Comments on "Price Stability and Japanese Monetary Policy" (2)

Kenneth N. Kuttner

Invoking the venerable quantity theory of money, Hetzel (2004) argues that central banks are not powerless to end deflation, even when short-term interest rates are zero. While agreeing with his overall conclusion that central banks do possess tools to fight deflation, this commentary points out that the sixfold expansion in current account balances over the past three years has thus far failed to have any discernable impact on the volume of M2+CDs in Japan. This observation highlights an important obstacle to the direct implementation of the quantity theory's policy prescription when the zero lower bound on the short-term nominal interest rate is binding. Hetzel's proposal to link Japan's current account balance target is nonetheless a useful one, however, as it would represent a step toward a price level target.

Oberlin College and National Bureau of Economic Research (E-mail: kenneth.kuttner@oberlin.edu)

I. Introduction

If there is one thing economists can agree on, it is that Japan's 13-year long slump has seriously challenged the conventional wisdom about the efficacy of macroeconomic stabilization policy. And this is nowhere more true than in the area of monetary economics, where Japan's experience has spawned a vast amount of research on the extent to which the zero lower bound (ZLB) on nominal interest rates renders monetary policy impotent in deflationary, or near-deflationary, conditions.

Naturally, research on the ZLB has a direct bearing on the question of what the Bank of Japan (BOJ) can do to lift Japan's economy out of deflation. BOJ officials have, at various times, insisted that there was nothing more policy could do once the call rate was cut to zero.[1] This contention provoked spirited rejoinders by a wide range of economists: Krugman (1998), Blanchard (2000), Bernanke (2000), Auerbach and Obstfeld (2003) and Eggertsson and Woodford (2003), to cite just a few, argue that there *are* steps the BOJ could, and should, take to end deflation.[2]

Hetzel (2004) makes very much the same point as these authors, concluding that central banks are not, in fact, powerless to end deflation when the interest rate hits zero. In addition, his eminently sensible proposal to explicitly link the stance of monetary policy to some nominal target bears a certain resemblance to Eggertsson and Woodford's (2003) proposed price level target. But the route he takes to arrive at his conclusion differs fundamentally from the ways in which others have made the case for monetary expansion. While most recent research on the topic has emphasized the importance of expectations—and in particular, committing to a policy designed to increase inflation expectations—Hetzel's argument rests on the familiar quantity theory of money. The purpose of this comment is to discuss the ways in which his "monetarist" approach lends insight into the challenges the BOJ faces, as well as some ways in which this approach fails to illuminate Japan's policy conundrum.

II. The Zero Lower Bound Problem

Macroeconomic models used for policy analysis nowadays almost universally reflect the prevailing view that monetary policy affects the economy through its effect on the real interest rate. This view of the transmission mechanism is embodied in the "IS" curve that is a key ingredient of these models, like that of Clarida, Gali, and Gertler (1999),

$$y_t = -\varphi \left[i_t - E_t \pi_{t+1} \right] + E_t y_{t+1} + u_t, \tag{1}$$

where y_t is the output gap, i_t is the nominal interest rate, $E_t \pi_{t+1}$ is the time-t expectation of inflation in period $t+1$, and u_t is a demand shock.

The ZLB problem is readily apparent in the IS specification, (1). The time-t output gap depends on the real interest rate, $i_t - E_t \pi_{t+1}$; but with i_t constrained at

---

1. See, for example, Okina (1999).
2. Bernanke (2002) makes a similar argument in the context of the United States.

zero, the real rate cannot fall below $-E_t\pi_{t+1}$. With negative rates of inflation, as in Japan, this translates into a *positive* lower bound on the real rate of interest, which limits the monetary stimulus the central bank can provide by cutting the current short-term interest rate.[3]

