

IMES DISCUSSION PAPER SERIES

One Year Under ‘Quantitative Easing’

Masaaki SHIRAKAWA

Discussion Paper No. 2002-E-3

IMES

INSTITUTE FOR MONETARY AND ECONOMIC STUDIES

BANK OF JAPAN

**C.P.O BOX 203 TOKYO
100-8630 JAPAN**

NOTE: IMES Discussion Paper Series is circulated in order to stimulate discussion and comments. Views expressed in Discussion Paper Series are those of authors and do not necessarily reflect those of the Bank of Japan or the Institute for Monetary and Economic Studies.

One Year Under ‘Quantitative Easing’

Masaaki SHIRAKAWA *

Abstract

The Bank of Japan adopted a new framework of monetary easing, so-called ‘quantitative easing,’ in March 2001. Active debate continues with respect to the effectiveness of monetary policy under zero interest rates but very few arguments present a clear explanation about exactly through what kind of transmission mechanism monetary policy can exert easing effects. This paper addresses this issue based on the standard theory of the transmission mechanism of monetary policy by focusing on facts observed during the year since the adoption of the new framework, especially the observed facts in financial markets and the behavior of financial institutions. The paper also takes up the effects of ‘unconventional monetary policy’ as well as makes a simple comparison between the present situation in Japan and the experiences of Japan, the US, and Sweden in the 1930s.

Key words: Quantitative Easing; Transmission Mechanism; Zero Interest Rate Boundary

* Adviser to the Governor, Policy Planning Office, Bank of Japan (E-mail: masaaki.shirakawa@boj.or.jp)

This is an English translation of a Japanese paper included in a forthcoming book from Nihon-Keizai Shinbunsha. It is the same as the original Japanese version except for some editorial changes made for the benefit of foreign readers. Opinions expressed in this paper are those of the author and not those of the Bank of Japan. The analysis in this paper was made based on data available as of March 20, 2002.

1. Introduction: Current State of Debate on Japan's Monetary Policy

The Bank of Japan adopted a new framework of monetary easing, so-called 'quantitative easing', in March 2001. Under this framework, short-term interest rates declined to virtually zero and monetary base grew by almost 30 percent, year on year, as of March 2002. Despite this, nominal GDP growth continues to be negative and economic activity remains stagnant.

Against this background, active debate continues with respect to the effectiveness of monetary easing. Indeed, we have seen a considerable amount of literature on the subject from scholars and economists at home and overseas, many of whom have called for further monetary easing. Very few, however, present a clear explanation about exactly through what kind of transmission mechanism monetary policy can exert easing effects under the current environment.¹ For example, some call for 'aggressive easing' by the Bank of Japan on the grounds of high real interest rates or the low growth of money supply. According to such arguments, once the Bank of Japan starts to conduct 'aggressive monetary policy', money supply growth will instantly increase and inflationary expectations will be generated. They assume an economy where money supply is determined exogenously by a central bank and the inflation rate responds to an increase in money supply in a rather mechanical manner. I do not deny that there exist some cases in which such a convention could be useful in analyzing the effects of monetary policy. In today's Japan, however, money supply and inflation rate do not respond to the abundant provision of liquidity and zero interest rates. Given these hard facts regarding Japan's economy, it cannot be denied that the argument based on the aforementioned simple model ignores the main issues right at the start and has little to do with the situation and problems monetary policy makers are facing. Put another way, when evaluating the effectiveness of current monetary policy, it is indispensable to make clear exactly what kind of transmission mechanism is assumed.²

As it was in the case of the development of economics, analysis of the effects of monetary policy requires a feedback process whereby everything starts from facts upon which hypotheses and theories are constructed and the facts are then reinterpreted by the hypotheses and theories. Verification based on a standard economic theory and facts

¹ Komiya [2002] and Ueda [2001] provide an analysis based on a standard theory with respect to the transmission mechanism of monetary policy.

² Kato [2001] is one of the few books which took due account of actual financial market developments.

is particularly important in thinking about the future conduct of monetary policy in Japan. This is because Japan is the first instance of an economy actually facing a zero-interest rate boundary, and, additionally, the size of non-performing loans the economy is shouldering is almost unprecedented. Indeed, an economy confronted with these two factors simultaneously is the first experience in modern economic history.

Given such recognition, this paper, based on the standard theory of the transmission mechanism of monetary policy, considers the effectiveness of monetary easing by focusing on facts observed in the past one year, especially the observed facts in the financial markets and the behavior of financial institutions.³ The purpose of this paper is, by considering these issues, to provide materials for exploring the future conduct of Japan's monetary policy. There are obviously other important issues with respect to past monetary policy and policies other than monetary policy, but they are not taken up in this paper.

This paper is composed as follows. Section 2 describes the author's understanding of the standard theory of the transmission mechanism of monetary policy. Section 3 explains the framework of monetary easing measures adopted in March 2001 and subsequent developments. Sections 4-7 examine whether monetary policy can exert easing effects under zero interest rates when viewed from the standard theory of the transmission mechanism, by breaking down the issue into four questions. Section 8 takes up the effects of 'unconventional monetary policy' which is defined as policy to affect financial asset prices by altering the demand and supply balance of such assets, and thereby envisages the materialization of monetary easing effects. Section 9 makes a simple comparison between the present situation in Japan and the experiences of Japan, the US, and Sweden in the 1930s which have been occasionally quoted as successful examples of countries escaping from deflation. Section 10 concludes the paper with the author's remarks.

³ This paper is of the nature of a follow-up to the author's previous paper, "*Zero-kinri seiyakuto B/S chouseikano kinyu seisaku*" ("Monetary policy under a zero-interest rate boundary and balance sheet adjustment," *Economics* 5, pp.39-52, Summer 2001, Toyo-Keizai Shinpousha). An English translation of the previous paper is forthcoming in *International Finance* Vol. 4, Issue 3, 2002.

2. Transmission Mechanism of Monetary Policy: the Standard Theory

To begin, I will explain my understanding of the transmission mechanism of monetary policy. In this regard, what I consider to be the standard theory was concisely described in “Purposes & Functions”, an official publication of the Federal Reserve Board [1994]:⁴

- *The initial link between monetary policy and the economy occurs in the market for reserves. The Federal Reserve’s policies influence the demand for, or supply of, reserves at banks and other depository institutions, and, through this market the effects of monetary policy are transmitted to the rest of the economy (p.18).*
- *As preceding discussion illustrates, monetary policy works through the market for reserves and involves the federal funds rate. A change in the reserves market will trigger a chain of events that affect other short-term interest rates, foreign exchange rates, long-term interest rates, the amount of money and credit in the economy, and levels of employment, output, and prices (p.23).*

As the above indicates, according to the standard theory, the starting point of the transmission mechanism of monetary policy is a change in reserves and an associated change in short-term interest rates. The transmission mechanism of monetary policy consists of at least the following four phases (Figure 1):

- (i) short-term interest rates change according to a change in reserves;
- (ii) changes in short-term interest rates subsequently affect the prices of financial assets such as medium- and long-term interest rates, foreign exchange rates, and stock prices;
- (iii) then, the behavior of financial institutions changes; and
- (iv) lastly, the behavior of domestic private economic agents such as firms and households and overseas economic agents change.

A change in reserves is itself a small ripple, and, in any country, the size of the central bank balance sheet is small compared with that of GDP and money supply. The reason why a change in reserves can affect economic activity, notwithstanding its

⁴ The same can also be found in the publications of other central banks such as “The Monetary Policy of the ECB” by the European Central Bank [2001, p.42], and “The Transmission Mechanism of Monetary Policy” by the Bank of England [1999, p.3].

limited size, is that reserves can only be provided by a central bank. Other economic agents cannot provide alternatives. Therefore, when a central bank increases its provision of reserves, short-term interest rates will certainly decline. It is indeed attributable to this simple fact that monetary policy can be effective. Put differently, when the level of short-term interest rates reaches zero, monetary policy cannot exert additional easing effects as long as a textbook-type transmission mechanism is assumed. This situation was quite similar to that when the Bank of Japan embarked on a new monetary easing framework in March 2001. No textbooks clearly explain whether monetary policy can still exert easing effects under such a situation. The purpose of this paper is to give a tentative answer to this unsolved question. If we were to list the kind of arguments which support the effectiveness of monetary policy, without evaluating their validity, there would be three categories:

- The first type of argument stands on standard economic theory and expects that a minute decline in short-term interest rates will stimulate economic activity. In March 2001, the overnight call rate was 0.15%, and, even though there was little room for a further decline, it was possible to bring the overnight rate very close to zero. One can also think of an easing effect through another route, related to that just described, where a central bank can contain uncertainty with respect to future liquidity financing on the part of market participants by exhibiting a posture to provide ample liquidity and by making such commitment.⁵
- The second type of argument assumes that, by purchasing specific assets such as long-term government bonds, foreign currency assets, and stocks in providing reserves, a central bank can alter the demand and supply balance and affect the prices of such assets, through which an easing effect will materialize. This idea, which is rarely discussed in the standard theory, infers that what is important is not the increase in total amount of reserves nor the resultant decline in short-term interest rates but types of assets to be purchased. Monetary policy having such objectives is often called *unconventional monetary policy*.
- The third type of argument assumes that a central bank could affect expectations through routes other than interest rates. The importance of expectations is also

⁵ The aforementioned FRB [1994] refers to the role of a central bank in preventing turmoil in financial markets and the economy by using monetary policy tools as follows: “Moreover, if a threatening disturbance develops, the central bank can cushion its effects on financial markets and the economy by providing liquidity through its monetary policy tools.”

emphasized in the standard theory of the transmission mechanism, and monetary policy effects vary according to an increase in reserves and engendered expectations with regard to the future path of short-term interest rates. However, such expectation effects through a decline in short-term interest rates cannot be envisaged once room for a further decline disappears. Therefore, the expectation effect taken up here is not related to interest rate changes, rather it is the effect which can be expected when a central bank's behavior for some reason gives a shock to economic agents' expectations and alters them exogenously, and perhaps could be called the *independent expectation effect*.

After explaining the monetary easing framework of March 2001 in Section 2, this paper analyzes how monetary easing measures since March 2001 have affected economic activity with the above theoretical understanding in mind. In this regard, the following four questions will be asked in Sections 4 to 7. Analysis will start by reviewing the facts necessary to examine the four questions and, then, several hypotheses and understandings as well as newly raised issues with respect to the effect of monetary policy facing a zero interest rate boundary will be presented. Answers to these questions are 'yes' when interest rates are not facing a zero interest rate boundary. But the issue here is whether answers are still 'yes' even with zero short-term interest rates.

- Can a central bank increase reserves infinitely?
- Does an increase in reserves affect financial asset prices?
- Does an increase in reserves affect financial institutions' behavior?
- Does an increase in reserves activate economic activity?

3. Monetary Easing Framework of March 2001

This section describes the monetary easing framework currently adopted by the Bank of Japan. The framework adopted in March 2001 consists of the following four pillars (Figure 2).

- ***Bank of Japan current account deposits*** The main target of the Bank's money market operations was changed from the uncollateralized overnight call rate (hereafter, call rate) to the outstanding balance of current account deposits at the

Bank⁶ (hereafter ‘reserves’ interchangeably). The target amount of current account deposits (Figure 2) was set at a level of about 5 trillion yen in March, which exceeded the past average of about 4 trillion yen, and was raised to about 6 trillion yen in August. On the day following the September terrorist attacks in the US, the actual current account balance was raised to 8 trillion yen to ensure financial market stability. At the Monetary Policy Meeting immediately after, the target was set at a level above 6 trillion yen since demand for reserves was unstable, and the actual balance became about 9 trillion yen during the reserve maintenance periods from September to November. In December, a new target of about 10-15 trillion yen was set and the actual balance has since been around 15 trillion yen. At the end-February 2002 Monetary Policy Meeting, the Bank confirmed it would flexibly provide liquidity irrespective of the guideline above in light of the expected substantial increase in liquidity demand toward the end of the fiscal year.

- ***Commitment to halt the decline in prices*** The Bank has committed to continuing the new framework of monetary easing until the year-on-year growth of CPI (excluding fresh food) becomes stable at or above zero percent. The latest CPI (excluding fresh food) growth rate figure available is -0.8% for January 2002, and thus naturally the monetary easing framework adopted in March 2001 has been maintained. With little room for a rate decline, the commitment based on CPI could be understood that it tries to strengthen easing effects by clearly indicating the path of monetary policy in the future. Such effect is called the ‘commitment effect.’
- ***Purchase of long-term government bonds*** The Bank announced it would increase its purchase of long-term government bonds when necessary for providing reserves smoothly while setting the outstanding balance of banknotes issued as an upper limit for such purchases.⁷ Subsequently, in August, when the target amount of current account deposits was raised to about 6 trillion yen, the size of such purchases was increased from the previous 400 billion yen to 600 billion yen per month, and thereafter to 800 billion yen in December, and further to 1 trillion yen in February 2002. Under the current monetary easing framework,

⁶ Different from the US, financial institutions not subject to the reserve requirement hold current deposit accounts at the Bank and actually keep some outstanding balances.

⁷ As of February 2002, the outstanding balance of long-term government bonds held by the Bank was 50 trillion yen and the outstanding balance of banknotes issued was 65 trillion yen.

the purchase of long-term government bonds is regarded as a means to provide reserves smoothly and not as a means to affect the price of government bonds.

- ***Lombard-type lending facility*** In February 2001, the Bank introduced a Lombard-type lending facility whereby financial institutions can borrow from the Bank at their request at the official discount rate if certain conditions such as eligible collateral are met. The official discount rate was reduced twice: in February 2001 from 0.5% to 0.25%, and further to 0.1% in September 2001.

4. Is It Possible to Infinitely Increase the Provision of Reserves?

This section examines the first question of the four raised in Section 2: Can a central bank increase reserves infinitely? According to the standard theory, the starting point of the transmission mechanism of monetary policy is an increase in reserves. While an increase in reserves is a self-evident premise, under a situation where nominal short-term interest rates are almost zero, it becomes an issue whether it is possible for a central bank to infinitely increase reserves.

Standard textbooks show a downward sloping demand curve whereby demand for reserves increases as nominal interest rates decline (Figure 3.1, upper panel). However, the shape of the demand curve in the territory of nominal interest rates infinitely close to zero is not known, or there has not been need to pay much attention to it.⁸ If one could assume a friction-free economy where there is no cost for holding reserves other than interest rates as an opportunity cost, the demand curve for reserves is infinitely elastic vis-à-vis interest rates. Consequently, a central bank can infinitely increase the provision of reserves along the demand curve and the nominal short-term interest rate can infinitely decline to 0.01%, 0.001%, 0.0001%. However, in actual financial markets, there are some costs other than interest rates (hereafter ‘transaction costs’) which relate to certain transactions and the holding of reserves. Transaction costs include transaction charges accompanying the extension of call loans and the receipt of call money, charges for using settlement services, and staff expenses. Where transaction costs exist, the amount of reserves which a central bank can provide will be constrained by them, and thus there will be an upper limit (Figure 3.1, lower panel).

⁸ Goodfriend [2000] deals with this issue.

While a central bank's ability to provide reserves under zero interest rates can theoretically be summarized as such, to what extent a central bank can provide reserves in practice should be judged in the light of actual experience. Hence, after explaining an outline of institutional aspects of the Bank's monetary operations, we review our experiences about the provision of reserves through such operations since March 2001.

Monetary operations by the Bank Like other central banks, the Bank of Japan provides reserves (or monetary base) by purchasing financial assets from the market⁹. Since fluctuations in banknotes in circulation and fiscal position are quite large in Japan, the Bank conducts short-term monetary operations¹⁰ to adjust the reserve level more frequently than the FRB and the ECB. Looking at the outstanding balance of assets which have been purchased in exchange for market operations (monetary base), long-term government bonds account for the highest proportion of about 60% (Figure 4). The counterparts of Bank monetary operations are selected according to pre-announced criteria, and banks as well as securities firms participate.¹¹

Insufficient bids in the first half of May 2001 When the monetary easing framework was introduced in March 2001, the reserve level was raised from about 4 trillion yen to about 5 trillion yen. As a result, the call rate declined to 0.01%, below the 0.02% during the zero-interest rate policy period (February 1999 to August 2000). Among short-term interest rates, those for longer terms, called *term rates*, declined due to the ample provision of reserves as well as the *commitment effect*. For example, the 3-month TB rate declined in May to 0.010%, below the lowest level (0.015%) during the zero-interest rate policy period (Figure 5). From the beginning to the middle of May, when short-term interest rates substantially declined, the highest bid rate for the provision of reserves by the Bank declined to the then lower limit (0.01%), and the Bank experienced 16 occasions when there were insufficient bids for monetary operations using short-term instruments (Figure 6). The situation shown in the lower panel of Figure 3.1 emerged. In response, aiming at smoothly providing reserves, the Bank decided to reduce the unit of interest rate for bidding from 1/100% to 1/1000%. Because of this measure, the highest rate could go down to as low as 0.001%, which improved the bidding situation and thus the situation of insufficient bids disappeared.

⁹ The money market operations by the Bank of Japan, the FRB, and the ECB are explained in Borio [2001] and Blenck, Hasko, Hilton, & Masaki [2001].

¹⁰ Short-term operations include bill, short-term government bond, repo, and CP repo operations.

¹¹ For example, of the 40 counterparts in long-term government bond operations, 26 are securities firms.

Looking at the demand curve for reserves, this can be explained as a case where the lower limit of transaction costs is reduced (Figure 3.2, upper panel).

Experience of August-December 2001 As the reserve target was increased from about 5 trillion yen to about 6 trillion yen in August and the outstanding balance of reserves actually increased, the ratio of competitive bids to offers gradually declined (Figure 6). Against such a backdrop, in early September, market participants anticipated it was highly likely insufficient bids would be seen before long. However, following the September 11 terrorist attacks in the US, demand for reserves immediately soared and the situation drastically changed. In response to the increased demand for reserves, the Bank provided ample liquidity beyond the then target and, subsequently, set a new target of ‘beyond 6 trillion yen’ with no upper limit. Consequently, the amount of reserves from the September to November reserve maintenance periods was at the substantially increased level of about 9 trillion yen, and the ratio of competitive bids to offers recovered. The sharp increase in demand for reserves after the terrorist attacks was observed not only in Japan but also in the US and European countries. What deserves attention is that while demand for reserves was restored to normal in about one week in other countries, it has continued at a high level in Japan. Several factors for this have been pointed out as reasons.

The first factor is the reduction in the interest rate unit for call market transactions from 1/100% to 1/1000% at the beginning of September. Previously when ample reserves had been provided, the call rate could only go down to 0.01% due to the interest rate unit constraint. But, with the reduction, it became possible for the call rate to decline to as low as 0.001%, and it actually declined to this level. Looking at the reserve demand curve previously mentioned, this can be seen as new experience in the territory below 0.01% (Figure 3.2, upper panel).

The second factor was an increase in domestic financial institutions’ precautionary demand for liquidity against the background of uncertainty with respect to liquidity conditions. There are various reasons for such uncertainty. Initially, the demand increase stemming from the terrorist attacks in the US was one of them and increased demand for liquidity before the year-end and fiscal year-end another. However, what was more important was that, owing to more corporate bankruptcies and plunge in stock prices, especially in stock prices of financial institutions, uncertainty over financial system problems gradually intensified. Such uncertainty, combined with a receding appetite on the part of financial institutions which used to lend funds in the short-term

money market, contributed to financial institutions' increasing demand for reserves. This can be expressed as a rightward shift of the demand curve for reserves (Figure 3.2, lower panel).

The third factor was increased demand for reserves at foreign banks which took advantage of the negative yen funding cost through yen-dollar swap transactions (Figure 7). In raising dollars, financial institutions in Japan had become increasingly dependent on yen-dollar swap transactions, which combine yen-selling/dollar-buying transactions in the spot market with yen-buying/dollar-selling transactions in the forward exchange market. Against the backdrop of issues such as financial system problems, conditions for swap transactions became disadvantageous for Japanese financial institutions and advantageous for foreign banks. Foreign banks obtain yen funds in exchange for providing dollar funds to Japanese financial institutions for a certain period, and, because of the cost to obtain yen funds (yen swap rate) becoming negative, foreign banks were more or less guaranteed a profit margin even though the interest rate on yen fund investment was virtually zero. In such a case, since the short-term interest rate is almost zero, there would be no incentive for foreign banks to invest in the call market by shouldering certain credit risk, and thus they opted to invest in credit risk-free Bank of Japan current account deposits. By the end of December, the outstanding amount of current accounts held by foreign banks reached 4 trillion yen, comprising the major portion of the excess reserves. Such increased demand for reserves on the part of foreign banks can also be expressed as a rightward shift of the demand curve for reserves.

Experience since December 2001 Reflecting a rise in liquidity demand against the backdrop of concern over the financial system and the year-end factor, TB rates once exceeded 0.030% in mid-December. The reserve target was raised to 10-15 trillion yen in December to meet the demand. With reserves being increased in line with the new target, TB rates gradually declined. Upon entering 2002, not only 3-month but also 1-year TB rates were at the unprecedented low level of 0.001% (Figure 5). Looking at subsequent developments, demand for reserves increased further towards the latter half of March given a temporary increase in precautionary demand before the termination of the blanket guarantee of bank liabilities in April. Reflecting such developments, the level of reserves was maintained at around 15 trillion yen until mid-March and rose further towards the month-end. With respect to money market operations, abundant reserves have been provided and short-term interest rates have been maintained at a level close to zero. Consequently, competitive bidding rates have

fallen, resulting in insufficient bids almost every day since mid-January.

Tentative assessment In March 2001 when the new easing framework was adopted, it was not certain by how much the Bank could increase reserves at zero interest rates, but it has in fact been able to increase them to a level which was originally thought to be difficult to attain. It has thus become clear that a central bank can increase reserves if the demand curve shifts to the right. Put another way, it is not clear whether a central bank can maintain an increased reserve level if the demand curve shifts to the left. In any case, the increment represents an increase in excess reserves on the part of financial institutions subject to reserve requirements and also those not subject to requirements, and does not correspond to an increase in money supply and associated rise in required reserves (Figure 8). As stated, the increase also reflects factors such as concern over financial system stability and the diminishing function of the short-term money market. This is a situation similar to what Keynes described as a 'liquidity trap'. The effects of the increased provision of reserves under a 'liquidity trap' are discussed in the following sections.

