

**The Bank of Japan's Approach to
Liquidity Risk Management in Financial Institutions**

Bank of Japan

June 26, 2009

Executive Summary

The turmoil in global financial markets since the summer of 2007 has again highlighted the importance of liquidity risk management in financial institutions. This paper clarifies the relationship between liquidity risk in financial institutions and a central bank's policy and operations, and then describes the Bank of Japan's approach to liquidity risk management. This paper aims at contributing to the further improvement in risk management in Japanese financial institutions and to international discussions on liquidity risk management.

What makes liquidity risk management in financial institutions difficult is the fact that where the risk lies and how significant it is cannot necessarily be assessed from the figures on the balance sheets. Factors that trigger the manifestation of liquidity risk lurk in all the areas of financial institution management, and the way of manifestation and the size of liquidity risk can vary according to the business model and its surrounding environment. Thus, in considering liquidity risk management, it is important to take into account a broad range of factors associated with liquidity.

In terms of yen currency, Japanese financial institutions, on the whole, have robust asset/liability structures, including off-balance items, against liquidity risk: (1) a high share of deposits, which are a stable funding source, (2) a sizable amount of securities holding that can be liquidated through selling or pledging as collateral and (3) the limited size of contingent liabilities. In terms of foreign currencies, though the gap between investment and funding remains large, the financial institutions, on the whole, have maintained a conservative short-term foreign currency position.

The Bank gauges and analyzes the developments in liquidity as a whole in the financial markets and the financial system from a macro-perspective. In addition, the Bank monitors closely financial institutions' liquidity conditions on a daily basis, and offers guidance and advice if necessary.

The Bank's liquidity monitoring consists of off-site monitoring, in which the staff constantly conduct research through interviews with officers of financial institutions and regular information gathering, and on-site examination, in which examiners visit and investigate financial institutions at regular intervals. The Bank utilizes those two channels in an integrated manner. For example, it monitors financial institutions' funding and investment policies, financial data, and liquidity positions largely in the

off-site monitoring section and it grasps and verifies the internal control mechanism and the preparation of contingency plans mainly through the on-site examination.

In the off-site monitoring section, persons in charge are placed for all the counterparty financial institutions including banks, securities firms and Japanese branches of foreign financial institutions. They monitor liquidity positions on a daily basis and exchange opinions regularly, which is a major characteristic of the Bank's liquidity monitoring. Moreover, based on the recent diversification and globalization of the businesses of financial institutions, the Bank is in close communication with other central banks and domestic and foreign regulatory authorities.

In assessing liquidity risk in financial institutions, the Bank does not assess it using a single financial indicator but takes into consideration multiple indicators and qualitative information from financial institutions. To be more precise, the Bank verifies the following aspects of liquidity risk in each financial institution in detail and offers guidance and advice.

- Profile of liquidity risk and administration
- Balance sheet management
- Daily cash management
- Action plan in case of emergency

The nature and size of liquidity risk can change significantly as a result of business developments in financial institutions and changes in the circumstances surrounding financial institutions. It is important for financial institutions to properly grasp their own liquidity risk profile at the time, and to adequately manage liquidity risk. The Bank will also make sure whether individual financial institutions are taking appropriate measures, and encourage improvement if necessary. On that basis, the Bank will contribute further to financial system stability by ensuring smooth settlement of funds between financial institutions.

1. Background and Purpose

The turmoil in global financial markets since the summer of 2007 has again highlighted the importance of liquidity risk management in financial institutions. Overseas, some banks faced a sharp deterioration in financial positions along with funding difficulties in financial markets resulting from a sudden surge of wariness about counterparty credit risk. One direct trigger of the collapse of Lehman Brothers in September 2008 was the sudden worsening of the financial position triggered by a deluge of customers' withdrawals of assets.

With the downturn in the world economy, financial institutions are expected to effectively perform the financial intermediation function necessary for the economic recovery. To that end, strengthening liquidity risk management has become an importance issue, in addition to the quick disposal of troubled assets and the enhancement of capital adequacy.

The Basel Committee on Banking Supervision compiled¹ sound practices regarding liquidity risk management in financial institutions last September, and continues to discuss regulations on liquidity in financial institutions. In addition, review of regulations and supervisions on liquidity risk management have been started in some major countries.

In considering the liquidity risk issues of financial institutions, it is critical to put in perspective a central bank's policy and operations, namely, the daily market operations, the exercise of the lender of last resort function, and the management of the payment and settlement system. By controlling its assets and liabilities, a central bank daily provides central bank currency (banknotes and current accounts at the central bank) to markets, and influences the liquidity level in the financial markets on the whole and the liquidity positions of individual financial institutions². Through such measures, the central bank influences the interest rates and the total funds of financial markets, and aims at accomplishing its missions of maintaining the stability of prices and the stability of the financial system.

¹ The Basel Committee on Banking Supervision published "Principles for Sound Liquidity Risk Management and Supervision" in September 2008. (<http://www.bis.org/publ/bcbs144.pdf>)

² In this paper, "liquidity level" refers to the total amount of current account balances at a central bank and banknotes in the financial markets on the whole. "Liquidity position" refers to a financial institution's estimated balance of the current account at a central bank and banknotes, which is calculated by incorporating dues of financial transactions.

This paper clarifies the relationship between liquidity risk in financial institutions and a central bank's policy and operations, and then describes the Bank of Japan's approach to liquidity risk management. This paper aims at contributing to the further improvement in risk management in Japanese financial institutions and to international discussions on liquidity risk management.

2. Nature of Liquidity Risk and Central Bank's Involvements

(1) Nature of Liquidity Risk

According to the definition by Basel Committee on Banking Supervision, liquidity risk is "the risk that a financial institution will not be able to acquire necessary funds to meet its matured obligations without affecting either its daily operations or the financial condition." In general, the word 'liquidity' is used as either 'funding liquidity' which straightforwardly refers to the ease of funding or 'market liquidity' which is the ease of trading financial products in the financial markets. In this paper, in principle, the word 'liquidity' indicates the former, 'funding liquidity,' and will focus on the risks in funding liquidity in financial institutions.

