

**Monetary Policy in Japan:
Problems and Solutions***

Takatoshi Ito
University of Tokyo
and National Bureau of Economic Research
and
Frederic S. Mishkin
Graduate School of Business, Columbia University, and
National Bureau of Economic Research

For the Solutions conference, June 19-20, 2004
Roppongi, Tokyo

13 August 2004

* For presentation at the US-Japan Conference on the Solutions for the Japanese Economy, sponsored by the Center on Japanese Economy and Business, Columbia Business School and Research Center for Advanced Science and Technology, The University of Tokyo, June 19-21, 2004. Any views expressed in this paper are those of the author only and not those of University of Tokyo, Columbia University or the National Bureau of Economic Research. We thank Hugh Patrick, David Weinstein, Anil Kashyap, Hiroshi Fujiki, Kunio Okina and participants at the conference and at the Economic and Social Research Institute (ESRI) Conference. The authors are grateful to Shoko Nakano and Emilia Simeonova for their excellent research assistance.

Introduction

The Japanese economy has been underperforming for more than a decade. The average growth rate of real GDP over the past 12 years has been just above 1 percent, and the nominal GDP has been shrinking since 1997 due to deflation. Nominal GDP for 2003 is 4 percent below what it was in 1997. In order to stimulate the stagnant economy, the government has cut taxes and increased expenditures. As a result the government debt/GDP ratio has risen to 150 percent, an unprecedented level for an advanced country in peacetime. The CPI has been declining since 1998, while the GDP deflator has been declining since 1995. Stock prices and land prices have been declining for the decade, with the Nikkei 225 index going down in the Spring of 2003 to a low below 8,000, one-fifth of the peak at the end of 1989. There is no doubt that the economy is in deflation. Important questions about the deflation are how much deflation is due to demand factors and how much to supply factors; and whether deflation is a result of stagnant economy or a cause of the stagnation.

The conduct of monetary policy by the Bank of Japan in the deflationary environment has been a source of the controversy for the last several years. Inflation or deflation is in the long-run, ultimately a monetary phenomenon. In theory, when the growth rate is below potential and the prices are dropping, monetary policy should be eased without hesitation. This paper will review theoretical and practical issues surrounding the controversy. It will argue that although a recovery of the Japanese economy appears to be underway since 2003, additional monetary policy steps to exit deflation is necessary for the Japanese economy to reach its full potential.

The paper is organized as follows. The first section will raise the issues on monetary policy during the deflationary period, 1998-2003. The second section will discuss possible solutions to the deflationary environment in Japan and recommendations for monetary policy. A final section contains concluding remarks.

1. Monetary Policy to Combat Deflation

1.1 Deflation

Figure 1 shows deflation measured by CPI and GDP deflator. Both measures move in parallel until the mid-1990s. They are adjusted to take out the temporary impacts of consumption tax rate increases in April 1989 and April 1997, so that the inflation rate shown in the graph is different from those shown elsewhere in the literature.¹ After that, the inflation rate measure by the GDP deflator has moved lower than the CPI inflation rate.

Although the CPI has been declining since 1998 (since 1995 for the GDP deflator), deflation worsened from 2001 to 2003, and the speed of deflation was about 1 percent for the CPI measure and more than 2 percent for the GDP deflator in 2003. Although 1 to 3 percent deflation may not be serious for a short period, the cumulative effects are due to the prolonged deflation. At the end of 2003, the level of CPI was about 4 percent lower than the peak in 1998, and the level of GDP deflator was about 10 percent lower than the peak in 1994. The magnitude of cumulative deflation has been becoming larger, and the concern about its effect has been voiced more frequently than before.

The reasons and possible cures for disinflation and deflation in Japan are controversial. In the beginning stage of deflation, from 1997 to 1999, some economists in Japan argued that deflation may be good for consumers and even for the macroeconomy. Advocates of good deflation theory cited that disinflation was a worldwide, supply-side phenomenon. Technological advances,

¹ To eliminate the effects of consumption tax rate increases (0% to 3% in April 1989; and 3% to 5% in April 1997), the following adjustment is applied. Inflation rate of CPI excluding fresh food are downward adjusted by 1.9 percentage point from 1989:II to 1990:I; and by 1.6 percentage point from 1997:II to 1998:I; and inflation rate of GDP deflator are downward adjusted by 1.4 percentage point from 1989:II to 1990:I and 1.3 percentage point from 1997:II to 1998:I. These amounts are inferred as the gap that would make the inflation rate of the quarter after the tax rate increase equalized to that of the quarter just before the tax rate increase.

especially in the information and communication technology (ICT) sector, have driven down prices in not only in the ICT sector but in other sectors through the use of cheaper ICT goods. For example, Governor Hayami repeatedly mentioned that price declines due to technological innovations and their use in the distribution sector is good for consumers.²

The New Economy argument in the United States provides an explanation for the combination of high economic growth without inflation. This argument has been used by some Japanese economists to support the view that deflation was the result of a beneficial supply-side effect. In addition, they cite the competitive pressures from China as a source of deflation. Moreover, the advocates of good deflation have argued that lowering prices would benefit consumers as their real income would grow. They also cited that Japanese consumer prices had been higher than those in comparable large cities in the world, so that declining prices were a natural process.

However, most economists regard the good-deflation view as inconsistent with economic theory. First, the good deflation argument citing the ICT revolution mistakenly generalizes the need for relative price changes among sectoral prices to macroeconomic inflation/deflation. It is true that innovation would bring down prices of ICT goods, but that is relative to all other goods. The average price of all goods and services can go up or down depending on all other economic factors, including monetary policy and household income. Second, if supply expansion was a major cause for the prices to decline, output should be expanding too. A shift of the aggregate supply curve to the right should cause prices to decline and output to rise. Therefore, the price decline should be accompanied by output expansion. This was clearly not the case in Japan. The average

² “Though it is true that prices of a number of products have been declining, this is against the backdrop of various revolutionary changes including the so-called IT revolution, that is, the progress of technological innovation in information and telecommunications, as well as the revolution in distribution networks represented by the emergence of so-called "category killers." Such phenomena cannot necessarily be regarded as pernicious price declines.” (Speech given by Masaru Hayami, Governor of the Bank of Japan, to the Research Institute of Japan in Tokyo on March 21, 2000)

growth rate between in the past ten years was barely above 1 percent, much below the potential growth rate.

Figure 2 shows the relationship between the growth rate (defined by the change in quarterly GDP over the preceding four quarters) and the inflation rate (defined by the change in the GDP deflator over the preceding four quarters). In view of sticky responses of the prices to demand-supply conditions, the growth rate is lagged by four quarters. In other words, we assume that the growth rate of last year affects the prices of this year. The figure clearly shows the positive relationship between the growth rate and the inflation rate (a variant of the Phillips curve). Thus, the decline in growth is associated with deflation. This suggests that deflation is due to declining demand.

ICT effects may explain the productivity increase in the United States, but the comparable effects were not observed in Japan or in Europe. Productivity increases were not observed in the ICT industry, but also in other industries, unlike in the United States. Some rigidity in labor markets (layoffs are very difficult) in Japan may explain why ICT has not been widely employed to reduce costs and increase productivity in various industries. Imports from China explain only 2 to 3 percent of GDP and they alone cannot have a large impact on the GDP deflator to Japan. Moreover, these global impacts of ICT and Chinese imports are as important in the United States as in Japan, but the United States has not fallen into deflation.

1.2. Potential vs. Actual GDP

After examining both sides of arguments on whether deflation was due to insufficient demand or ever-expanding supply, our view is that it was the demand side that was more responsible for deflation and stagnation. **Figure 3** shows the annual growth rate from 1973 to 2003. The average growth rate from 1973 to 1992 was about 4%, while the average growth rate from 1993 to

2003 was 1.2%. If one thinks that the trend growth rate reflects the supply side, then one concludes that Japanese productivity suddenly declined sharply. Another possibility is that demand is lower than otherwise, and the economy was not achieving its potential after the 1990s.

Economic common sense would lead to an educated guess that the US boom with high growth rates and disinflation was driven by the ICT industries, while the Japanese stagnation with deflation was more due to a lack of aggregate demand.

The Japanese economy measured by nominal GDP in 2003 is about 4% smaller than the peak of 520 trillion yen that was achieved in 1997. A shrinking economy results in problems in many aspects of macroeconomy. Tax revenues will decrease more than proportionately due to the nominally fixed tax brackets. The real burden of nominally-contracted debts will increase, so that major debtors in the economy, the government and corporations suffer from the ever-increasing real debt. As a consequence, deflation has caused a severe strain on the macroeconomy. Just to illustrate the point, suppose that nominal GDP in Japan had grown at 3% since 1997, the hypothetical economy in 2003 would have been 25% larger in nominal terms than the actual economy. Tax revenues would have been higher, corporate profits would have been higher, and nonperforming loans would have been lower.

1.3. Zero Interest Rate Policy and Monetary Policy

The nominal interest rate cannot become negative, because at a negative interest rate cash would dominate holdings of any debt instrument. Zero percent is thus a lower bound for the interest rate.³ When the rate of deflation rises, then the real interest rate, that is the difference between the nominal interest rate and the inflation rate, rises. The worse deflation becomes, the

³ Interest rates on extremely liquid debt instruments like Treasury bills can actually go very slightly negative because they may have liquidity advantages over cash. Indeed this actually happened in Japan in November 1998 when the interest rate on 6-month Treasury bills had an interest rate of -0.004 percent. However, for all practical purposes, the floor for interest rates is zero.

higher is the real interest rate, thus leading to an unintended tightening of monetary policy.

A higher real interest rate and expectation of future deflation discouraged investment and consumption in Japan. Lower aggregate demand widened the GDP gap, contributing to lowering prices. This is the first part of a deflationary spiral. Since the nominal interest rate cannot be lowered below zero, the traditional monetary policy instrument, that is, the short-term interest rate, loses its effectiveness in combating the deflationary spiral. In textbooks, this situation is described as a liquidity trap, but we prefer to refer to it as a deflationary trap, because we do not take the view, as will be clear below, that monetary policy, particularly of the nonconventional variety, is ineffective in this situation, as it is in the liquidity trap of the conventional Keynesian model.

Another part of a deflationary cycle that operates through the real burden of the debt is also important. Most debt contracts—bonds, bank loans, mortgages, for example—are contracts with nominal payments (denominated in a fixed amount of yen). Therefore, if the actual inflation rate turned out to be lower than the expected inflation rate at the time of the contract, then debtors have a windfall loss, since the real burden of the debt has increased. Although there is no precise measure of expected inflation, an educated guess suggests that from 1992 to 2003, the inflation rate continuously turned out to be lower than the expected inflation rate generated three or more years earlier. Debtors continuously suffered unexpected real burdens—lower rents, dividends, sales, or income to pay for the debts. Some went bankrupt due to deflation. The process is commonly known as debt deflation (Fisher, 1933).

Conventional monetary policy, using short-term interest rates as the policy instrument, is not effective in combating the deflationary cycle and debt deflation after the short-term interest rate has reached zero because the policy instrument cannot be lowered further. Should the central bank just watch things deteriorate in the cyclical process and hope that improvement in the economy occurs as a result of positive external shocks? Or should the central bank use tools that are

beyond conventional policy instruments to get the economy out of a deflationary cycle? What are the probability of success and risk in employing unconventional policy tools? These are the questions that have been hotly debated from 1998 to now.

