

Financial Strains and the Zero Lower Bound: The Japanese Experience

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Abstract

In this paper, we analyze the causes of the persistent deflation in Japan by estimating the long-run Phillips curve equation using the GDP deflator and the estimated GDP gap. We also document the conduct of monetary policy in the face of zero lower bound of interest rates. The gradually accelerating deflation has been the origin of the two serious problems of the Japanese economy, the non-performing loan problem and the increasing national debt.

I. Introduction¹

In this paper, we analyze the cause of the persistent deflation in Japan by estimating the long-run Phillips curve equation using the GDP deflator and the estimated GDP gap. We also document the conduct of monetary policy in the face of zero lower bound of interest rates. The gradually accelerating deflation has been the origin of the two serious problems of the Japanese economy, the non-performing loan problem and the increasing national debt.

The profit margin of Japanese banks has been 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. Because of this situation, 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.

National debt has been increasing rapidly. Due to the declining tax revenue and the successive budgetary stimulus packages, the debt-GDP ratio had reached 157 percent by the end of 2003. With extremely large budget deficit and declining nominal GDP, this ratio was increasing by 8 to 9 points a year.

The Japanese economy was in a very serious situation in early 2003. In spite of the zero-interest rate policy by the Bank of Japan, the GDP deflator was falling more than 2 percent per annum. The budget deficit was more than 8 percent of GDP and fiscal consolidation was almost impossible under zero or negative nominal growth. Nikkei 225 stock price index had fallen to only one fifth of its peak in 1989. The capital of major banks and life-insurance companies was running out very quickly due to the increasing non-performing loans and falling stock prices.

¹ An earlier version of this paper was presented at the BIS conference on “Monetary stability, financial stability and the business cycle,” on 28-29 March 2003. The author would like thank helpful comments by Marvin Goodfriend, Oliver Blanchard and other participants of the conference. Correspondence: fukao@fbc.keio.ac.jp

Since short-term interest rates were already zero, conventional monetary policy tools had lost effectiveness. Usually a potent monetary policy weapon, an open market purchase of short-term government papers by the Bank of Japan (BOJ) was no-longer effective because zero-interest base money and zero-interest short-term government papers are now perfect substitutes. Long-term bond yields had fallen to extremely low levels. A further injection of base money was not likely to push down long-term rates further.

Since the spring of 2003, Japanese economy has shown a surprising recovery. While it is very difficult to identify the causes of this turnaround, we can list the possible contributing factors:

(i) The new governor of the Bank of Japan, Mr. Fukui, skillfully used “announcement effects” of monetary policy by showing that he is seriously fighting against deflation. While we could not expect much from the individual policy actions taken by the Bank, Mr. Fukui succeeded to improve the expectations of the Japanese business community. We may call it a “placebo effect” of monetary policy.

(ii) The rescue of failing Resona Bank in the spring of 2003 changed the perceived risk profile of shares of major Japanese banks. When the government nationalized Long-Term Credit Bank of Japan and Nippon Credit Bank in 1998, the shareholders’ equity was wiped out. On the other hand, the government saved the shareholders of Resona Bank with public money when it injected capital to the bank. This rescue operation changed the risk of bank stocks and started a “moral hazard rally” in the market.

(iii) The very rapid expansion of Chinese economy induced an export boom for Japanese manufacturing companies. The Japanese export to China grew about 30 percent in 2003.

(iv) The massive official interventions in the foreign exchange market kept the yen relatively weak. The government bought JPY 32.6 trillion of US dollars (about US\$ 300 billion) in fiscal 2003 that ended March 2004. This is more than 6 percent of Japanese GDP and about twice the value of Japanese current account surplus in the same year.

As a result, the real GDP grew almost 5 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 more than 2 percent per annum and it has not shown any signs of improvement yet at the time of writing. Given the estimated potential growth rate of 1.5 percent, the Japanese economy still faces a risk of having a negative nominal growth in the near future again.

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 2003, 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 12 percent from the peak in early 1994 to the first quarter of 2004.

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.² The estimation was made with the following procedure:

- (1) A Cobb-Douglas production function was estimated with real GDP, labor

² See Japan Center for Economic Research (2004) for the details of the estimation procedure.

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.

$$\ln Y_t = 0.29 \ln K_t + 0.71 \ln L_t + \ln TFP_t$$

Y_t : Real GDP,

K_t : Capital adjusted for capacity utilization,

L_t : Labor input measured by man-hours,

TFP_t : 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 separately because the normal working hours declined due to the changes in the labor-relations 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. Chart 3 shows the estimated potential GDP growth rate that is defined as the changes in the maximum GDP. The potential growth rate for the past 2 years has been about 1.5 percent a year. The large negative labor contribution from 1988 to 94 and from 1997 to 2000 was due to the introduction of five-day workweek. The TFP was estimated from the smoothed residual term of the equation and it has been increasing at about one percent per annum in recent years.

