Monetary Policy Under the Zero Interest Rate Constraint and Balance Sheet Adjustment

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There are two contrasting evaluations of the conduct of Japan's monetary policy since the early 1990s. One is that monetary policy has not been easy enough to promote economic recovery in Japan. The other is that since monetary policy has already been substantially eased, further easing would not contribute to economic recovery, but would rather delay the progress of structural reform that is a prerequisite for sustainable economic growth. With these evaluations in mind, this paper examines the effect of monetary policy in general and the effect of so-called 'quantitative easing'[2] in particular when nominal short-term interest rates are zero and balance sheet adjustment is in progress.

The paper is structured as follows. Sections 1 and 2 present an overview of the development of Japan's economy since the early 1990s, and explain the background against which the argument for quantitative easing has emerged. Section 3 elucidates the implications of both balance sheet adjustment and zero interest rate constraint that have reduced the effectiveness of monetary policy since the early 1990s. Sections 4 and 5 examine various arguments regarding quantitative easing, in particular the effect of increasing the outright purchase of long-term Japanese government bonds (JGBs). Sections 6 and 7 evaluate the effect of monetary easing measures the Bank of Japan decided on March 19, 2001 in light of the foregoing analyses. Section 8 offers a few concluding remarks.

1. Japan's Economy Since the Early 1990s

Substantial increase in the monetary base

First, let us briefly review the development of Japan's economy and the conduct of monetary policy by the Bank of Japan since the early 1990s. What should be emphasized at the outset is that the current stance of monetary policy is for substantial easing whether measured in terms of the 'price' of funds

[1] This is an English translation of a Japanese paper included in the forthcoming issue of "*Economics*" (end-May 2001, Toyo-Keizai Shinpou-sha). It is the same as the original Japanese version except that it incorporates additional data released after the submission of the Japanese draft as well as some extra explanations for the benefit of foreign readers. Views expressed in this paper are those of the author and do not reflect those of the Bank of Japan.

[2] There exist a number of papers analyzing the effect of various monetary policy options when the nominal short-term interest rate is zero. Among them, Clouse et al. (2000) presents one of the clearest analyses.

(call market rates) or 'quantity' of funds (monetary base), though how to gauge the stance of monetary policy has generally been a controversial issue.

In terms of the price of funds, the uncollateralized overnight call rate, which is a policy rate, was reduced to 0.25% in September 1998, and in February 1999 the zero interest rate policy was adopted. In August 2000, the zero interest rate policy was lifted and the call rate increased to 0.25%. Furthermore, in February 2001, it was lowered again, and since the end of March has been virtually zero. In terms of the quantity of funds, monetary base has shown a substantial increase. For example, the ratio of monetary base to nominal GDP in Japan is conspicuously high among G7 countries, and has been rising recently (Figure 1). Furthermore, it traced a marked rising trend during the 1990s compared with the late 1920s through the early 1930s when Japan experienced financial disruption followed by the expansionary fiscal policy of then Finance Minister Korekiyo Takahashi (Figure 2) which eventually led to hyper-inflation.[3] Granted that so-called 'quantitative easing' can be interpreted differently, it can be argued that Japan has been in a state of quantitative easing for quite a while in the sense that the growth rate of both reserves and monetary base have been quite high. On the fiscal policy front, an expansionary stance has been maintained. For example, the ratio of central and local government outstanding debt to nominal GDP has reached around 130%, which is markedly higher than the 50% when fiscal policy became expansionary in 1931 when Korekiyo Takahashi became Finance Minister.

Macroeconomic performance

Though both fiscal and monetary policy have been fully mobilized since the early 1990s, Japan's economy has not yet returned to a sustainable growth path. Figure 3 shows the year-on-year rate of change in key variables such as monetary base, money supply, commercial bank lending, nominal GDP, real GDP, and the Consumer Price Index (CPI) from 1998 through 2000. While monetary base increased at an annual rate of 7-8%, commercial bank lending declined. Both nominal GDP and CPI were flat or slightly negative. Figure 4 shows the rate of change in these variables in the 1970s, 1980s, and 1990s. While we can observe a relationship that we would generally expect among such variables during both the 1970s and 1980s, development since the early 1990s, particularly since the late 1990s, has not been in line with expectations.

2. 'Quantitative Easing' or 'Non-Quantitative Easing'?

The above description of Japan's economy is the background against which the argument for 'quantitative easing' has emerged. 'Quantitative easing' is something of a strange term because it seems to imply that there are two types of monetary easing: 'quantitative easing' and 'non-quantitative easing.' However, no such distinction is made in standard textbooks of macroeconomics or monetary

[3] In 1932, the Bank of Japan started underwriting government bonds.

economics.[4]

Like for all other goods, services, and assets, the price and quantity of reserves (the current account balances of commercial banks with the central bank) are not independently determined. A fall in short-term interest rates, which is the opportunity cost of holding reserves, will lead to an increase in demand for reserves. Assuming that a stable demand function for reserves exists, the central bank can control short-term interest rates by adjusting the supply of reserves.[5] The level of short-term interest rates will automatically determine the quantity of reserves, and vice versa. Under such circumstances, there is no room for such a concept as 'quantitative easing' to emerge.

Nevertheless, it becomes possible for this concept to emerge when short-term interest rates approach virtually zero. For example, when searching for articles containing the term 'quantitative easing' in major Japanese daily newspapers, we found that the number of articles on the subject has increased dramatically since around 1998 when the uncollateralized overnight call rate was reduced to 0.25% (Figure 5). Though limited, there were a few articles on quantitative easing in the early 1990s. During this period, in spite of lower short-term interest rates, money supply and commercial bank lending did not increase, and economic recovery was slow against the backdrop of balance sheet adjustment following the bursting of the bubble economy. This suggests that there are two reasons behind the argument which advocates quantitative easing. One is the constraint that the nominal interest rate cannot fall lower than zero. The other is serious balance sheet adjustment. To evaluate monetary policy since the early 1990s, it is necessary to analyze its effect which is characterized by both the zero interest rate constraint and balance sheet adjustment that have reduced its effectiveness.

3. Decline in the Effectiveness of Monetary Policy

Balance Sheet Adjustment

As shown in Figure 6, the accumulative capital loss on property and stocks after the bursting of the bubble amounted to almost twice nominal GDP. Not all, but a substantial part of the investment in property and stocks during the bubble period was debt-financed. Thus, the fall in asset prices led the entire economy to be overly-indebted and under-capitalized. Figure 7 shows corporate debt outstanding as a ratio of nominal GDP. The ratio increased during the bubble period, decreased slightly after the bursting of the bubble, and remains still quite high. Under such circumstances, firms

[4] When we made a keyword search of articles (titles and abstracts) published from 1969 through February 2001 using the EconLit database for economics, we found 19,877 instances of 'monetary policy' but none for 'quantitative easing.'

[5] It should be noted that demand for reserves throughout the reserve period from the 16th of each month to the 15th of the following month is not sensitive to interest rates when the reserve requirement rate is high and demand for required reserves larger than transactional demand. Even in this case, interest rates will influence the decision of commercial banks as to the timing and profile of reserve accumulation during the reserve maintenance period.

are repaying debt from increased cash flow reflecting improved profitability as the economy recovers.

The effect of monetary policy is based on the presumption that an increase in reserves creates an imbalance in the portfolios of financial institutions which leads to rebalancing to resolve such imbalances. Such activity is often called 'arbitrage'. Arbitrage here does not mean price equalization without risk, but involves speculative activity of risk-taking. When financial institutions and firms find their own capital insufficient, they become risk averse and it is difficult for arbitrage to work smoothly. In this case, even if a central bank amply provides reserves, credit creation will not be activated, and money supply, including deposits, will not increase to the degree initially anticipated. Figure 8 shows the change in the portfolios of financial institutions: an increase in reserves has led to a higher holding of JGBs, while lending has continued to decline. This is the manifestation of balance sheet adjustment.

Zero Interest Rate Constraint

As described above, the effect of monetary easing is derived from creating an imbalance with an increase in reserves through the purchase of financial assets in the market by a central bank. When interest rates decline to zero, the marginal value of 'liquidity service,' which is the benefit of holding reserves, also decreases to zero. Thus, no matter how much the central bank increases reserves through the purchase of short-term assets, such an operation is simply the exchange of perfectly substitutable assets with zero interest rates, and liquidity will not increase in any meaningful economic terms.[6] In this situation, a portfolio imbalance will not arise, and, as a result, rebalancing activity will not be seen. Thus, monetary policy will not be effective.

The room for a reduction in nominal interest rates during past recessions is shown in Figure 9.[7] From the 1970s through the early 1990s, there was sufficient room for interest rate reduction at the beginning of recessions, and monetary policy could respond to recession by taking advantage of such leeway. For example, during the recession caused by the appreciation of the yen after the Plaza Agreement, there was room for an interest rate reduction of 6.4 percentage points, and the accumulative reduction of interest rates was 2.5 points during the period. Then, in the economic slowdown immediately after the bursting of the bubble economy, when there was room for an interest rate reduction of 8.3 points, the accumulative reduction was 5.8 points. As call market rates were reduced every time the economy experienced a slowdown after the bursting of the bubble, they are now virtually at zero, and there exists practically no further room for reducing nominal short-term interest rates. In the meanwhile, an economic slowdown could occur even under such circumstances. What is disturbing about the zero interest rate constraint is that the policy response of an interest rate

[6] For example, in the money market operation of April 25, 2001, the weighted average uncollateralized overnight call rate was 0.01%, where the call loan rate adjusted for commissions was 0.005% and the call money rate 0.015%. On the same day, the average auction rate for *gensaki* monetary operations of two and a half months maturity using short-term government bills was 0.01%.

[7] The figure is taken from Clouse et al. (2000).

reduction is not possible at a time when the economy is constantly faced with the danger of falling into a deflationary spiral.

4. Quantitative Easing

Unproductive Controversy

Those who argue for quantitative easing judge the extent of monetary easing by money supply, prices, and real GDP. They assert that it is not appropriate to evaluate monetary policy stance by nominal interest rates. If measured by interest rates adjusted for deflation, monetary policy can be said to have never been expansionary. Thus, if a central bank aggressively increases the quantity of money, prices would rise and the economy recover.

A central bank certainly cannot directly reduce real interest rates. What the central bank can do directly is to provide reserves through daily money market operations. As a result, an imbalance is created in the portfolios of financial institutions, and then the rebalancing activity of financial institutions changes asset prices including interest rates that brings about a change in the portfolio selection of such economic agents as firms and households. The effect of monetary easing is realized by the change in the behavior of financial institutions and firms which is caused through the change in the financial market. Similarly, money supply and prices are determined as a result of the central bank working on the behavior of a variety of economic agents. Thus, the central bank cannot directly control such variables as money supply and prices. Economists in favor of quantitative easing argue that an increase in money supply and commercial bank lending would improve the economy when what should really be discussed is how to increase money supply and commercial bank lending. Hence, discussion regarding quantitative easing often becomes unproductive.

Purchase of Various Assets by the Central Bank

At issue are concrete measures to increase money supply and commercial bank lending, thereby raising real GDP growth. One possible definition of quantitative easing is that the operating target of a central bank is changed from short-term interest rates to reserves which are, in fact, increased. If so defined, the Bank of Japan adopted quantitative easing in the form of reserve targeting operations at its March 19 Monetary Policy Meeting.[8, 9]

Another definition of quantitative easing, which is often talked about, is for a central bank to purchase

[8] During the financial crises since 1997, the central banks of countries like Indonesia, the Philippines, and Taiwan temporarily adopted reserve targeting. However, most central banks in the world adopt interest-rate targeting, and very few, including the Federal Reserve in the era of the Volcker shock, adopt reserve targeting.