1.4. The Monetary Policy Challenge

The new Bank of Japan law became effective in April 1998. Mr. Hayami, 72 years and two new Deputy Governors were appointed at around the same time. The Monetary Policy Board was enhanced with new additional members. Discussions and decisions of Monetary Policy Meetings are disclosed in timely manner. Did these institutional changes help the Bank of Japan make timely, well-informed decisions?

The Japanese economy was performing poorly at the time that the Bank of Japan gained independence. The Asian currency crisis, which had started with the collapse of the Thai bath in July 1997, became a full-blown regional economic crisis. The Japanese banking crisis was still getting worse. The official discount rate at the was 0.5%, and the call rate at the time was about 0.4-0.5%. Throughout the summer of 1998, economic conditions were deteriorating, and the discussion on bills to strengthen the financial system was heating up. The policy interest rates were maintained until September 9, 1998, when the target of the call rate was reduced to 0.25%, without any accompanying change in official discount rate.⁴

With further bad news on the economy in the rest of 1998, the Bank of Japan decided take additional actions in February 12, 1999. The Board decided to lower the call rate as low as possible,

⁴ “The Policy Board determined to further ease the stance of money market operations for the inter-meeting period ahead as follows: The Bank of Japan will encourage the uncollateralized overnight call rate to move on average around 0.25%. (Bank of Japan Announcement of Decisions, Spetember 9, 1998).

with an immediate action to lower it to 0.15%.⁵ The call rate became very close to zero by the end of March. This is the beginning of the so-called zero interest rate policy (ZIRP). In April, Governor Hayami declared that the ZIRP would continue “until deflationary concerns are dispelled.” It was clear that the economy was in a very weak condition. At the time, the GDP growth rate was thought to be registering five consecutive quarters of negative growth rate from 1997:IV to 1998:IV (according to the GDP statistics of that time).

The economy showed some recovery from mid-1999 to 2000, mainly due to the IT boom in the stock market. Exports and consumption became engines of growth. Stock prices rose from the low of 13,000 yen (Nikkei 225 index) in the beginning of 1999 to 20,000 yen in the spring of 2000. As the stock prices rose, the economy also recovered. The economic growth rate of 2000 exceeded 3% (according to the GDP statistics at the time).

Several indicators had shown brighter prospects in the spring of 2000. However, the CPI inflation rate was still negative in the summer of 2000. The call rate rose from 0.01% to 0.25% immediately. Against this background, the Bank of Japan decided to lift the ZIRP in August 2000, citing that these deflationary concerns were over. The government opposed the decision by submitting the proposal to delay the vote of lifting the ZIRP, according to the law, but was overruled. Two out of nine Board members cast nay votes. The decision to raise the interest rate was severely criticized by many economists as an unnecessarily hasty decision to get out of ZIRP. Although there were signs of increasing output activities and a consumption increase, there was no sure sign of an investment increase at that time.

The Bank of Japan’s judgment to terminate the ZIRP indeed turned out to be premature.

⁵ “The Bank of Japan will provide more ample funds and encourage the uncollateralized overnight call rate to move as low as possible. To avoid excessive volatility in the short-term financial markets, the Bank of Japan will, by paying due consideration to maintaining market function, initially aim to guide the above call rate to move around 0.15%, and subsequently induce further decline in view of the market developments.” (Bank of Japan, Announcement of Decisions, February 12, 1999)

The IT boom was ending, and stock markets in major countries were declining, while the US economy was entering into a recession. The Japanese business cycle hit a peak in October 2000. The economy entered into a recession, again.

The growth rate of 2000:III turned negative and the economy weakened substantially toward the end the year. Many economists urged changes in monetary policy. Some economists had recommended the return to ZIRP and others recommended quantitative easing and unconventional monetary policy including increasing the amount of regular purchases of long-term government bonds, and new purchases of listed mutual funds of stocks, foreign bonds, and, in some cases, even real estate funds. These unconventional monetary tools were opposed by Bank of Japan economists.

With continuing weakness and worsening deflation, the Bank of Japan decided to ease. In February, the Bank adopted the so-called Lombard lending facility, and the official discount rate was cut from 0.5% to 0.35%. The Lombard lending facility was to lend automatically to banks with collateral at the official discount rate, hence capping the interest rate at 0.35%. However, the market rate was at around 0.2 – 0.25%, so there was little real impact from its introduction. Pressure to ease monetary conditions did not cease because of these measures.

The Bank of Japan decided to take more actions within a month. On March 19, 2001, the Bank of Japan lowered the ODR to 0.25% from 0.35%, and changed the policy instrument from the short-term interest rate to the balance of current accounts (reserves) at the Bank of Japan. The target of the current account balance was set at 5 trillion yen. The required reserve was about 4 trillion yen at the time, so targeting 5 trillion yen was effectively providing enough liquidity for banks so that excess reserves would be accumulated in the Bank of Japan account without earning interest. Therefore, this was effectively a return to ZIRP as far as the interest rate is concerned. The Bank has also made clear the conditions under which it would terminate the ZIRP: that is, ZIRP would not

be abandoned until the CPI inflation rate became stably above zero. Later, the condition would be further clarified in October 2003, to be explained later.

Deflation, measured either in the Consumer Price Index (CPI) or in GDP deflator, became worse in 2000-2001. The CPI inflation rate dropped to around minus 1 percent, while the GDP deflator inflation rate became close to minus 2 percent. As the period of deflation became longer, and the degree of deflation became significant, the expectation of future deflation was strengthened. The yield curve started to flatten.

Quantitative easing beyond the zero interest rate policy has taken three different forms since March 2001. First, the amount of long-term government bonds that the Bank of Japan purchased was expanded in several steps. In August 2001, the amount of outright purchases of long-term government bonds was raised from 400 billion yen per month to 600 billion yen per month. In December 2001, the amount was raised to 800 billion in December, to 1 trillion yen in February 2002, and to 1.2 trillion yen in October 2002. Second, the target of current account (effectively excess reserves) was raised to 6 trillion yen in August 2001, to 10-15 trillion yen in December 2001, to 15-20 trillion yen in October 2002, to 17-22 trillion yen in April 1, 2003, to 22-27 trillion yen in April 30, 2003, to 27-30 trillion yen in May 2003, to 27-32 trillion in October 2003, and 30-35 trillion yen in January 2004. Third, assets that could be purchased were expanded to qualified corporate bonds, commercial papers, and asset-backed securities.

Those changes are shown in Figure 1 (Changes of Quantitative Easing). It is certain that these quantitative easing contributed to an expansion of monetary base. However, expansion of monetary base did not result in a sharp increase in money supply. Bank credit to corporations continued to decline. Therefore, the regular transmission mechanism did not work. Those who advocated quantitative easing pointed out that despite a failure in expanding bank credit through quantitative easing, it had two distinct positive effects. First, quantitative easing contributed to

financial systemic stability. There was no panic reaction to news on failure of some commercial banks, such as Resona Bank and Ashikaga Bank in 2003. Second, the quantitative easing, combined with policy commitment to ZIRP, seems to have contributed to a flattening of the yield curve. The lower long-term interest rate encouraged banks and nonfinancial investors to take more risk in the stock market and foreign currency denominated assets. Therefore, although its transmission channel is not clear cut, quantitative easing may have contributed to a recovery of the economy toward the end of 2003.

The economy seemed to turn around in 2003. The economic growth rate exceeded 2%, and the degree of deflation is diminishing. Stock prices rose to above the low of 8,000 in April to the 10,000 mark toward the end of the year. How much of the recovery is due to monetary policy is difficult to assess, but a firm commitment to ZIRP seems to have worked under the new Governor Fukui, who took over the governorship in March 2003. From March 2003 to January 2004, the target amount of current account of the Bank of Japan (effectively, excess reserves) was raised to strengthen quantitative easing, and in October 2003, necessary conditions for an exit from ZIRP were further clarified.

The recent history of Japanese monetary policy, which we have surveyed in another paper (Ito and Mishkin, 2004), has created two basic problems for the Japanese monetary authorities today.⁶ First, the Bank of Japan's policies have left Japan in a prolonged deflationary environment in which conventional monetary policy through lowering the short-term interest rate is no longer effective because the policy rate has hit a floor of zero. Second, past Japanese monetary policy, particularly under the Hayami regime, has left the Bank of Japan with a severe credibility problem in which the markets and the public are unconvinced that Japanese monetary policy can be committed to future expansion that would return the economy to health. Both of these problems present the

⁶ For a fuller treatment of monetary policy, see Ito and Mishkin (2004), and for a political economy explanation why the Bank of Japan rejected inflation targeting, see Ito (2004).

Bank with particular challenges in getting the economy out of deflation quickly. We address how they can do this in the next section.

2. Solutions

Despite recent growth rates of the aggregate economy of around 2.7% (annual growth rate, 2003), the Japanese economy has fallen far behind where it would have been if it had not experienced the deflation and financial instability problems of recent years. As is emphasized in other chapters in this volume, for the Japanese economy to reach its full potential, it needs a major reallocation of capital and restructuring of many of its industries. By ending deflation and restoring the price level to where it would have been if deflation had not occurred, Japanese monetary policy can play a positive role in this restructuring process.

Given the problems zero-bound and credibility problems of the Bank of Japan, how can the monetary policy be used to help return the economy to health. Here we propose a hybrid strategy of both price level and inflation targeting, which goes several steps further than the current policies of the Bank of Japan. After describing this strategy, we then go on to consider a key feature of implementation of this strategy given that the policy interest rate cannot go below a floor of zero: nonconventional policies that use central bank purchase of other assets besides short-term bonds.

2.1 Price Level and Inflation Targeting

At first blush, it might appear as though monetary policy cannot be effective in escaping the deflation trap because there is no way to drive the standard interest-rate instrument below zero. Indeed, as we have seen, this claim has been raised repeatedly by the BOJ to explain why it was unable to stimulate the economy, without risk (e.g., Okina, 1999a, b, Oda and Okina, 2001).

However, recent literature (Krugman, 1998, Ito (1999), Cargill, Hutchison, and Ito (2000) and Eggertson and Woodford, 2003, Auerbach and Obstfeld, 2003, and Svensson, 2003) suggests that there is a solution to this problem: management of expectations. If the central bank can convince the markets and the public there will be higher inflation in the future, then even with the interest rate at a floor of zero, the real interest rate will fall and this will stimulate aggregate demand through the usual channels (Mishkin, 1996). But how is the central bank to do this?