Given the nature of its business, a financial institution inherently carries liquidity risk that stems from the difference between the maturities of investment and funding, which is called maturity mismatch. The paths through which liquidity risk may surface can be outlined as follows:

(a) Liquidity risk associated with funding

Unexpected outflow of funds

- Deposit outflow due to deteriorated creditworthiness of financial institutions
- Deposit transfer to other financial institutions reflecting the change in deposit interest rates
- More-than-expected dissaving reflecting depositors' demand for funds

Increased difficulty in acquiring new funds

- Increased difficulty in funding from the financial markets associated with the decline in market functions
- Deterioration in the ability of new funding resulting from lower creditworthiness

(b) Liquidity risk associated with investment

Unrecoverable market investment and loans

- Failure in market investment
- Bankruptcy of the borrowers

Unexpected increase in investment

- A large amount of drawdown under the commitment line agreements

Deterioration in market liquidity of holding assets

- Lower marketability of holding assets
- Steep decline in sale prices of holding assets
- Loss of collateral eligibility of holding assets

(c) Liquidity risk associated with other factors

- Lack of funds inflow from the counterparties caused by clerical and other accidents
- Failure in its own computer system
- Troubles in payment and settlement system

For a financial institution, liquidity risk can surface through various routes. Put it another way, it is the intrinsic function of a financial institution to exert financial intermediation while properly managing liquidity risk that is inherent in the entire financial system. Also, this in itself can become a source of added value for a financial institution.

What makes liquidity risk management difficult is the fact that where the risk lies and how significant it is cannot necessarily be assessed from the figures on the balance sheets. Factors that trigger manifestation of liquidity risk lurk in all the areas of financial institution management, from troubles in the computer system to increased difficulty in market funding owing to the institution's lower creditworthiness. Thus, the state and size of liquidity risk can vary according to the business model and its surrounding environment. For instance, liquidity risk can be different in size and time span until surfacing between a financial institution that mainly funds from the financial markets and one that mainly funds from retail deposits, even though both institutions have similar asset portfolios.

Consequently, liquidity risk cannot be fully managed with a uniform numerical criterion across the board. Therefore, if a numerical criterion is adopted from the perspective of

financial institutions that mainly fund from the financial markets, the asset-liability management in other financial institutions can be excessively restricted and might undermine the maturity transformation function. That function is to convert short-term debts like deposits into medium- and long-term assets like loans, and is intrinsic to financial system. In considering the liquidity risk management in financial institutions, it is important to keep in mind such consequences and take into account a broad range of factors associated with liquidity.

(2) Liquidity in Financial Institutions and Central Bank

In today's financial regime, a central bank supplies central bank money (banknotes and current accounts at the central bank) to the financial markets through financial institutions, and influences the liquidity level in the financial markets on the whole and the liquidity positions of individual financial institutions. Therefore, in considering the risk management in financial institutions, it is essential to have a clear perspective of the role of a central bank in the liquidity in financial institutions.

The liquidity in financial institutions and the operations of a central bank are involved in the following areas.

(a) Central bank's assets and liabilities and financial institutions' liquidity

Banknotes and current accounts, which are the liabilities of a central bank, are two of the most liquid assets for financial institutions.

Monetary operations conducted by the central bank work on the current account balance at the central bank by trading assets between the central bank and financial institutions and influence the liquidity positions of financial institutions. For example, supplying funds through the purchase of assets increases the current account balances and improves the liquidity positions of financial institutions. Adversely, absorbing funds through the sale of assets decreases the current account balances and worsens the liquidity positions. The central bank tries to fulfill its mission by influencing the interest rates and the amount of funds in the financial markets through changes in liquidity positions of financial institutions.

In the case that liquidity risk in a financial institution surfaces, resulting in a shortage of funds, the central bank may play the role of 'the lender of last resort' to ensure the

stability of the financial system. In that case, on the balance sheet of the central bank, the amount of loans on the asset side and the balance of the current accounts on the liability side increase at the same time, thereby resolving the funds shortage of the financial institution.

(b) Payment and settlement system / market infrastructure and liquidity in financial institutions

Liquidity risk in financial institutions is deeply related to the payment and settlement system and the structure of financial markets. The amount of liquidity required for payment by a financial institution, for example, largely varies according to the speed of the settlement system and the existence of intraday overdraft facility for smoother settlement. Also, practices in the financial markets such as the number of days between transaction and settlement also have a substantial influence on the amount of liquidity financial institutions should hold in preparation for emergency. A central bank in each country continues with its efforts to improve the efficiency and safety of the payment and settlement system by operating the system on its own and by offering an intraday overdraft facility for smoother settlement. Central banks not only oversee the private payment and settlement systems for their efficient and safe operations but also contribute to the development of the financial market infrastructure.

3. Characteristics of Liquidity Risk in Japanese Financial Institutions and the Operation of the Bank of Japan

(1) Characteristics of Liquidity Risk in Japanese Financial Institutions in terms of Asset/Liability Structures

The asset/liability structures of banks, which are depository corporations, reflect the characteristics of the flow of funds in the country. In Japan, banks are often divided into major banks whose business is based in big cities and regional banks based in rural areas, in light of the wide gap in their asset/liability structures historically (see Box 1 for a more detailed description of the current state of liquidity risk in banks).

Through the 1990s, loans by major banks were mostly comparable with deposits. As a result of addition of investment in securities, major banks were short of funds constantly and were dependent on short-term market funding. On the other hand, loans by regional

banks were always smaller than deposits, and they tended to invest their surplus funds into the financial markets. Since the beginning of the 2000s, however, loans by major banks also fell below deposits partly due to the contraction of the magnitude of a fund shortage in the corporate sector, and major banks became less dependent on market funding on a net basis.

Almost all the major banks in Japan have a strong domestic deposit base. Although liquid deposits such as current and savings deposits account for a major share of their deposits, those deposits could be regarded as a stable funding source. In contrast to the highly liquid attribute of these products, liquid deposits can be considered as a stable funding source in Japan as by experience the rapid outflows and inflows are uncommon. At the same time, Japanese banks have a small proportion of originate-to-distribute type of business often seen in US and Europe in recent years and have a limited size of contingent liabilities, like provision of liquidity enhancement facility, related to this business.

A large proportion of highly liquid securities held by both major and regional banks is another characteristic of Japanese banks in relation to liquidity risk. That reflects the structure of the flow of funds in which the banking sector holds a substantial share of the increased issuance of government and local bonds, amidst Japanese people's continuous strong deposit preference. Amid the recent expansion of structured product markets overseas, Japanese banks have also invested in securitized products with relatively low market liquidity. However, the size of those investments has been relatively small, compared with that of US and European financial institutions.

In light of the above, major banks in Japan on the whole possess asset/liability structures, including off-balance items, that are robust against yen-denominated liquidity risk.

