

**Japanese Monetary Policy under Quantitative Easing:
Neo-Wicksellian versus Monetarist Interpretations**

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Abstract: This paper examines Japanese monetary policy under the ‘quantitative easing’ regime since March 2001. The policy commitments and operating procedures adopted under this regime have been conditioned on a conventional neo-Wicksellian view of the monetary transmission process, which sees the problem of monetary policy at the zero bound on nominal interest rates as primarily one of expectations management. However, central bank policies are unlikely to be credible in the absence of a compelling account of the underlying monetary policy transmission mechanism at the zero bound. The neo-Wicksellian approach undermines the credibility on which it depends by advancing an irrelevance proposition for open market purchases at the zero bound. Japan’s experience with the zero bound illustrates many of these problems. We argue instead for a monetarist interpretation of the transmission mechanism that is more robust to an environment in which central bank credibility and conventional policy instruments have been exhausted. The BoJ should condition its policy commitments and operating procedures on this view of the transmission process. The neo-Wicksellian and monetarist approaches are potentially complementary.

Japanese Monetary Policy Under Quantitative Easing: Neo-Wicksellian versus Monetarist Interpretations

The dominant neo-Wicksellian paradigm for monetary policy analysis argues that monetary policy affects an economy predominantly via expectations for the future path of an officially-determined real interest rate and its relationship with a notional equilibrium real rate (Woodford 2003). The zero bound is potentially a binding constraint on monetary policy in this framework, unless policymakers can influence expectations for the future path of either nominal interest rates and/or inflation. This leads to an inversion of the traditional dynamic inconsistency problem (Kydland and Prescott 1977), requiring that the central bank credibly commit to an *inflationary* bias for the effectiveness of monetary policy to be maintained at the zero bound. Krugman (1998) has characterised the problem as committing to being 'irresponsible.' However, we argue that such commitments are unlikely to be credible in the absence of a compelling account of how the monetary policy transmission mechanism works at the zero bound. In dismissing the effectiveness of quantitative approaches to monetary policy, the neo-Wicksellian paradigm undermines the very credibility on which it depends for its effectiveness.

Japan's experience with the zero bound illustrates many of the problems with the neo-Wicksellian approach. Japan has been urged by a wide range of authorities to adopt inflation or price level targets designed to 'spring' its economy from a 'liquidity trap.' The Bank of Japan (BoJ) has generally rejected these policy proposals, fearing that announced targets would be insufficient in themselves to change expectations and could lead to a further loss of credibility. While Japan has

also experimented with a quantitative approach to monetary policy since March 2001, it has relied on an otherwise conventional view of the transmission process that has conditioned its operating procedures and limited the effectiveness of the quantitative easing regime.

We argue instead for a monetarist interpretation of the monetary policy transmission mechanism based on changes in the size and composition of a central bank's balance sheet as an alternative policy instrument at the zero bound. This approach potentially has important operational advantages over the more conventional neo-Wicksellian view of the transmission process. In particular, it does not require central bank policy actions to be particularly credible and does not depend on a particular view of the process by which expectations are formed. These are important attributes in a macroeconomic environment in which more conventional macro policy instruments have been exhausted and central bank credibility is likely to be under challenge.

Japanese Monetary Policy under Quantitative Easing

On 19 March 2001, the BoJ adopted a new framework for monetary policy. The Bank's principal monetary policy operating instrument was changed to the level of current account balances held by financial institutions at the Bank which, together with notes and coins on issue, constitutes the money base. The new framework for monetary policy, known as 'quantitative easing,' was announced as follows:¹

¹ 'New Procedures for Money Market Operations and Monetary Easing,' press release, Bank of Japan, 19 March 2001.

a) Change in the operating target for money market operations: The main operating target for money market operations be changed from the current uncollateralized overnight call rate to the outstanding balance of the current accounts at the Bank of Japan. Under the new procedures, the Bank provides ample liquidity, and the uncollateralized overnight call rate will be determined in the market at a certain level below the ceiling set by the Lombard-type lending facility.

b) CPI guideline for the duration of the new procedures: The new procedures for money market operations continue to be in place until the consumer price index (excluding perishables, on a nationwide statistics) registers stably a zero percent or an increase year on year.

c) Increase in the current-account balance at the Bank of Japan and declines in interest rates: For the time being, the balance outstanding at the Bank's current accounts be increased to around 5 trillion yen, or 1 trillion yen increase from the average outstanding of 4 trillion yen in February 2001. As a consequence, it is anticipated that the uncollateralized overnight call rate will significantly decline from the current target level of 0.15 percent and stay close to zero percent under normal circumstances.

d) Increase in outright purchase of long-term government bonds: The Bank will increase the amount of its outright purchase of long-term government bonds from the current 400 billion yen per month, in case it considers that increase to be necessary for providing liquidity smoothly. The outright purchase is, on the other hand, subject to the limitation that the outstanding amount of long-term government bonds effectively held by the Bank, i.e., after taking account of the

government bond sales under gensaki repurchase agreements, be kept below the outstanding balance of banknotes issued.

The rationale for the adoption of this quantitative approach to monetary policy was detailed in the minutes of the 19 March 2001 policy board meeting:²

In the course of discussions on the advantages and disadvantages of setting a quantitative target or an interest rate target, members gradually came to share the view that the effects previously brought about by the zero interest rate policy could be achieved and at the same time the market mechanism could be maintained to some extent, if the operating target was changed to the outstanding balance of current accounts at the Bank and the amount was increased to a level that would reduce the interest rate to virtually zero percent (the level was estimated to be around 5 trillion yen given the experience of the zero interest rate policy [between February 1999 and August 2000]). Members, at the same time, agreed to continue examining what would be the effects of increasing the outstanding balance of current accounts at the Bank as well as the possibility of a further easing through an increase in the outstanding balance...

Members generally agreed that whatever monetary easing measure the Bank decided to adopt, (1) it was necessary to make a strong commitment in terms of policy duration in order to ensure the "commitment effect," and (2) it was desirable to make the commitment clearer than "until deflationary concern was dispelled," the

² Minutes of the Bank of Japan's Monetary Policy Meeting on March 19, 2001. English translation prepared by the Bank's staff based on the Japanese original, released May 1, 2001.

phrase the Bank had used under the zero interest rate policy...