One way to manage expectations to stop a deflation is by having the central bank announce a positive inflation target as has been suggested by Krugman (1998), Posen (1998) and Bernanke (2000). Clearly, an announcement of a positive inflation target by itself is far from sufficient because it may not indicate to the markets that the central bank has a strong commitment to stopping deflation and thus may leave inflation expectations unchanged. This is why advocates of inflation targets stress that central banks need to do much more than announce an inflation target to make it credible. Successful inflation-targeting, central banks have put a lot of effort into increasing transparency and improving communication by publishing inflation forecasts, testifying publicly and putting out *Inflation Reports* in which the central bank explains how it is to achieve its inflation target in the future and why it has or has not been able to achieve its inflation target in the recent past (Bernanke, Laubach, Mishkin and Posen, 1999). An inflation targeting regime thus can be helpful in managing expectations and preventing deflation

However, once an economy has entered a prolonged deflation as it has in Japan, lowering the real interest rate to stimulate the economy requires a substantial increase in expected inflation. This is why Krugman(1998) made the radical suggestion for the BOJ to adopt an inflation target of 4% for a fifteen-year period. However, a high inflation target, as suggested by Krugman, is unlikely to be credible for two reasons. First, a commitment to a high inflation target may not be credible because it is too much at variance with a goal of price stability. As documented in

Bernanke, Laubach, Mishkin and Posen (1999), no inflation targeting central bank in an industrialized country has chosen an inflation target above 3%, whether makes use of a core or a headline CPI measure. Indeed, we suspect that the Krugman proposal may have increased the Bank of Japan's resistance to inflation targeting because this level of inflation was well above what officials in the Bank believed was consistent with price stability. Furthermore, once the economy has emerged from a deflationary spiral and starts to recover, the central bank will be tempted to renege on its commitment to a high inflation target because it would like the economy to return to an inflation rate consistent with price stability. Thus as pointed out by Eggertsson (2003), a central bank in a deflationary environment is subject to a time-inconsistency problem: it cannot credibly commit to "being irresponsible" and so continue to shoot for high inflation. The result of time-inconsistency problem is that the markets would not be convinced the inflation would remain high, inflation expectations would not be sufficiently high to lower real rates sufficiently to stimulate the economy out of the deflation trap.

Another problem with an inflation target is that it is not "history-dependent" because it is purely forward-looking (Woodford, 2000, 2003). An inflation target is not adjusted depending on the past outcome of inflation: in other words it lets bygones be bygones. As Eggertsson and Woodford (2003) have shown, such a purely forward-looking target will not be effective in extricating an economy from a deflation trap. When the interest rate has hit a floor of zero, a deflationary shock which lowers the price level and puts the economy even farther below its potential output requires an even higher expected inflation in order for the real interest rate to be lowered and be even more stimulative. Since an inflation target is not revised when it is undershot because of the deflationary shock, it will not generate the required increase in expected inflation.

On the other hand, a price level target does generate higher expected inflation when a

deflationary shock hits. A price level target means that monetary policy is attempting to hit a particular set path of the price level and bygones are not allowed to be bygones. Thus when a deflationary shock occurs the price level has to rise even further in order to get back to the target. In other words, the price level target is “history dependent” because the desired medium-term inflation rate is affected by what has happened in the past. Thus with a price level target when there is a deflationary shock, inflation will be expected to be higher, and this produces exactly the right response of a lower real interest rate and more stimulative monetary policy.

The theoretical argument for a price level target when an economy is in a deflationary environment is thus quite strong. But there is a further reason why a price level target is needed in the current environment in Japan, even if the Japanese economy continues to have a solid recovery. Japan is currently experiencing a severe balance-sheet problem that prevents the financial system from working properly (e.g., Posen, 1998, Mishkin, 1998, Hoshi and Kashyap, this volume). Non-performing loans have weakened bank balance sheets, and the lack of capital has meant that banks have been forced to cut back on lending, particularly for new investment. The result is that the financial system is unable to allocate capital to productive investment opportunities, and this is a key element in the stagnation in Japan. The deflation has also weakened corporate balance sheets who have found their debt increase in value in real terms while their assets have not (the debt-deflation phenomenon described by Irving Fisher, 1933). The resulting loss in net worth makes lenders less likely to lend to firms, particularly small and medium sized-ones for whom information about their activities is harder to get, because with less at stake in these firms, they are more likely to engage in risky (moral hazard) behavior (Mishkin, 1997). As a result, even if these firms have productive investment opportunities they may not be able to get the funds to pursue them. Thus restoring both financial and non-financial balance sheets is crucial to helping the Japanese economy to achieve a more efficient allocation of capital

that will restore it to health.

A price level target that would get the price level to what it would have been if the Japanese economy had not experienced deflation in recent years is one way to help restore Japanese balance sheets. A higher price level would lead to lower real indebtedness of Japanese firms and would thereby increase their net worth, making it more attractive to lend to them if they have productive investment opportunities. The improvement in firms' balance sheets would also help reduce non-performing loans which would have a positive knock-on effect on bank balance sheets, thus making it easier for them to lend.

Furthermore, both the BOJ and commentators on the Japanese economy have stressed the need for restructuring of the Japanese economy if it is to return to health. Indeed, the BOJ has continually argued that the economy cannot recover without restructuring and has worried that expansionary monetary policy may be seen as an alternative to the needed restructuring and thus may be counterproductive. Closing down inefficient firms and financial institutions may be exactly what the economy needs in the long run, but in the short-run it might lead to severe dislocations and unemployment. Indeed, this is probably why there has been so much resistance to the restructuring process on the part of Japanese politicians. Here is where a price level target to raise the price level comes in. As we have seen, a higher price level would help restore financial and non-financial balance sheets due to unexpected deflation, and would help the financial system to start working again to allocate capital, which is critical to a restructuring process.⁷ Contrary to a belief among some Bank of Japan Board members' view, restoring a low but positive inflation rate is not bailing out debtors that are the source of non-performing loans,

⁷ At the press conference after deciding the end of ZIRP in August 2000, Governor Hayami mentioned of the side effects of ZIRP as not taking up innovative production process or not restructure due to freely borrowing money. (see Hayami, <http://www.boj.or.jp/press/00/kk0008a.htm>, only in Japanese.)

inflating away debtors' problem, or slowing down further structural reform. Price stability means a low, but positive inflation rate which restores a balance from depressing further investment to encouraging a normal level of investment. Also to the extent that a commitment to a higher price level by the monetary authorities helps raise aggregate demand, this would help cushion the short-term negative effects of the restructuring process. A price level target which encourages more expansionary monetary policy is thus more sensibly viewed as a complement to restructuring rather than an impediment. Indeed, we would argue that an economic recovery with the Japanese economy growing a couple of percent will still leave the Japanese economy below the potential that it could reach if the necessary restructuring occurs. Raising the price level back to where it would have been if deflation had not occurred is needed to help the restructuring to occur.

The logic of our analysis leads us to the following recommendation for the conduct of Japanese monetary policy.

(Recommendation) The Japanese monetary authorities should announce that monetary policy would be conducted to raise the price level to the path that it would have achieved if deflation had not set in starting in October 1997.

Note that since October 1997, the CPI excluding fresh food has fallen by 3.5% to the present, while annual averages, the CPI has fallen by 2.5% between 1998 and 2003. This certainly understates the amount of deflation because, as is well known, measured inflation is likely to be an upward biased measure of true inflation.⁸ Most estimates of measurement error in CPI inflation in industrialized countries is around 1%. In Japan, Shiratsuka (1999) estimated that

⁸ The CPI excluding fresh food was 101.1 in October 1997, that turned out to be a peak. In February 2004, the index is 97.5, after a 3.5% decline from the peak. In an annual average, the peak was 1998, with the index level of 100.4. The annual average of 2003 was 98.0, the level that is 2.4% less than the peak.

the bias in Japan as about 0.9%, although redefinition of the CPI price index in Japan may mean that the bias is now lower. We regard 1% in measured CPI increase as absolute price stability. So this would suggest that a target for the CPI would be at least 7.5% over current levels.⁹ However, because the price level target is a moving target it would continue to rise at the 1% rate and so the cumulative price increase when the target is reached would necessarily be higher in the future.

An illustration of how this might work is illustrated in Figure 5. Suppose that the price level target was reached by the end of 2008, as is shown by the hypothetical CPI in the figure, then the cumulative increase from now (June 2004) to December of 2008 would be 13%, or an inflation rate of 2.5% per year over the period. If this target was credible, this would mean that even with a nominal interest rate of zero, the real interest rate would fall to -2.5% which would be highly stimulative, exactly along the lines that Eggertsson and Woodford (2003) suggest would be appropriate.

The Bank of Japan also needs to make it clear that the commitment to a price level target is a commitment to price stability. Although achieving the price level target might result in temporarily high inflation, returning to the price level that would have occurred if deflation had not set in is actually more consistent with price stability than just letting the price level stay at a permanently lower level. Thus achieving the price level target should increase the credibility of the Bank of Japan's commitment to price stability.

But what should be done once the price level target is achieved? One strand of the literature suggests that it would be optimal to continue with the price level target. In models with a high degree of forward-looking behavior (e.g., Svensson, 1999, Woodford, 1999, 2003, Svensson and Woodford, 2003, Clarida, Gali and Gertler, 1999, Dittmar, Gavin and Kydland, 1999, Dittmar and Gavin, 2000, Vestin, 2003, and Eggertson and Woodford, 2003) a price level target

⁹ The gap is estimated as the 2.4% (measured index decline) plus the inflation bias (1% x 5 years), that results in about 7.5 percent.

produces less output variance than an inflation target. However, empirical evidence (e.g., Fuhrer, 1997) does not clearly support forward-looking expectations formation, and models with forward-looking behavior have counterintuitive properties that seem to be inconsistent with inflation dynamics (Estrella and Fuhrer, 1998).

The traditional view, forcefully articulated by Fischer (1994), argues that a price-level target might produce more output variability than an inflation target because unanticipated shocks to the price level are not treated as bygones and must be offset. Specifically, a price-level target requires that an overshoot of the target must be reversed and this might require quite contractionary monetary policy, then with sticky prices this could lead to a sharp downturn to the real economy in the short run. Indeed, if the overshoot is large enough, returning to the target might require a deflation, which could promote financial instability and be quite harmful to the economy. Our suspicion is that this traditional view has strong supporters in central banks in most countries and this is why no central bank currently has adopted a price level target.¹⁰ Note that this criticism of a price level target does not argue against it when an economy is in a deflation trap and is far from the appropriate price level target as Japan is currently. Then the price level is necessarily below the target, and so the price level target promotes higher expected inflation which lowers real interest rates, and this then works in exactly the right direction to get the economy back on track.¹¹

Taking the traditional view into account suggests that a conservative strategy is to abandon the price level target once it is achieved, and replace it with a more conventional inflation

¹⁰However, a price level target was used in the 1930s in Sweden (Berg and Jonung, 1999).

¹¹See Ito and Mishkin (2004) for a more detailed discussion of the choice between an inflation or a price level target.

target.¹² Indeed, this is close to the position advocated by Governor Bernanke (2003) who is agnostic about keeping a price level target or going to an inflation target once the price level target in Japan is achieved. There is one further reason why an inflation target at this stage may be more desirable. An inflation target is a little easier to explain to the public because it is not a moving target. Because increased transparency and accountability is a highly desirable attribute for the conduct of monetary policy, it seems sensible to follow the so-called KISS principle (“Keep it simple, stupid”).

