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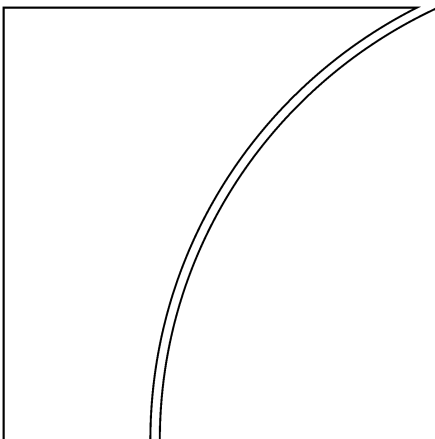
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No 141

Financial strains and the zero lower bound: the Japanese experience

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Abstract

We analyse the case of persistent deflation in Japan by estimating the long-run Phillips curve equation using the GDP deflator and the estimated GDP gap. Then we show that the Japanese banking sector has been losing money since the early 1990s due to the heavy credit cost and that it is quickly running out of capital. The Japanese government has been preventing a banking crisis by providing a blanket guarantee on most banking sector liabilities. However, the government is facing a rapid deterioration of financial conditions due to massive budget deficits and the negative nominal GDP growth in recent years. In spite of the quantitative easing of monetary policy, the traditional interest rate policy has lost its potency due to the zero lower bound of nominal interest rates and accelerating deflation. Without stopping deflation quickly, the Japanese government may face capital flight due to the uncontrolled budget deficit. In order to cope with this unusual situation, two non-traditional policy measures are proposed: massive open market purchases of high-quality real assets and a negative nominal interest policy by levying tax on all government-guaranteed yen financial assets.

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Foreword

On 28-29 March 2003, the BIS held a conference on "Monetary stability, financial stability and the business cycle". This event brought together central bankers, academics and market participants to exchange views on this issue (see the conference programme and list of participants in this document). This paper was presented at the conference. Also included in this publication are the comments by the discussants. The views expressed are those of the author(s) and not those of the BIS. The opening speech at the conference by the BIS General Manager and the prepared remarks of the four participants on the policy panel are being published in a single volume in the BIS Papers series.

Conference on
"Monetary stability,financial stability and the business cycle"
28-29 March 2003, Basel

Conference programme

Opening keynote remarks

Andrew Crockett (Bank for International Settlements)

Session I: The lessons from history

Chair: William White (Bank for International Settlements)

Paper 1: The price level, relative prices and economic stability: aspects of the interwar debate

Author: David Laidler (University of Western Ontario)

Discussants: Olivier Blanchard (Massachusetts Institute of Technology)
                   Nobuhiro Kiyotaki (London School of Economics)

Paper 2: The Great Depression as a credit boom gone wrong

Authors: Barry Eichengreen (University of California, Berkeley)
                     Kris Mitchener (Santa Clara University)

Discussants: Michael Bordo (Rutgers University)
                   Charles Goodhart (London School of Economics)

Session II: Monetary and financial frictions in business fluctuations

Chair: John Moore (London School of Economics)

Paper 3: Public and private information in monetary policy models

Authors: Jeffery Amato (Bank for International Settlements)
                     Hyun Song Shin (London School of Economics)

Discussants: Marvin Goodfriend (Federal Reserve Bank of Richmond)
                   Lars Svensson (Princeton University)

Paper 4: External constraints on monetary policy and the financial accelerator

Authors: Mark Gertler (New York University)
                     Simon Gilchrist (Boston University)
                     Fabio Natalucci (Board of Governors of the Federal Reserve System)

Discussants: Philippe Bacchetta (Study Center Gerzensee)
                   Philip Lowe (Reserve Bank of Australia)

Session III: Monetary policy challenges

Chair: Charles Freedman (Bank of Canada)

Paper 5: Asset prices, financial imbalances and monetary policy: are inflation targets enough?

Author: Charles Bean (Bank of England)

Discussants: Ignazio Visco (Bank of Italy)
                   Sushil Wadhwani (Wadhwani Asset Management LLP)

Paper 6: Financial strains and the zero lower bound: the Japanese experience

Author: Mitsuhiro Fukao (Keio University)

Discussants: Ignazio Angeloni (European Central Bank)
                   Jürgen von Hagen (University of Bonn)

Session IV: Achieving monetary and financial stability

Panel discussion

Chair: Andrew Crockett (Bank for International Settlements)

Panellists: Roger Ferguson (Board of Governors of the Federal Reserve System)
                   Otmar Issing (European Central Bank)
                   Michael Mussa (Institute for International Economics)
                   Yutaka Yamaguchi (formerly Bank of Japan)

Conference on
"Monetary stability,financial stability and the business cycle"
28-29 March 2003, Basel

Participants in the conference

Ignazio Angeloni	European Central Bank
Philippe Bacchetta	Study Center Gerzensee
Armando Baqueiro Cãrdenas	Bank of Mexico
Charles Bean	Bank of England
Olivier J Blanchard	Massachusetts Institute of Technology
Michael Bordo	Rutgers University
Barry Eichengreen	University of California, Berkeley
Charles Freedman	Bank of Canada
Mitsuhiro Fukao	Keio University
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Marvin Goodfriend	Federal Reserve Bank of Richmond
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Otmar Issing	European Central Bank
Nigel Jenkinson	Bank of England
Thomas J Jordan	Swiss National Bank
Nobuhiro Kiyotaki	London School of Economics
David E Laidler	University of Western Ontario
Flemming Larsen	International Monetary Fund
Philip Lowe	Reserve Bank of Australia
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William English	
Andrew Filardo	
Ben Fung (Representative Office for Asia and the Pacific)	

Contents

x

1.   Introduction[1]

Japan's gradually accelerating deflation is the origin of the two serious problems facing the Japanese economy: the non-performing loan problem and the increasing national debt. Regarding the non-performing loan problem, from banks' financial statements 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 climate of mild deflation. Banks' capital base has become insufficient, and since this spring banks' own capital, including public funds, has been almost depleted.

The financial sector problem can be stabilised by using public money. Either by injecting capital into banks or by extending the full government guarantee for deposits, the government can stabilise the fragile financial system. However, a far larger problem will surface in that event: the critical situation of the national debt.

Because of accelerating deflation and rising real interest rates, the Japanese economy is shrinking rapidly. The nominal GDP growth rate for 2002 was –1.7%, and this level of negative growth is likely to continue without very strong policy actions. The gross debt of general government will exceed 200% 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, the lowest ratings among major economies. If the Japanese government cannot stabilise the macroeconomy 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 its funding from long-term bonds to short-term notes so as to reduce interest costs. However, the shortening maturity of JGBs will increase the vulnerability of funding to a sharp rise in interest rates.

Moreover, such downgrading of government bonds would adversely affect the international operations of private financial institutions and corporations. Since a 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 obtain long-term funds from foreign banks even with JGBs as collateral.

Furthermore, even a mild capital flight from Japan could lead to a fiscal crisis if it occurs after the large accumulation of short-term government debts. If the Japanese household sector shifts 4% of gross financial assets from yen to foreign currencies, it may wipe out Japan's entire foreign exchange reserves. A flight of capital from Japan will cure its deflation through a sharp devaluation of the yen. However, Japan's exit from deflation may trigger a budgetary crisis. Suppose that Japan already has 200% 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% rise in interest rates will increase the annual net interest payment by 10% of GDP or ¥50 trillion in two years. This figure is higher than the total national government tax revenue excluding social security contributions.

In order to escape from this deflationary spiral before it is too late, it is necessary to implement 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 2.5%, and the GDP deflation gap is about 5%. This means that we are facing a serious situation where deflation will gradually be accelerating unless GDP is increased by 5% 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 paper by the Bank of Japan (BOJ) is no longer effective because zero interest base money and zero interest short-term government paper are now perfect substitutes. Long-term bond yields have fallen to extremely low levels, less than 1% for 10-year bonds and less than 0.25 basis points for five-year bonds at the end of February 2003. A further injection of base money is not likely to push long-term rates down 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 of future inflation rates. 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 impact.

