Financial Strains and the Zero Lower Bound: the Japanese Experience

by

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I. Introduction

The gradually accelerating deflation is the origin of the two serious problems of the Japanese economy, the non-performing loan problem and the increasing national debt. Regarding the non-performing loan problem, from financial statements of banks, we can show that it is impossible for them to secure enough net interest return to cover the risk of default, even in the current mild deflation. Banks' capital base has become insufficient, and as of spring 2003 banks' own capital, including public funds, is almost depleted.

Financial sector problem can be stabilized by public money. Either by injecting capital to banks or by extending the full government guarantee of deposits, the government can stabilize the fragile financial system. However, a far larger problem will surface in that event; the critical situation of the national debt.

Because of the accelerating deflation and rising real interest rates, Japanese economy is shrinking rapidly. The nominal GDP growth rate for 2002 was minus 1.7 percent and this level of negative growth is likely to continue without very strong policy actions. The gross debt of general government will exceed 200 percent by 2007. At the time of writing, the Japanese yen government bond (JGB) is rated AA- by Standard & Poor's and A2 by Moody's and this is the lowest ratings among major countries. If the Japanese government cannot stabilize the macro economy by stopping deflation, I expect that the JGB will be downgraded to a speculative grade within five years. In that event, the government will have to shift their funding from long-term bonds to short-term notes so as to reduce interest costs. However, the shortening maturity of JGB will increase the funding vulnerability against a sharp rise in interest rates.

Moreover, such downgrading of the government bonds would adversely affect the international operations of private financial institutions and corporations. Since sovereign credit rating usually sets the ceiling rate for private companies, they will be deprived of access to international capital markets. Japanese banks will not be able to get long-term finds from foreign banks even with JGBs as collateral.

Furthermore, even a mild capital flight from Japan could lead to a fiscal crisis. If Japanese household sector shifts four percent of gross financial asset from the yen to foreign currencies, it may wipeout all the foreign exchange reserve of Japan. A capital flight from Japan will cure its deflation by a sharp devaluation of the yen. However, the exit of Japan from the deflation may trigger a budgetary crisis. Suppose that Japan already has 200 percent gross debt mostly financed by short-term liabilities. Since most of its gross assets are invested in long-term fixed interest assets, the government cannot count on a higher interest income in the short run under increasing interest rates. A 5 percent rise in interest rate will increase the annual net interest payment by 10 percent of GDP or 50 trillion yen in two years. This figure is about the size of the total national government tax revenue excluding social security contributions.

In order to get out form this deflationary spiral before getting too late, it is necessary to apply a very strong policy package. Policies will be ineffective unless the size of the policy measure matches the economic condition. My estimate is that the trend deflation rate in terms of the GDP deflator is about two and half percent, and the GDP deflation gap is about five percent. This means that we are facing a serious situation where deflation will gradually be accelerating unless GDP is increased by five percent from the current level.

Since short-term interest rates are already zero, conventional monetary policy tools have lost effectiveness. Usually a potent monetary policy weapon, an open market purchase of short-term government papers by the Bank of Japan (BOJ) is no-longer effective because zero-interest base money and zero-interest short-term government papers are now perfect substitutes. Long-term bond yields have fall to extremely low levels, less than one percent for 10-year bonds and less than 0.25 basis points for 5-year bonds at the end of February 2003. A further injection of base money is not likely to push down long-term rates further. Even a massive open-market purchase of long-term government bonds is no-longer effective to stop deflation unless it can somehow change expectations on future inflation rate. The Ministry of Finance (MOF) has already been issuing massive amounts of zero-interest short-term notes. Since such short-term notes are a perfect substitute for base money, the MOF is effectively injecting a large amount of near base money without much effect.

My proposals are as follows. First the government should set and announce

to the public a target for price stability (inflation target) around 1.5 percent of consumer price inflation plus/minus 1 percent per year for three years. To achieve this target, laws must be revised to allow the Bank of Japan to buy all securities, not just bonds, for its open market operation, and purchase real assets such as TOPIX based mutual funds and REIT (real estate investment trusts) up to a few trillion yen per month. This should stop the asset price deflation.

If that does not stop deflation of goods and services, then the interest rate should be made "negative" by taxing the balance of all government-backed financial assets such as bank deposits, government bonds, postal savings, cash, etc., at the rate that is slightly higher than the deflation rate until deflation is stopped. In order to levy tax on cash, the Bank of Japan should introduce new banknotes and charge fees for exchange. In times of deflation, people are increasing their holdings of cash and bank deposits, because doing so is safest and best in portfolio management. We should encourage investments in stocks and real estate by taxing cash and bank deposits.

The negative interest rate policy is expected to decrease savings and stimulate investment. The total tax revenue for the government would amount to about 20 trillion yen. While such a novel tax might cause some confusion, the government could make use of the tax revenue to reduce its budget deficit, re-capitalize deposit insurance funds or to improve its anti-unemployment policy.

Once deflation is overcome, the nominal interest rate would rise, possibly causing the bankruptcies of corporations with excess debts and the failures of banks and life insurance companies due to sharp falls in bond prices. Therefore, we need to take sufficient precautions for risk management. Without overcoming deflation and experiencing the pain associated with the end of deflation, the Japanese economy will never recover.

II. Gradually Accelerating Deflation

The deflation in Japan is steadily accelerating. The Chart 1 shows the GDP deflator and core CIP since 1985. They are Seasonally Adjusted Annual Rates (SAAR) and show fairly erratic movements. Both of them are adjusted for VAT increases in 1989 and 1997. The chart also shows their trends estimated by Hodrick-Prescott (HP) Filter with the conventional parameter for quarterly time series. The trend of core CPI started to fall in 1998 and that of GDP deflator started to fall in

1995. The GDP deflator deflation rate has been larger than CPI because the upward bias of CPI is more pronounced than that of the deflator. By the end of 2002, the GDP deflator deflation rate is more than two percent and still accelerating. Chart 2 shows that the general price level measured by the GDP deflator has fallen by about 9 percent from the peak in early 1994.

The deceleration of inflation in the first half of 1990 and the acceleration of deflation rate in the second half of the decade strongly suggest that Japan has maintained a deflationary GDP gap since the collapse of the bubble economy in the late 1980s. I estimated the size of the GDP gap with the Financial Study Group of Japan Center for Economic Research based on the conventional production function approach. (See Japan Center for Economic Research, *Accelerating Deflation and Monetary Policy*, Financial Research Report No. 8, 2003, in Japanese.) The estimation procedure followed the following procedure:

(1) A Cobb-Douglas production function was estimated with real GDP, labor input (man-hour used) and capital adjusted for capacity utilization. The factor-income share was used to calibrate the parameter of the production function. The trend of the residual of the production function indicates the Total Factor Productivity (TFP) for the production function.

$\ln Yt = 0.29 \ln Kt + 0.71 \ln Lt + \ln TFPt$
Yt: Real GDP,
Kt: Capital adjusted for capacity utilization,
Lt: Labor input measured by man-hours,
TFPt: Estimated total factor productivity.

(2) Estimate the maximum inputs by connecting the cyclical peaks of the labor hour and capacity utilization. In this process, the peaks of labor force were identified for the working age population and the retirement age population. The peaks of working hours were identified for overtime hours and normal working hours because the normal working hours declined because of the change in the labor relation law.
(3) The maximum production potential is estimated from the production function in (1) and the maximum labor and capital inputs in (2). The gap between this maximum GDP and the actual GDP is the unadjusted GDP gap.
(4) The NAIRU level of the real GDP was calculated from the estimated long-run

Phillips Curve relationship. At the NAIRU level of GDP, the inflation rate will be steady. If the real GDP is below this NAIRU level, the inflation rate gradually decelerates and becomes negative. If the real GDP is above the NAIRU, the inflation rate accelerates. In estimating the Phillips Curve with the data since 1985, we found that the acceleration of deflation rate in the second half of 1990s was much slower than the deceleration of inflation in the first half of the 1990s. Therefore, we assumed a structural change in the equation when the GDP deflator started to fall in 1994. Table 1 shows the estimated Phillips Curve equation. The acceleration parameter under deflation, 0.116, was only one quarter of the parameter under inflation, 0.440. The NAIRU level GDP is 4.183 point below the potential GDP. This 4.183 is called a natural level of GDP gap because the inflation rate is steady when the unadjusted GDP gap is equal to this figure.

(5) The adjusted GDP gap is estimated by subtracting this natural level of GPD gap, 4.183, from the unadjusted GDP gap. In the following, we call this adjusted GDP gap as "the GDP gap."

