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The Effects of 'Gesell' (Currency) Taxes in Promoting Japan's Economic Recovery

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Abstract

The traditional interest rate policy has lost its potency due to the zero-lower bound of nominal interest rates and the gradual accelerating deflation in Japan. Without stopping deflation, the Japanese government may face a rapid erosion of credit worthiness due to an uncontrolled budget deficit. In order to cope with this unusual situation, a non-traditional monetary policy measure is proposed. A negative nominal interest rate is needed to clear Japanese markets and can be achieved by levying a tax on all the government-guaranteed yen financial assets. This is a modified version of Gesell's stamp duty on currency for actual implementation in the contemporary context. The benefits and side effects of this tax for Japan are analyzed here.

The Effects of 'Gesell' (Currency) Taxes in Promoting Japan's Economic Recovery

Mitsuhiro Fukao[1]

"As the owners of goods are always in a hurry for exchange, it is only just and fair that the owners of money, which is the medium of exchange, should also be in a hurry.   Supply is under an immediate, inherent constraint; therefore demand must be placed under the same constraint."

Silvio Gesell, *The Natural Economic Order*, 1906.

1. INTRODUCTION

Since short-term interest rates are already zero, conventional monetary policy tools have lost their effectiveness.   Thus, a potent monetary policy weapon, an open market purchase of short-term government paper by the Bank of Japan (BOJ), is no-longer effective because base money and zero-interest short-term government paper are perfect substitutes under a zero-interest rate regime.   Long-term bond yields have fallen to extremely low levels; about 1.5 percent for 10-year JGBs (Japanese Government Bonds) at the time of writing of this paper. Since the yields on long-term bonds reflect the large downside risk of bond prices as well as the expected future path of short-term interest rates, a further injection of base money is not likely to push down long-term rates further.   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 under a zero interest-rate policy, the MOF is effectively injecting a large amount of near base money without much effect.

Some economists have argued that the Bank of Japan can lower long-term interest rates

further by buying all the outstanding JGBs.[2] If the Bank literally buys all the JGBs, the government bond market will disappear and it will no longer be possible to observe market yields of JGBs.   However, private bond and lending markets will remain open and the interest rates on private bonds will be determined in such markets.   The disappearance of JGBs will marginally reduce private bond yields, but the long-term interest rate on private bonds is not likely to fall much given the large downside risk of bond prices.   If the Bank also buys private bonds at lower-than-market yields, the Bank will effectively provide subsidies to some of the private borrowers and such operations should be regarded as an unconventional monetary policy. In order to affect private spending, it is necessary to reduce interest rates on private borrowings in the financial market.

Since the spring of 2003, the Japanese economy has shown some recovery.   Real GDP grew almost 4 percent in fiscal 2003 and the deflationary gap has shrunk considerably. Corporate profits, private investments and the employment situations have shown a steady recovery.   However, the GDP deflator is still falling by about 1.5 percent per annum and has not shown any signs of improvement yet at the time of writing (January 2005).   Given the estimated potential growth rate of 1.5 percent, the Japanese economy still faces a risk again of a negative nominal growth in the near future.[3]   In such a situation, Japanese government cannot reduce its massive budget deficits and it will gradually lose public confidence on its financial health.   The youth unemployment problem is also likely to continue and it will destroy the valuable human capital for the future.

If the Japanese economy cannot exit from continuing deflation under the current recovery, it is necessary to implement a very strong expansionary policy to achieve a positive inflation rate without increasing budget deficits.[4]   In order to get out of this deflationary trap,

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[2] Willem Buiter suggested such policy in his comment on an earlier draft of this paper.

[3] See Fukao (2003) for an estimation of the potential GDP growth rate.

[4] In his comment, Buiter argued that budget deficit and high public debt should not constrain Japanese policy makers because the monetization of public debt is a clear policy option.   Unfortunately, we cannot safely forget about the money created by the monetization of national debts forever.   When the Bank of Japan moves out of a zero short-term interest rate to a positive interest rate regime, the Bank has

the Japanese government and BOJ have to implement a non-traditional monetary policy. My proposals are as follows. First the government should set and announce to the public a target for price stability (inflation target). The target inflation rate should be about 1.5 percent par annum measured by the core consumer price index, and the margin of error should be plus or minus 1 percent per year over a three-year horizon. To achieve this target, laws must be revised to allow BOJ to buy all securities, not just bonds, for its open market operation, and purchase real assets such as TOPIX[5] based mutual funds and REITs[6] up to a few trillion yen per month. This should stop the asset price deflation in the short run. However, the effect on prices of goods and services is not certain. If this open market purchase of real asset does not stop deflation of goods and services, asset price deflation will start again. In this event, 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. This policy is similar to Silvio Gesell's stamp duty on currency first proposed in Gesell (1906).

In order to levy a tax on cash, the BOJ should introduce new banknotes and charge fees for exchange with old notes. 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 revenue for the government with a 2-percent tax would amount to about 30 trillion yen or six percent of GDP. 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 and/or improve its anti-unemployment policy.

Once deflation is overcome, the nominal interest rate would rise, possibly causing the

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to sell most of the purchased bonds to absorb excessive base money. Otherwise, the Bank has to allow general prices to raise about 2000 percent to increase the transaction demand for base money. See Figure 6.

[5] TOPIX is a market capitalization based stock-price index of the Tokyo Stock Exchange.

[6] Real Estate Investment Trusts listed on the Tokyo Stock Exchange but not included in the TOPIX index.

bankruptcies of corporations with excess debts and the failures of banks and life insurance companies due to sharp falls in bond prices.   In consequence, precautions for risk management are needed.   Without overcoming deflation and experiencing the pain associated with the end of deflation, the Japanese economy may continue to suffer from a stagnant economy.

2. GRADUALLY ACCELERATING DEFLATION

Deflation in Japan is steadily continuing.   Figure 1 shows the GDP deflator and core CPI since 1981. Note that a 3 percent consumption tax was introduced in April 1989, and that this tax rate was raised again by 2 points to 5 percent in April 1997.   As a result, the two price indices are biased upwards in these years.   The core CPI started to fall in 1998 and the GDP deflator started to fall in 1995.   The GDP deflator deflation rate has been larger than the CPI because the upward bias of CPI is more pronounced than that of the deflator.   By the end of 2003, the GDP deflator deflation rate is about 1.5 percent and still declining.   Figure 2 shows that the general price level measured by the GDP deflator has fallen by about 10 percent from the peak in early 1994 to mid-2004.

While the public discussions of monetary policy and deflation generally focus on CPI, the movement of the GDP deflator is more important for the health of the Japanese economy. Corporate profits and labor income depend on the nominal GDP that is the product of the GDP deflator and real GDP.   Tax revenue is also dependent on nominal GDP.   The gap between the CPI and GDP deflator has been widening in the 1990s, and the average gap is 0.9 percent over the past five years (1999-2003).   This means that even if the Bank of Japan can stabilize the CPI at zero inflation, the GDP deflator will be falling at 0.9 percent.   Therefore, in this paper, we focus on the GDP deflator deflation rate.

BOJ has pointed out that the GDP deflator exaggerates the rate of deflation due to the very rapid fall in computer prices and the Paasche index bias.   Partly due to this criticism, the government changed the formula for the GDP deflator from a Paasche index to a chain-weight index in December 2004.   Because of this change, the GDP deflator deflation rate was revised from about 2.5 percent to 1.5 percent in 2004.   The revision was not so large or one-sided for the data until the end of 2002.   On the other hand, the revision has been 0.9 to 1.3 points since 2003.   Such a full one point revision was surprisingly large, but the government did not change

nominal figures much. As a result, the real growth rate has been revised downwards since 2003 by about 1 point.