However, there is the issue of what numerical value of the inflation rate should be adopted and this requires taking a stance on what price stability means. Alan Greenspan has provided a widely-cited definition of price stability as a rate of inflation that is sufficiently low that households and businesses do not have to take it into account in making everyday decisions. This definition of price stability is a reasonable one and operationally, any inflation number between 0 and 3% seems to meet this criterion. Some economists, Martin Feldstein (1997) and William Poole (1999) being prominent examples, argue for a long-run inflation goal of 0%, which has the psychological appeal of the "magic number" of zero. Indeed one concern is that an inflation goal greater than zero might lead to a decline in central bank credibility and instability in inflation expectations which could lead to an upward creep in inflation. However, evidence in Bernanke, Laubach, Mishkin, and Posen (1999), suggests that maintaining a target for inflation above zero, but not too far above (less than 3%), for an extended period, does not lead to instability in the public's

¹²What the optimal level of inflation for the inflation target should be is not obvious. One of the authors (Bernanke, Laubach, Mishkin and Posen, 1999) has been associated with a target for true inflation of 1% (which would be a 2% CPI inflation target if CPI inflation was subject to a measurement bias of 1 percentage point). He has advocated a true inflation rate above zero in order to provide a cushion against deflation which he believes has potentially harmful effects on the economy.

inflation expectations or to a decline in central bank credibility.

Thus having an inflation target does not appear too costly. In addition, there are two arguments why it would be beneficial to have an inflation target above zero. First Akerlof, Dickens and Perry (1996) have argued that setting inflation at too low a level produces inefficiency and will result in increase the natural rate of unemployment. They argue that downward rigidity of nominal wages, which they argue is consistent with the evidence, indicates that reductions of real wages can occur only through inflation. The implication is that a very low rate of inflation might prevent real wages from adjusting downward in response to declining labor demand in certain industries or regions, thereby leading to increased unemployment and hindering the re-allocation of labor from declining sectors to expanding sectors. We do not find their argument totally convincing because as pointed out by Groshen and Schweitzer (1996, 1999), inflation not only can put "grease" in the labor markets and allow downward shifts in real wages in response to a decline in demand along the lines of Akerlof, Dickens and Perry (1996), but can also put in "sand" by increasing the noise in relative real wages. This noise reduces the information content of nominal wages about what is happening to relative real wages and hence the efficiency of the process by which workers are allocated across occupations and industries.

The second, and we believe, more persuasive argument against an inflation goal of zero, as opposed to, say, one, is that it makes it more likely that the economy will experience episodes of deflation. We have argued above that deflation can be highly dangerous because it promotes financial instability. The implication is that undershooting a zero inflation target (i.e., a deflation) is potentially more costly than overshooting a zero target by the same amount. The logic of this argument suggests that setting an inflation target a little above zero is worthwhile because it provides some insurance against episodes of deflation. Indeed, in Bernanke et al (1999), one of us has have argued for a long-run inflation goal of 1% above true inflation. With measurement error in Japan

estimated to be on the order of 1% (Shiratsuka, 1999), this suggests a reasonable inflation target of 2%.¹³ The analysis here thus leads to a second recommendation for Japanese monetary policy.

(Recommendation) The Japanese monetary authorities should also announce that they will move to an inflation targeting regime with a long-run goal for inflation once the price level target described in the previous recommendation is achieved.

The commitment to an inflation target once the price level target is achieved is also crucial to strengthening the credibility of the monetary authorities. One possible danger from a price level target is that inflation would have to be temporarily high in order to get the price level back up to its target. To make sure that the temporarily high inflation does not weaken the credibility of the Bank of Japan's commitment to price stability, the Bank of Japan must make it clear that it will be extremely aggressive in fighting inflation once the price level target is achieved. The commitment to an inflation target will help do this.

If there is a commitment to an inflation target, then the next question is whether it should be a point target (say 2% plus/minus a 1% tolerance range), or a target range (1-3%). The Bank of England adopted point targeting, while the Bank of Canada, the Reserve Bank of Australia have adopted a target range. Presumably, the central bank with a point target has a utility function with a peak at the target point and declining utility around it, while it is possible that a central bank with a target range feels indifferent so long as the inflation rate is within the range. However, a central bank with a target range could take the view that it has a utility function with a peak at the center of a target range. Those who favor the point target cite its strong effect on inflation anchoring. The Bank of England points out the fact that the inflation expectation for 10 years in future

¹³ The recent redefinition of the Japanese CPI might have changed this bias. If research indicates that the bias has changed, then it can be incorporated into the numerical value of the inflation target.

(measured by the difference between yields of the straight bonds and the inflation-indexed bonds) have converged to its inflation target point, 2.5% (under the old RPIX measure). Those who favor a target range worry that the point target may suffer from a danger of fine tuning. Because we do not have a strong view on whether a point target would be better than a target range, and the difference between them may not be that great depending on the central bank's communication strategy, we do not make a recommendation on which should be adopted.

2.2 Nonconventional Monetary Policy

Critics of inflation targeting (Friedman, 2003) have argued that the concept of “managing expectations” is problematic. Why would announcing an inflation rate or a price level target pin down expectations? Aren't actions more important than words? We would agree that words by themselves are not enough. But neither are actions. Indeed, it is words plus actions that is critical to successful monetary policy. Also, when there are doubts among the market participants about the precise interpretation of price stability, announcement of the intention is quite important. This raises the issue of what actions will actually influence the economy and help make a price level or inflation target credible, particularly when the policy interest rate has hit a floor of zero, as is currently the case in Japan? Once the short-term, policy interest-rate is at the floor of zero, it clearly cannot be driven lower. Thus the conventional monetary policy tool of manipulating the short-term, policy interest rate is no longer an option. Is the central bank powerless? What nonconventional policy measures can it take to affect the economy and thereby achieve its price level or inflation target? We look at four types of measures below: 1) quantitative easing, 2) open-market operations in long-term bonds, 3) foreign exchange rate intervention, and 4) open market purchases of private assets.

2.2.1 Quantitative Easing

The nonconventional monetary policy tried by the BOJ has been the so-called “quantitative easing.” This involves an expansion of the monetary base, even when the policy interest rate cannot be driven any lower, either through open market purchase of government debt, or through unsterilized purchases of foreign currency. The BOJ has been conducting such a policy since March 2001, and more aggressively since December 2001.

Figure 6 shows that growth rates of monetary base (MB) and the money supply (M2+CD, hereafter simply M2). MB had indeed expanded quickly from the end of 2001, but with little impact on M2. How to explain the deviation between MB and M2 is a challenge, and another is whether an expansion of MB without an expansion of M2 has positive impacts on the economy. The monetary base includes the amount of current account at the Bank of Japan, the amount of excess liquidity in the system. In normal times, excess reserves would be unlikely to help stimulate the economy. However, an expansion of the monetary base might be beneficial even if it does not produce a significant increase in M2 when the interest rate is zero. First, ample liquidity in the system may help avoid a potential financial crisis that was a concern in 2002-2003. Second, liquidity may encourage financial institutions to take more risk in portfolio management, in particular taking positions in long-term bonds, equities, and foreign bonds, any of which would contribute to stimulating the economy indirectly. The economic recovery in 2003 may be due to ample liquidity in the system.

The data do not look favorable to this approach. The monetary base has increased by 20-40% from 2002 to 2003 and yet deflation did not stop. One problem with coming to this conclusion based on the evidence from Japan is that, as we have discussed in Ito and Mishkin (2004), the BOJ under Hayami created market expectations that even when it pursued expansionary monetary policy for a time, it would soon reverse it. Then it is no surprise that quantitative easing

did not work. Given the very different rhetoric under Fukui, there is the possibility that quantitative easing may be more successful in the future.

However, in addition there are good theoretical reasons why quantitative easing might be ineffective. The conventional liquidity trap analysis suggests that when the short-term interest rate hits a floor of zero, short-term bonds become a perfect substitute for money and so expanding the monetary base will have no effect on the economy. Eggertsson and Woodford (2003) show that this result can even hold if short-term bonds and money do not become perfect substitutes, although this conclusion still is based on the specific features of their model. However, as they emphasize, quantitative easing might help stimulate the economy if it provided a signal that the monetary base would be higher than it otherwise would be once the deflation is over. This is the position taken by Auerbach and Obstfeld (2003).

However, given theoretical arguments against its being effective and the fact that quantitative easing did not work, at least under Hayami, to stimulate the economy and stop deflation in Japan, there is clearly a strong case that the BOJ needs to also look at other approaches to conducting monetary policy.

2.2.2 Open Market Operations in Long-Term Bonds.

Alternative non-conventional monetary policies involve the monetary authorities in conducting open market operations in other assets besides short-term bonds. The most conventional of these is a shift toward central bank purchases of long-term rather than short-term bonds: i.e., the BOJ could engage in even larger purchases of JGBs rather than Treasury bills. Since, long-term interest rates are more likely to figure in household and business decisions about spending, it seems that open market purchase of these bonds might succeed in lowering long-term interest rates, thereby stimulating the economy. However, in order for purchase of long-term bonds to work, there would have to be significant portfolio-balance effects, so that a shift in the supply of

long-term versus short-term government debt in the hands of the public as a result of the open market purchases would affect risk (term) premiums and so result in a fall in long-term rates. The evidence that risk (term) premiums can be affected by changing the supply of long-term bonds relative to short-term bonds in the hands of the public is, unfortunately, far from clear. One episode where this was tried was the so-called “Operation Twist” in the United States in the early 1960s in which the Federal Reserve bought long-term bonds in order to lower long rates relative to short rates. It has generally been viewed as a failure with only a very small effect if any on the relative interest rates of long versus short-term bonds (see Meulendyke, 1998, for a summary of the literature and Fujiki, Okina, and Shiratsuka, (2001, pp. 106-107) for their negative appraisal of the Operation Twist or any increase in long-term bonds at the time of their writing).

Bernanke (2002) has suggested that the apparent failure of Operation Twist does not mean that the central bank could not drive long-term bond rates down as long as the central bank announced that it would peg interest rates on long-term bonds at a very low interest rate (possibly zero) and stood ready to purchase any amounts of these bonds at this low rate. This peg could certainly work because the commitment is easily verifiable since the price and interest rates on long-term bonds are immediately known. However, this could require the central bank to purchase the entire stock of long-term bonds which it might not be fully comfortable about doing.

Clearly another way for the central bank to lower long-term bond rates (Orphanides and Wieland, 2000) is to convince the markets that it will continue to pursue a zero-interest-rate policy (ZIRP) for a considerable time even after the deflation is over. Then, as is suggested by the expectations hypothesis of the term structure, because long-term bond rates are an average of the expected future short-term rates, long-term interest rates would necessarily fall. Indeed, this strategy is complimentary to Bernanke’s because it is a way of committing to more expansionary policy in the future even after the economy has bounced back.

Earlier, the Bank of Japan economists were skeptical, if not negative, of the recommendation of increasing the JGB purchase (see Goodfriend (2000)'s recommendation and negative reactions from Fujiki, Okina, and Shiratsuka, 2001 to the Goodfriend recommendation). However, the Bank of Japan gradually increased the amount of JGB purchase from 400 billion yen per month prior to August 2001 to 1.2 trillion yen per month in October 2002. The policy has been followed. In addition, the Bank of Japan had made it clear that the zero interest rate policy would be maintained in the future. These actions contributed to declining JGB yield to the level below 1 percent in late 2002 to mid-2003.