Some issues for discussion Since March last year, various interesting facts have emerged, based on which I would like to take up the following two interesting questions which are important in considering the capacity of a central bank to provide reserves.

The first is, with the demand curve given, if the interest rate unit applied to call market transactions were further reduced to 1/10000% from 1/1000%, could the Bank increase reserve provision infinitely? The lowest call rate at present is 1/1000%. At this rate, even though one invests 10 billion yen overnight, interest income would only be 274 yen, which would not even cover brokerage and personnel expenses. Therefore, from the viewpoint of financial institutions holding excess reserves, even now there is little incentive for them to invest their reserves in the short-term money market in the form of call loans. As such, while there is already little incentive for investing funds, the incentive would further diminish if the lowest call rate level became 0.0001%. In this sense, while further cutting the interest rate unit for transactions could contribute to the supply of reserves, for individual financial institutions holding excess funds there would be little incentive to obtain further funds through bidding for Bank operations.

On the other hand, even for financial institutions short of reserves, given that funds can be obtained from the market at 0.001%, reducing the lowest rate to 0.0001% is not likely to heighten the incentive to bid for Bank operations taking account of transaction

costs. However, as already discussed, if fund provision by financial institutions with excess reserves decreases, precautionary demand on the part of financial institutions short of reserves might heighten, their having more concern for the funding of reserves in the short-term money market¹². It is quite difficult to forecast with 100% accuracy the behavior of both lender and borrower financial institutions in such an extreme situation. Considering transaction costs, it is more appropriate to assume that the capacity of a central bank to provide reserves depends not only on the total amount of reserves but also how reserves are distributed among financial institutions. In any event, even if the Bank were to increase reserve provision, the resulting situation would not be different from that similar to what Keynes called a ‘liquidity trap.’

The second question is whether a central bank can increase the total amount of reserves by changing the types of assets to be purchased through operations. In considering this issue, it is necessary to distinguish between demand for the stock of reserves and demand for the flow of reserves provided by market operations. Financial institutions decide their optimal reserve level by taking account of such factors as their own financing prospects and opportunity cost resulting from holding assets in the form of reserves. From the side of financial institutions, market operations can be regarded as an adjustment valve necessary for achieving a certain level of reserves which they judge to be optimal. Put another way, it is financial institutions, not a central bank, that determine the optimal level of reserves. More explanation should be given with respect to ‘an adjustment valve’ because it might give the impression that market operations are solely passive in nature. Needless to say, if interest rates have not reached zero, there is room for a central bank to actively adjust the level of reserves, and such room is the starting point for the effects of monetary policy to be exerted.

In addition, financial institutions decide which market operations to participate in, and to what extent, depending on their judgment about which operations are most profitable. Under zero interest rates, incentives for financial institutions to bid for market operations would be higher if operations were conducted for assets whose substitutability with reserves was lower. If a central bank purchases assets at better prices, financial institutions will actively participate in market operations. In this regard, compared to short-term government bills, it is easier to purchase long-term government bonds at better prices because of the greater room for a rate decline. In practice, while insufficient bids for short-term operations have become of serious

¹² Under zero interest rates, market operations of the Bank of Japan partly substitute for the

concern since entering 2002, such has not been the case with respect to operations using long-term government bonds.¹³ However, this does not necessarily mean that the reserve level can be increased if the Bank conducts more long-term government bond operations. Since financial institutions decide their optimal level of reserve demand by taking account of interest rates and their forecast of future financing, Bank operations are nothing but one of the adjustment valves to achieve the reserve level which the institutions deem optimal. Therefore, if the central bank increases operations that use long-term government bonds, it is highly likely that financial institutions would reduce their bidding for short-term operations. It seems that, to some extent, the increase in insufficient bids for short-term market operations since January 2002 is attributable to the increase in market operations using long-term government bonds. Put metaphorically, whether the Bank provides reserves from its right pocket (short-term operations) or from its left pocket (long-term government bond operations), the amount individual financial institutions intend to hold will not change. If a central bank offers to purchase assets on advantageous terms to financial institutions, financial institutions would actively bid in order to obtain subsidies. And, if a central bank attached subsidies to all operations and expanded the size of operations, it could increase reserve provision. However, this would in effect correspond to the central bank conducting fiscal policy (see Section 8). Even if a central can increase reserves in this way, it still cannot avoid the problem of a *liquidity trap*.

5. Does an Increase in Reserves under Zero Interest Rates Affect Financial Asset Prices?

This section examines the second question related to the transmission mechanism of monetary easing under the constraint of zero interest rates: How has the increase in reserves affected financial asset prices?

Short-term money market In response to an increase in reserves, the call rate declined to 0.001% which is below the level seen during the zero-interest rate policy period, February 1999 to August 2000, although the size of the decline was obviously very small (Figure 9). Similarly, longer-term interest rates all declined and the yield on one-year short-term government bonds declined to 0.001%. Looking at three-month

waning function of the short-term money market to adjust fund excesses and shortages.

¹³ Maturity terms for short-term operations in January 2002: 18 days the shortest, 155 days the longest, and 64.3 days the average.

euro-yen rates, they have declined in line with call rates and the yield on short-term government bonds. But they picked up when book-closing approached or financial system uncertainty heightened. And, looking at expected short-term interest rates based on three-month euro-yen futures, those starting more than one year ahead are below those during the zero-interest rate policy period. This implies that market participants are expecting an extremely low interest rate level to continue for an extended period of time, longer than during the zero-interest rate policy period. As such, the previously mentioned ‘commitment effect’ is working strongly (Figure 10).

Government bond market As a general observation after adoption of the new monetary easing framework in March 2001, long-term interest rates (yields on government bonds), despite some ups and downs, have not declined in response to a reserve increase nor an increase in the outright purchase of long-term government bonds. Looked from a longer perspective, long-term rates are slightly lower compared with those during the zero-interest rate period and period after the lifting of the zero-interest rate policy (August 2000 to March 2001) but not lower than in 1998 (Figure 11). Upon closer examination of the term structure of the present yield curve, the extent of decline is slightly larger in the medium-term zone compared with the zero-interest rate policy period, implying that the commitment effect has been powerful. If we select the top ten days since March 2001 when long-term interest rates showed substantial moves, regardless of ups and downs, and look at the reasons market participants gave for such developments (Figure 12), one can see that the rates sensitively responded to news about fiscal conditions and government bond issuance.

Credit market Since interest rates on CP and corporate bonds will also change according to changes in risk-free interest rates, developments unique to the credit market can be confirmed by looking at the differential (credit spread) between interest rates on CP and corporate bonds and yields on risk-free government bonds. CP rates declined substantially from around February 2001, before the adoption of the new monetary easing framework, and credit spreads of high-grade CP (A1 or above) broadly moved at about 0.02% (Figure 13, upper panel). Subsequently, credit spreads rose to above 0.10% toward mid-December. While they somewhat declined after the announcement of a reserve increase and the Bank’s active use of CP repo operations, they still significantly exceed the level experienced up to autumn 2001. On the other hand, the spread for lower-grade CP had been rising and the issuance of CP rated A2 or lower has been decreasing significantly. Credit spreads on corporate bonds declined marginally after the announcement of the new monetary easing framework in March

2001. Since October, however, while the spreads on high-grade corporate bonds have generally been unchanged, those on low-grade corporate bonds have been rising since investors have become more cautious about credit risk, and thus the contrast has become more evident (Figure 13, lower panel).

Stock market From March 2001, stock prices temporarily rose until around May because of the anticipated favorable impact of structural reform, but turned to decline thereafter due to a deterioration in the economic outlook (Figure 14, upper panel). Looking at the broad picture, until September stock prices basically followed the movement of US stock prices. From September, however, stock prices plunged after the terrorist attacks in the US and, although there were some temporary recoveries, prices fell from November 2001 until February 2002 led by declines in banking and construction stocks (Figure 14, lower panel). Since March, stock prices have been rallying, partly triggered by strengthened controls on short selling. As such, while stock prices fluctuate reflecting various factors, the most important one is prospects for economic fundamentals, namely corporate profits, and it does not seem that an increase in reserves has pushed up stock prices.

Foreign exchange market From March 2001 the yen rate against the dollar mostly moved in the lower 120s but temporarily rose to 116 in September and the Ministry of Finance conducted yen-selling intervention. Subsequently, the yen depreciated rapidly from November 2001 until February 2002 (Figure 15, upper panel), attributable not to monetary easing but rather a change in economic outlook – while expectations for recovery of the US economy strengthened, uncertainty about prospects for Japan’s economy intensified, including financial system stability. In fact, while US stock prices recovered relatively quickly after the terrorist attacks, Japanese stock prices did not follow suit and the difference became conspicuous from November (Figure 15, lower panel).

Tentative assessment Responses of financial markets since March 2001 and their implications can be summarized as follows. First, it was the call rate and short-term interest rates with longer maturity which, relatively speaking, responded the most to the increase in reserves. This is a natural result considering that a central bank has a monopoly on the provision of reserves and thus has control over the demand and supply balance and prices (interest rates) in the short-term money market even though the interest rate level had started from already quite close to zero and thus the extent of decline was not large. Second, in the credit market, we observed that spreads on high-

grade corporate bonds remained at a low level in general but the spreads of low-grade corporate bonds and CP widened. This fact shows that confidence in the availability of liquidity has an effect, although limited, of reducing the liquidity premium on prices of high-grade corporate bonds. On the other hand, with respect to low-grade corporate bonds and CP, the creditworthiness of corporations, a fundamental factor, is having a dominant impact on pricing. Third, discernible effects of a reserve increase were not observed in the long-term government bond market, stock market, or foreign exchange market. This is not surprising given that there was little room for a decline in short-term interest rates.

6. Does an Increase in Reserves under Zero Interest Rates Affect the Behavior of Financial Institutions?

This section examines the third question which concerns the transmission mechanism when faced with the constraint of zero interest rates: Does an increase in reserves affect financial institutions' behavior?

Developments in monetary aggregates To begin with, let us first look at the development of monetary figures closely related to the behavior of financial institutions. The year-on-year growth of reserves gradually increased to reach close to four times in February 2002. With respect to banknotes, which constitute a major part of monetary base, growth was around 12%, year on year, reflecting a shift from high-yield maturing fixed postal savings deposits and commercial banks' deposits due to a decline in deposit interest rates. As a result, the growth of monetary base gradually rose and marked 27% compared with the previous year in February 2002, the highest figure since the first oil shock (Figure 16, middle panel). The year-on-year growth rate of money supply has been increasing somewhat, attributable to shifts from (i) high-yield maturing fixed postal savings set ten years ago and also from (ii) investment trusts which lost many investors as a result of the default of corporate bonds¹⁴ (Figure 16, upper panel). In the meantime, the year-on-year growth of broadly-defined liquidity¹⁵ has been rather declining which implies that an increase in money supply is a phenomenon reflecting

¹⁴The outstanding amount of bond investment trusts declined from 44 trillion yen in October 2001 to 28 trillion yen in February 2002, mainly due to a decline in money market funds.

¹⁵ A liquidity indicator which covers the wider scope of financial assets such as the deposits of post offices and credit cooperatives, investment trusts, repurchase agreements, and securities lending with cash collateral, bank debentures, government bonds, and foreign bonds.

the aforementioned shifts among financial assets. In any case, 3% growth in money supply is relatively high in comparison with the real growth rate and inflation but much lower compared with the growth of monetary base. The relationship between monetary base and money supply is called the money multiplier, and there is a decline in the multiplier which just offsets the increase in monetary base (Figure 16, lower panel).

Behavior of financial institutions While the behavior of financial institutions can be broadly traced by the growth of deposits, additional information regarding their risk-taking activity can be obtained by looking at developments on the corresponding asset side. To begin with, the total assets of financial institutions had declined (Figure 17). Looking at the components, lending and stocks decreased, while government bonds increased. However, the risk shouldered by financial institutions cannot be accurately measured from balance sheet figures alone. We should also look at the amount of risk assets used in calculating the capital adequacy ratio as a proxy variable for the total amount of credit risk shouldered by financial institutions. Risk asset reduction at major banks slightly gained pace after entering fiscal 2001. Financial institutions as a whole curtailed their risk assets, becoming especially cautious about investing in stocks involving higher risk and lending to firms with low credit quality (Figure 18). As such, despite the significant increase in reserves, financial institutions are rather becoming more cautious in their lending and investment.

How can these facts be interpreted in light of the transmission mechanism of monetary policy? The first route through which monetary easing affects financial institutions' behavior is widening margins. This basically reflects the fact that the average maturity of assets is longer than that of liabilities. But, once reaching zero short-term interest rates, widening of margins cannot be expected. As we have seen, once short-term rates reach zero, a reserve increase can no longer lower long-term interest rates. But if it happens, margins will narrow. The second route is the so-called 'credit channel' which is different from an interest rate channel. In discussing the credit channel, Bernanke and Gertler [1995] see the effect of monetary policy through improvements in a firm's cash flow and increase in collateral asset value. Indeed, the author of this paper also considers the credit channel to be an important transmission mechanism of monetary policy. However, such a credit channel can only be realized with a decline in short-term interest rates, and thus cannot be expected to materialize in a situation where there is little room for any further decline in short-term interest rates. The third route is to reduce concern with respect to liquidity funding. In this regard, the

Lombard-type lending facility introduced in February 2001 and the determination by the Bank of Japan to provide ample liquidity have contributed to diminishing concern over liquidity funding.

Do financial institutions have incentives to expand their balance sheets? Those who stress the effects of monetary easing often judge the degree of monetary easing by the growth rate of money supply. In the current situation characterized by zero interest rates and non-performing loans, do financial institutions have incentives to expand their balance sheets? To examine this issue, as a benchmark, let us suppose a case in which a financial institution accepts deposits and invests in risk-free government bonds of the same maturity. At present, the investment performance of accepting deposits and investing in government bonds under matched terms is back spread (Figure 19). Under such a situation, there are three theoretical options open to financial institutions for making profits.

The first is to make the deposit rate negative and refuse to accept deposits. In this case, as a result of shifting from deposits to cash on the part of households and firms, financial institutions would face difficulty in funding existing loans and securities investment. Since most of the credit intermediation function has been performed by private financial institutions, it would become necessary to have new financial institutions take it over, or have capital markets totally bear such function, in order to support sustainable economic growth. In this regard, when the US faced the non-performing loan problem in the early 1990s, a decline in bank lending was covered by an increase in corporate bonds and CP. This has not been the case in Japan (Figure 20).

The second option is that financial institutions, with the present level of capital, make profits by actively taking risks. In addition to non-performing loans, financial institutions are facing price risks regarding their stock holdings and, resultantly, have been cautious in taking risks. On the other hand, Japanese firms as a whole still carry excessive debt and, in the absence of attractive projects for investment, put priority on utilizing improved cash flow to repay debt. Against this background, financial institutions are reducing loans and stocks while increasing investment in bonds, especially government bonds. A substantial amount of the increased investment in government bonds is in short-term government bonds. While an increase in short-term government bond holding does not imply an increase in interest rate risk, it seems that overall interest rate risk borne, including that relating to off-balance sheet transactions,

has been on a growing trend. The swap interest rate, the interest rate of a private financial institution's obligation, is normally higher than the yield on government bonds. However, unlike in other major countries, swap interest rates have been lower than yields on government bonds in present Japan (Figure 21). This implies that, in the form of 'receiving fixed interest rate and paying flexible interest rate' swap transactions, Japanese financial institutions have been forming an interest rate risk position similar to investment in long-term government bonds. If the level of risk borne has been excessive in relation to the capital position of a financial institution, regardless of on-balance or off-balance, one cannot deny the possibility of a certain shock triggering a temporary rise in interest rates and destabilizing the financial system. Thinking this way, in the current situation, it appears that the expansion of the balance sheets of financial institutions and an associated increase in money supply may not be desirable from a macroeconomic standpoint or for the purpose of achieving sustainable growth. This point has nothing to do with how the composition of the assets held by financial institutions changes either the combination of an increase in securities investment and a decrease in lending or vice versa.

The third option is that financial institutions do not actively take risks but dispose of non-performing loans as much as their profits allows. Thus, when the economy somehow returns to a sustainable growth path, profits and net worth of financial institutions would improve, and, as a result, their investment stance becomes active. If things do not develop in this way, financial institutions will see a deterioration in profits damaging their capital position and the economy would be adversely affected. In this sense, this third option is not desirable from a macroeconomic standpoint.

Tentative assessment As such, facing a zero interest rate boundary and sizable non-performing loans, it is difficult to expect monetary easing to result in activation of financial institutions' behavior and an associated increase in money supply. Indeed, after the bursting of the bubble economy, monetary easing has yet led to active behavior on the part of financial institutions. We can point out two background factors which should be clearly distinguished: the zero interest rate boundary and non-performing loans. The non-performing loan problem, which had existed before the adoption of the monetary easing framework in March last year, can be understood as a factor making firms and financial institutions unresponsive to the stimulus of an interest rate decline. On the other hand, the zero interest rate boundary is qualitatively different as a constraint because it prevents an interest rate decline itself.

7. Does an Increase in Reserves under Zero Interest Rates Activate Economic Activity?

This section considers the fourth question regarding the transmission mechanism of monetary easing: Does an increase in reserves under zero interest rates activate economic activity? The answer to this question can be mostly derived from the answers to the previous three questions but will also raise new issues.

Figure 22 shows changes during 1995-2000 and in the past one year with respect to Bank of Japan current account deposits, monetary base, money supply, real GDP, and CPI. In the five years from 1995 to 2000, despite an increase in monetary base, the growth of money supply was far less, real GDP grew slightly, and CPI was almost flat. This situation remained much the same in the past one year, but because Bank of Japan current account deposits increased four times and monetary base increased by 27%, the lack of response of real GDP and CPI has become even more conspicuous.

In the previous two sections, we analyzed the effects of a reserve increase under zero interest rates on financial asset prices and on the behavior of financial institutions, and confirmed that no significant effects were observed on either. Based on this, it is logical to assume that the increase in reserves has had no effect in stimulating economic activity. The same conclusion can be derived from the standard theory of the transmission mechanism of monetary policy. Figure 23 illustrates the long-term development of monetary base, money supply, and nominal GDP since the 1990s. As is shown, they moved reasonably in parallel until the first half of the 1990s, despite the problem of non-performing loans. However, the relationship obviously collapsed from the mid-1990s when short-term interest rates reached 0.5%. Such a fact seems to imply that once an economy approaches a zero interest rate boundary, it becomes more difficult to expect an increase in reserves to have easing effects which would otherwise be the case.

Independent Expectation Effect Against such a conclusion, some argue that, even when short-term interest rates reach a zero interest boundary, monetary policy could still exert stimulative effects if the central bank's drastic easing alters the expectations of economic agents. Obviously, expectations play an important role in the transmission mechanism of monetary policy. First, a central bank's actions and messages change expectations with respect to the future path of short-term interest rates. If there are changes in expectations with respect to future short-term interest rates, then

long-term interest rates and prices of other financial assets will be affected. However, as we have already seen, under zero interest rates, there is no route to affect long-term interest rates except the commitment effect. Second, to some extent, a central bank can contain uncertainty with respect to future liquidity funding by sending a clear message. Even if future risk-free short-term interest rates (yields on short-term government bonds) are expected to become zero, there is a possibility that individual economic agents, including financial institutions, might face difficulties in liquidity funding due to changes in the market perception of their creditworthiness. In this regard, as shown in the pricing of high-grade corporate bonds and CP, it would seem that the determined posture of providing ample liquidity has the effect of containing, to some extent, premiums due to uncertainty about liquidity funding. However, this effect of reducing liquidity premium derives from the central bank's decision that if demand for liquidity increases it will immediately respond. Therefore, it should be noted that, once credibility has been gained with respect to the central bank's posture in terms of liquidity provision, it does not mean that an increase in the reserve amount would proportionately resolve future liquidity uncertainty.

In contrast, those who emphasize the 'expectation effect' of monetary easing seem to assume a situation such that drastic action on the part of the central bank will induce changes in 'a monetary policy regime', and thus dramatically change the expectations of economic agents¹⁶. We cannot completely rule out the possibility *a priori* that the 'independent expectation effect' will emerge when we increase reserves and the outright purchase of long-term government bonds. So far, however, it is difficult to say that the 'independent expectation effect' has been observed as a result of the switch to the new procedures for money market operations with reserves as a major target or an increase in the purchase of long-term government bonds. The adoption of inflation targeting in this present situation depends on whether such 'independent expectation effects' exist or not. The author believes that, in the absence of effective measures to realize price increases, it is difficult to assume that prices will stop declining merely by the Bank of Japan announcing a target inflation rate.

Tentative assessment Sections 4 to 7 examined the effects of a reserve increase under zero interest rates by raising four questions. Although it is difficult to compare

¹⁶ For example, when one says the purchase of long-term government bonds has an 'independent expectation effect,' it means that while the Bank might raise short-term interest rates despite its clear commitment, such concern is no longer necessary once the Bank increases its purchase of long-term government bonds.

with the case where a reserve increase did not take place, as a tentative conclusion, it is safe to say that we have observed little stimulus arising from a reserve increase under zero interest rates. When one refers to a decline in the effectiveness of monetary policy based on such observation, the following two points should be borne in mind. First, although both are pointed out as factors constraining the effectiveness of monetary policy, effects stemming from the non-performing loan problem and those from the zero interest rate boundary need to be clearly distinguished. While the non-performing loan problem is indeed a factor which substantially reduces monetary policy effectiveness, an increase in reserves had nevertheless exerted easing effects until short-term interest rates reached zero. In contrast, the zero interest rate boundary is qualitatively different in that it constrains increased reserves in order for easing effects to be produced. Since the 1990s, while there has been relatively active discussion as to whether the non-performing loan problem has reduced the effectiveness of monetary policy, the meaning of the zero interest rate boundary is still not thoroughly understood.¹⁷

Second, when saying that monetary policy lost effectiveness, one should clearly distinguish between ‘additional monetary easing’ and ‘easy monetary conditions’. As stimulus to economic activity, additional monetary easing has been losing effectiveness after reaching zero interest rates. On the other hand, once demand starts to rise due to any exogenous factor, easy monetary conditions are expected to support rising demand and strongly stimulate economic activity. The Bank of Japan is committed to maintaining the current easing framework until CPI recovers a stable positive level. This commitment means that market interest rates will be maintained low for a while even when the “natural rate of interest rises” in Wicksellian terminology, which implies that it strongly stimulates economic activity.