In terms of assets and liabilities denominated in foreign currencies, on the other hand, the gap between investment and funding remains large because banks have increased overseas lending in the past few years. But the banks are considered to have maintained a conservative foreign currency liquidity position in the short term compared with their excess holding of unused collateral denominated in foreign currencies with high liquidity. That is one factor that prevented Japanese banks from falling into a liquidity crisis in foreign currency funding despite the tightening of the dollar funding markets after the outbreak of the subprime mortgage problem.

The preceding sections have reviewed funding liquidity centering on major banks in Japan. The conditions of financial institutions' liquidity and asset/liability structure depend largely on their business category. For example, at Japanese major securities firms, securities including government bonds and reverse repo account for the bulk of their assets, and funding is carried out mainly through repo backed by securities. For assets with relatively low market liquidity, funds are raised through long-term bank borrowing and corporate bonds. It is one feature of major securities firms to manage their liquidity risk by minimizing the asset/liability duration mismatch, with a small portion of uncollateralized funding from the money market.

(2) The Bank of Japan's Operations in Relation to the Liquidity in Financial Institutions

The following are the characteristics of the Bank's operations in relation to liquidity in financial institutions.

- a) *High accuracy in monitoring the liquidity position:* The level of liquidity in the financial markets on the whole is determined mainly by the development of banknotes and the fiscal funds, and fund provision and absorption by a central bank. Payment and settlement among financial institutions further affect the liquidity position of individual financial institutions. Through the main office and branches of the Bank, the sections that deal with financial institutions, the currency issue section, the government securities and treasury funds services section, and the open market operations section, monitor them with staying in close contact with the financial institutions, market players and organizations concerned. Such monitoring of the liquidity position of the financial institutions is extremely precise and allows the Bank to conduct policy operations smoothly and effectively (details are described in the next section).

- b) *Expeditious and flexible conduct of monetary operations:* The Bank conducts open market operations to guide the short-term market rate to the target rate set by the Monetary Policy Meeting and influences the liquidity level in the financial market. Those operations are marked by being conducted expeditiously on a daily basis using various measures. If viewed from a standpoint of financial institutions, they can control their liquidity positions by taking advantage of the Bank's operations. Also, the Bank provides creditworthy financial institutions with permanent facility

that allows them to borrow money up to the amount pooled as collateral³. This is named complementary lending facility as it is positioned to complement market operations. The Bank conducts these operations and complement market operations for Japanese financial institutions, foreign banks, and securities firms in Japan.

- c) *Exercise of the lender of last resort function*: In the case that a financial institution faces a liquidity shortage for unexpected reasons, the Bank supplies credit (supplies liquidity) to the financial institution as a lender of last resort if necessary in the light of maintaining financial system stability. Although in such a case the Bank secures collateral from financial institutions in principle, it can also supply credit to financial institutions without collateral for a certain period in the case of a temporary fund shortage due to incidents such as computer trouble. Also, the Bank can provide loans with special conditions, including the provision of uncollateralized loans when there may be a serious impact on the stability of the financial system, at the request of the Prime Minister (delegated to the Commissioner of FSA) and the Finance Minister. In that case, the Bank decides whether or not to comply with the request, based on the nature and the purpose of the lender of last resort function and in light of the so-called four principles⁴.
- d) *Stable and efficient operation of payment and settlement system*: The Bank offers not only safe settlement measures such as banknotes and current accounts but also the payment and settlement system called the Bank of Japan Network Funds Transfer System (the BOJ-NET) for the settlement of funds and government bonds. The Bank utilizes Real Time Gross Settlement (RTGS)⁵ in the BOJ-NET whereby

³ The Bank manages collaterals accepted from financial institutions as revolving collateral (pooled collateral) for operations, complementary lending facility and intraday overdraft and so on. This pooled collateral framework facilitates financial institutions to control collateral and liquidity flexibly. For example, financial institutions can use collateral for intraday overdraft as that for complementary lending facility and can replace collaterals as needed even during the operation period.

⁴ The Bank released the statement “Application of four principles on special loans to maintain financial system stability” in 1999 and made its view clear in applying the following four principles on lending concerning Article 38 of the Bank of Japan Act (special loans).
Principle 1: There must be a strong likelihood that systemic risk will manifest itself.
Principle 2: There must be no alternative to the provision of central bank money.
Principle 3: All relevant parties are required to take clear responsibility to avoid a moral hazard.
Principle 4: The financial soundness of the Bank itself must not be impaired.

⁵ For the settlement method in the BOJ-NET, the Bank abolished in January 2001 a ‘designated-time net settlement’ and introduced the RTGS. In the ‘designated-time net settlement,’ payment and transfer instructions were accumulated until a specified settlement time and settled on a net basis, while in the RTGS, payment and transfer instructions are processed immediately

each payment order and transfer order is settled by the gross. Also, the Bank adopted a framework for supplying passive intraday credit within the margin of collateral to make settlement smoother on the BOJ-NET. As many financial institutions make full use of these facilities, most of payment and settlement of funds and government bonds on the BOJ-NET are completed during the morning hours, thus contributing to the efficient and safe settlement.

4. Framework and Conduct of Liquidity Monitoring of Financial Institutions

(1) Characteristics of the Bank of Japan's Approach to Gauging Liquidity

As described the above, the Bank influences the liquidity level in the financial markets on the whole and the liquidity positions of individual financial institutions through its open market operations and lending facility, and tries to achieve its purposes of 'price stability' and 'smooth settlement of funds between banks and other financial institutions, thereby contributing to maintaining financial system stability.' In addition, in order to accomplish that, the Bank comprehends and analyzes the trend of liquidity overall in the financial market and the financial system from a macro perspective, and monitors closely individual financial institutions' liquidity positions on a daily basis, and offers them guidance and advice if necessary.

The comprehension and analysis of liquidity from a macro perspective are indispensable to the policy conduct of the central bank. For example, after the collapse of Lehman Brothers in the fall of 2008, the movement to hold substantial cash reserves spread among financial institutions and non-financial companies in the financial market, causing an abrupt liquidity crunch. Based on the grasp and anatomy of the conditions, the Bank has taken a variety of measures in monetary policy. In addition, comprehension and analyses of the trend of liquidity from a macro perspective are critical in assessing the stability of the financial system and the payment and settlement system. That is because, for example, the extremely heightened anxiety for liquidity in the financial market could lead to the extension of systemic risk and threaten the stability of the financial system. The bank has put together the results of the

and individually upon receipt. In addition, the Bank introduced in October 2008 a new type of settlement called 'Next-generation' RTGS in the BOJ-NET. That added a liquidity saving facility to the RTGS for current accounts, which enabled more efficient use of funds while making settlements on a gross basis.

examinations and analyses in the form of the Financial System Report, the Financial Markets Report, and the Payment and Settlement Systems Report, and has released them.