The Bank of Japan's recent announcements, in particular the one in October 2003, about a condition for lifting the zero-interest-rate policy have some elements of this strategy but does not go nearly far enough. The BOJ has announced that it will not reverse the ZIRP policy until there is clear cut evidence that the deflation is over and that it is unlikely to recur in the future. In particular, the announcement of October 2003 states that the inflation rate should be above zero "for a few months" and would not go back to the negative territory (deflation) again as a condition to change the current quantitative easing policy. However, this is a far weaker commitment than the strategy above suggests. We would like to see the BOJ commit to stay with ZIRP not only until the deflation is clearly over, but until they have a prospect of achieving the price level target described above in which the CPI would have to rise by 2.5% or more for several years if it takes time to get to the target.¹⁴ There is still the problem that an announcement of this type might not be believed by the markets because of the past behavior of the BOJ, particularly under Governor Hayami, where the ZIRP was reversed in August 2000 as soon as it looked as if the economy might be recovering.

¹⁴ In order not to overshoot the target, ZIRP would have to be abandoned a little while before the target is reached, but for all practical purposes, this would be a commitment to keep ZIRP for a substantial period after the deflation is over.

However, this is where the purchase of JGBs might help.¹⁵ The BOJ could buy substantial amounts of these long-term JGBs as a signal of its confidence that their price will remain high because ZIRP will be continued well after the deflation is over.¹⁶

2.2.3 Foreign Exchange Intervention.

Depreciation of the currency provides an additional way of exiting from a deflation trap. A fall in the value of the domestic currency makes imports more expensive and exports cheaper. The result is expenditure switching in which exports rise and imports fall, thereby increasing the demand for domestically produced goods which stimulates aggregate demand. Intervention in the foreign exchange market, the selling of yen and purchase of foreign currency, has thus been suggested as a powerful way of getting the Japanese economy moving again (Bernanke, 2000, McCallum, 2000a, 2002, 2003, Meltzer, 2001, Orphanides and Wieland, 2000, and Svensson, 2001, 2003). Indeed, in recent years the Ministry of Finance and BOJ have been intervening in the foreign exchange market to keep the yen from appreciating, but has not engineered a depreciation of the yen.¹⁷

¹⁵ There is a concern that premature rise in the nominal long-term interest rate may harm balance sheets of commercial banks that hold a large amount of long-term bonds. First, the average maturity of bonds held by commercial banks is being shortened. Second, the long-term interest rate rises is most likely when the economy shows a strong recovery accompanied with a rise in stock prices. Since the Japanese commercial banks still hold a substantial amount of equities, although the ratio of equities to assets has been lowered, capital gains in stocks will likely offset, if not completely, capital losses in long-term bonds. Finally, a stronger commitment to ZIRP and purchase of JGBs is likely to prevent a premature rise in long-term interest rates.

¹⁶ If the Bank of Japan had concerns about its balance sheet, buying long-term bonds would also provide incentives for the BOJ to stick with the ZIRP policy after the deflation is over because premature abandonment of ZIRP would lead to losses on the JGBs that it has bought. However, as argued later in the paper, we believe that the Bank of Japan's balance sheet should not be an important consideration in the conduct of monetary policy.

¹⁷ The amount of intervention has become very large. The monetary authorities have sold 20 trillion yen in 2003 and 15 trillion yen in the first three months of 2004. However, the yen appreciated

One problem with this transmission mechanism is that it also requires that portfolio-balance effects be operational. The exchange rate intervention in which the purchase of foreign-denominated assets (like U.S. Treasury bills) are bought with yen, thereby increasing the supply of yen-denominated assets relative to foreign-denominated assets, only affects the exchange rate if domestic and foreign assets are imperfect substitutes. As was the case for short-term versus long-term bonds, the evidence for portfolio-balance effects are not strong (see the survey in Sarno and Taylor, 2001).

However, here is where a price level target and the management of expectations can again come to the rescue. Svensson (2001, 2003) has advocated that along with an announcement of a price level target along the lines we have described above, the BOJ and the Japanese government commit to an exchange rate peg which is consistent with that price level target. This involves a commitment to an immediate depreciation of the yen which would then be allowed to appreciate at the rate of the foreign interest rate differential (so that the expected return on foreign and domestic assets is equalized.) The peg would then be abandoned once the price level target has been achieved and a price level or inflation targeting regime would be put into place. Committing to the peg is also a commitment to the higher price level target and continued expansionary monetary policy even after the deflation is over. Thus it solves the commitment problem described above.

Clearly, implementing such a peg would require cooperation between the BOJ and the Ministry of Finance because it is the government that has the ultimate authority over the exchange rate and exchange rate interventions in Japan. Also since the policy calls for a substantial depreciation of the yen from current levels, it would require that the Japanese stand ready to buy large amount of foreign-denominated assets to ensure that they are a good investment relative to yen-denominated assets. This would just mean an even larger accumulation of international

from 120 in January 2003 to 103 in March 2004. See Ito and Yabu (2004) showing that the effects of intervention has become much smaller in 2003 compared to earlier period.

reserves for Japan, which is always feasible. (This is in contrast to a case where a country wants to prop up the value of its currency and thus must sell foreign assets, thereby losing international reserves which may run out and thus force the abandonment of the peg.) The commitment to a peg also has the advantage that it provides incentives for the central bank and the government to stick with the peg until the price level target is achieved: early abandonment would lead to an appreciation of the yen which would result in substantial losses on Japan's international reserves.

Although, we agree with Svensson that his "foolproof way" to escape the deflation trap would work, we do have our doubts about this strategy. Such a strategy suffers from two difficulties. First, Japan's trading partners would be likely to be up-in-arms if an exchange-rate peg of this type were announced. We have seen strong U.S. complaints against the Chinese peg of the yuan at a depreciated rate, and we expect that this outcry would be even harsher if Japan adopted Svensson's suggestion. The yen appreciated substantially in September 2003 when G7 called for "flexibility in the exchange rate" without naming countries. The outcome of a depreciated peg might be trade sanctions against Japan and a rise in protectionism that could be disastrous for the world trading system. Globalization and free trade have become dirty words for many politicians and this could get much worse if Japan adopted a highly depreciated, exchange-rate peg. Earlier in 2002 and early 2003, when the Japanese economy, stock market and financial system were at a low point, the chance of a depreciation strategy winning tacit approval of trading partners might have been reasonably high, if Japan had argued that this was a temporary strategy to prevent the economy to fall into another crisis, and that a strong Japanese economy would be beneficial to the rest of the world. However, the logic has lost its appeal when the fourth quarter of 2003 registered a strong recovery and the stock prices had risen by 50% from the trough.

A second problem is that adoption of an exchange rate peg might cause a shift of the

nominal anchor away from the price level or inflation to the exchange rate. We do not dwell on this here because we discuss this extensively in another paper (Ito and Mishkin, 2004). Inflation targeting central banks have gotten into trouble when they have included an exchange-rate peg as part of their monetary policy strategy – Chile, Hungary and Israel immediately come to mind. The exchange rate ends up as the dominant influence over monetary policy and this results in monetary policy not focusing sufficiently on domestic considerations with poor economic outcomes the result.

The bottom line is that we believe that the Svensson plan would be a serious mistake, not because we disagree with Svensson’s logic, but because the political economy of such a plan could be disastrous. Svensson’s “foolproof way” would be a red flag to protectionist and anti-Japanese elements in the rest of the world and would be likely to hinder a communication strategy based on the price stability objective. Nonetheless, we do think that a more subtle approach makes sense. We advocate Japanese intervention in the foreign exchange market to depreciate the yen as one element of non-conventional monetary policy, but no precise exchange rate target should be announced. Instead the BOJ and the Ministry of Finance should emphasize that exchange-rate interventions, along with other measures, are being conducted as a method of pursuing expansionary monetary policy and to achieve a higher price level and a stronger Japanese economy. These interventions should be unsterilized so that they are a signal that their primary purpose is to produce expansionary monetary policy that raises the price level and is not focused on a target level of the exchange rate.¹⁸ It would also be important for the Japanese authorities to emphasize that Japan’s escape from its deflation trap would help get Japan’s economy back on track and would eventually be highly beneficial for Japan’s trading partners.

¹⁸ Under the zero interest rate policy, unsterilized intervention becomes equivalent to sterilized intervention because the interest rate is not affected. Therefore, the difference is mainly through its effect through increasing monetary base. The Bank of Japan economists are skeptical on this argument, see Fujiki, Okina, and Shiratsuka (2001).

2.2.4 Open market purchase of private assets.

An even more radical step for the Japanese monetary authorities would be to purchase private assets such as stocks, corporate bonds or real estate. Purchase of these assets would raise their prices directly and would lead to expansion in aggregate demand through a number of channels of monetary transmission (Mishkin, 1996, and Ito 1999). Purchase of private assets would also directly help restore balance sheets in the economy and help get the financial system working again, which we have seen is crucial to Japanese recovery.

However, BOJ purchase of these assets is not without problems. Government purchase of private assets can be highly politicized. Which assets should the BOJ buy? Different elements in the private sector would lobby for purchase of the assets that would make them profits. Some of this problem could be mitigated by the BOJ buying broad based bundles of assets or market indices so that specific private firms do not benefit over others. (Ito, 2001, proposed that the Bank of Japan buy ETF—the Japanese version of listed, market-based, stock mutual funds.) However, there still is the question of how much real estate should be bought versus stocks, or the relative amounts of corporate bonds versus equities. Decisions on what to buy would have important distributional consequences, which would put the BOJ under intense political pressure. Not only might this result in distortionary decisions, but it could politicize the BOJ and interfere with the independence that this institution has worked so hard to get.

Another problem with BOJ purchase of private assets is that it involves the government in ownership of the private sector. The trend in recent years has been toward privatization because it is believed that the private sector has better incentives to produce efficiently than does the government sector. Having substantial purchases of private assets by the BOJ, which after all is a government entity, goes against this trend. Maybe the problems of BOJ ownership of private

assets can be minimized by announcing that the BOJ will have no involvement in running of the companies or real estate that it has taken a position in, but political pressures may make this hard to do.

We therefore do have a concern that if BOJ purchases of private assets are sizeable, there could be adverse consequences both for the BOJ and the economy. However, if nothing else worked, then this more radical step might be necessary as a way of stimulating the economy and achieving a higher price level. We are thus reluctant to advocate a policy of purchase of private assets, at this point, but it should not be entirely ruled out: it would be a monetary policy of last resort.¹⁹

In response to suggestions of purchasing large amounts of long bonds, equities, and foreign assets, the Bank of Japan has expressed concern about its balance sheet. Governor Hayami and Bank economists argued that those unconventional policies would put the balance sheet of the Bank of Japan at risk because of possible losses on these assets. Theoretically speaking, this argument is specious. The Bank of Japan, despite being legally independent, is still part of the public sector. Any profits (seigniorage) are paid to the government and any losses beyond the seigniorage should be offset by a government fiscal injection. However, politically, the Bank of Japan may not be in a comfortable position to ask for fiscal money, if losses become too large.²⁰ We recommend that the Ministry of Finance provide assurances that it will cover possible balance sheet losses in return for introducing the price level target.

¹⁹ We believe that if these policies had been employed sometime in 2001 and 2002, then the Japanese economy would have started a recovery much earlier than 2003.