8. Can Monetary Policy Realize Easing Effects Through the Purchase of Specific Financial Assets?

So far, we have discussed the effectiveness of conventional monetary policy. As experience since March 2001 shows, the effects of an increase in reserves in stimulating

¹⁷ In analyzing effects of increases in monetary base and money supply on Japan’s present economy by using an econometric model, the zero interest rate boundary needs to be explicitly incorporated. Occasionally, ‘simulations’ are reported which treat past relationships between monetary base and money supply and between money supply and nominal GDP as constant. To draw policy implications by using such simulations seems to carry a fatal flaw.

economic activity seem to be extremely limited under zero interest rates. Now, we move to unconventional monetary policy because, based on actual experience, the focus of the argument of those calling for further monetary easing has gradually shifted from the effects of a reserve increase itself to the effects of purchasing long-term government bonds, corporate bonds, stocks, exchange traded funds (ETFs), and foreign currency-denominated assets. ‘Unconventional monetary policy’ aims to work on risk premiums by altering the demand and supply balance, thereby affecting economic activity.¹⁸ While the total amount of reserves is important in ‘conventional monetary policy,’ measures to provide reserves become important in ‘unconventional monetary policy’.

In the following, we will examine the effects of ‘unconventional monetary policy’ which involves the purchase of long-term government bonds, corporate bonds, and foreign currency-denominated assets, all of which the Bank is permitted to purchase under the current Bank of Japan Law.

Long-term government bonds Reflecting forecasts of the future path of short-term interest rates, arbitrage transactions take place among yields on long-, medium-, and short-term government bonds. However, as long as the future path of short-term interest rates cannot be accurately forecast, there remain certain risk premiums among them. In fact, the Bank of Japan, in the new monetary easing framework adopted in March 2001, committed to continue this framework until the year-on-year growth rate of CPI is stable at zero percent or above. The commitment adopted by the Bank is a powerful one to the extent that it committed monetary policy to the actual rate of inflation in the future and is considered to have the effect of reducing risk premium. This can be confirmed by the fact that forward rates, especially those which start from one year or more ahead, are below those observed during the zero-interest rate policy period (Figure 10).

Other than the reduction in risk premiums caused by the above-mentioned commitment effect, does an increase in the purchase of long-term government bonds reduce risk premium by altering the demand and supply balance of such bonds? The outstanding

¹⁸ As a rationale for advocating central bank purchase of financial assets such as long-term government bonds, corporate bonds, stocks, and foreign currency-denominated assets, some point out that such assets have low substitutability with reserves and are therefore not likely to experience insufficient bids in market operations. Such a view still falls in the category of ‘conventional monetary policy,’ since it is based on the idea that an increase in reserves can exert stimulative effects.

issue amount of long-term government bonds inclusive of medium-term ones was as much as 367 trillion yen as of end-September 2001 (Figure 24). There are also plenty of long-term bonds which are substitutable with long-term government bonds. If we limit assets which are substitutable with long-term government bonds to a narrow range and only add municipal bonds, government-guaranteed bonds, corporate bonds, samurai bonds, and asset-backed securities (ABS) to the balance of long-term government bonds, the total issue amount reaches 480 trillion yen. It has already been announced that the gross issuance of medium- to long-term government bonds for fiscal 2002 will be 74 trillion yen. Against this, the purchase of long-term government bonds by the Bank of Japan has increased three times since March 2001 to 1 trillion yen per month, or 12 trillion yen per year. While the purchase amount has more than doubled compared with past practice, it is still natural to think that such operations will bring only marginal change to the total outstanding amount in the market. In addition, there is an active market for interest-rate swaps which have the same economic effects as on-balance assets. If the size of such a market is also taken into account, the effects of purchasing long-term government bonds in reducing risk premium are considered to be minimal. In following such a line of reasoning, at least under the existence of a powerful commitment effect, it is quite natural to think that there would be almost no additional effect such that an increase in long-term government bonds reduces risk premium by altering the demand and supply balance of such bonds. For reference, looking at moves in long-term interest rates on the three occasions the Bank announced an increase in the purchase of long-term government bonds, they rose in two cases and declined in one (Figure 11). This seems to suggest that the demand and supply balance effect is of little significance, if any. If affecting the demand and supply balance of long-term government bonds is important, as Komiya [2002] argues, the government can bring exactly the same effect through debt management policy by reducing the issuance of long-term bonds and increasing that of short-term bonds. Given the current size of issuance, the government's debt management policy is more effective in changing the demand and supply balance although the author is skeptical about the effect stemming from the change.

Foreign exchange market According to the Bank of Japan Law, the Bank of Japan can purchase foreign currency-denominated assets as a means to provide reserves. However, the purchase of foreign currency-denominated assets aiming at guiding the foreign exchange rate comes under the jurisdiction of the government, and thus the

Bank cannot implement such action on its own judgment and own account.¹⁹ Putting such a legal issue aside, if the Bank tries to affect risk premium through working on the supply and demand balance, the necessary amount to be purchased would be enormous, much more than in the case of long-term interest rates.²⁰ While there is a possibility that foreign exchange intervention might be to some extent effective when several conditions are met, a recognition that its effect is limited is generally taken for granted in an economy with active capital movements, and many empirical studies seem to support this.

Corporate bond market Major elements comprising the risk premium on corporate bonds, or spread against government bonds, are credit premium and liquidity premium. The size of credit premium depends on default probability, the recovery rate at time of default, and investors' capacity to shoulder credit risk. Under normal conditions, monetary easing can affect these components related to credit spreads by improving cash flow and raising asset prices, although such route would not be available under zero interest rates. With respect to liquidity premium, it seems to be reduced to a certain extent by way of ample liquidity provision, which can be seen from the slight decline in the spread of high-grade corporate bonds since March 2001. The issue is whether one can expect a further narrowing of the spread. In this regard, spreads of high-grade corporate bonds are already at a low level. Comparing the curves depicting the relationship between ratings and credit spreads in Japan and the US, the curve for Japan is located below that for the US (Figure 25). Keynes conceptualized the liquidity trap in which demand for not bonds but currency infinitely increases in the face of possible capital losses stemming from a future rise in long-term interest rates. Likewise, if corporate bond spreads narrow significantly, a situation could arise where only a rise in spreads is possible and thus capital losses become of concern. It is not certain whether Japan is currently in such a situation, but we should bear in mind that there is a lower limit to a decline in credit spreads and once spreads reach such territory investors would not increase corporate bond holdings, thus inducing a liquidity trap situation where demand for liquidity becomes infinite.

Some issues for discussion As discussed above, it seems to be difficult to affect the prices of specific financial assets through the market operations of a central bank. Nevertheless, some might argue that if a central bank purchased a huge amount of

¹⁹ See Article 40 of the Bank of Japan Law.

²⁰ Foreign exchange interventions in the past three years were all yen-selling operations: 7.6 trillion yen in 1999, 3.2 trillion yen in 2000, and 3.2 trillion yen in 2001.

specific financial assets, it might affect the prices of such assets. In response to such argument, the author would like to point out the following three points.

The first point is that the purchase of assets with the aim of artificially boosting their price is in effect fiscal policy. If a central bank tried to affect financial asset prices by purchasing corresponding assets, it would be required to continue purchases even if it resulted in short-term losses. Such aggressive purchase means providing a subsidy to a specific economic group, which is effectively fiscal policy. If such a subsidy to a specific economic group is deemed effective as macroeconomic policy, the author believes that it would be more appropriate, from the viewpoint of a democracy, that such action should be taken not in the form of monetary policy, but as fiscal policy following a decision by the legislature²¹.

The second point is that, if an agent were to aggressively purchase assets, which agent would be the most effective? The extent to which aggressive purchases succeed or not would depend on whether the market would believe that the purchasing agent was ready to purchase any amount. Since profits and losses of the Bank of Japan eventually belong to the government, the success of such operations ultimately depends on the capacity and determination of the government to incur losses. In addition, even if a central bank purchased certain assets, it is unlikely that any effects would materialize if market participants judged that the central bank would not aggressively purchase such assets, simply because it is the central bank. If one seriously pursues the effectiveness of aggressively purchasing specific financial assets in changing the demand and supply balance, it would seem more effective for the government to set up a special fund for that purpose.²²

The third point is that, when the government purchases specific assets by setting up a special fund, it should incur financing costs in normal cases but such costs are extremely low at present. For example, suppose the government finances the purchase of specific assets by issuing one-year government bonds, the issuance cost is only 0.001% at present.²³ In fact, looking at bids for the issuance of short-term government

²¹ Although changes in interest rates also affect income distribution between debtors and creditors, the degree of arbitrary intervention in resource allocation and income distribution is smaller than the purchase of specific assets such as stocks and corporate bonds.

²² Komiya [2002] denies the effectiveness of stock and corporate bond purchases by the central bank and refers to the idea that the government, if it so wishes, could establish a special purchasing framework.

²³ If purchase by a government fund could have any meaning, it would be in the situation where

bonds, despite some seasonal changes, overheating (bid-to-cover ratio of over 200 times) has been the case since January 2001 (Figure 5). If upward pressure is put on short-term interest rates because of the issuance of short-term government bonds, a rise in short-term interest rates will be contained because of the aforementioned commitment of the Bank of Japan under the current monetary policy framework.

As the previous considerations suggest, the effectiveness of aggressive monetary policy to affect prices of specific financial assets is, after all, attributable to a large extent to the issue of whether fiscal policy is effective and feasible under the present situation. Debate with respect to further monetary easing has been somewhat twisted, since, despite starting from the recognition that the feasibility and effectiveness of fiscal policy is limited, it suggests that the effectiveness of monetary easing can be ensured if monetary policy shoulders the function of fiscal policy.

9. What Can We Learn from the Inter-war Period?

In this section we take up the oft-quoted experience of Japan, the US, and Sweden in the 1930s, namely the central bank's underwriting of long-term government bonds led to economic recovery in Japan, the Fed's government bond purchasing operations resulted in economic recovery in the US, and price-level targeting had beneficial effects in Sweden. In all cases a 'regime shift of monetary policy' was said to have led to economic recovery according to the proponents of this view.

Economic policy under Finance Minister Takahashi Junnosuke Inoue who became Finance Minister upon inauguration of the Hamaguchi Cabinet in July 1929 adopted austerity measures including lifting of the gold embargo (January 1930). With additional effects stemming from the world depression, prices and industrial production substantially declined in 1930-31. In December 1931, the Inukai Cabinet was established, and Finance Minister Takahashi immediately re-imposed the gold embargo and adopted an expansionary policy, leading to economic recovery beginning in 1932. So-called 'Takahashi's economic policy' refers not only to fiscal policy but also consisted of the three pillars of (i) non-interference in the yen's depreciation, (ii)

the price of the assets to be purchased is undershooting due to excessive pessimism among private economic agents. In such a case, it could be anticipated that the price will be restored to 'a normal level' as a result of government purchase. If the purpose of the fund is understood in this way, the period for holding the purchased assets should be short.

issuance of government bonds underwritten by the Bank of Japan and expansion of fiscal expenditure, and (iii) a low-interest rate policy. If we examine the mechanism of how economic recovery was brought about, it critically differed from Japan's current situation in four respects (Figure 26).

- **Room for substantial decline in interest rates** The Bank reduced the official discount rate on four occasions from March 1932. The Bank also sold a massive amount of government bonds (which it had underwritten) to the market on the one hand, and promoted monetary easing by reducing interest rates on the other. The call rate was 5.5% in November 1931, right before the beginning of 'Takahashi's economic policy,' and subsequently went down to 2.4% in February 1936. Similarly, the yield on government bonds was 5.9% in November 1931 and declined to 4.0% in February 1936. As such, the biggest difference compared with the present situation in Japan was that the standard transmission mechanism of monetary policy worked in the form of a decline in interest rates at the time. In the meantime, monetary base during the period had been growing at a relatively moderate pace while in the recent period it has been growing much more sharply (Figure 26).
- **Depreciation of the yen** Upon entering the 'Takahashi's economic policy' period, the gold embargo was immediately re-imposed, and, under the government's policy of non-interference in the foreign exchange rate, the yen/dollar rate, which was initially 100 yen to about 50 dollars (Figure 27, lower panel), sharply depreciated to 100 yen to about 35 dollars during the short period of December 1931 to January 1932. Thereafter, the yen further depreciated to the level of 100 yen to about 20 dollars in December 1932. According to Ito, Okina, and Teranishi [1993] which examined daily developments in exchange rates, of the 60% depreciation of the yen against the dollar, half of such depreciation occurred immediately after withdrawal from the gold standard (reimposition of the gold embargo) which aimed at maintaining a foreign exchange rate which was beyond a level consistent with Japan's economic fundamentals, the remaining half coming from perception of a weaker yen against the backdrop of military operations and international isolation such as the Shanghai Incident, establishment of Manchuria, and report of the Lytton Commission among others. In addition, it is pointed out that the drain of foreign reserves upon lifting of the gold embargo during the period of Finance Minister

Inoue also contributed to the yen's depreciation.²⁴

- **Regime shift due to military expansion and establishment of yen bloc economies** Finance Minister Takahashi shifted to an expansionary fiscal policy centering on expenditure for military expenses and public works for local authorities. Consequently, fiscal expenditures in 1932 and 1933 recorded a double-digit nominal increase for two consecutive years (Figure 28, upper panel). In addition, from late 1933, an increase in exports accompanied by direct investment in yen-bloc economies such as Manchuria, Korea, and Taiwan propped up demand. During the same period, the trade balance improved against the yen bloc and deteriorated against other areas (Figure 28, lower panel). It could be said that a regime shift in establishing a yen-bloc economy due to military advances in other countries and colonial rule led the public to expect increases in fiscal expenditure and exports, thus inducing private investment and triggering a move toward economic recovery. However, it goes without saying that such a scenario is not an appropriate option today.
- **Progress of consolidation and market selection of firms and financial institutions in the preceding period** Corporate bankruptcies peaked in 1930 under Finance Minister Inoue and had started to decline, although still at a high level, when 'Takahashi's economic policy' started. Apart from the issue of how to evaluate the quite deflationary austere fiscal policy of Finance Minister Inoue, some argue that a foundation was made whereby fiscal and monetary easing measures could be effective because consolidation and market selection of firms and financial institutions had progressed to some extent (Shima [1983]).

The US experience in the 1930s As a reason for US economic recovery from 1933, when Roosevelt became president, some point out the purchase of government bonds by the Federal Reserve. However, the following two points deserve attention in making comparison with current monetary policy in Japan.

- The US economy did recover to some extent from 1933 but it was a recovery from a level where economic activity had plunged by almost one-third of the peak, and

²⁴ At the time, about 20% of government bonds were foreign currency-denominated bonds, and net foreign reserves (excluding such foreign currency-denominated bonds) had been negative. In contrast, the present level of Japan's foreign reserves is about 10% of GDP and there are no foreign currency-denominated government bonds.

thus it was by no means a full-fledged recovery. It was only from 1941 when the US entered World War II and massive government expenditures were made that the economy posted a full-fledged recovery (Figure 29).

- From 1929 to 1933, approximately 40% of commercial banks went bankrupt and money supply decreased by one-third. Many academics criticize the Federal Reserve during the period for not acting as the lender of last resort. Before 1932, however, the then Federal Reserve Act, influenced by the gold standard and ‘real-bills’ doctrine, allowed the Federal Reserve to hold only gold, gold certificates, and eligible commercial bills as backing for banknotes, but not government bonds. In addition, it was required that at least 35% of the deposit liabilities of the Federal Reserve should be backed by gold. As such, the then Federal Reserve, even if it had had the will to do so, were significantly constrained in providing liquidity through the purchase of government bonds. However, the Glass-Steagall Act of 1932 eased the constraint on the backing for banknotes and enabled the Federal Reserve to play a more active role, at least legally, in maintaining financial system stability²⁵. In contrast, the Bank of Japan has no constraints in purchasing government bonds and, in practice, has played an active role as ‘lender of last resort’ throughout the period since the bursting of the bubble. As such, money supply has not shrunk in Japan because the Bank has contained systemic risk concerns, unlike in the US in the 1930s.

The Swedish experience in the 1930s When the UK withdrew from the gold standard in September 1931, the Swedish krona became the target of speculative attacks and thus Sweden was also forced to withdraw from the gold standard after about a week. At this time, since inflation stemming from higher import prices was a concern, the Swedish government announced its intention that the government would maintain the domestic purchasing power of the krona by employing all available means. In May 1932, however, the price decline became a serious matter of concern, and, in the comprehensive price stability program legislated by the Riksdag (Swedish parliament) it was stated that management of the value of the krona should first be tackled by maintaining the domestic price level. Because of the 1931 statement and the comprehensive program in 1932, Sweden’s policy of that time is sometimes referred to now as ‘price-level targeting’. Here, the author would like to point out the following

²⁵ The greater part of the increase in the Federal Reserve’s monetary base in the 1930s stemmed from the increased inflow of gold after devaluing gold parity and not from the purchase of government bonds.

points in considering current monetary policy in Japan.

- **Nature of policy to target domestic price stability** In September 1931, Sweden withdrew from the gold standard in order to escape from a deflationary situation and the government announced its target of domestic price stability. After that, the krona initially faced sharp depreciation, and thus not deflation but rather inflation was a matter of concern due to rising import prices which would likely permeate nationwide. Therefore, immediately after withdrawal from the gold standard, the official discount rate was raised to 8% from 6% (Kjellstrom [1934] pp.53-54). Subsequently, upward pressure on prices was not as strong as initially envisaged, and, because of stagnant exports and domestic demand, the situation changed after 1932 so that the price decline gradually became a concern. Accordingly, the intent of price stabilizing policy changed promptly. It was recognized that, in the language used today, neither inflation nor deflation was desirable and that price stability was important as a goal of monetary policy. Neither the September 1931 government statement nor the May 1932 comprehensive program legislated by the Riksdag set a numerical target for the price level. Rather, it was considered that monetary policy should not be linked to a specific price index figure, and it was emphasized that in the conduct of monetary policy a central bank should not depend on simple rules but take into account all factors affecting the economic welfare of the nation as a whole (Berg and Jonung [1999]). This is similar to the present situation at the Bank of Japan which has announced its determination to prevent price declines, while not adopting a targeting framework with specific numerical numbers.
- **Room for interest rate decline** At the time of withdrawing from the gold standard, the official discount rate was 6% and the yield on long-term government bonds was about 5%, and thus there was plenty of room for rates to decline. While the official discount rate was raised immediately after withdrawing from the gold standard and yields on long-term government bonds rose accordingly, subsequently the central bank implemented monetary easing by way of utilizing the room for a rate decline. Thereafter, the official discount rate was reduced on several occasions to reach 2.5% at end-1933 and yields on long-term government bonds gradually declined to the 3% level in late 1933.
- **Depreciation of the currency** Sweden withdrew from the gold standard at almost the same time as the UK. As a result, while the rate of depreciation of the

krona against the sterling pound was contained at about 10%, it substantially depreciated by 40-50% against the dollar as the US maintained the gold standard until April 1933.

Implication derived from the history of the 1930s While economic recovery in Japan, the US, and Sweden in the 1930s was not achieved through identical mechanisms, we can point out some big differences between the experiences of the 1930s and present-day Japan, the following being important from the viewpoint of the transmission mechanism of monetary policy.

The first point is that, in the 1930s, there was room for short-term interest rates to decline, and monetary easing had been conducted by utilizing such room. In contrast, today there is no room for short-term interest rates to decline in Japan. The second point is the depreciation of the domestic currency in the foreign exchange market in the form of withdrawal from a fixed foreign exchange rate regime. In contrast, Japan presently adopts a floating foreign exchange rate system under free capital movements, and thus it cannot artificially guide the exchange rate of the yen. The third point is that the credit intermediation function of financial institutions performed in the 1930s. With respect to Japan, some point out the fact that the progress of consolidation and market selection of firms and financial institutions under Finance Minister Inoue had enhanced the effectiveness of ‘Takahashi’s economic policy.’ Sweden, which did not have serious financial system problems, realized a relatively prompt economic recovery. In contrast, the non-performing loan problem in Japan today has yet to be resolved. The fourth point is that government expenditure increased in the 1930s.

Some point to the effects of a ‘regime shift of monetary policy.’ However, the regime shift of monetary policy in the 1930s proved to be effective because there was room for short-term interest rates to decline, and, for both Japan and Sweden, the depreciation of their currencies was possible upon withdrawing from the gold standard since exchange rates were pegged at a level beyond that consistent with economic fundamentals under the gold standard. In addition, at the time of ‘Takahashi’s economic policy’, the reason the public expected a demand increase as a result of fiscal policy and exports was, apart from its appropriateness, due to a regime shift to military expansion and establishment of the yen bloc. In other words, in order to induce changes in the formation of public expectations it is necessary that there exists a route through which a regime shift can actually affect the economy.

10. Concluding Remarks

The Bank of Japan adopted a new monetary easing framework in March 2001. It is still too early to draw definite conclusions on the effects of the framework, and, in this regard, conclusions in this paper are still tentative. As mentioned at the outset, the current state of Japan's economy is unprecedented in that it confronts both a zero interest rate boundary and sizable non-performing loans, and thus the author will continue to examine the tentative conclusions in this paper by cross-checking them in light of facts and theories.