Recognizing this limitation, proposals to overcome the ZLB, such as those of Krugman (1998) or Blanchard (2000), focus, in one way or another, on raising expected inflation, $E_t\pi_{t+1}$, rather than lowering i_t.[4] This is easier said than done, however. The complications are twofold: the first is that generating inflation requires creating a positive output gap, either now or, in forward-looking models, in the future. Moving the output gap into positive territory is hard to do, however, when the nominal interest rate is constrained by the ZLB—and in any case, deflation would be a non-issue if output were above potential. The second complication is that, as pointed out by Eggertsson (2003), any pledge to raise inflation to a level above the central bank's underlying objective would not be time-consistent. Eggertsson and Woodford's (2003) proposed policy rule solves the first of these two problems, essentially by committing to running positive output gaps in the future. Nonetheless, credibility remains essential to making such a strategy work, as Hetzel aptly notes.[5]

The main lessons from this line of research are twofold. The first is that monetary policy is not, in fact, powerless to prevent or overcome deflation in the face of the ZLB. The second lesson is that expectations are of critical importance in formulating a successful anti-deflationary policy. What is required is to go beyond thinking of policy in terms of the current setting of the short-term interest rate, and frame it instead in terms of a rule specifying the setting of the policy instrument—whatever it is—in a way that contributes to the formation of stabilizing, rather than *de*stabilizing expectations.

III. The Quantity Theory Approach

Hetzel's diagnosis of Japan's malaise relies on the familiar "quantity theory" of money, which emphasizes the role of the money supply in determining nominal variables. The prescription following from his diagnosis is self-evident: "If inflation is a monetary phenomenon, the price level varies to give the nominal money stock the real purchasing power desired by the public," he writes. "Because the central bank retains control of money creation, it retains the ability to end deflation even when the short-term interest rate is zero." The answer is, as Meltzer (2000) suggested, simply to "print money."

Hetzel is able to bypass the complications introduced by the ZLB problem because he views monetary policy transmission as taking place through the money supply,

---

3. Puzzlingly, Hetzel associates this scenario of central bank impotence with something he refers to as the "liquidity" view, which emphasizes the role of bank intermediation in monetary policy transmission. While bank lending may be a contributing factor, it not essential to the story: the underlying problem is a shortfall in aggregate demand caused by a real interest rate kept "too high" by the ZLB.

4. An exception is Goodfriend (2000), who entertains the possibility of forcing i_t below zero through the imposition of a tax on holding currency.

5. Friedman (2003) expresses serious doubts about the viability of any policy based entirely on managing expectations.

rather than through the interest rate. His basic argument is readily understood in the context of the well-known equation of exchange,

$$MV = PY, \tag{2}$$

where M is the money stock, P is the price level, Y is real GDP, and V is the "velocity" of money. The quantity theory view simply amounts to the proposition that velocity is stable, in which case increasing M must, in the long run, increase either P or Y.[6]

Expressed in this form, the critical links in Hetzel's argument become clear. The first key assumption is that there exists a stable relationship between some monetary aggregate (taken to be the stock of M2+CDs in the case of Japan) and nominal GDP. The second is that the monetary authority can effectively control the volume of M2+CDs. In assessing Hetzel's diagnosis and prescription, therefore, it is important to know how well these propositions hold in practice.

It turns out that the link between money, prices, and real GDP has held up surprisingly well in Japan, despite huge changes to the economy and the financial system. Hetzel offers two pieces of evidence supporting such a linkage. One is an empirical money demand equation, estimated in first differences, that appears to fit well in the sample (Table 1 and Figure 7 in Hetzel's paper).[7] Another is a plot of inflation and M2+CD growth (Figure 1 in Hetzel's paper) that appears to show a positive correlation, at least in the long run.