(4) The natural level of the real GDP was calculated from the estimated long-run Phillips Curve relationship (Table 1). At the natural level of GDP, the inflation rate will be steady. If the real GDP is below this natural level, the inflation rate gradually decelerates and becomes negative. If the real GDP is above the natural level, 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. The acceleration parameter under deflation, 0.081 ($0.081 = 0.348 - 0.267$), was only one quarter of the parameter under inflation, 0.348. The natural level GDP is 3.249 point below the potential GDP. This 3.249 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 GDP gap, 3.249, from the unadjusted GDP gap. In the following, we call this adjusted GDP gap as “the GDP gap.”

Chart 4 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 2.5% 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 from 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 reached 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 accelerated. By the last quarter of 2003 (the last data point of Chart 4), the GDP gap had declined to less than 4 percent. Given the 1.4 percent growth in the first quarter of 2004, the GDP gap is probably at 2.5 percent at the time of writing.

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 rely on Fukao (2003) and explain the performance of Japanese banking sector since mid 1990s.

Table 2 shows the profit-loss accounts of all commercial banks. In the ten years from fiscal 1992 to fiscal 2002, banks made around JPY 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 about JPY 3 trillion (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 JPY 13 trillion yen a year (row A + row B).

Total costs – including personnel and other operating expenses – were over JPY 7 trillion (row C). Operating costs declined during 1998-2000 period 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 stunted on improving systems because of the 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 JPY 6 trillion in loan losses each year since fiscal 1994 (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 in some years (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 in increasing 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. Sansei Bank that reduced the loan to small and medium sized firms was ordered to increase such loans by FSA. Because of this situation, banks often disregard the internal model-based required lending margin to make new loans to small companies. Given this poor lending market conditions, Citibank decided to significantly reduce consumer loan business in Japan.³

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.

Table 3 shows the Capital structure of major Japanese banks at the end of March 2003. More than 100 percent of tier I capital of Resona Bank and Mitsui Trust Holdings consists of deferred tax assets (present value of the future tax shelter). More than one-half of the tier I capital of UFJ and Sumitomo-Mitsui Financial Group corresponds to the deferred tax asset. 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.

³ According to March 16, 2003 edition of Japan Economic Journal, Japanese edition, Citibank group would eliminate up-to 500 consumer-loan offices and about 2000 employees by the end of 2003.

Third, friendly life insurance companies hold banks' subordinated debts and bank stocks. The banks, in turn, hold subordinated loans and surplus notes of the life companies. At the end of March 2003, Japanese banks provide JPY 1.9 trillion of capital to 10 major life-insurance companies. On the other hand, 10 major life-insurance companies hold JPY 1.9 trillion yen of banks stocks and JPY 4.4 trillion of subordinated liabilities of banks.⁴ 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.

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 JPY 24.8 trillion of capital on their balance sheet at the end of March 2003, this figure is inflated with JPY 10.6 trillion of deferred-tax assets, JPY 5.4 trillion of under-reserving, and JPY 7.3 trillion of government capital. Removing these amounts, the privately held equity of the banking sector is only JPY 1.5 trillion. This is very small compared to JPY 64.6 trillion of classified loans and JPY 23.2 trillion of stocks held by banks.

In the 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. As we will see in the next section, borrowers are already facing relatively high real interest rates due to gradual acceleration of deflation. Therefore, an increase in the average lending rate is likely to depress the Japanese economy and will aggravate the deflation. In order to avoid this adverse effect, it is necessary to

⁴ See Fukao and Japan Center for Economic Research (2004), p. 133.

raise nominal interest rates 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.

We have to take note of the fact that a simple injection of government capital to weakened banks would not stabilize the banking sector without a bigger lending margin. Loss-making banks will deplete the injected money sooner or later. In order to revitalize the banking sector without aggravating deflation, the government has to do two things: allow banks to obtain enough lending margin that is consistent with the expected credit costs, and reduce real interest rates by stopping deflation.

At the time of writing, we do not have the financial results of all banks for the fiscal year 2003 yet. Given the sharp recovery of stock prices and the improving performance of borrowing firms, we can expect somewhat better results for the fiscal year. Nikkei index rose from 7,973 at the end of March 2003 to 11,715 one year later. This sharp recovery of stock prices would have increased the market value of stocks held by banks by about JPY 11 trillion. The recovery of the economy would also reduce the loan loss figures for most banks. On the other hand, one major bank, Resona, and one regional bank, Ashikaga, were effectively nationalized in 2003. Resona group banks alone lost as much as JPY 1.34 trillion yen for fiscal year 2003 and Ashikaga Banks is likely to announce a large loan loss figure for the same fiscal year. It means that the banking sector is close to the breakeven point but not earning enough profit margins to stand on their own feet. Probably, they have to increase lending margin by about 100 basis points to make their lending reasonably profitable.

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 5). 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 6 shows a phase diagram of monetary base and nominal short-term interest rates since 1986 and it can be regarded as an empirical demand function for monetary base. When the short-term nominal interest rate was between 1 to 8 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 6 clearly shows that Japanese economy has been in a liquidity trap.