Chart 3 shows the estimated GDP gap with GDP deflator inflation rate. Since SAAR data are highly erratic, we used a three-quarter moving average of SAAR series. The GDP gap hit the peak of 2.3% in 1990 and started to fall. It became negative in mid 1992 and the deflationary environment continues since then. The gap narrowed to zero in early 1997 when the planned increase of the VAT stimulated consumption on consumer durables and housing. However, the gap became very large by mid 1999 due mainly to the financial crisis form the fall of 1997 until early 1999. Although capital injection and the cyclical recovery briefly narrowed the gap in 2000, the Japanese economy fell into a deeper trough in 2002. We can see that the deflationary gap is reaching about 5 percent of the natural level of GDP in the late 2002. If the current level of GDP gap is kept constant, the GDP deflator deflation rate will accelerate by 0.85 in two years and it will reach minus 3.32% by the end of 2004.

This 5 percent gap means that the government has to push up Japanese GDP by at least 5 percent to stop the acceleration of deflation. The estimated Keynesian multiplier for tax cut is about 1.0 and that for public investment is about 1.4. In order to close the deflationary gap by conventional income tax cut, the government has to abolish national income tax and corporate income tax completely. This policy is clearly too dangerous because the Japanese Government may lose market confidence completely.

Chart 4 and 5 check the general movements of estimated GDP gap by comparing the gap with the overtime hours worked and the capacity utilization of the manufacturing sector. These charts show that the estimated GDP gap reasonably reflects the slack in the labor market and the production capacity.

III. Deflation and non-performing loan problem

Banking in Japan has become an unprofitable, structurally depressed industry. Excluding capital gains realized by selling shares and real estate, Japan's banks as a group have been in the red since the year ended March 1994 (fiscal 1993). The primary cause of this is low profit margin and high level of loan losses. In this section, I update financial conditions of Japanese banking sector described in Fukao, Mitsuhiro, “Financial Sector Profitability and Double-Gearing,” NBER working paper 9368, 2002.

Table 2 shows the profit-loss accounts of all commercial banks. In the nine years from fiscal 1992 to fiscal 2000, banks made around ¥10 trillion each year as lending margin (row A, defined as interest and dividends earned minus interest paid). Revenue from such sources as bond and currency dealing and service charges were over ¥2 trillion, and ¥3 trillion more recently (row B). This includes all other revenue except capital gains realized on stocks and real estate. Revenues from banks' principal operations therefore amount to roughly ¥12 trillion to ¥13 trillion yen a year (row A + row B).

Total costs ・ including personnel and other operating expenses ・ were over 7 trillion (row C). Operating costs declined during 1998-2000 because of cost cutting measures. It is likely to be difficult to continue that pace of cost cutting. Certainly, the banks may cut labor costs further by reducing employment and cutting average compensation. But the banks have to invest heavily in information technology to remain competitive.

In the 1990s bank stinted on improving systems because of preoccupation with bad-loan problems, and now they have poor quality computer systems. Thus, for example, the zengin electronic fund transfer system, which is the main payment system among bank customers, cannot handle 2-byte codes, so it cannot send customer names and messages in kanji (characters).) As a result, more and more payments (especially utility bills) are handled by convenience store chains, which have installed sophisticated

terminals.

Since the early 1990s more and more loans held by banks have turned into non-performing assets. Banks have suffered over ¥6 trillion in loan losses each year since fiscal 1994, and almost ¥10 trillion in the fiscal 2001 (row E). As a result, banks have not reported positive net operating profit since fiscal 1993 (row F). However, because of occasional realization of capital gains on stocks and real estate (row G), banks have shown a positive bottom line (row F + row G).

Clearly, the profit margin of Japanese banks is too small to cover the increased default risk after the crush of the bubble. Banks have not succeeded to increase their lending margin under a strong competitive pressure from government-backed financial institutions and weakened borrowers under a deflationary economy. Moreover, under the terms and condition of government capital injection in March 1999, banks are legally required to maintain and increase loans to small and medium sized firms. Sinsei Bank that reduced the loan to small and medium sized firms was ordered to increase such loans by FSA. Because of this condition, banks often disregard the internal model-based required lending margin to make new loans to small companies.

Corresponding to the flow – profit – figures, the capital position of Japanese banks has been deteriorating. Under Japanese accounting rules for banks and lenient application by the regulators, BIS capital ratios have been manipulated in many ways. First, banks have under-reserved against bad loans. This tends to increase bank core capital by the same amount.

Second, banks have large deferred-tax assets on their balance sheets even though they have been losing money continually since 1993 and loss carry-forwards are limited to five years. There is little prospect of utilizing the deferred-tax asset by showing genuine profit in the near future, so it should be written off.

Third, friendly life insurance companies hold most of banks' subordinated loans. The banks, in turn, hold subordinated loans and surplus notes of the life companies. This is double gearing and the cross-held quasi-capital should not be treated as genuine capital for either the banks or the life insurance companies.

Table 3 shows the Capital structure of four major Japanese Bank at the end of

March 2002. More than one-half of the tier I capital of Mizuho, UFJ and Sumitomo-Mitsui groups corresponds to the deferred tax asset (present value of the future tax shelter). Regarding these three groups, almost entire capital consists of deferred tax asset and government-injected capital. One-third of the tier-I capital of Tokyo-Mitsubishi Group is also the deferred tax asset. The double gearing between banks and life-insurance companies also inflates the bank capital. Banks provides surplus notes (similar to redeemable non-voting preferred shares) and subordinated debts for life-insurance companies. In return, life-insurance companies provide equity capital, preferred capital notes and subordinated loans to banks. Since I could not identify all the individual cases of double gearing from disclosed materials, the Table 3 shows only the identifiable ones. In addition to the figures in this table, there is an extensive crossholdings of subordinated debts among banks and life-insurance companies.

The capital position of banks is quite sensitive to stock prices. Table 4 shows the capital structure of all commercial banks. Core capital based on traditional historical cost accounting is adjusted for unrealized capital gains on stocks, deferred taxes, the public capital injection, and under-reserving for loan losses. Although banks show ¥29.3 trillion of capital on their balance sheet at the end of March 2002, this figure is inflated with ¥10.7 trillion of deferred-tax assets, ¥6.9 trillion of under-reserving, and ¥7.2 trillion of government capital. Removing these amounts, the privately held equity of the banking sector is only ¥4.5 trillion. This is very small compared to ¥71.8 trillion of classified loans and ¥34.4 trillion of stock portfolio held by banks.

Because the ¥34.4 trillion market value of stocks held by banks is about 7.5 times their net capital, a 10% fall in the stock price index wipes out about 76% of their capital. In the late 1980s and early 1990s, unrealized capital gains (the difference between column A and B), was very large and banks could withstand fluctuations in stock prices. However, in the 1990s, banks sold stock to realize gains to offset huge loan losses. The increase in book value of shares (column B) during the 1990s shows the banks were buying back most of the stock they sold.

To sum up, banks are losing money by high level of loan losses and very thin profit margin. Banking sector is running out of capital and they are surviving with government guarantee of their liabilities. In order to stabilize the banking sector, it is

necessary to increase the lending margin of banks without raising the real cost of debt for weakened borrowers. Only way to do this is to stop deflation and have a mild inflation (Table 5). By raising trend inflation rate from minus 2 percent to plus 2 percent, for example, banks can raise average lending rate from current 2 percent to 4 percent. At the same time, the real cost of debt for borrowers will fall from 4 percent to 2 percent.

IV. Macro-economic policy under large GDP gap and zero-interest rate

The Bank of Japan is providing a large amount of monetary base but broadly defined money supply is not increasing much (Chart 6). As the short-term interest rates moved close to zero, the monetary base was hoarded by banks and short-term money market dealers and was held as current deposits at the Bank of Japan. Chart 7 shows a phase diagram of monetary base and nominal short-term interest rates since 1980 and it can be regarded as an empirical demand function for monetary base. When the short-term nominal interest rate was between 1 to 12 percent, the monetary base-GDP ratio moved between 7 to 9 percent. However, when the short-term interest rate reached 0.5 percent in the summer of 1995, the demand for monetary base became very elastic. The monetary base-GDP ratio increased to 11 when zero-interest rate policy was adopted in February 1999. From the start of the quantitative easing in March 2001 until the end of 2002, the ratio increased from 12.5 percent to more than 18 percent. The flat part of the Chart 7 clearly shows that Japanese economy has been in a liquidity trap.

In spite of the aggressive increase of monetary base by the Bank of Japan, the real interest rates have been on a rising trend since mid 1998. The Chart 8 shows nominal and real interest rates since 1986. This chart shows the average new lending rate of all banks and over-night call rates. The call rate indicates the short-term interest rates for high-quality borrows. On the other hand, the average new lending rate indicates the borrowing costs for small and medium-sized enterprises (SMEs). Nominal rates are shown in dotted lines and the real rates in solid lines. While the real and nominal interest rates fell until 1998, the real rates started to rise because of the acceleration of deflation.