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% of consumer price inflation plus/minus 1% 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 operations, and purchase real assets such as TOPIX-based mutual funds and REITs (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 the prices of goods and services, the asset price deflation will start again. 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 and cash at a rate 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 exchanging old notes. In times of deflation, people increase 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% tax would amount to about ¥30 trillion. While such a novel tax might cause some confusion, the government could make use of the tax revenue to reduce its budget deficit, recapitalise deposit insurance funds or improve its anti-unemployment policy.

Once deflation is overcome, the nominal interest rate would rise, possibly causing the bankruptcy of corporations with excess debts and the failure 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.

2.   Gradually accelerating deflation

Deflation in Japan is steadily accelerating. Graph 1 shows the GDP deflator and core CPI 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 graph also shows their trends estimated by a 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 the GDP deflator in 1995. The GDP deflator deflation rate has been higher 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 was more than 2% and still accelerating. Graph 2 shows that the general price level measured by the GDP deflator has fallen by about 9% from the peak in early 1994.

The deceleration of inflation in the first half of the 1990s 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. I estimated the size of the GDP gap with the Financial Study Group of the Japan Center for Economic Research based on the conventional production function approach.[2] The estimation was made using the following procedure:

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[2]   See Japan Center for Economic Research (2003) for the details of the estimation procedure.

Graph 1

**CPI and GDP deflator deflation rates
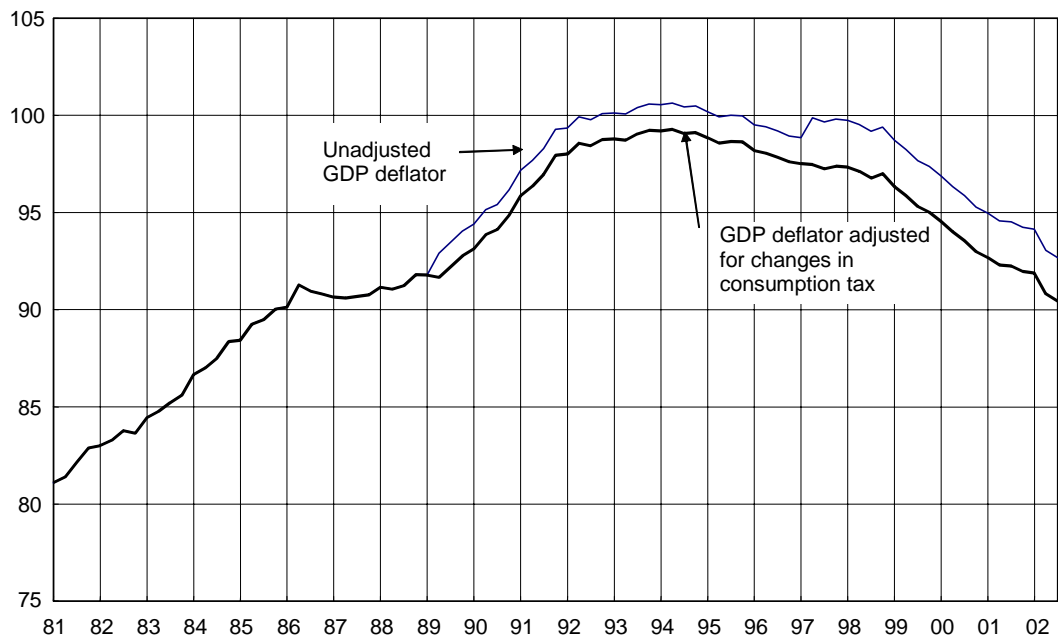(index, 1995 = 100)**
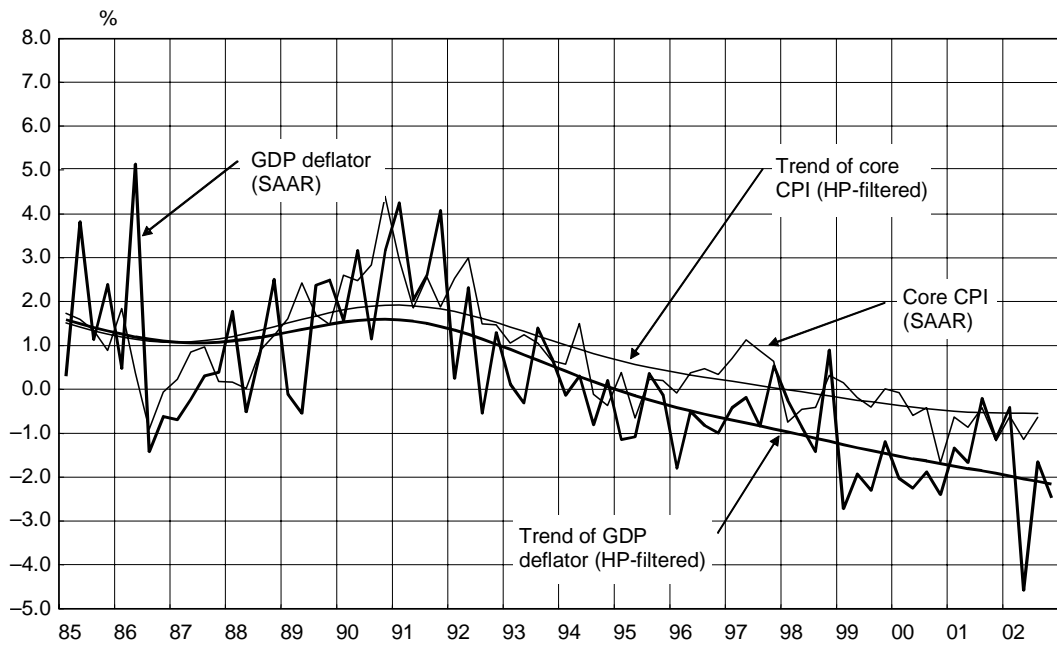
Note: The GDP deflator inflation rate is adjusted for changes in the consumption tax rate in 1989 and 1997.

Source: Japan Center for Economic Research (2003).

Graph 2

Price level developments

Note: The adjusted GDP deflator is adjusted for changes in the consumption tax rate in 1989 and 1997.

Source: Japan Center for Economic Research (2003).

(1)   A Cobb-Douglas production function was estimated with real GDP, labour input (in man-hours) and capital adjusted for capacity utilisation. 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 utilisation

L_t: labour input measured in man-hours

TFP_t: estimated total factor productivity

(2)   The maximum inputs were estimated by connecting the cyclical peaks of the labour hours and capacity utilisation. In this process, the labour force peaks were identified for the working age population and the retirement age population. The working hour peaks were identified for overtime hours and normal working hours separately because the normal working hours declined due to the changes in the labour relations law.

(3)   The maximum production potential is estimated from the production function in (1) and the maximum labour and capital inputs in (2). The gap between this maximum GDP and actual GDP is the unadjusted GDP gap.

(4)   The NAIRU level of 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 real GDP is below this NAIRU level, the inflation rate gradually decelerates and becomes negative. If 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 the deflation rate in the second half of the 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 (= 0.440 – 0.324), was only one quarter of the parameter under inflation, 0.440. NAIRU level GDP is 4.183 points below 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 "the GDP gap".

Graph 3 shows the estimated GDP gap with the GDP deflator inflation rate. Since SAAR data are highly erratic, we used a three-quarter moving average of SAAR series. The GDP gap hit a peak of 2.3% in 1990 and 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 VAT stimulated consumption of consumer durables and housing. However, the gap became very large by mid-1999 due mainly to the financial crisis from autumn 1997 until early 1999. Although capital injections 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 was reaching about 5% of the natural level of GDP in late 2002. If the current level of GDP gap is kept constant, the GDP deflator deflation rate will accelerate by 0.85 points in two years and reach –3.32% by the end of 2004.