A somewhat more rigorous look at the money-income relationship appears in Kuttner and Posen (2001). The statistical tests presented in that paper demonstrated that one could formally reject the null of no cointegration between money, real GDP, and the price level in the sample ending in 1989.[8] They found, however, that extending the sample through 2001 weakened the results somewhat, although a plot of the (log) level of M2 and the fitted values from the cointegrating relationship revealed that the pre-1990 long-run relationship appeared to hold, albeit somewhat more loosely, even into the 1990s. That figure, updated with data through 2004/II, appears as Figure 1. Despite having been fitted over a sample that ended in 1989, the estimated equation captures the trend in M2 reasonably well. Thus, while the statistical evidence has weakened somewhat in recent years, there is good reason to believe that a long-run relationship between money, real GDP, and the price level has endured.
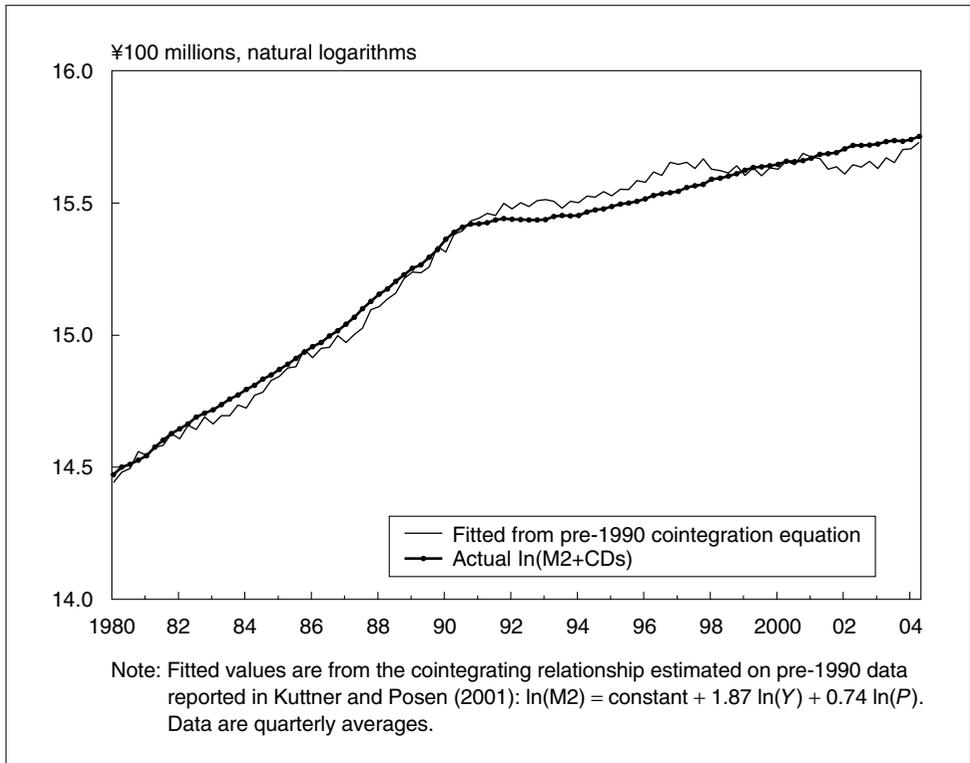
The empirical evidence is less supportive of a durable link between the BOJ's quantitative policy instrument (i.e., current account balances [CABs], or the monetary base) and broader monetary aggregates (M2+CDs). While Hetzel's paper raises the narrow question of whether the money multiplier exceeds unity, this important issue is, unfortunately, left unexplored.

....

6. Hetzel allows that, in the short run, V may vary due to policy-induced "portfolio rebalancing"—in other words, that an outward shift in money supply results in a movement down and to the right along a downward-sloping money demand curve.
7. Judging the fit of dynamic equations from in-sample simulations is difficult, however, because of the presence of the lagged dependent variable.
8. The income elasticity of 1.87 in the estimated cointegrating relationship of Kuttner and Posen (2001) is well in excess of the unit elasticity implied by equation (2).

Figure 1 The Long-Run Relationship between Broad Money, GDP, and Prices

¥100 millions, natural logarithms

[Legend:]
— Fitted from pre-1990 cointegration equation
—•— Actual ln(M2+CDs)

Note: Fitted values are from the cointegrating relationship estimated on pre-1990 data
reported in Kuttner and Posen (2001): ln(M2) = constant + 1.87 ln(*Y*) + 0.74 ln(*P*).
Data are quarterly averages.