Moreover, we have to pay attention to the fact that the gap between the lending rates and the call rate gradually increased in the 1990s. In the 1980s, the difference between the lending rate and the call rate was very small and less than 50 bps. By the

mid 1990s, the gap increased to over 150 bps. The increasing gap is the result of the decontrol on deposit interest rates and the declining market interest rates towards zero. Banks lost regulatory rent from deposit in the early 1990s. As the market rates fell towards zero in the 1990s, banks had to raise loan rates to maintain profit margin. The real new lending rate is close to 4 percent which is close to the booming bubble period in the late 1980s. Even the real call rate is about 2 percent which is much higher than the short-term market rate in United States. The high real cost of funding for SMEs is depressing economic activities.

Japan is probably in a deflationary trap. High real interest rates due to deflation are depressing the economy. The depressed economy, in turn, accelerates the deflation and the real interest rates rise further as a result. Conventional open-market purchase of government notes and bonds is no longer effective. Since interest rates on short-term treasury bills (TBs) are very close to zero, they have become a perfect substitute for monetary base. An open market purchase of TBs has no expansionary effect because it is an exchange of two perfectly substitutable assets. An open market purchase of long-term government bonds is also ineffective because long-term interest rates are extremely low and the Bank of Japan cannot push down long-term rates anymore.

The extremely large budget deficit also makes it very difficult to use fiscal policy to stimulate the economy. Table 6 shows the budgetary situations of the general government of Japan that includes the central government, local government, and the social security fund. The debt-GDP ratio is already 150 percent at the end of 2002. With extremely large budget deficit and declining nominal GDP, this ratio is likely to incase by 9 point a year. The gross debt of general government will exceed 200 percent by 2007. Moreover, these figures do not include off-balance-sheet liabilities such as failing national pension system and loss-making government owned companies.

At the time of writing, the Japanese yen government bond (JGB) is rated AA- by Standard & Poor's and A2 by Moody's and this is the lowest ratings among major countries. If the Japanese government cannot stabilize the macro economy by stopping deflation, I expect that the JGB will be downgraded to a speculative grade within five years. In that event, the government will have to shift their funding from long-term bonds to short-term notes so as to reduce interest costs. However, the shortening maturity of JGB will increase the funding vulnerability against a sharp rise in

interest rates.

Such downgrading of the government bonds would adversely affect the international operations of private financial institutions and corporations. Since sovereign credit rating usually sets the ceiling rate for private companies, they will be deprived of access to international capital markets. Japanese banks will not be able to get finds from foreign banks even with JGBs as collateral.

Furthermore, even a mild capital flight from Japan could lead to fiscal crisis. If Japanese household sector shifts five percent of 1400 trillion yen gross financial asset from the yen to foreign currencies, it would wipeout all of the 500 billion US dollar foreign exchange reserve of Japan. A capital flight from Japan will cure its deflation by a sharp devaluation of the yen. However, the exit of Japan from the deflation may trigger a budgetary crisis if it is too late. Suppose that Japan already has 200 percent gross debt mostly financed by short-term liabilities. Since most of its gross assets are invested in long-term fixed interest assets, the government cannot count on a higher interest income in the short run under increasing interest rates. A 5 percent rise in interest rate will increase the annual net interest payment by 10 percent of GDP or 50 trillion yen in two years. This figure is about the size of the total national government tax revenue excluding social security contributions. (See Fukao and Japan Center for Economic Research, *Examining the Banking Crisis*, Tokyo: Japan Economic Journal, 2003, in Japanese.)

In order to get out form this deflationary spiral before too late, it is necessary to apply a very strong policy package. Since short-term interest rates are already zero, conventional monetary policy tools have lost effectiveness. A further injection of base money is not likely to push down long-term rates further. Even a massive open-market purchase of long-term government bonds is no-longer effective to stop deflation unless it can somehow change expectations on future inflation rate. The Ministry of Finance (MOF) has already been issuing massive amounts of zero-interest short-term notes. Since such short-term notes are a perfect substitute for base money, the MOF is already injecting a large amount of base money without much effect.

In my view, the current deflation in Japan can be regarded as a negative bubble; people are shifting assets from stock and real estates to cash, deposits, and government bonds. They are blindly buying government-backed financial assets even though the

credit worthiness of the government is rapidly deteriorating. This negative bubble is clearly unsustainable. At some point, people will realize that the government cannot honor the massive public debt and a massive shift of asset from cash, deposits and government bonds to foreign currencies and real assets will happen.

One possible scenario is shown in Table 7. As the budget deficits continues, a large amount of short-term government liabilities are accumulated. As the weak links of the government such as some local governments and government sponsored companies fails, Japanese investors will gradually lose confidence in the Japanese government and they start to shift assets to foreign currencies and real assets. Yen starts to fall sharply, beyond 200 yen per US dollar, and other Asian countries may also devalue their currencies against the US dollar and the euro in the face of increased competitive pressures from Japan. With a deep devaluation of the yen the Japanese economy will get out of deflation. The Bank of Japan starts to raise short-term interest rates to stop the acceleration of inflation. However, Japanese government will face a massive increase in its debt service due to shorted liability structure. The Japanese government faces a sharp down-grading of its credit ratings and interest rates rise further. In that even, the Bank of Japan will be forced to print money to sustain the government. In the mean time, the simultaneous devaluation of Asian currencies may even drag the United States into a deflation.

In order to avoid such a scenario, it is necessary to stop deflation before too late. My proposals are as follows:

First the Bank of Japan sets and announces to the public a target for price stability (inflation target) around 1.5 percent of consumer price inflation plus/minus 1 percent per year for three years. To achieve this target, laws must be amended to allow the Bank of Japan to buy all securities, not just bonds, for its open market operation, and purchase real assets such as TOPIX based ETS (exchange-traded mutual funds) and REIT (real estate investment trusts) up to a few trillion yen per month. Since the outstanding amount of ETF and REIT is only a few trillion yen, it would be necessary for the Bank to buy exchange-traded TOPIX futures until more funds are supplied. This should stop the asset price deflation at least in the short-run.

If this policy can crush the negative bubble, the deflation will stop. However, if the Japanese investors continue to buy government backed assets blindly, the flow

price deflation will continue. Since the asset prices are determined by underlying cash flows of profits and rents, they will also start to fall again. Therefore, the open-market purchase of stocks and real estates is not a panacea and it may fail to work.

If the ETF and REIT operation does not stop deflation, then the interest rate has to be made “negative” by taxing the balance of all government-backed financial assets such as bank deposits, government bonds, postal savings, cash, etc., at the rate that is slightly higher than the deflation rate until deflation is stopped. In times of deflation, people are increasing their holdings of cash and bank deposits, because doing so is safest and best in portfolio management. We should encourage investments in stocks and real estate by taxing cash and bank deposits. In other words, the government has to levy tax on the target of negative bubble. Tax rate should be somewhat higher than the rate of deflation and the government has to declare that the tax will be applied repeatedly as long as deflation continues.

This tax is similar to the famous Silvio Gesell’s stamp-duty on currency. This is described in the chapter 23 of the Keynes (1936). (Keynes, John M., *General Theory of Employment, Interest, and Money*, London: Macmillan. 1936.) Details of my proposal are shown in Table 8.

The government has to levy tax on the balance of all the government guaranteed financial assets. Taxable assets include all the central and local government liabilities, all the government guaranteed assets such as postal saving deposits and postal life insurance policies, and all the yen liabilities of the banking sector. In order to avoid tax loopholes, yen cash payments on derivative transactions by banks should also be taxed. Finally, the banknotes should be taxed. In order to tax cash, the Bank of Japan has to print new bank notes and levy fees for exchange. Alternatively, the government can levy stamp duty on old bank notes.

This tax will have very strong effects on expenditures. Table 9 summaries the effects of this policy. People will shift assets from "safe" assets to risky assets. In other words, people shift asset from taxable assets to all the non-taxable assets. Since stocks, real estates, corporate bonds, foreign bonds, and consumer durables are not taxed, the demand for these assets will increase. The yen exchange rate would also depreciate against foreign currencies. This tax will also stimulate bank lending activities. Banks will shift assets from BOJ deposits and government bonds to loans

and corporate bonds. Inter-corporate credit will also expand because receivables are not taxed but cash and deposit will be taxed.

This tax will also generate a large amount of revenue for the government. The total tax revenue of 2 percent tax on the government guaranteed financial assets would amount to about 28 trillion yen. The government could make use of the tax revenue to reduce its budget deficit, re-capitalize deposit insurance funds or to improve its anti-unemployment policy.

One negative aspect of this tax is the possible negative effect on the credit rating of Japanese government. For example, Moody's Investors Service states that an imposition of tax on the government liabilities may constitute an event of partial default by the government. However, this is a relatively minor problem because only a small portion of JGB is held by foreign investors.

Once deflation is overcome, conventional interest rate policy will become useful again. The Bank of Japan can maintain relatively low real interest rates at the shorter end of the term structure. The environment for new business will improve. The commercial banks can increase profit margin without raising real borrowing costs for customers. Life insurance companies will be able to overcome negative carry from old insurance contracts with high guaranteed rates. The big upward shifts in the expectations on future price path will push up stock and real estate prices. These changes in the financial market will make it much easier to resolve perennial non-performing loan problem in the banking sector.