This 5% gap means that the government has to push up Japanese GDP by at least 5% to stop the acceleration of deflation. The estimated Keynesian multiplier for tax cuts is about 1.0 and that for public investment about 1.4. In order to close the deflationary gap through conventional income tax cuts, 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 the markets' confidence entirely.

Graphs 4 and 5 check the general movements of the estimated GDP gap by comparing the gap with the overtime hours worked and the capacity utilisation of the manufacturing sector. These graphs show that the estimated GDP gap reasonably reflects the slack in the labour market and the production capacity.

4

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: unadjusted GDP gap.

G^n: natural level of GDP gap.

DUM: dummy variable. From 1985 to 1993, DUM = 0; after 1994, DUM = 1.

$$\pi_t = 0.560 \times \sum_{i=1}^{4} \pi_{t-i} / 4 + 0.440 \times \sum_{i=5}^{8} \pi_{t-i} / 4 + 0.440 \times (G_t - (-4.183))$$
$$\quad (3.91) \qquad\qquad (2.46) \qquad\qquad (4.32) \qquad (11.56)$$

$$- 0.324 \times DUM \times (G_t - (-4.183)) + \varepsilon_t$$
$$\quad (3.01)$$

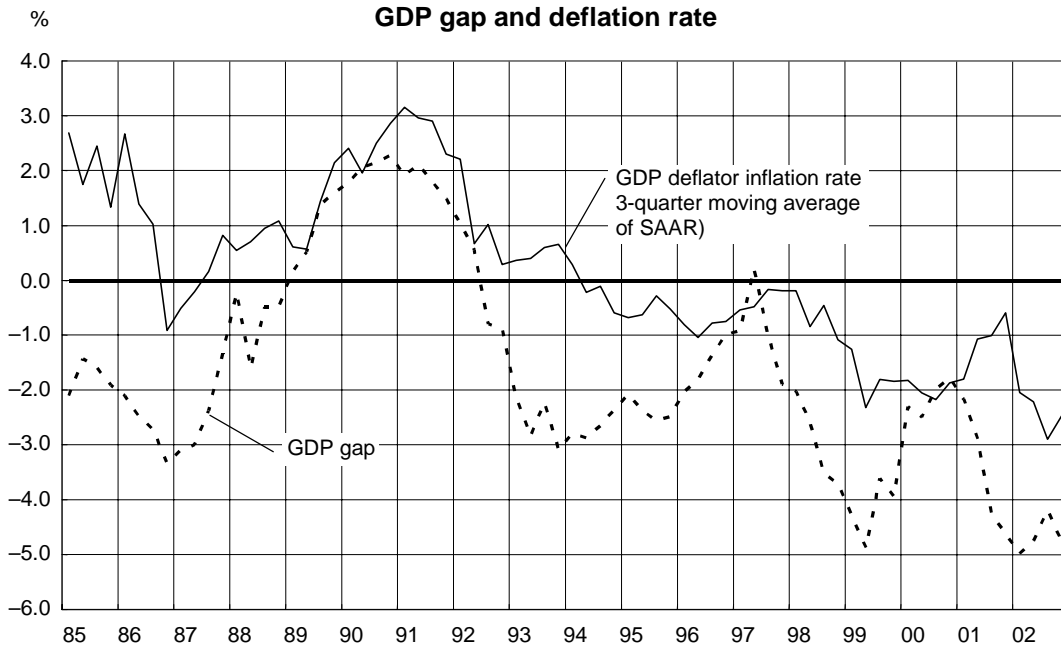Adjusted R2 = 0.51, SE = 1.31.

Estimation period: 1985 Q1-2002 Q4.

Source: Japan Center for Economic Research (2003).

Graph 3

GDP gap and deflation rate

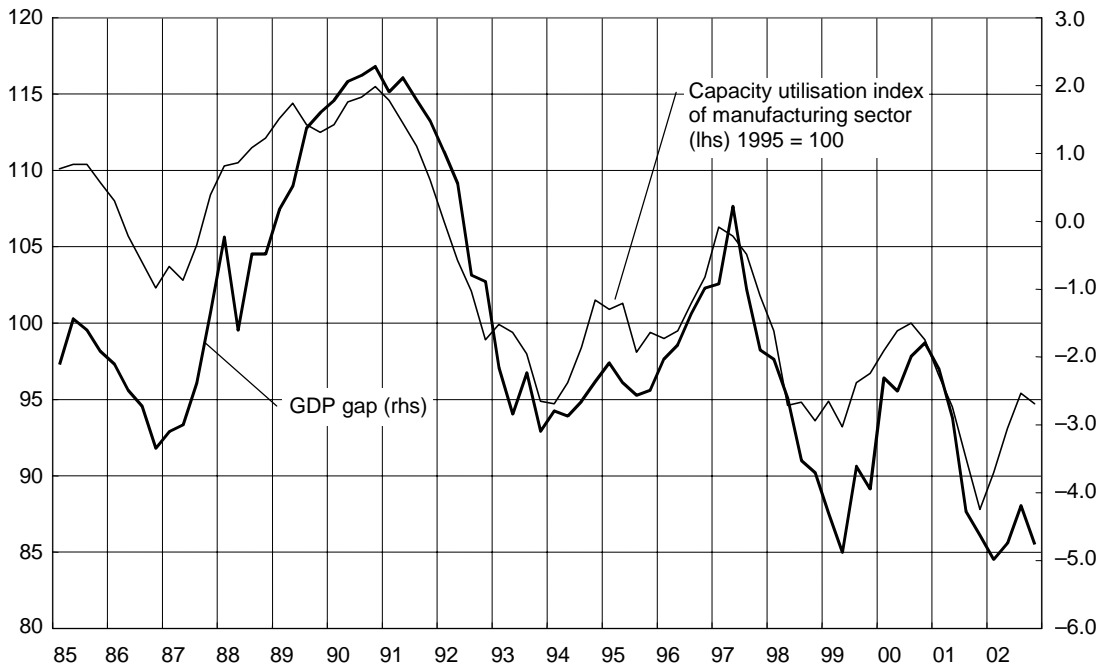Graph 4

GDP gap and overtime hours worked

GDP gap (rhs)

Overtime hours worked (lhs)

Graph 5

GDP gap and capacity utilisation of manufacturing sector

Capacity utilisation index
of manufacturing sector
(lhs) 1995 = 100

GDP gap (rhs)

3. Deflation and the non-performing loan problem

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

Table 2 shows the profit and 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 was over ¥2 trillion, and ¥3 trillion more recently (row B). This includes all other revenue except capital gains realised on stocks and real estate. Revenues from banks' principal operations therefore amount to roughly ¥12-13 trillion a year (row A + row B).

Table 2

Profitability of the Japanese banking sector

(in trillions of yen)

Fiscal 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
Realised 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 statements of all commercial banks. Other revenue (B) includes all the other profit such as dealing profits and fees but excludes realised capital gains on stocks and real estate. Realised capital gains include gains on stocks and real estate.

Source: Japan Center for Economic Research (2001), updated by the author.