In this context, we should note that the BOJ paper does not mention the possible upward bias in the GDP deflator. Because most price indices do not take account of quality changes in goods and services, the GDP deflator does have some upward bias from this source.

The deceleration of inflation in the first half of 1990 and the acceleration of the 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. In Fukao (2003), with the help of the Financial Study Group of the Japan Center for Economic Research, I estimated the size of the GDP gap based on the conventional production function approach with an estimated Phillips curve.

Figure 3 shows the estimated GDP gap with the GDP deflator inflation rate. Since SAAR (seasonally adjusted annual rate) data are highly erratic, I used a three-quarter moving average of SAAR series. The GDP gap peaked at 2.3% in 1990 and then started to fall. It became negative in mid 1992 and the deflationary environment has continued 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, with the deflationary gap reaching 6.9 percent of the natural level of GDP in the first quarter of 2002. Since then, the Japanese economy recovered slowly until mid-2003 and the growth rate was relatively high until early 2004 (Figure 4). By mid-2004, the GDP gap had declined to about 2.8 percent. In spite of this recovery, the GDP deflator deflation rate has not improved yet and it continues to decline by about 1.5 percent a year.

The continuing deflation has caused various problems. Keynes (1924, 1936) and Fisher (1933) documented the negative effects of deflation on economic activities. Since the downward adjustments of wages are often slower than the downward price adjustments of goods and services, corporate sector profits are temporarily squeezed. The real value of the

debt of the enterprise sector has risen.   The declining profit and the increasing value of the debt tend to depress business activities and raise unemployment.   Under a deflationary environment, asset prices decline more sharply than those of goods and services because asset prices reflect the expected decline of future cash flows from investments.   These factors also contribute to the deterioration of the asset quality of financial institutions and depress lending activities.[7]

3. MACRO-ECONOMIC POLICY UNDER LARGE GDP GAP AND ZERO-INTEREST RATE

The BOJ is providing a large amount of monetary base, but the broadly defined money supply is not increasing much (Figure 5).   As 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 BOJ.   Figure 6 shows a phase diagram of the monetary base and nominal short-term interest rates since 1980, and it can be regarded as an empirical demand function for the monetary base.[8]   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 percent when the zero-interest rate policy was adopted in February 1999.   From the start of the quantitative easing in March 2001 until the end of 2003, the ratio increased from 12.5 percent to 21 percent. The flat part of Figure 6 clearly shows that the Japanese economy has been in a liquidity trap.

Figure 7 shows the reaction function of the BOJ in the face of a falling inflation rate. The overnight call rate was reduced in line with the GDP deflator inflation rate.   A one point fall in the deflation rate induced the Bank of Japan to cut the nominal rate by 1.8 points, thereby reducing the real interest rate by 0.8 points.   The BOJ ran out of room for maneuver when the

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[7] Andrew Coleman has suggested that the author document the negative effects from deflation.

[8] This Figure also implies that the general price level has to rise dramatically if the BOJ does not absorb the monetary base in the face of rising prices.   In order to increase the demand for base money to the actual level at the end of 2003, prices have to rise by about 150 percent.   If the BOJ monetizes all the government debts amounting to 170 percent of GDP, the general price level will be about 20 times higher than the current level under a new equilibrium.

deflation rate fell to minus 1.23 percent (1.23=2.22/1.81).   The Bank faced the zero lower bound of the nominal interest rate.   If the BOJ could have used a negative policy interest rate, it would have set its policy interest rate at minus 0.5 percent under the 1.5 percent GDP deflator deflation rate that was reached in the first half of 2004.

In spite of the aggressive increase in the monetary base, real interest rates have risen somewhat from the trough of mid 1998.   Figure 8 shows nominal and real interest rates since 1986, together with 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 borrower, while 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 rose somewhat because of the acceleration of deflation.

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, less than 50 base points.   By the mid 1990s, the gap increased to over 150 base points.   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 regulated deposits in the early 1990s.   As the market rates fell towards zero in the 1990s, banks had to raise loan rates to maintain profit margins.   The real new lending rate is about 3 percent and close to the booming bubble period in the late 1980s.   Even the real call rate is about 1.5 percent, which is higher than the real short-term market rate in United States.   The high real cost of funding for SMEs is depressing economic activity.

Japan may be on the verge of entering a deflationary trap.   A further increase in the real interest rates due to deflation may depress the economy.   The depressed economy, in turn, may accelerate deflation, and the real interest rates may rise further as a result.   An open market purchase of long-term government bonds is only marginally effective because long-term interest rates are already extremely low, and the BOJ cannot push down long-term rates in any significant amount.

The extremely large budget deficit also makes it very difficult to use fiscal policy to

stimulate the economy. Table 1 shows the budgetary situation of the general government of Japan that includes the central government, local government, and the social security fund. The debt-GDP ratio was already 158 percent at the end of 2003. With an extremely large budget deficit and declining nominal GDP, this ratio is likely to increase by 8 points a year. The gross debt of the general government will reach 200 percent by 2008. Moreover, these figures do not include off-balance-sheet liabilities such as the failing national pension system and loss-making government owned companies.

At the time of writing (January 2005), the Japanese yen government bond (JGB) is rated AA- by Standard & Poor's and A2 by Moody's. These are the lowest ratings among major countries. If the Japanese government cannot stabilize the macro economy by stopping deflation, the JGB will be downgraded further. In that event, the government will have to shift its 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 to a sharp rise in interest rates. Such downgrading of the government bonds would adversely affect the international operations of private financial institutions and corporations.

Furthermore, even a mild capital flight from Japan could lead to fiscal crisis. If the Japanese household sector shifts six percent of the 1400 trillion yen gross financial assets from the yen to foreign currencies, it would wipe out all of the 820 billion US dollar foreign exchange reserve of Japan. A capital flight from Japan might cure its deflation with a sharp devaluation of the yen. However, the exit of Japan from deflation may trigger a budgetary crisis if it comes too late.[9] 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 higher interest income in the short run under increasing interest rates. A 5 percent rise in the interest rate will increase the annual net interest payments by 10 percent of GDP or 50 trillion yen in two years. This figure is more than the size of the total national government tax revenue excluding social security

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[9] A capital flight is less damaging for creditor countries than for debtor countries. A depreciation of the domestic currency usually generates capital gains for creditors and capital losses for debtors. Since Japan is a creditor country, the capital gains will outwait the capital losses in the event of a capital flight.

contributions.[10]

One possible scenario is shown in Table 2. As budget deficits continue, 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 may fail, Japanese investors will gradually lose confidence in the Japanese government and start to shift assets to foreign currencies and real assets. The yen may start to depreciate 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 BOJ may start to raise short-term interest rates to stop the acceleration of inflation. However, the Japanese government will face a massive increase in its debt service due to a shortened liability structure. The Japanese government may face a sharp down-grading of its credit ratings and interest rates may rise further. In that event, the BOJ will be forced to print money to sustain the government. In the meantime, the simultaneous devaluation of Asian currencies may even drag the United States into a deep recession.

4. MONETARY POLICY TO OVERCOME DEFLATIONARY TRAP

Given that the Japanese economy is experiencing an economic recovery, it might be able to get out of this deflation without strong policy measures. However, if it cannot exit from deflation with this recovery, it may be necessary to apply a very strong policy package to get out form this deflationary trap before it is too late. Since short-term interest rates are already zero, traditional monetary policy tools are no longer very effective. In order to avoid prolonged stagnation and the rapid deterioration of the budgetary situations of the Japanese government, it is necessary then to implement non-traditional policy measures. My proposals are as follows.