We also have to take note on the negative side effects of the exit from deflation. The nominal long-term interest rate would rise considerably, causing bankruptcies of corporations with excess debts. A number of weakened banks and life insurance companies may also fail due to the sharp fall in bond prices. Therefore, we need to take sufficient precautions for risk management.

IV. Concluding Remarks

In this paper, we analyzed the cases of the persistent deflation in Japan. We found that the deflation has been accelerating gradually since mid 1990s. Because of the acceleration of deflation, the real interest rates are rising and conventional monetary policy tool has lost effectiveness. I proposed that the Bank of Japan should buy large

amount of ETF and REIT to fight against deflation. If this measure is not effective, the government should introduce negative interest rate by levying tax on all the government guaranteed financial assets.

However, I did not propose a massive open market purchase of long-term government bonds. This is because an excessive amount of open market purchase may cripple the soundness of the Bank of Japan. Table 10 illustrates this problem. Suppose the Bank bought 150 trillion yen of 10-year JGB on top of the portfolio of March 2003 and it increased the current deposits held by banks. Suppose further that Japan finally gets out of deflation and the long-term market rates rose to 5 percent. Four percentage points rise in the long-term rate will reduce the market value of 10-year JGB by almost 40 percent. Once the deflation ends, the Bank of Japan has to raise short-term interest rates by mopping up excess liquidity in the short-term money market. As we have seen in Chart 7, the demand for monetary base is about 8 percent of GDP when nominal rates are about 3 to 4 percent and the Bank has to reduce the monetary base to this level However, the Bank of Japan will run out of sellable assets due to the capital loss in its long-term bonds. As is shown in this Table 10, the Bank will be forced to issue interest-bearing promissory notes to raise short-term rates from zero. The Bank of Japan has to ask the government to provide subsidy to cover its operating

Chart 1 CPI and GDP Deflator Deflation Rates

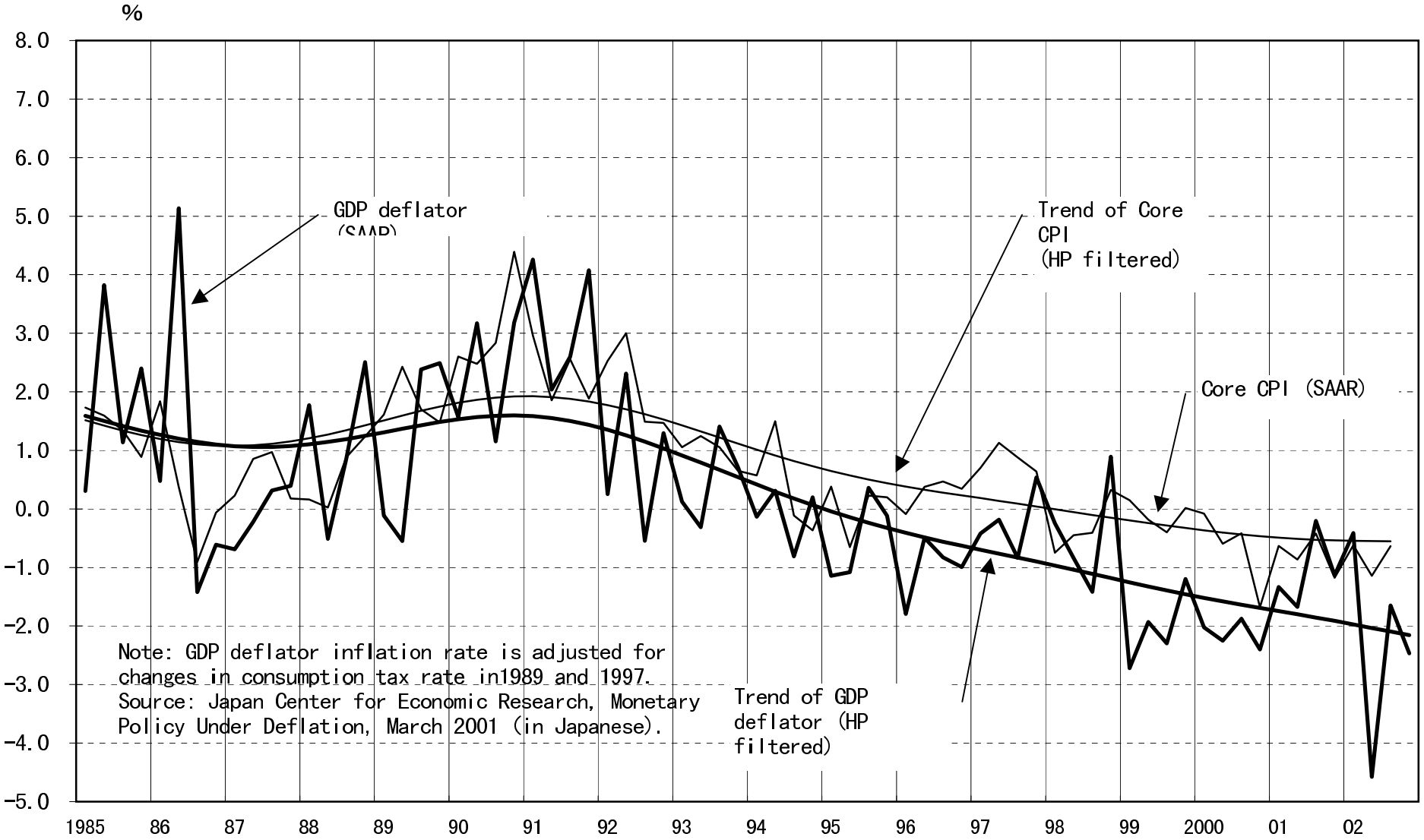


Chart 2

Developmens in Price Level

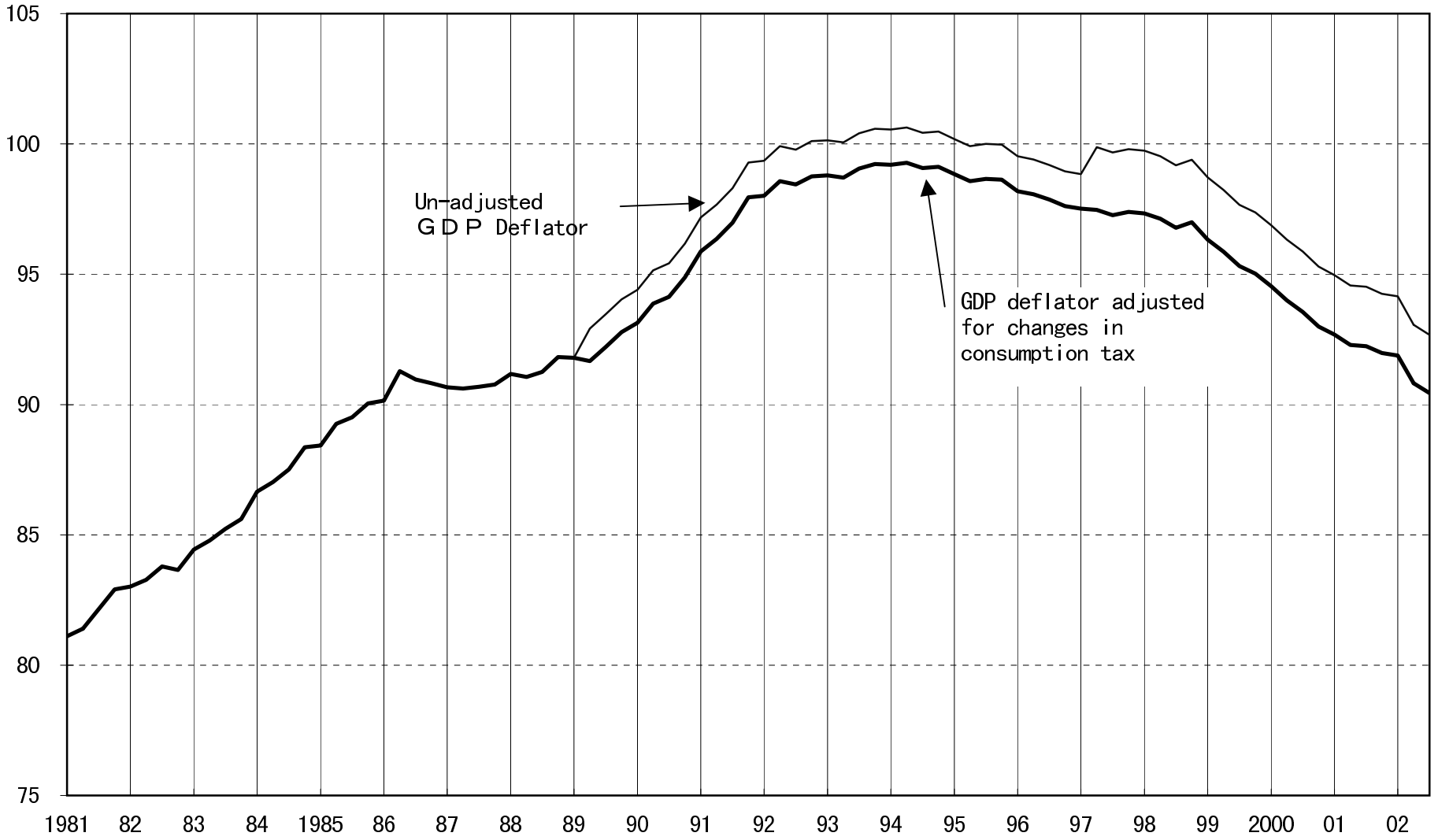


Table 1　　Estimated Price Equation with GDP gap

Specification

$$\pi_t = \alpha \times \sum_{i=1}^{4} \pi_{t-i} / 4 + (1-\alpha) \times \sum_{i=5}^{8} \pi_{t-i} / 4 + \beta \times (G_t - G^N) + \gamma \times DUM \times (G_t - G^N) + \varepsilon_t$$