[9] The Bank of Japan introduced a 'Lombard-type' lending facility on March 16, 2001 enabling financial institutions to freely borrow funds from the Bank (within the range of their eligible collateral submitted to the Bank) at the prevailing discount rate. Since the discount rate which serve as a ceiling of the market rate is now at 0.25%, change of market rates has been limited to a narrow range.

those assets not substitutable for reserves even under the zero interest rate. For example, the central bank aggressively purchases in the market such instruments as long-term JGBs, foreign assets, and private obligations, including corporate bonds and commercial paper (CP).

Among the assets that could be purchased by the central bank, the purchase of foreign exchange comes under the jurisdiction of the Ministry of Finance in the current legal framework of Japan. Thus, it is not a policy option that the Bank of Japan itself can exercise.[10]

Though corporate bonds and CP are currently being used in money market operations, their role is limited to collateral complementing the creditworthiness of financial institutions. They are not purchased based on their own creditworthiness alone. Normally, major central banks would not purchase the obligations of a firm solely based on its own creditworthiness. Of course, if a central bank does purchase the obligation of a firm based on its own creditworthiness and if it substantially lowers the standard for eligible obligations, funding of the firm in question will be greatly eased. However, in such a case, commercial bank lending is simply being replaced by central bank lending, and there is no guarantee that net lending in the overall economy would increase. Furthermore, if the central bank is prepared to incur losses resulting from its money market operations, it will in fact be providing capital, not the liquidity that the central bank should provide, which is tantamount to the role of fiscal policy. On the other hand, if the central bank extends loans to firms at the same level of allowance for risk as commercial banks, there is no advantage to firms in borrowing from the central bank.

As far as long-term JGBs are concerned, the Bank of Japan has been purchasing them twice a month in the amount of 200 billion yen each time, amounting to about 5 trillion yen a year. Together with short-term government obligations, the Bank of Japan holds roughly 11% of JGBs outstanding. As shown in Figure 10, the ratio of long-term JGBs held by the Bank of Japan to monetary base is 70%. This relationship indicates that monetary base, which the Bank of Japan provides, is mostly supported by the Bank's holding of long-term JGBs.

5. Effect of the Outright Purchase of Long-Term JGBs

Let me examine the effect of monetary easing when interest rates are zero by referring to the example of the increase in the outright purchase of long-term JGBs.[11]

Can Reserves Be Increased?

A reduction in call market rates requires an increase in reserves. If a central bank simply wants to

[10] Article 40 of the Bank of Japan Law stipulates that the Bank of Japan can buy and sell foreign assets with the aim of stabilizing the foreign exchange rate only as an agent of the Ministry of Finance.
[11] Clouse et al. (2000), Meyer (2001).

increase reserves, it does not necessarily have to be long-term JGBs that the central bank purchases. However, once interest rates are zero, the picture completely changes since short-term government obligations and reserves become a perfect substitute for each other. In such a situation, the purchase of short-term government obligations by the central bank would not change the total amount of liquidity as previously explained, and therefore not have any meaningful economic impact. Furthermore, even if the central bank attempted to provide reserves virtually at the zero interest rate level, there is a possibility that there might not be enough demand for reserves on the part of financial institutions and that therefore there might not be sufficient bidding for money market operations. For example, with respect to money market operations during the period from February 1999 through August 2000 when the zero interest rate policy was in place, there were insufficient bids on 31 occasions (Figure 11). For these 31 cases, the average bid rate was 60% of the offered amount. In an extreme case like the bill purchase operation on June 4, 1999, there were no bids for the offered amount of 200 billion yen.

When interest rates are at zero, it may make sense to increase the outright purchase of long-term JGBs since they offer interest rates significantly higher than zero percent. However, there is a caveat. As long-term interest rates decline, long-term JGBs become substitutes for reserves. To this extent, it would become difficult to increase reserves through the purchase of long-term JGBs, and, even if reserves increased, there is a possibility that it would not bring about any meaningful economic change, which is the same as in the case of the purchase of short-term government obligations. Thus, under the zero interest rate constraint, it will eventually become very difficult to increase reserves themselves. Unfortunately, it is not necessarily the case that this kind of practitioners' viewpoint backed by actual experience is fully understood, except by market participants.

Could the Effect of Relative Supply Induce a Reduction in Long-Term Interest Rates?

What kind of economic effects would an increase in the outright purchase of long-term JGBs create? Normally, the main economic effect is said to be a decline in long-term interest rates. The decline in long-term interest rates is an important channel in the transmission mechanism of monetary policy, and it becomes particularly important after short-term interest rates reach zero. Long-term interest rates are the sum of the average future expected short-term interest rate and the term premium. While term premium depends on the balance of the relative supply of short- and long-term bonds among others, the future expected short-term interest rate depends on the future stance of monetary policy.

The outright purchase of long-term JGBs would reduce the term premium by changing the balance of the relative supply of long- and short-term bonds, thereby having the effect of somewhat lowering long-term interest rates. The total outstanding amount of long-term bonds, including government bonds, government agency bonds, municipal bonds, and corporate bonds, amounts to 530 trillion yen. And, in fiscal 2001 there will be the new issuance of government bonds totaling almost 100 trillion yen on a gross basis. In light of such a high level of outstanding bonds, it would be natural to assume that

there would be a limited effect from relative supply resulting from the outright purchase of long-term JGBs by the Bank of Japan, since, even if purchases were doubled, they would only reach 10 trillion yen a year. If we want to take advantage of the effect of relative supply, it would be far more effective for the government to shorten the maturity of newly issued government bonds in terms of the amount provided to the market.[12]

Could the Effect of Expectations Induce a Reduction in Long-Term Interest Rates?

The outright purchase of long-term JGBs would also influence long-term interest rates through the effect of expectations that would affect future expected short-term interest rates. Even if the outright purchase of long-term JGBs were carried out in the current period, there is no guarantee that it would continue. Clouse et al. (2000) presented a possible route, that is to say, the effect of the outright purchase of long-term government bonds creates the incentive for a central bank to avoid capital losses, i.e. the central bank would have an incentive to suppress a rise in short-term interest rates because the larger its holding of long-term government bonds as a result of purchases, the larger potential capital losses would be when short-term interest rates began to increase. This may be true, but it is not at all clear that market participants would anticipate such loss-avoiding behavior on the part of the central bank. Moreover, if an increase in the outright purchase of long-term government bonds were perceived as the de facto underwriting of government bonds by the central bank or the loss of fiscal discipline, long-term interest rates might well rise.

The outright purchase of long-term JGBs would change future expected short-term interest rates, not because it has a quantitative impact, but rather because market participants perceive it as a signal of a change in future expected short-term interest rates. If the policy intention is to affect expectations, the purchase of long-term JGBs may be a roundabout way of achieving this. It may be more effective for a central bank to directly affect the expectations of market participants. The Monetary Policy Meeting on March 19, 2001 decided and announced a commitment that the new framework for monetary policy operations would remain in place until the year-on-year change in CPI (excluding perishables) is stable at zero percent or above. This is one way for the central bank to directly affect future expected short-term interest rates.

6. Effect of Monetary Easing Measures Decided in March

At the Monetary Policy Meeting on March 19, 2001 the Bank of Japan decided monetary easing measures (Figure 12). This section examines how these measures might affect the economy.[13]

Let us first review the actual developments. Despite some ups and downs on a daily basis, the current account balances of financial institutions have been at about 5 trillion yen (Figure 13). With

[12] Komiya (1999).
[13] Okina (2001).

respect to insufficient bids for money market operations, there were 16 occasions as of mid-May (Figure 14).

Effect Through Lower Short- and Long-Term Interest Rates

An increase in the current account balances of financial institutions at the Bank of Japan would reduce call market rates virtually to zero. Figure 15 shows government bond yields classified by remaining years to maturity, and one can see that, as of mid-May, yields on bonds with 1-year and 5-year maturity have substantially declined to 0.02% and 0.47%, respectively. The effect derived from an explicit commitment would lower both short- and long-term interest rates and the question is how a decline in interest rates affects the overall economy.

a. Narrowing Credit Spread

A reduction in both short- and long-term interest rates on government obligations that carry no credit risk would force private economic agents to rebalance portfolios and to increase investments in assets other than government obligations. In the past, the credit spread between private sector obligations, such as corporate bonds and CP, and government obligations, narrowed substantially as interest rates on government obligations came down (Figure 16). However, there exists a limit to such narrowing of the credit spread in view of the higher credit risk involved in private sector obligations.

b. More Aggressive Credit Extension by Banks

Monetary easing is usually expected to improve corporate funding. Lower interest rates should see financial institutions becoming more aggressive in their lending attitude because of wider interest rate margins. However, once interest rates reach zero, we cannot expect such an effect to stem from the widening of interest rate margins. For firms, lower interest rates reduce the present value of payments on existing debt. As a result, the risk evaluation of these firms by financial institutions would improve. However, once interest rates reach zero, such an effect becomes very limited. The remaining channel is the effect of the zero interest rate through such asset prices as property and stock prices. At present, this effect may not be so large in view of the magnitude of non-performing assets. If property and stock prices stop declining, or if they turn to rise, the capital position of financial institutions and firms will improve, and there will be more room for taking credit risks.

c. Depreciation of the Yen

Lower short- and long-term interest rates due to the commitment effect might create an investment shift to foreign assets, which would probably lead to the depreciation of the yen. Nevertheless, whether or not depreciation actually occurs depends on a variety of factors such as the capital position of institutional investors relative to foreign exchange risks.

Effect of Commitment

Though the commitment regarding CPI has the effect of lowering both short- and long-term interest rates, it intrinsically possesses a dynamic effect through an additional channel. Namely, when the

economy slows down and the fall in CPI accelerates, the effect of commitment automatically strengthens because the current monetary policy framework will be maintained longer than otherwise.

On the other hand, when the economy begins to recover, upward pressure will be put on interest rates in general. However, it is more likely that short- and medium-term interest rates would be kept at relatively low levels, as they are more susceptible to the effect of commitment. Moreover, real short- and medium-term interest rates would further decline because inflation rises with economic recovery and nominal short- and medium-term interest rates are kept at relatively low levels. Considering that interest rates tend to remain low in a stagnant economy regardless of whether or not there is such a commitment as the one regarding CPI, such commitment would have the maximum effect when the economy is on a recovery path.

The nature of such commitment suggests that the stimulative effect of monetary policy would become fairly large if the real expected rate of return on investments in tangible assets could be raised. Under the zero nominal interest rate constraint, there is a limit to how far nominal interest rates can come down, but there is no limit to the increase in the real rate of return. Currently, there are a number of concrete proposals in various areas of structural reform in Japan. For example, clearer demarcation of the role played by the public and private sectors, the disposal of excess corporate debt and the non-performing assets of financial institutions, and legal and tax systems that will not hinder smooth reallocation of resources through the market mechanism. All of these are important. Of course, it is not easy to change the institutional framework and promote structural reform since it necessarily involves the vested interests of all the related individual economic agents. However, if the direction toward structural reform becomes clear, the 'natural rate of interest' in Wicksell's terminology will rise, and the stimulative effect of the 'market interest rate,' which is kept extremely low by the commitment, will most likely become very large.