1. Open Market Purchase of Real Assets

First the BOJ should set and announce to the public a target for price stability (inflation

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[10]   See Fukao and Japan Center for Economic Research (2003).

target) of around 1.5 percent of consumer price inflation plus/minus 1 percent per year for a three-year time horizon. To achieve this target, laws must be amended to allow the BOJ 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 REITs (real estate investment trusts) up to a few trillion yen per month. Since the outstanding amounts of ETFs and REITs are 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 change the expectations on future inflation rate to a positive number, the deflation is likely to stop. However, if Japanese investors continue to buy government backed assets, the flow price deflation will continue. Since 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 may fail to work.

2. Negative Interest Rate Policy by Gesell Tax

If the ETF and REIT operations do not stop deflation, then the interest rate has to be made "negative" by taxing the balances of all government-backed financial assets such as bank deposits, government bonds, postal savings, cash, etc., at a rate that is slightly higher than the deflation rate until deflation is stopped. Investments should be encouraged in stocks and real estate by taxing cash and bank deposits. The tax rate should be somewhat higher than the rate of deflation and the government should 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.[11] Goodfriend (2000) has proposed to levy a carry-tax on cash as an effective measure to stop deflation. Details of my proposal are shown in Table 3. While Gesell proposed to levy a tax only on cash, I am proposing to levy a tax on all government-guaranteed financial assets. Instead of

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[11] Gesell proposed to levy a 0.1 percent stamp duty on bank notes every week. The annual tax rate would be 5.1 percent of the face value. At the end of the year, a note with 51 stamps would be exchanged for a new note. See Gesell (1906), part IV. This proposal is also described in chapter 23 of Keynes (1936).

cumbersome stamp duty, I am proposing to charge fees to exchange old bank notes with new ones.

The government has to levy a tax on the balance of all government guaranteed financial assets. Taxable assets include all central and local government liabilities, all government guaranteed assets such as postal saving deposits and postal life insurance policies, and all 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, banknotes should be taxed. In order to tax cash, the BOJ has to print new bank notes and levy fees for exchange. Alternatively, the government can levy a stamp duty on old bank notes.

Buiter (2004) has argued that it is not necessary to levy a tax on all government guaranteed financial assets. Instead, he proposed that the central bank should monetize all government debts, and a tax should be levied only on base money to avoid legal complications. However, Buiter's procedure is possible only when nobody expects such a future tax. If the private sector anticipates a new tax on base money, the market prices of non-taxable government assets will rise relative to the base money by the amount of the expected tax rate. Moreover, people will shift their portfolios away from the base money to near-monies such as treasury bills and bank deposits. Therefore, we cannot avoid taxing all the government guaranteed financial assets to achieve the necessary expansionary effects from the Gesell tax.

This tax will have very strong effects on expenditures. Table 4 summaries the effects of this policy. People will shift from "safe" assets to risky assets. In other words, people will shift from taxable assets to all the non-taxable assets. Since stocks, real estate, 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 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 30 trillion yen (about 6 percent of Japan's GPD). The government could make use of the tax

revenue to reduce its budget deficit, re-capitalize deposit insurance funds, or improve its anti-unemployment policy.

There are a number of negative side effects of this policy. First, this tax may have a possible adverse effect on the credit rating of the Japanese government. For example, Moody's Investors Service states that an imposition of a tax on government liabilities may constitute an event of partial default by the government.[12] However, this is a relatively minor problem because only a small portion of JGB (about 3.6 percent at the end of 2003) is held by foreign investors. Second, it will be very difficult to pass a new law to levy this tax. New taxes are always opposed by the public. One way to sweeten this medicine is to distribute cash to all the Japanese people. A cash distribution of JPY 50,000 per person will offset the 2 percent tax on JPY 2,500,000. The cost of this cash rebate is about JPY 6 trillion or one-fifth of the tax revenue. Third, many financial institutions such as banks or life-insurance companies face a large tax bill because they hold large amounts of government bonds with liabilities of nominally fixed values. One way to compensate these financial institutions is to reduce deposit insurance corporation fees and insurance policyholder protection organization fees. By using a part of the tax revenue to fund these financial safety-net organizations, the government can provide financial relief to banks and life-insurance companies.

Once deflation is overcome, conventional interest rate policy will become useful again. The BOJ can maintain relatively low real interest rates at the shorter end of the term structure. The environment for new business will improve. Commercial banks can increase profit margins without raising real borrowing costs for customers. Life insurance companies will be able to overcome negative carryover from old insurance contracts with high guaranteed rates.[13] The big upward shifts in the expectations on the 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 problems in the banking sector.

We also have to take note of the negative side effects of the exit from deflation. The

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[12] On the other hand, Moody's does not regard inflation, even hyper inflation, as an event of default even though the government is effectively reducing the real value of its debt.

[13] See Fukao (2002) on the life-insurance business in Japan.

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.

5. CONCLUDING REMARKS

In this paper, I have analyzed the causes of the persistent deflation in Japan. It was found that deflation had accelerated from 1995 to 1999 and has remained at about 1.5 percent since then. Because of the deflation, real interest rates are relatively high for the stagnant Japanese economy and conventional monetary policy tools are now much less potent. I propose that the BOJ should buy large amounts of ETFs and REITs to fight against deflation. If this measure is not effective, the government should introduce a negative interest rate by levying a tax on all the government guaranteed financial assets.

I do not propose a massive open-market purchase of long-term government bonds. This is because an excessive amount of open-market purchases may cripple the soundness of the BOJ. Table 5 illustrates this problem. Suppose the Bank bought one-half of the outstanding long-term government bonds held by the private sector, 150 trillion yen of JGBs, on top of the portfolio of March 2004, and it increased the current deposits held by banks. Suppose further that Japan finally gets out of deflation and the long-term market rates rise to 5 percent. A four percentage point rise in the long-term rate will reduce the market value of 10-year JGB by almost 30 percent. Once the deflation ends, the BOJ has to raise short-term interest rates by mopping up excess liquidity in the short-term money market. As seen in Figure 6, 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 BOJ will run out of saleable assets due to the capital loss in its long-term bonds. As shown in Table 5, the Bank will be forced to issue interest-bearing promissory notes to raise short-term rates from zero. The BOJ has to ask the government to provide a subsidy to cover its operating costs.