Traditionally, the Bank also regards the monitoring of individual financial institutions' liquidity positions as a significant function of the central bank in maintaining financial system stability, and has allocated abundant managerial resources in this area to date. In the past, part of the liquidity monitoring section at the Bank was located in the department in charge of open market operations and branches. At present, the liquidity monitoring section as well as the on-site examination section belongs to the department that deals with various issues for the maintenance of an orderly financial system ("the Financial Systems and Bank Examination Department") and branches. The present structure was taken to assess the management of financial institutions and risks more effectively, and that department has close contact with the open market operations section on a daily basis.

The method of the Bank's liquidity monitoring roughly consists of off-site monitoring, or a constant survey through interviews with officers of financial institutions and regular information gathering, and on-site examination, in which examiners visit and investigate financial institutions at regular intervals. Through systematic management of the two channels, the Bank strives to come to grips with the state of liquidity and the size of risk in financial institutions. For example, the Bank constantly monitors financial institutions' funding and investment policies, financial data, and liquidity positions largely in the off-site monitoring section. At the same time, the Bank investigates the internal control mechanism and the preparation of contingency plans mainly through the on-site examination.

In the off-site monitoring section, those in charge are placed for all the counterparty financial institutions including banks, securities firms and Japanese branches of foreign banks and securities firms, and they monitor liquidity positions on a daily basis and exchange opinions regularly, which is the main characteristic of the Bank's liquidity monitoring.

In assessing the liquidity risks of financial institutions, the Bank does not assess, employing a single financial indicator, but takes into consideration multiple indicators and qualitative information from financial institutions. As described above, that is due to the fact that the factors that may prompt liquidity risk to surface exist in every area of

management of financial institutions, and the appearance and magnitude of liquidity risk vary widely and change as time passes according to the business model or management environment. Thus, the comprehension of current conditions as well as future prospects of each financial institution's liquidity position, and a full understanding and assessment of qualitative information regarding overall management play an essential role in monitoring liquidity risk by the Bank.

Furthermore, with the diversification and globalization of the businesses of financial institutions, the understanding and control of risk on a global basis are also becoming important in the field of liquidity risk management. Under those circumstances, information sharing and cooperation in policies among central banks in other countries and domestic and foreign regulatory authorities are becoming increasingly vital, and the Bank strives to keep in close communication with those organizations.

(2) The Bank of Japan's Liquidity Monitoring Operations toward Financial Institutions

In monitoring liquidity in financial institutions, the Bank examines the current situation and provides guidance and advice to the financial institutions on each of the following items (a) profile of liquidity risk and administration, (b) balance sheet management, (c) daily cash management, (d) action plan in case of emergency.

The following sections will discuss the Bank's specific actions in carrying out liquidity risk management at financial institutions on the bases of the above items (Some specific examples of the Bank's liquidity monitoring operations are shown in Box2).

(a) Profile of Liquidity Risk and Administration

The liquidity risk profile of a financial institution may vary widely according to the nature of its business and management policy, i.e. whether it funds/invests actively in markets, and whether it operates internationally, as well as the markets' reputation toward the institution.

It is therefore important for the Bank to keep in mind whether each institution conducts appropriate risk management that reflects its liquidity risk profile. Consequently, in liquidity monitoring, it is important to check whether each financial institution conducts appropriate risk management reflecting its profiles of liquidity risk.

Liquidity risk management in a financial institution, first of all, requires a solid risk management system to be in place. Specifically, the development of an internal control system is needed, which includes 1) establishment of risk management policy, 2) assignment of person in charge of risk management with adequate empowerment and installment of a management reporting line. Moreover, it is important to secure consistency with risk management policy when deciding on risk tolerance levels and in compiling a contingency plan.

Accordingly, the Bank probes into the following points mainly through its on-site examination.

- Whether or not the understanding of the profile of liquidity risk in line with the nature of business and management policy is adequate
- Whether or not the commitment by management to upgrade the internal control system is sufficient
- Whether or not the contingency plan that includes the framework for transition to a more proper control system, reflecting the tightness of liquidity and a mechanism for incorporating the impact to liquidity in case of emergency is adequate
- Whether or not due attention is given to the potential factors which may influence liquidity from the perspective of risk management (including the financial institution's business condition, as well as system failures and operational errors)

If the results indicate the contingency plan to be ineffective for such reasons as the insufficient risk management system and/or lenient or obsolete stress assumptions, the Bank encourages the financial institution to make improvements in the necessary areas.

(b) Balance Sheet Management

The starting point to grasp the state of a financial institution's liquidity risk is to monitor changes in its assets and liabilities including off-balance items --loans and deposits, securities' investments, market transactions, and derivatives transactions--, and thereby gauging a mismatch between the maturity of assets and liabilities and the degree of leverages. Financial institutions should manage their balance sheets adequately from the perspective of liquidity risk management, such as maintaining the asset and liability

balance based on funding capacity, diversifying the maturity dates and source of funding, and paying attention to the assets with low market liquidity which often become difficult to unwind.

In addition, when projecting liquidity risk in the future, the perspective of funding availability, or “whether a financial institution can raise funds when necessary”, is important. As a financial institution’s funding availability depends on the lenders’ assessment of the institution’s risk, it is difficult to project the future availability only from the past data. Accordingly, in order to forecast a possible change in a financial institution’s asset and liability structure in the future, it is essential to obtain qualitative information, including its funding/investment policy or the prospects for the funding environment in the market; and to comprehend the amount of contingent liabilities that may cause additional funding demand ahead.

The Bank regularly gathers financial institutions’ data, including their financial positions mostly on a monthly basis, and, makes efforts to grasp their qualitative information as well. Based on those data and qualitative information, the Bank explores the following points, mainly through its off-sight monitoring.

- Whether or not the asset and liability structure itself, such as the balance between funding and investment, the mismatch between the maturity of assets and liabilities, and the dependence on funding from the market, is adequate for its funding ability
- Whether or not the size of contingent liabilities is excessively large, compared with its funding ability
- Whether or not there is tolerance in future investment/funding policy to build up assets without due consideration to its funding ability

Following the assessment of financial institutions’ stable funding efforts, the Bank encourages institutions to improve their liquidity risk management, when, for example, the Bank recognizes that the gap in the maturity structure of assets and liabilities is large and therefore the funding demand is greater than the funding ability.