As a result of the above discussions, members came to concur that, in order to show the Bank's determination to prevent the economy from falling into a deflationary spiral, it would be appropriate to express the Bank's policy duration commitment as "until the CPI (excluding perishables) registered stably a zero percent or an increase year on year."

This policy commitment was augmented in October 2003 with a requirement that both actual and *expected* core inflation should be above zero, with inflation expectations being measured by the central tendency of the policy board's inflation forecast contained in the BoJ's semi-annual *Outlook for Economic Activity and Prices*.³ The quantitative easing framework and the associated policy commitment was thus seen primarily as an alternative operating procedure for reintroducing zero interest rates and influencing expectations for the future stance of policy. The BoJ sought to rely on the 'policy duration effect,' which allowed it to 'borrow' from the effects of future easing by linking the continuation of its policy stance to future inflation outcomes. The Bank was thus still relying on a conventional view of the monetary policy transmission mechanism, based on expectations for the future path of official interest rates. At the 19 March 2001 policy board meeting, only one member explicitly invoked a direct effect from an expansion of the money base as an argument for quantitative easing, with the minutes of the meeting noting that the member 'argued that the Bank should change its operating target to the monetary base, citing a VAR (vector auto regression) model analysis that showed

³ 'Enhancement of Monetary Policy Transparency,' press release, Bank of Japan, 10 October 2003.

that expansion of the monetary base had positive effects on Japan's stock prices, business fixed investment, and production.’⁴

It is noteworthy that the initial increase in the target for current account balances was limited to that necessary to accommodate demand for reserves on the part of financial institutions and cap the overnight call rate at zero. The BoJ did not seek to force excess liquidity on to the banking system in excess of demand for reserves. Subsequent increases in the target for current account balances were consistent with reserve demand accommodation, given growing precautionary demand for liquidity on the part of financial institutions associated with concerns about the stability of the financial system. This approach was made explicit by BoJ Deputy Governor Yamaguchi:⁵

the Bank did not simply raise the target regardless of demand. The Bank decided the level of the target such as five trillion or six trillion based on a judgement that it was the maximum demand for the current account balance at the time.

The BoJ’s Policy Planning Office (2002, p. 15) has also noted that ‘the fact that the Bank was able to increase the provision of massive amount[s] of funds implies that there was corresponding demand for such funds on the part of financial institutions.’

⁴ Minutes of the Bank of Japan’s Monetary Policy Meeting on March 19, 2001. English translation prepared by the Bank's staff based on the Japanese original, released May 1, 2001. The board member in question was most likely Teizo Taya, the policy board’s house monetarist at the time.

⁵ Remarks by Yutaka Yamaguchi, Deputy Governor of the Bank of Japan, at the JCIF International Finance Seminar on October 17, 2001. Hetzel (2003) notes numerous other official statements along these lines.

The target for the level of current account balances was raised on several occasions between March 2001 and January 2004, particularly after Toshihiko Fukui became Governor of the Bank in March 2003. Fukui won plaudits for his supposedly expansionary approach to monetary policy and was even credited with the cyclical recovery in the Japanese economy over the same period, even though his predecessor actually presided over a faster growth rate in the money base.⁶ However, as financial conditions improved and demand for liquidity on the part of financial institutions diminished, the Bank of Japan found it increasingly difficult to maintain the target at the level set in January 2004, demonstrating that the level of current account balances is essentially demand-determined. This has seen increased speculation that the target would be lowered and an outbreak of dissent on the BoJ policy board over the appropriate response to falling demand for liquidity.⁷

An important implication of the BoJ's approach to quantitative easing is that the observed call rate can still be viewed as at least a partial reflection of the Bank's monetary policy stance, since the policy has been designed explicitly to cap the call rate at zero, as well as influencing expectations for the future path of the call rate.

⁶ For example, *The Economist* magazine said on 14 February 2004 (p. 9) that 'the best case for optimism that this time the recovery will last, is that the Bank of Japan's monetary policy has now become steadily and credibly expansionary. Although the change towards such an expansionary stance has been claimed to be happening for several years, it has become consistent and believable only since Toshihiko Fukui took over as central bank governor.' Not only was this an inaccurate characterisation of the stance of monetary policy, it was also a poor forecast. Japan was in recession again by Q3 2004.

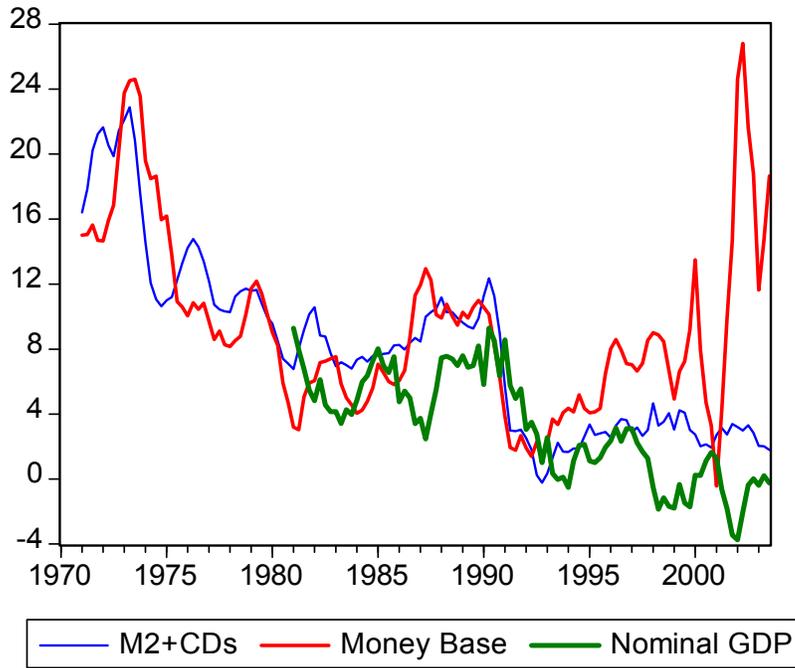
⁷ 'BoJ Fukui: Two Voted Against Policy Decision,' *Nikkei*, 28 April 2005.