Instead of summarizing the wide-ranging issues examined in the paper, the author would like to again emphasize the importance of the fact that Japan's economy is confronting zero interest rates. As reiterated, in the standard theory of the transmission mechanism of monetary policy, the starting point from which monetary easing exerts effects is an increase in reserves and a subsequent decline in short-term interest rates. Based on this, in a situation where there is little room for a further decline in short-term interest rates, the effects of monetary easing will necessarily be limited. The fact that economic activity has not been stimulated despite an aggressive increase in reserves since March 2001 seems to be consistent with what such standard theory predicts. This kind of conclusion may frustrate readers who seek to find a monetary policy solution. Some may argue that, without other options, the Bank of Japan should try unconventional monetary policy even if the effects are not certain. However, given the difficulty of the problems facing Japan's economy, before jumping to such conclusion, economists are expected to present sober analysis of the situation fully utilizing all the information and knowledge available. In discussing monetary policy or macroeconomic policy, the author believes it necessary to more seriously accept the fact that the economy is already confronting a zero interest rate boundary and discuss what kind of remedies are available to handle the situation based on such recognition. Looking at past experiences and orthodox textbooks of economics gives us, at least, some tips for considering what kind of policy could be more effective.

Reference

Japanese:

Kato, Izuru, *Nichigin ha shindanoka? – Chou kinyuu kanwa no kouzai*, Nihon Keizai

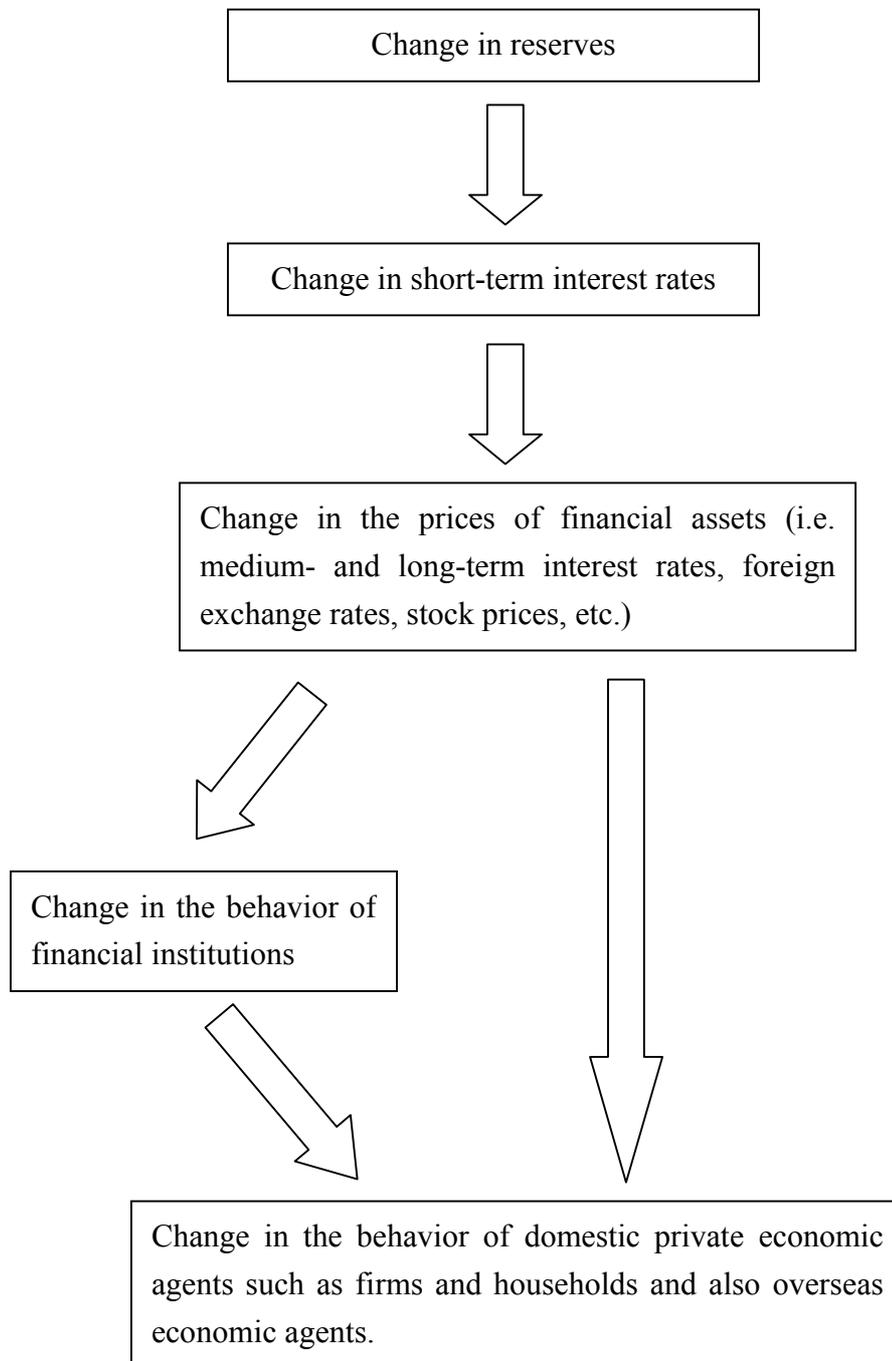
- Shinbunsha, 2001.
- Komiya, Ryutaro, "Kinyuu seisaku rongi ni kansuru jakkan no oboegaki," mimeo, 2002.
- Shima, Kinzo, "Iwayuru 'Takahashi Zaisei' ni tsuite," *Kin'yu Kenkyu*, Vol.2, No.2, 1983, pp.83-124.
- Shirakawa, Masaaki, "Zero kinri seiyaku to baransu shiito chousei ka no kinyu seisaku," *Economics*, No. 5, 2001, pp. 39-52, Toyo-keizai Shinpousha. An English translation of this article is forthcoming in *International Finance* Vol. 4, Issue 3, 2002.
- Ueda, Kazuo, "Ryudousei no wana to kinyu seisaku," special lecture at the Autumn Meeting of the Japan Society of Monetary Economics in 2001, http://www.boj.or.jp/press/press_f.htm, 2001.
- Ueki, Nobuyasu, "Ryutsuu Shijou ni okeru shasai supureddo ni tsuite," Financial Markets Department Working Paper 99-J-5, 1999.

English:

- Bank of England, The Monetary Policy Committee, "The Transmission Mechanism of Monetary Policy," 1999.
- Berg, C. and L. Jonung, "Pioneering Price Level Targeting: The Swedish Experience 1931-1937," *Journal of Monetary Economics*, Vol. 43, 1999.
- Bernanke, B.S. and M. Gertler, "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," *Journal of Economic Perspectives*, Vol. 9, No. 4, 1995.
- Blenck, D., H. Hasko, S. Hilton and K. Masaki, "The Main Features of the Monetary Policy Frameworks of the Bank of Japan, the Federal Reserve and the Eurosystem," *BIS Papers*, No. 9, 2001.
- Borio, C.E.V., "A Hundred Ways to Skin a Cat: Comparing Monetary Policy Operating Procedures in the United States, Japan and the Euro Area," *BIS Papers*, No. 9, 2001.
- European Central Bank, *The Monetary Policy of the ECB*, 2001.
- Federal Reserve Board, *Purposes & Functions*, 1994.
- Goodfriend, M., "Overcoming the Zero Bound on Interest Rate Policy," *Journal of Money, Credit and Banking*, 32(4) Part 2, November 2000.
- Ito, T., K. Okina and J. Teranishi, "News and the Dollar/Yen Exchange Rate, 1931-33: The End of the Gold Standard, Imperialism, and the Great Depression," *Journal of the Japanese and International Economies*, Vol. 7, No. 2, June 1993.
- Kjellstrom, E., *Managed Money: The Experience of Sweden*, Columbia University Press, New York, 1934.

Figure 1

The Standard Transmission Mechanism of Monetary Policy



BOJ 's Current Monetary Easing Framework

1. New Procedures for Money Market Operations: Outstanding Balance of Current Account Deposits at BOJ as the Main Operating Target

- Adopted in March 2001.
- Money Market Operation Guideline (Target amount of current account deposits)

	[around 4 trillion yen]	
March 2001	around 5 trillion yen	Should there be a risk of financial market instability such as a surge in liquidity demand, the Bank will provide more liquidity irrespective of the guideline above. (*)
August 2001	around 6 trillion yen	
September 2001	above 6 trillion yen	—————
December 2001	around 10-15 trillion yen	The same as (*).
February 2002	around 10-15 trillion yen	For the time being, to secure the financial market stability towards the end of a fiscal year, the Bank will provide more liquidity irrespective of the guideline above.

2. Strong Commitment in Terms of Policy Duration

- The current monetary easing framework will continue in place until CPI registers stably at 0% or an increase year on year.

3. Outright Purchase of Long-term Government Bonds

- The Bank will increase the outright purchase of long-term government bonds, if it considers it necessary for the smooth provision of liquidity.
- Outright purchase of long-term government bonds

	(400 billion yen per month)
August 2001	600 billion yen per month
December 2001	800 billion yen per month
February 2002	1 trillion yen per month

4. “Lombard-type” Lending Facility

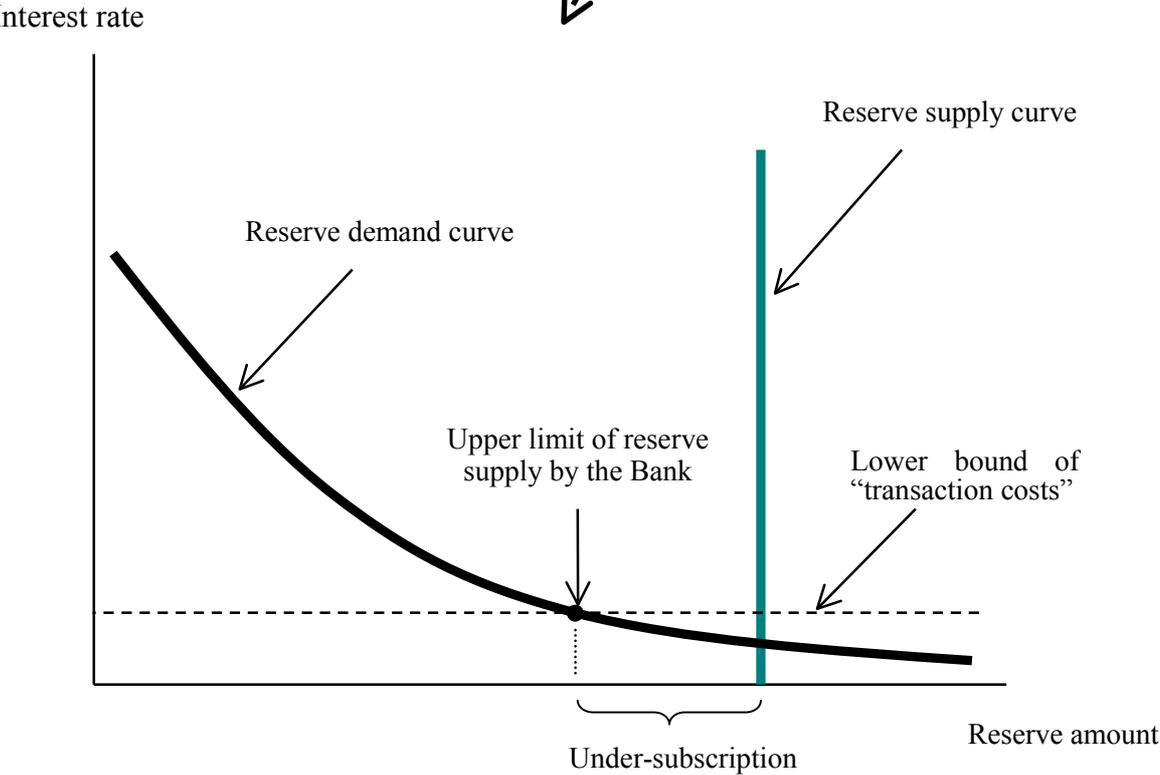
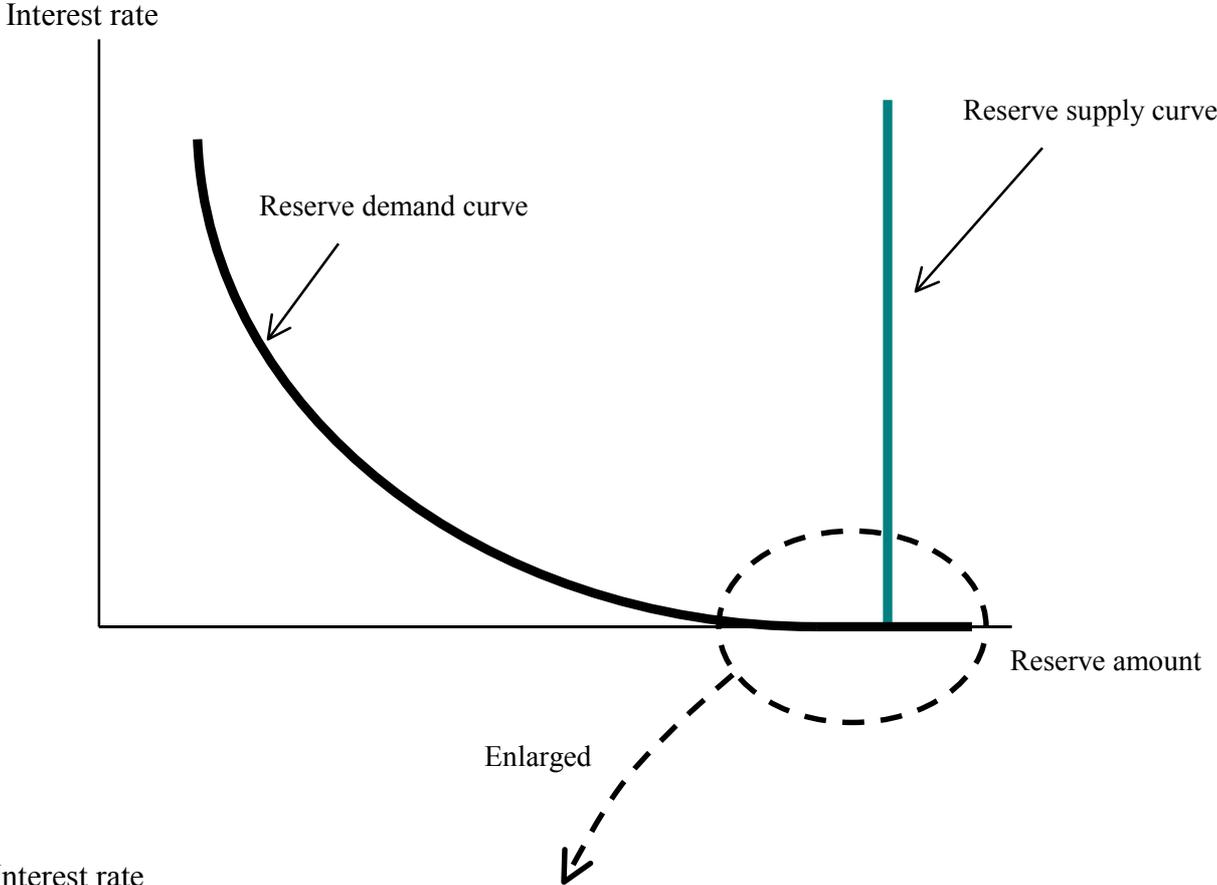
— A standby lending facility through which financial institutions can borrow from the Bank at the official discount rate if conditions pre-specified by the Bank are met.

- Introduced in February 2001.
- Official discount rate, which is applied to “Lombard-type” lending.

	(0.5%)
February 9, 2001	0.35%
February 28, 2001	0.25%
September 18, 2001	0.1%

Figure 3.1

Reserve Demand and Supply



Reserve Demand and Supply

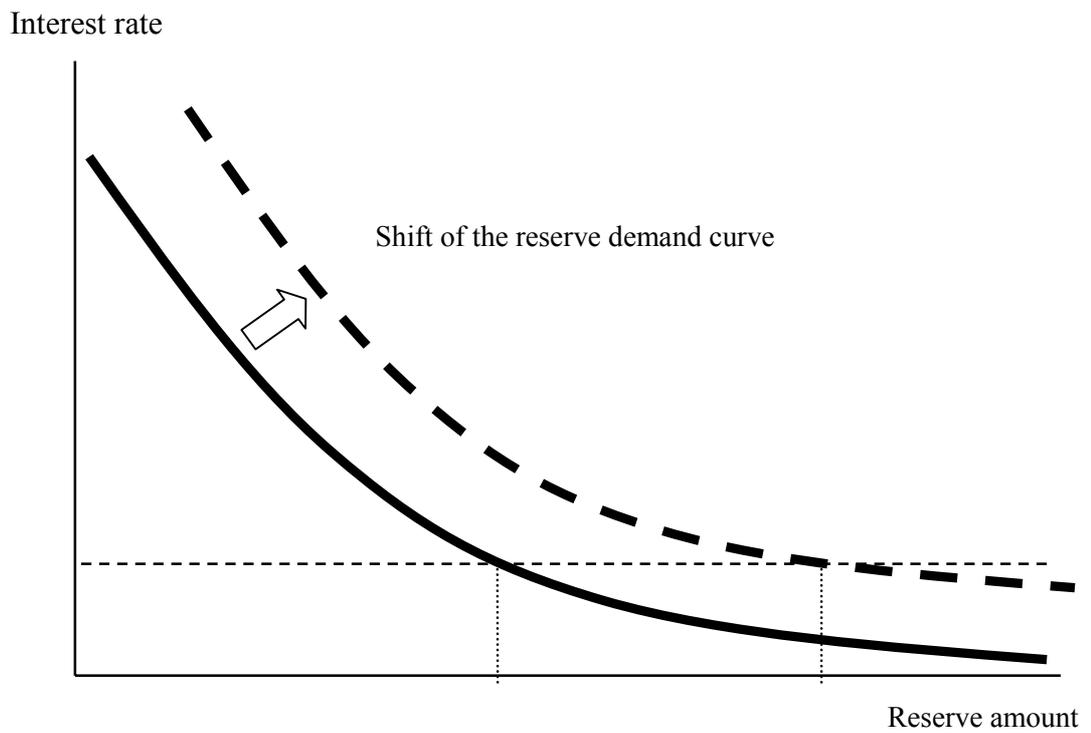
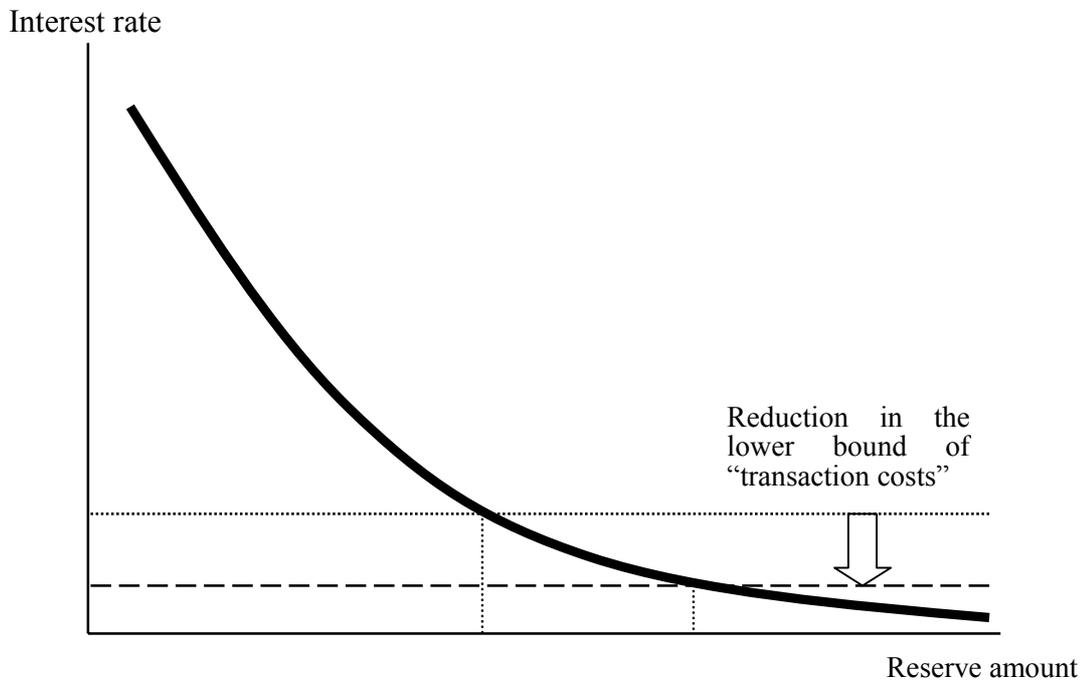
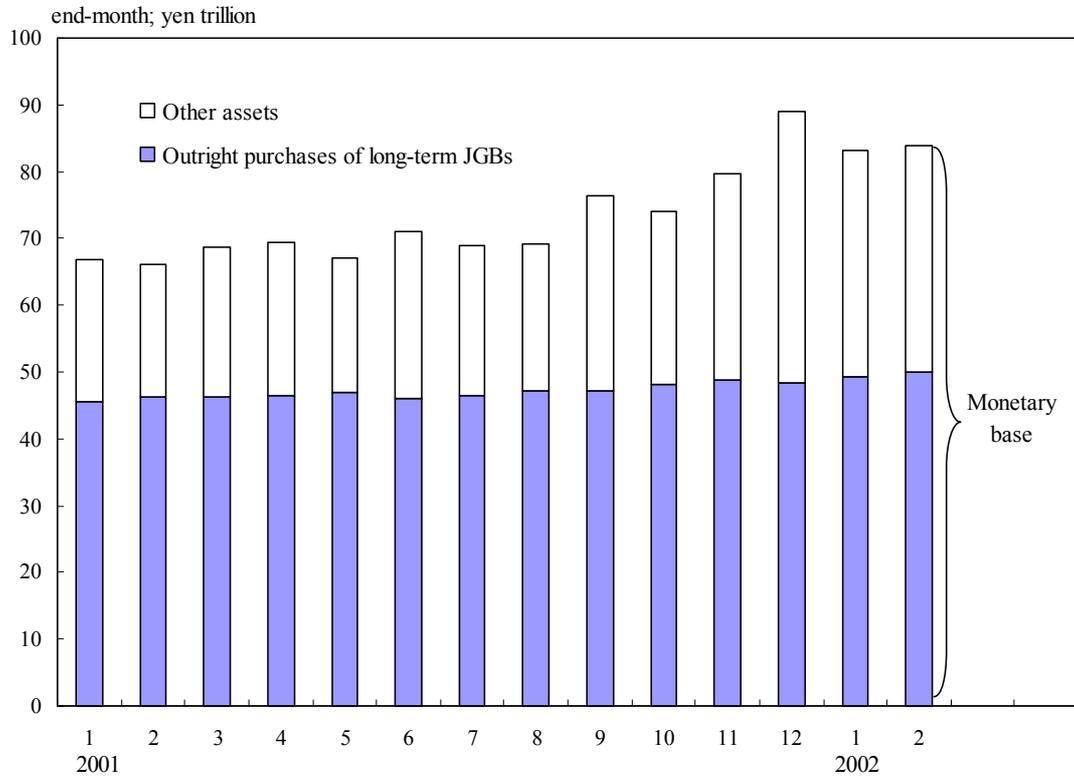