(c) Daily Cash Management

Financial institutions engage in daily finance operations, such as investment and funding in the short-term money market and purchase and sale of other liquid assets, according to their policies on liquidity risk management.

In addition to collecting financial data as discussed above, the Bank obtains information on daily finance operations from financial institutions every day in principle. For example, that includes performances of investment and fund-raising according to transactions, forecasts of the money they need to finance on the next business day, and their current accounts balances at the Bank. The Bank also monitors the operations of the payment and settlement system in real time.

Based on the collected information, the Bank inquires into the following points mainly through its off-site monitoring.

- Whether or not the financial institution secures necessary funding stably and facilitates smooth settlement
- Whether or not there are irregular movements in trading rates, including a surge in funding rates
- Whether or not the daily fund requirements exceed its funding capacity
- Whether or not there are problems in managing collateral, including the Bank's eligible collateral

When a shift in the funding environment of a financial institution occurs, some sort of sign in funding conditions in financial markets is likely to be observed. Such signs include the ability to rollover maturing transactions and changes in transaction rates. Thus, by checking those signs on a daily basis, the Bank makes efforts to recognize at an early stage any problem financial institutions may have in their liquidity management and to advise financial institutions against the problem.

(d) Action Plan in Case of Emergency

The funding environment of a financial institution is susceptible to dramatic swings for reasons such as changes in risk perception of fund suppliers (market participants, depositors, etc.) regarding the soundness or any other aspects of the financial institution and changes in circumstances in the market itself. In that case, the financial institution would have to make appropriate responses in the areas including management of its funding position, methods of risk management, and the internal reporting line on its liquidity position, according to the change.

If a financial institution is viewed to have been impacted in its funding or suffers increased risk due to the occurrence of trouble in fund raising from the market and/or a

massive drain of deposits and any other fund, the Bank will strengthen monitoring and conduct flexible on-site examination, and will investigate whether appropriate measures are being taken in the following areas.

- In the area of internal governance, whether or not the institution has proper recognition of the changing funding environment and moves to a control system that matches the tightness of the market
- Whether or not the mechanism for incorporating intensified liquidity constraints into business operations is effectively functioning
- In operational areas, whether or not adequate liquidity management is in place to control positions according to the tightness of funding and also whether or not there are measures to secure additional funds by diversifying funding sources and methods and through the sale of assets

If more improvements are found necessary as the results of reviews on those points, the Bank will advise the financial institution to make effective measures promptly.

5. Closing Remarks

The central bank is intricately linked to liquidity risk in financial institutions in various aspects of its policy and operations. Based on such close relationship, the Bank's approach to liquidity risk management in financial institutions can be summarized as a process (1) that takes a diversity of financial institutions and changes in market conditions into consideration, (2) with a perspective to foresee the future availability of funds, and (3) makes comprehensive judgments on the state of liquidity risk, based on ample information acquired through constant and detailed monitoring, and, if necessary, gives guidance and advice.

Given that Japanese financial institutions have avoided a liquidity crisis amid the recent turmoil in the global financial markets, the Bank's framework for liquidity monitoring of financial institutions, along with market operations and measures to secure financial stability, have worked effectively so far.

The nature and size of liquidity risk can change significantly as a result of business developments in financial institutions and changes in the circumstances surrounding financial institutions. It is important for financial institutions to properly grasp their own

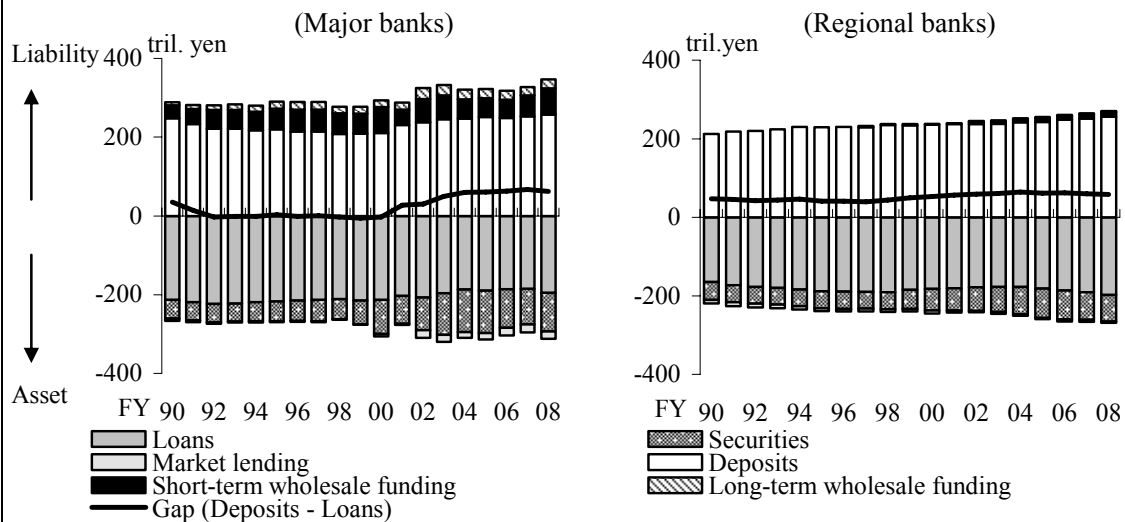
liquidity risk profile at the time, and to adequately manage liquidity risk without losing the awareness of the importance of liquidity risk management accompanying the future financial stabilization. The Bank will also make sure whether individual financial institutions are taking appropriate measures, and encourage improvement if necessary. On that basis, the Bank will contribute further to financial system stability by ensuring smooth settlement of funds between financial institutions.

Box 1: Liquidity Risk in Japanese Banks in terms of Asset/Liability Structures

With regard to the yen-denominated liquidity in Japanese banks, the asset/liability structure of the balance sheets shows that through the 1990s, major banks mostly had a comparable size of loans to deposits, and from time to time the outstanding loans exceeded the outstanding deposits. That, in conjunction with the investments in securities, generated constant fund shortages, which led to the increase in dependence on the short-term market-based funding of which risk sensitivity is relatively high. Meanwhile, deposits of the regional banks almost always exceeded loans, and their surplus funds were predominantly invested in the short-term money market.