Chart 7 shows the reaction function of the Bank of Japan in the face of falling inflation rate. The overnight call rate was reduced in line with the GDP deflator inflation rate. One point fall in deflation rate induced the Bank of Japan to cut nominal rate by 1.8 points thereby reduce the real interest rate by 0.8 points. The Bank of Japan ran out of the room for maneuver when the deflation rate fell down to minus 1.23 percent ($1.23 = 2.21 / 1.80$). The Bank faced the zero lower bound of nominal interest rate.

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 has been in a deflationary trap. High real interest rates due to deflation have been depressing the economy. The depressed economy, in turn, has accelerated the deflation and the real interest rates rose 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 158 percent at the end of 2003. With extremely large budget deficit and stagnant nominal GDP, this ratio is likely to increase by 8 to 9 points a year. The gross debt of general government will reach 200 percent by 2008. 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 these are the lowest ratings among major countries. Unless the Japanese economy can get out of deflation with the current economic recovery, I expect that the JGB will be downgraded further. 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 Japanese financial institutions and companies. Since sovereign credit rating usually sets the ceiling rate for private companies, they will face a rising funding cost in international financial markets.

IV. Concluding Remarks

In this paper, we analyzed the causes 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.

As we have explained in the introduction, Japanese economy started to recover in 2003 due to the succession of propitious events. If the economy can overcome deflation with this recovery, the Japanese episode of zero-interest rate will be over. However, we economist has to think hard to come up with a monetary policy instruments that will be effective even under a deflation. One such instrument is the idea of Gesell tax or famous stamp duty on money.⁵ By levying tax on the outstanding amount of government guaranteed financial asset, it is possible to set nominal return on safe assets at a negative number. In other words, it is possible to overcome zero lower bound on nominal interest rates by introducing a new tax on a part of financial assets.

⁵ See Chapter 23 of Keynes (1936).

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Chart 1 CPI and GDP Deflator Deflation Rates