The expected nominal rate is unobservable and can only be approximated with reference to observed rates on other instruments. Whether the observed nominal call rate is a *complete* reflection of the Bank's monetary policy stance depends critically on the view taken of the underlying monetary policy transmission mechanism. Given the demand-determined nature of the level of current account balances and the BoJ's dismissal of the effectiveness of an expansion in base money other than as a means of influencing the unobserved expected call rate (see next section), it can be argued that the observed nominal call rate still fully reflects the Bank's *intended* policy stance, despite the change in operating instrument under the quantitative easing regime. The BoJ's operating procedures and view of the transmission process thus call into question whether changes in the target for current account balances constitute a genuine change in monetary policy, as opposed to a change in the BoJ's willingness or ability to accommodate reserve demand on the part of financial institutions.

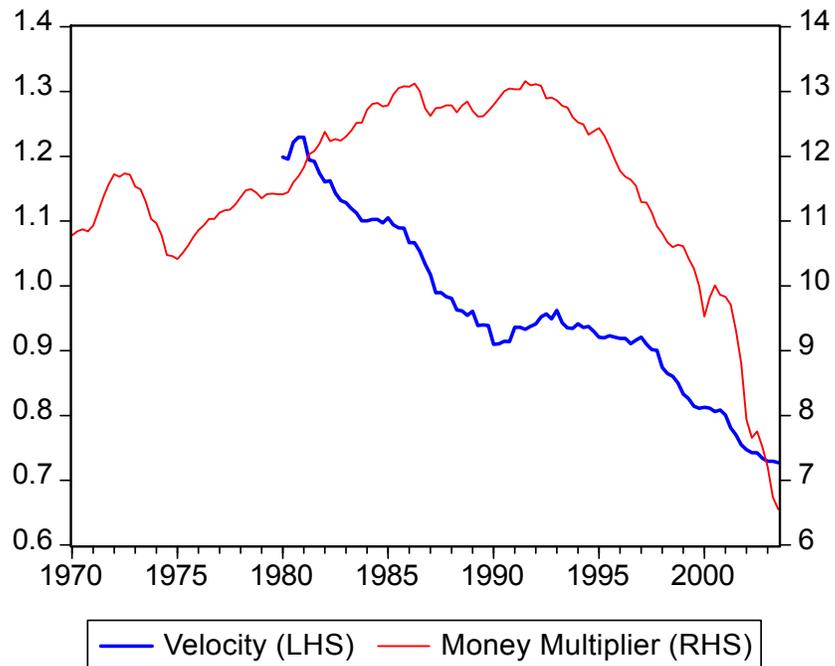
Broader monetary and credit aggregates are likely to be reflective of economic and financial conditions and developments in relation to financial intermediation and their role in monetary policy transmission. The following chart shows the annual growth rate of the money base, M2+CDs,⁸ and nominal GDP, while the second chart shows the money multiplier (M2+CDs/money base) and velocity (nominal GDP/M2+CDs).

⁸ M2+CDs, Japan's main money supply aggregate, includes currency, demand deposits, time deposits and certificates of deposit.

Japan Money Base, M2+CDs & Nominal GDP
(annual growth rate)



Japan Velocity & Money Multiplier (M2+CDs)



The secular decline in the money multiplier and velocity evident in the chart has accelerated under the quantitative easing regime. Indeed, the ratio of base money to nominal GDP has reached 17%, the highest in a century (ex-World War II) under quantitative easing (Office 2002, p. 1). The decline in the multiplier and velocity suggests little translation from increases in base money into broader monetary aggregates, inflation and nominal GDP. The decline in velocity also points to a sharp increase in money demand attributable to the series of rolling financial crises that Japan witnessed during the 1990s, especially during 1997-98. This is symptomatic of a break in the long-run relationship between monetary aggregates and nominal GDP and inflation. The massive increase in base money under the quantitative easing regime has not had the stimulatory effect on inflation and nominal GDP that the wide range of proponents of this policy prescription assumed would follow, suggesting a problem with monetary transmission. BoJ economists (Baba, Nishioka, Oda *et al.* 2004, p. 12) have cited this as ‘a clear case of monetarism failing to explain the relationship between money and inflation.’

This experience with monetary aggregates, nominal GDP and inflation has reinforced the BoJ’s conventional neo-Wicksellian view of the monetary policy transmission process. Although we have seen that at least one policy board member⁹ rationalised the adoption of quantitative easing on the basis that an increase in the quantity of base money would be expansionary in its own right, the BoJ’s policymakers and research establishment have been quite dismissive of monetarist interpretations of the transmission process. During the 1999-2000 zero

⁹ Most likely Teizo Taya, who had a reputation as the policy board’s house monetarist. Ironically, he subsequently dissented from a decision to increase the target for current account balances in January 2004 on the grounds that the quantitative easing regime was not proving to be effective.

interest rate policy episode prior to the introduction of quantitative easing, economists at the BoJ's Institute for Monetary and Economic Studies argued that 'providing monetary base under the zero interest rate policy is not an effective monetary easing measure theoretically unless the financial assets involved are not substitutes for the monetary base...the level of monetary base, or reserves as a component, cannot be an appropriate indicator for monetary conditions as long as the zero interest rate policy continues' (Fujiki, Okina and Shiratsuka 2000, p. 7). This scepticism continued after the quantitative easing regime was introduced (Shirakawa 2002). Policy board member Miyako Suda (2003, p. 5) has acknowledged a possible role for portfolio balance effects from a theoretical standpoint, but argues on the basis of casual observation that these effects do not appear to be operative in Japan. The BoJ has long questioned the desirability of influencing long-term bond yields through outright purchases of Japanese government bonds (JGBs) and even its ability to do so (Okina 1999). The BoJ has played host to visits from a number of leading monetarists, such as Allan Meltzer and Robert Hetzel, but its policy and research staff have generally rejected their views of the transmission process in favour of a neo-Wicksellian interpretation, in particular, the 'irrelevance' proposition for open market purchases of Eggertsson and Woodford (2003).¹⁰ As leading BoJ economists Fujiki et al (2004, p. 2) put it in direct response to a paper by Hetzel (2004) 'we fully agree with the importance of influencing market expectations, especially under zero interest rates, as *a central bank has no reliable policy instruments other than its influence on market expectations*' (emphasis added).

