JAPANESE MONETARY POLICY

Bennett T. McCallum

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1. Introduction

Monetary policy by central banks other than the Federal Reserve is of proper concern to the SOMC for two reasons: (i) monetary conditions in the rest of the world have significant effects on U.S. macroeconomic performance and vice-versa, and (ii) policy procedures, institutions, and developments elsewhere may have important lessons for the United States. In recent years, Japanese monetary policy has been the topic of a great deal of discussion, commentary, and debate. Accordingly, this paper considers issues relating to recent and prospective policy measures of the Bank of Japan (BOJ).

It is hard to avoid the impression that BOJ policy has been overly restrictive for about a decade. This statement does not imply that Japan's poor economic performance during the 1990s is entirely or even primarily attributable to monetary policy; structural flaws have also been very important.[1] It does suggest, however, that Japanese economic performance would have been more desirable, from the perspective of ordinary Japanese citizens, if BOJ policy had been less restrictive. In the pages that follow, I will attempt to support the foregoing claim, describe some alternative strategies that the BOJ could have used to better effect, and develop some (highly uncertain) estimates of how large the macroeconomic effects of a more stimulative policy would have been.

[1] Major banking-system difficulties are widely recognized and in addition it is likely that the growth rate of "potential" or "natural-rate" output has fallen from the level of the 1970s and 1980s. But the severity of the bank-solvency problem has been increased by the deflation of the past several years and it is almost certainly the case that actual output has fallen far below potential.

2. Has Bank of Japan Policy been Tight?

That BOJ policy has been quite tight—low interest rates notwithstanding—is suggested by the most prominent and highly-regarded rule for the conduct of monetary policy, the one developed by John Taylor (1993). The Taylor rule can be expressed as

(1) $R_t = 3 + \Delta p^a_t + 0.5(\Delta p^a_t - 2) + 0.5(y_t - \bar{y}_t)$,

where R is the call rate, Δp^a_t is the average inflation rate (GDP deflator) over the previous 4 quarters, y is real GDP and $\bar{y}$ is its potential value.[2] A chart contrasting Taylor-rule prescriptions for the overnight call rate[3] with actual values of this rate over the years 1972-1998 appeared in a recent paper of mine (McCallum, 2000b). That comparison is reproduced in the top half of Figure 1. There it is clear that the actual value exceeded the setting prescribed by Taylor's rule during almost every quarter beginning with 1993.1. Of course, the negative values called for by the rule are not feasible, but that does not alter the fact that Taylor's policy guideline has called for greater monetary ease throughout this period.

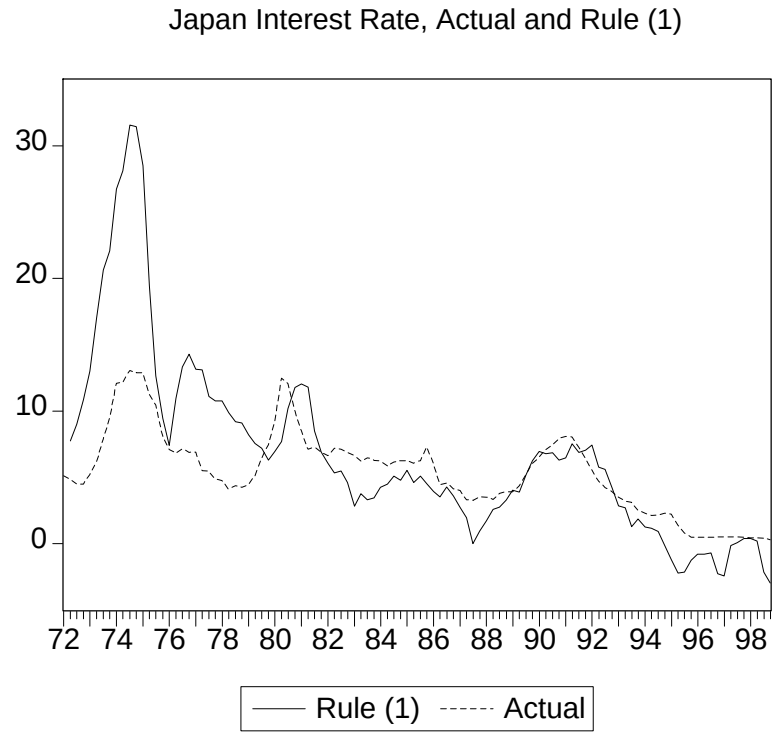
An alternative rule involving management of the monetary base has been promoted in several of my papers. It can be written as