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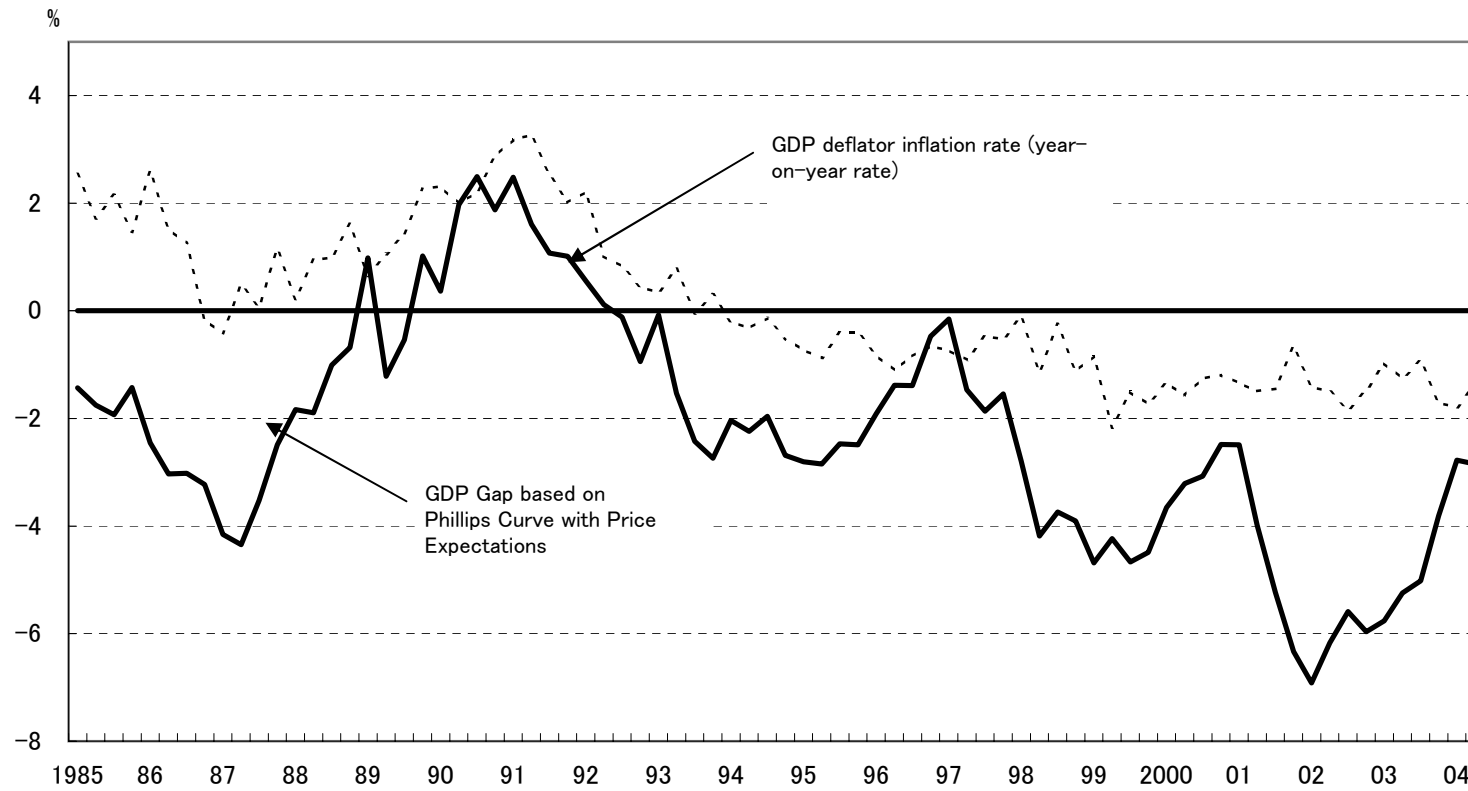
Figure 1
GDP Deflator and CPI (Yearly Change)
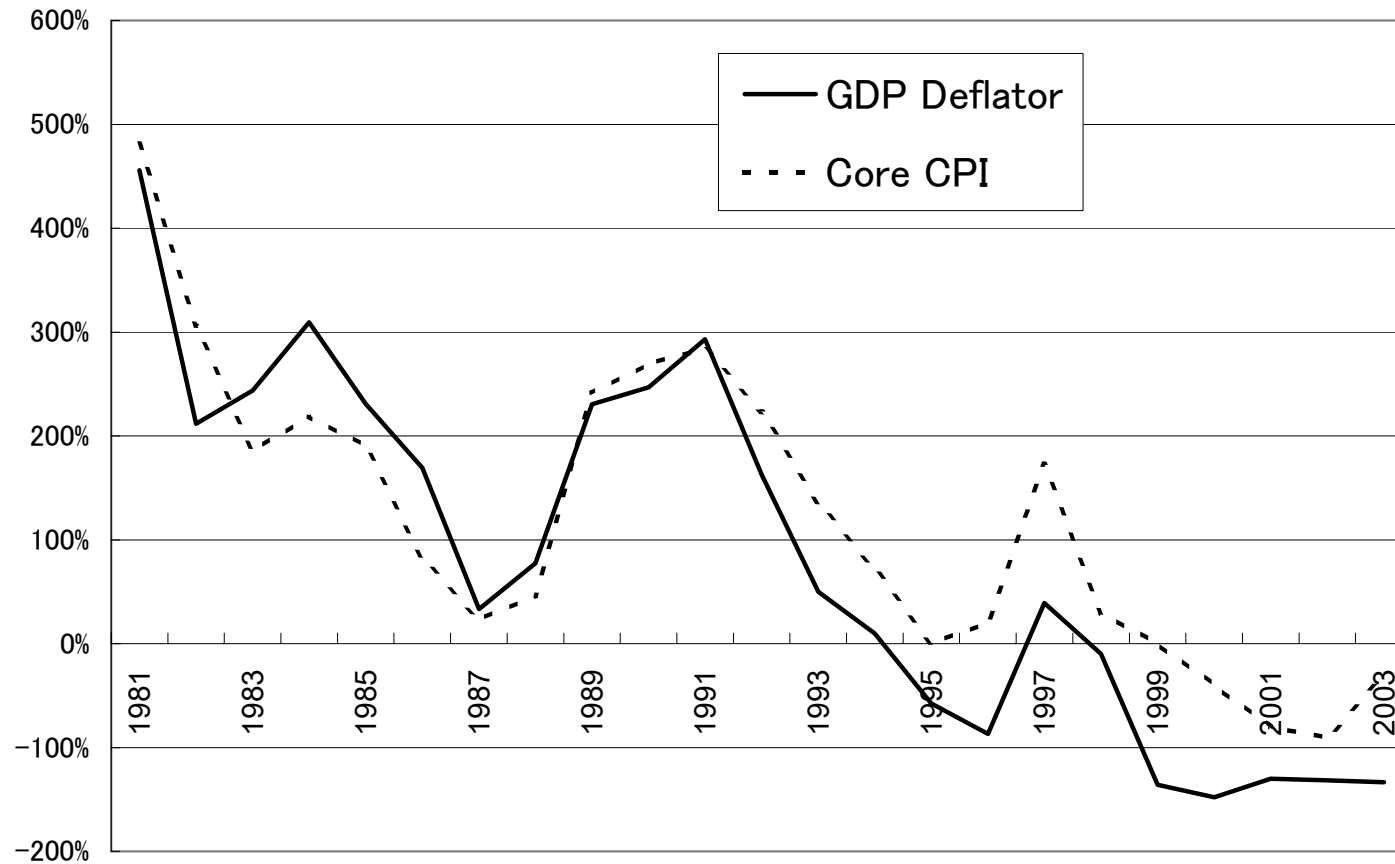
Source: Prepared by the author based on the SNA statistics.