7. Points of Contention

Effect of an Increase in the Quantity of Reserve

As described above, an increase in reserves would affect both short- and long-term interest rates as well as the foreign exchange rate through portfolio rebalancing. But, is there any direct impact of the increase in reserves itself that would stimulate economic activity other than the effect emanating from a decline in interest rates? This appears to depend on the following two factors.

First is the extent of substitutability of reserves for other assets. Even under the zero interest rate policy, reserves and other assets are not perfectly substitutable in a strict sense. To the extent they are not perfectly substitutable, the change in reserves could stimulate economic activity. Second, as long as economic agents believe the change in reserves itself could affect the economy, there is a possibility that it could reinvigorate economic activity. The second factor, however, presupposes that eventually the increase in the quantity of reserves itself has the effect of stimulating economic activity

other than the effect emanating from a decline in interest rates.

To summarize, it does not appear possible to give a definite answer to the question "Could the increase in the quantity of reserves itself affect the economy other than through the interest rate channel?" Even if it does affect the economy, it would not be easy to establish an appropriate exit policy of moving from a state of excessively inflated reserves to a normal state. If we failed to exit from an excessively inflated state, we would be faced with other risks such as the resurgence of inflation. Fundamentally, what is important for maximizing the effectiveness of monetary policy is not to increase the quantity of reserves, but rather to change expectations resulting in the revitalization of economic activity.[14]

What Is an Effective Commitment?

If a commitment is to be made under a zero interest rate with the aim of affecting future expected short-term interest rates, what might be the most effective one? A commitment under a zero interest rate is similar to setting a height in the pole jump. The effect on expectations will not be sufficient if the height is too high or too low. Following the commitment announced by the Bank of Japan on March 19, some said that it might constrain the future conduct of monetary policy. Indeed, it might be true that it would be easier to fulfill the commitment if we lowered the height in such a way that the current policy would remain in place until the year-on-year increase in CPI is consistently more than minus 0.2%. In this case, however, the period of monetary easing would be shorter than otherwise, and the effect of commitment weakened. As a result, it would be difficult to exit from economic stagnation.

Others commented that the Bank of Japan should pursue the new procedures for money market operations until the year-on-year increase in CPI is consistently more than 2%. If we make a very strong commitment under the condition of considerable uncertainty regarding the future economy, we would create the risk that the central bank might not be able to respond to dramatic changes in the environment that it cannot anticipate. Moreover, if the private sector also recognized such a risk, then the commitment itself would not be credible. Furthermore, if a central bank does not have credible policy measures against the backdrop of the zero nominal interest rate and balance sheet adjustment, the commitment itself would become simply wishful thinking, and it would not be able to affect expectations effectively. A very strong commitment might be effective if the sole purpose is just to exit from the current stagnant economy, but it would likely impair macroeconomic stability in the long run.

Should the Bank of Japan Provide Liquidity Without Limit Until the Effect Emerges?

Some argue that the Bank of Japan should provide liquidity without limit until the effect emerges. According to this argument, the Bank of Japan should simply terminate quantitative easing the

[14] Krugman emphasizes the importance of expectations, and he seems to be skeptical about simple quantitative easing which does not have any effect on expectations (2000).

moment harmful effects arise. Or, if harmful effects are anticipated, the Bank of Japan, an independent central bank, could tighten monetary policy to avoid any undesirable situation such as the resurgence of inflation.

In the end, this kind of argument boils down to what determines the action of a central bank. Should we hold that a central bank can conduct monetary policy in any way it likes, or should we believe that even monetary policy conducted by an independent central bank is not entirely independent from various social demands and pressures? Looking at the history of central banks worldwide, we see that both ways of thinking exist. As shown by many studies relating the independence of central banks to economic performance, it is often the case that strong legal independence leads to an improvement in economic performance. It should be noted, however, that even in countries where strong independence is given to the central bank, there exist a variety of precautions regarding the institutional framework to ensure that independence is not undermined. For example, the action of the fiscal authority and the fiscal condition will ultimately have a large impact on the action of a central bank and the general price level as is well documented in a series of discussions related to the 'fiscal theory of price level.'[15] There are many countries that impose strict conditions on fiscal management due to the presumption that ultimately fiscal discipline is important in conducting appropriate monetary policy.

For example, in Europe, the Maastricht Treaty stipulates, as a necessary condition to participate in the single currency, that the ratio of government debt to nominal GDP must be less than 60% and that the ratio of the fiscal deficit to nominal GDP must be less than 3%. Thus, it is important to carefully design various systems, including fiscal policy, that can ultimately affect monetary policy. Without giving due consideration to this point, proper balance appears to be lost if it is single-mindedly argued that a central bank should be responsible for both inflation and deflation, or that a central bank should provide liquidity without limit until the intended effect emerges.

8. Conclusion

The current economic and financial situation in Japan characterized by severe balance sheet adjustment and the zero interest rate constraint raises a number of interesting issues in the formulation of economic policy as well as economic theory. We have always observed a difference of opinion between central bankers and economists regarding monetary policy. This reminds me of the response of academia to the bubble economy in Japan in the late 1980s. In fact, discussion of the conduct of monetary policy during the bubble period continues between economists at home and abroad, and no consensus appears to exist. There were very few economists who argued for the

[15] Proponents of the 'fiscal theory of price level' assert that inflation is not an issue for which only the central bank is responsible, but that is also affected by decision of the fiscal authority. More specifically, they argue that the government's choice of how to finance its debt plays a crucial role in determining the future time path of the inflation rate.

need to tighten monetary policy in the late 1980s in Japan. Since then, more than ten years have passed. Now, regarding whether or not tight monetary policy could have prevented the emergence of the bubble, the majority of economists argue that the Bank of Japan should have tightened monetary policy during the bubble period. It seems to me that perhaps discussion regarding the conduct of monetary policy under both severe balance sheet adjustment and the zero interest rate constraint will look different a few years from now. In this regard, it is essential that we look squarely at severe balance sheet adjustment and the zero interest rate constraint, and conduct further theoretical and empirical research. What should be clearly recognized by theorists and monetary policymakers with respect to policy prescription is the significance of the combination of both balance sheet adjustment and the zero interest rate constraint.

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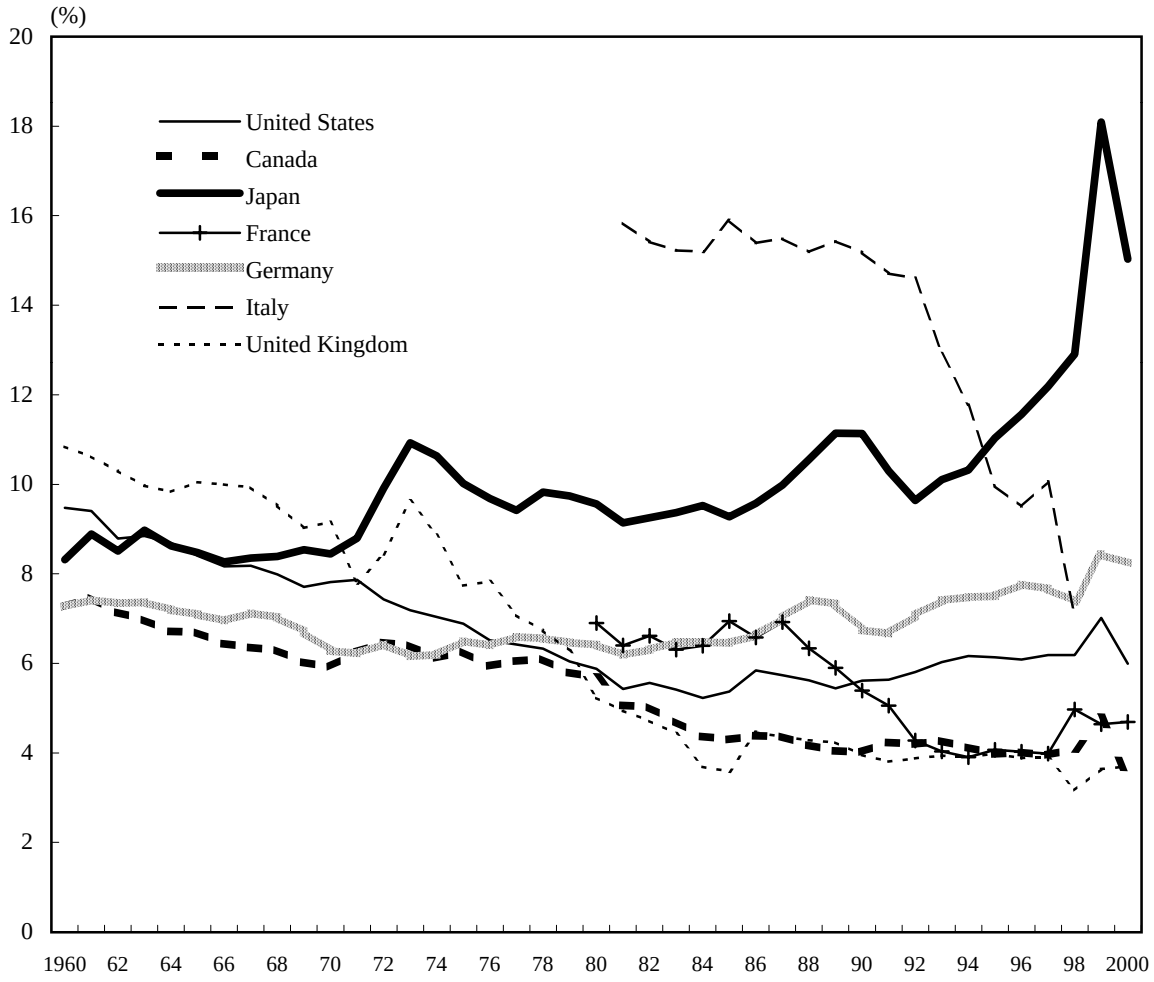
(Figure 1)

The Ratio of Monetary Base[1] to Nominal GDP in G-7 Countries

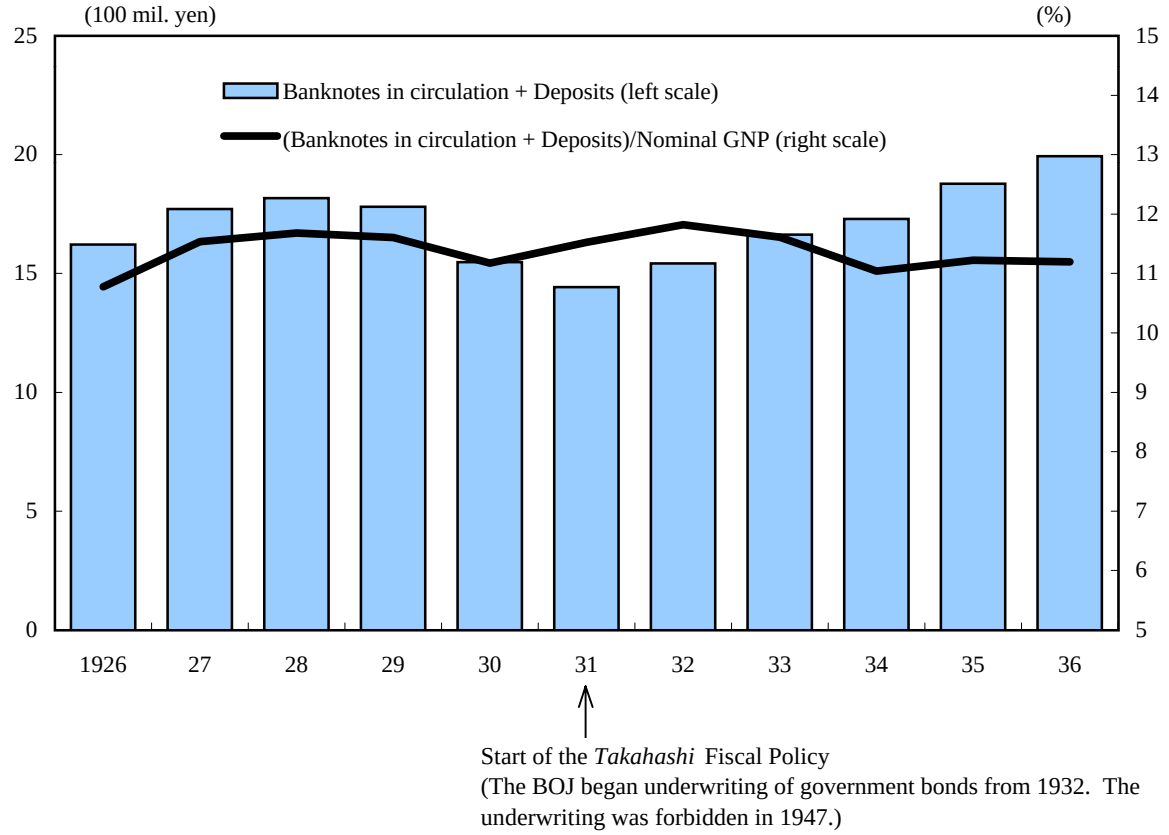


Note: 1. Amount outstanding at end-December, or average amount outstanding in December.