²⁰ The hesitation is understandable from its concern for independence. The old law was explicit in that the Ministry would fill the losses, but this clause was eliminated in the new law of 1998, presumably to make the Bank take responsibility in independent decision making. The independence can be said to have come at a wrong time if this change made the Bank more timid in adopting policy that may potentially cause the losses in balance sheet.

(Recommendation) If the Bank of Japan achieves the price level target with losses in balance sheet, the Ministry will inject fiscal money to restore the capital position of the Bank of Japan without asking the responsibility of Governor and other Policy Board members for such losses. This policy should be announced unilaterally by the Ministry.

2.2.5 Taking Ownership of Monetary Policy

There are two reasons why non-conventional monetary policies may not have worked in the past in Japan. First is that they were not coordinated with management of expectations using a price level target of the type we have recommended here. To the contrary, particularly under the Hayami regime, the Bank of Japan was unwilling to commit to raising the price level, and, as in August 2000, reversed its expansionary monetary policy as soon as there were glimmerings of economic recovery. Second is that when the Bank of Japan has conducted non-conventional policies, after March 2001, it has not taken ownership of them: that is, it has been reluctant to say that they would work. For example when quantitative easing was implemented in March 2001, the Bank did not explain why the change in policy would be effective, and this was particularly important because the Bank had not been positive on its effectiveness in the past. In addition, high officials in the Bank of Japan have argued that other non-conventional policies would be unlikely to be effective.²¹

²¹ “Three options for further monetary easing can be considered when money market interest rates are near zero. ...Third, the BOJ can carry out unconventional operations by purchasing assets other than short-term Japanese government securities. ...The third policy option is for a central bank to purchase non-traditional assets such as government bonds, foreign currencies, corporate bonds, stocks, or real estate which are more imperfectly substitutable for base money than are short-term government securities. As stated above, central bank operations that amount to the exchange of perfect substitutes produce little effect on the economy. Such non-traditional operations are effective because they directly alter the prices of the assets in question. Possible benefits and costs of this monetary policy option, however, are extremely uncertain.” ([Kazuo Ueda, Member of the Policy Board, at the semi-annual meeting of the Japan Society of Monetary Economics held at Fukushima](#))

Our discussion here has indicated that none of the non-conventional monetary policy strategies are without their problems. Thus we advocate a multifaceted approach in which many non-conventional monetary policies are tried to see which works best. For non-conventional monetary policies to work, the Bank of Japan needs to take ownership of monetary policy through the following recommendation.

(Recommendation) The Bank of Japan will commit to using different non-conventional policies until deflation is ended and its price level target is achieved.

To supplement this announcement, the Bank of Japan needs to declare that it is accountable for achieving its price stability goals and that it does have the tools to lead the economy out of deflation.

One concern might be that the uncertainty about the impact of the different approaches might make it harder to be sure of what the outcome of using them might be. One response would be paralysis and then not to try any of them. Indeed, in the past the Bank of Japan has defended doing nothing because it was unsure of what the effects of non-conventional policies might be (Okina (1999)). The BOJ, particularly under Governor Hayami, was concerned that non-conventional policies might lead to uncontrollable inflation.

There are two responses to these concerns. The first is that having a clear cut price level/inflation target to pin down expectations can make it highly likely that less conventional tools of monetary policy can achieve the goal of price stability and that inflation would not spin out of control. In recent years we have seen major successes in the ability of monetary policy to

[University in Fukushima City on September 29, 2001, http://www.boj.or.jp/en/press/01/ko0112a.htm#0301](http://www.boj.or.jp/en/press/01/ko0112a.htm#0301)). Also see Okina (1999).

control inflation in many industrialized countries. We would argue that this is not because central banks have become so much more knowledgeable about the transmission mechanisms of monetary policy. There still is tremendous ignorance on this score. What has changed in recent years is that central banks in industrialized countries have been able to put in place much stronger nominal anchors (targets or goals that tie down the price level). The result is greatly improved performance on both the inflation and output fronts. One method has been to adopt inflation targets, as in the New Zealand, Canada, the United Kingdom, Sweden and Australia, and to some extent in the European Monetary Union.²² Alternatively, a strong nominal anchor can be put into place without a formal inflation target through direct communication with the public about the commitment to price stability and actions that are consistent with it. This is the strategy pursued by the Federal Reserve, which has as strong a nominal anchor as inflation-targeting, central banks although it is embodied in an individual, Alan Greenspan (Mishkin, 2000).²³ Adopting a price level target and committing to an inflation target in Japan would make it highly unlikely that inflation would spin out of control thereafter.

3. Conclusions

We have argued that the Bank of Japan can end deflation with two steps: 1) managing expectations by announcing a price level target and an inflation target once the price level is achieved; and 2) by taking ownership of monetary policy and indicating that it will take whatever

²²The European Central Bank does not like to call their monetary policy strategy “inflation targeting” but it is pretty close: there is a strong commitment to price stability and an explicit inflation goal of less than but close to 2% has been announced.

²³This does not mean that there are no reasons for the Federal Reserve to move to an inflation target. See Mishkin (2004).

non-conventional monetary policy actions are needed to achieve its price stability goals. The most obvious reason why the Bank of Japan needs to take these steps is that they will directly stimulate the economy which can help restore it to health.

The currently declared (Monetary Policy Board, October 2003) exit conditions from ZIRP and quantitative targeting are (1) when the year-on-year CPI (excluding fresh food) inflation rate registers zero or positive for a few months; and (2) majority of the Board members forecast that the inflation rates will stay above zero in the coming year.²⁴ We think that these conditions may prompt premature tightening. As of this writing (June 2004), the Japanese economy is showing a strong recovery (more than 6 percent (annualized, quarter-to-quarter basis) growth in 2003:IV and 2004:I), so there is a possibility that CPI inflation may rise above zero in the near future. Nevertheless, we recommend that the Bank of Japan raise the price level to what it would have been if deflation had not occurred and then move to a forward-looking inflation target of 2%. This would surely involve maintaining ZIRP for a long time and is needed to ensure a strong economic recovery.

The second reason why the BOJ, in concert with the Ministry of Finance, needs to pursue more radical actions to stimulate the economy is that the weakness of the Japanese financial sector and the need for massive restructuring of the Japanese economy requires extraordinary measures. Clearly, monetary policy by itself cannot solve Japan's economic problems. Indeed, we believe that financial and nonfinancial restructuring is probably far more crucial to restoring Japan's economic health than are changes in Japanese monetary policy, and this is the subject of other chapters in this book.

However, monetary policy is crucial to making the restructuring process more successful and palatable to the Japanese public. Using monetary policy to reflate the economy will promote

²⁴ The Bank of Japan call them necessary conditions.

restoration of balance sheets that will help the financial system recover. Expansionary monetary policy that increases aggregate demand will make it easier to deal with the disruption that will necessarily be caused by restructuring: it will make it easier for workers in a displaced sector of the economy move to a sector where they will be more productive.

It is a tragedy to see the once great Japanese economy fall far behind a country like the United States. Japan has tremendous strengths -- a highly educated work force, an incredibly hard working population, and superb engineers. This is manifested in Japan's incredibly vibrant export sector which is the envy of the world. It is not good enough for Japan to be satisfied with growth rates of 2 to 3%, when it has fallen so far behind where it would have been if deflation and financial instability had not set in. There is room for the Japanese economy to grow even faster until it reaches its full-employment level of resources.²⁵ In addition, if monetary policy can help in the restructuring of the financial as well as the nonfinancial sectors of the economy, higher productivity growth could be the result.

Monetary policy can be effective in unleashing the enormous Japanese potential. As Franklin Delano Roosevelt, one of the greatest American presidents, said, "The only thing we have to fear is fear itself."²⁶ These are wise words that might be taken to heart by the Japanese monetary authorities. We hope that the analysis in this paper provides some guidance for how Japanese monetary policy can be improved to help Japan reach its full potential.

²⁵ Higuchi and Hashimoto (this volume).

²⁶ Bernanke (2000) cites the same quote in the context of what the monetary authorities in Japan need to do.

References

Akerlof, George, Dickens, William, and George Perry, 1996. "The Macroeconomics of Low Inflation," *Brookings Papers on Economic Activity* 1: 1-59.

Auerbach, Alan J. and Maurice Obstfeld (2003), "The Case for Open Market Purchases in a Liquidity Trap," Working Paper, University of California, Berkeley

Berg, Claes and Lars Jonung (1999), "Pioneering Price Level Targeting: The Swedish Experience 1931-1937," *Journal of Monetary Economics* 43, pp. 525-551.

Bernanke, Ben S. (2000). "Japanese Monetary Policy: A Case of Self-Induced Paralysis?" in Ryoichi Mikitani and Adam S. Posen, eds. *Japan's Financial Crisis and its Parallels to U.S. Experience*, Washington D.C., Institute for International Economics.

Bernanke, Ben S. (2002), "Deflation: Making Sure "It" Doesn't Happen Here," remarks before the National Economists' Club, November 21st, 2002.

Bernanke, Ben S. (2003), "Some Thoughts on Monetary Policy in Japan," address to the Japan Society of Monetary Economics, Tokyo, May 31st, 2003.

Bernanke, Ben, Laubach, Thomas, Mishkin, Frederic S. and Adam S. Posen (1999). *Inflation Targeting: Lessons from the International Experience* (Princeton University Press: Princeton, 1999).

Cargill, Thomas F.; Hutchison, Michael M.; and Ito, Takatoshi (2000). *Financial Policy and Central Banking in Japan*, MIT Press.

Clarida, Richard, Jordi Gali and Mark Gertler (1999), "The Science of Monetary Policy: A New-Keynesian Perspective," *Journal of Economic Literature* 37, pp. 1661-1707

Dittmar, Robert and William Gavin (2000), "What Do New-Keynesian Phillips Curves Imply for Price-Level Targeting?" *Federal Reserve Bank of St. Louis Review*, vol. 82, no. 2, March-April 2000, pp. 21-30

Dittmar, Robert, William Gavin and Finn E. Kydland (1999) "The Inflation-Output Variability

Tradeoff and Price-Level Targets,” Federal Reserve Bank of St. Louis Review, vol. 81, no. 1, Jan.-Feb. 1999, pp. 23-31

Eggertsson, Gauti (2003), “Fighting Deflation at Zero Nominal Interest Rates: Committing to Being Irresponsible,” IMF Working Paper no. 03/64 March 1, 2003

Eggertsson, Gauti B. and Michael Woodford (2003), “Optimal Monetary Policy in a Liquidity Trap,” NBER Working Paper 9968

Estrella, Arturo and Jeffrey Fuhrer (1998), “Dynamic Inconsistencies: Counterfactual Implications of a Class of Rational Expectations Models,” Federal Reserve Bank of Boston Working Paper: 98/05, July 1998

Feldstein, Martin (1997). "Capital Income Taxes and the Benefits of Price Stability," NBER Working Paper No. 6200, September.

Fischer, Stanley. 1994. "Modern Central Banking," in Forest Capie, Charles Goodhart, Stanley Fischer and Norbert Schnadt, *The Future of Central Banking*, Cambridge University Press, Cambridge, U.K.: 262-308.