In an effort to understand the scope for BOJ policy to affect the relevant money stock, Figure 2 plots the level of CABs, M2+CDs, and M2+CDs *excluding* CABs. The figure shows that CABs began to rise sharply once the BOJ began its "quantitative easing" in earnest, in August 2001. As of September 2004, CABs had risen sixfold to more than ¥30 trillion from roughly ¥5 trillion as of mid-2001. This increase has had little, if any, impact on the stock of M2+CDs, however. The main effect of the increase in CABs has been a precipitous decline in the money multiplier, which fell from 150 in February 2001 to 21 as of July 2004.

More relevant in the multiplier itself, however, is the *marginal* effect of CABs on broad money. This effect has been quite small. In fact, during the second half of 2002 and all of 2003, the stock of M2+CDs *excluding* CABs was essentially flat, which suggests that the quantitative easing policy had *no* effect on M2+CDs, beyond its direct effect on CABs.

Not surprisingly, the primary effect of the flood of CABs has been to completely saturate the market for overnight funds, and to drive the call money rate to virtually zero. This effect is apparent in Figure 3, which plots the call money rate against the logarithm of CABs using monthly data from January 1992 through July 2004. Points to the right of the vertical dashed line all date from the post-2001 quantitative easing period. The scatter seems to trace out a relatively stable, well-defined reserve demand function, and one that is, for all intents and purposes, flat at the near-zero interest

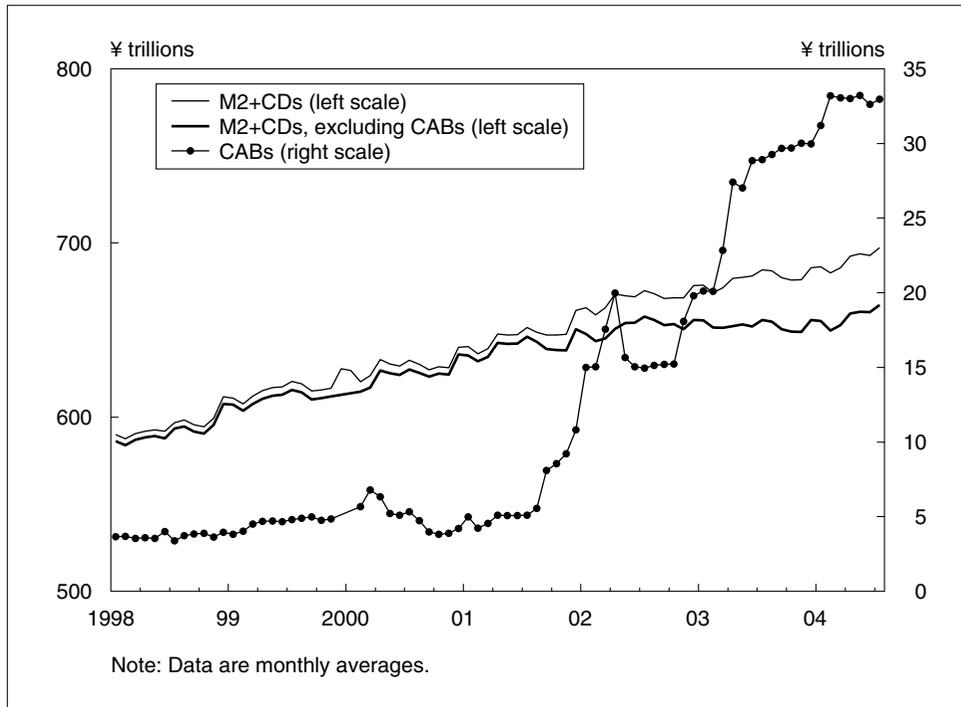**Figure 2 Current Account Balances and Stock of M2+CDs**

¥ trillions   ¥ trillions

- M2+CDs (left scale)
- M2+CDs, excluding CABs (left scale)
- CABs (right scale)

Note: Data are monthly averages.