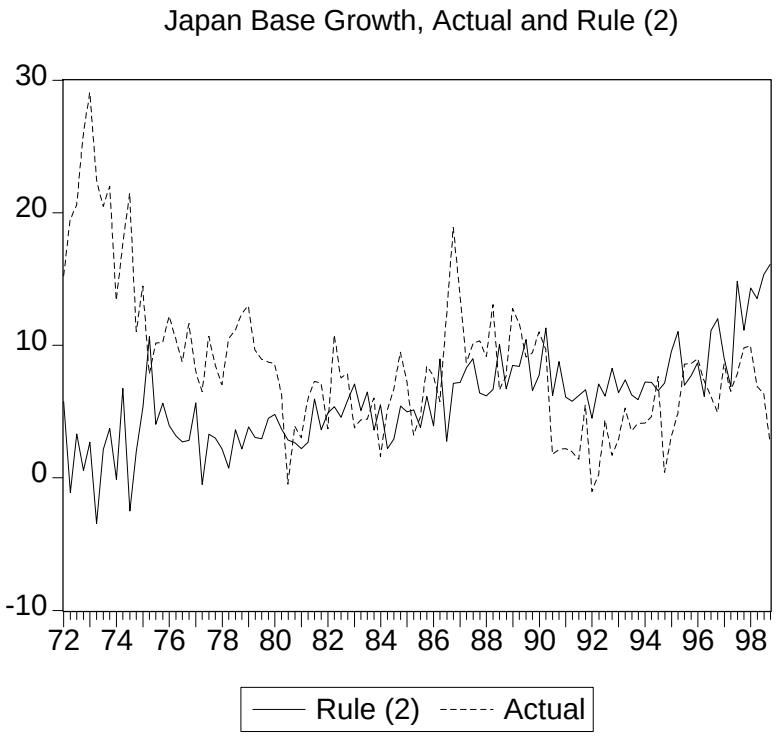
(2) $\Delta b_t = 5 - \Delta v^a_t + 0.5(5 - \Delta x_{t-1})$,

where b and x are logs of the monetary base and nominal GDP, while Δv^a_t is the average rate of base velocity growth over the previous four years. Here 5 is the target value for nominal GDP growth, obtained from a 2 % inflation target and a 3% assumed long-run average growth rate for real GDP. This rule is much less popular than Taylor's,

[2] Here the long-run average real rate of interest is taken to be 3 % p.a. and the inflation target rate to be 2%. Some versions of the rule use other values for the coefficients attached to the target variables.
[3] The (uncollateralized) overnight call rate was the BOJ's operating target or instrument variable through

Figure 1





the period of the 1990's. A recent change is described below, in Section 4.

primarily because actual central banks focus upon interest rates, not monetary base growth rates, in designing their policy actions. Especially in an environment with near-zero call rates, however, its prescriptions may be of interest. In any event, the actual and McCallum-rule settings for base growth rates are shown in the lower panel of Figure 1.[4] There the indication is that actual BOJ policy has been too tight virtually all of the time ever since the middle of 1990!

Increased base money growth rates have been recommended for over two years by Mr. Nobuyuki Nakahara, a member of the BOJ's Monetary Policy Board (MPB). But until the recent change in policy, announced at the MPB meeting of March 19, 2001, the BOJ's position was that additional base growth would have no stimulative effect since short-term nominal interest rates were close to zero. With such low rates, base money and short-term securities become almost perfect substitutes so the purchase of the latter by the BOJ would have no effect on asset markets and consequently none on the economy, according to the BOJ view.