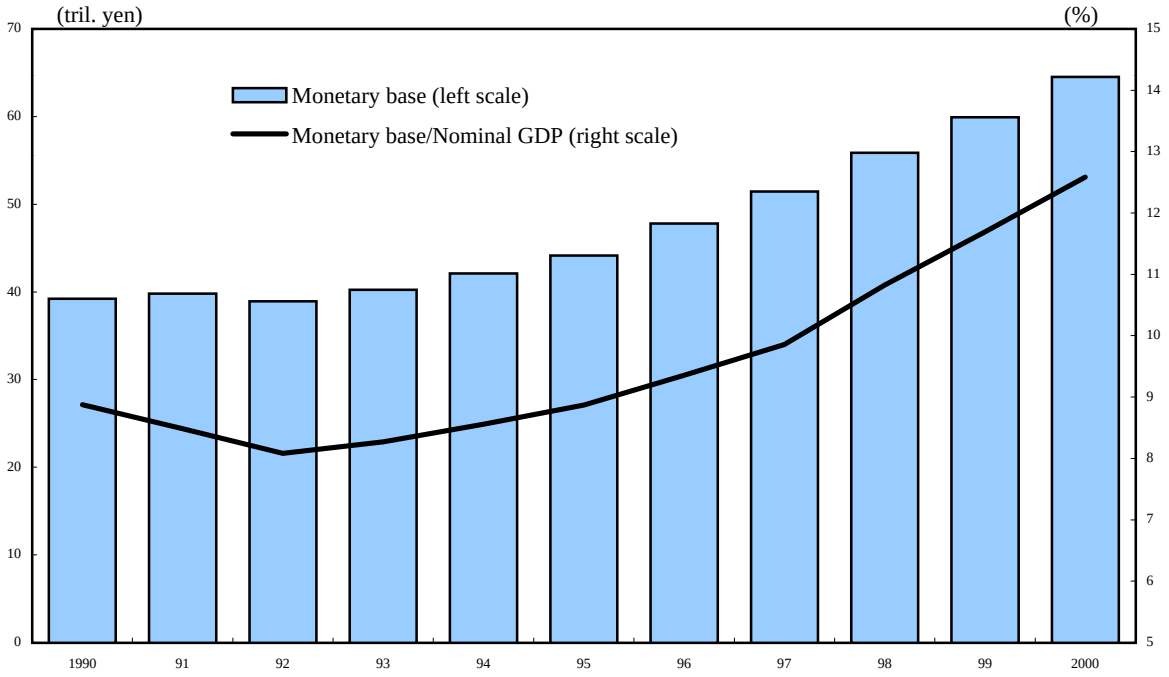
(Figure 2)

Monetary Base in Japan : A Comparison between the Last Decade and the Early *Showa* Period (1926-1936)

(1) 1926-1936[1]



(2) 1990-2000[2]

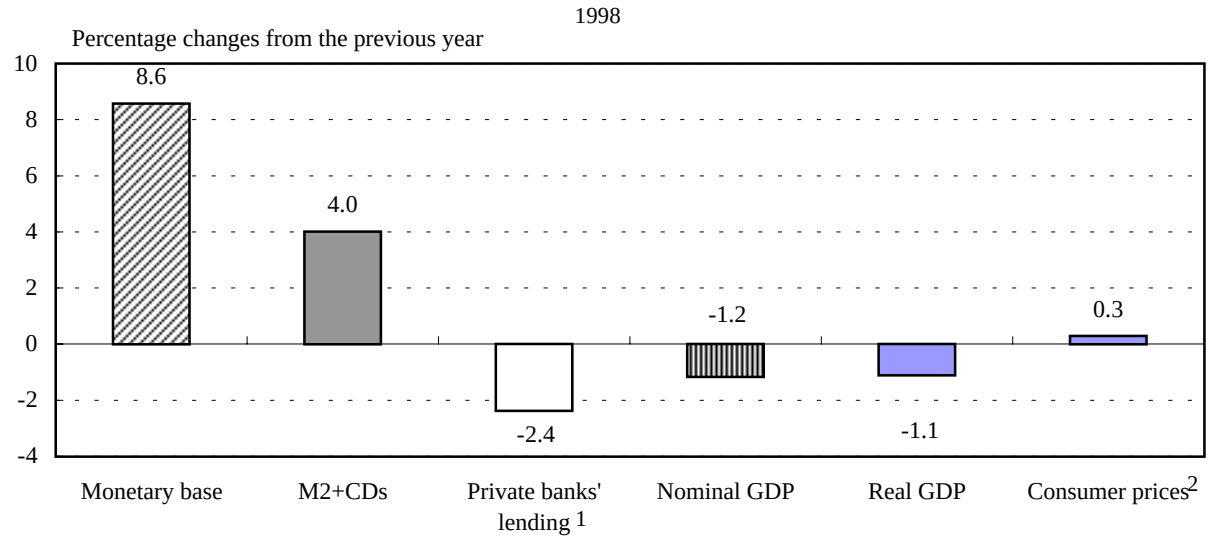


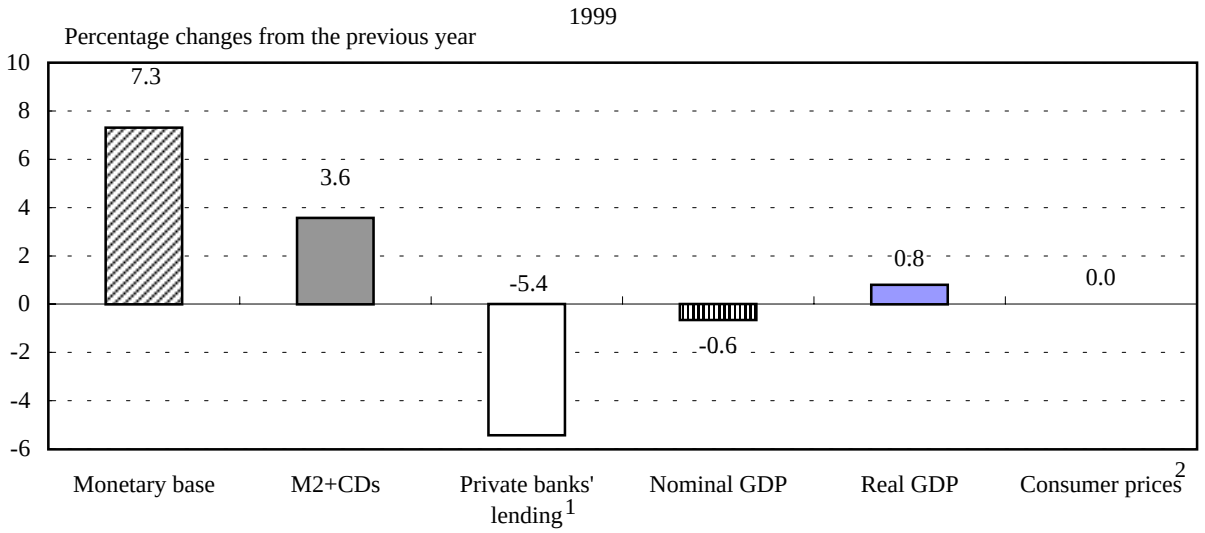
Notes: 1. Amount outstanding at end-December.

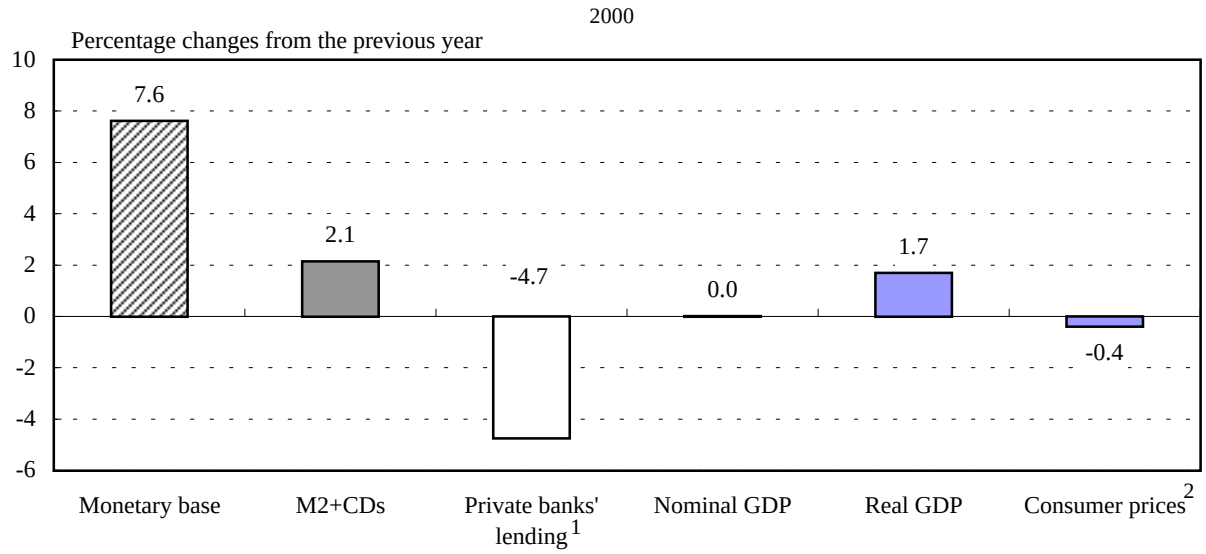
2. Monetary base defined as banknotes and coins in circulation, and current account balances at the Bank of Japan. Average amount outstanding over the year.