Fisher, Irving (1933), “The Debt-Deflation Theory of Great Depressions,” *Econometrica* vol. 1 no. 4, pp. 337-357

Friedman, Benjamin (2003), “Discussion of ‘Inflation Targeting: A Critical View,’” presented at the Federal Reserve Bank of St. Louis Annual Conference, “Inflation Targeting: Prospects and Problems,” October 16-17.

Fuhrer, Jeffrey C. (1997), “The (Un)Importance of Forward-Looking Behavior in Price Specifications,” *Journal of Money, Credit, and Banking*, vol. 29, no. 3, August 1997, pp. 338-50

Fujiki, Hiroshi; Kunio Okina; and Shigenori Shiratsuka, (2001). “Monetary Policy under Zero Interest Rate: Viewpoints of Central Bank Economists,” *Bank of Japan, Monetary and Economic Studies*, February: 89-130.

Goodfriend, Marvin, (2000). “Overcoming the Zero Bound on Interest Rate Policy,” *Journal of Money, Credit, and Banking*, vol. 32, no. 4, part 2, 2000: 1007-1035.

Groschen, Erica L. and Schweitzer, Mark E. 1996. "The Effects of Inflation on Wage Adjustments in Firm-Level Data: Grease or Sand?" Federal Reserve Bank of New York Staff Reports, No. 9.

Groschen, Erica L. and Schweitzer, Mark E. 1999. "Identifying Inflation's Grease and Sand Effects in the Labor Market," in Martin Feldstein, ed., *The Costs and Benefits of Price Stability* University of Chicago Press, Chicago: 273-308.

Higuchi, Yoshio and Masanori Hashimoto, (this volume). "Problems in Japanese Labor Market", this volume.

Hoshi, Takeo and Anil Kashyap (this volume), "Solutions to Japan's Banking Problems: What might work and what definitely will fail"

Ito, Takatoshi (1999). "Introducing Inflation Targeting in Japan," *Financial Times*, October 19.

Ito, Takatoshi (2001). "How to Rescue Japan" *Financial Times*, October 23. ¥

Ito, Takatoshi (2004). "Inflation Targeting and Japan: Why has the Bank of Japan not adopted Inflation Targeting?" presented at Conference on the Future of Inflation Targeting, the Reserve Bank of Australia, August.

Ito, Takatoshi and Mishkin, Frederic S. (2004), "Two Decades of Japanese Monetary Policy and the Deflation Problem," presented at the NBER 15th East Asian Seminar on Economics, Tokyo, June.

Ito, Takatoshi and Yomoyoshi Yabu (2004), "What Prompts Japan to Intervene in the Forex Market? A New Approach to a Reaction Function," NBER working paper no. 10456, April.

Krugman, Paul (1998), "It's Baack! Japan's Slump and the Return of the Liquidity Trap," *Brookings Papers on Economic Activity* 1998, vol. 2, pp. 137-187

McCallum, Bennett (2000a), "Theoretical Analysis Regarding a Zero Lower Bound on Nominal Interest Rates," *Journal of Money, Credit and Banking* vol. 32, no. 2, pp. 879-904

McCallum, Bennett (2002), "Inflation Targeting and the Liquidity Trap," in N. Loayza and R. Soto, eds. *Inflation Targeting: Design, Performance, Challenges*, Central Bank of Chile

McCallum, Bennett (2003), "Japanese Monetary Policy 1991-2001," *Federal Reserve Bank of Richmond Economic Quarterly* 89

Meltzer, Allan H. (2001), "Monetary Transmission at Low Inflation: Some Clues from Japan," *Monetary and Economic Studies* 19, no. S-1, Bank of Japan, February: 13-34.

Meulendyke, Ann-Marie, *US Monetary Policy and Financial Markets* New York, Federal Reserve Bank of New York, 1998

Mishkin, Frederic S. (1996). "The Channels of Monetary Transmission: Lessons for Monetary Policy," *Banque De France Bulletin Digest* No. 27 (March): 33-44.

Mishkin, Frederic S. (1997). "The Causes and Propagation of Financial Instability: Lessons for Policymakers," *Maintaining Financial Stability in a Global Economy* (Federal Reserve Bank of Kansas City, Kansas City, MO.): 55-96.

Mishkin, Frederic S. (1998). "Promoting Japanese Recovery," in Kenichi Ishigaki and Hiroyuki Hino, eds., *Towards the Restoration of Sound Banking Systems in Japan -- the Global Implications* (Kobe University Press and International Monetary Fund: Kobe 1998). 130-161.

Mishkin, Frederic S. (2000). "What Should Central Banks Do?" *Federal Reserve Bank of St. Louis Review*, vol. 82, #6 (November/December): 1-13.

Mishkin, Frederic S., (2004) "Why the Fed Should Adopt Inflation Targeting," *International Finance* 7:1 (2004), forthcoming.

Oda, Nobuyuki, and Okina, Kunio, (2001). "Further Monetary Easing Policies under the non-Negativity Constraints of Nominal Interest Rates: Summary of the Discussion Based on Japan's Experience," *Money and Economic Studies*, 19 (S-1), Institute for Monetary and Economic Studies, Bank of Japan, 2001, pp.323-360.

Okina, Kunio (1999a). "Monetary Policy under Zero Inflation: A Response to Criticisms and Questions Regarding Monetary Policy" Bank of Japan Money and Economic Studies, 17, Institute for Monetary and Economic Studies, Bank of Japan: 157-182.

Okina, Kunio (1999b). "Rejoinder to Comments Made by Professors McKinnon and Meltzer" Bank of Japan Money and Economic Studies, 17, Institute for Monetary and Economic Studies, Bank of Japan: 192-197.

Orphanides, Athanasios and Volker Wieland (2000), "Efficient Monetary Policy Design near Price Stability," Journal of Japanese and International Economies 14, pp. 327-356

Posen, Adam S. (1998), Restoring Japan's Economic Growth, Institute for International Economics, Washington, DC

Poole, William, (1999). "Is Inflation Too Low," *Review*, Federal Reserve Bank of St. Louis, vol. 81, no. 4: 3-10.

Sarno, Lucio and M.P. Taylor (2001), "Official Intervention in the Foreign Exchange Market: Is it effective and, If So, How Does It Work?" Journal of Economic Literature, vol. 39, pp. 839-68

Shiratsuka, Shigenori (1999), "Measurement Errors and Quality-Adjustment Methodology: Lessons from the Japanese CPI," Federal Reserve Bank of Chicago Economic Perspectives, vol. 23, no. 2, 2nd Quarter 1999, pp. 2-13

Svensson, L.O. (1999), "Price Level Targeting vs. Inflation Targeting," Journal of Money, Credit and Banking 31, pp. 277-295

Svensson, L.O. (2001), "The Zero Bound in an Open Economy: A Foolproof Way of Escaping from a Liquidity Trap," Monetary and Economic Studies, vol. 19, no. S-1, February: 277-312

Svensson, L.O. (2003), "Escaping from a Liquidity Trap and Deflation: the Foolproof Way and Others," NBER Working Paper 10195

Svensson, L.O. and Michael Woodford (2003), "Optimal Policy with Partial Information in a Forward-Looking Model: Certainty-Equivalence Redux," NBER Working Paper 9430

Vestin, David (2003), "Price-Level Targeting Versus Inflation Targeting in a Forward-Looking Model," working paper.

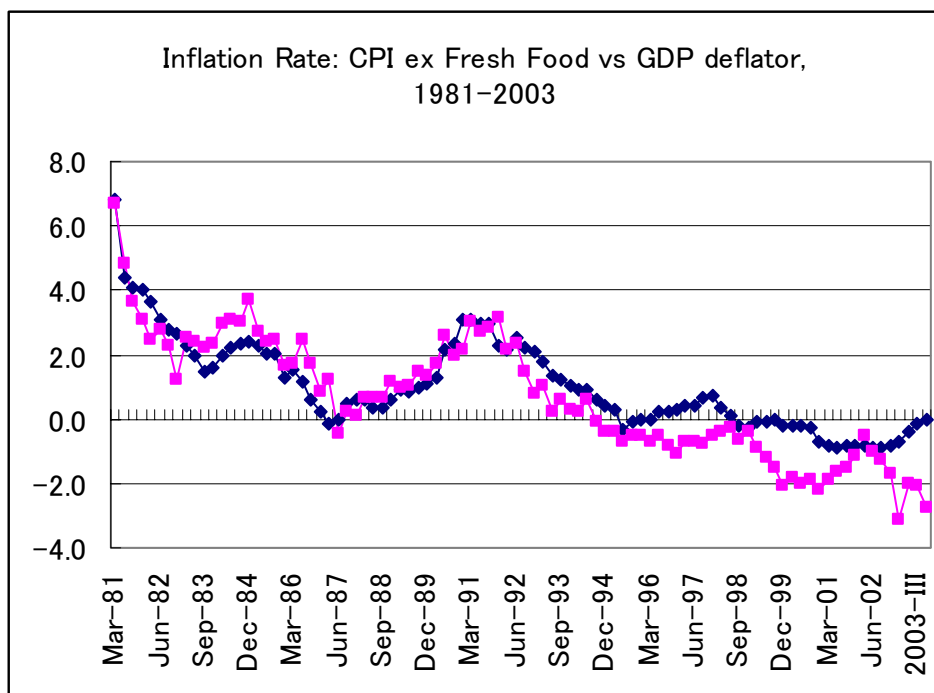
Woodford, Michael (1999), "Optimal Monetary Policy Inertia," NBER Working Paper no. 7261

Woodford, Michael (2000), "Pitfalls of Forward-Looking Monetary Policy," *American Economic Review* vol. 90, no. 2, pp.100-104

Woodford, Michael (2003), *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton: Princeton University Press, 2003.