π: GDP-deflator inflation rate

G: Un-adjusted GDP gap

G^n: Natural level of GDP gap

DUM：Dummy variable.　From 85 to 93, DUM=0, after 1994, DUM=1.

1985Q1-1993Q4

$$\pi_t = 0.560 \times \sum_{i=1}^{4} \pi_{t-i} / 4 + 0.440 \times \sum_{i=5}^{8} \pi_{t-i} / 4 + 0.440 \times (G_t - (-4.183)) + \varepsilon_t$$

1994Q1-～2002Q3

$$\pi_t = 0.560 \times \sum_{i=1}^{4} \pi_{t-i} / 4 + 0.440 \times \sum_{i=5}^{8} \pi_{t-i} / 4 + 0.116 \times (G_t - (-4.183)) + \varepsilon_t$$

Adjusted R2=0.51, SE=1.31, D-W=2.36

Chart 3

GDP Gap and Deflation Rate

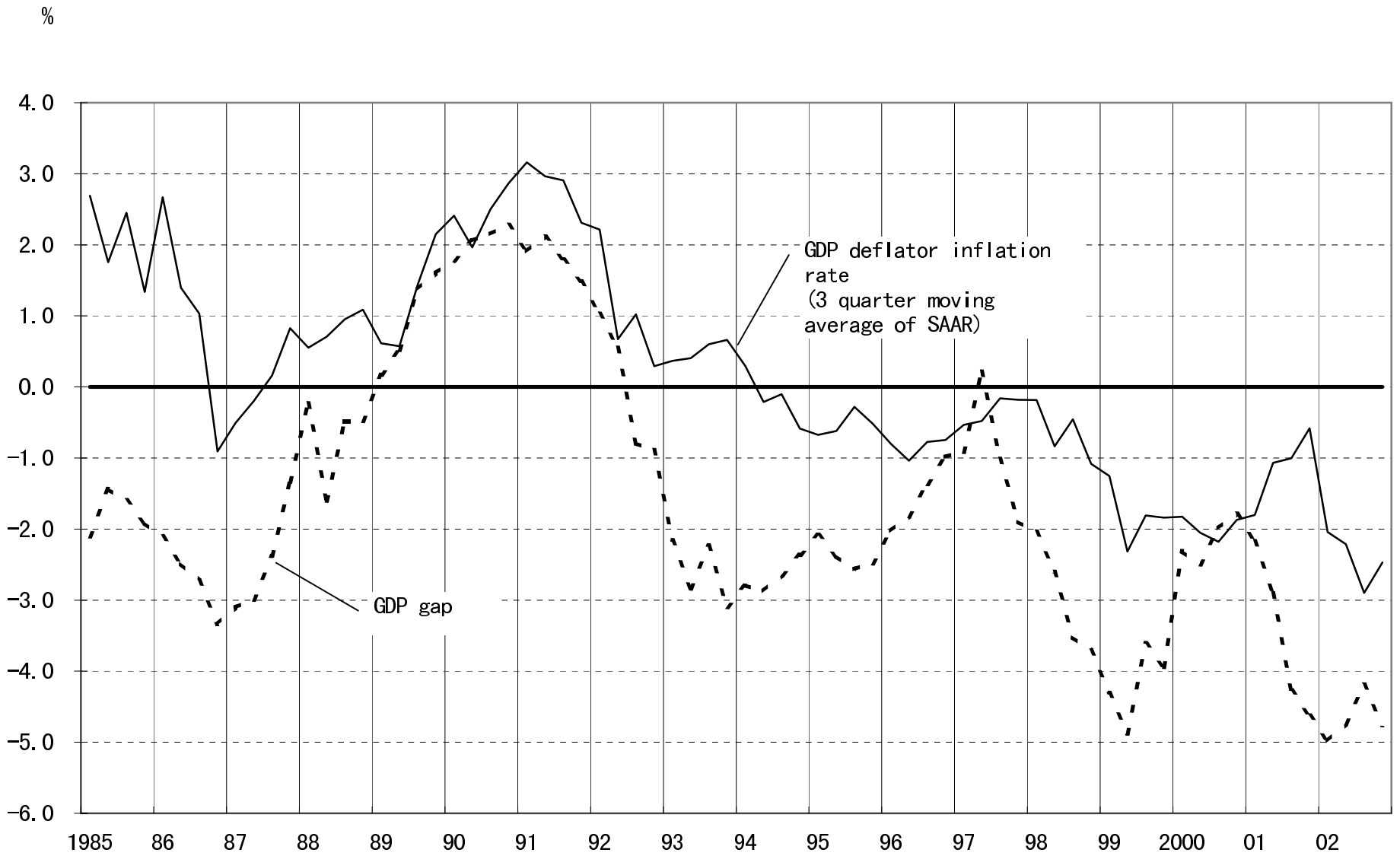


Chart 4

GDP Gap and Overtime Hours Worked

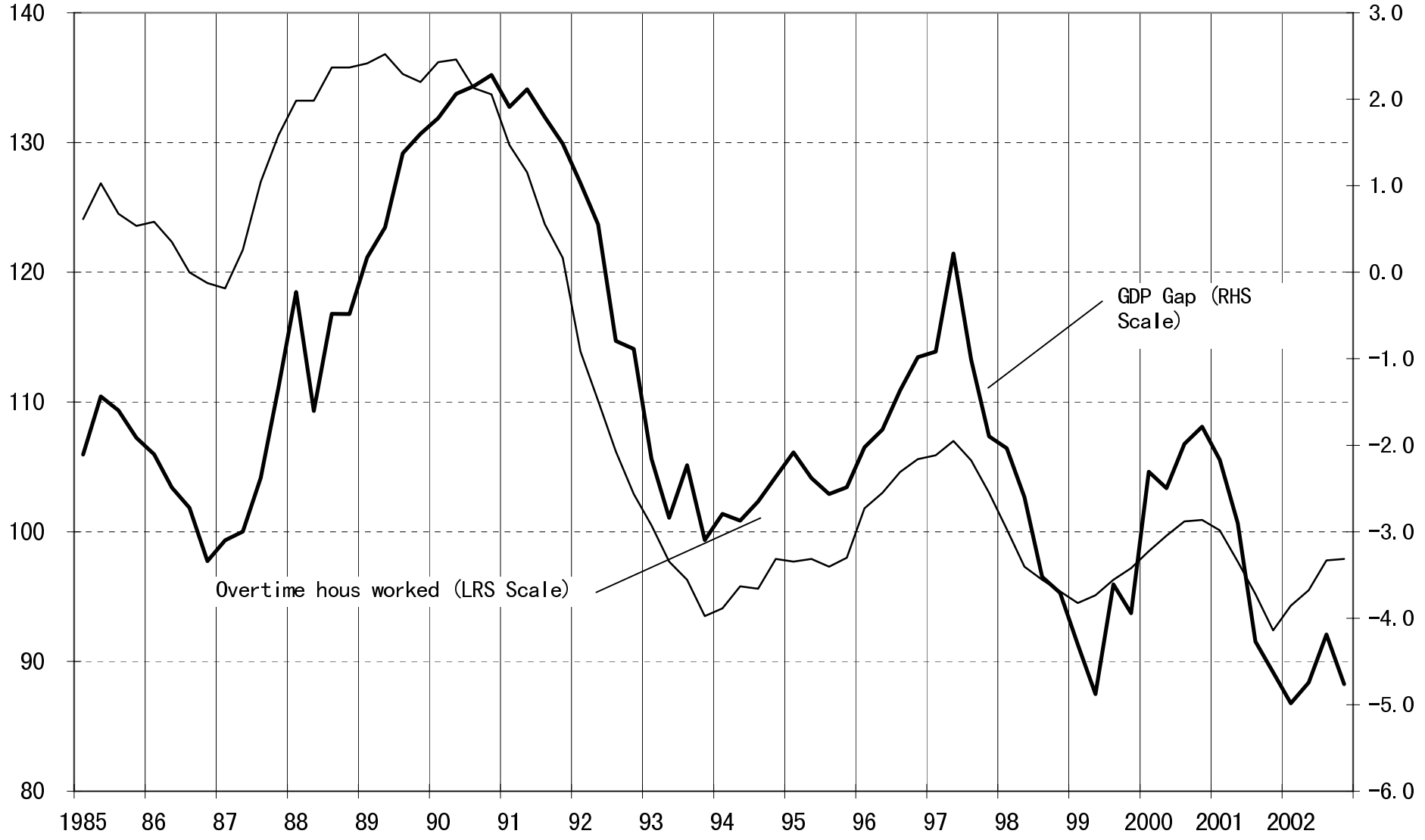


Chart 5 Gap and Capacity Utilization of Manufacturing Sector

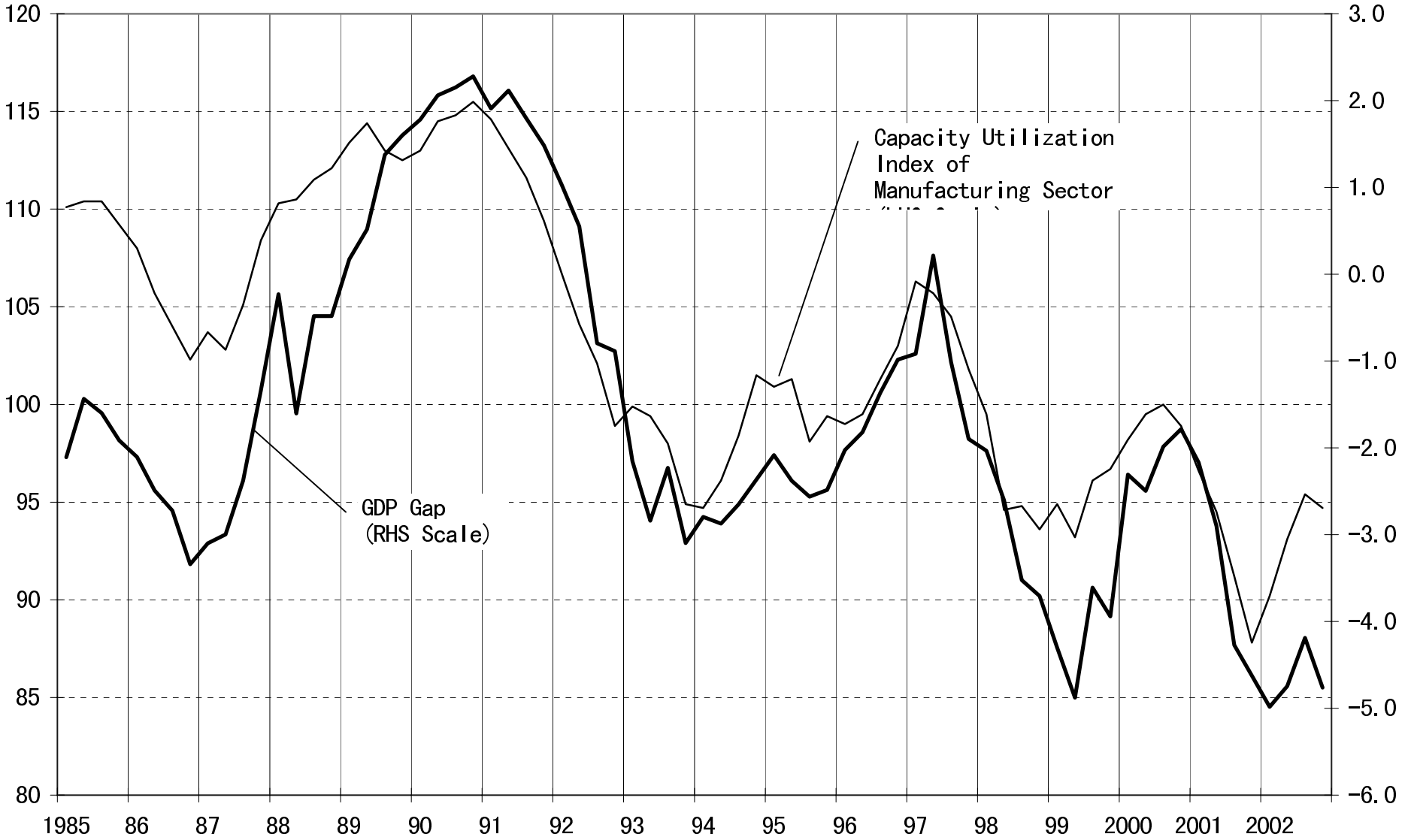


Table 2

Profitability of Japanese Banking Sector

Trillion yen

Financial Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Lending Margin (A)	7.5	7.1	8.9	9.8	9.2	9.7	10.8	10.7	10.0	9.6	9.7	9.4	9.8
Other Revenue (B)	2.5	2.6	2.2	2.5	2.8	2.1	3.3	3.7	3.6	3.1	2.5	3.0	3.1
Operating Costs (C)	6.6	7.1	7.5	7.7	7.7	7.8	7.8	8.0	8.0	7.5	7.3	7.1	7.0
Salaries and Wages	3.5	3.7	3.9	4.0	4.0	4.0	4.0	4.0	4.0	3.6	3.5	3.4	3.2
Gross Profit (D)=(A)+(B)-(C)	3.3	2.6	3.5	4.5	4.3	4.0	6.3	6.4	5.6	5.2	4.9	5.3	5.9
Loan Loss (E)	1.4	0.8	1.0	2.0	4.6	6.2	13.3	7.3	13.5	13.5	6.3	6.6	9.4
Net Operating Profit (F)=(D)-(E)	1.9	1.8	2.5	2.5	-0.4	-2.2	-7.0	-1.0	-7.9	-8.3	-1.4	-1.3	-3.5
Realized Capital Gains (G)	2.8	2.0	0.7	0.0	2.0	3.2	4.4	1.2	3.6	1.4	3.8	1.4	-2.4
Net Profit (F)+(G)	4.7	3.8	3.3	2.5	1.7	1.0	-2.6	0.2	-4.2	-6.9	2.3	0.1	-5.9
Asset	943.6	927.6	914.4	859.5	849.8	845.0	848.2	856.0	848.0	759.7	737.2	804.3	772.0
Outstanding loans	496.0	522.0	537.0	542.0	539.0	539.0	554.0	563.0	536.0	492.0	476.0	474.0	465.0

Note: Financial Statement of All Commercial Banks.
Other revenue (B) includes all the other profit such as dealing profits and fees but excludes realized capital gains of stocks and real estates.
Realized capital gains includes gains of stocks and real estates.

Source: Japan Center for Economic Research, *Monetary Policy Under Deflation* , March 2001 (in Japanese) . Updated by the author.

Table 3 Structure of Tier I Capial of Large Japanese Banks

End of March 2002

100 Million Yen

	Mizuho Group	Tokyo Mitsubishi Group	UFJ Group	Sumitomo Mitsui Group
Shareholders' Equity	47,314	33,244	26,008	29,126
Government-injected Capital	19,490	0	14,000	13,010
Deferred Tax Asset	25,091	10,321	14,583	18,825
Tier I Capial	50,291	31,811	29,573	37,194
Tier I-Risk Asset Ratio	5.33%	5.27%	5.77%	5.51%
Preferred Capial Notes Issed by SPEs	8,725	0	5,299	8,636
Preferred Capital Notes-Risk Asset Ratio	0.93%	0.00%	1.03%	1.28%
Surplus Notes of Life Insurance Companies Held by Banks (A)	2,524	663	1,114	2,357
Stocks of Banks held by Life Insurance Companies (B)	3,192	5,143	1,308	3,632
Minimum of A and B (C)	2,524	663	1,114	2,357
BIS ratios of (C)	0.27%	0.11%	0.22%	0.35%

Source: Disclosure materials of individual banks.