Upon entering the 2000s, Japanese banks saw the decrease in loans due to the reduced level of the fund shortage in the corporate sector, and the increase in their deposits from the inflow of funds following the maturity of a sizable volume of fixed-amount postal savings. Consequently, even at the major banks the outstanding deposits began to outpace the outstanding loans, and the degree of net dependence on market-based funding was lowered. Meanwhile, deposits of the regional banks continued to surpass loans (Chart 1).

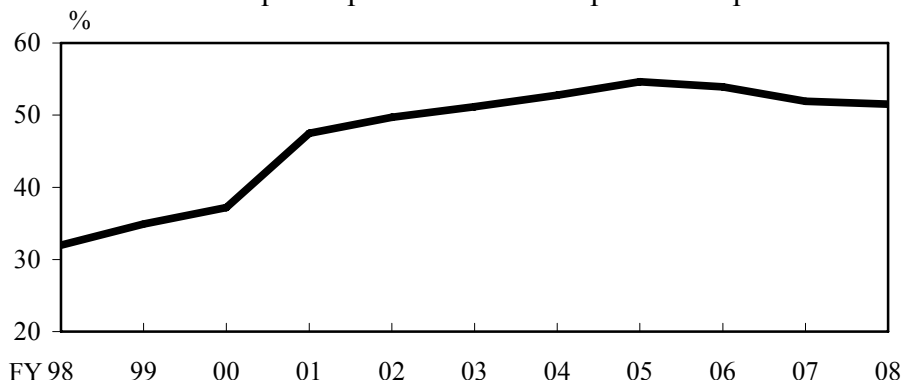
Chart 1: Assets and liabilities of Japanese banks (domestic sector)



- Notes:
1. Long-term funding = bonds and notes + borrowed money (excluding borrowed money from the Bank of Japan).
 2. Short-term funding = CDs + call money + payables under repurchase agreements + payables under securities lending transactions + short-term corporate bonds + borrowed money from the Bank of Japan.
 3. Figures for city banks were used as data for major banks.

Looking at the details of the deposits, which are the principal funding instrument of Japanese banks, liquid deposits such as current deposits and savings deposits have comprised a substantial proportion since the end of the 1990s when the level of interest rates sharply declined (Chart 2). In contrast to the highly liquid attribute of these products, liquid deposits can be considered as a stable source of funding in Japan as by experience the rapid outflows and inflows are uncommon.

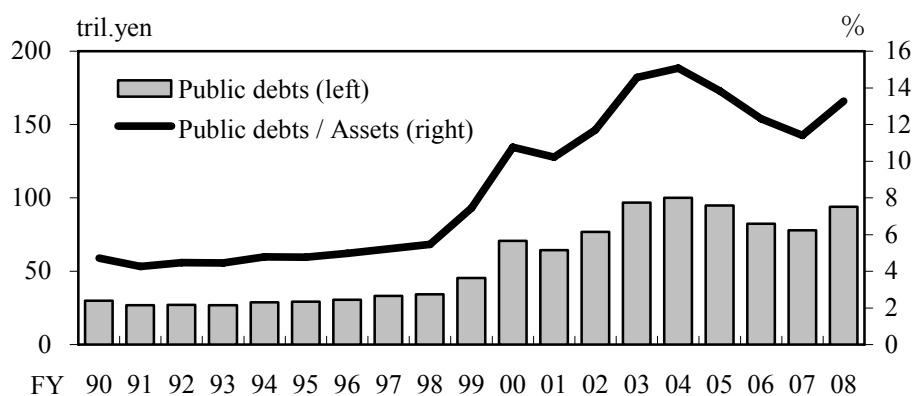
Chart 2: Ratio of liquid deposits to overall deposits in Japanese banks



Note: Ratio of liquid deposits = demand deposits / deposits.

As for the investments in securities, regardless of the major banks or the regional banks, it is another characteristic of Japanese banks in terms of liquidity risk that banks hold a considerable proportion of securities with high market liquidity. That reflects the flow of funds structure that the increase in the issuance of public bonds, such as government and municipal bonds, resulted in a sizable amount of holdings of such securities by the banking sector, as Japanese citizens' preference on deposits persists (Chart 3).

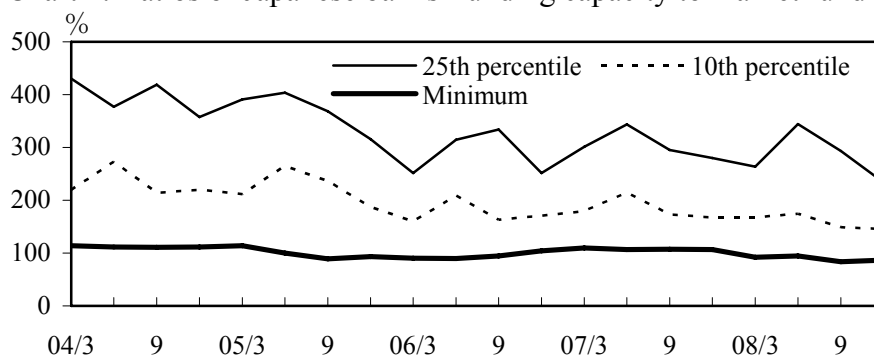
Chart 3: Outstanding public bonds held by Japanese banks



Note: Public bonds = government bonds + municipal bonds (municipal bond certificates).

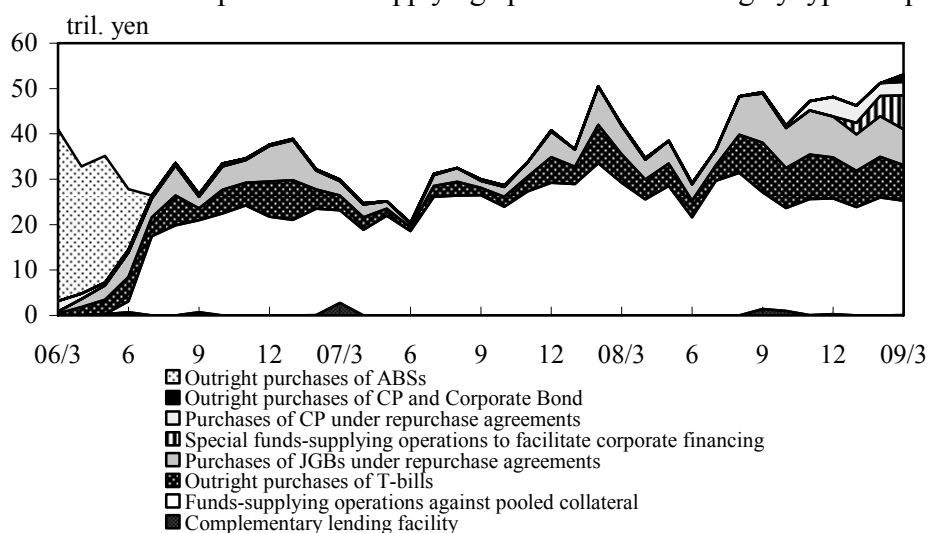
To assess Japanese banks' funding capacity, the ratio of the outstanding short-term market-based funding to the total of the collateral and receivables for the short-term market-based investments shows that, at present, the aggregate amount of the collateral and receivables for the short-term investments sufficiently covers the outstanding short-term market-based funding, which as a whole indicates that the conservative liquidity management is being maintained (Chart 4). Such collateral can be considered as highly liquid assets for financial institutions, since they can be used for the Bank's funds-supplying operation and complementary lending facility under the Bank's collateral policy (Chart 5).