Empirical research by the Bank's staff has generally rejected an expansionary effect

¹⁰ We discuss these views fully in a later section.

from increases in the money base in its own right (Kimura, Kobayashi, Muranaga *et al.* 2002), in favour of transmission via interest rates expectations (see, eg, Marumo, Nakayama, Nishioka *et al.* 2003; see, eg, Okina and Shiratsuka 2003). Oda and Ueda (2005, p. 5) note that while changes in the BoJ's balance sheet might induce portfolio balance effects 'none of the BoJ's statements have mentioned any intent to produce this sort of effect.' Their results using a benchmark term structure model of the yield curve suggest that the BoJ's direct purchases of JGBs have not reduced the risk premium embodied in the yield curve, although there is evidence for an announcement effect from changes in the target for current account balances and the associated policy commitments. Oda and Ueda (2005, p. 18) conclude that 'the BoJ's monetary policy under the zero interest rate environment since 1999 has functioned mainly through the zero rate commitment, which has led to reduced medium- to long-term interest rates.'

This in-house research does not strictly represent an official policy position on the part of the Bank of Japan, but it certainly informs official thinking and is consistent with the pronouncements of the Governor of the Bank and members of the BoJ policy board, who have emphasised the 'policy duration effect' almost exclusively in their public comments on monetary policy transmission. There is contrary empirical evidence from the one non-BoJ source to examine the issue of the effectiveness of quantitative approaches to monetary policy in the Japanese context. Bernanke *et al.* (2004), using a very similar analytical and empirical approach based on a benchmark term structure model of the yield curve, reach diametrically opposed conclusions to the BoJ. They find no reliable relationship between policy expectations and BoJ policy statements, but do find support for an effect from quantitative easing measures on bond yields and stock prices, although

they also question whether these effects are large enough to have substantial macroeconomic implications. None of these authors using the term structure approach attempt to reconcile their seemingly conflicting results, which are likely attributable to differences in specification and methodology.

Monetary Policy Transmission at the Zero Bound: The Neo-Wicksellian View

Having considered the Bank of Japan's quantitative easing framework and its official rationale, we now seek to place these developments in the context of the literature on monetary policy transmission at the zero bound. Contemporary analysis of the role of monetary policy in an economy usually proceeds on the basis that the short-term official interest rate is the main operating instrument and transmission mechanism for policy. This reflects the widespread adoption of interest rate targeting as the operating regime of most central banks, along with a neo-Wicksellian analytical framework for monetary theory and practice (Woodford 2003). This framework relates the effect of monetary policy on an economy to the deviation in the official interest rate from an equilibrium rate determined by real factors. There is now an extensive literature, following Taylor (1993), that seeks to characterise monetary policy and its effects in terms of interest rate rules, which can be derived explicitly from hypothesised central bank welfare functions. These rules serve both as empirical characterisations of central bank behaviour, as well as offering policymakers guidance on the efficient conduct of policy. The 'Taylor principle,' for example, argues that for an economy to have a nominal anchor with an official interest rate as the monetary policy operating instrument, nominal official rates should be moved in line with inflation to ensure that the real interest

rate is consistent with its equilibrium level.

The low inflation-interest rate environment of the late 1990s and early 2000s presents a challenge to this framework for monetary theory and policy practice. Summers (1991) highlighted the combination of low rates of inflation and the zero bound on nominal interest rates as setting an effective floor for the real interest rate, constraining policymakers' scope to respond to depressed economic conditions through reductions in the real interest rate and providing a rationale for targeting a positive rate of inflation. The zero bound on nominal interest rates has become an issue for policymakers, most notably with the onset of deflation and zero nominal interest rates in Japan and the prospect that Japan's experience might become more widespread among the major industrialised economies. Monetary policy transmission at the zero bound was widely debated at the time of the 2003 global deflation scare.¹¹

There is now an extensive literature addressing the issue of the zero-bound for nominal interest rates and the structural non-linearities this induces in models where an official interest rate serves as the policy instrument and, by implication, the main transmission mechanism for policy. The Taylor principle implies that these models become globally unstable in the presence of low inflation or deflation and a binding zero bound, with a deflationary spiral the necessary outcome of real interest rates being held above their equilibrium level. This literature argues for a more aggressive, non-linear policy response in a low inflation environment, to preempt the prospect of zero nominal interest rates and deflation (Benhabib, Schmitt-Grohe and Uribe 2002; Fuhrer and Madigan 1997; Orphanides and Wieland 2000;

¹¹ The report of the IMF's (2003) task force on deflation is representative.

Reifschneider and Williams 2000).

A pre-emptive monetary policy may not be sufficient to avoid the zero bound becoming a binding constraint on policy. Indeed, many of the models in this literature resort to fiscal policy dominance of monetary policy by relying on the *ad hoc* assumption of fiscal policy interventions to prevent deflationary spirals and ensure model stability. If the combination of a zero nominal interest rate and expected inflation leaves the ex ante real rate above its equilibrium level, then the zero bound becomes a binding constraint, *unless* the central bank can exert sufficient upward influence on inflation expectations to lower the ex ante real rate or can influence expectations for the future path of the nominal rate. Most proposals for addressing the zero bound problem thus focus on the issue of promoting both actual and expected inflation or expectations for the nominal interest rate. This can be done either through credible policy commitments, the preferred neo-Wicksellian approach, or through the use of policy instruments other than the official interest rate designed to positively impact actual and expected inflation and nominal spending. There are a wide range of alternatives to the official interest rate, almost all of which involve a change in the size or composition of a central bank's balance sheet. These instruments can include open market purchases of a wide range of potential debt instruments or other assets, including outright debt monetisation (printing money), and unsterilised foreign exchange market intervention or exchange rate pegging below some notional equilibrium level. Since most of these instruments involve an expansion of the money base, we can conveniently address the potential effectiveness these instruments under the general question of the effectiveness of money base expansion at the zero bound.