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 labour 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 their preoccupation with bad loans, and now they have poor-quality computer systems. Thus, for example, the Zengin electronic funds transfer system, which is the main payment system among bank customers, cannot handle two-byte codes, so it cannot send customer names and messages in kanji (characters). As a result, more and more payments (especially utility bills) are being 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 sustained over ¥6 trillion in loan losses each year since fiscal 1994, and almost ¥10 trillion in fiscal 2001 (row E). As a result, banks have not reported positive net operating profit since fiscal 1993 (row F). However, because of the occasional realisation 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 crushing of the bubble. Banks have not succeeded in increasing their lending margin under strong competitive pressure from government-backed financial institutions and weakened borrowers in a deflationary economy. Moreover, under the terms and conditions of government capital injection in March 1999, banks are legally required to maintain and increase loans to small and medium-sized firms. Sinsei Bank, which reduced lending to small and medium-sized firms, was ordered by the FSA to increase such loans. Because of this situation, banks often disregard the internal model-based required lending margin to make new loans to small companies. Given these poor lending market conditions, Citibank decided to significantly reduce its consumer loan business in Japan.[3]

In line with 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 underreserved 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 utilising the deferred tax assets by showing genuine profit in the near future, so they 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 issued by 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 banks at the end of March 2002. More than half of the Tier 1 capital of the Mizuho, UFJ and Sumitomo-Mitsui groups corresponds to deferred tax assets (present value of the future tax shelter). Regarding these three groups, almost the entire capital consists of deferred tax assets and government-injected capital. One third of the Tier 1 capital of Tokyo-Mitsubishi Group is also deferred tax assets. The double gearing between banks and life insurance companies also inflates the bank capital. Banks provide surplus notes (similar to redeemable non-voting preferred shares) and subordinated debt 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 material, Table 3 shows only the identifiable ones. In addition to the figures in this table, there are extensive cross-holdings of subordinated debt 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 unrealised capital gains on stocks, deferred taxes, the public capital injection, and underreserving for loan losses. Although banks showed ¥29.3 trillion of capital on their balance sheets at the end of March 2002, this figure is inflated with ¥10.7 trillion of deferred tax assets, ¥6.9 trillion of underreserving, 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 the ¥71.8 trillion of classified loans and ¥34.4 trillion of stocks 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, unrealised capital gains (the difference between column A and B) were very large and banks could withstand fluctuations in stock prices. However, in the 1990s, banks sold stock to realise gains to offset huge loan losses. The increase in the book value of shares (column B) during the 1990s shows that the banks were buying back most of the stock they sold.

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[3]   According to the 16 March 2003 edition of the *Japan Economic Journal* (Japanese edition), Citibank group would eliminate up to 500 consumer loan offices and cut about 2,000 staff by the end of 2003.

Table 3

Structure of Tier 1 capital of large Japanese banks

(End of March 2002, in 100 millions of yen)

	Mizuho	Tokyo-Mitsubishi	UFJ	Sumitomo-Mitsui
Shareholders' equity	47,314	33,244	26,008	29,126
Government-injected capital	19,490	0	14,000	13,010
Deferred tax assets	25,091	10,321	14,583	18,825
Tier 1 capital	50,291	31,811	29,573	37,194
Tier 1 risk asset ratio	5.33%	5.27%	5.77%	5.51%
Preferred capital notes issued by SPCs	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 capital ratios of (C)	0.27%	0.11%	0.22%	0.35%

Source: Disclosure material from individual banks.

To sum up, banks are losing money on account of their high level of loan losses and very thin profit margin. The banking sector is running out of capital and is only surviving thanks to government guarantees for its liabilities. In order to stabilise the banking sector, it is necessary to increase the lending margin of banks by about 1 percentage point. As we will see in the next section, borrowers are already facing relatively high real interest rates due to the gradual acceleration of deflation. Therefore, an increase in the average lending rate is likely to depress the Japanese economy and will aggravate deflation. In order to avoid this adverse effect, nominal interest rates must be increased without raising the real cost of debt for weakened borrowers. The only way to do this is to stop deflation and have mild inflation (Table 5). By raising the trend inflation rate from –2% to +2%, for example, banks can raise the average lending rate from the current 2% to 4%. At the same time, the real cost of debt for borrowers will fall from 4% to 2%.

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

Table 4

Stock portfolios and capital in the banking sector

(in trillions of yen)

	Market value of shares held by banks	Book value shares held by banks	Capital account (core capital)	Deferred tax assets	Estimated under-reserving	Equity capital held by the government	Net capital account	Nikkei 225 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	…	0.0	33.3	15,860
Mar 87	*63.7*	13.4	13.8	0.0	…	0.0	44.0	21,567
Mar 88	*77.6*	17.6	17.2	0.0	…	0.0	53.2	26,260
Mar 89	*97.1*	23.2	22.5	0.0	…	0.0	66.8	32,839
Mar 90	*88.6*	29.7	28.6	0.0	…	0.0	63.9	29,980
Mar 91	77.7	33.1	30.2	0.0	…	0.0	57.0	26,292
Mar 92	56.4	34.5	31.3	0.0	…	0.0	44.4	19,346
Mar 93	56.4	34.5	31.8	0.0	…	0.0	44.9	18,591
Mar 94	61.9	36.5	32.3	0.0	…	0.0	47.5	19,112
Mar 95	52.0	39.8	32.3	0.0	…	0.0	39.6	15,140
Mar 96	64.3	43.0	27.9	0.0	…	0.0	40.7	21,407
Mar 97	54.1	42.9	28.5	0.0	15.0	0.0	20.2	18,003
Mar 98	50.8	45.7	24.5	0.0	5.1	0.3	22.2	16,527
Mar 99	47.1	42.7	33.7	8.4	4.6	6.3	17.1	15,837
Mar 00	54.5	44.4	35.2	8.1	6.6	6.9	19.7	20,337
Mar 01	44.5	44.3	36.7	7.3	7.6	7.1	14.8	13,000
Mar 02	34.4	34.4	29.3	10.7	6.9	7.2	4.5	11,025

Note: Figures represent amounts on the banking accounts of all banks in Japan. Market and book values represent listed shares only. The market value of stock portfolios was not published prior to March 1990, so we have estimated backwards using the Nikkei 225 share price index from the end of March 1991. However, the figures for 1985-86 should be discounted, because bank stock portfolios have been gradually increasing, so that values estimated from the end of fiscal 1990 will have an upward bias the further back one goes. A 40% corporate tax rate is assumed. Estimated underreserving (E) = Required loan loss reserves – Actual loan loss reserves. Required loan loss reserves = 1% of normal loans + 20% of substandard loans + 70% of doubtful loans +100% of estimated loan losses.

Source: Federation of Bankers Associations of Japan, *Analysis of bank financial statements*, various issues; securities reports for individual banks.

Table 5

**Illustrative example of banking sector profit margin**
(percent)

	Current situation	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

4.   Macroeconomic policy under a large GDP gap and zero interest rate

The Bank of Japan is providing a large amount of monetary base but the broadly defined money supply is not increasing much (Graph 6). 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 Bank of Japan. Graph 7 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. When the short-term nominal interest rate was between 1 and 12%, the monetary base/GDP ratio moved between 7 and 9%. However, when the short-term interest rate reached 0.5% in summer 1995, the demand for monetary base became very elastic. The monetary base/GDP ratio increased to 11 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 2002, the ratio increased from 12.5% to more than 18%. The flat part of Graph 7 clearly shows that the Japanese economy has been in a liquidity trap.
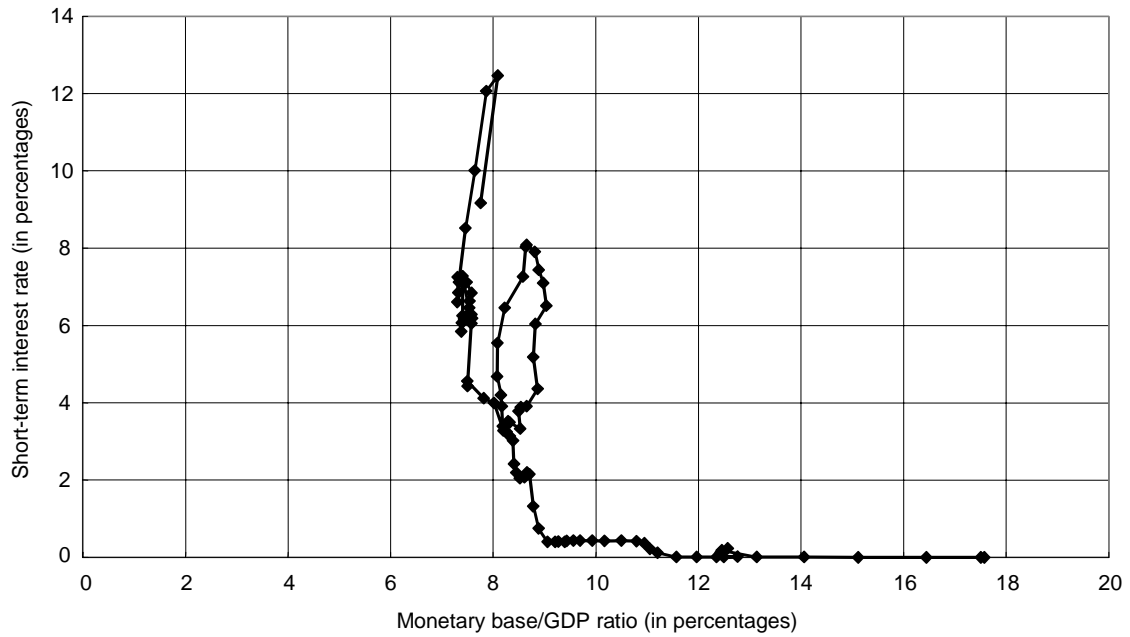
Graph 6