Figure 2
GDP Deflator Price Level (Unadjusted 1995=1.0)

Un-adjusted
GDP Deflator

GDP deflator adjusted
for changes in
consumption tax
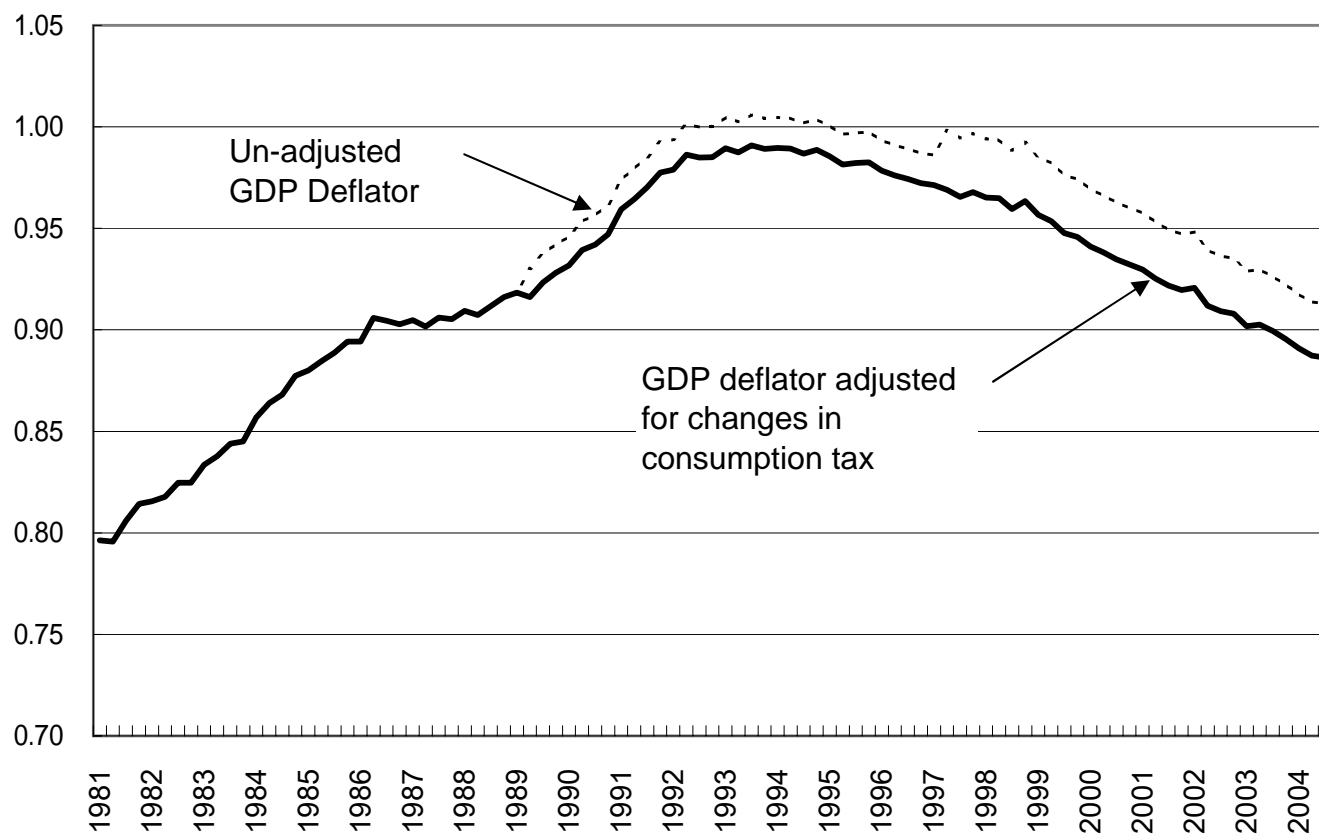
Note: Adjusted for changes in consumption tax in April 1989 and April 1997.
Source: Prepared by the author based on the SNA statistics.

Figure 3
GDP Gap and GDP Deflator

%

GDP deflator inflation rate (year-on-year rate)

GDP Gap based on Phillips Curve with Price Expectations

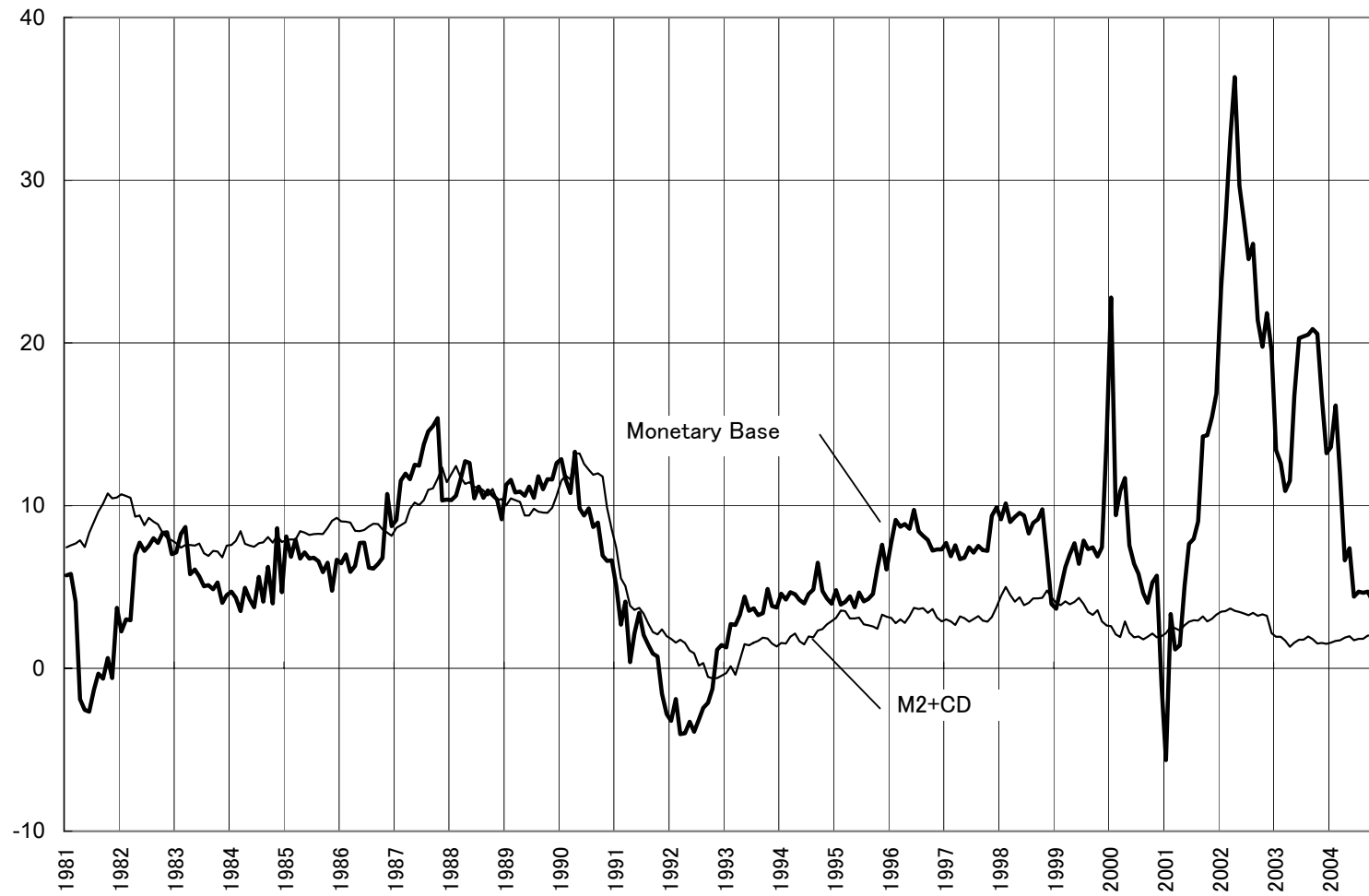1985 86 87 88 89 90 91 92 93 94 95 96 97 98 99 2000 01 02 03 04

Source: Japan Center for Economic Research (2004), Figure 1-23 was updated by the author.