Within the dominant neo-Wicksellian paradigm, there is a strong emphasis on credible policy commitments as the basis for any solution to the zero bound problem, at the expense of any reliance on open market purchases and an expansion of the money base. It is often argued that an expansion of the money base will be ineffective at the zero bound, due to money and short-term debt instruments becoming perfect substitutes, ruling out real balance effects. As Woodford (2003, p. 134) argues:

It is sometimes supposed that the conduct of monetary policy through interest-rate control leaves monetary policy impotent in the case of a deflationary trap, because the nominal interest-rate instrument cannot be lowered below zero, whereas it is actually still possible to stimulate aggregate demand by increasing the money supply. But monetary control has no such advantage. It is important to remember that there is no real-balance effect once the short nominal interest rate falls to zero, even if it is still possible to increase the size of the excess real money balances (ie, balances held in excess of the satiation level) held by the public. This is because higher real balances increase desired spending, for any given expected path of real interest rates, only insofar as they are able to increase the marginal utility of additional expenditure associated with a given level of real expenditure. Once the satiation level of real balances is reached, additional money balances no longer lead to any further relaxation of constraints upon transactional flexibility, so they cannot stimulate aggregate demand. (emphasis in original)

Eggertsson and Woodford (2003) generalise this argument to advance an ‘irrelevance proposition for open market operations in a variety of types of assets

that the central bank might acquire, under the assumption that the open-market operations do not change the expected future conduct of monetary or fiscal policy.’ While their demonstration of this proposition is somewhat specific to their analytical model, they argue that it has general applicability. Instead, they prefer to rely on the fact that a ‘central bank can clearly control the future path of short-term nominal interest rates if it has the will to do so’ (Eggertsson and Woodford 2003, p. 145). Monetary policy can thus be made effective, so long as a central bank can credibly influence and borrow from expectations for the future path of interest rates. The central bank’s ability to influence inflation expectations can also give it traction over the ex ante real rate.

Those in the neo-Wicksellian framework typically assume away or trivialise the many problems associated with making policy actions or announcements credible. These problems have long been recognised in the literature on monetary policy pre-commitment that developed in response to the dynamic inconsistency problem first explored in a macroeconomic context by Kydland and Prescott (1977). The problem of committing to an inflationary monetary policy is an inversion of the more traditional dynamic inconsistency problem faced by central banks. In his much discussed contribution to the literature, Krugman (1998, p. 10) treats generating positive inflation expectations via a credible commitment to a permanent expansion of the money base as being ‘outside the usual boundaries of economics.’ Krugman argues that policies of this kind can be made effective, without being dependent on any particular view of the underlying monetary policy transmission mechanism, although as Goodfriend (2000, p. 1011) notes ‘one would think that a central bank with the power to create inflation would have the power to stimulate spending directly.’ Like Krugman, Eggertsson and Woodford

(2003, p. 164) maintain that the problem of the zero bound can be addressed 'without explicit consideration of the role of central bank open-market operations of any kind.' Svensson (2001) is an exception in addressing credibility issues as the basis for his 'Foolproof Way' for escaping a 'liquidity trap,' involving a crawling exchange rate peg, coupled with a commitment to a price level target. Svensson (2003, p. 160) is probably right in claiming that his approach 'is unique in providing the central bank with a concrete action that demonstrates the central bank's commitment to a higher future price level...and stimulates the economy by reducing the real interest rate.' Svensson (2003, p. 152) shares the neo-Wicksellian scepticism about the effectiveness of quantitative approaches to monetary policy, arguing that 'the precise mechanism through which an expanded money base will alter expectations is not altogether clear.' As we will show in the next section, a base money expansion need not rely on changed expectations for its effectiveness. Those who advocate that the BoJ adopt an inflation or price level target other than for purely procedural or governance-related reasons (see, eg, Ito 2004) are relying on the view that managing expectations is the central problem faced by the Bank in confronting the zero bound problem.

We can turn these neo-Wicksellian arguments around to suggest that central bank announcements and policy actions are unlikely to be credible in the absence of a compelling account of how the monetary policy transmission mechanism might work at the zero bound to generate positive inflation expectations. The Bank of Japan's reluctance to embrace inflation targeting stems precisely from its conviction that if such policy commitments prove ineffective in practice, then a loss of credibility will follow that will further undermine its ability to influence expectations. The Bank of Japan's experience suggests that expectations

management is not a trivial issue. If open market operations are deemed to be ineffective, as those in the neo-Wicksellian framework argue, then the ability of the central bank to determine the future path of nominal short-term interest rates is effectively limited to committing to a zero rate for indefinitely long periods with a view to borrowing from whatever positive interest rate expectations might be priced into the long end of the yield curve. Japan's experience is not encouraging in this regard, with yields on 30 year bonds having fallen below 1% in recent years. This suggests little by way of future easing to be borrowed from further out along the yield curve, although existing policy commitments and easing measures might be partly responsible for this apparent exhaustion of positive interest rate expectations priced into the yield curve. In either case, this channel looks vulnerable to exhaustion based on Japan's experience.

This leaves only actual and expected inflation as means of making policy effective. The credibility of monetary policy thus cannot be divorced from the view taken about the underlying monetary policy transmission mechanism. The neo-Wicksellian framework does not solve the zero bound problem, it merely relocates it to the realm of expectations, where it remains essentially unsolved. The dominance of the neo-Wicksellian paradigm and New Keynesian models in which a nominal short-term interest rate rule fully describes monetary policy, such as those in Clarida et al (1999), helps explain the neglect of base money as an alternative policy instrument in both monetary theory and practice. Bordo and Filardo (2004, p. 1) note that 'most central banks today put too little emphasis on the role of monetary aggregates in assessing broad strategic policy trade-offs presented by deflation and that economists are often too eager to characterise low inflation economies as being in a liquidity trap.'