3. Policy Proposals

Several prominent monetary economists have taken up this issue—i.e., how to conduct monetary policy with interest rates near zero—including Marvin Goodfriend (1997, 2000), Paul Krugman (1998, 2000), Allan Meltzer (1999, 2000), Athanasios Orphanides and Volker Wieland (2000), Lars Svensson (2000), and McCallum (2000). Goodfriend proposes a tax on base money that would keep it from being a perfect substitute for short-term securities and open the way for an effective monetary policy even when a zero-lower-bound situation is in effect. This scheme's logic is clearly impeccable, but the probable unpopularity of the explicit tax would seem to present a

[4] The plot is reproduced from the same source as before.

formidable practical barrier (even though it would make possible a reduced implicit tax on money that would prevail on average). Accordingly, the other proposals involve the central bank purchase, with base money, of assets other than the traditional short-term yen securities. Meltzer, for example, suggests that purchase of long-term Japanese government bonds would be stimulative. McCallum and Svensson suggest instead the purchase of foreign exchange (i.e., short-term securities that are claims to dollars or other non-yen currencies). They suggest implicitly that (e.g.) dollars are less close substitutes for short-term yen securities than are long-term yen securities. But the general ideas behind these asset-purchase proposals are basically similar.

A few critics of the foreign-exchange strategy have contended that a central bank cannot reliably influence its currency's exchange rate. In that regard it is of course true that raising a currency's real foreign-exchange value by monetary policy is not possible, and keeping its nominal value high requires extreme measures that are unlikely to be tolerated for long in a nation with democratic political processes. But to depreciate a fiat currency in nominal terms is not difficult; all that is required is the creation of an excess quantity of the currency. And a reduction in value is what is needed in the case of Japan.[5]

Proceeding under the presumption that a central bank can exert adequate control over its currency's nominal exchange rate, I have considered a policy rule for use in a zero-lower-bound situation of the following form:

$$(3) \qquad \Delta s_t = \mu_0 + \mu_1 (2 - \Delta p_t) + \mu_2 (\bar{y}_t - y_t), \qquad \mu_0, \mu_1, \mu_2 > 0.$$

Here the rate of depreciation of the exchange rate is increased when inflation and/or output are below their target values. Such a rule would be implemented in a manner

[5] Even a depreciation could not be effected if the currency were literally a perfect substitute for foreign

similar to that typically used with an interest rate instrument. Thus the central bank observes the relevant asset price almost continuously and makes open-market purchases (sales) when it wishes to depreciate (appreciate) the currency's value.[6] It is important to note that rule (3) does not represent a fixed exchange rate. Instead, it represents a regime that subordinates the exchange rate entirely to macroeconomic conditions.

4. Recent Bank of Japan Policy Changes

On March 19, the BOJ announced several important policy changes, designed primarily to provide easier (more stimulative) monetary conditions. The BOJ's announcement reads—with some slight editing—as follows.

> a) The main operating target for money market operations will be changed from the current uncollateralized overnight call rate to the outstanding balance of the current accounts [mostly bank reserves] at the Bank of Japan. The Bank will provide ample liquidity, and the call rate will be determined in the market ... below the ceiling set by a Lombard-type lending facility.
> b) The new procedures for money market operations continue to be in place until the consumer price index (excluding perishables) registers stably a zero or positive increase year on year.
> c) For the time being, the balance outstanding at the Bank's current accounts will be increased to around 5 trillion yen, or 1 trillion yen increase from the average outstanding of 4 trillion in February 2001. It is anticipated that the call rate will decline and stay close to zero percent under normal circumstances.
> d) The Bank will increase the amount of its outright purchase of long-term government bonds from the current 400 billion per month, in case it considers an increase to be necessary for providing liquidity smoothly. The outright purchase will, on the other hand, be kept below the outstanding balance of banknotes issued.

These moves certainly mark a considerable change in BOJ procedures and are quite welcome. To be using a reserve aggregate instead of an interest rate as its main operating target (instrument) is a dramatic step for the BOJ, and the objective of getting core inflation out of the negative range is certainly a step in the right direction. Also, the

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currencies, but such is not the case. Interesting new evidence of a market-microstructure type has recently been developed by Evans and Lyons (2000).