Figure 4
GDP Growth Rate
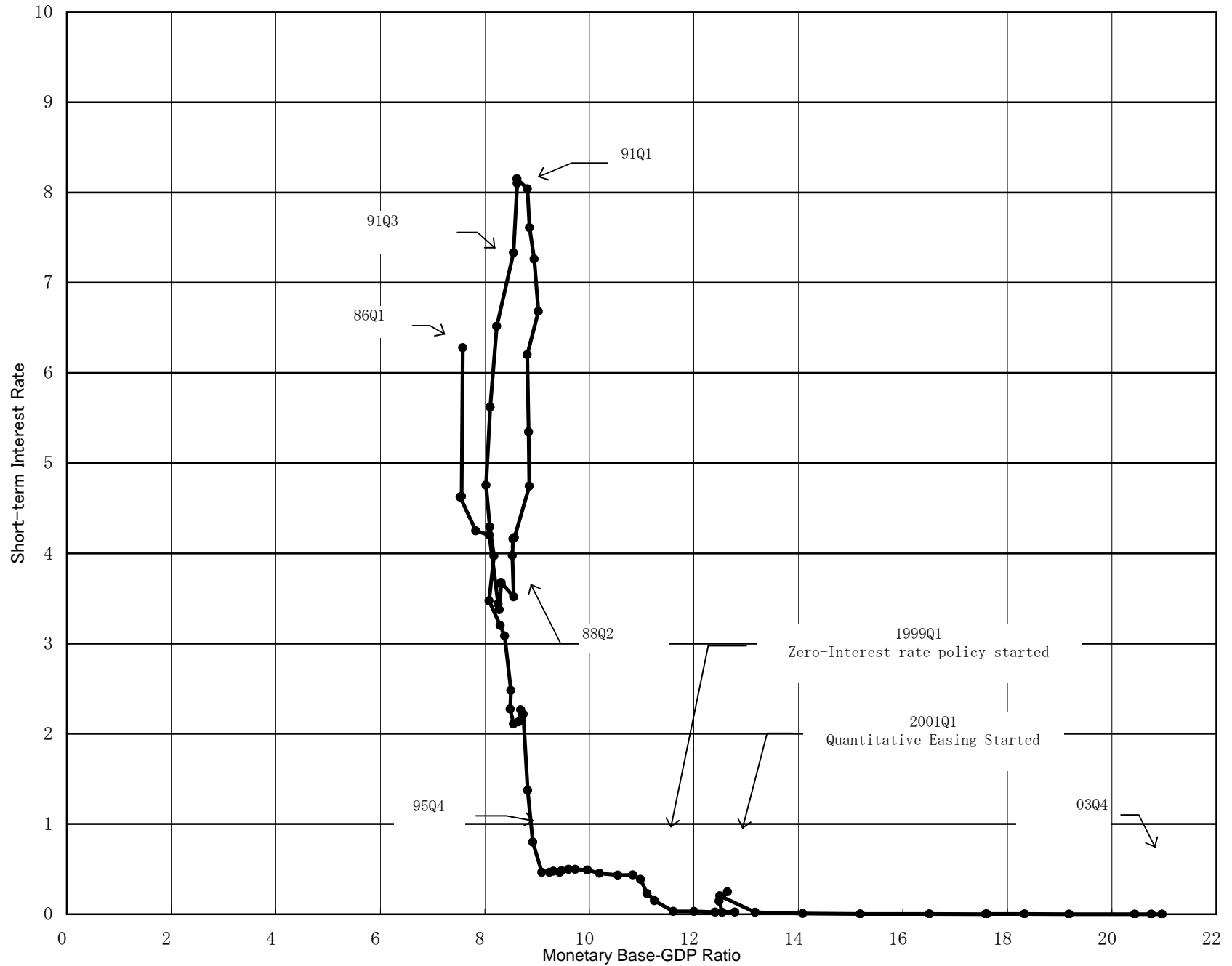
Annual Rate after 3-Quarter Moving Average
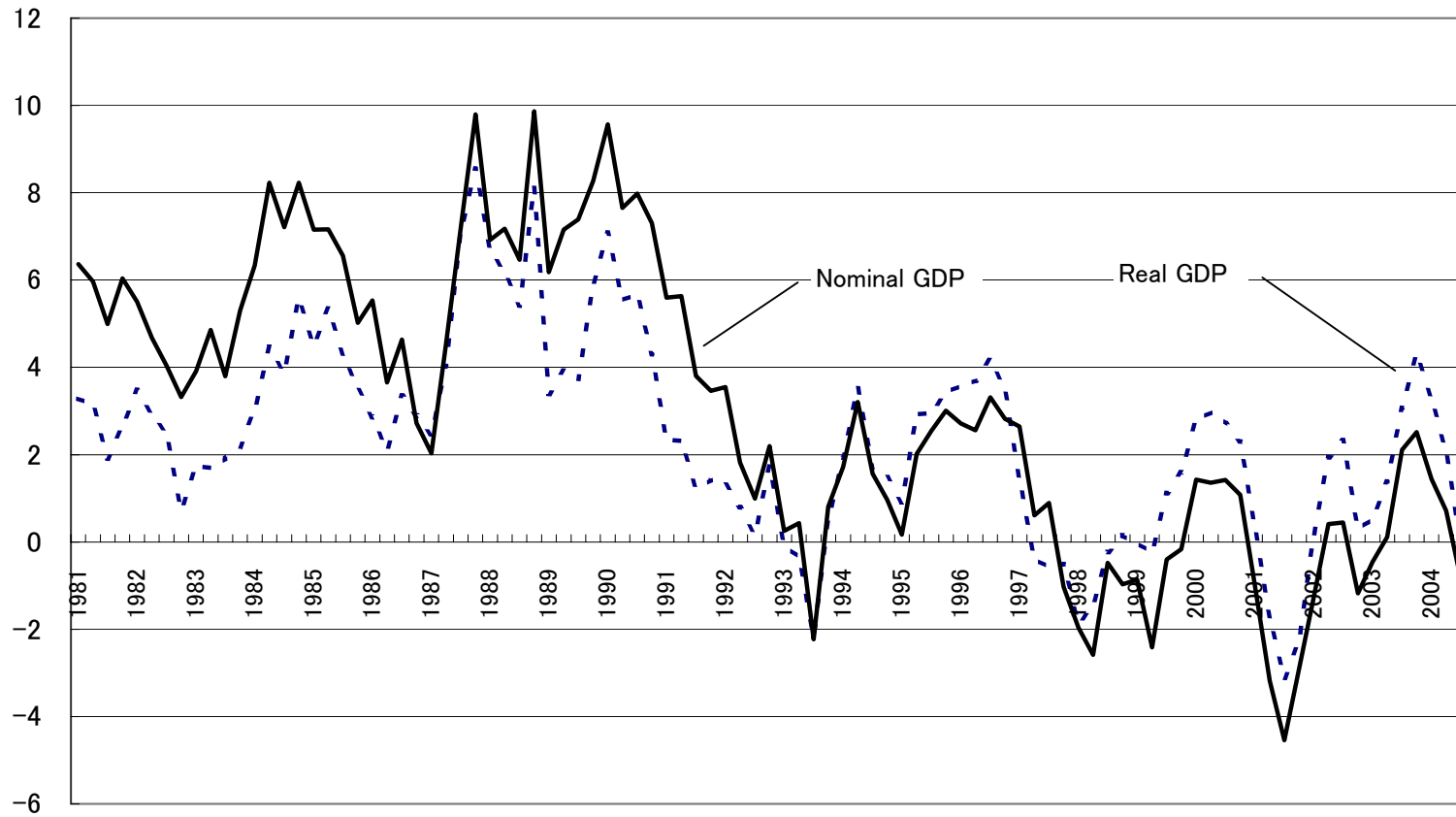
Source: Prepared by the author based on the SNA statistics.