(Figure 3)

Growth in Money and the Economy (1)



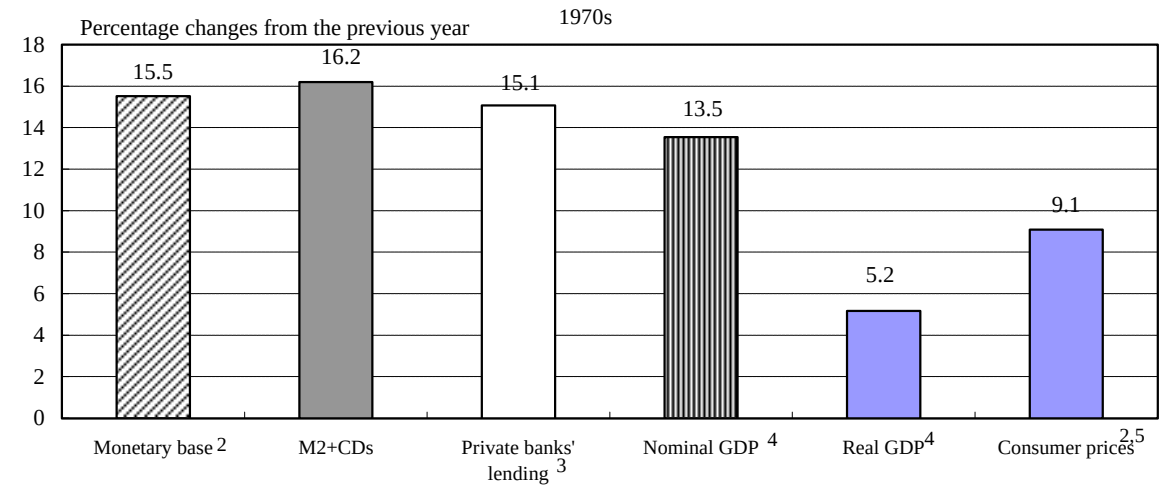


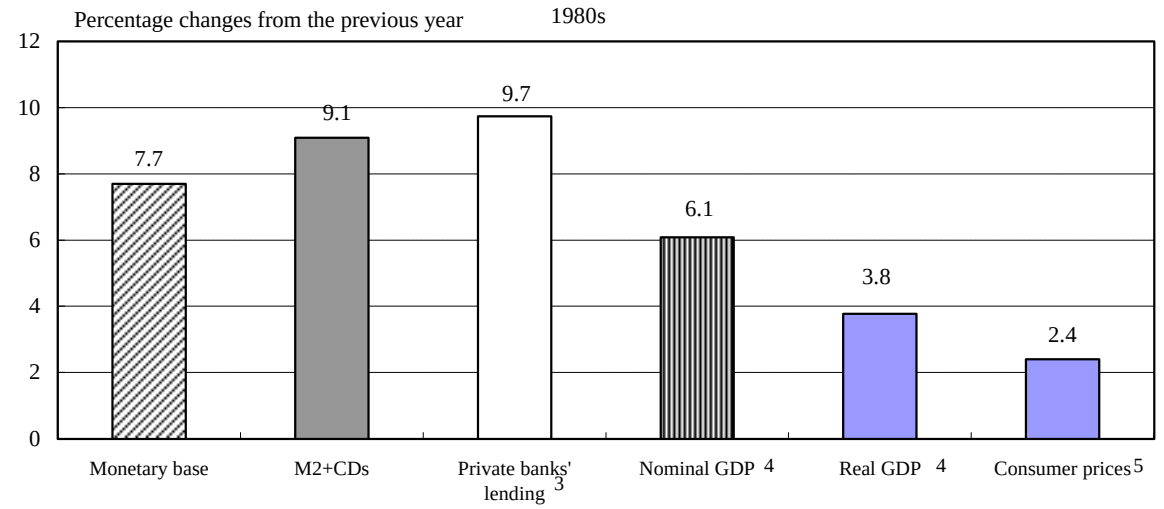


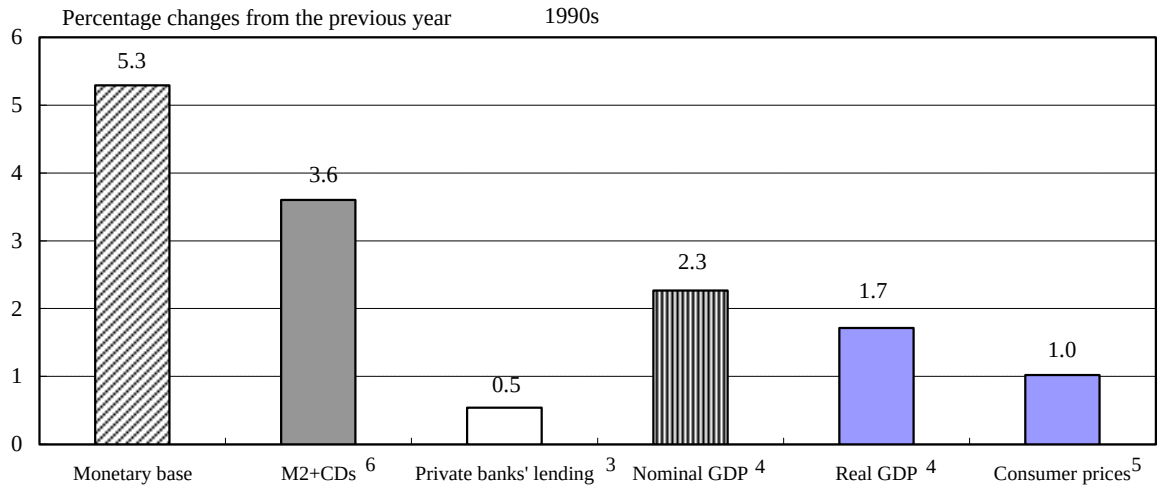
Notes: 1.Figures are not adjusted for special factors such as fluctuations due to liquidation and write-offs of loans and exchange rate movements.
2. In terms of the consumer price index excluding perishables.

(Figure 4)

Growth in Money and the Economy (2)[1]



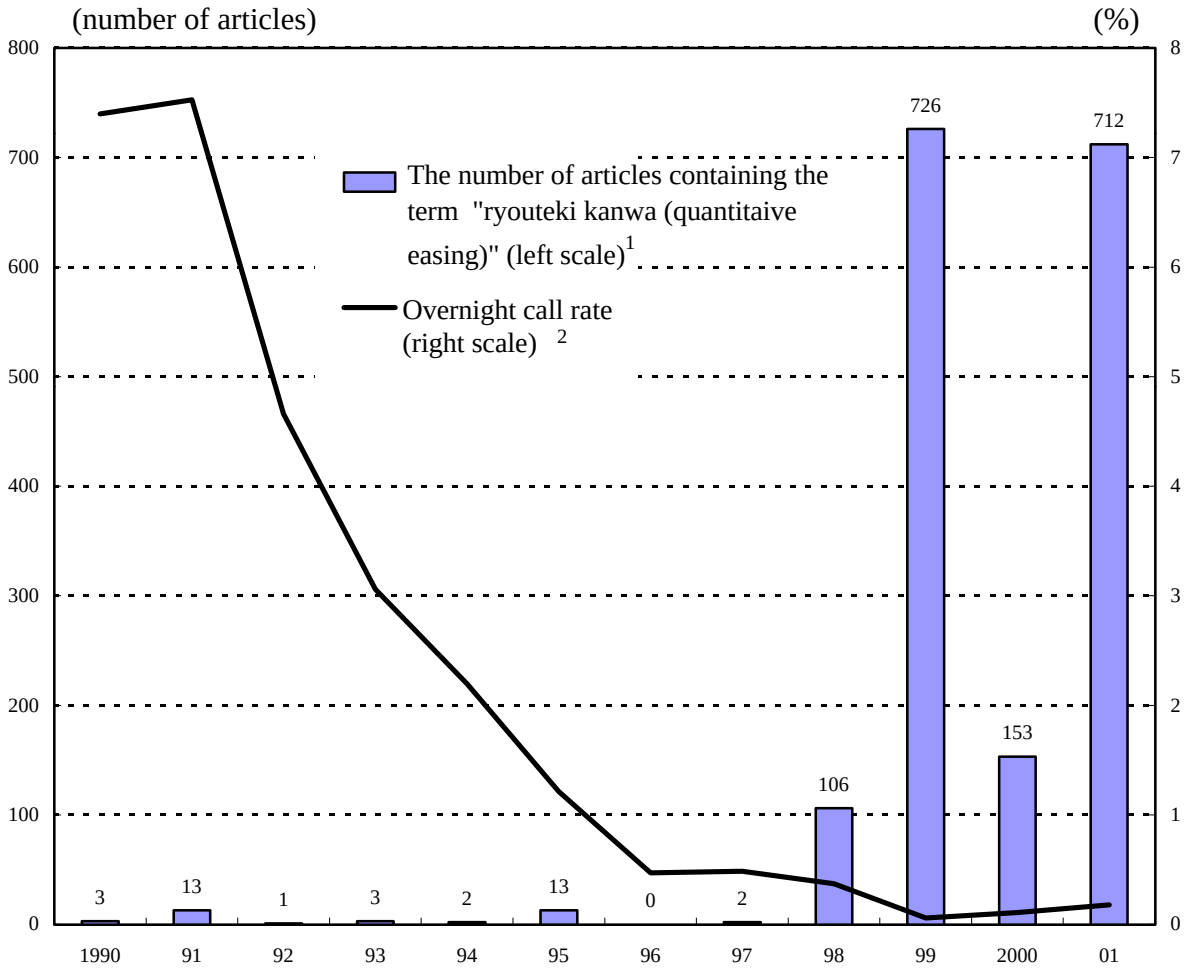




Notes: 1. Calculated using geometric means.
2. 1971-79 figures.
3. Figures are those for "Financial Assets" of "Financial Institutions" in the "Flow of Funds Accounts." Figures for the 1970s and 1980s are based on amount outstanding at the end of the calendar year. Figures for the 1990s are based on amount outstanding at the end of the fiscal year (March).
4. Figures for the 1970s and 1980s are calculated based on the System of National Accounts (SNA) established in 1968 by the United Nations, and for the 1990s, based on the SNA as amended in 1993.
5. In terms of the consumer price index excluding perishables.
6. A comparison between before and after the inclusion of additional components in 1998.