Figure 3 Current Account Balances and the Call Money Rate

Call money rate, percent

Quantitative
easing

ln(current account balance, ¥100 millions)

Note: Data are monthly averages, January 1992 through July 2004.
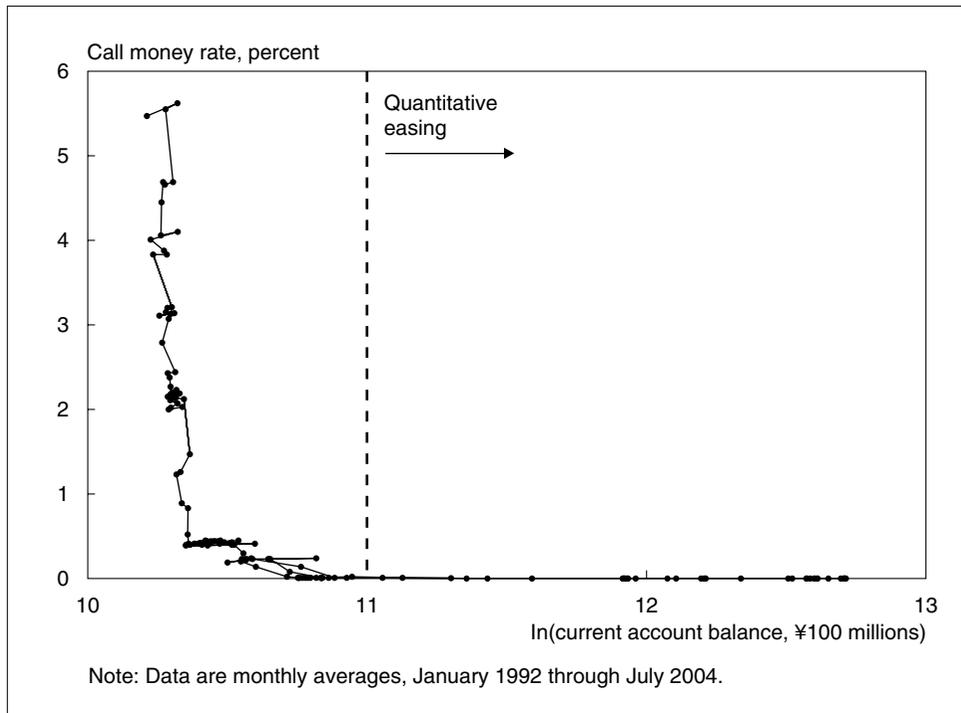
rates prevailing in Japan. If a "liquidity trap" is a situation in which the demand for central bank-issued money is infinitely elastic, post-2001 Japan surely qualifies.

Hetzel contends that the increase in CABs is not, in reality, a monetary expansion, attributing it instead to the BOJ accommodating exogenous increases in banks' reserve demand stemming from heightened risk. The sheer scale of post-2001 CAB growth casts doubt on this interpretation, however. In addition, pre-2001 episodes of banking system stress, such as the 1997 closure of Hokkaido Takushoku Bank, seem not to be associated with a significant outward shift in the reserve demand curve. While one might criticize the BOJ Policy Board for the seemingly *ad hoc* way in which it sets the CAB target, it is probably not accurate to conclude, as Hetzel does, that the level of CABs is entirely demand determined.

These observations about the links between reserves, money, output, and prices collectively suggest that the monetarists' basic quantity theory is of limited use in pointing the way toward a solution to Japan's deflation problem. Engineering a significant, permanent increase in M2+CDs would probably work—but the link from CABs to monetary aggregates appears too weak to exploit. Clearly, there is more to it than just "printing money," at least if money is printed and distributed in the conventional manner by exchanging reserves for government debt.