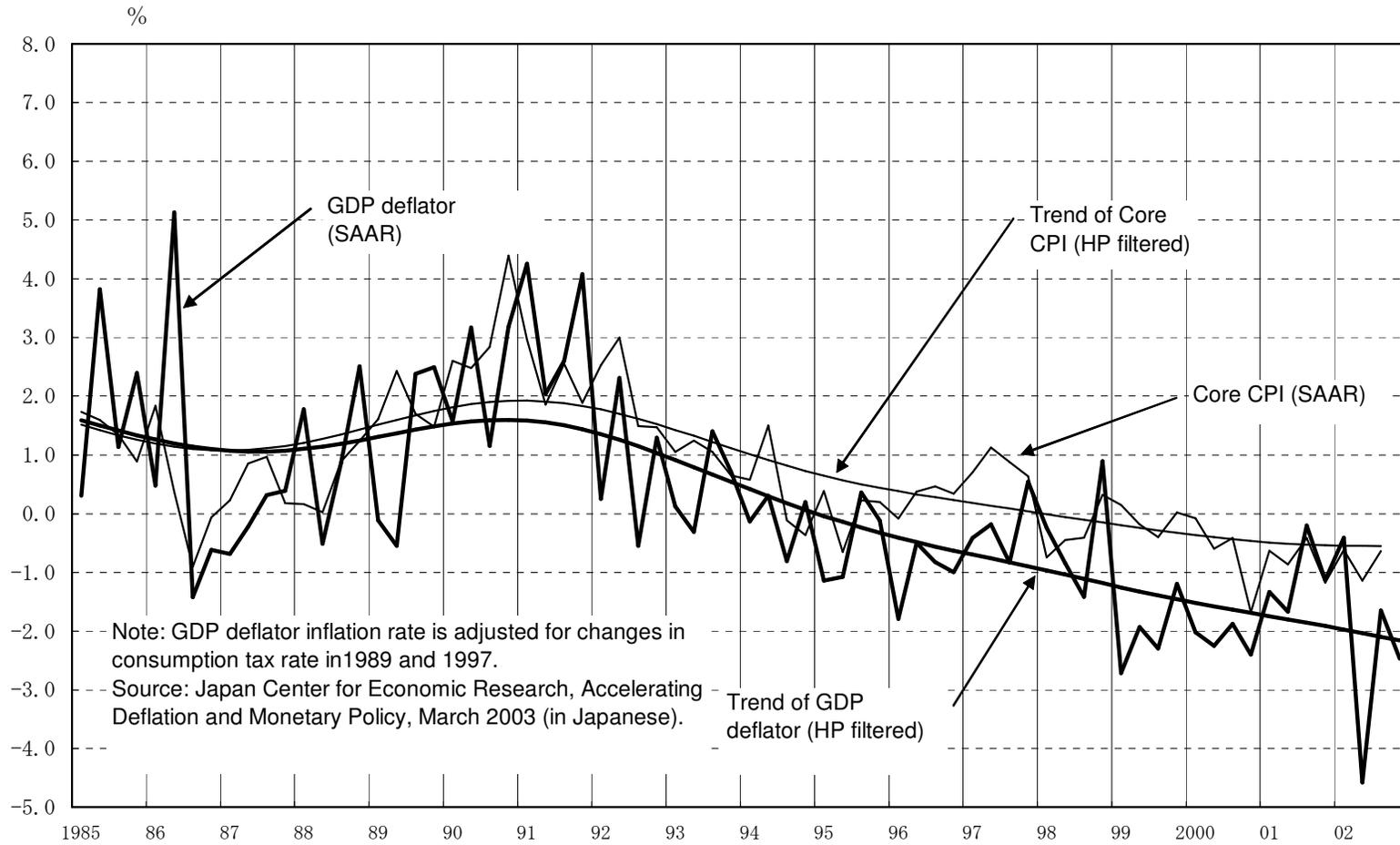
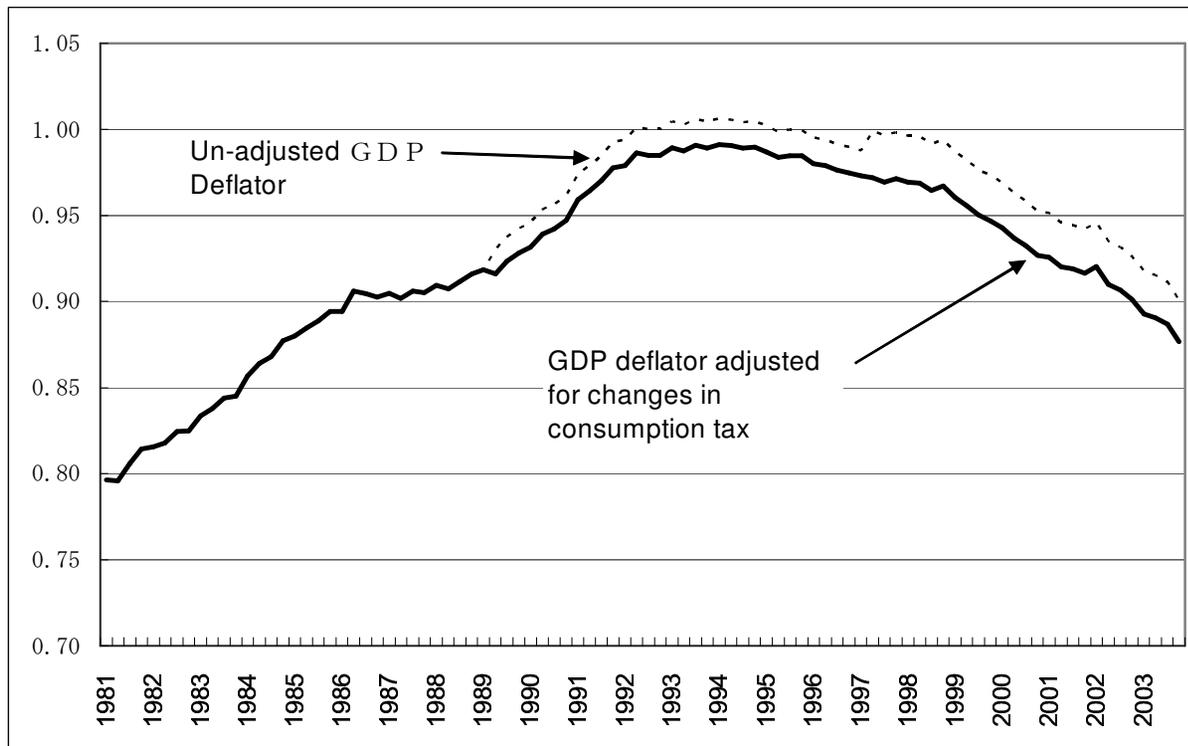