Figure 5
Money Supply Developments

Yearly change in percent

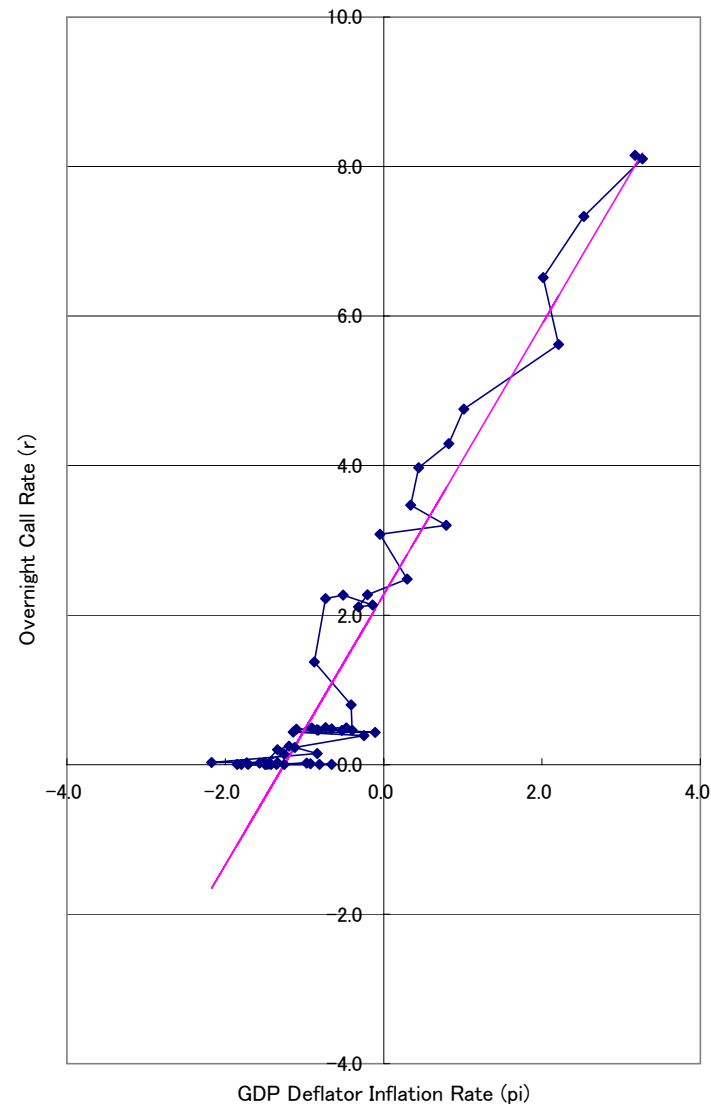Source: Prepared by the author based on the Bank of Japan statistics.

Figure 6
Demand for Monetary Base

Note: The phase diagram plots the nominal- overnight call-money interest rate and the base money-GDP ratio.

Figure 7

Inflation and Short-term Money Rate (1981/Q1-2004/Q3)

OLS regression   1991/1-1999/1
Period: before zero-interest rate policy

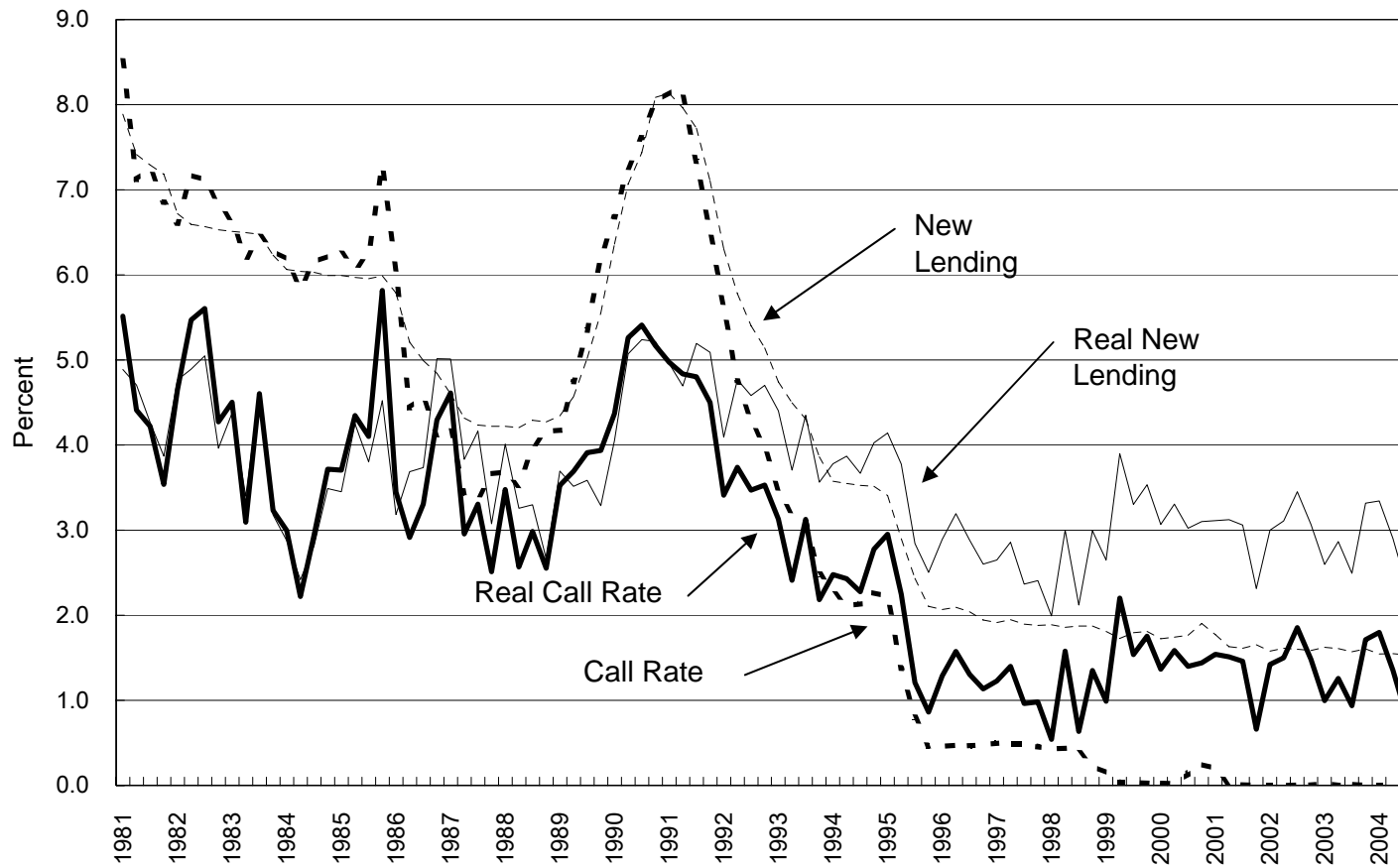r = 2.225 + 1.814 x pi + e   R2 = 0.89
   (16.0)   (15.7)   F = 255.2
                              SE = 0.82

r: Overnight call rate
pi: GDP deflator inflation rate
e: Error term

Real interest rate reaction function
r - pi = 2.225 + 0.814 x pi

Source: Prepared by the author.