Table 4

Stock portfolios and capital in the banking sector

(trillion yen)

	Market value of shares	Book value of shares	Capital account (Core capital)	Deferred tax asset	Estimated Under-reserving	Equity capital held by the government	Net capital Account	ikkei225 Index
	A	B	C	D	E	F	C+(A−B)×0.6−D−E−F	
Mar.86	*46.9*	11.9	12.3	0.0	NA	0.0	33.3	15860
Mar.87	*63.7*	13.4	13.8	0.0	NA	0.0	44.0	21567
Mar.88	*77.6*	17.6	17.2	0.0	NA	0.0	53.2	26260
Mar.89	*97.1*	23.2	22.5	0.0	NA	0.0	66.8	32839
Mar.90	*88.6*	29.7	28.6	0.0	NA	0.0	63.9	29980
Mar.91	77.7	33.1	30.2	0.0	NA	0.0	57.0	26292
Mar.92	56.4	34.5	31.3	0.0	NA	0.0	44.4	19346
Mar.93	56.4	34.5	31.8	0.0	NA	0.0	44.9	18591
Mar.94	61.9	36.5	32.3	0.0	NA	0.0	47.5	19112
Mar.95	52.0	39.8	32.3	0.0	NA	0.0	39.6	15140
Mar.96	64.3	43.0	27.9	0.0	NA	0.0	40.7	21407
Mar.97	54.1	42.9	28.5	0.0	15.0	0.0	20.2	18003
Mar.98	50.8	45.7	24.5	0.0	5.1	0.3	22.2	16527
Mar.99	47.1	42.7	33.7	8.4	4.6	6.3	17.1	15837
Mar.00	54.5	44.4	35.2	8.1	6.6	6.9	19.7	20337
Mar.01	44.5	44.3	36.7	7.3	7.6	7.1	14.8	13000
Mar.02	34.4	34.4	29.3	10.7	6.9	7.2	4.5	11025

Source of data: Federation of Bankers Associations of Japan, "Analysis of Bank Financial Statements," various issues; securities reports for individual banks. Note that both market and book values represent listed shares only.

Note: Tables represent amounts on the banking accounts of all banks in Japan.
The market value of stock portfolios was not published prior to March 1990, so we have estimated backwards using the Niikkei 225 share price index from the end of March 1991. However, the tables for 1985-1986 should be discounted, because bank stock portfolios have been gradually increasing, so that values estimated from the end of fiscal 1990 will have an upwards bias the father back one goes.
40% corporate tax rate is assumed.
See Table 2 for the estimation of under reserving.