(Figure 5)

Number of Articles containing the Term "Quantitative Easing" in Major Japanese Newspapers

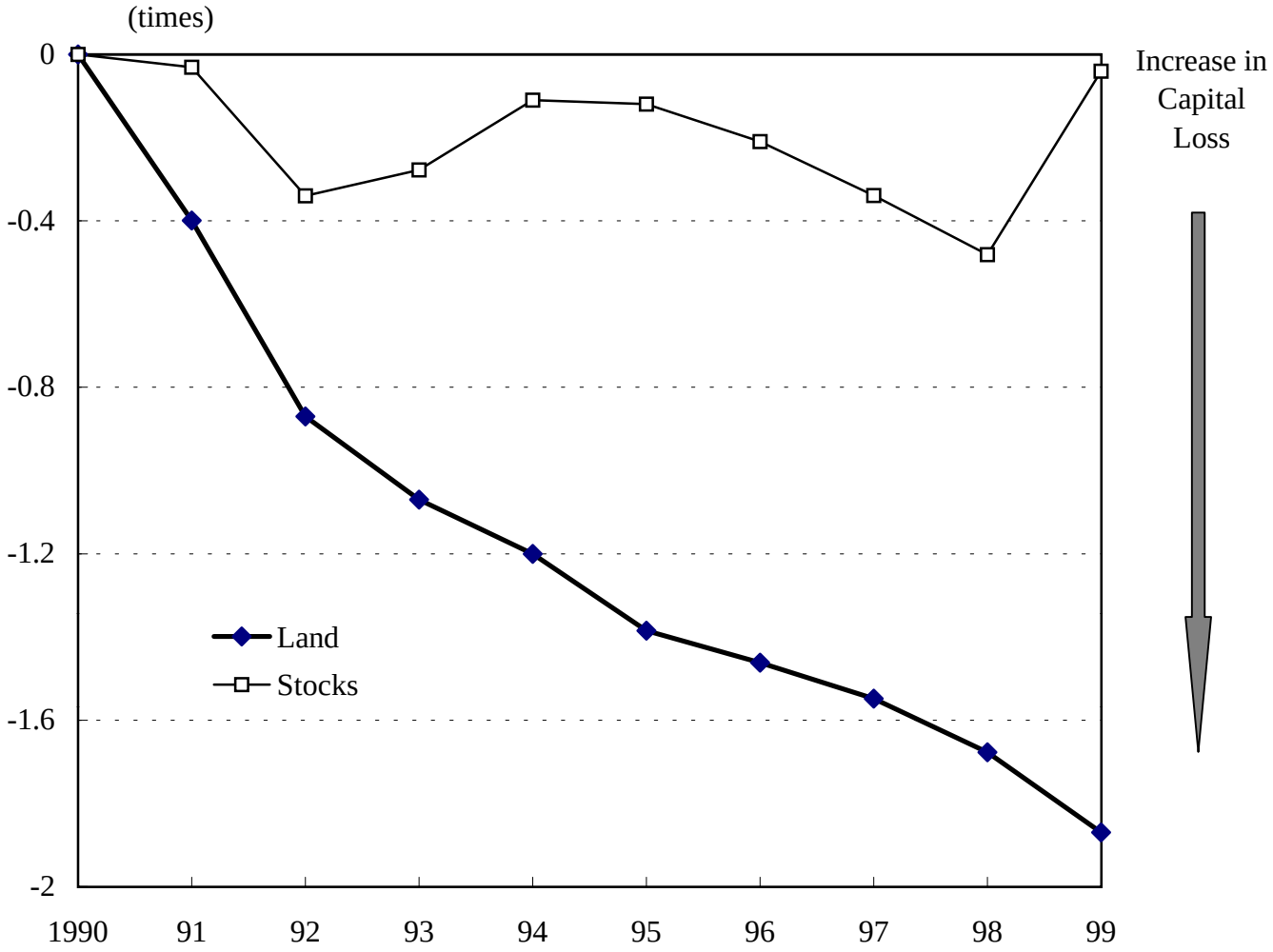


Notes: 1. The total number of articles containing the term "*ryouteki kanwa* (quantitative easing)" in major daily newspapers in Japan, i.e., Nihon Keizai Shimbun, Asahi Shimbun, Yomiuri Shimbun, The Mainichi Newspapers, and The Sankei Shimbun. The figure for 2001 is the total for January to March.

2. The uncollateralized call rate. Arithmetic averages of monthly figures. The figure for 2001 is the average for January to March.

(Figure 6)

Capital Loss in Land and Stocks after the Burst of Bubble[1]



Note: 1. Accumulative capital loss in land/stocks as a percentage of nominal GDP, 1990.

(Figure 7)

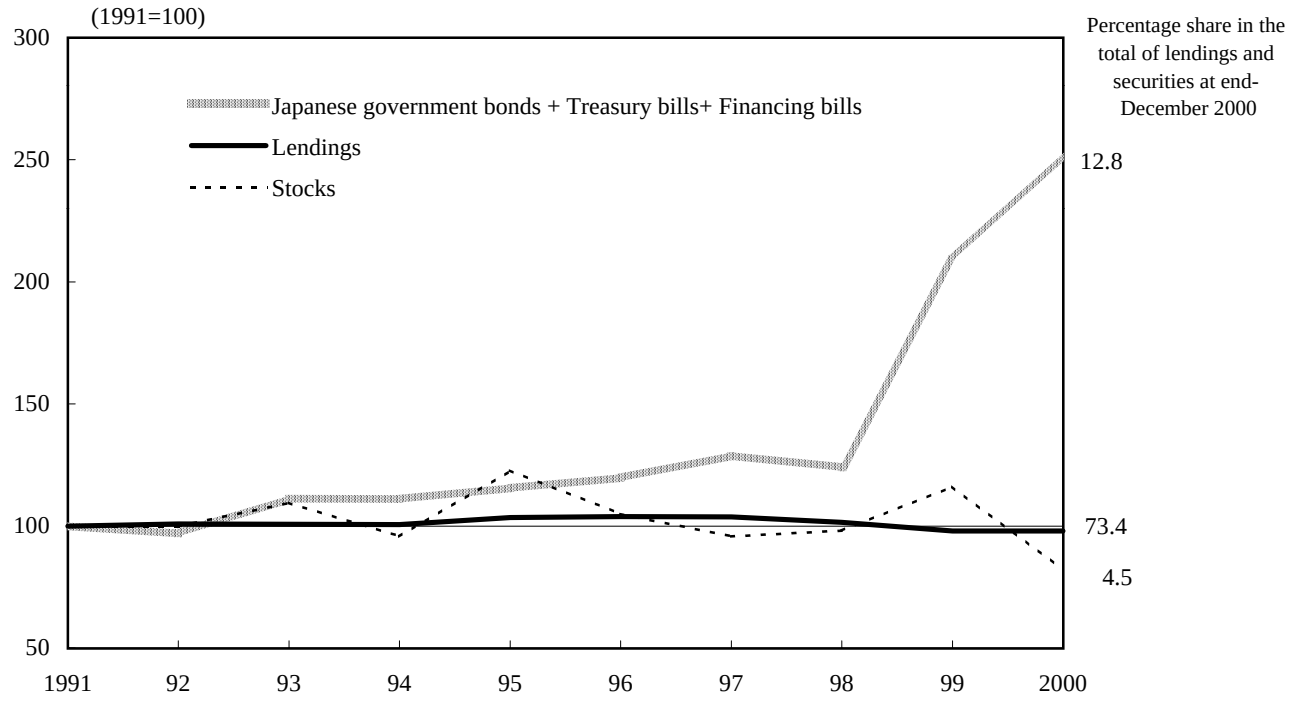
Corporate Debt Outstanding[1]

Note: 1. Defined as the total outstanding of short- and long-term loans from financial institutions, corporate bonds, and bills discounted.

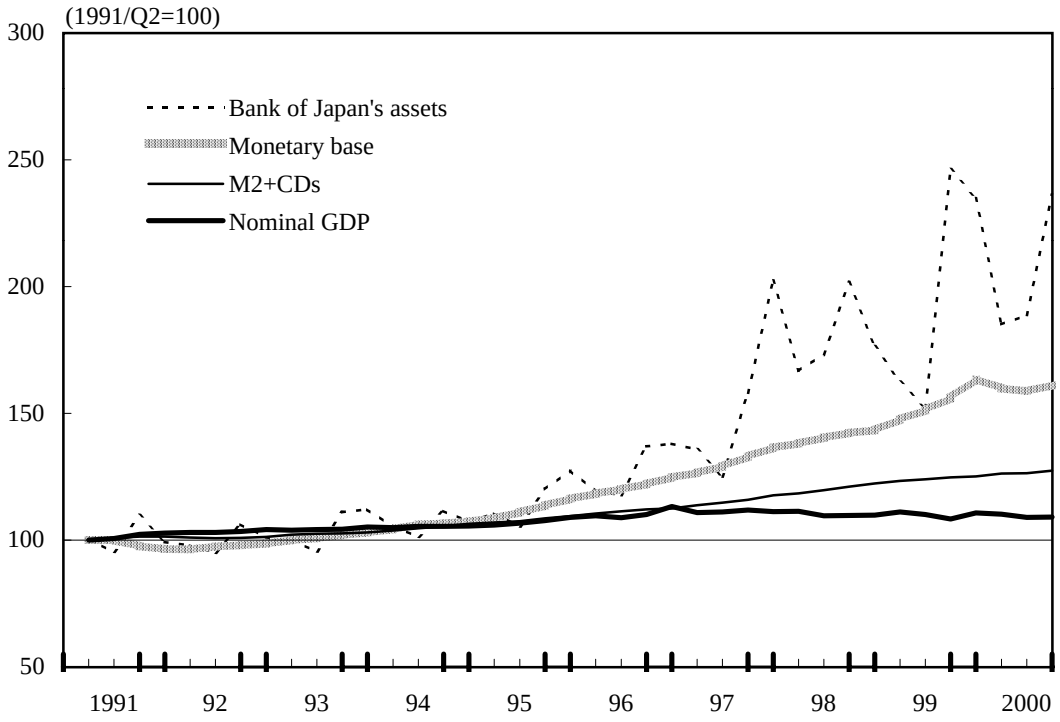
(Figure 8)

Developments during the Recent Monetary Easing

(1) Private Banks' Asset Portfolios[1]



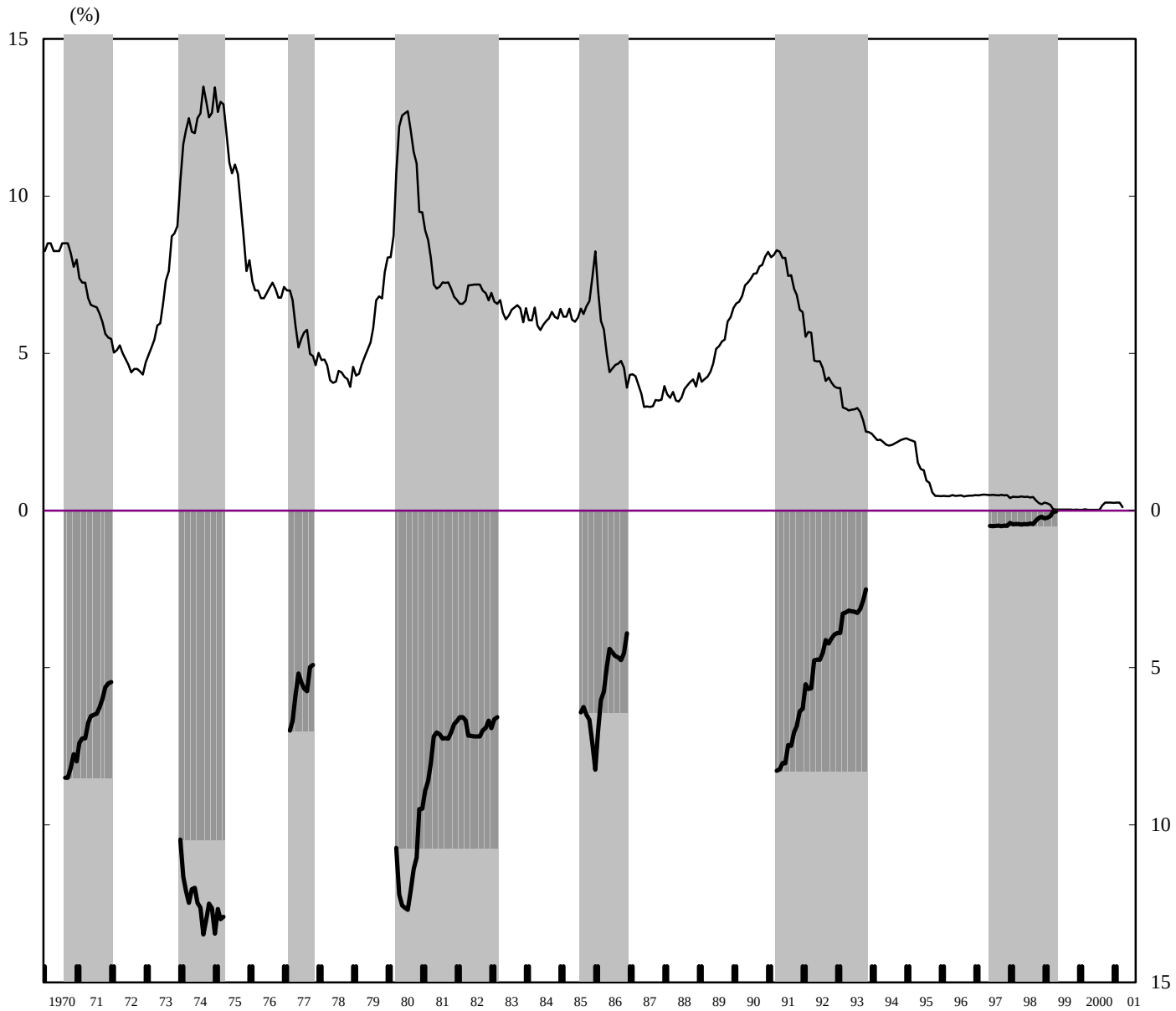
(2) Monetary Aggregates



Note: 1. Figures at the fiscal year-end.