Figure 8
Real and Nominal Interest Rates

Note: Real Interest Rates are estimated with 3Q moving average of GDP deflator inflation rate (SAAR).
Source: Prepared by the author based on Bank of Japan statistics and SNA statistics.

Table 1
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	-1.4	-5.8	120.4	36.0	3.5	1.3
2000	0.8	-6.1	130.7	43.5	3.1	1.3
2001	-1.1	-4.7	142.0	51.0	2.8	1.4
2002	-1.5	-6.0	150.2	59.2	2.1	1.2
2003	0.1	-6.3	157.6	66.6	2.1	1.4
2004	0.0	-6.3	165.3	74.3	2.1	1.6
2005	0.0	-6.3	173.2	82.2	2.3	1.9
2006	0.0	-6.3	181.4	90.4	2.7	2.4
2007	0.0	-6.3	190.1	99.1	3.0	3.0
2008	0.0	-6.3	199.4	108.4	4.0	4.3
2009	0.0	-6.3	210.0	119.0	4.0	4.8

Note: Figures until 2003 are based on IMF, *World Economic Outlook* and OECD, *Economic Outlook*.
　　General government gross assets are assumed to be constant after 2002.
　　　Sharp downgradings of JGB are assumed after 2006.
Source: Prepared by the author.

Table 2
Capital Flight Scenario

1. Large amounts 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 gets out of deflation. and the BOJ tries to
   raise interest rates to stop the acceleration of inflation.

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

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

8. The BOJ will be forced to print money to sustain the government.

Source: Prepared by the author.

Table 3
Proposed Gesell Tax on Government Guaranteed Assets

1. Levy tax on all 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 repeatedly as long as deflation continues.

2. Taxable assets are as follows:
   All central and local government liabilities.
     Central and local government bonds and other liabilities.
   All 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 BOJ has to print new bank notes and levy fees for
   exchange.
   Alternatively, levy stamp duty on old bank notes.

Source: Prepared by the author.

Table 4
Effects of Gesell Tax

1. Asset substitution
   People shift assets from "safe" assets to risky assets.
     From taxable assets to all non-taxable assets, which include:
     Stocks, real estate, corporate bonds, foreign bonds, and
     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 expected real return on cash and government guaranteed
   deposit will decline because of the cost of taxation.

Source: Prepared by the author.

Table 5
Massive Long-Term Bond Purchase and the Bank of Japan Balance Sheet

Before the Exit from Deflation

The Bank purchases 150 trillion yen of 10 year JGB

150 trillion yen of long-term bonds and the same amount of current
deposits are added to March 2004 figures

Long-term bonds	216	Bank notes	71
Short-term notes	62	Current deposits	186
Other assets	21	Other liabilities	39
		Net assets	3
Total	299	Total	299

After the Exit from Deflation

The long-term interest rate rises by 5 points and long-term bonds
lose 30% of the value

Long-term bonds	151	Bank notes	71
Short-term notes	62	Current deposits	186
Other assets	35	Other liabilities	39
		Net assets	-48
Total	248	Total	248

The BOJ absorbs the excess liquidity by open-market sales of its
of its assets

Long-term bonds	0	Bank notes	35
Short-term notes	0	Current deposits	5
Other assets		Other liabilities	
Gold, real estate		Bills sold	13
and foreign assets	5	Net assets	-48
Total	5	Total	5

Source: Prepared by the author.

Reserve Supply and Short-term Market Rate (Jan 1994-April 2004)
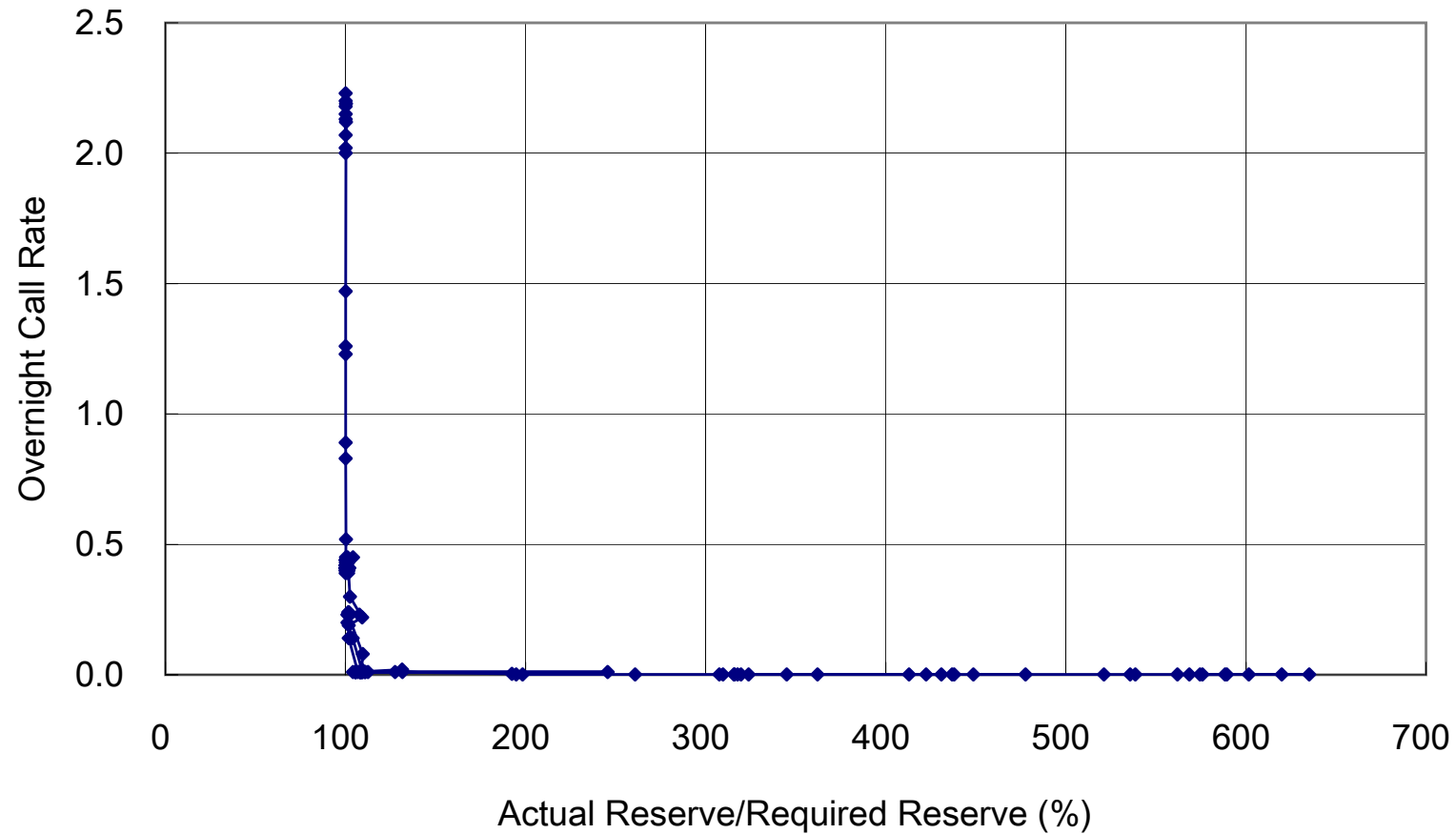
Note: The reserves held by financial institututions that are required to hold reserves at the Bank of Japan are counted as actual reserves.