Monetary Policy Transmission at the Zero Bound: A Monetarist Perspective

The relationship between money, income and prices is one of the oldest issues in macroeconomics, dating back to at least Hume. Given the dominance of the neo-Wicksellian framework for monetary theory and policy practice, and the irrelevance of money in most contemporary approaches to macroeconomic modelling, these issues are no longer at the forefront of analysis. However, the challenge that low inflation and the zero bound on nominal interest rates presents to the neo-Wicksellian framework and the role of base money as an alternative policy instrument suggests that many of these issues need to be revisited.

The direction of causality between money, interest rates, output and prices has long been the subject of theoretical and empirical dispute. We do not intend to resolve this issue in a general sense, but simply note the arguments for treating base money as potentially causal for interest rates, output and prices. Perhaps the most thoughtful analysis of the role of causal reasoning in contemporary macroeconomics is Hoover (2001), who devotes a large part of his book to a consideration of this long-running issue. Hoover (2001, p. 49) defends the monetarist position against what he calls the accommodationist view by arguing that the issue of causality is entirely conditioned by the choice of monetary regime:

the antimonetarist argument is correct up to a point. There exist causal fields in which it is correct to think that income causes money. But they are wrong to think that such a causal field eliminates the causal priority of money over interest rates and, therefore, of money over income. The central bank is not eliminating that

linkage but exploiting it in its policy. Even if one regarded the policy as one in which money does not cause interest rates or income, an understanding of the causal structure should lead one to say, "so what?" The causal field in which income causes money is one that has been chosen by the central bank; it has abrogated control. Still, it remains within the power of the central bank to establish control, to change the causal field and to change the variables that appear in its reaction function. As an argument against monetarism in such a world, the accommodationist position fails.

While statistical approaches are useful in testing issues of causality in a given setting, we still require a theoretical framework to account for the underlying causal mechanism being tested. In particular, we need to motivate a role for money in the economy and monetary policy transmission, including in the context of the zero bound on nominal interest rates.

There is no essential role for money in the Arrow-Debreu Walraisian general equilibrium framework that underpins most approaches to modern macroeconomics, in which money serves only as a store of value. Since this paradigm abstracts from transaction, search and information costs, as well as uncertainty, the institution of money largely disappears from analysis (Goodhart 1989, pp. 22-23). By contrast, in a monetary economy:

The use of a medium of exchange is a substitute for investment in information and for labour allocated to search. By using money, individuals reduce the costs of settling on exchange arrangement, and they reduce the number of transactions in which they engage to convert initial endowments into consumption baskets. The

use of money increases the welfare of each transactor by reducing costs of acquiring information and transacting in an uncertain world (Brunner and Meltzer 1993, p. 67).

The medium of exchange role of money endows it with some special properties. As Brunner and Meltzer (1993, p. 69) note:

the return to money differs from the return to bonds or other financial assets...An increase in uncertainty would...increase the real return to money and induce substitution toward money from other assets. Technological changes in the payments system and changes in the cost of information also change the relative demands for money and other assets. Money and financial assets are substitutes in portfolios, but they are not perfect substitutes.

Recognition of financial market frictions and incomplete markets is important in establishing the imperfect substitutability of different types of assets and the ability of changes in relative supplies of these assets to affect financial market prices. Monetary and non-monetary wealth are not homogenous.

As well as being an imperfect substitute for other assets, money is endowed with special properties that flow from recognition of non-Walraisian price dynamics and the lack of an own market for money. The tatonnement price dynamics that form the basis of general equilibrium theorising, which hold that excess demand equations are homogenous of degree zero in all nominal variables, 'camouflages many of the central features of short-run monetary disequilibrium' (Hynes 1974, p. 78), in which relative prices are in a constant state of adjustment and real

production decisions are 'formed and implemented in the "disequilibrium" state' (Hynes 1974, pp. 81-82). Yeager (1997, p. 228) characterises this process as follows, noting that the necessarily discoordinated nature of price change:

intertwines with a banal but momentous fact: money, as a medium of exchange, unlike all other goods, lacks a price and a market of its own. No specific "money market" exists on which people acquire and dispose of money, nor does money have any specific price that straightforwardly comes under pressure to clear its (nonexistent) market. Money's value (strictly, the reciprocal of its value) is the average of individual prices and wages determined on myriad distinct though interconnecting markets for individual goods and services. Adjustment of money's value has to occur through supply and demand changes on these individual markets, where these changes can affect not only prices but also quantities traded and produced. In particular, an excess demand for money will tend to deflate not only prices but also quantities - unless prices absorb the entire impact, which is unlikely.

The discoordinated nature of price change and the resulting changes in relative prices are an important source of monetary non-neutrality. Disequilibrium price dynamics ensure the persistence of these non-neutralities and that they are effective regardless of the way in which expectations are formed. Monetary policy is effective regardless of whether changes in the money supply are expected or predictable, because economy-wide adjustments in relative prices are a necessary part of the response to a change in the money supply. As Yeager (1997, p. 225) argues, 'one cannot consistently both suppose that the price system is a communication mechanism - a device for mobilising and coordinating knowledge

dispersed in millions of separate minds - and also suppose that people *already* have the knowledge that the system is working to convey' [emphasis in original]. Brunner and Meltzer (1993, p. 42) also note that the rational expectations hypothesis serves to 'obscure, rather than clarify, the policy problem by endowing everyone with information they cannot have at zero cost.' In contrast to the New Classical or rational expectations view, it is not unanticipated changes in money or inflation that cause changes in output, but the change in money not absorbed by prices. The non-neutrality of money follows explicitly from the equation of exchange: 'price inflation is in rivalry with output expansion' (Yeager 1997, p. 166) in accounting for changes in nominal spending. The resort to *ad hoc* wage and other contracting mechanisms to force a role for forward-looking expectations in rational expectations models of inflation and to replicate inflation persistence (Calvo 1983; Fuhrer and Madigan 1997; Taylor 1980) is arguably a proxy for this process of discoordinated price change. The non-neutralities identified by this disequilibrium view of the role of money suggest that private sector beliefs about the permanence or otherwise of monetary expansion may not be essential to its effectiveness. This is potentially an important operational advantage of the monetarist view of the transmission process.