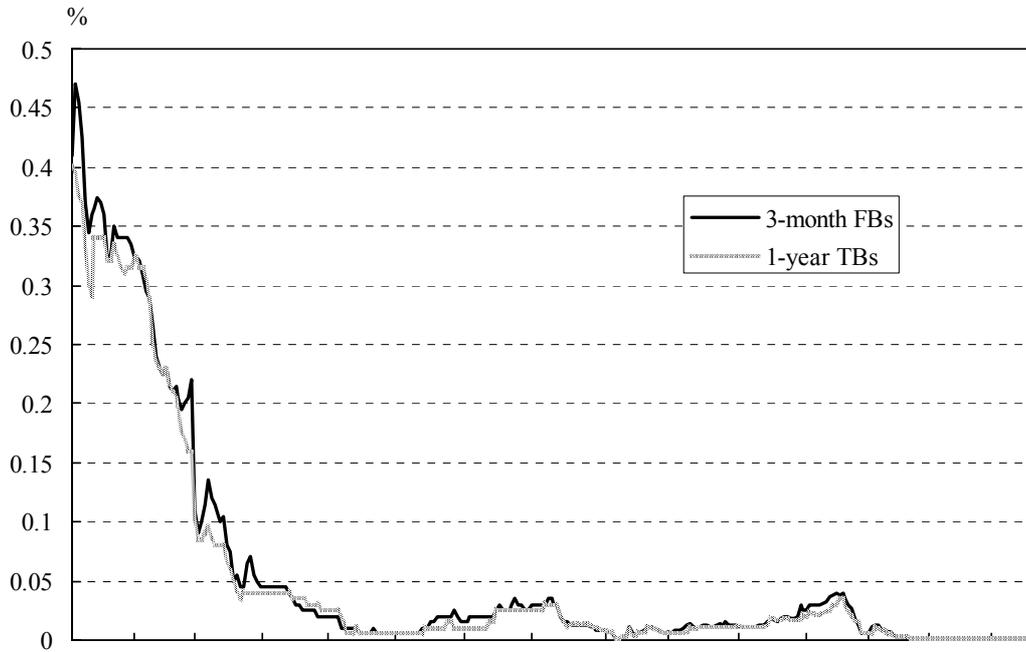
Figure 4

Monetary Base and Bank of Japan Transactions

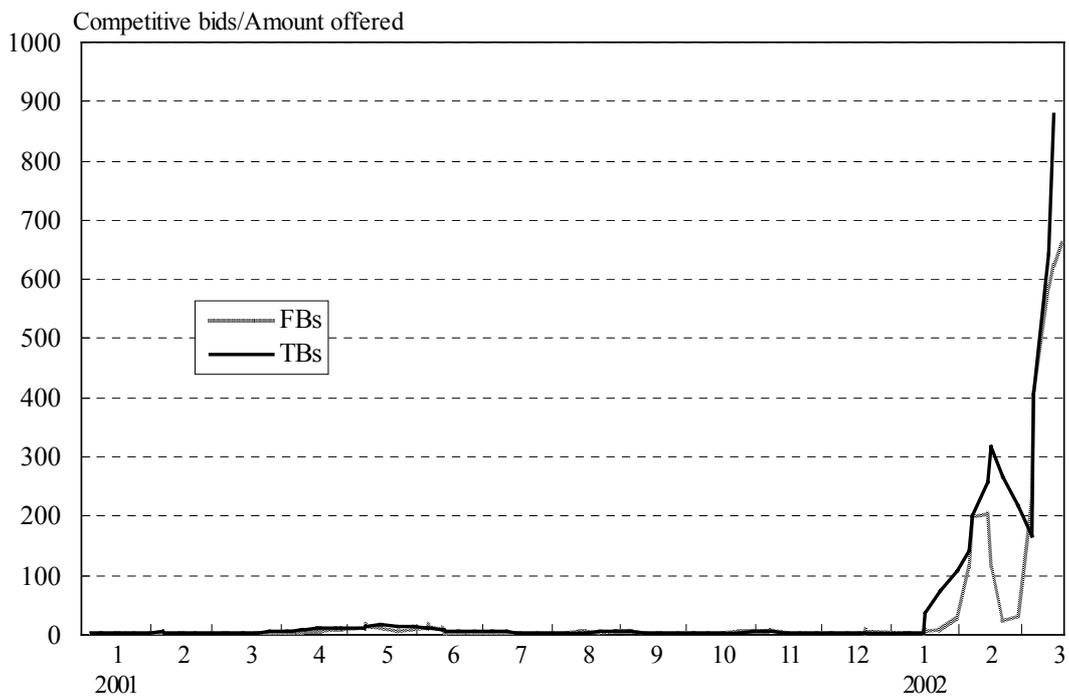


TBs and FBs

(1) Yields on TBs/FBs in the Secondary Market

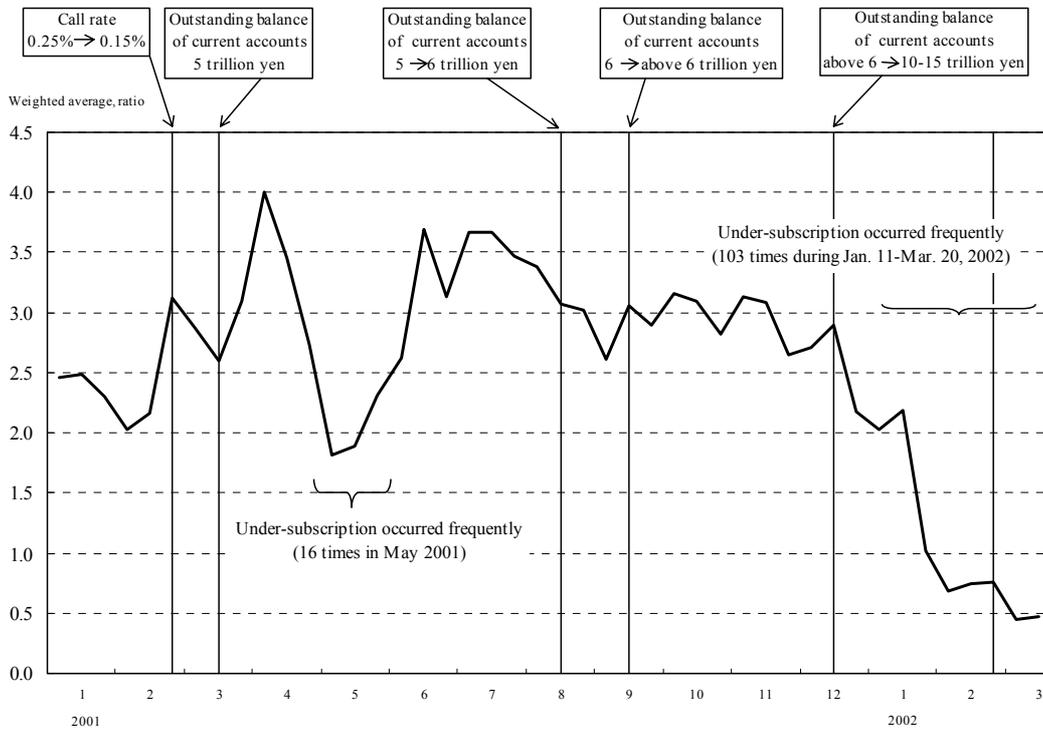


(2) Ratio of Competitive Bids to Amount Offered, Newly Issued TBs/FBs

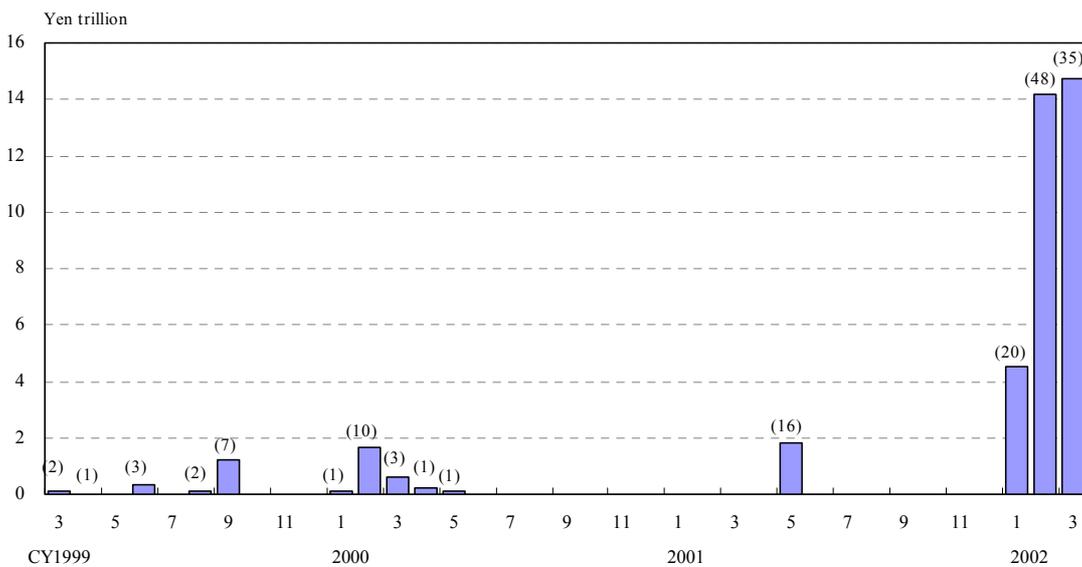


Short-term Monetary Operations for Reserve Provision

(1) Average Ratio of Competitive Bids to Amount Offered in Short-term Monetary Operations for Reserve Provision



(2) Under-subscription in Short-term Monetary Operations for Reserve Provision

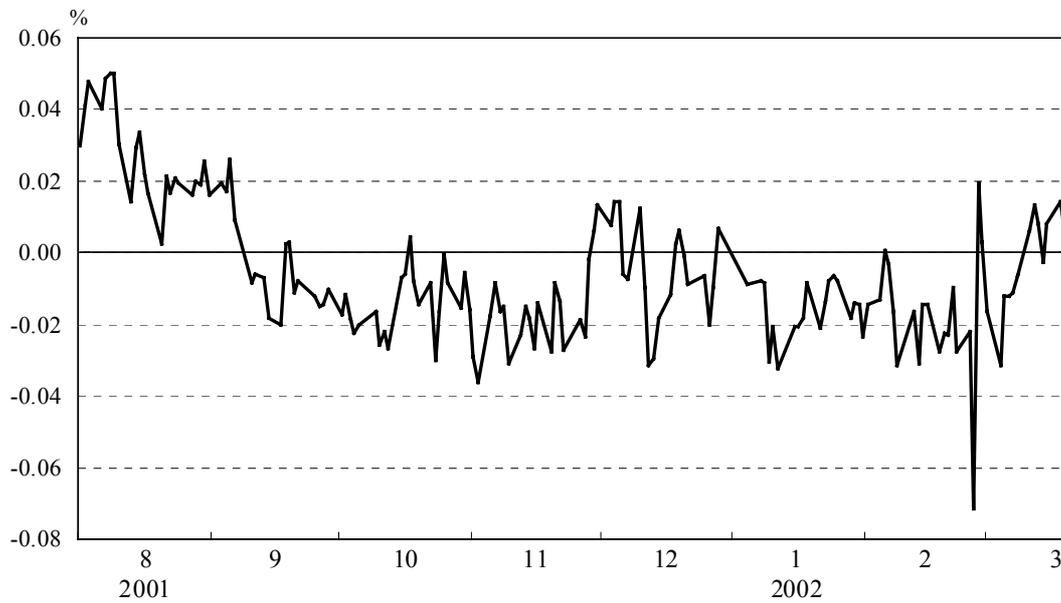


Notes: 1. Figures in parentheses indicate number of times under-subscription occurred.

2. Data for March 2002 is up to March 20.

Yen Funding Cost of Foreign Banks and Current Account Balances at the Bank of Japan

(1) Yen Funding Cost of Foreign Banks Through the Yen-Dollar Swap Transaction



(2) Current Account Balances of Foreign Banks at the Bank of Japan

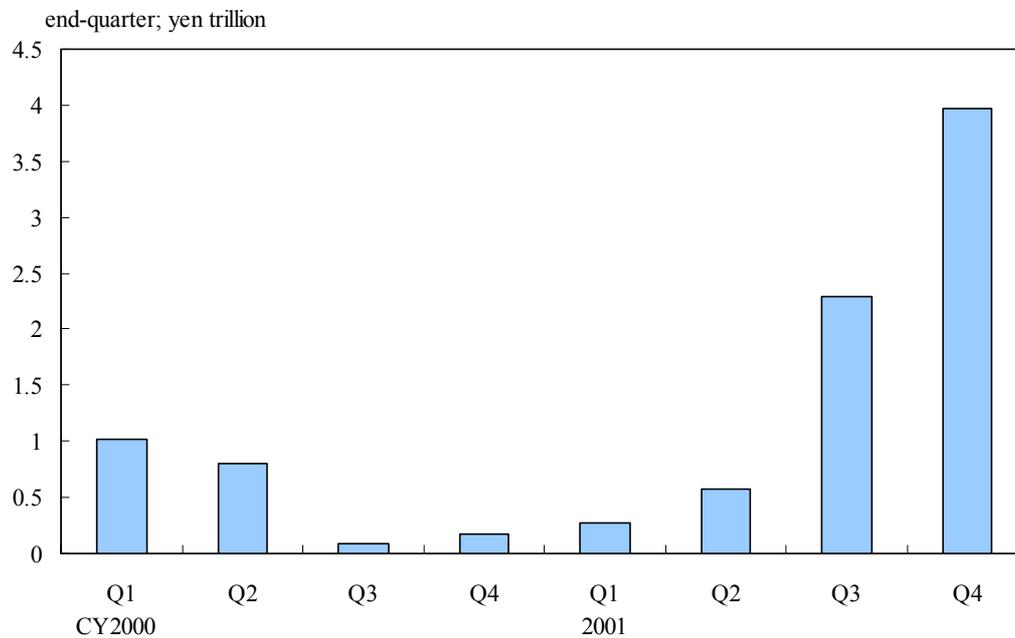


Figure 8

Current Account Deposits at the Bank of Japan

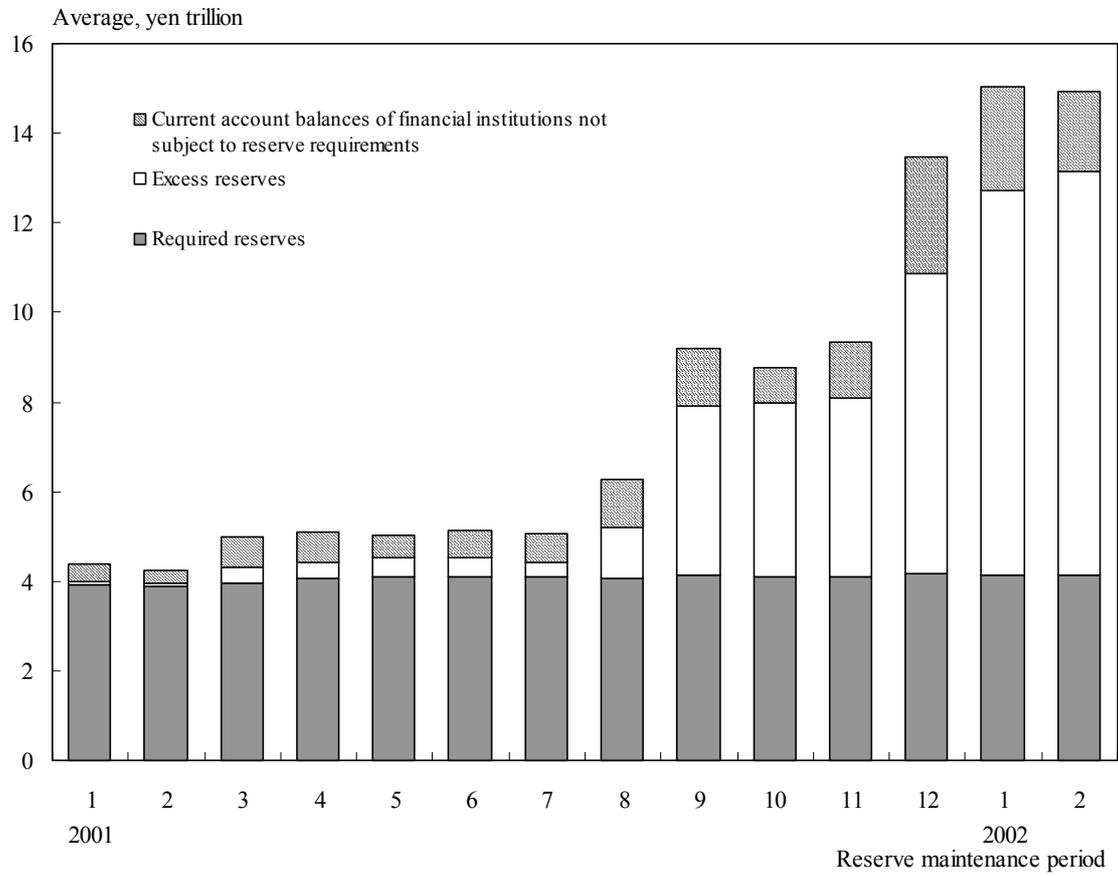


Figure 9

Short-term Interest Rates

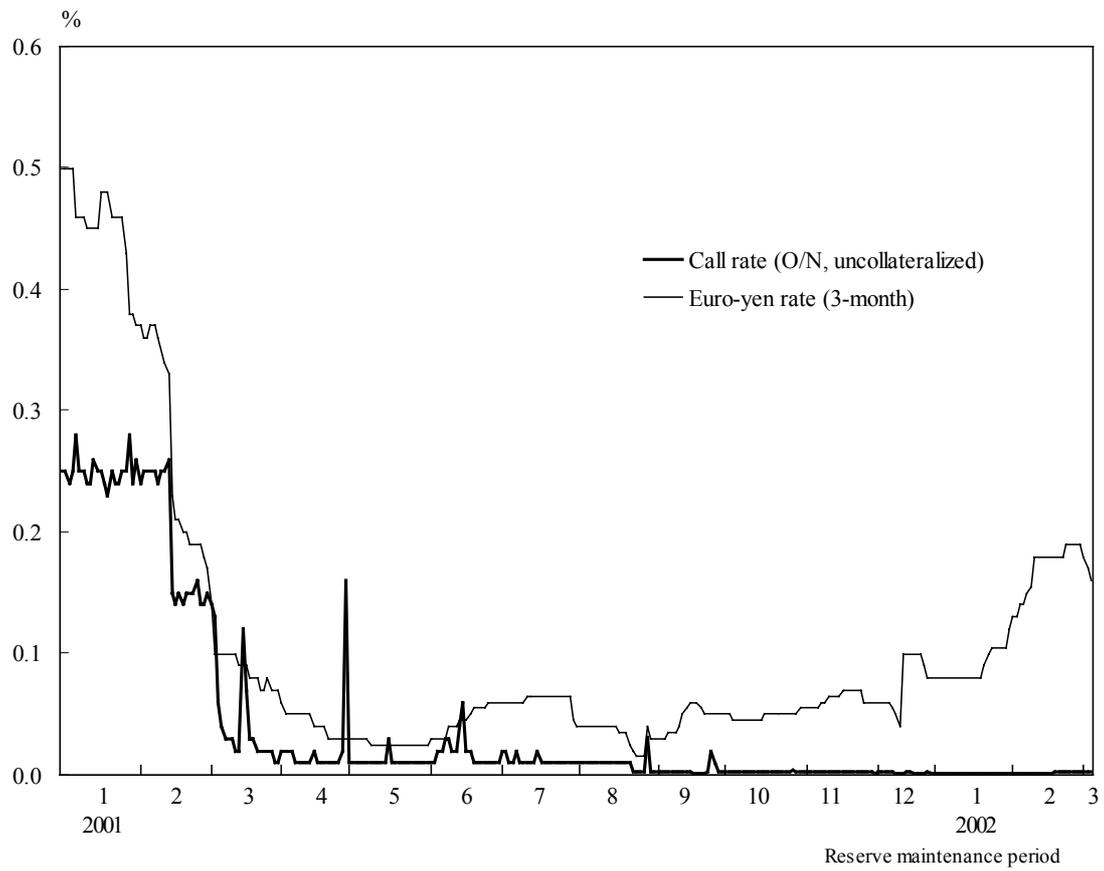
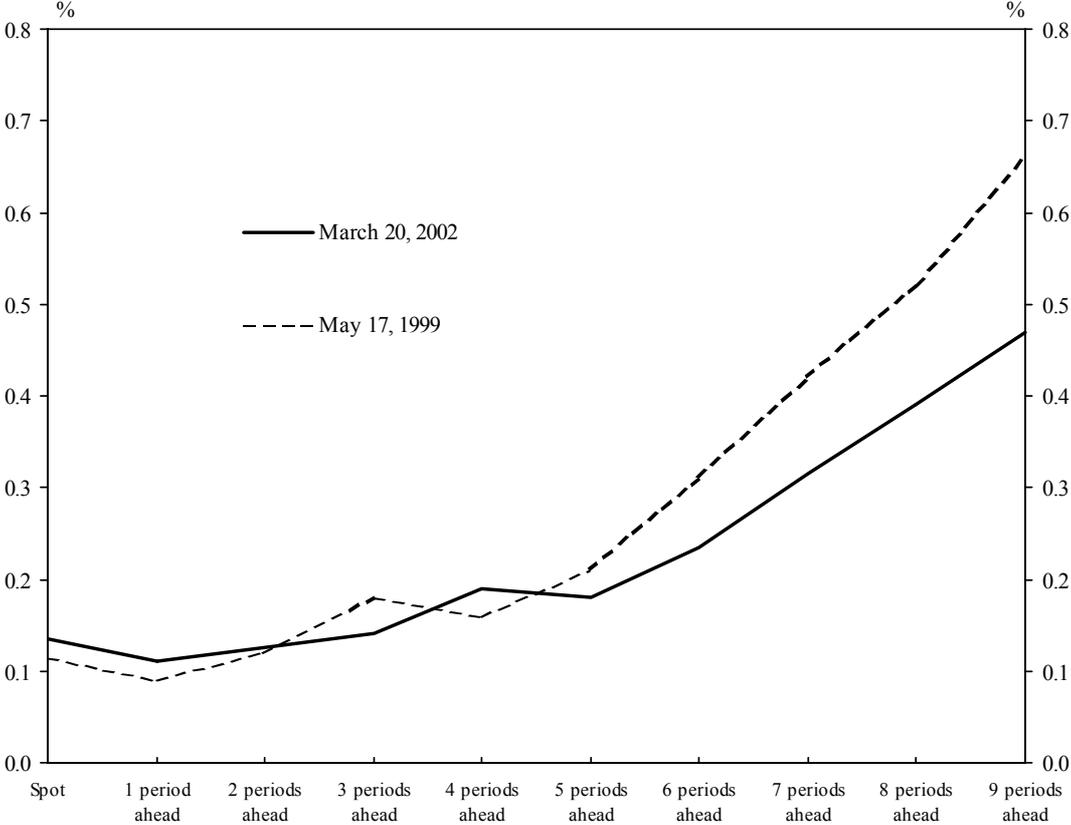