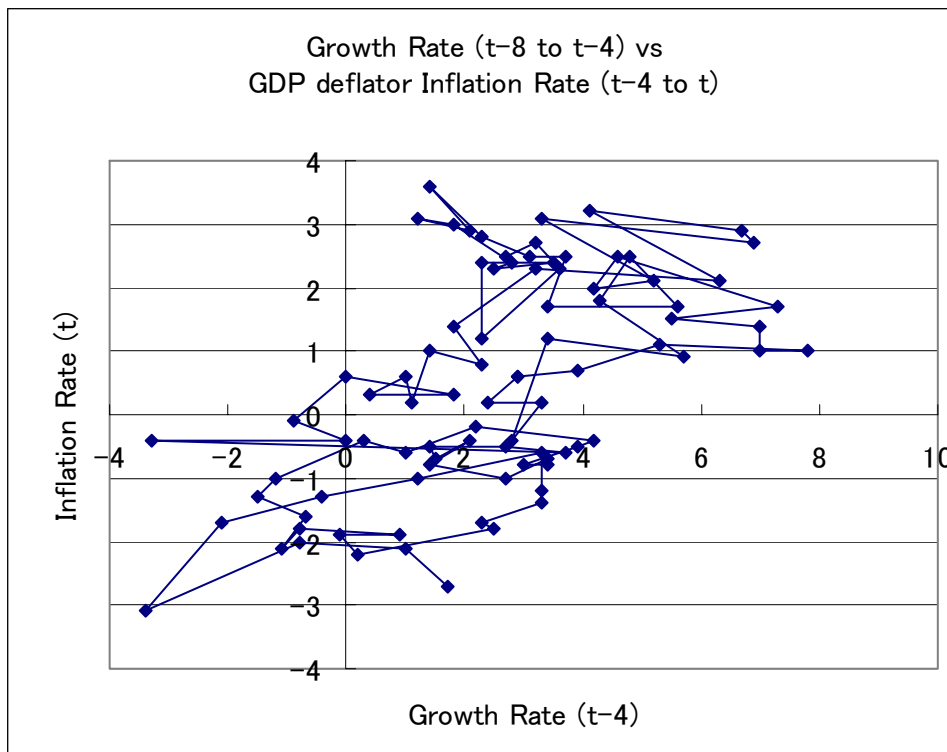
~~Ueda, Kazuo (2000). "Why the Bank of Japan Won't Target Inflation," *Wall Street Journal*, March 6.~~

Figure 1.1. Two Inflation Rates 1981-2003. Quarterly Data



- Notes: (1) “CPI excluding Fresh Food” and “GDP deflator” inflation rates are shown.
- (2) Monthly “CPI excluding fresh food” is converted into quarterly data by taking the average of the three months.
- (3) GDP deflator is the original data before seasonal adjustment.
- (4) Inflation rate is calculated as the percentage change from the same quarter of the preceding year.
- (5) To eliminate the effects of consumption tax rate increases (0% to 3% in April 1989; and 3% to 5% in April 1997), the following adjustment is applied. Inflation rate of CPI excluding fresh food are downward adjusted by 1.9 percentage point from 1989:II to 1990: I, and by 1.6 percentage point from 1997: II to 1998:I, and inflation rate of GDP deflator are downward adjusted by 1.4 percentage point from 1989:II to 1990:I and 1.3 percentage point from 1997:II to 1989: I.

Figure 1.2. Growth rate vs Inflation Rate



- Notes: (1) Growth Rate is defined by the growth rate of Quarterly GDP from the same quarter of the preceding year.
- (2) GDP deflator Inflation Rate is calculated as the percentage change from the same quarter of the preceding year.
- (3) To eliminate the effects of consumption tax rate increases (0% to 3% in April 1989; and 3% to 5% in April 1997), the following adjustment is applied. The inflation rate of GDP deflator are downward adjusted by 1.4 percentage point from 1989:II to 1990:I and 1.3 percentage point from 1997:II to 1998:I.

Figure 1.3: Growth rate of Japan

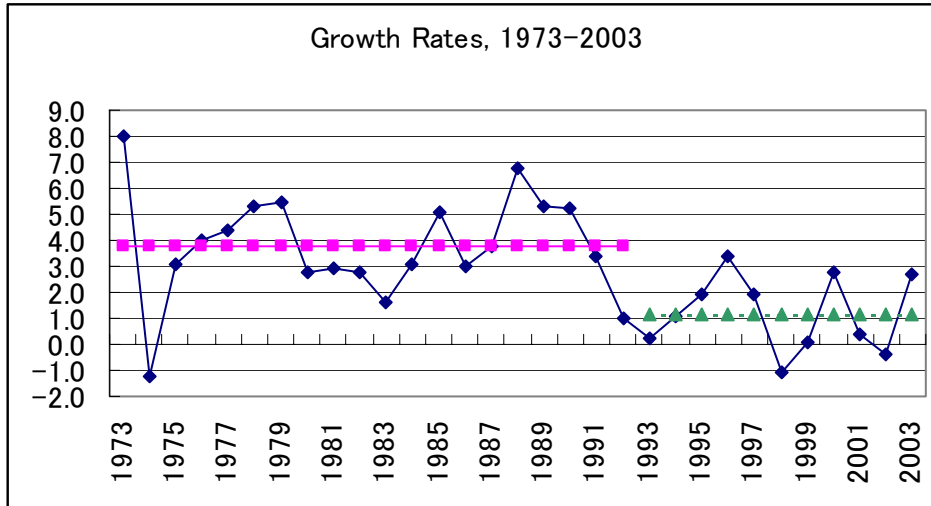


Figure 1.4. Quantitative Easing

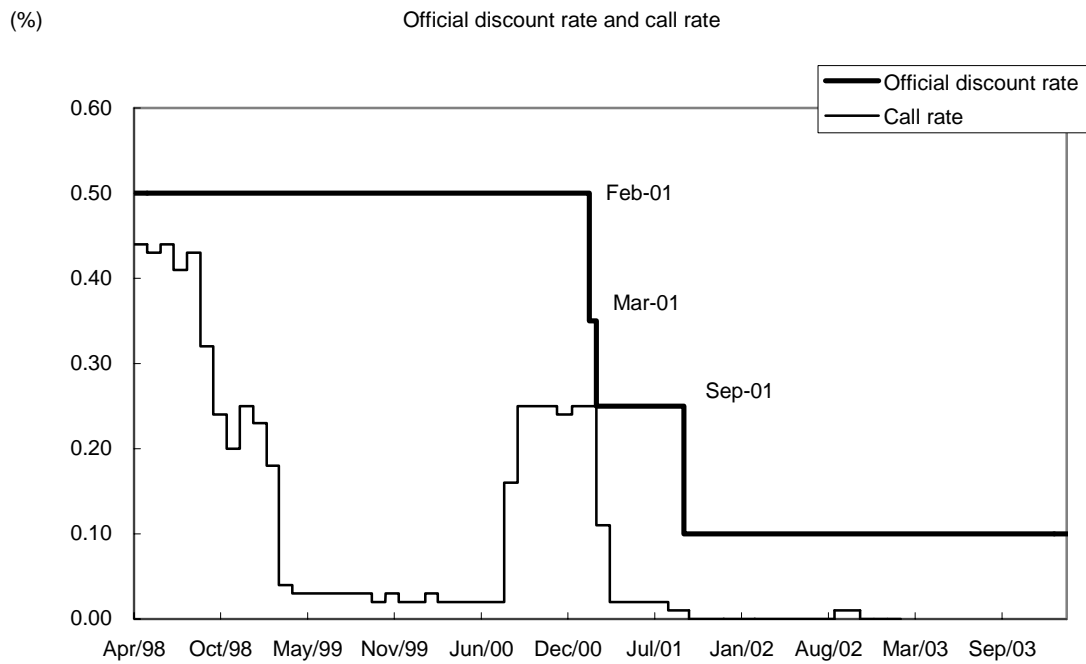
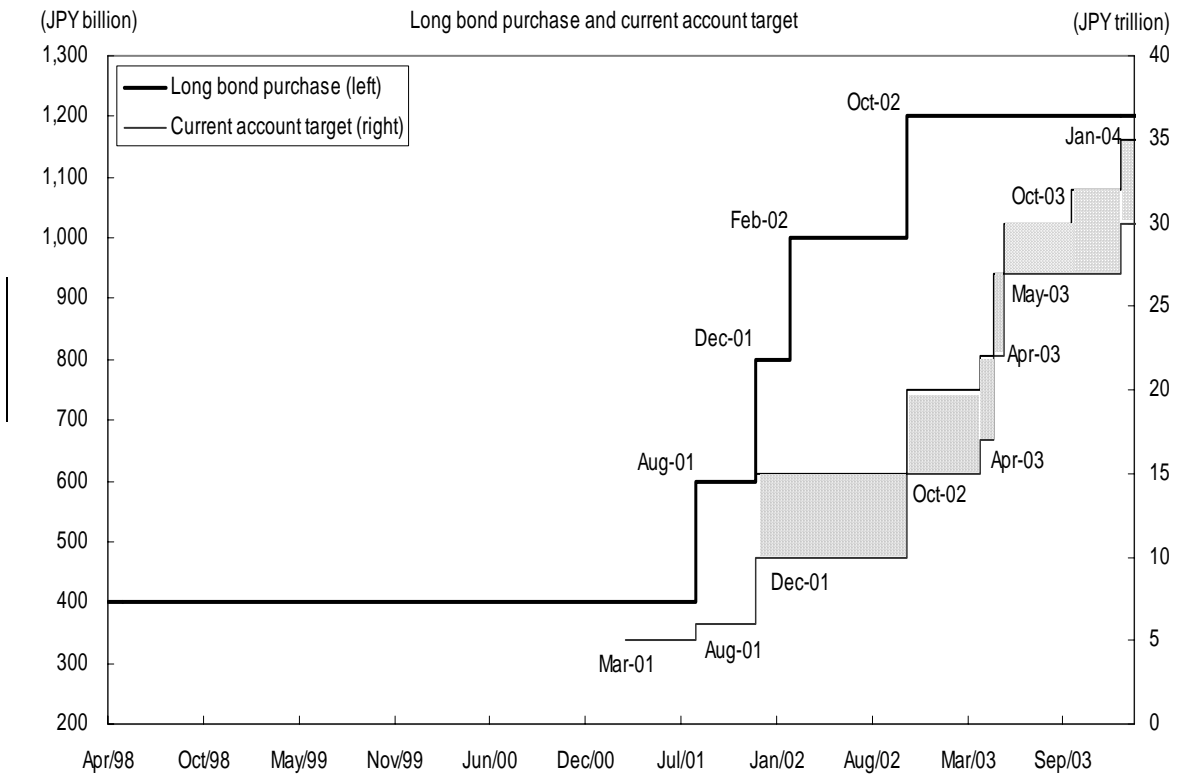


Figure 2.1 Price Level Target:
CPI ex fresh food: Actual (1980–2003),
hypothetical A; hypothetical B

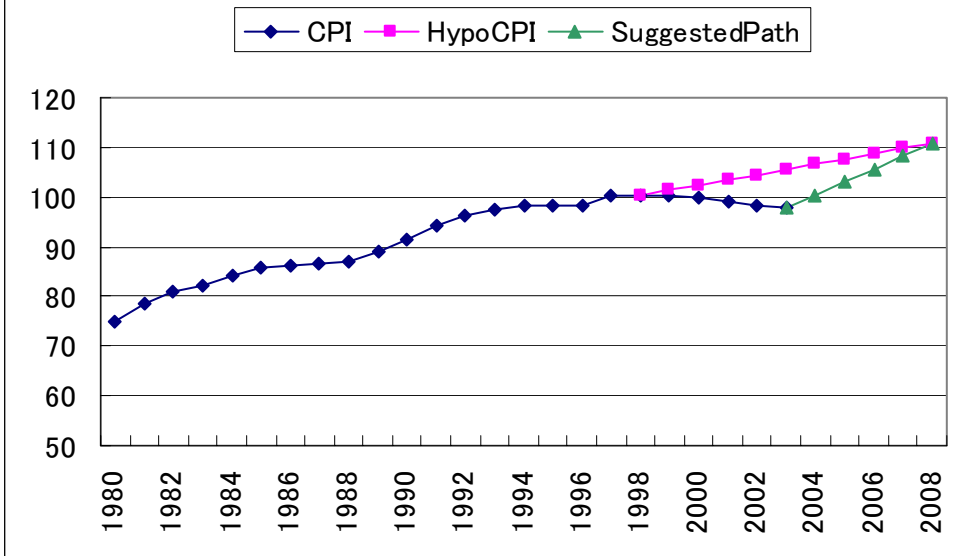


Figure 2.2. Monetary Base and M2+CD