**Money supply developments
(year-on-year percentage change)**
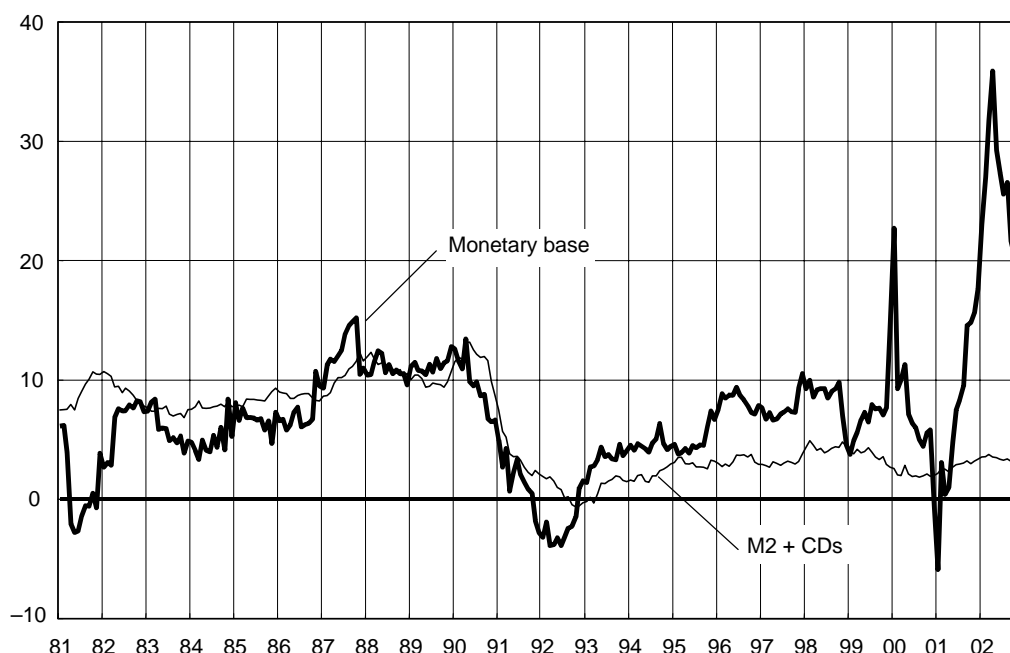
In spite of the aggressive increase in the monetary base by the Bank of Japan, real interest rates have been on a rising trend since mid-1998. Graph 8 shows nominal and real interest rates since 1986. This graph shows the average new lending rate of all banks and overnight call rates. The call rate indicates the short-term interest rates for high-quality borrowers. On the other hand, the average new lending rate indicates the borrowing costs for small and medium-sized enterprises (SMEs). Nominal rates are shown as dotted lines and real rates as solid lines. While real and nominal interest rates fell until 1998, 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 rate 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 bp. By the mid-1990s, the gap had increased to over 150 bp. The increasing gap is the result of the decontrol on deposit interest rates and market interest rates declining towards zero. Banks lost regulatory rent from deposits in the early 1990s. As 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%, which is close to that of the booming bubble period in the late 1980s. Even the real call rate is about 2%, which is much higher than the short-term market rate in the United States. The high real cost of funding for SMEs is depressing economic activity.

Graph 7

Monetary base and short-term interest rate

1980 Q1-2002 Q3

Graph 8

Real interest rates

(1986 Q1-2002 Q4)
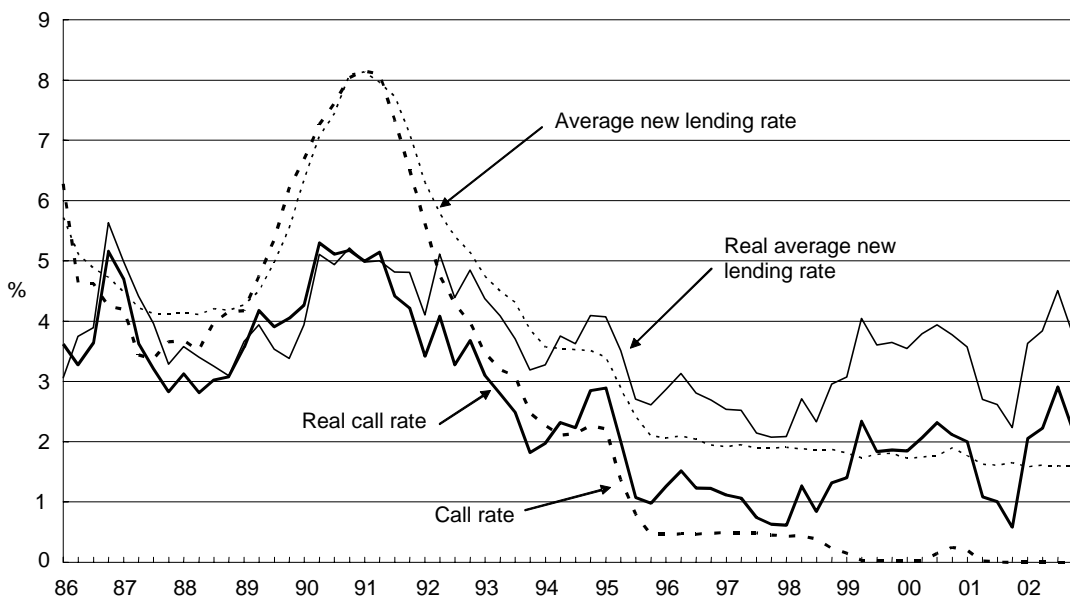
Note: Real interest rates are estimated with a three-quarter moving average of the GDP deflator inflation rate (SAAR).

Japan is probably in a deflationary trap. High real interest rates due to deflation are depressing the economy. The depressed economy, in turn, is accelerating deflation, with real interest rates rising further as a result. Conventional open market purchases of government notes and bonds are no longer effective. Since interest rates on short-term Treasury bills (TBs) are very close to zero, they have become a perfect substitute for the 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 any more.

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, which includes the central government, local government and the social security fund. The debt/GDP ratio was already 150% at the end of 2002. With an extremely large budget deficit and declining nominal GDP, this ratio is likely to increase by 9 percentage points a year. The gross debt of general government will exceed 200% by 2007. Moreover, these figures do not include off-balance sheet liabilities such as the failing national pension system and loss-making government-owned companies.

Table 6

Projection of 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 assets are assumed to be constant after 2002. Sharp downgradings of JGBs are assumed after 2005.