Chart 6

Money Supply Developments

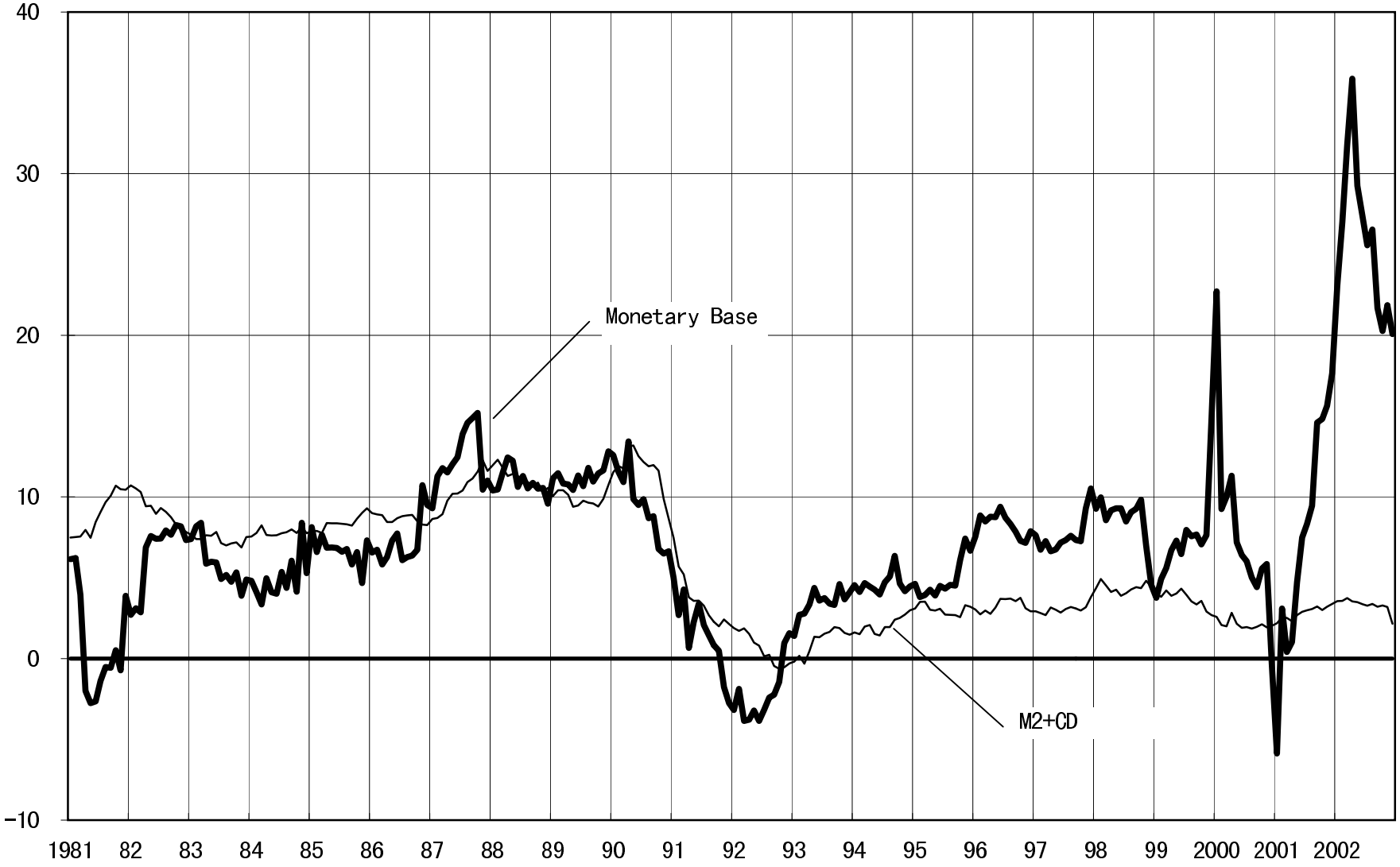


Chart 7 Monetary Base and Short-term Interest Rate 1980/Q1-2002/Q3

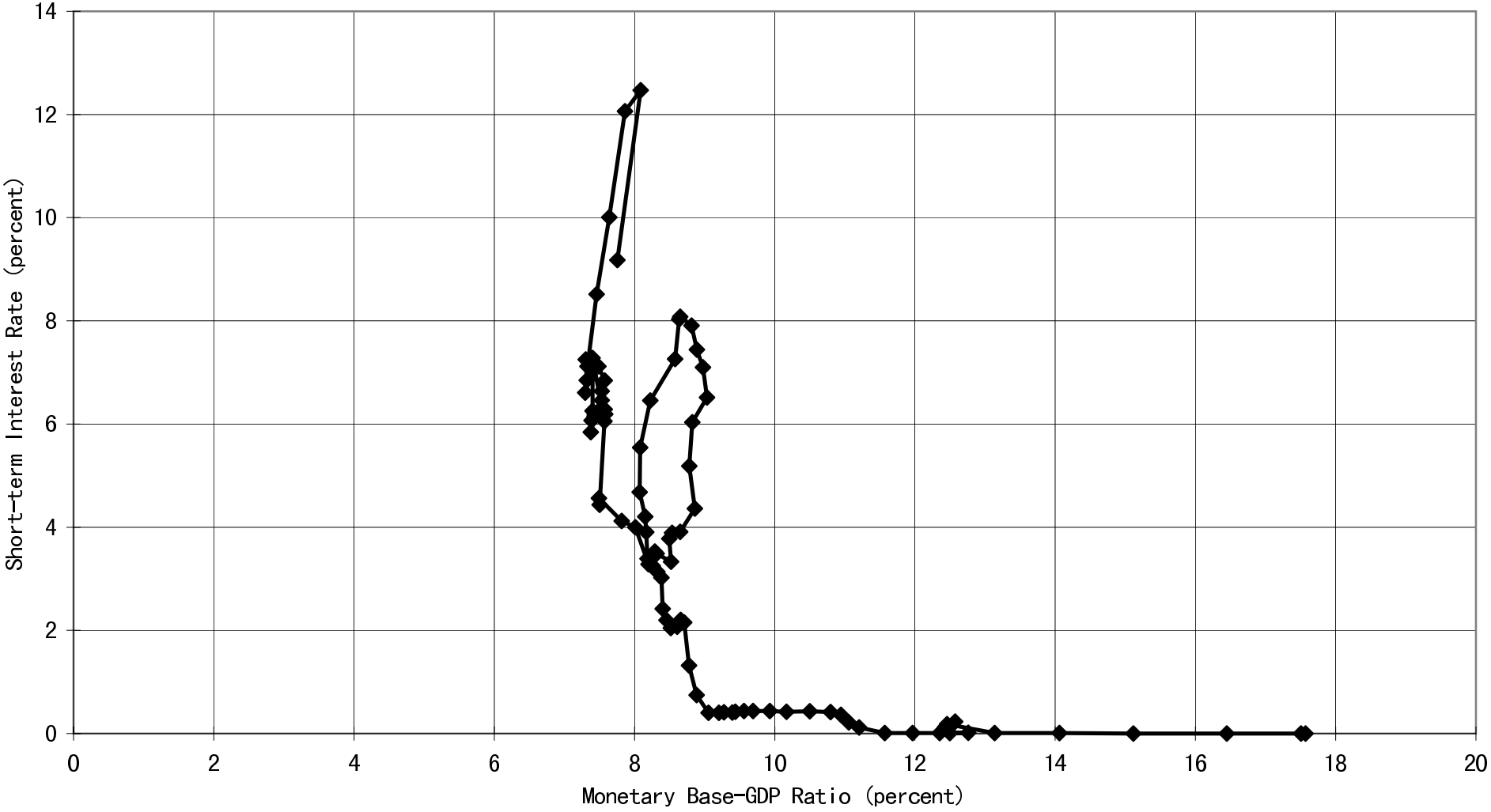
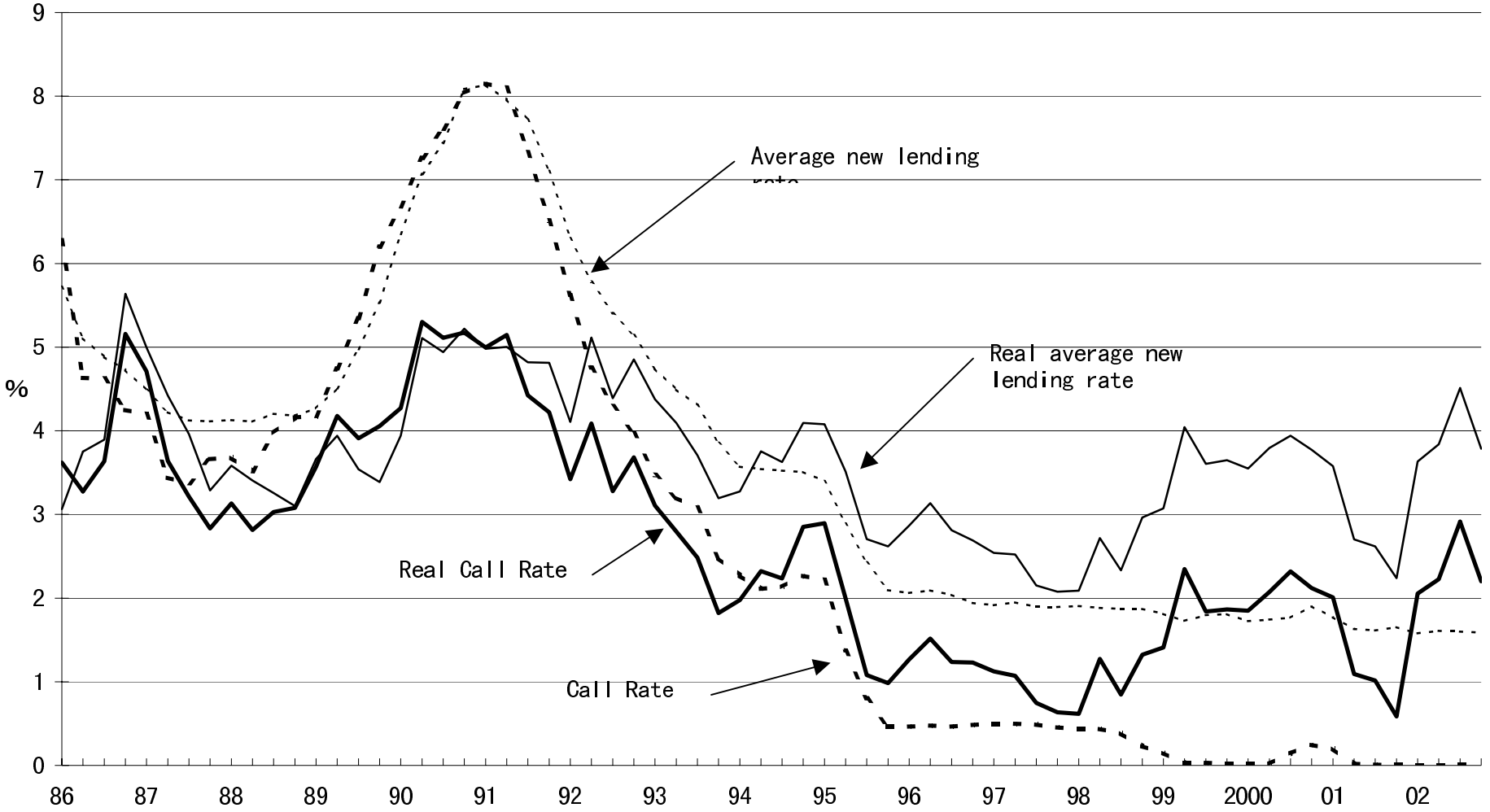


Chart 8

Real Interest Rates
(1986Q1-2002Q4)



Note: Real Interest Rates are estimated with 3Q moving average of GDP deflator inflation rate (SAAR).

Table 5 Illustrative Example of Banking Sector Profit Margin

		Current Situations	Mild Inflation
Lending rate	(A)	2.0	4.0
Inflation rate	(B)	-2.0	2.0
Real interest rate	(A) - (B)	4.0	2.0
Funding cost of banks	(C)	0.2	1.0
Profit margin	(A) - (C)	1.8	3.0

Table 6

Projection on General Government Budget Deficits

Year	Nominal GDP Growth Rate	Primary Balance GDP Ratio	General Government Gross Debt GDP Ratio	General Government Net Debt GDP Ratio	Effective Interest Rate on Net Debt	Net Interest Cost GDP Ratio
1999	−0.8	−5.7	120.4	36.0	3.5	1.3
2000	0.3	−6.8	130.7	43.5	3.3	1.4
2001	−1.4	−5.7	142.0	51.0	2.9	1.5
2002	−1.7	−6.4	150.8	59.8	2.5	1.5
2003	−2.0	−6.4	159.9	68.9	2.1	1.4
2004	−2.0	−6.4	169.2	78.2	2.1	1.6
2005	−2.0	−6.4	178.9	87.9	2.3	2.0
2006	−2.0	−6.4	189.1	98.1	2.7	2.6
2007	−2.0	−6.4	200.3	109.3	3.0	3.3
2008	−2.0	−6.4	212.2	121.2	4.0	4.8
2009	−2.0	−6.4	226.0	135.0	4.0	5.4

Note: Figures until 2002 are based on IMF, *World Economic Outlook* and OECD, *Economic Outlook*.

General government gross asset is assumed to be constant after 2002.

Sharp downgradings of JGB are assumed after 2005.

Table 7 Capital Flight Scenario

1. Large amount of short-term government liabilities are accumulated.

2. Japanese investors lose confidence in the Japanese government

3 Investors start to shift assets to foreign currencies.

4. Yen starts to fall sharply and other Asian countries start to devalue their currencies against the US dollar and the euro.

5. Japanese economy will get out of deflation. and the Bank of Japan will try to raise interest rates to stop the acceleration of inflation.

6. Japanese government will face a massive increase in its debt service due to shorted liability structure.