IV. Alternative Transmission Channels for Quantitative Policies

Despite the limitations of the quantity theory of money, narrowly defined, there are circumstances under which "printing money" *would* be effective, even when the banking system seems willing to absorb an arbitrarily large amount of reserves at a microscopic interest rate.

The theoretical literature has focused on three situations in which a quantitative policy could be effective. The first of these is the case in which the expansion of base money resulted from the monetization of real assets. This is the scenario Bernanke (2000) has in mind when he points out that such a policy *must* increase the price level—failing to do so would violate the economy's budget constraint. But such a policy has a fiscal component, as it is indistinguishable from a bond-financed purchase of real assets that is subsequently monetized; Bernanke's logic would not apply directly to conventional open market purchases of government bonds, unaccompanied by purchases of real assets.

The second case is one in which imperfect substitutability between assets means changes in asset quantities can affect asset prices through "portfolio balance" effects. Hetzel alludes to just such a mechanism when he suggests that the BOJ purchase "illiquid" assets, such as privately issued bonds, equities, or even real estate.[9] Goodfriend (2000) contains perhaps the most fully articulated description of such a policy, and why it might be expected to work. The basic idea is simply that large-scale purchases of these asset classes would surely affect these assets' prices,

---

9. McCallum's (2000) proposal to influence the exchange rate relies on a similar portfolio balance channel.

which may in turn have stimulative macroeconomic effects. But such a policy would, of course, raise other, non-monetary policy issues, such as those summarized in Clouse *et al.* (2003).

And finally, in the context of a cash-in-advance model, Auerbach and Obstfeld (2003) point out that open market purchases of bonds will increase the price level in a liquidity trap (i.e., with a non-binding cash-in-advance constraint) *if* the constraint is expected to bind at some future date. This only works if the injection of reserves is viewed as permanent, however. Hence, expectations, and the credibility of the central banks' policy play a decisive role, just as they do in Eggertsson and Woodford's (2003) proposed policy rule.

V. Linking the CAB Target to a Nominal Variable

To its credit, Hetzel's article does go beyond the usual "just print money" dictum to outline a rule for guiding the expansion of CABs. The centerpiece of his proposal is a rule linking the CAB target to a nominal variable—some combination of M2+CDs and nominal GDP. One desirable feature of Hetzel's proposal is that it would make the BOJ's quantitative easing policy more systematic and transparent than it is at present.

Moreover, there is reason to believe that such a policy could successfully dispel Japan's deflation, despite the dysfunctional link between CABs and broader monetary aggregates noted above. The reason is that a well-publicized policy rule, like that proposed by Hetzel, could help raise inflation expectations—and it would surely be more effective in this regard than the seemingly *ad hoc* way in which the CAB target has been set thus far. A credible commitment to a rule like Hetzel's would signal that the BOJ was prepared to tolerate an "overshoot" in the inflation rate of sufficient magnitude to return some nominal variable—nominal GDP, or the price level—to the trajectory it would have followed in the absence of deflation. Moreover, because the reserves injection would be understood to be permanent, it would be more likely to affect the price level, consistent with the insight of Auerbach and Obstfeld (2003).

These channels may already be functioning, to some extent: the evidence presented by Fujiki, Okina, and Shiratsuka (2004) suggests that increases in the CAB target tend to lead to an increase in the expected duration of the BOJ's zero interest rate policy (the "policy duration" effect). Thus, a steadily rising CAB target could be used as a measure to supplement the proposal put forward by Eggertsson and Woodford (2003), which was essentially to link the policy duration to the deviation from the price level target.

VI. Conclusion

The purpose of this note has been to assess the usefulness of the "quantity theory of money" approach in understanding Japan's deflation problem, and the policy options available to the BOJ. The conclusion is that the answer to Japan's deflation problem is not quite as simple as "just printing money"—if it had been that easy, the BOJ

surely would have ended deflation long ago. Complications arise for two reasons: first, the discontinuity created by the zero lower bound on the nominal interest rates; and second, the difficulty of credibly establishing a positive inflation objective. Although Hetzel's analysis ignores these complications, in the end his policy prescription of linking the monetary expansion to some nominal variable, such as the price level, has merit—primarily because it would move the BOJ closer to something resembling a price level target.