At the time of writing, the JGB is rated AA- by Standard & Poor's and A2 by Moody's, the lowest ratings among major economies. If the Japanese government cannot stabilise the macroeconomy 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 its funding from long-term bonds to short-term notes so as to reduce interest costs. However, the shortening maturity of JGBs will increase the vulnerability of funding to a sharp rise in interest rates.

Such downgrading of government bonds would adversely affect the international operations of private financial institutions and corporations. Since a 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 obtain funds from foreign banks even with JGBs as collateral.

Furthermore, even a mild capital flight from Japan could lead to a fiscal crisis. If the Japanese household sector shifts 5% of ¥1,400 trillion of gross financial assets from yen to foreign currencies, it would wipe out all of Japan's $500 billion foreign exchange reserves. A flight of capital from Japan will cure its deflation through a sharp devaluation of the yen. However, Japan's exit from deflation may trigger a budgetary crisis if it is too late. Suppose that Japan already has 200% 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% point rise in interest rates will increase the annual net interest payment by 10% of GDP or ¥50 trillion in two years. This figure is about the size of the total national government tax revenue excluding social security contributions.[4]

In order to escape from this deflationary spiral before it is too late, it is necessary to implement 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 long-term rates down 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 of future inflation rates. 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 estate to cash, deposits and government bonds. They are blindly buying government-backed financial assets even though the government's creditworthiness is rapidly deteriorating. This negative bubble is clearly unsustainable. At some point, people will realise that the government cannot honour the massive public debt and a massive shift of assets from cash, deposits and government bonds to foreign currencies and real assets will occur.

One possible scenario is shown in Table 7. As the budget deficit continues, a large amount of short-term government liabilities is accumulated. As the weak links of the government, such as some local governments and government-sponsored companies, fail, Japanese investors will gradually lose confidence in the Japanese government and start to shift assets to foreign currencies and real assets. The yen will start to fall sharply, beyond ¥200 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 escape from deflation. The Bank of Japan will 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 the shortened liability structure. The government will face a sharp downgrading of its credit rating and interest rates will rise further. In that event, the Bank of Japan 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 deflation.

Table 7

Capital flight scenario

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1. A large amount of short-term government liabilities is accumulated.

2. Japanese investors lose confidence in the Japanese government.

3. Investors start to shift assets to foreign currencies.

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

5. The Japanese economy escapes from deflation, and the Bank of Japan tries to raise interest rates to stop the acceleration of inflation.

6. The Japanese government faces a massive increase in its debt service due to the shortened liability structure.

7. The Japanese government faces a sharp downgrading of its credit rating, and interest rates rise further.

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

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

In order to avoid such a scenario, it is necessary to stop deflation before it is 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% of consumer price inflation plus/minus 1% 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 operations, and purchase real assets such as TOPIX-based ETFs (exchange-traded mutual funds) and REITs (real estate investment trusts) up to a few trillion yen per month. Since the outstanding amount of ETFs and REITs 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, deflation will stop. However, if Japanese investors continue to buy government-backed assets blindly, flow price deflation will continue. Since asset prices are determined by the underlying cash flows of profits and rents, they will also start to fall again. Therefore, the open market purchase of stocks and real estate is not a panacea and 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 and cash at a rate slightly higher than the deflation rate until deflation is stopped. In times of deflation, people increase 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 the negative bubble. The 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 persists.

This tax is similar to Silvio Gesell's famous stamp duty on currency. This is described in Chapter 23 of Keynes (1936). Marvin Goodfriend (2000) proposed levying a carry tax on cash as an effective measure to stop deflation. Details of my proposal are shown in Table 8.

Table 8

Proposed Gesell tax on government-guaranteed assets

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1.   Levy tax on all government-guaranteed financial assets.
           The tax is levied on the balance of the assets.
           The tax rate should be somewhat higher than the rate of deflation.
           The tax has to be levied repeatedly as long as deflation persists.

2.   Taxable assets:
           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 derivatives transactions are taxable.
           Postal savings and postal life insurance policies.
           Cash (BOJ notes).

The government has to levy 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 savings 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 derivatives transactions by banks should also be taxed. Finally, banknotes should be taxed. In order to tax cash, the Bank of Japan has to print new banknotes and levy fees for exchange. Alternatively, the government can levy stamp duty on old banknotes.

This tax will have very strong effects on expenditures. Table 9 summarises the effects of this policy. People will shift assets from "safe" assets to risky assets. In other words, people will shift assets from taxable assets to all the types of 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. Moreover, this tax will stimulate bank lending activity. 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 from a 2% tax on government-guaranteed financial assets would amount to about ¥28 trillion. The government could make use of the tax revenue to reduce its budget deficit, recapitalise deposit insurance funds or to bolster its anti-unemployment policy.

One drawback of this tax is the possible negative effect on the credit rating of the Japanese government. For example, Moody's states that imposing tax on 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 JGBs are held by foreign investors.

Table 9

Effects of Gesell tax

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1.   Asset substitution

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

        From taxable assets to all the types of non-taxable assets.

        Non-taxable assets include:
        Stock, 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.   Expectation effects

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

Once deflation is overcome, conventional interest rate policy will become useful again. The Bank of Japan will be able to maintain relatively low real interest rates at the shorter end of the term structure. The environment for new business will improve. The commercial banks will be able to 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 of 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 the perennial non-performing loan problem in the banking sector.

We also have to take note of the negative side effects of the exit from deflation. The nominal long-term interest rate would rise considerably, causing the bankruptcy 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, we have analysed the cases of persistent deflation in Japan. We have found that deflation has been accelerating gradually since the mid-1990s. Because of the acceleration of deflation, real interest rates are rising and the conventional monetary policy tool has lost effectiveness. I have proposed that the Bank of Japan should buy large amounts of ETFs and REITs to combat

deflation. If this measure is not effective, the government should introduce negative interest rates by levying tax on all government-guaranteed financial assets.

However, I have not proposed 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 Bank of Japan. Table 10 illustrates this problem. Suppose the Bank bought half of the outstanding long-term government bonds held by the private sector, ¥150 trillion of JGBs, on top of the portfolio of March 2003, and it increased the current deposits held by banks. Suppose further that Japan finally escaped from deflation and long-term market rates rose to 5%. A four percentage point rise in the long-term rate will reduce the market value of 10-year JGBs by almost 40%. Once 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 Graph 7, the demand for monetary base is about 8% of GDP when nominal rates are about 3-4% 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 on its long-term bonds. As is shown in 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 costs.

Table 10

Massive long-term bond purchasing and the Bank of Japan balance sheet (in trillions of yen)

Before the exit from deflation

After the purchase of ¥150 trillion of 10-year JGBs,
¥150 trillion of long-term bonds and the same amount of
current deposits are added onto January 2003 figures

Long-term bonds	207	Banknotes	70
Short-term notes	26	Current deposits	170
Other assets	42	Other liabilities	33
		Net assets	2
Total	275	Total	275

After the exit from deflation

¥56 trillion capital loss on long-term government bonds is assumed
due to 5 percentage point increase in interest rates; the Bank of
Japan absorbs the excess liquidity through open market sales

Long-term bonds	0	Banknotes	35
Short-term notes	0	Current deposits	5
Other assets	0	Other liabilities	14
		Net assets	−54
Total	0	Total	0

6. References

Fukao, M (2002): "Financial sector profitability and double-gearing", *NBER Working Paper*, 9368.

Fukao, M and Japan Center for Economic Research (2003): "Examining the banking crisis", *Japan Economic Journal*, Tokyo, in Japanese.

Goodfriend, M (2000): *Financial stability, deflation and monetary policy*, paper for the Ninth International Conference at the Institute of Monetary and Economic Studies, Bank of Japan, on "The role of monetary policy under low inflation: deflationary shocks and their policy responses", July.