[6] As with current practice, market participants may to some extent move rates as desired by the central

BOJ's willingness to increase its rate of purchase of long-term government bonds is perhaps desirable in the present circumstances.

Nevertheless, there are several aspects of the BOJ announcement that keeps it from being as constructive as one might reasonably hope for. These include:

(i) A zero percent core inflation rate is still deflationary, given that the CPI tends to overstate actual inflation (according to several studies). A target of 2.0 or at least 1.0 percent inflation would be more in keeping with practice among central banks with the most-admired policy regimes.

(ii) The increased reserve balance is a one-time stock commitment, not an ongoing flow commitment. It might support an increase in the monetary base of a substantial magnitude but there is no commitment to any specified growth rate or any variable rule-based growth rate over the next few years, except to prevent measured deflation.

(iii) Nothing at all is said about exchange rates. This omission is not surprising, since the BOJ tends to emphasize the fact that Japanese regulations assign management of exchange rates to the Ministry of Finance, not the BOJ. But it needs to be the case in actuality, whatever the legalisms, that the BOJ does not take an exchange-rate depreciation to be a signal to reverse its monetary easing. It is my distinct impression, documentation of which cannot be provided here, that such a tendency has in fact been in place in the past. In that regard it should be added, however, that most of the evidence pertains to periods before the BOJ gained its independence. Also, it should be said that the U.S. government has probably exerted pressure on Japan to tighten or loosen policy when the yen has been tending to depreciate or appreciate relative to its long-run trend—or simply when altered Japanese policy could be useful (from a short-term perspective) to

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bank, even without actual open-market operations, if the central bank's intentions are made clear.

the U.S. government. Indeed, it may well have been U.S. pressure that led the BOJ to be somewhat too loose (even on traditional standards that ignore asset price movements[7]) during 1986-88, a stance that permitted the asset price boom of the late 1980s—which set the stage for a clampdown that began the past decade's slump.

5. Some Quantitative Results

A natural question to ask is, "how would macroeconomic conditions in Japan have evolved if monetary policy had been conducted as suggested by one of the proposed policy rules discussed above?" A well-developed and authoritative answer to this question would require a major research undertaking, but it is possible to provide here a preliminary and partial answer for the case of the monetary base rule specified in equation (2). This case is much easier to attack than those based on the Taylor rule or equation (3), because they require models that reflect dependence of macroeconomic variables upon interest rates and exchange rates. Such models are very common in the theoretical literature, but their empirical estimation is fraught with difficulties and most existing attempts have been highly unsuccessful.

What will be done here is to consider an up-dated and modified version of the simplest model of macroeconomic conditions utilized in McCallum (1993). It is a single-equation dynamic relationship of nominal income growth and its dependence on money base growth. Let x_t and b_t denote logarithms of nominal GDP and the adjusted monetary base, respectively, so that Δx_t and Δb_t are quarterly growth rates. The data series extend from 1970.1 through 2000.4 and are seasonally adjusted.[8] Least-squares estimation over 1970.3-2000.4 yields the following relationship:

[7] See the lower panel in Figure 1.
[8] These series were obtained from the web pages of the BOJ (base) and the Japanese government's

(4) $\Delta x_t = -0.0003 + 0.246\ \Delta x_{t-1} + 0.351\ \Delta x_{t-2} + 0.281\ \Delta b_{t-1}$

(.0018) (.0876) (.0831) (.0846)

$R^2 = 0.513$ SE = 0.0111 DW = 2.14 Pval = 0.12[9]

The numbers in parentheses are standard errors, so Δb_{t-1} evidently has a highly significant effect on Δx_t and its subsequent values. A similar relationship was utilized in McCallum (1993), where it provided results quite comparable to those of somewhat more complex structures.