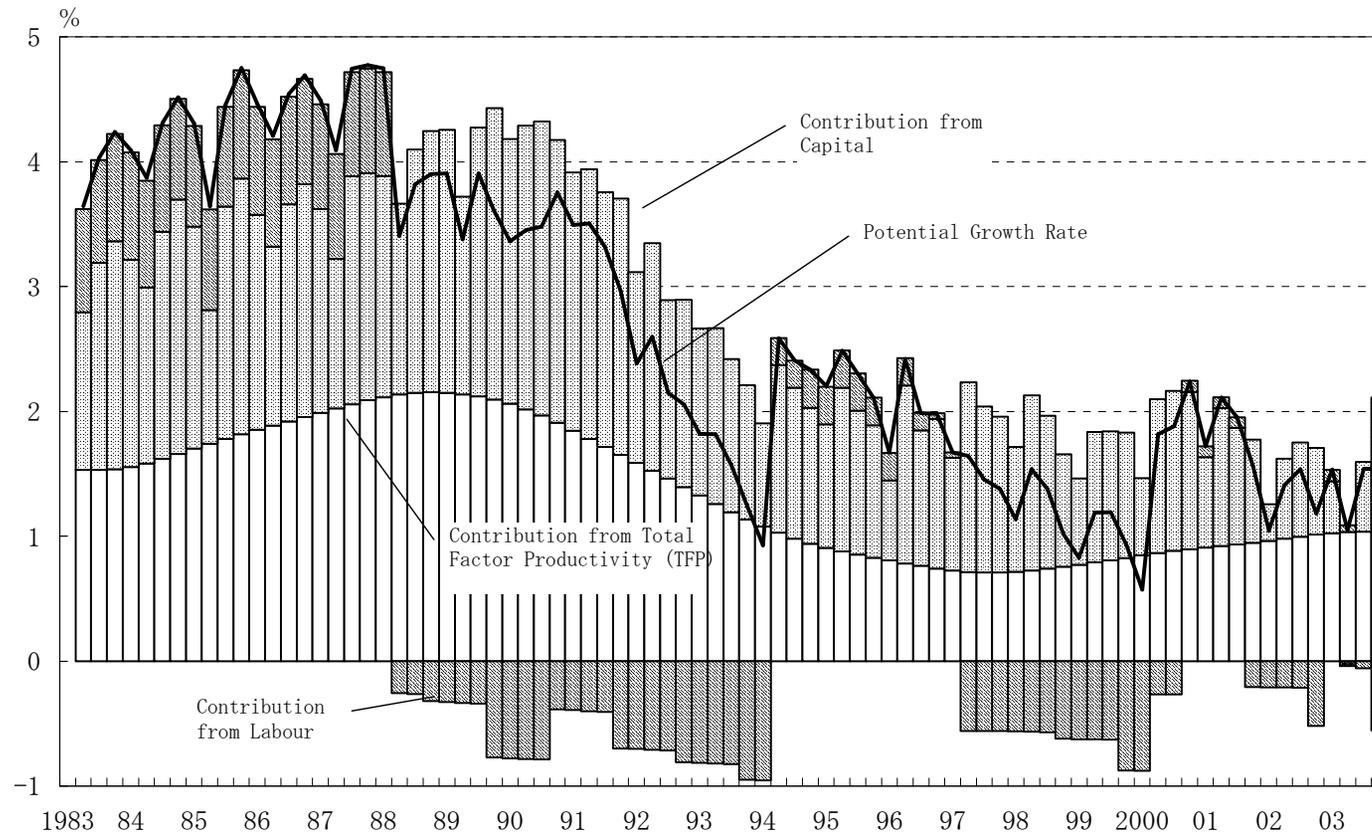
Chart 2 GDP Deflator Price Level (Unadjusted 1995=1.0)



Note: Adjusted for changes in consumption tax in April 1989 and April 1997.

Chart 3

Potential Growth Rate



Source: Japan Center for Economic Research (2004): Economic Analysis of Deflation, Yen Appreciation, and Long-Term Interest Rates, Financial Research Report No. 10, in Japanese.

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.

$$\pi_t = 0.551 \times \sum_{i=1}^4 \pi_{t-i} / 4 + 0.449 \times \sum_{i=5}^8 \pi_{t-i} / 4 + 0.348 \times (G_t - (-3.249))$$

(2.51) (2.46) (2.23) (4.13)

$$- 0.267 \times DUM \times (G_t - (-3.249)) + \varepsilon_t$$

(1.69)