Japan Center for Economic Research (2001): "Monetary policy under deflation", *Financial Research Report*, 4, in Japanese.

——— (2003): "Accelerating deflation and monetary policy", *Financial Research Report*, 8, in Japanese.

Keynes, J M (1936): *General theory of employment, interest, and money*, London: Macmillan.

Discussion of "Financial strains and the zero lower bound: the Japanese experience" by Mitsuhiro Fukao

Ignazio Angeloni[1]

Despite its relative brevity, this is a very broad-ranging and ambitious paper. Professor Fukao does many things: he examines the state and prospects of Japan's deflation; he offers an econometric interpretation of it; he overviews a number of policy prescriptions; and finally, he proposes a bold and original package of measures. All this sums up to a very stimulating and useful paper. I am glad I had the opportunity to discuss it at this conference.

Fukao's diagnosis of the Japanese situation can be summarised in the following way. Japan's economy is shrinking, in real and nominal terms. This process is far from being exhausted; on the contrary, according to Fukao it is accelerating. This conclusion is drawn from observing the recent dynamics of the GDP deflator (which is increasingly negative) and also from an estimated econometric model linking price dynamics to a measure of the output gap. Accelerating deflation has two consequences. First, real interest rates tend to rise, due to the zero bound constraint on nominal ones. This exacerbates problems because it not only raises the cost of capital, but also squeezes the interest rate margins of banks (a point which I shall come back to). Second, the size of the government debt increases in relative terms. This is particularly worrisome, in view of the role fiscal policy plays in the Japanese macroeconomic strategy. A government debt rising from the current high levels may easily generate fears of insolvency, which in turn would reduce and eventually even reverse the positive effect of Japan's expansionary fiscal policy. Moreover, a sizeable depreciation of the yen (seen by many as an essential component of Japan's anti-deflationary strategy; see Svensson (2001) and Coenen and Wieland (2003)) could as a side effect reduce Japanese households' predilection for domestic bonds, with further risks for Japanese government debt. This conveys the impression that the room for manoeuvre available to the Japanese authorities is also shrinking, and that decisive and credible action becomes more urgent by the day.

Fukao's reasoning on all these issues is correct, in my view. One could perhaps object that certain aspects of his analysis contribute to drawing an overly negative picture. For example, the recent developments in consumer prices are more favourable than those of the GDP deflator (see my chart), and the former are arguably a more appropriate proxy for price deflation than the latter. But these issues are rather marginal, and do not alter the substance of the argument. Moreover, recent survey measures of price expectations confirm that, even if CPI is taken as a reference, deflationary expectations are worsening. After four years (1999-2002) in which CPI deflation turned out to be greater than expected (measured by Consensus forecasts), in 2003 expectations have taken a decisive turn for the worse. The recently published IMF *World Economic Outlook* (April 2003) stresses this particular, noting also that deflationary expectations are becoming more widespread and entrenched in the economy.

Fukao's policy prescriptions are essentially twofold. First, open market operations by the Bank of Japan should include purchases of additional assets, such as mutual fund shares and real estate investment trusts. This should be accompanied by announcements indicating that the central bank will do everything needed to enact a medium-term inflation objective of 1.5%. Second, the zero bound constraint on nominal interest rates should be removed by introducing a tax on currency (echoing the so-called Gesell tax discussed by Keynes in the General Theory).

I agree with the idea that enhanced open market policy and proactive central bank announcements are a necessary component of any successful policy package for Japan. However, I doubt they can be really effective, unless supported by other conditions. We know from theory (from Keynes himself) that open market operations are ineffective at very low interest rate levels, because investors are willing to absorb an unlimited amount of liquidity. Japanese data for the last two years, reported in Fukao's paper, showing astronomical expansions of the money base in the midst of continuing deflation, are a

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painful illustration that that theory is valid. Extending the range of assets being purchased by the central bank would not necessarily help, unless the central bank was prepared to buy so much of those other assets (eg real estate) to have a significant effect on their price (something I regard as doubtful). Moreover, central bank announcements of any given inflation rate would not necessarily be credible, in the absence of adequate instruments to enact that inflation rate. This objection applies to Fukao's paper as well as to other suggestions for central bank inflation announcements, formulated by Krugman (1998) and others. To break this vicious mix of policy ineffectiveness and lack of credibility, a combination of domestic and external conditions seems necessary.

I have rather serious reservations concerning the proposal for a Gesell-type tax. Such a tax would require the introduction of a new currency and a banknote stamping procedure, both measures administratively complex and burdensome. One should not forget that the tax would have a direct deflationary impact, like any tax. There is also a risk that, being a rather extreme and unconventional measure, it could negatively affect consumer confidence and increase precautionary savings. These side effects and risks must be carefully weighed against the potential benefits, which are uncertain.

Even if effective in removing the zero bound constraint, I am not convinced that such a tax would contribute positively to the viability of the banking system. Fukao's data on Japanese banks' profit and loss situation (Table 2 of the paper) show that lending margins and gross profits of Japanese banks have not decreased significantly in the last 15 years. The problem is concentrated in the loan loss component, which sharply deteriorated in the second half of the 1990s. The real issue in Japanese banking is that of the quality of credit. Minor adjustments in the margin between deposit and lending rates, such as the ones that a Gesell tax could bring about, would do nothing to cure this problem.

The paper does not, in my view, address or put sufficient emphasis on the structural problems of the Japanese financial system. Observers have recently noted that not only the quality of bank lending, but also that of the banks' credit screening practices are far from showing signs of improvement. In a *Wall Street Journal* article, Kashyap (2002b) recently characterised the situation as one in which "bankrupt banks continue to lend to bankrupt firms" (see also a related working paper, Kashyap (2002a)). If this is the situation, it seems clear to me that the most urgent problems are of a structural nature, and macro-monetary measures can at best have a supporting role.

I am convinced that the solution to Japan's malaise will come from a combination of factors acting together, not from a single decisive measure or event. Continuing expansionary monetary and fiscal policies, and exchange rate depreciation - in the context of a more favourable international environment - will have to be accompanied by supply side improvements stemming from corporate restructuring and more transparent and objective credit screening procedures by banks. A mix of these components will eventually work, though progress may not be as rapid as one would hope. A further ingredient of the appropriate policy mix for Japan is likely to be patience.

Japan: price indices

(year-on-year percentage change)
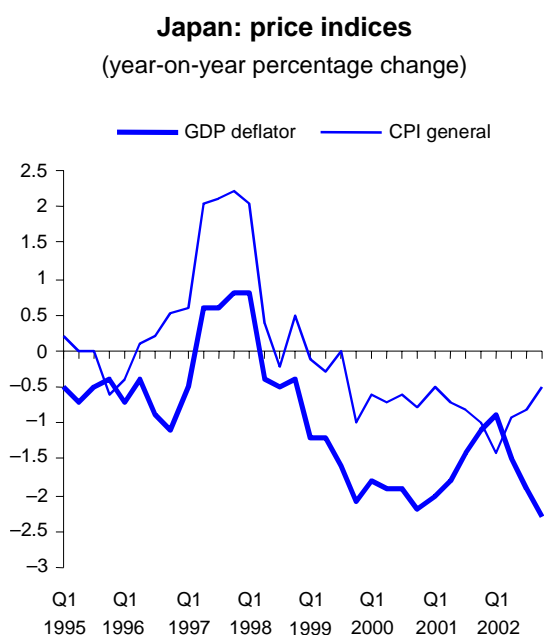
Source: Financial Thomson Datastream, Cabinet Office.

References

Coenen, G and V Wieland (2003): "The zero-interest-rate bound and the role of the exchange rate for monetary policy in Japan", prepared for the "Conference on the tenth anniversary of the Taylor rule", in the *Carnegie-Rochester Conference Series*, ECB Working Paper, 218, March.

Kashyap, A (2002a): "Sorting out Japan's financial crisis", *NBER Working Paper*, 9384.