Those in the monetarist tradition have long been critical of the Keynesian focus on interest rates at the expense of broader transmission channels, arguing that monetary policy works by affecting economy-wide asset prices, not just the yield on a single, officially-determined short-term interest rate. The official interest rate is an incomplete representation of the stance of monetary policy. As Bernanke et al (2004, p. 7) note 'a given policy rate may coexist with widely varying configurations of asset prices and yields, and hence with varying degrees of policy

stimulus broadly considered.’ Aggregate demand is jointly determined by changes in economy-wide asset prices and yields. Only in general equilibrium does a single interest rate serve as a useful summary measure of relative asset prices. So long as money remains an imperfect substitute for a wide range of financial and real assets, monetary policy can change relative asset prices, with implications for aggregate demand, through portfolio re-balancing, wealth and substitution effects, changed liquidity premia and expectations (Meltzer 1999). Brunner and Meltzer (1968; 1993) show this formally. This remains the case even when money is endogenous to the determination of an official interest rate. As Meltzer (1995, p. 56) argues, ‘control of the interest rate does not avoid portfolio or output market responses and may amplify these responses.’ These are not uniquely monetarists propositions. The imperfect substitutability of different assets is a key feature in the Keynesian models of Tobin (1969), who argued against the view that all non-monetary assets and debts should be treated as perfect substitutes at a common interest rate and that any single variable captured the impact of monetary policy. Indeed, Yeager (1997, pp. 281-305) argues that many New Keynesian insights are simply a re-labelling of old school, pre-rational expectations, monetarism.

Of the various non-interest rate transmission channels emphasised by Meltzer, the portfolio balance and liquidity premium channels are perhaps the most important. Although we treat them separately, in practice, they are closely linked (Goodfriend 2000, p. 1024). Goodfriend (2000, p. 1024-25) argues that for open market purchases to be effective at the zero bound, they must influence liquidity broadly defined. Open market purchases can be effective in offsetting a negative aggregate demand shock regardless of the nominal and real interest rate:

by expanding the monetary base in exchange for long bonds, open market purchases reduce somewhat the high implicit marginal liquidity services yield on monetary assets. As a result, holders of monetary assets seek to rebalance their portfolios by acquiring less liquid assets including consumer durables, physical capital and claims to intellectual and organisational capital. The public cannot rid itself of the excess aggregate monetary liquidity. But the attempt to rebalance portfolios reverses somewhat the fall in asset prices that accompanied the adverse demand shock. Portfolio balance is achieved when the prices of less liquid assets have regained enough of their lost ground that their expected return has fallen in line with the reduced implicit liquidity yield on monetary assets.

Goodfriend notes that very large injections of base money may be required to make this channel effective, consistent with the neo-Wicksellian critique of this channel. He goes on to argue that ‘economists will have to develop and estimate models of how the monetary base influences the economy independently of interest rate policy.’

Monetary policy transmission is often thought to include a credit channel. As we have seen, the BoJ’s quantitative easing regime has been designed in part to alleviate liquidity problems in the financial sector, although this extra liquidity has been absorbed by increased demand for reserves on the part of financial institutions rather than promoting increased financial intermediation. The Bank of Japan has recognised the importance of impaired financial intermediation in Japan’s wider economic problems in its implications for monetary policy transmission (Baba, Nishioka, Oda et al. 2004). The BoJ has sought to alleviate

these problems through its money market operations under the zero interest rate policy and quantitative easing, by expanding the scope of its money market operations to include a wider range of credit instruments. There is some evidence to suggest that these policies have been effective in easing liquidity and term premia in the markets for these instruments (Hayakawa and Maeda 2000; Shirakawa 2002), but these operations have not been not the major focus of policy.

Those in the monetarist tradition accept the importance of the credit channel as a transmission mechanism, particularly in the context of a financial crisis associated with debt-deflation and have incorporated a credit channel into their more formal analyses of the monetary policy transmission mechanism, using the same multi-asset model that rejects the possibility of a liquidity trap (Brunner and Meltzer 1993, pp. 90-97). Monetarists argue that credit 'shocks' are actually endogenous rather than exogenous events, an induced response to deflation attributable to a failure of monetary policy. Brunner and Meltzer (1988, p. 217) seek to reconcile the endogenous monetary and exogenous credit interpretations of the Great Depression, giving an account that has a good approximate fit with Japan's experience from the late 1980s onwards:

explicitly acknowledging the role of debt and credit in the propagation of major depressions, removes an objection to the monetary explanation of the Great Depression. The observation that real balances rose and velocity fell during the early 1930s is said to disconfirm the thesis of a (possible partial) monetary shock. The banking and debt crisis, unleashed in the propagation of such a shock through the economy under prevailing monetary arrangements, explains the emergence of the relatively large decline in velocity. This, in turn, explains why the deflation and

decline are disproportionately large relative to the decline in the money stock. The secondary and tertiary effects of monetary retardation, transmitted through the money-credit process and augmented by the failure of the lender of last resort, magnified the response to the monetary decline and induced an endogenous flight to money large enough to raise real cash balances. Despite the rise in real balances, however, real wealth fell. The effect of an increase in real balances on net worth (emphasised in the Pigou effect) was overwhelmed by the debt problem and the fall in the real value of real assets.

A credit channel can also be given a role in the transmission open market purchases at the zero bound. According to Goodfriend (2000, pp. 1020-1021):

the implicit marginal broad liquidity services yield declines (given income, consumption and wealth) as the aggregate stock of monetary assets increases. Generally speaking, this would be so because the greater abundance of liquidity reduces the exposure of households and firms to the external finance premium. Liquidity broadly defined is at the heart of the leverage that quantitative monetary policy can exert when the nominal interest rate is at the cost-of-carry floor [ie, the zero bound].

Open market operations in *short-term* securities are unlikely to be effective in easing liquidity constraints, given that these instruments are close substitutes for cash, but this is not true of less than perfect substitutes, such as longer term securities and other assets. A central bank's open market purchases could be expanded to include a broad range of assets and even goods and services, such as producer or consumer durables, effectively substituting central bank credit for

private sector credit. This could be a useful approach in situations where financial intermediation is impaired, as has been the case in Japan. Overpaying for these purchases is an obvious means by which a central bank can bring about monetary transfers.