Figure 10

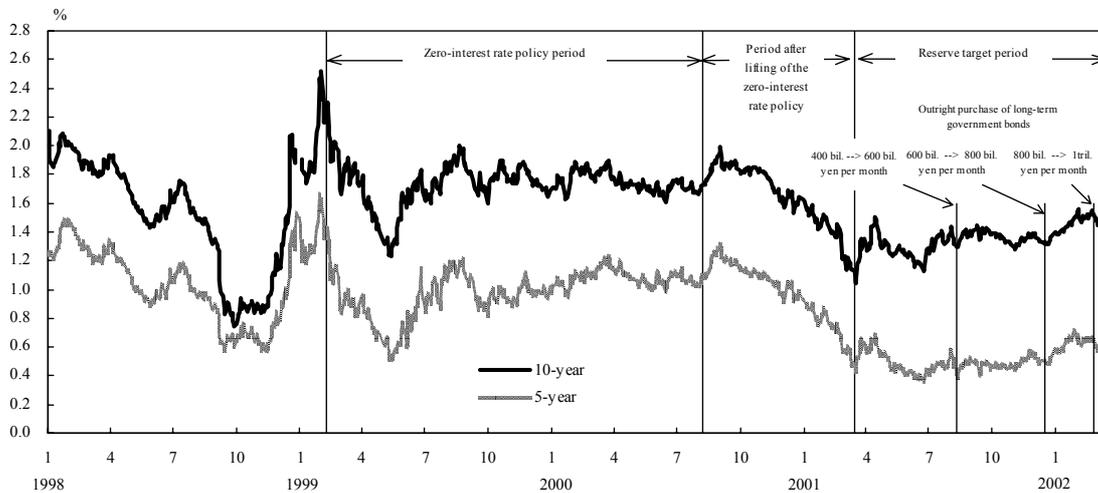
Three-month Euro-Yen Futures



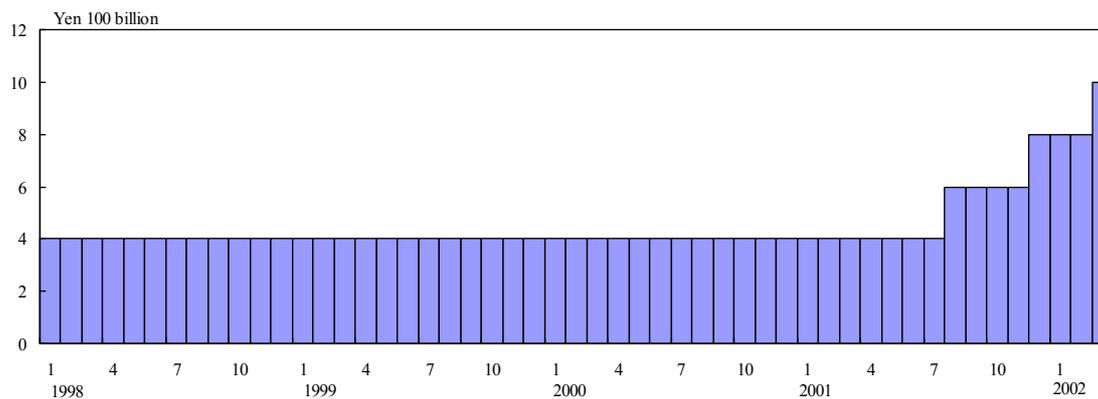
Note: On May 17, 1999, the yield on 10-year JGBs declined to its lowest level (1.23%) in the zero-interest rate policy period (February 12, 1999-August 11, 2000).

Yields on Government Bonds

(1) Yields on Government Bonds



(2) Outright Purchase of Long-term Government Bonds by BOJ (Amounts offered)



(3) Average Yields During each Period

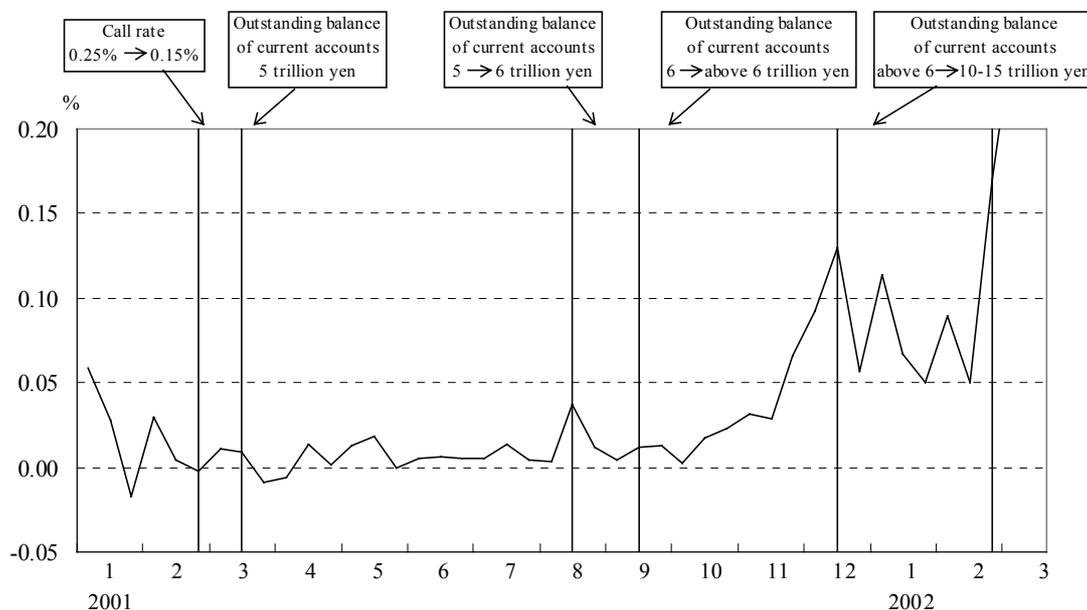
	Average yields (%)	
	5-year	10-year
Zero-interest rate policy period	0.99	1.74
Period after lifting of the zero-interest rate policy	0.98	1.65
Reserve target period	0.51	1.35

**Top Ten Days when Long-term Interest Rates
Showed Substantial Moves
(March 19, 2001 - March 20, 2002)**

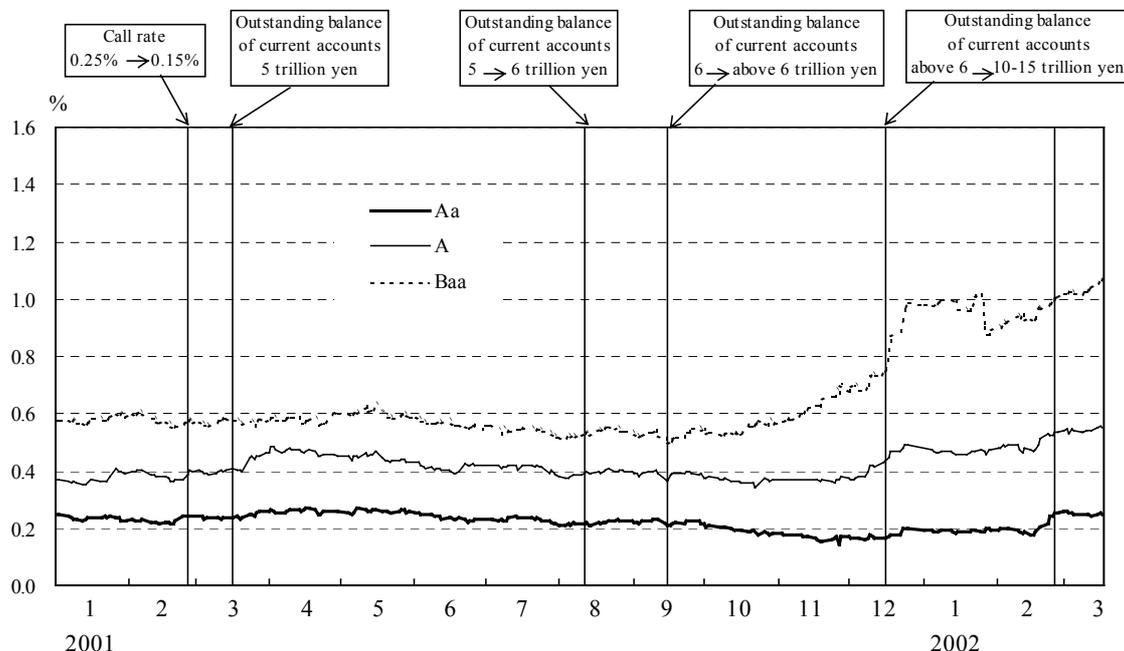
Date	Change (% points)	Background
March 23, 2001	0.120	The 10 trillion yen tax reduction plan proposed by the Liberal Democratic Party (LDP) was reported. The competitive auction of newly issued 10-year JGBs was substantially underbid.
April 12, 2001	0.120	All LDP presidential election candidates except Koizumi proposed the expansion of fiscal expenditures.
July 9, 2001	0.100	Stock prices dropped sharply and the expectation of the expansion of fiscal expenditures spread.
March 21, 2001	-0.095	Monetary easing by BOJ.
March 28, 2001	0.095	The competitive auction of newly issued 10-year JGBs was substantially underbid.
July 2, 2001	0.085	The subject of the Japanese economy came up at the Japan-US summit. Leading coalition ruling party and opposition party figures show flexible attitude towards a supplementary budget.
March 30, 2001	-0.080	More than expected competitive bids in the auction of newly issued 5-year JGBs.
April 2, 2001	0.080	Investors hesitated to buy JGBs before the competitive auction of 20-year JGBs and the release of an emergency economic package.
September 17, 2001	-0.075	Expectations of additional monetary easing rose. "A flight to quality" was observed after the terrorist attacks in the US.
August 8, 2001	-0.070	The Council on Economic and Fiscal Policy released an outline of austere guidelines concerning budget requests.

Credit Spreads

(1) CP Spreads (A-1 or higher, 1-month, yields on newly issued CP - GC repo rates)



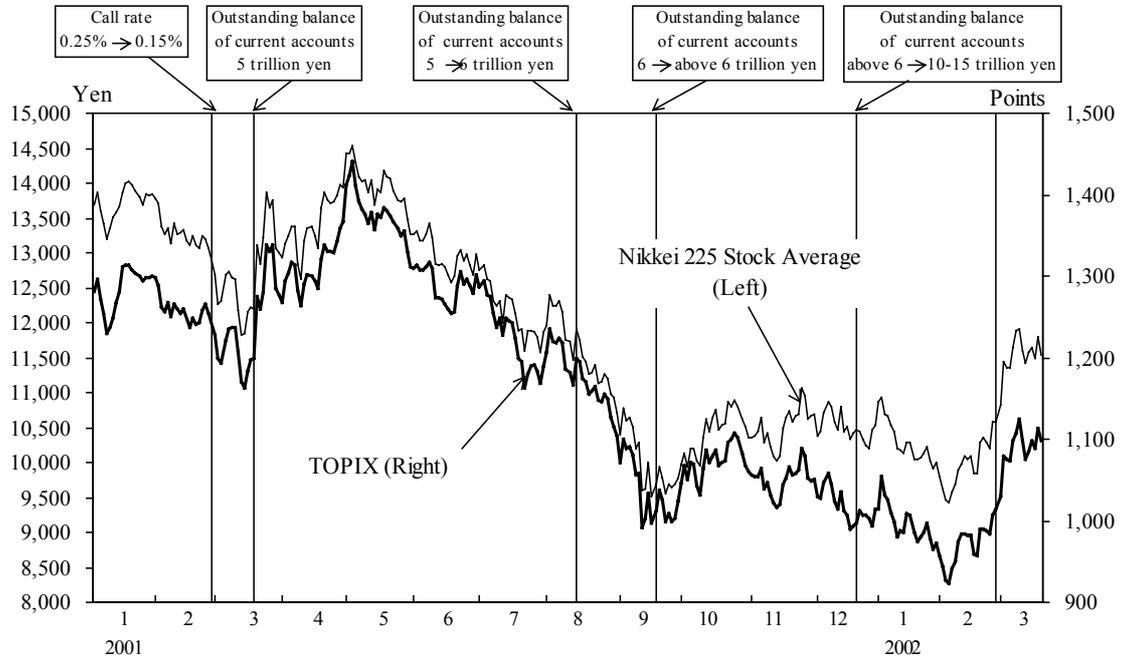
(2) Credit Spreads between JGBs and Corporate Bonds by Rating



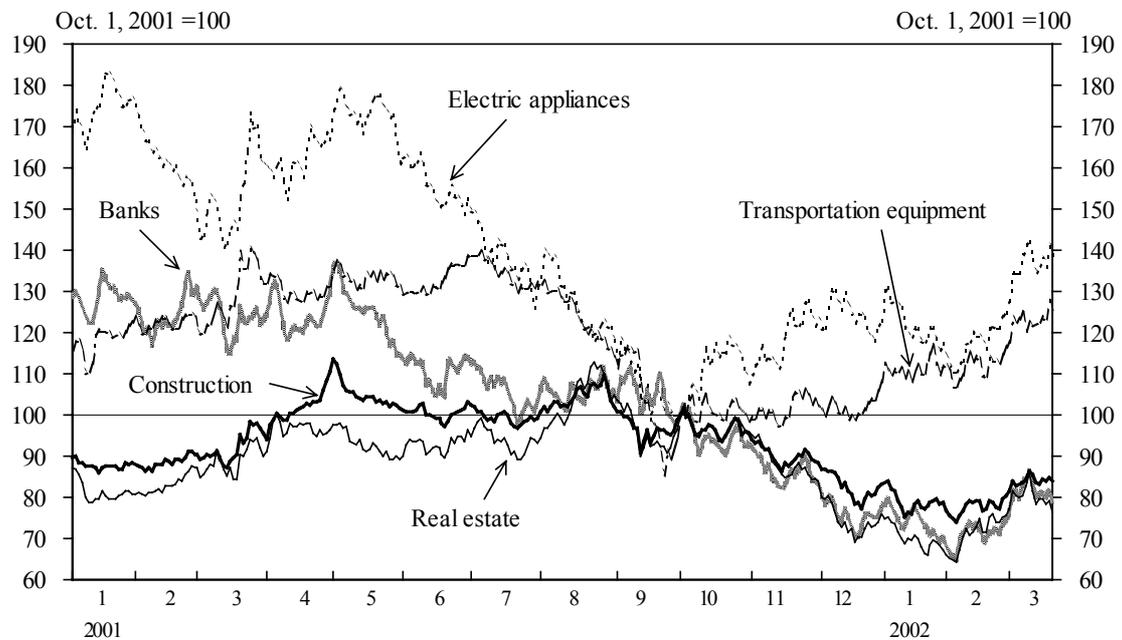
- Notes:
1. Yields on bonds with 5-year maturity.
 2. Yields on corporate bonds by Japan Securities Dealers Association, "Over-the-Counter Standard Bond Quotations."
 3. Moody's ratings.

Stock Prices

(1) Nikkei 225 Stock Average and TOPIX

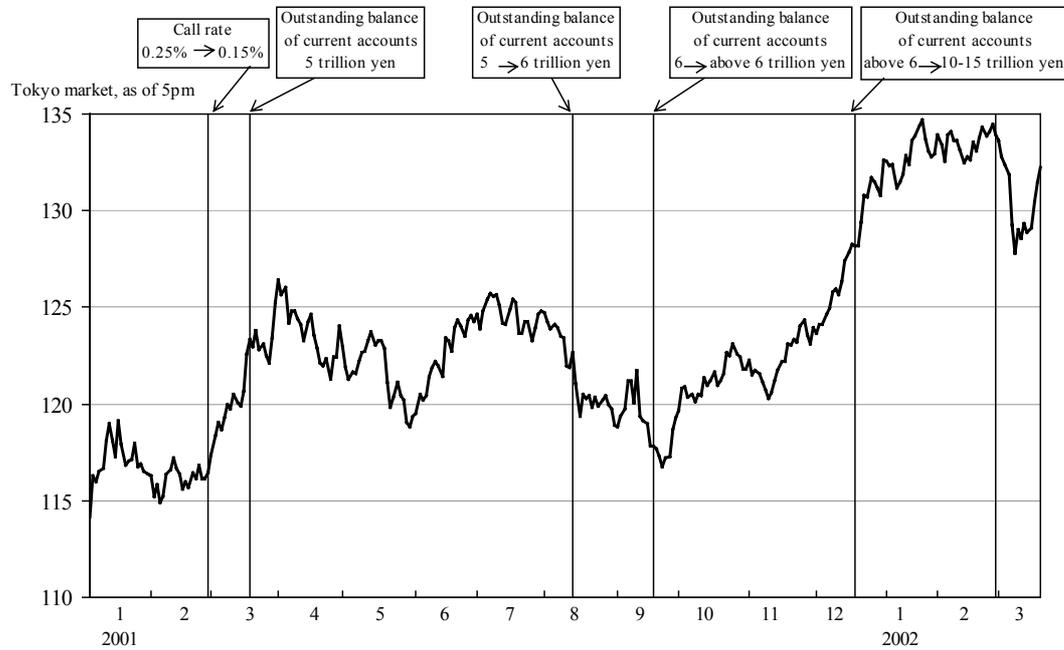


(2) Stock Price Indices by Industry

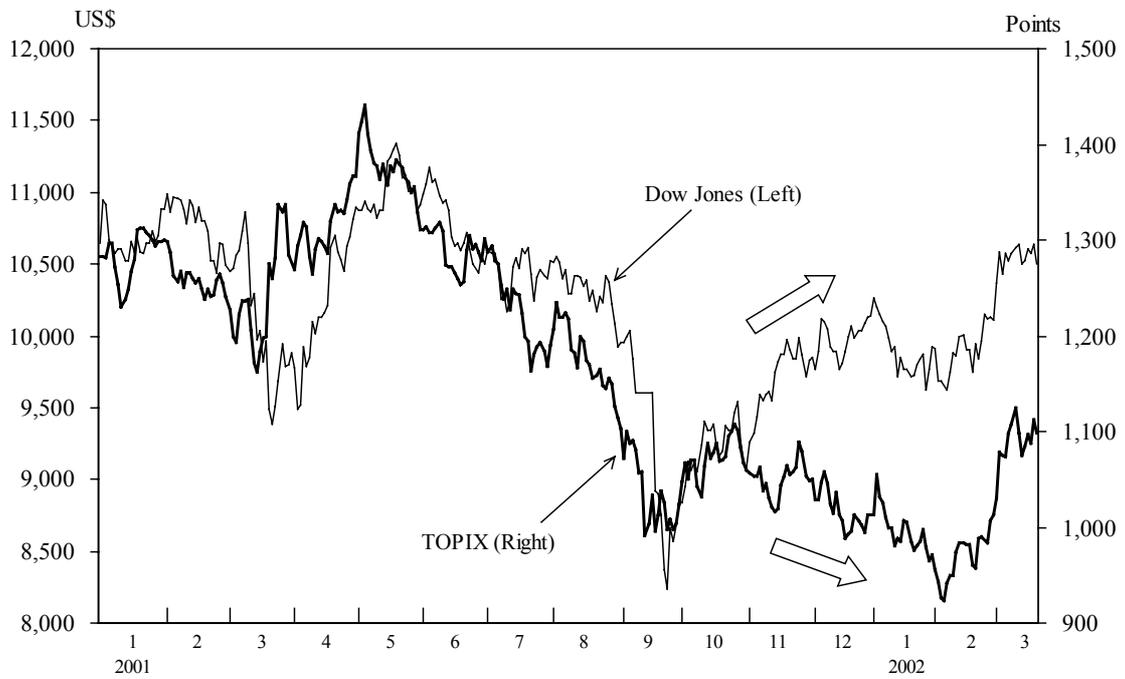


Exchange Rates and Stock Prices

(1) Exchange Rates (Yen/US\$)

