FRBSF ECONOMIC LETTER

Number 2006-28, October 20, 2006

Did Quantitative Easing by the Bank of Japan "Work"?

On March 19, 2001, the Bank of Japan (BOJ) embarked on an unprecedented monetary policy experiment, commonly referred to as "quantitative easing," in an attempt to stimulate the nation's stagnant economy. Under this policy, the BOJ increased its target for "current account balances" of commercial banks at the BOJ far in excess of their required reserve levels. This had the expected impact of reducing the already low overnight call rate (which is roughly equivalent to the Federal Reserve's monetary policy instrument, the federal funds rate) effectively to zero. In addition, the BOJ committed to maintain the policy until the core consumer price index registered "stably" a 0% or a positive increase year on year. The policy was lifted five years later, in March 2006. At the launch of the program, many were skeptical that it would have any impact on the real economy, as overnight interest rates were already close to zero, so flooding Japanese commercial banks with excess reserves would only amount to a swap of two assets with close to zero yields.

Now that the program has been lifted, several studies have attempted to assess its impact through a number of channels. These include a direct effect of increases in current account balances, an impact on the expectations of market participants, increased central bank purchases of long-term Japanese government bonds (JGBs) that would reduce long-term interest rates, and an encouragement of greater risk-tolerance in the Japanese financial system.

The success, or lack thereof, of the quantitative easing program is of interest not only as an important experience in Japanese economic history, but more generally as an unprecedented experiment in monetary policy under very low nominal interest rates. In this *Economic Letter,* I review the evidence that has emerged to date concerning the impact of the quantitative easing policy.

Direct impact of current account balance increases

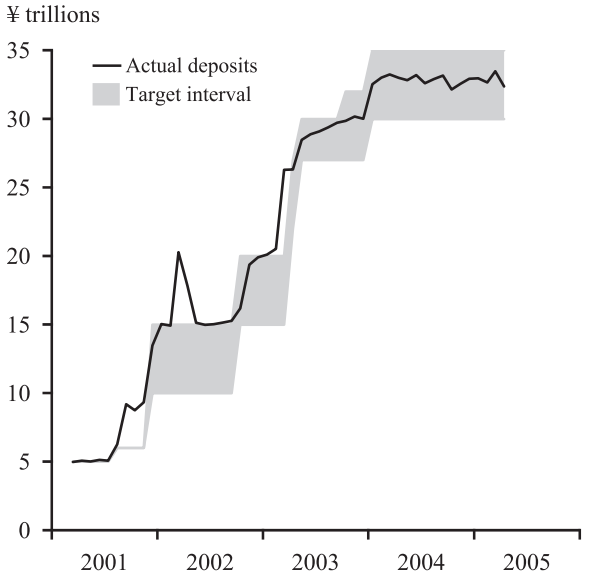
The primary policy innovation of quantitative easing was that the outstanding balance of current accounts held by Japanese commercial banks at the BOJ replaced the overnight call interest rate as the main target for monetary operations. The BOJ initially increased the current account balance approximately ¥1 trillion, to a target of ¥5 trillion. As this new target level exceeded required reserves, which did not pay interest, the change reduced the call rate from its 0.15% level to close to 0%.

The BOJ raised its current account target nine more times between March 2001 and December 2004, when the target reached ¥35 trillion, its final upper limit of the target range. The increases in current account balances were achieved primarily through monthly purchases of JGBs in open market operations. The BOJ was generally successful in keeping its monthly current account balances within its announced target ranges (see Figure 1), though there were short deviations, most notably in 2005, largely due to an insufficient supply of JGBs (there were also some earlier episodes, for example in 2002, where movements above the target range were quickly followed by upward adjustments in the range, but these were not considered problematic from a policy standpoint).

Most economic models fail to predict that simple increases in banks' current account balances could have an impact on real activity in an environment when interest rates are close to zero. However, there appears to have been a perception that the BOJ was concerned that abruptly running down the current account balances of commercial banks could have adverse consequences

PACIFIC BASIN NOTES *Pacific Basin Notes* appears on an occasional basis. It is prepared under the auspices of the Center for Pacific Basin Studies within the FRBSF's Economic Research Department.

Figure 1
Current account target and actual deposits



for the financial system. If markets did have this perception, then a buildup of the stock of reserves alone could push markets' expectations of future interest rates downward.

Oda and Ueda (2005) do find a small but statistically significant impact of increases in the current account on medium- to long-term JGB yields. They find that a ¥10 trillion increase in the current account balance target would be expected to reduce three-year JGB yields by 19 basis points and five-year JGBs by 17 basis points. However, they interpret these changes as extending the market's perception of the duration of the quantitative easing program, that is, the length of time that interest rates would be maintained at their zero levels. In contrast, Kobayashi et al. (2006) fail to find evidence of extra-normal returns on Japanese bank stock equities on dates where announcements of increases in the current account targets were not accompanied by increases in the ceiling on long-term JGB purchases.

Impact of policy maintenance commitment

A second channel through which quantitative easing could have real effects is its impact on expectations. As the quantitative easing policy drove short-term rates to zero, markets may have believed in the BOJ's commitment to maintaining the policy until the inflation criteria were met, that is, they may have believed that short-term interest rates would remain at zero until these criteria were achieved, even in the face of economic conditions that might have led to interest rate increases in the absence of any commitment. As inflation may respond to this recovery only with a lag, the impact of the policy commitment may have led to expectations of lower interest rates going forward.

However, it is relevant to ask why the public should believe in the BOJ's commitment to meet its inflation criteria even though tightening might be desirable in the wake of a fledgling economic recovery. One answer may be that the BOJ perceives that its policy independence would be curtailed if it reneged on a commitment. This argument is analogous to that suggesting that formally adopting an inflation target that matches a central bank's existing policy preferences could also have real effects.