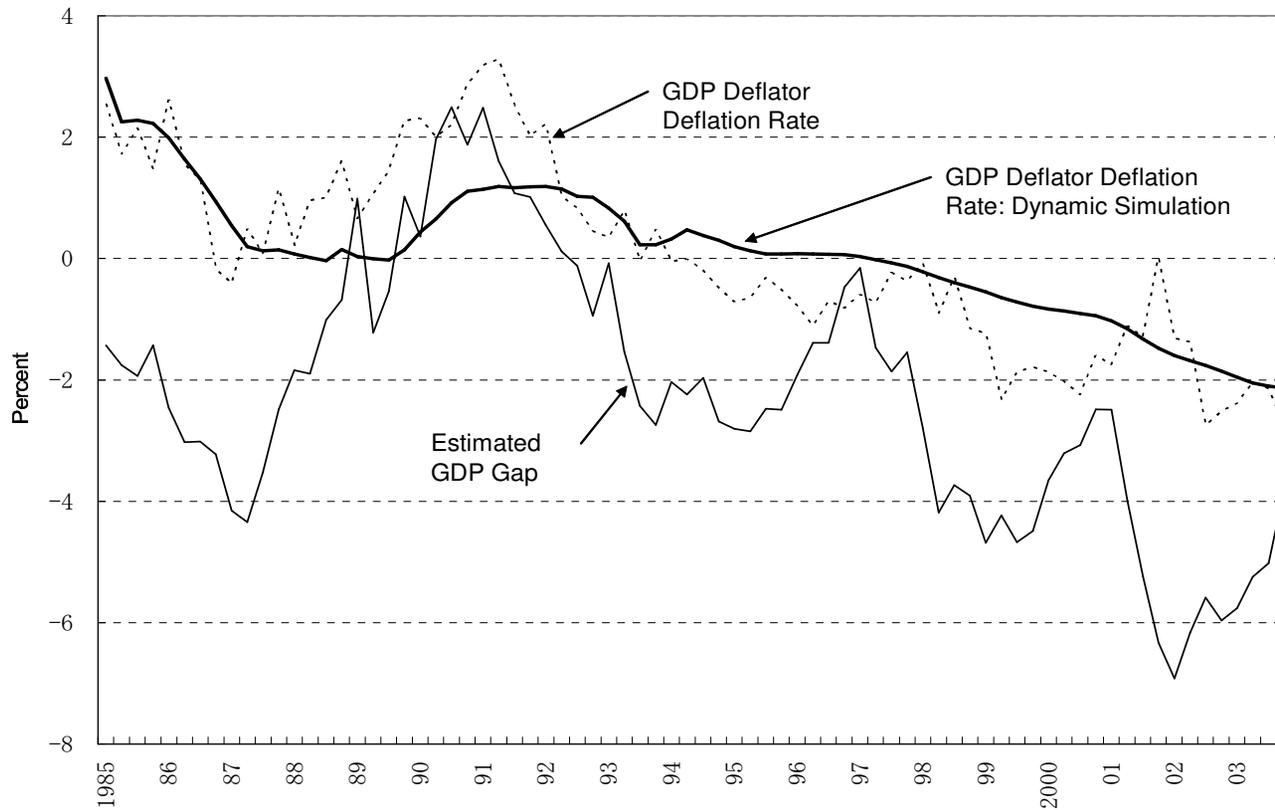
Adjusted R²=0.43, SE=1.47

Estimation Period: 1985/Q1-2003/Q4

Source: Japan Center for Economic Research (2004): *Economic Analysis of Deflation, Yen Appreciation, and Long-Term Interest Rates*, Financial Research Report No. 10, in Japanese.

Chart 4

Estimated GDP Gap and Deflation Rate



Source: Japan Center for Economic Research (2004): Economic Analysis of Deflation, Yen Appreciation, and Long-Term Interest Rates, Financial Research Report No. 10, in Japanese.

Table 2

Profitability of Japanese Banking Sector

Trillion yen

Financial Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Lending Margin (A)	7.1	8.9	9.8	9.2	9.7	10.8	10.7	10.0	9.6	9.7	9.4	9.8	9.4
Other Revenue (B)	2.6	2.2	2.5	2.8	2.1	3.3	3.7	3.6	3.1	2.5	3.0	3.1	3.6
Operating Costs (C)	7.1	7.5	7.7	7.7	7.8	7.8	8.0	8.0	7.5	7.3	7.1	7.0	7.0
Salaries and Wages	3.7	3.9	4.0	4.0	4.0	4.0	4.0	4.0	3.6	3.5	3.4	3.2	2.8
Gross Profit (D)=(A)+(B)-(C)	2.6	3.5	4.5	4.3	4.0	6.3	6.4	5.6	5.2	4.9	5.3	5.9	6.0
Loan Loss (E)	0.8	1.0	2.0	4.6	6.2	13.3	7.3	13.5	13.5	6.3	6.6	9.4	7.0
Net Operating Profit (F)=(D)-(E)	1.8	2.5	2.5	-0.4	-2.2	-7.0	-1.0	-7.9	-8.3	-1.4	-1.3	-3.5	-1.0
Realized Capital Gains (G)	2.0	0.7	0.0	2.0	3.2	4.4	1.2	3.6	1.4	3.8	1.4	-2.4	-4.1
Net Profit (F)+(G)	3.8	3.3	2.5	1.7	1.0	-2.6	0.2	-4.2	-6.9	2.3	0.1	-5.9	-5.1
Asset	927.6	914.4	859.5	849.8	845.0	848.2	856.0	848.0	759.7	737.2	804.3	772.0	722.0
Outstanding loans	522.0	537.0	542.0	539.0	539.0	554.0	563.0	536.0	492.0	476.0	474.0	465.0	452.0

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 The Ratio of Deferred Tax Asset in the Core Capital of Major Japanese Bank
March 2003

	Core Capital (A) Billion yen	Net DTA (B) Billion Yen	Ratio (B/A) Percent
Mitsubishi Tokyo Financial Group	3,338	1,303	39.0
UFJ Holdings	2,665	1,522	57.1
Resona Holdings	635	522	82.2
Resona Bank	366	401	109.6
Saitama Resona Bank	155	44	28.4
Sumitomo Mitsui Financial Group	3,168	1,842	58.1
Mizuho Financial Group	4,322	2,105	48.7
Mistui Trust Holdings	341	346	101.5

Source: Disclosure materials of individual banks.

Notes: Net DTA means deferred tax assets minus deferred tax liabilities.

Table 4**Stock portfolios and capital in the banking sector**

(trillion yen)

	Market value of shares held by banks	Book value of shares held by banks	Capital account (Core capital)	Deferred tax asset	Estimated Under-reserving	Equity capital held by the government	Net capital Account	Nikkei225 Index
	A	B	C	D	E	F	$C + (A-B) \times 0.6 - D - E - F$	
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
Mar-03	23.2	23.2	24.8	10.6	5.4	7.3	1.5	7973

Source of data: Federation of Bankers Associations of Japan, "Analysis of Bank Financial Statements," various issues.

Notes:

Tables represent amounts on the banking accounts of all banks in Japan.