References

Auerbach, Alan, and Maurice Obstfeld, "The Case for Open-Market Purchases in a Liquidity Trap," NBER Working Paper No. 9814, National Bureau of Economic Research, 2003.

Bernanke, Ben S., "Japanese Monetary Policy: A Case of Self-Induced Paralysis?" in Ryoichi Mikitani and Adam S. Posen, eds. *Japan's Financial Crisis and Its Parallels to U.S. Experience*, Washington, D.C.: Institute for International Economics, 2000.

———, "Making Sure 'It' Doesn't Happen Here," speech presented to the National Economists Club, Washington, D.C., on November 21, 2002.

Blanchard, Olivier, "Bubbles, Liquidity Traps, and Monetary Policy," in Ryoichi Mikitani and Adam S. Posen, eds. *Japan's Financial Crisis and Its Parallels to U.S. Experience*, Washington, D.C.: Institute for International Economics, 2000.

Clarida, Richard, Jordi Gali, and Mark Gertler, "The Science of Monetary Policy: A New Keynesian Perspective," *Journal of Economic Literature*, 37, 1999, pp. 1661–1707.

Clouse, James, Dale Henderson, Athanasios Orphanides, David H. Small, and Peter A. Tinsley, "Monetary Policy When the Nominal Short-Term Interest Rate Is Zero," *Topics in Macroeconomics*, 3 (1), 2003.

Eggertsson, Gauti B., "How to Fight Deflation in a Liquidity Trap: Committing to Being Irresponsible," IMF Working Paper No. 03/64, International Monetary Fund, 2003.

———, and Michael Woodford, "The Zero Bound on Interest Rates and Optimal Monetary Policy," *Brookings Papers on Economic Activity*, 1, 2003, pp. 139–211.

Friedman, Benjamin M., "Comments on 'The Zero Bound on Interest Rates and Optimal Monetary Policy,'" *Brookings Papers on Economic Activity*, 1, 2003, pp. 212–219.

Fujiki, Hiroshi, Kunio Okina, and Shigenori Shiratsuka, "Comments on 'Price Stability and Japanese Monetary Policy (1),'" *Monetary and Economic Studies*, 22 (3), Institute for Monetary and Economic Studies, Bank of Japan, 2004, pp. 25–36 (this issue).

Goodfriend, Marvin, "Overcoming the Zero Bound on Interest Rate Policy," *Journal of Money, Credit and Banking*, 32, 2000, pp. 1007–1035.

Hetzel, Robert L., "Price Stability and Japanese Monetary Policy," *Monetary and Economic Studies*, 22 (3), Institute for Monetary and Economic Studies, Bank of Japan, 2004, pp. 1–24 (this issue).

Krugman, Paul R., "It's Baaack: Japan's Slump and the Return of the Liquidity Trap," *Brookings Papers on Economic Activity*, 2, 1998, pp. 137–205.

Kuttner, Kenneth N., and Adam S. Posen, "The Great Recession: Lessons for Macroeconomic Policy from Japan," *Brookings Papers on Economic Activity*, 2, 2001, pp. 93–198.

McCallum, Bennett T., "Theoretical Analysis Regarding a Zero Lower Bound on Nominal Interest Rates," *Journal of Money, Credit and Banking*, 32, 2000, pp. 870–904.

Meltzer, Allan H., "Time for Japan to Print Money," *AEI Policy Brief*, Washington, D.C.: American Enterprise Institute, 2000.

Okina, Kunio, "Monetary Policy under Zero Inflation: A Response to Criticisms and Questions Regarding Monetary Policy," *Monetary and Economic Studies*, 17 (3), Institute for Monetary and Economic Studies, Bank of Japan, 1999, pp. 157–182.