Chart 4: Ratios of Japanese banks' funding capacity to market funding



- Notes: 1. Ratios of banks' funding capacity to market funding = (market lending up to three months + reserve deposits + government bond holding) / market borrowing up to three months.
 2. Ratios of banks' funding capacity to their market funding are sorted out in ascending order. The minimum, 10th percentile, and 25th percentile are shown.
 3. Government bond holding is adjusted according to the ratio of the collateral value to the face value of the government bonds accepted by the Bank at the end of December 2008.
 4. Banks consolidated by another bank or a holding company are summed up a single banking group. Data exclude banks with no market borrowing up to three months.

Chart 5: The Bank of Japan's funds-supplying operation outstanding by type of operation

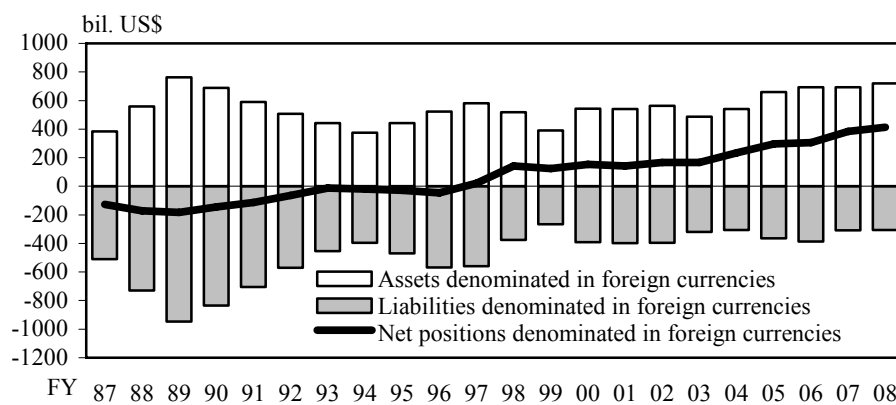


Note: Funds-supplying operations against pooled collateral are the loans that are made against pooled eligible collateral by way of open market operations with loan rates determined by competitive auctions.

Thus, for Japanese banks, the share of retail deposits, which are a stable funding source, is high and a sizable amount of securities that can be liquidated through selling or pledging as collateral is held. Therefore, Japanese banks on the whole can be considered to have robust asset/liability structures, including off-balance items, against the yen-currency liquidity risk.

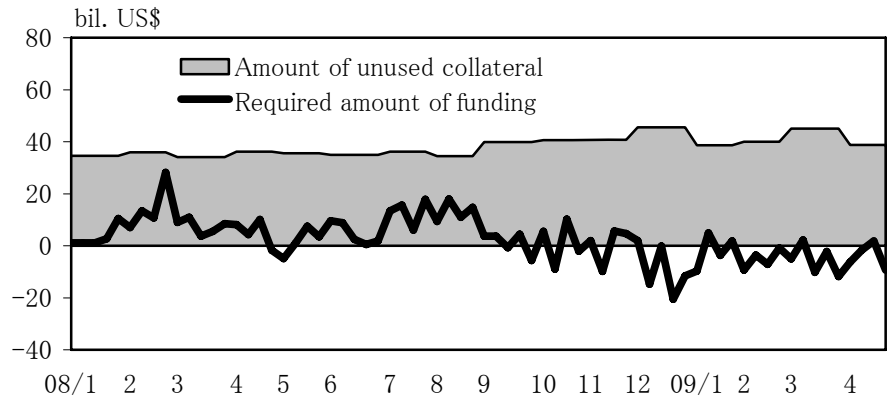
On the other hand, in terms of assets and liabilities denominated in foreign currencies, both the Japanese banks' assets and liabilities diminished significantly in the 1990s by the decline in Japanese banks' creditworthiness since the collapse of the bubble economy and the constraints in risk assets following the adoption of Basel Capital Accord (Basel I). However, since around 2004, the gap between investment and funding has remained large as a result of increases in overseas lending (Chart 6).

Chart 6: Banks' foreign assets and liabilities denominated in foreign currencies



Meanwhile, looking at the short-term liquidity position of foreign currencies of Japanese banks, demand for foreign currency funds almost always remained within the amount of unused collateral denominated in foreign currencies with high liquidity, suggesting their conservative management of short-term foreign currency funding (Chart 7). This is one factor that prevented Japanese banks from falling into a liquidity crisis in foreign currency funding despite the tightening of the dollar funding markets after the outbreak of the subprime mortgage problem. Moreover, after the collapse of Lehman Brothers, Japanese banks have taken an even more conservative attitude in foreign currency funding, by preempting funding of short-term foreign currency funds.

Chart 7: Required amount of funding and amount of unused collateral of foreign currencies of Japanese banks



- Notes: 1. Required amount of funding is the data until Friday of each week as of Tuesday of the same week.
 2. Amount of unused collateral includes US government bonds, lending facility of the Federal Reserve (Discount Window), etc.
 3. The amounts are the sum of 6 major banks which are subject to international standards.

Box 2: The Bank of Japan's Liquidity Monitoring Operations

For a better understanding of the Bank's daily liquidity monitoring of the financial institutions, the way of monitoring and the contents of guidance and advice are explained in detail in the following sections taking Bank A, a hypothetical bank, as an example.

1. Liquidity monitoring of Bank A at normal times

The structure of Bank A's balance sheet and the characteristics of liquidity risk

The structure of Bank A's balance sheet is shown in Chart 8. From the viewpoint of liquidity risk, the following features are assumed.