There exists, however, considerable opinion to the effect that the relationship between base growth and nominal income has "broken down" in recent years. Indeed, such an impression is supported by visual inspection of a simple plot of these two variables against time. To consider the matter more formally, accordingly, I have reestimated relationship (4) permitting certain parameters to change in 1995.1.[10] Inclusion of a 0-1 dummy variable, that changes from 0 to 1 in 1995.1, indicates a downward shift in the equation's constant term, with a highly significant t-statistic of −2.89. If instead the slope coefficient on the base growth variable is permitted to change at that time, again a significant decrease is detected, with the t-statistic being −2.51. Inclusion of both effects seems most appropriate (since the two variables are correlated) and leads to the following estimates:

(5) $\Delta x_t = 0.0027 + 0.148\Delta x_{t-1} + 0.250\ \Delta x_{t-2} + 0.371\ \Delta b_{t-1} - 0.147\ D95\ \Delta b_{t-1} - 0.0065\ D95$

(.0022) (.091) (.091) (.099) (.192) (.0041)

$R^2 = 0.548$ SE = 0.0108 DW = 2.09 Pval = 0.37

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[9] This statistic is the p-value for a test of no residual serial correlation based on a Q(4) statistic.

[10] This break date, or one close to it, is suggested by the extensive recent empirical study by Miao (2000).

The latter will be used in what follows as a model of nominal income determination.

To estimate how nominal income would have evolved in Japan if the base rule had been followed beginning with 1991.1, we solve the pair of equations provided by (5) and the base growth policy rule. The latter is the same as reported in equation (2), except that a coefficient of 1.0 is attached to the final term. The simulation is conducted while feeding in estimates of the shocks that hit the economy during those years, these being estimated by the residuals from equation (5). The resulting time path for the log of nominal GDP is given by the dotted curve in Figure 2. The average growth rate of nominal GDP for the years in question is about 3.1 percent p.a. This figure falls short of the 5 percent target value built into the rule, because it is a growth rate rule that permits drift in the level of nominal income. But the actual performance of nominal GDP was as shown by the solid curve, which represents an average growth rate of only 0.7 percent. My tiny model does not specify how nominal GDP growth would have been split between inflation and real output growth, but it seems very likely that a substantial increase in real growth would have occurred.

In addition, it should be kept in mind that a higher inflation rate—or a reduced deflation rate—would also have been helpful in the case at hand, for it might have kept Japan away from the near-zero nominal interest rates that tended to immobilize monetary policy during the years 1995-2000. Indeed, it could be argued that the shift effects, represented in our model (5) by the D95 dummy variable, would not have occurred if the policy rule had been in place. In that case, nominal GDP growth would have been more rapid than indicated by the dotted curve of Figure 2.

