loan interest rate is an average contract interest rate on short-term loans outstanding. Aggregate of domestically licensed banks. Market interest rate is the 1-year government bond yield. Latest data as at the July-September quarter of 2017.
2. Natural rate of interest is estimated following Laubach and Williams (2003). Latest data as at the April-June quarter of 2017.
- Source: Bloomberg; Ministry of Finance; BOJ.

Chart 14 Number of bank accounts per capita: international comparison

Number of settlement accounts (excluding savings accounts)
based on internationally comparable statistics



(*) Covers only demand deposit accounts held at all financial institutions (excluding the Japan Post Bank). Including time and savings deposit accounts and accounts held at the Japan Post Bank, etc., the number of personal accounts per capita amounts to about 10.

Note: Data as at end-2011 for U.K., as at end-fiscal 2015 for Japan, and as at end-2015 for other countries.
Source: BIS, "Red Book."