- Looking at the balance between investment and funding, the sum of loans and investment in securities exceed deposits.
- As the demand for funds cannot be covered by deposits, the portion of funds raised from financial markets is relatively high.
- Looking at the funding from markets in detail, the number of suppliers is limited and the maturity dates of transactions tend to converge.

Chart 8: Bank A's balance sheet

Investment	bil. yen	Funding	bil. yen
Cash and deposits	10	Deposits	60
Securities	5		
Market Investments	10		
Loans (1 month - 3 yrs)	75	Market Funding	30
		Net Worth	10
Sum	100	Sum	100

Characteristics of Bank A's deposits

- Pace of money flow is slower than that of market funding.

Characteristics of Bank A's market funding

- Portion of call money is high.
- The number of suppliers is limited.
- Maturities are from overnight to 1 yr.
- Maturity dates tend to converge before the end of each quarter.

The Bank's Response

Through the on-site examinations and off-site monitoring, the Bank studies the business model of Bank A and verifies the conditions of balance sheet management (see attachment for an example of the daily liquidity position report). In this case, with an aim to enhance the stability of funding while giving due consideration to profitability, the Bank, for example, scrutinizes the following points and provide guidance and advice if necessary.

- a) The Bank checks whether the scale of funding from the markets matches A's funding capacity using tools such as stress-testing. If the dependence on the funding from the markets is excessive, the Bank encourages A to take actions

including broadening its deposit base and /or restraining investment.

- b) The Bank encourages A to increase the number of suppliers of funding from markets and to spread the maturity dates of transactions.

2. The Bank of Japan’s actions in the case of deterioration in Bank A’s funding environment

Below is the case that funding by Bank A becomes difficult for reasons such as abrupt changes in the funding environment of the market or the decline in A’s creditworthiness in the financial markets.

Detection of changes through daily monitoring of liquidity conditions

A change in the funding environment of a financial institution is often detected as a rise in funding rates or a failure in transaction rollover, through the Bank’s daily liquidity monitoring.

In response to those signs of change, the Bank decides to intensify liquidity monitoring of Bank A and collects more detailed information on liquidity conditions and plans on future investment and funding.

Chart 9 shows “the forecast for the structure of investment and funding” that comes to light as a result of the detailed information gathering.

- Increasing difficulty in uncollateralized funding causes the balance of market funding to drop sharply.
- In order to generate liquidity, short-term investments in the market will be ceased and some securities will be sold, but some of its cash and deposits are expected to decrease.

Chart 9: The forecast for Bank A’s balance sheet in the future, the end of the month

	Investment bil. yen	Funding bil. yen
Cash and deposits	2.5	Deposits 60
Securities	2.5	
Market Investments	0	
Loans	75	Market Funding 10
Sum	80	Net Worth 10
		Sum 80

Part of cash, deposits and securities will be provided for repayment of market funding.

Market investments will be ceased, reflecting difficult funding condition.

Outstanding balance will be cut by two-thirds reflecting harder market funding.

If market funding (10 bil. yen) decreases more than the sum amount of cash, deposits and securities (5 bil. yen), there might be a shortage of liquidity.

Note: Shaded areas represent estimated decrease from the current balance.

The Bank's Response

The Bank provides guidance and advice on the areas that require improvement based on the information obtained in the enhanced monitoring. In this case, the Bank does not ask for a standardized response but encourages necessary improvement based on the situation of Bank A.

- For example, in the case where the funding environment abruptly changes on a market-wide basis, the Bank verifies and encourages improvement in the following points.
 - (1) Whether or not it recognizes how serious the change in the environment is and moves toward a more appropriate management system.
 - (2) Whether or not it manages its liquidity position so as not to hinder its future funding, despite the worsening of the funding environment. An example of this is to control the required amount of funding to be within the amount of eligible collateral for smooth settlement by using measures such as the Bank's complementary lending facility, until the funding environment recovers.

- In the case where Bank A's creditworthiness in the financial markets declines, a recovery in its funding environment cannot be expected in a short period of time. Also there is a possibility that A will suffer a severe outflow of deposits in the course of time. Taking those into account, in addition to above (1) and (2), the Bank, for example, verifies the efforts of A in the following points and advises A to take effective measures for improvement immediately if necessary.
 - (3) Fundamental review of investment to improve the liquidity position, including reduction in loans and sale of securities.
 - (4) Strengthening of funding capacity by measures including securing new suppliers and obtaining additional funding from close suppliers and acquiring more deposits.
 - (5) Identifying additional assets eligible for collateral and holding them in pledge.

Liquidity Position Report for the Day and the Next Day (A Sample)

1. Transaction Result of the Day

<Interbank Transaction>

(100 mil. yen, %)

	Types of Transaction and Terms, etc.	Investment		Funding	
		Amount	Rate	Amount	Rate
Call Loan / Call Money (Uncollateralized, Overnight)	Direct Dealing				
	Brokers				
Call Loan / Call Money (Collateralized, Overnight)	Broking				
	Dealing				
T/N					
S/N					
Term Instrument					
Intraday Call					

<Open Market Transaction>

	Terms	Amount	Rate
FX Swap			
NCD			
CP			
Funding by Repo			
Investment by Repo			

<BOJ Open Market Operation>

Type	Terms	Amount	Rate

2. Amount Outstanding at the End of the Day

<Interbank Transaction>

Call Loan	Uncollateralized	
	Collateralized	
Call Money	Uncollateralized	
	Collateralized	
BOJ Open Market Operation		

<Open Market Transaction>

FX Swap	
NCD	
CP	
Funding by Repo	
Investment by Repo	

<Amount Outstanding of Reserve Balance at BOJ>

3. Estimate for the Next Day

<Sources of changes in current account>

Cash		FX Swap	
Government Revenues		NCD	
Loan		CP	
Securities		Repo	
Deposit			

<Interbank Transaction>

		Investment	Funding
End	Call Loan /	Uncollateralized	
	Call Money	Collateralized	
	BOJ Open Market Operation		
Start	Call Loan /	Uncollateralized	
	Call Money	Collateralized	
	BOJ Open Market Operation		

<Today's Funding>

Amount	
Reserves	

<The Probable Maximum Intraday Overdraft>

Time Zone	
Amount	
Usable Collateral	

Note: An example of simplified liquidity position report. Practically, items are customized for each institution depending on its business and other factors.