(Figure 9)

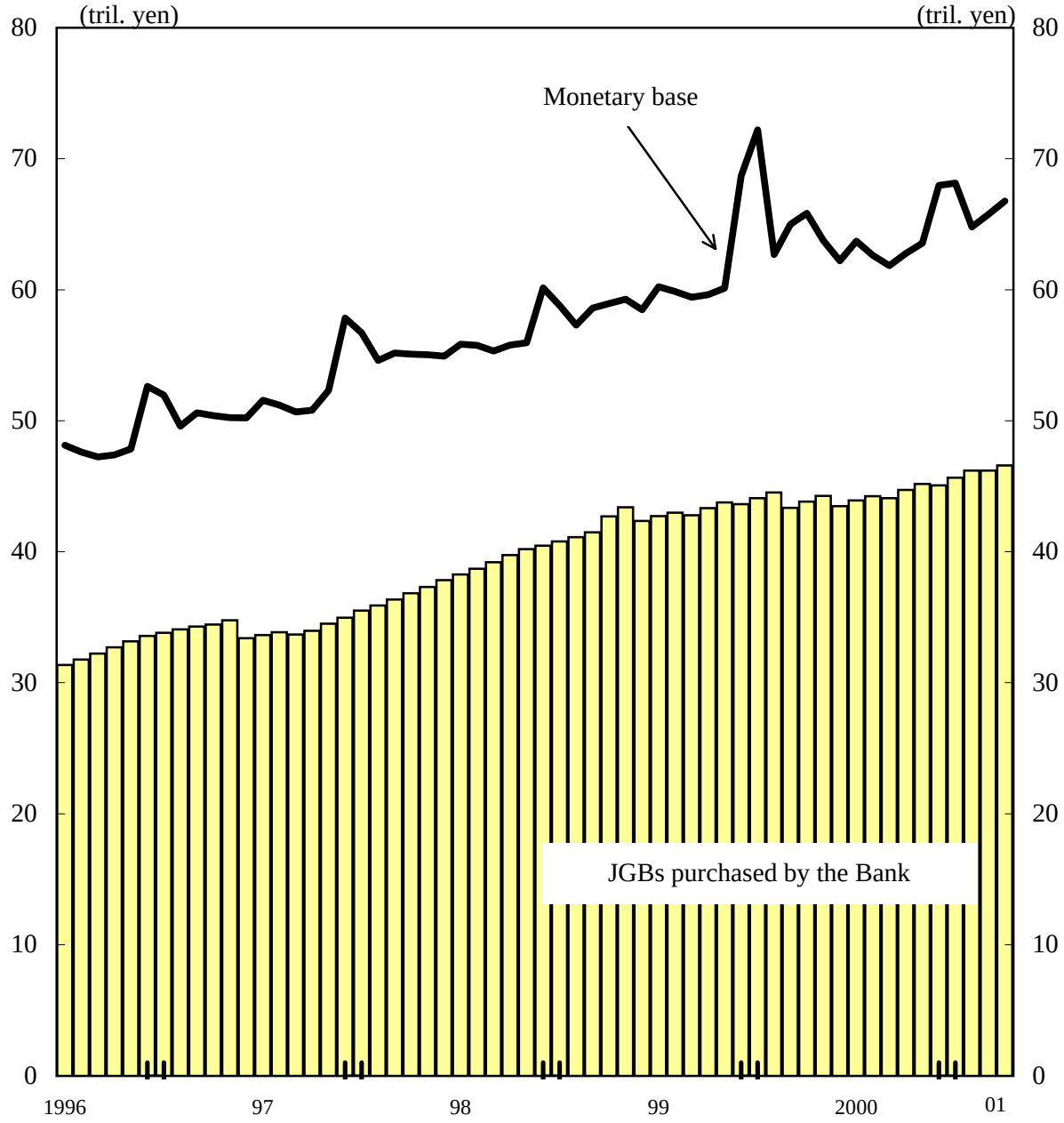
The Room for Reduction in Nominal Interest Rates at the Beginning of a Recession[1]



Note: 1. Measured in terms of the overnight call rate. The shaded areas indicate periods of recession. In the bottom half of the chart, the height of each dark area represents the interest rate level at the beginning of each recession, that is, the extent to which the Bank can reduce the call rate (right scale). Actual movements in the call rate during the same period are shown by the thick line (a mirror image of the top half).

(Figure 10)

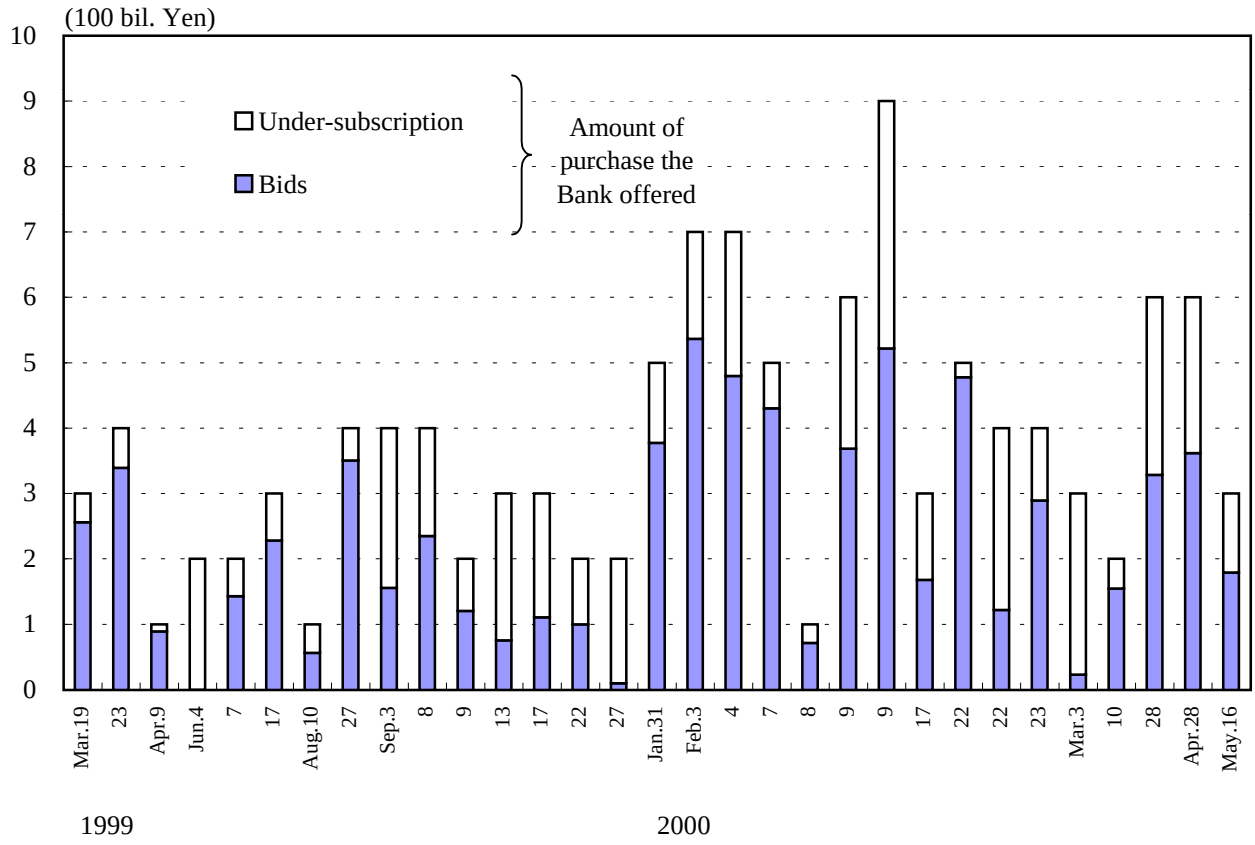
Monetary Base and the Amount Outstanding of Long-Term JGBs Purchased by the Bank of Japan[1]



Note: 1. The amount outstanding of long-term JGBs purchased and held by the Bank for which the Bank bears price fluctuation risk.

(Figure 11)

Under-subscription for the Bank of Japan's Market Operation Auctions Under the Current Policy Regime (Feb 1999 - Aug 2000)*



* Cases where bids from financial institutions fell short of the amount offered by the Bank of Japan during the zero interest rate policy.

(Figure 12)

The New Procedures for Monetary Easing, Decided by the Bank on March 19,2001

- The main operating target for money market operations will be changed from the uncollateralized overnight call rate to the outstanding balance of the current accounts at the Bank of Japan.