With the exception of the monetarist authors already cited, and the extensive literature on the Great Depression in the US in the 1930s, there is only a small contemporary empirical and analytical literature dealing with the effectiveness of the monetarist approaches to the transmission mechanism at the zero bound. Research under the auspices of the US Federal Reserve Board has offered in-principle support for this view of the transmission mechanism at the zero bound (Clouse, Henderson, Orphanides *et al.* 2000). Bernanke, Reinhart et al (2004) address this issue empirically and find evidence for an effect on bond yields and other asset prices from changes in the size and composition of central bank balance sheets in the context of term structure models of the yield curve for both the US and Japan, the latter explicitly dealing with the ZIRP and quantitative easing episodes. They argue that 'our findings go some way toward refuting the strong hypothesis that non-standard policy actions, including quantitative easing and targeted asset purchases, cannot be successful in a modern industrial economy' (Bernanke, Reinhart and Sack 2004, p. 77). They also note that Japan's approach to quantitative easing 'has in fact been somewhat conservative in its execution. Despite some interesting initiatives intended to promote the development of various financial markets, the BoJ has largely restricted its open-market purchases to the usual suspects - government securities - thereby inhibiting any effect that might work through imperfect substitutability' (Bernanke, Reinhart and Sack 2004, p. 20). Whereas the Federal Reserve suffers from statutory restrictions on the

range of instruments that might be made the subject of open market purchases (Clouse, Henderson, Orphanides et al. 2000), the BoJ is subject to fewer constraints.

Orphanides and Wieland (2000) consider the role of a portfolio balance effect operating through an exchange rate channel and reflecting changes in base money. This narrow transmission mechanism is shown to be weak, implying very large changes in base money to be effective. The authors nonetheless conclude that ‘the zero bound would not present a significant concern for stabilisation policy. Policy would need to be much more activist in terms of the monetary base but could still effectively stabilise the economy’ (Orphanides and Wieland 2000, p. 362). Auerbach and Obstfeld (2003) argue that open market purchases of government securities can improve welfare by reducing the real value of government debt and the excess burden of future taxes. Lebow (2004) shows how monetary expansion under quantitative easing has lowered the net debt position of the consolidated Japanese government and central bank, by exchanging irredeemable fiat money for debt instruments.

There is a broader literature that seeks to motivate a role for money in standard macroeconomic models that is not concerned explicitly with the zero bound problem. However, in these models, money is usually incorporated via either a cash-in-advance constraint, or by giving money a role in consumer utility functions. Yet we have seen that the transmission of base money to prices and output does not rely predominantly on a Pigovian real balance or wealth effect on consumption from changes in base money holdings. It is widely recognised that these wealth effects are small, given that the money base is typically a small part of household sector balance sheets, although a larger share of balance sheets of

Japanese households than most other developed countries. As Nelson (2002, p. 21-22) notes, studies of the real balance effect 'uniformly find that the role for money in the IS equation that arises from nonseparable utility is quantitatively negligible.' This role is likely to be even less significant at the zero bound, where money and short-term debt instruments become close substitutes and the interest rate is at the cost of carry floor. The neo-Wicksellian dismissal of quantitative approaches to monetary policy is largely a function of the trivial way in which money enters the standard dynamic general equilibrium models used to investigate these issues.

Instead, Nelson (ibid) argues that 'the proxy role for money arises from its ability to serve as an index of substitution effects, rather than wealth effects.' Nelson suggests that we need to enrich the asset specification of models of aggregate demand to reflect this proxy role of money. Inclusion of base money in an aggregate demand specification can proxy for the role of changes in the size and composition of a central bank's balance sheet in monetary transmission, resulting in a more complete representation of the contribution of monetary policy to aggregate demand. The real money base may also capture the non-neutralities arising from dis-coordinated price change and the lack of an own market for money discussed previously. Nelson finds a significant role for real base money in aggregate demand specifications for both the US and UK, arguing that base money proxies for the effects of monetary policy on longer-term yields. The author (Kirchner 2004) obtains similar results for Japan, which appear robust to the zero bound on nominal interest rates. Together with the results obtained by Bernanke, Reinhart et al (2004), this suggests scope for complementing neo-Wicksellian policy commitments with more aggressive use of quantitative approaches to monetary policy.

Conclusion

Japan could make improvements to the framework for monetary policy that might assist conventional neo-Wicksellian approaches to monetary policy transmission, including the adoption of a comprehensive inflation targeting regime, to replace the *ad hoc* policy commitments made under the ZIRP and quantitative easing. These changes might have some value from a procedural standpoint in enhancing policy transparency over and above their effectiveness in influencing expectations for inflation and interest rates. However, the neo-Wicksellian approach needs to be augmented by a compelling account of monetary policy transmission at the zero bound that does not rely exclusively on policy credibility and expectations management for its effectiveness.

We argue for the relevance of a monetarist interpretation of the transmission process than denies the possibility of a 'liquidity trap' arising from the neo-Wicksellian irrelevance proposition for open market purchases at the zero bound. This interpretation is based on an understanding of the role of money that has been neglected in literature on monetary policy in general and the zero bound in particular. This approach to monetary policy transmission does not rely on the credibility of central bank policy actions or a particular view of the expectations formation process and may thus have important operational advantages over more conventional views of the transmission process.

While Japan has adopted a quantitative approach to easing monetary policy, it has conditioned its policy actions and operating procedures on a conventional neo-

Wicksellian view of the transmission process. The BoJ's scepticism about its ability to influence inflation expectations apparently does not extend to its ability to exploit a neo-Wicksellian transmission channel via expectations for the official interest rate. The BoJ should instead re-condition its approach to quantitative easing and the associated operating procedures on a monetarist view of the transmission process. In particular, quantitative easing should not be calibrated to reserve demand accommodation. This might help impart credibility to its policy commitments, by yielding demonstrable impacts on actual inflation and other macroeconomic variables. The neo-Wicksellian and monetarist approaches are potentially complementary, but Japanese monetary policy has in practice fallen between the cracks of these two perspectives.

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