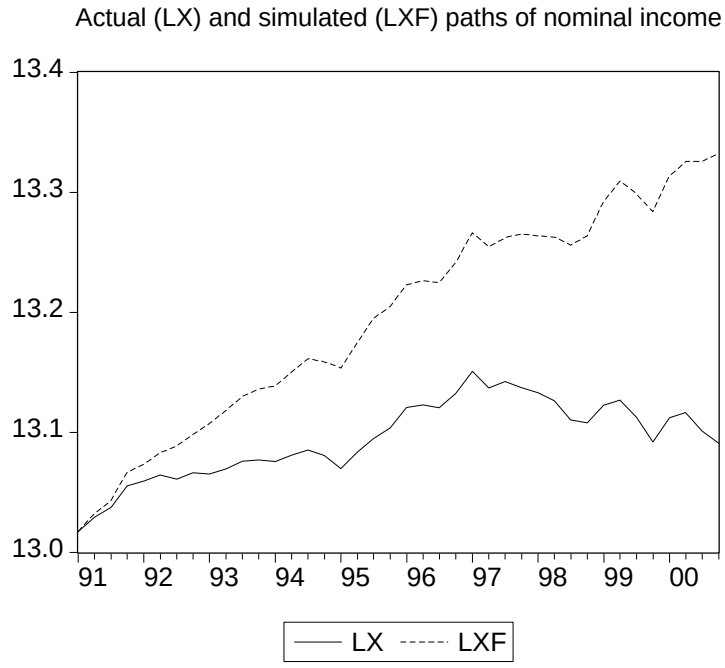

Figure 2

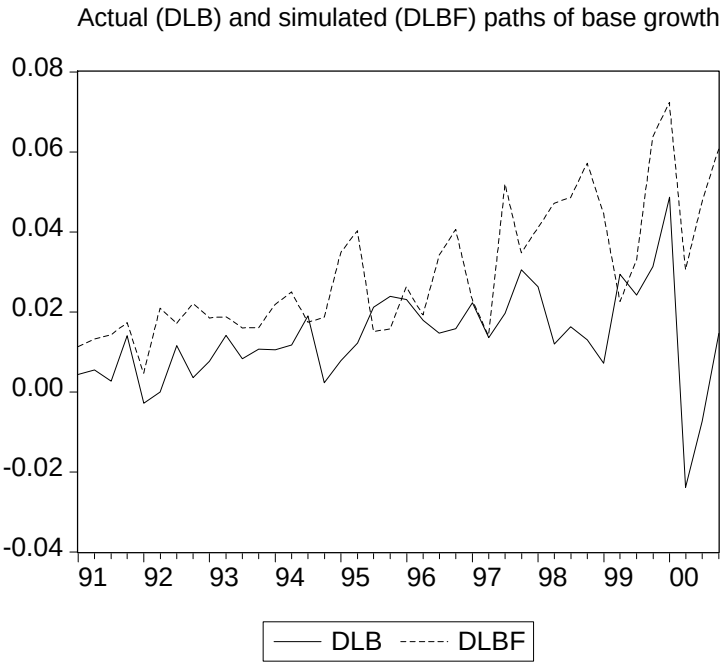

Figure 3

How much base money growth would have been necessary, according to the simulation underlying Figure 2? The answer is shown in Figure 3. There we see that the amount would have been substantial but not extreme, with growth rates averaging about 11.9 (rather than the actual 5.4) percent p.a. over the 10-year span.

The foregoing exercise falls well short of what should be done in principle. In particular, a much more satisfactory macroeconomic model is needed, one that not only includes interest rate, exchange rate, and real output variables, but in addition is based on optimizing analysis.[11] Use of such a model would provide more protection against Lucas-critique objections and would permit study of policy rules based on interest rate or exchange rate instruments. I consider the results presented above to be of a stop-gap nature, useful only in the absence of more adequate—but much more difficult—analysis.

6. International Relations

During the late 1990s, some officials of the International Monetary Fund and the U.S. Treasury were opposed to monetary stimulus as a means for combating Japan's ongoing economic weakness. Their reason was that monetary stimulus would lead to exchange rate depreciation, and the latter would be harmful to other nations seeking to expand (or, during the Asian crisis, maintain) exports to Japan. This source of objection to a more stimulative monetary policy, then or now, seems inappropriate. First, it is not at all obvious that such a policy would lead to lessened exports to Japan, for an increase in Japanese real income would induce imports and quite possibly to an extent greater than any decrease brought about by Japanese exchange rate depreciation. Second, monetary

[11] More along the lines of McCallum (2000a, pp. 888-897) but estimated with appropriate econometric procedures.

policy should be directed primarily toward keeping inflation low (but non-negative), with the avoidance of real cyclical fluctuations a secondary objective.[12] Fiscal policy and structural policies are more appropriate tools to use in managing balance-of-payments problems. Also, if Japan is not going to have a common currency with (e.g.) the United States, then their bilateral exchange rate should be free to float with each country managing its monetary affairs so as to keep a low inflation rate.[13] In short, the United States should not try to prevent a depreciation of the yen. More generally, the United States should not attempt to induce other nations to manage their monetary policy in a manner that is temporarily helpful for the United States. From a long-term perspective, the United States will benefit from having other important nations conduct their monetary policies in a manner that yields low inflation with domestic macroeconomic stability.

[12] Real cyclical conditions should provide only a secondary objective for monetary policy because monetary effects on these conditions are temporary and poorly understood, whereas monetary effects on prices (and thus on inflation rates) are long-lasting and well understood.

[13] Moreover, decisions to share a common currency should be made on grounds of microeconomic efficiency, not in an attempt to solve macroeconomic stabilization difficulties.

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