Estimated under reserving (E) = Required loan loss reserve - Actual loan loss reserve

Required loan loss reserve = 1% of normal loan + 20% of substandard loan + 70% of doubtful loan + 100% of estimated loss loan

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

Chart 5

Money Supply Developments



Chart 6 Demand for Monetary Base

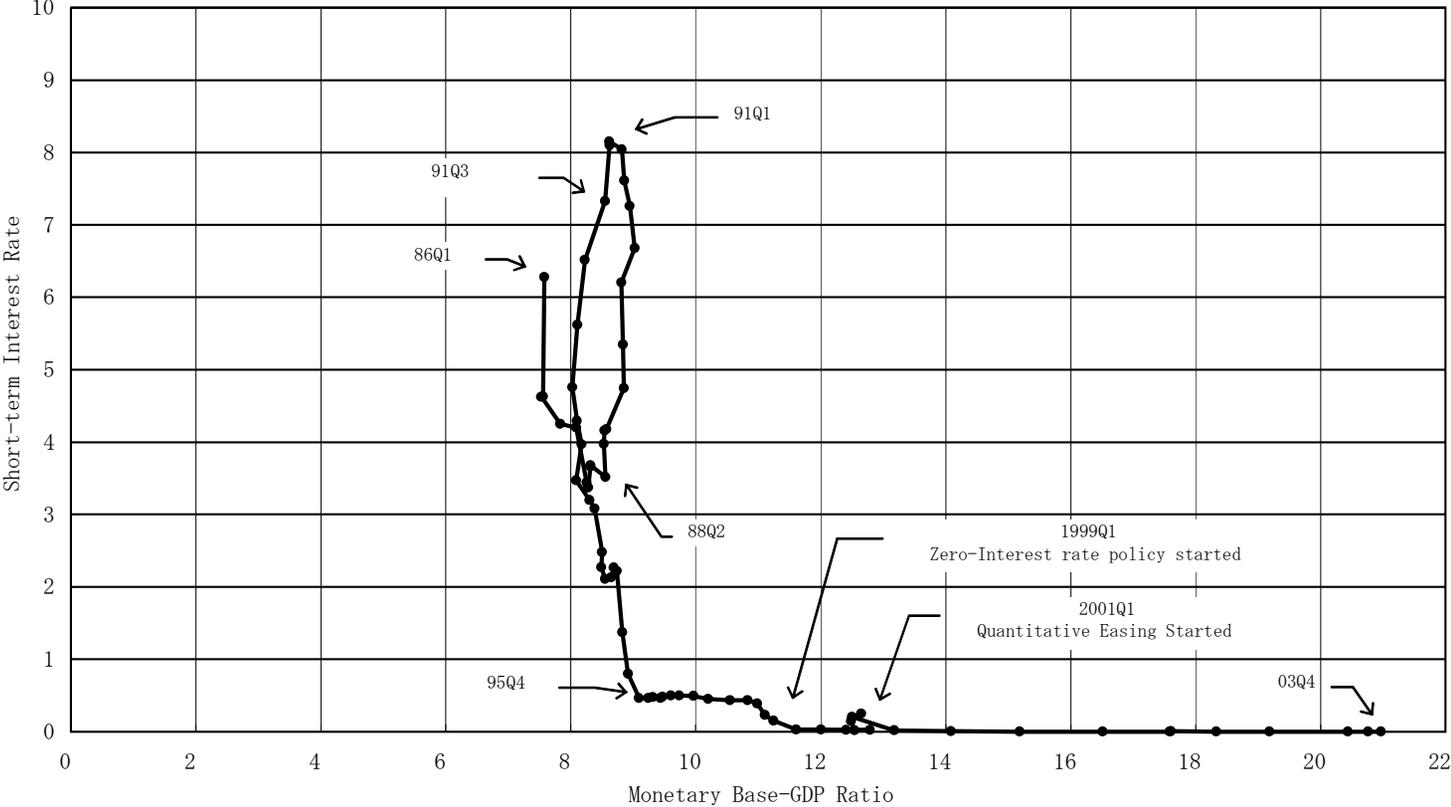
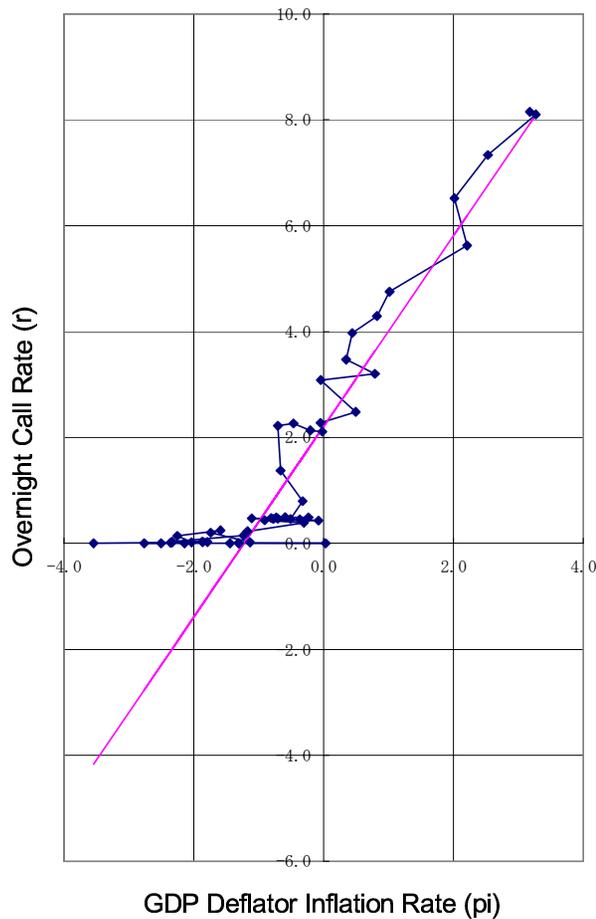