——— (2002b): "Japan, worse than you think", *Wall Street Journal*, letter to the editor commenting on an editorial titled "Japan, crisis and nationalism", 26 November.

Krugman, P (1998): "It's baaack: Japan's slump and the return of the liquidity trap", *Brookings Papers on Economic Activity*, 2:1998, pp 137-87.

Svensson, L E O (2001): "The zero bound in an open-economy: a foolproof way of escaping from a liquidity trap", *Monetary and Economic Studies*, 19, pp 277-312.

Discussion of "Financial strains and the zero lower bound: the Japanese experience" by Mitsuhiro Fukao

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Professor Fukao's interesting paper tells three main stories. The first is about gradually accelerating deflation in Japan. Professor Fukao explains that deflation is caused by a persistent and negative output gap, which should be closed by stimulating aggregate demand. The second story is about the Japanese banking sector. Professor Fukao argues that Japanese banks are structurally depressed and that the central bank should try to raise interest rates by raising the rate of inflation, which would give banks larger profit margins. The third story concerns a programme to save the Japanese economy. Professor Fukao explains that conventional open market operations have become ineffective as zero interest rates make bonds and base money perfect substitutes. The remedy is, therefore, to undertake open market operations in real assets and, if that does not work, to impose a Gesell tax on money. Tying these stories together is a macro model that focuses on the output gap to explain deflation and on the resulting low interest rates to explain the problems in the banking sector.

1. Does the output gap explain deflation in Japan?

Professor Fukao estimates a production function to derive potential output, which is then used to calculate an output gap. The output gap, in turn, is used in an equation explaining deflation in Japan. Thus, the validity of the output gap estimates is critical. Table 1 provides some information:

Table 1

	Average 1991-2000	**2001**	**2002**
Growth rate of capital stock	4.0	3.5	2.8
Growth rate of labour force	0.4	−0.2	−0.9
Growth rate of potential output	1.4	0.9	0.2
Growth rate of actual output	1.5	−0.3	−0.7
Rate of inflation	0.1	−1.2	−1.0
Output gap (Fukao)	−1.5	−2.0	−5.0
Output gap (OECD)	−0.09	−1.5	−2.9
Deflationary effect (Fukao)	−0.6	−0.6	−1.2
Deflationary effect (OECD)	−0.02	−0.25	−0.62

Source: OECD, *Economic Outlook*, October 2002.

Table 1 collects data for the capital stock and the labour force from the OECD and uses them to calculate first the output gap using Professor Fukao's model ["Output gap (Fukao)"] and then the deflationary effect using his model ["Deflationary effect (Fukao)"]. It also takes output gap data as provided by the OECD ["Output gap (OECD)"] as an alternative and uses them to calculate the deflationary effect from Professor Fukao's model ["Deflationary effect (OECD)"]. Note that these

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estimates are my own approximations. A first point is that the output gap derived from Professor Fukao's production function is −1.5% on average over the 1990s. Since, by definition of the concept, actual output and potential output should grow at similar rates over the medium and long run, this large and persistent negative gap seems puzzling. The OECD output gap does not have the same property. Second, the output gap calculated from Professor Fukao's model yields a deflationary effect of −0.6% annually on average over the 1990s. This is clearly at odds with the average inflation rate, which was zero. Again, the OECD output gap performs better. Finally, the deflationary effect of the output gap derived from Professor Fukao's model is too small compared to actual inflation in 2001 but it works well in 2002. In contrast, OECD output gaps give too small deflationary effects in both 2001 and 2002. My conclusion is that this explanation of deflation in Japan raises some doubts.

		Table 2		
Growth rate	**Average 1991-2000**	**2001**	**2002**	**Std dev 1991-2002**
Potential output	1.4	0.9	0.2	
Private consumption	1.6	1.4	0.8	
Non-residential investment	0.45	−0.1	−6.8	7.9
Residential investment	−2.2	−5.6	−4.0	8.7

Source: OECD, *Economic Outlook*, October 2002.

Table 2 provides some additional macroeconomic data for the Japanese economy in the 1990s. It shows, first, that consumption in the 1990s grows in line with potential output growth. There is little evidence suggesting that Japanese households are hoarding money, the point Gesell was worried about when proposing his tax on money. Second, what is striking in Japan is the very low investment rate and its very large volatility. Table 1 implies that capital productivity is falling by 2.5% on average over the 1990s. This raises the question of what is behind this very weak and volatile investment performance. Whatever the answer may be, if one thinks that deflation in Japan is due to a lack of aggregate demand, a policy to overcome it must address investment, not consumption.

2. Banking problems

Professor Fukao claims that Japanese banks are suffering from low profits due to the fact that interest rates are close to zero. Persistent problems of large non-performing loans have eaten up the banks' capital. An immediate question here is, obviously, why banks do not seek more profitable lending opportunities abroad, especially if the yen is expected to depreciate against the dollar. Furthermore, Table 2 in the paper indicates that the banks' gross profit rate on total assets (loans) was 0.4% (0.7%) on average in 1990-92, a period of moderate inflation, and 0.7% (1.2%) on average in 1999-2001, a period of deflation. Gross profits indeed seem to rise with deflation.

That there is a severe problem of non-performing loans is indicated by Table 2 in the paper. But it must be remembered that this is a stock problem, not a flow problem. To solve it, it takes a restructuring of bank portfolios. Germany's currency reforms in 1948 and 1990 show how this can be done (see eg Deutsche Bundesbank (1991)). The main point is to clean the bank balance sheets of non-performing loans by writing them off (which makes the corporate sector viable again) and replacing them with government securities that must be bought back by the central bank over a long time period. Replacing bad loans by low-interest bearing government securities makes the banks viable again. Of course, such an operation is not without cost to the government, and hence the taxpayer. But this is a sunk cost already. Injecting government-provided fresh bank capital into the banking industry, in contrast, is a much worse remedy, creating severe adverse incentives. New capital gives the owners temporary relief, allowing them to continue their bad lending practices.

3.   Monetary policy

To remedy Japan's economic woes, Professor Fukao proposes undertaking large-scale open market operations in real assets and real estate. It is not clear, however, whether that would do the trick. In the conventional Keynesian macroeconomic framework, bonds and real assets are perfect substitutes. In the liquidity trap, where money and bonds become perfect substitutes, money and real assets are perfect substitutes by implication. Hence open market operations in real assets cannot have any effect. In other frameworks, such as Tobin (1969) portfolio model or Brunner and Meltzer's (1976) monetarist frameworks, the Keynesian assumption is dropped and imperfect substitutability of bonds and real assets assumed. But, unfortunately, these models make very ambiguous predictions only about the effects of open market operations in real assets. They depend on a large set of cross-derivatives of the net asset demand functions with regard to all rates of return, which means that the relative degree of substitutability between money, bonds and real assets matters critically. Without empirical information about these derivatives, nothing can be said with any confidence.

At the same time, it is interesting to observe the large difference between the growth rate of base money and that of M3 in Japan. While the former has been high, the latter has been rather low and stable in recent years. This suggests that the Japanese economy has not responded to previous open market operations, because the banks' demand for reserves has absorbed any additional base money. If the Bank of Japan wishes to take unconventional measures to overcome the deflationary tendency, it might consider bypassing the banking sector in an effort to raise M3 growth, eg by handing out cheques to Japanese households.

4.   References

Brunner, Karl and A H Meltzer (1976): "An aggregative theory for a closed economy", in J L Stein (ed), *Monetarism*, Amsterdam, New York, North Holland.

Deutsche Bundesbank (1991): *Annual Report for 1990*, Frankfurt am Main.

OECD (2002): *Economic Outlook*, Paris, October.

Tobin, James (1969): "A general equilibrium approach to monetary theory", *Journal of Money, Credit, and Banking*, no 1, pp 15-29.

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