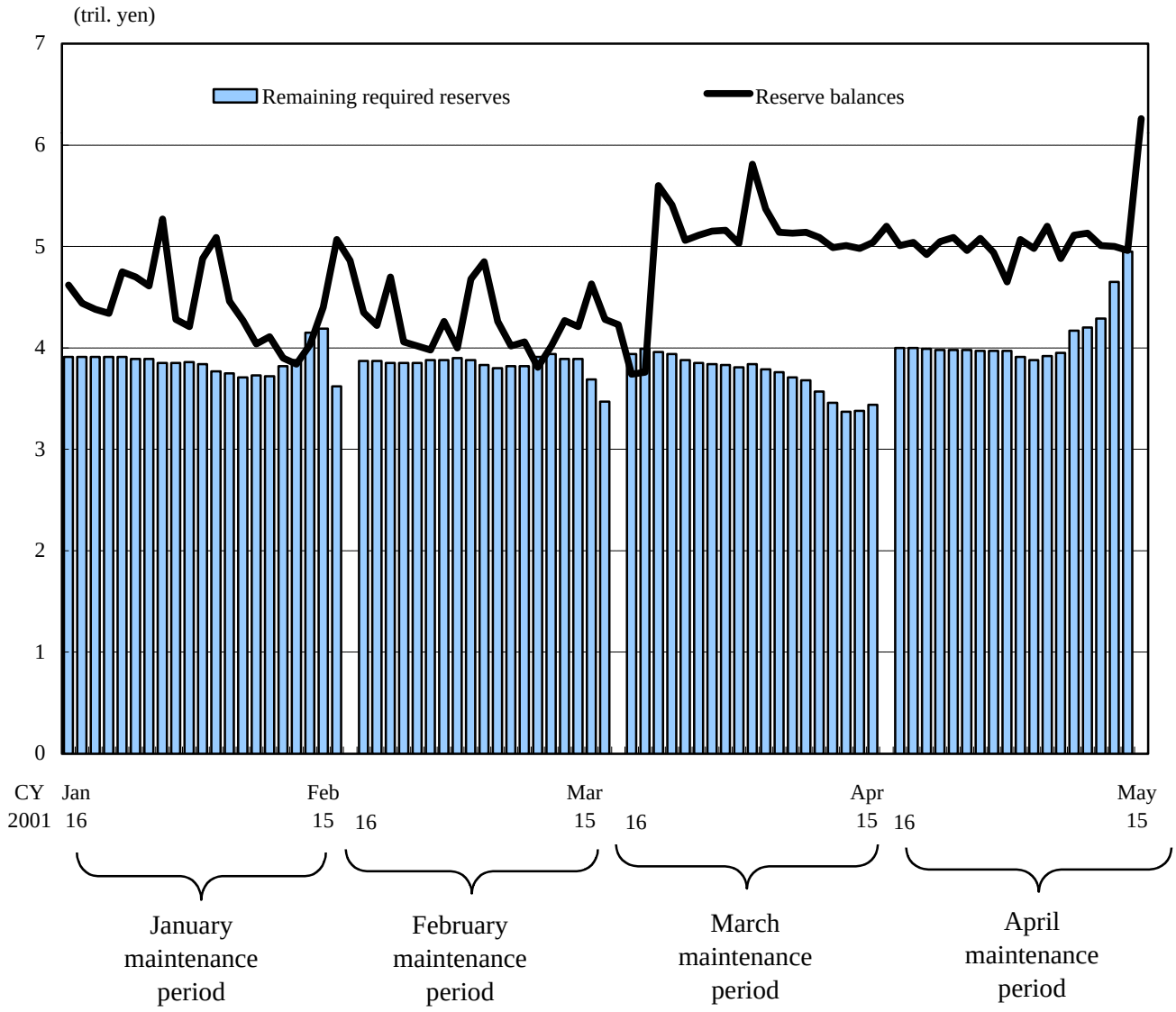
- The new procedures for money market operations will remain in place until the consumer price index (excluding perishables, on a nationwide statistics) registers stably a zero percent or an increase year on year.

- The balance outstanding in the Bank's current accounts will be increased to around 5 trillion yen from the average balance outstanding of 4 trillion yen, As a consequence, it is anticipated that the uncollateralized overnight call rate will stay close to zero percent under normal circumstances.

- The Bank will increase the amount of its outright purchase of long-term government bonds from the current 400 billion yen per month, in case it considers that increase to be necessary for providing liquidity smoothly. Such outright purchase is, on the other hand, subject to the limitation that the outstanding amount of long-term government bonds effectively held by the Bank, i.e., after taking account of government bond sales under *gensaki* repurchase agreements, be kept below the outstanding balance of banknotes issued.

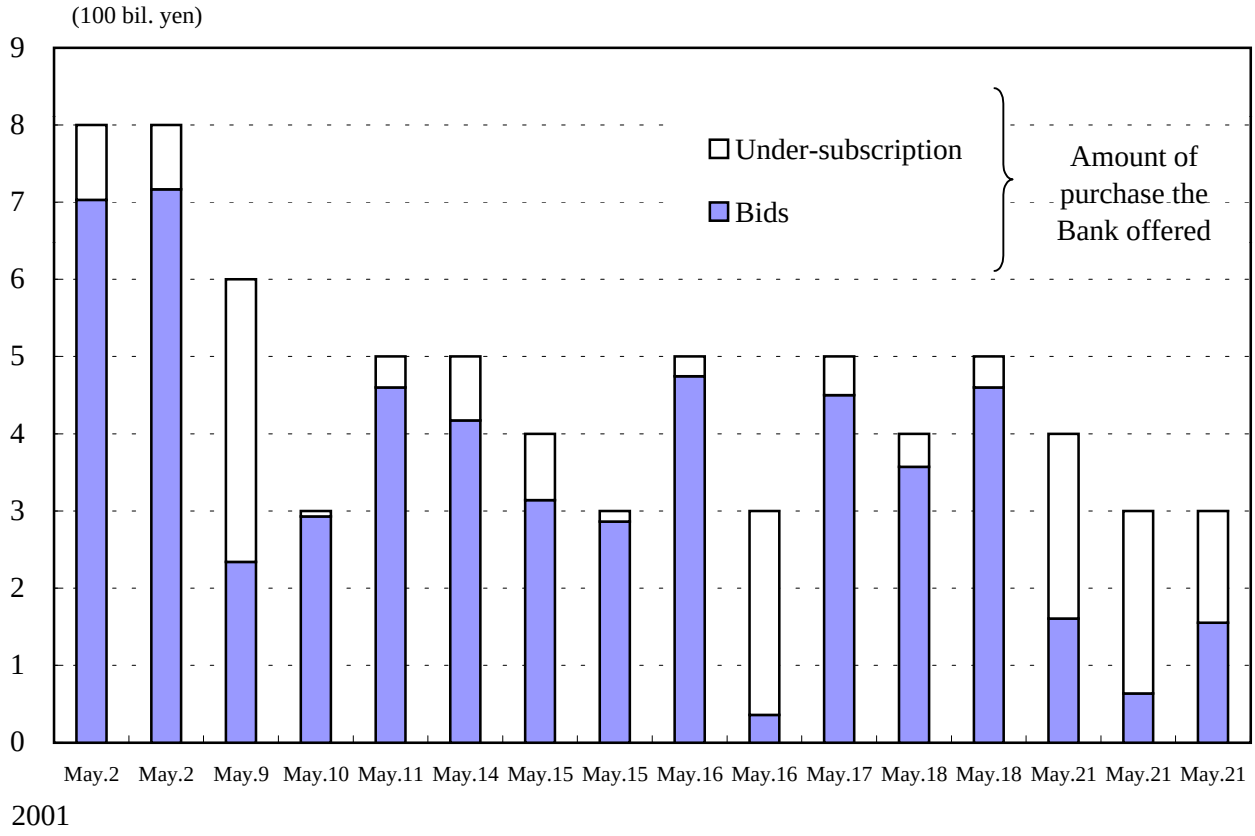
(Figure 13)

Reserve Balances



(Figure 14)

Under-subscription for the Bank of Japan's Market Operation Auctions Under the Current Policy Regime (Mar 2001 -)*



* Cases where bids from financial institutions fell short of the amount offered by the Bank of Japan during the current policy regime.

(Figure 15)

Government Bond Yields

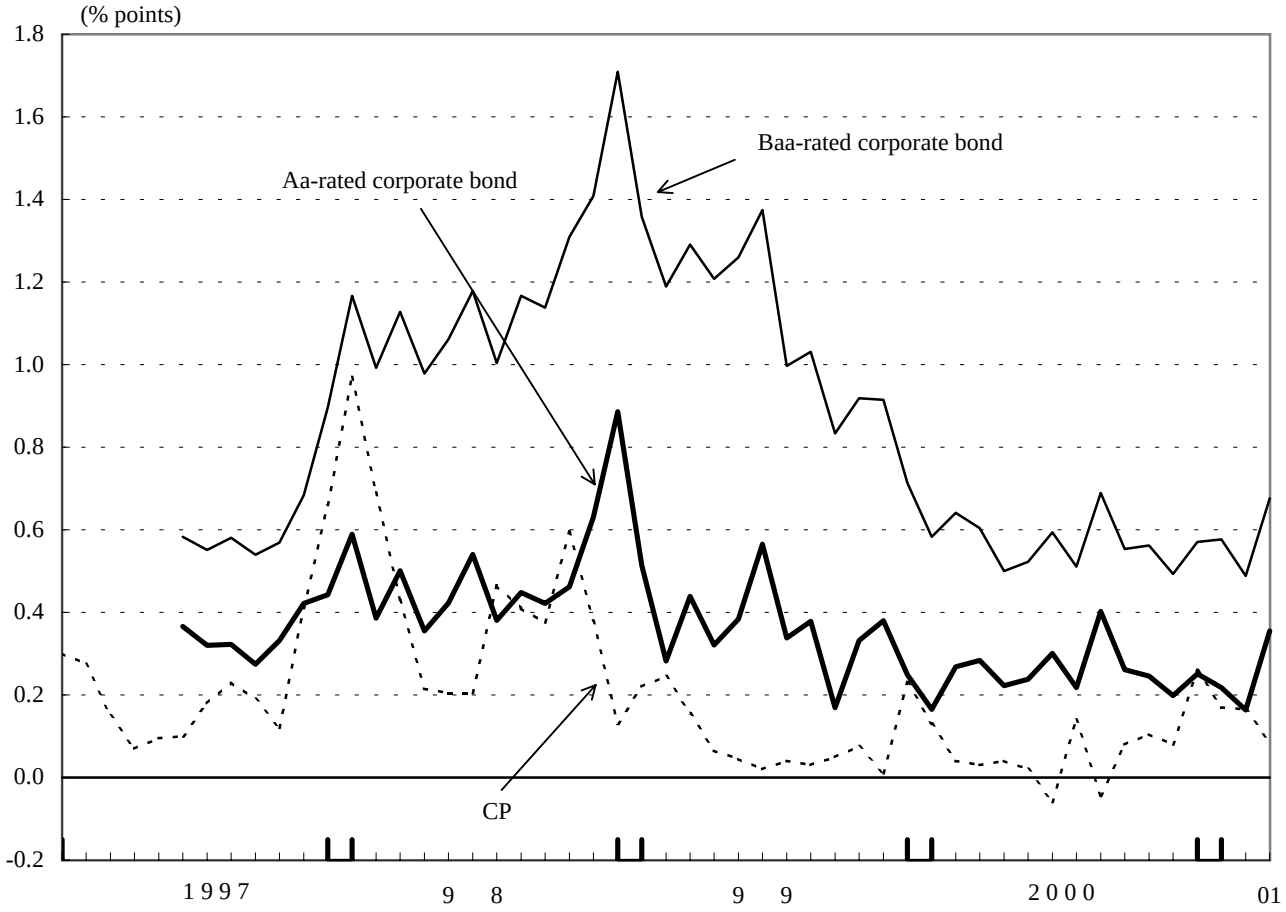
	Oct 2 1998[1]	May 17 1999[2]	Dec 30 2000	May 21 2001
Call rate (Overnight, uncollateralized)	0.26	0.03	0.20	0.01
Yield on bonds with 1-year maturity	0.274	0.029	0.435	0.017
Yield on bonds with 2-year maturity	0.344	0.077	0.462	0.068
Yield on bonds with 3-year maturity	0.442	0.171	0.617	0.166
Yield on bonds with 5-year maturity	0.603	0.525	0.962	0.472
Yield on bonds with 10-year maturity	0.740	1.230	1.640	1.285

Notes 1. Date when the 10-year government bond yield recorded its historically low.

2. Date when the government bond yield recorded its lowest rate under the zero interest rate policy.

(Figure 16)

Yield Spreads between Corporate Obligations and[1] Japanese Government Securities[2]



Notes: 1. Corporate obligations here are 5-year corporate bonds (CBs), and 3-month commercial paper (CP) issued by the highest rated firms. The CB ratings are of Moody's.
2. 5-year Japanese government bonds (JGBs) and 3-month treasury bills (TBs).