Chart 7 Inflation and Short-term Money Rate (1981-2003)



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

$$r = 2.210 + 1.800 \times \pi + e \quad R^2 = 0.89$$

(15.8) (16.2) F = 261.4
 SE = 0.82

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

Real interest rate reaction function

$$r - \pi = 2.210 + 0.800 \times \pi$$

Chart 8 Real and Nominal Interest Rates

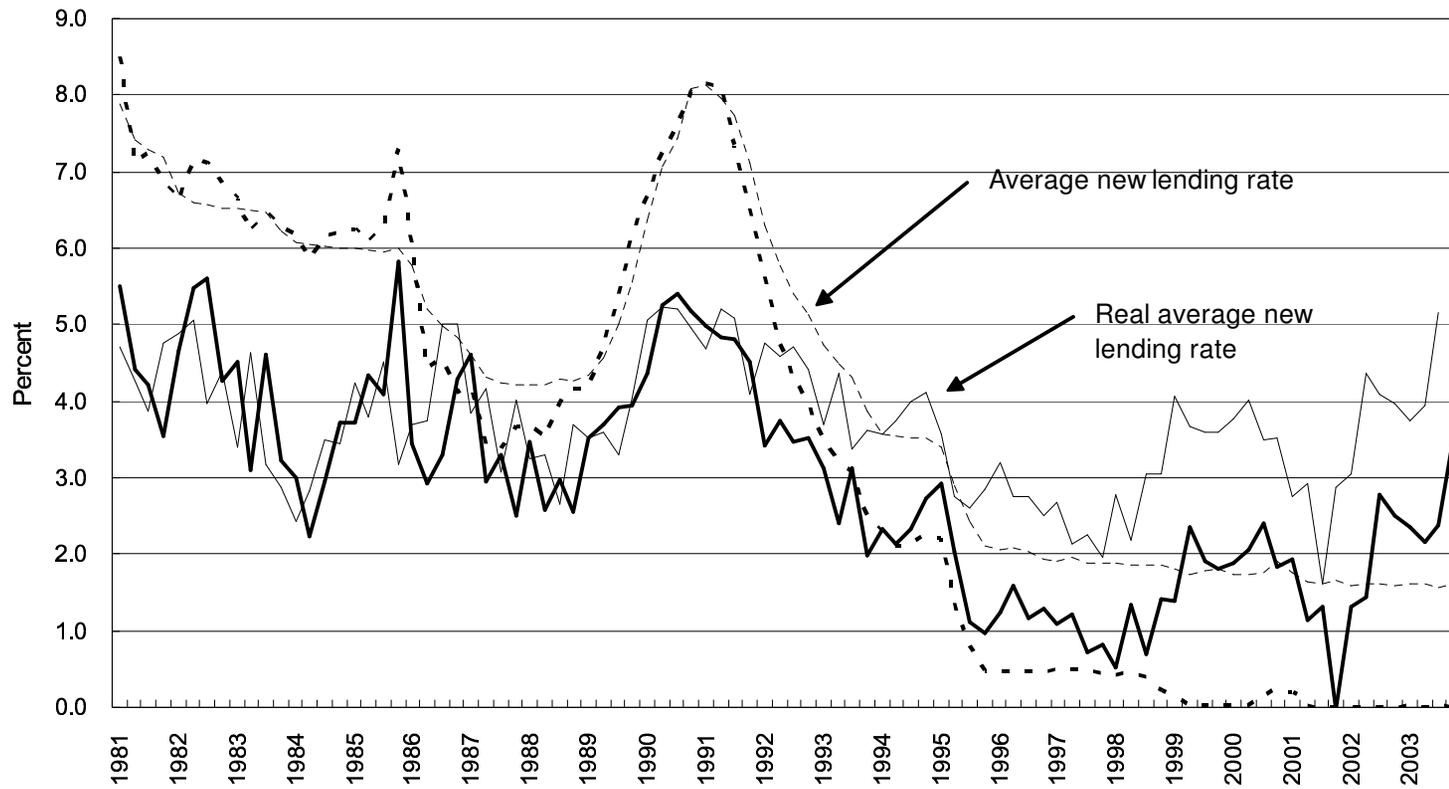


Table 6
Projection on General Government Budget Deficits

Year	Nominal GDP Growth Rate	Primary Balance GDP Ratio	General Governmen Gross Debt GDP Ratio	General Governmen 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 asset is assumed to be constant after 2002.
 Sharp downgradings of JGB are assumed after 2006.**