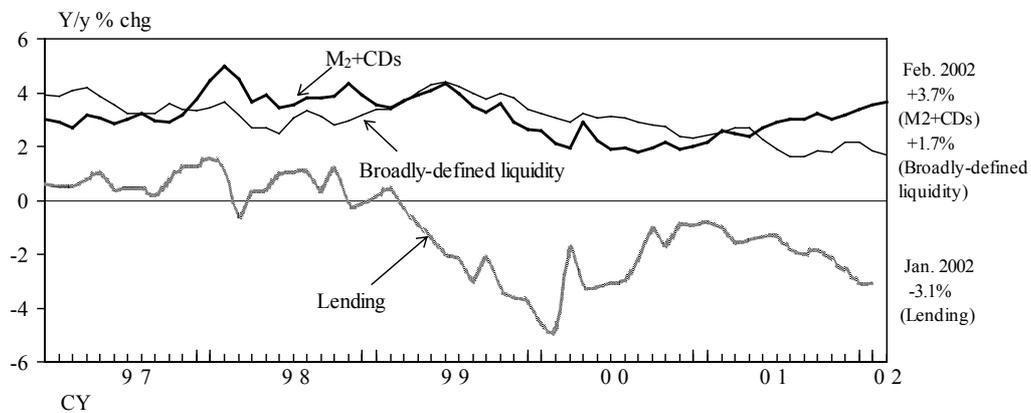


(2) Stock Prices in Japan and the US



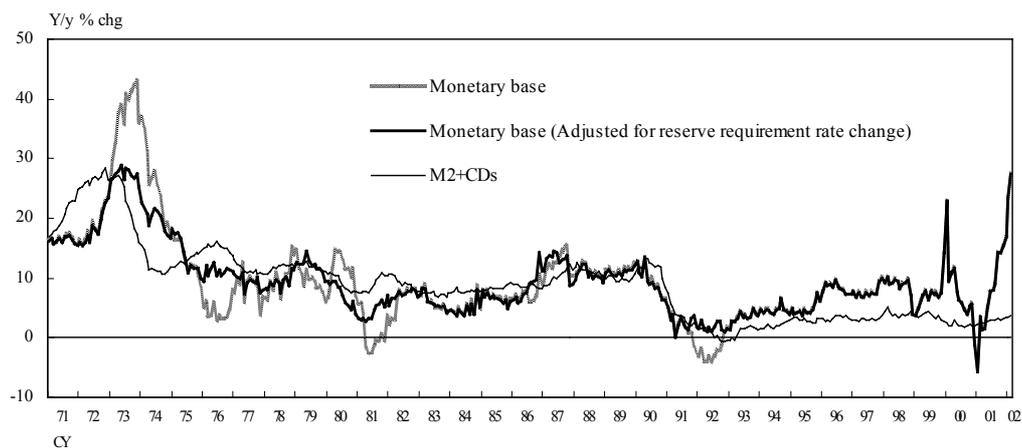
Money Supply and Commercial Bank Lending

(1) Money Supply and Lending

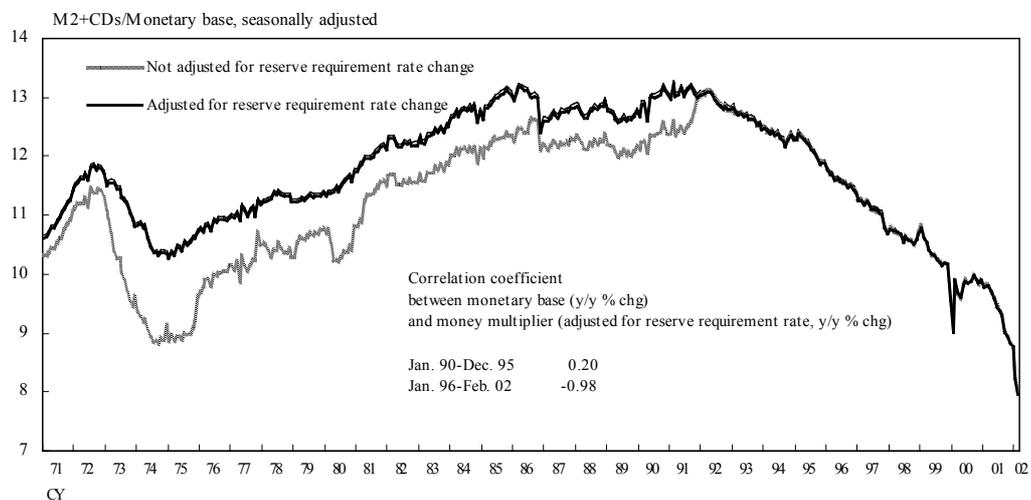


Note: Lending figures are those of domestically licensed banks.

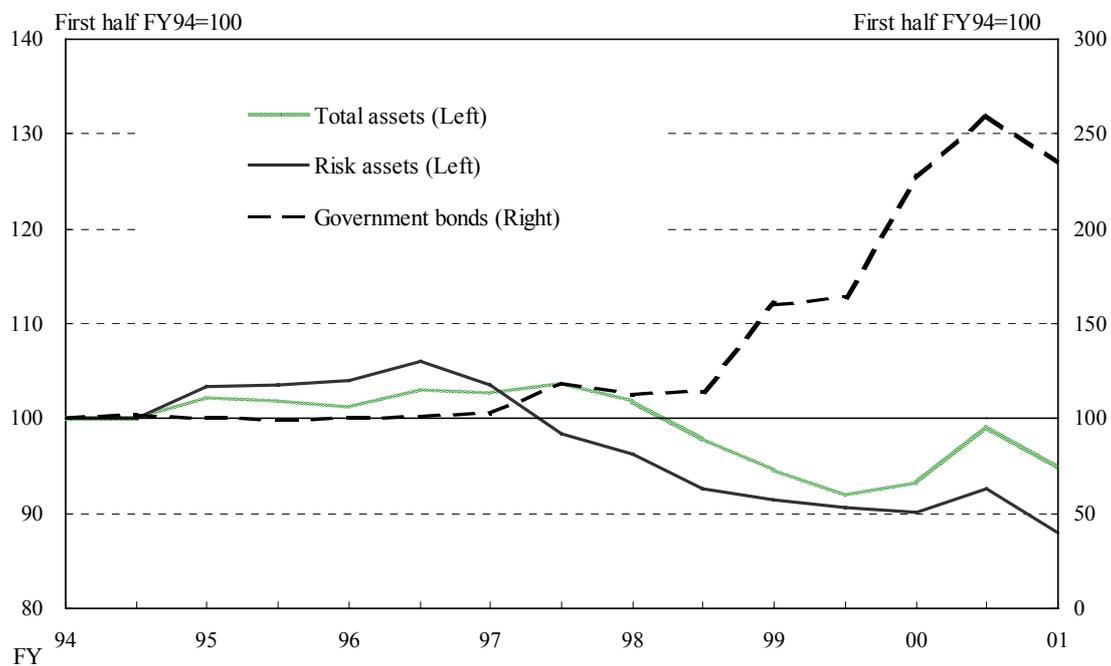
(2) Money Supply and Monetary Base



(3) Money Multiplier



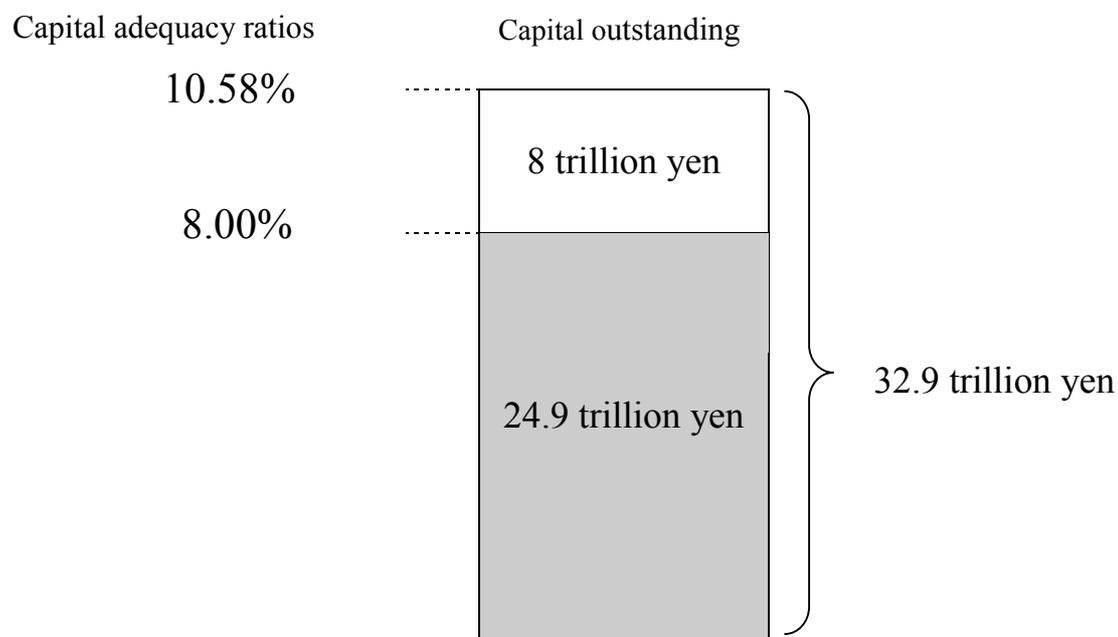
Commercial Banks' Assets



Notes: 1. Risk assets are those of internationally active major Japanese banks.
 2. Total assets and government bonds are those of domestically licensed banks.

Capital and Risks of Major Japanese Banks

Capital of Major Japanese Banks Subject to the International Standard (as of end-September 2001)



Price Volatility Risk in Holding Stocks (as of end-September 2001)

(Yen trillion)

Market value	Percent change in TOPIX			
	-1%	-5%	-10%	-20%
22.8	0.2	1.1	2.3	4.6

Note: Assuming that the value of stocks held by banks is perfectly correlated with TOPIX ($\beta=1$).

Disposal of Non-performing Loans

(Yen trillion)

FY98	FY99	FY00	FY01 (Projection)
8.8	3.7	3.7	5.6

Commercial Banks' Profitability

(As of March 2002; %)

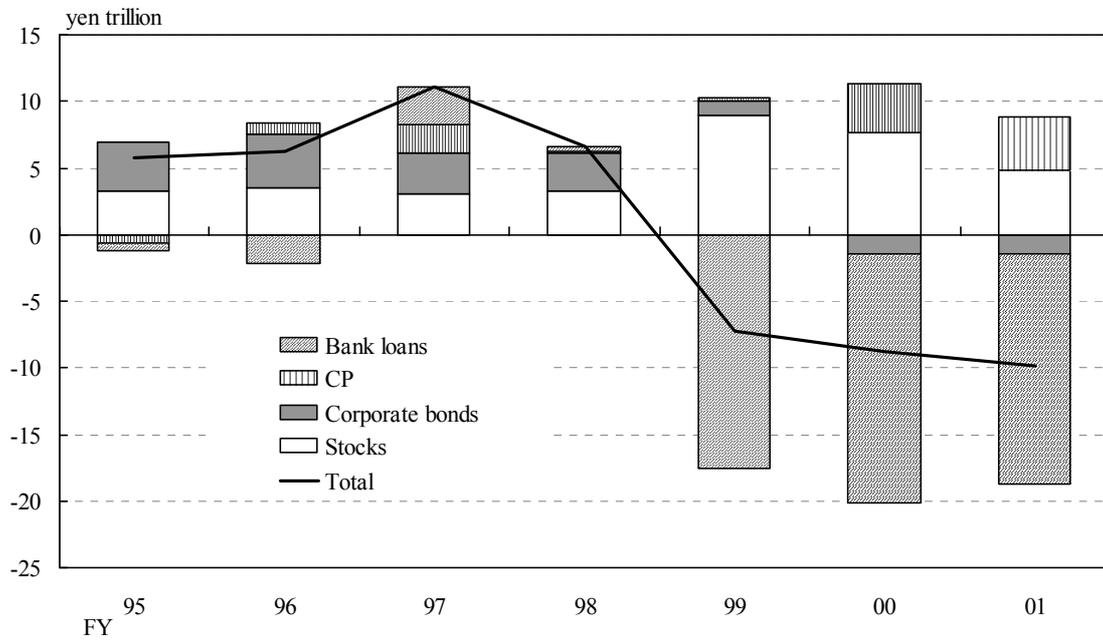
	Ordinary deposits	Time deposits (1 yr.)
Deposit rate (A)	0.020	0.040
Deposit insurance premium (B)	0.084	0.084
Short-term money market rate (C)	0.001*	0.001**
(C)-(A)-(B)	-0.103	-0.123

* The short-term money market rate corresponding to ordinary deposits is the overnight call rate.

** The short-term money market rate corresponding to time deposits is the yield on 1-year TBs.

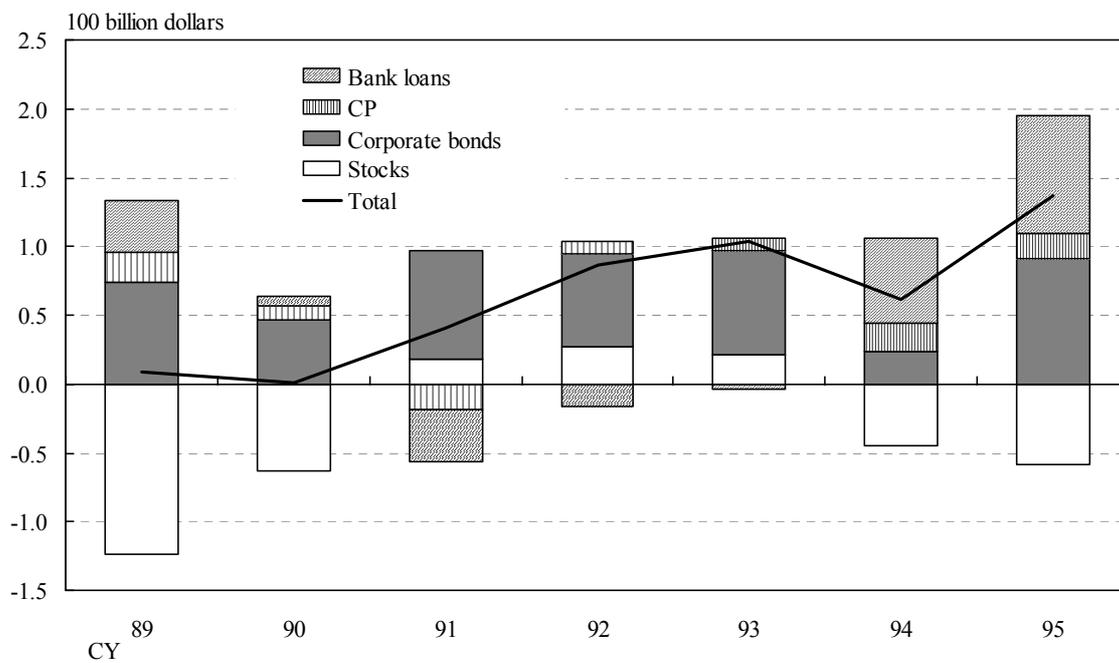
Fund Raising by Non-financial Corporations

(1) Japan



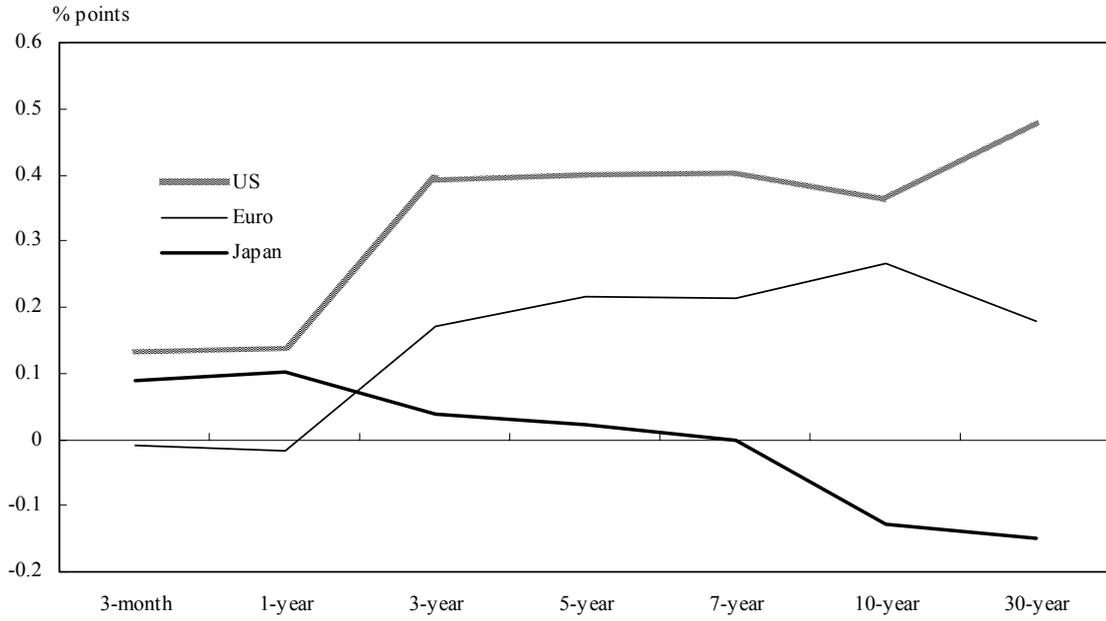
Note: 2001 figures are CY basis.

(2) US

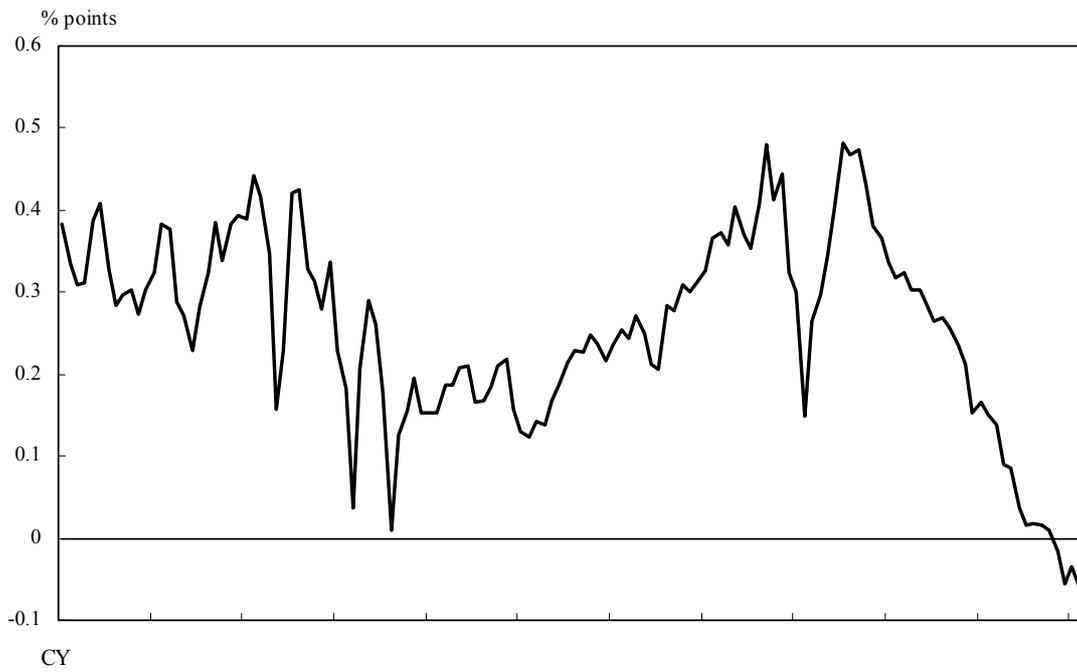


Swap Spreads

(1) Maturity Structure of Swap Spreads



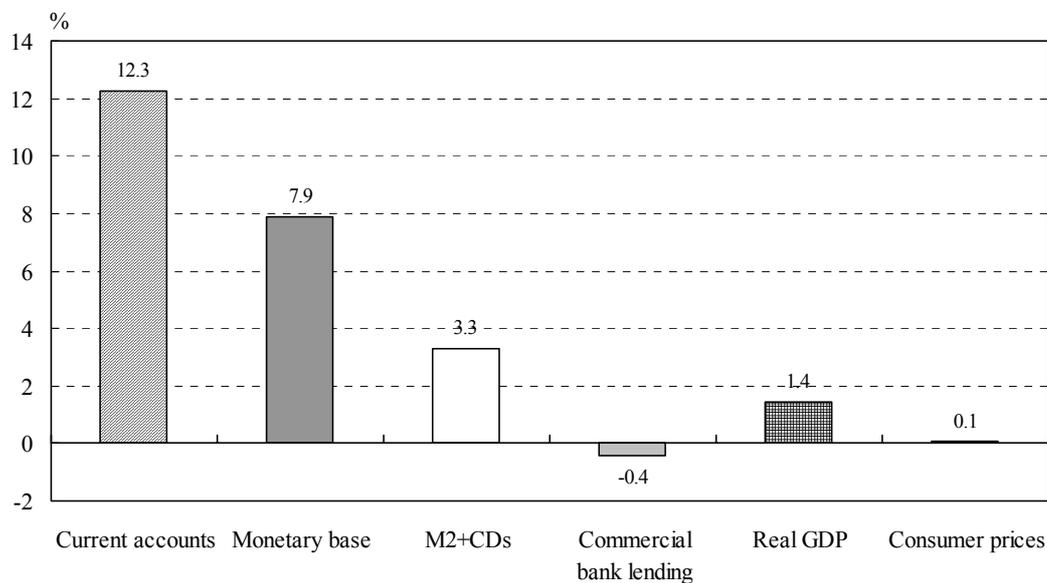
(2) 10-year Swap Spreads (Japan)