7. Japanese government face a sharp down-grading of credit ratings and interest rates rise further.

8. The Bank of Japan is forced to print money to sustain the government.

Table 8 Proposed Gesell Tax on Government Guaranteed Assets

1 Levy tax on all the government guaranteed financial assets.
Tax is levied on the balance of the asset.
Tax rate should be somewhat higher than the rate of deflation.
Tax has to be levied as long as deflation continues.

2 Taxable assets are as follows:
All the central and local government liabilities.
Central and local government bonds and other liabilities.
All the yen liabilities of the banking sector.
Yen cash payments on derivative transactions are taxable.
Postal saving and postal life-insurance policies.
Cash (BOJ notes)

3 Taxation on cash
The Bank of Japan have to print new bank notes and levy fees for exchange.
Alternatively, levy stamp duty on old bank notes.

Table 9 Effects of Gesell Tax

1 Asset substitution

People shift assets from "safe" assets to risky assets.

From taxable assets to all the non-taxable assets:

Non taxable assets includes:

Stocks, real estate, corporate bonds, foreign bonds, consumer durables.

Stock and real estate prices will rise.

The yen will depreciate against foreign currencies.

2 Credit expansion

Banks will shift assets from BOJ deposits and government bonds to loans and corporate bonds.

Inter-corporate credit will also expand because cash will be taxed.

3 Expectations effects

The real return on cash and government guaranteed deposit will decline because of the cost of taxation.

Table 10

The Balance Sheet Effect of Massive Long-Term Bond Purchase

Before the Exit from Deflation
After the purchase of 150 trillion yen of 10 year JGB

Based on January 2003 figures

Long-term bonds	205	Bank notes	80
Short-term notes	25	Current deposits	170
Other assets	35	Other liabilities	15
Total	265	Total	265

After the Exit from Deflation
40 percent capital loss on long-term government bonds is assumed

Long-term bonds	0	Bank notes	35
Short-term notes	0	Current deposits	5
Other assets	0	Other liabilities	15
Total	0	Total	55