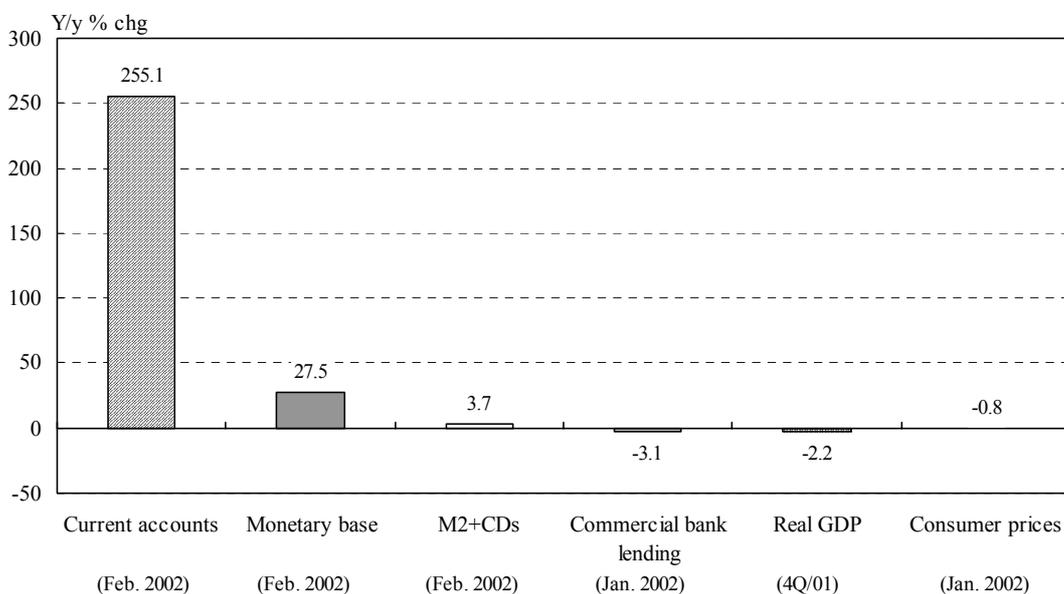
Note: Swap spread = Swap rate - Government bond yield

Monetary Aggregates and Economic Activity

(1) Average Annual Change During 1995-2000



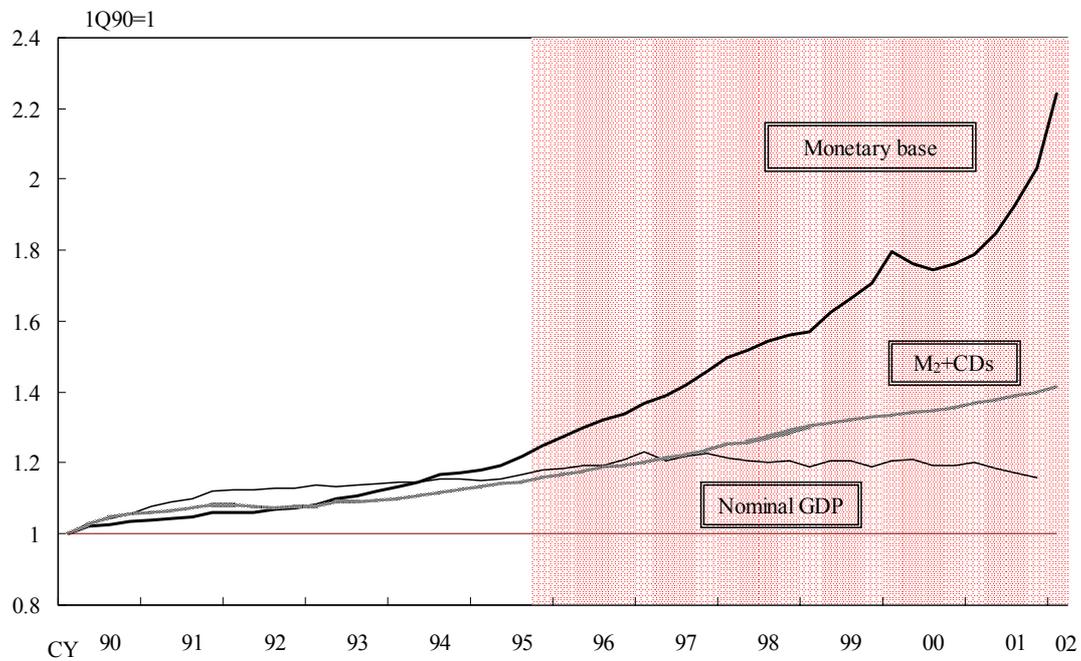
(2) Changes in the Last One Year



Note: Consumer prices are the Consumer Price Index excluding fresh food for Japan.

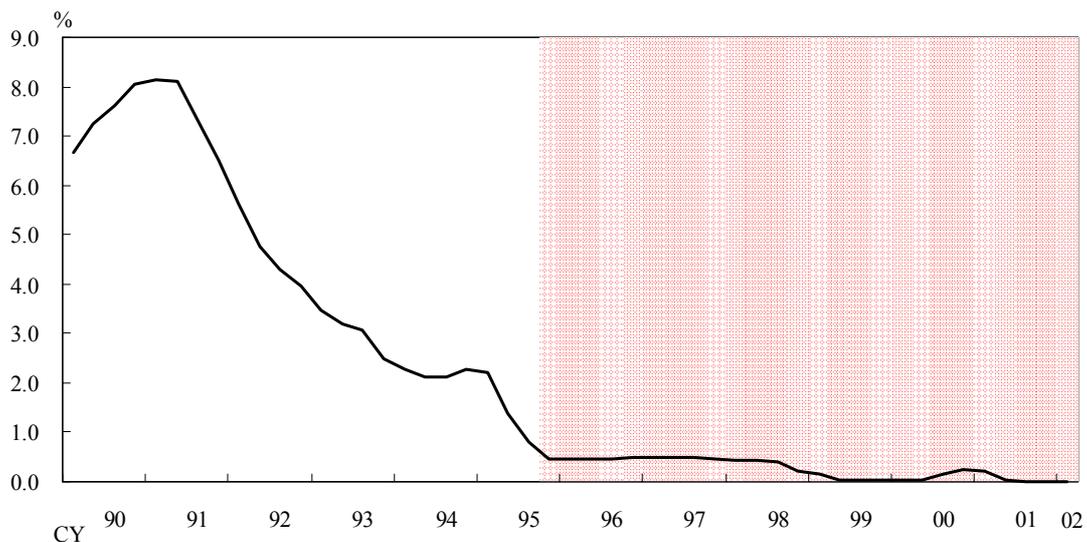
Monetary Aggregates and Nominal GDP

(1) Monetary Figures and Nominal GDP



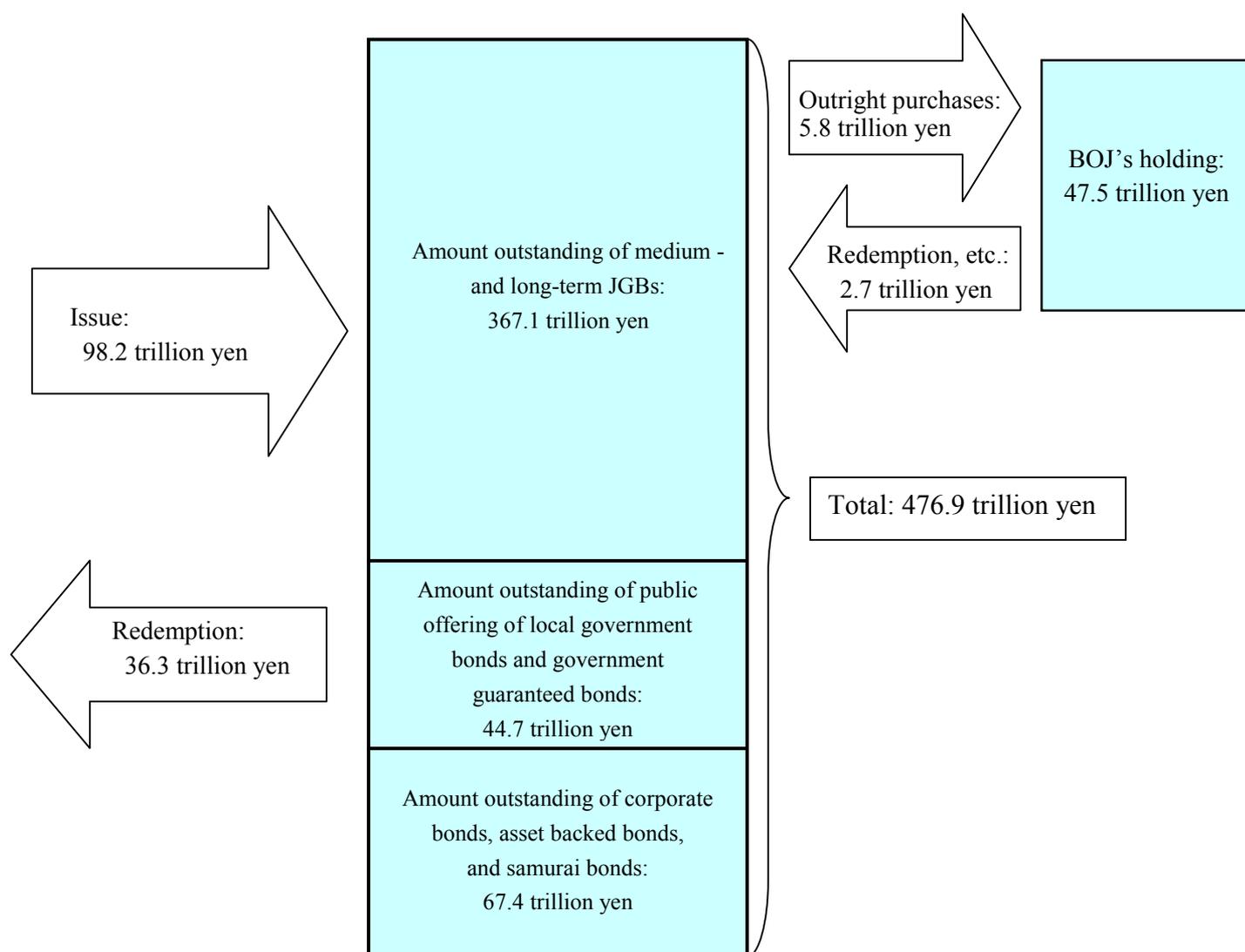
- Notes:
1. The monetary base figure is adjusted for changes in reserve requirement rate.
 2. Shaded area indicates period under very low interest rates.
 3. The figure for 1Q02 is the Jan.-Feb. average.

(2) Short-term Interest Rates (Uncollateralized Call Rate, O/N)



Note: The figure for 1Q02 covers the period through March 20.

Medium- and Long-term Bonds: Issue, Redemption, and Amount Outstanding

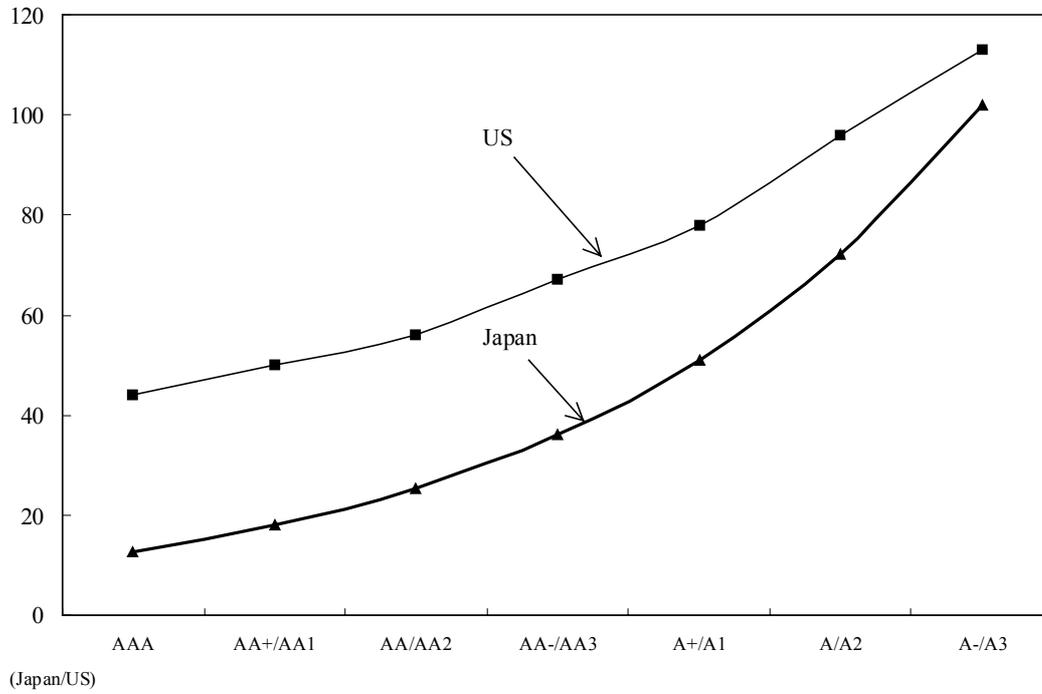


Notes: 1. Issue, redemption, and outright purchase amounts are for the year ended September 2001. Amounts outstanding are as of end-September 2001.

2. Redemption amount for BOJ's holding of JGBs includes not only redemption amount but also changes arising from revaluation.

Credit Spreads in Japan and the US (5-year, as of March 20, 2002)

Spreads between yields on corporate bonds and government bonds, bps



Notes: 1. Figures for Japan are estimated in the same way as Ueki [1999].
 2. US figures based on Bloomberg data.

Figure 26

Comparison Between the Period of “Takahashi’s Economic Policy” (Dec. 1931-Feb. 1936) and the Present

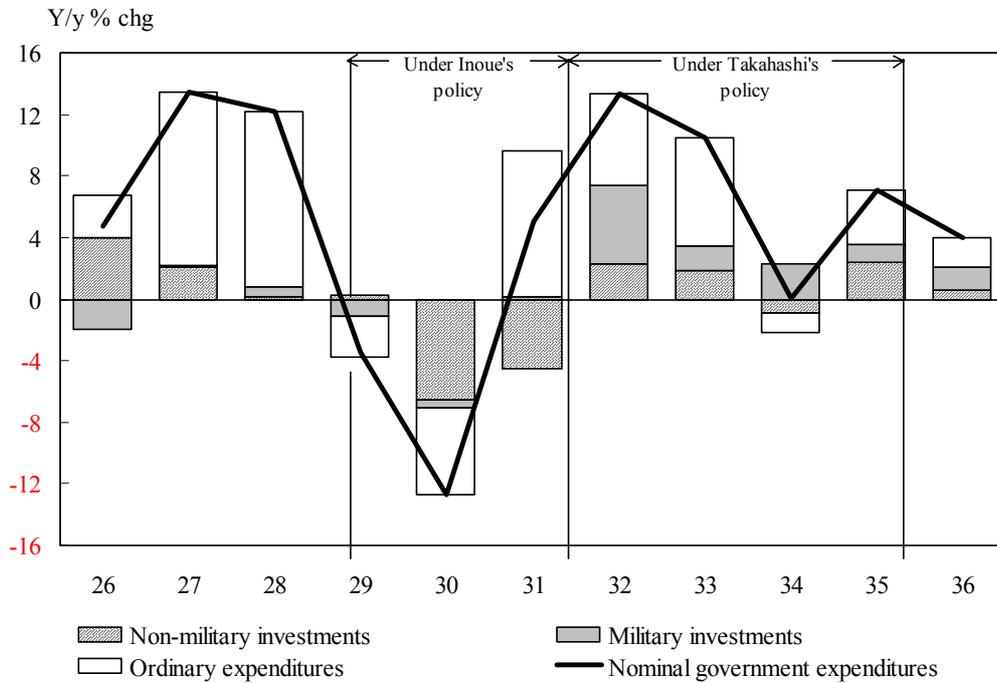
	Under Takahashi’s policy	Present (the last one year)
Amount outstanding of JGBs held by BOJ (Including FBs)	260 million yen → 730 million yen (end-CY1931) (end-CY1935) +30% annually	50.3 trillion yen → 75.4 trillion yen (end-CY2000) (end-CY2001) +50%
<u>BOJ’s holdings</u> Amount outstanding of JGBs	4.1% → 7.3% (end-CY1931) (end-CY1935)	12.6% → 16.4% (end-CY2000) (end-CY2001)
Monetary base	1.09 billion yen → 1.39 billion yen (Nov. 1931) (Feb. 1936) +6% annually	64.8 trillion yen → 82.6 trillion yen (Feb. 2001) (Feb. 2002) +27.5%
Call rate	5.5% → 2.6% (Nov. 1931) (Feb. 1936)	0.26% → 0.001% (end-Feb. 2001) (Mar. 20, 2002)
Yield on long-term government bonds	5.9% → 4.1% (Nov. 1931) (Feb. 1936)	1.35% → 1.43% (end-Feb. 2001) (Mar. 20, 2002)
Nominal fiscal expenditures (based on National Accounts)	+34% (CY1931 → CY1935)	-0.5% (FY00 → First half FY01)
Foreign exchange rate (Yen/US\$)	2.0 yen → 3.4 yen (Nov. 1931) (Feb. 1936)	116.44 yen → 132.21 yen (end-Feb. 2001) (Mar. 20, 2002)

Notes: 1. Yield figures for long-term government bonds are for interest-bearing government bonds (issue number 1, due 1969) in the period of “Takahashi’s economic policy” and recent 10-year JGBs.

2. Monetary base in the period of ‘Takahashi’s economic policy’ is the sum of banknotes and general deposits at BOJ, which include private sector deposits, but not those of the government.

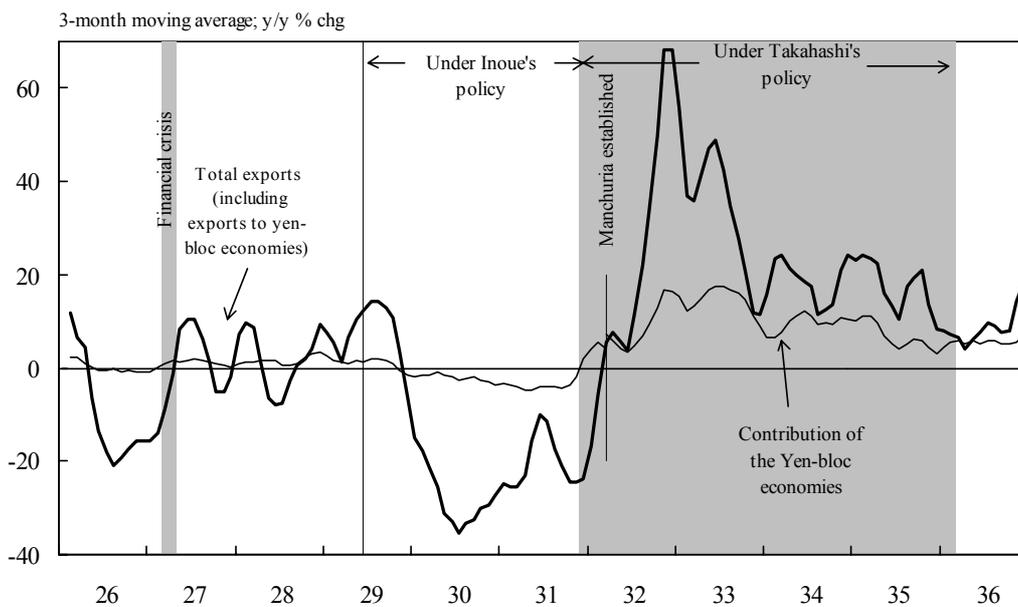
Nominal Government Expenditures and Exports

(1) Nominal Government Expenditures



Note: Based on GNP (estimated by Ohkawa).

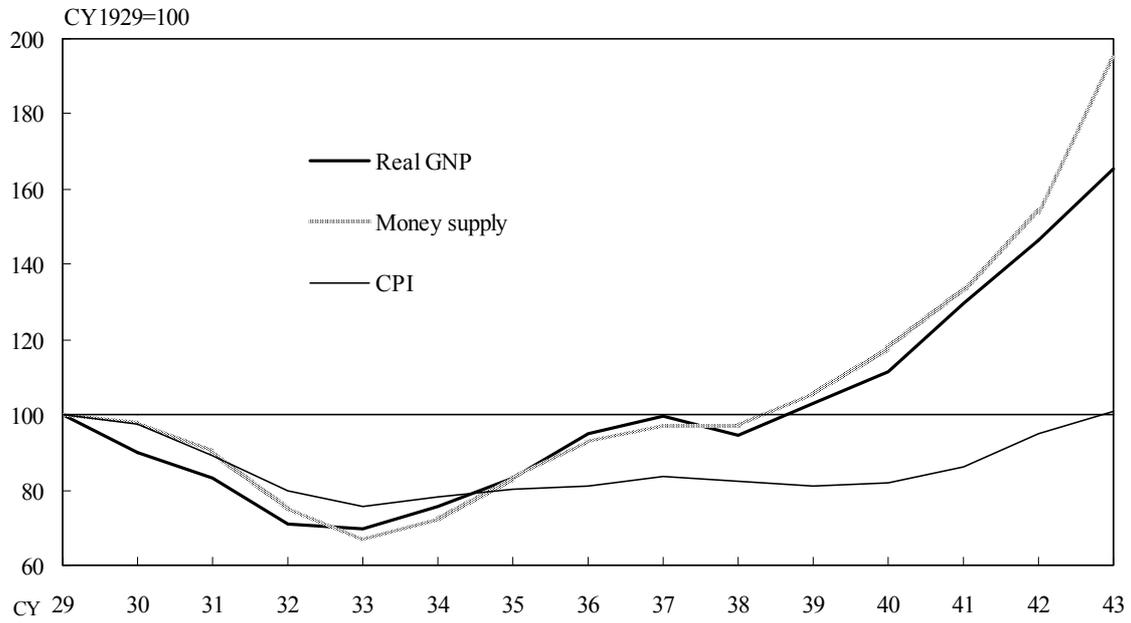
(2) Contribution of Yen-bloc Economies to Nominal Exports



Note: Yen-bloc economies include Korea and Taiwan before February 1932, and Korea, Taiwan, Manchuria and Kwantung leased territory after March 1932.

US Economy after the Great Depression

(1) Major Economic Indicators



(2) Real GNP