Some studies have found evidence that the program affected markets' expectations concerning future interest rates. Baba et al. (2005) use a macroeconomic model to estimate the impact of the policy commitment on the "yield curve," the discrepancy in the yields of long- and short-term interest rates. They find an impact of the policy commitment of about 5 basis points on five-year JGB yields and about 2 basis points on ten-year JGBs beginning in 2003. Okina and Shiratsuka (2004) estimate that, during the quantitative easing period, the expected duration of zero interest rates increased from six months to roughly a year.

Impact of long-term JGB purchases

In addition to raising the ceiling on commercial bank current account balances, under the quantitative easing program the BOJ tripled the ceiling on monthly purchases of long-term JGB purchases from ¥400 billion to ¥1.2 trillion. As yields on these long-term bonds were nonzero, there was a perception that if long- and short-term JGBs were imperfect substitutes, then these purchases could reduce long-term JGB yields and, thereby, reduce long-term interest rates and stimulate long-term investment. In addition, if increased JGB purchases flatten the yield curve, Auerbach and Obstfeld (2005) argue that such purchases could have expansionary effects by reducing the deficit financing costs of the Japanese government.

The empirical evidence of real effects of increased BOJ purchases of long-term JGBs is also mixed. Oda and Ueda (2005) fail to find any significant effects on medium- and long-term bond yields, while Kobayashi et al. (2006) find that Japanese banks experienced positive excess returns on event dates where both current account balance targets and ceilings on purchases of long-term JGBs were increased. This contrasts sharply with the failure to find any excess returns on dates where

the current account balance target was increased in isolation.

Financial system "soft spots"

A number of authors have also argued that the quantitative easing program specifically targeted weaker areas of the Japanese financial system to maintain the pace of credit creation. In 2001, Japanese banks were still in the process of reducing their large stock of nonperforming loans. In the month prior to the launch of quantitative easing, 19 Japanese banks experienced downgrades in their credit ratings.

Speeches by BOJ policymakers, as well as the minutes of the policy meeting where quantitative easing was launched, support this contention. Minutes of the Policy Board meeting reveal that some members were particularly motivated to embark on the quantitative easing policy as a vehicle to maintain the rate of credit creation by Japanese commercial banks. However, many have pointed to the actual declines in bank lending that occurred after the launch of the program to argue that it was unsuccessful in encouraging credit extension by Japanese commercial banks. Still, it is hard to know whether the pace of credit creation would have been even slower in the absence of the program.

While there is little evidence that quantitative easing stimulated overall lending activity, there does appear to be some evidence that quantitative easing disproportionately supported the weakest Japanese banks. Baba et al. (2005) demonstrate that the launch of the program reduced the variance of certificate of deposit rates across banks, even more than would be expected by the observed decline in the variance of bank credit ratings over their sample period. This left weaker Japanese banks relatively less disadvantaged in raising capital than they would have been in the absence of the program. Similarly, Kobayashi et al. (2006) find that increases in quantitative easing policies were associated with greater excess equity returns on weaker Japanese banks, again suggesting that the program disproportionately favored weaker Japanese banks.

Conclusion

The results of studies of the impact of the quantitative easing period are just now making their way into the literature, but several patterns already have emerged. First, the primary evidence for the real effects of quantitative easing appears to be associated with empirical evidence that the introduction of or advances in the program have been associated with some measurable declines in longer-term interest rates. These have been associated with both changes in agents' expectations of future interest rate levels and with purchases of "nonstandard" assets, such as longer-term JGBs. As these policies often occurred simultaneously, it is difficult to discriminate between the two. Second, there appears to be evidence that the program aided weaker Japanese banks and generally encouraged greater risk-tolerance in the Japanese financial system.

While these outcomes appear to be consistent with the intentions of the program, the magnitudes of these impacts are still very uncertain. Moreover, in strengthening the performance of the weakest Japanese banks, quantitative easing may have had the undesired impact of delaying structural reform.

Mark M. Spiegel
Vice President

References

Auerbach, Alan J., and Maurice Obstfeld. 2005. "The Case for Open Market Purchases in a Liquidity Trap." *American Economic Review* 95(1) (March), pp. 110–137.

Baba, Naohiko, Motoharu Nakashima, Yosuke Shigemi, Kazuo Ueda, and Hiroshi Ugai. 2005. "Japan's Deflation, Problems in the Financial System, and Monetary Policy." *Monetary and Economic Studies* 23(1), pp. 47–111.

Kobayashi, Takeshi, Mark M. Spiegel, and Nobuyoshi Yamori. 2006. "Quantitative Easing and Japanese Bank Equity Values." Forthcoming, *Journal of the Japanese and International Economies.*

Oda, Nobuyuki, and Kazuo Ueda. 2005. "The Effects of the Bank of Japan's Zero Interest Rate Commitment and Quantitative Monetary Easing on the Yield Curve: A Macro-Finance Approach." Bank of Japan Working Paper Series, No. 05-E-6. http://www.boj.or.jp/en/type/ronbun/ron/wps/data/wp05e06.pdf

Okina, Kunio, and Shigneori Shiratsuka. 2004. "Policy Commitment and Expectation Formation: Japan's Experience Under Zero Interest Rates." *North American Journal of Economics and Finance* 15(1) (March), pp. 75–100.

ECONOMIC RESEARCH

FEDERAL RESERVE BANK

OF SAN FRANCISCO

P.O. Box 7702
San Francisco, CA 94120
Address Service Requested

Index to Recent Issues of *FRBSF Economic Letter*

DATE	NUMBER	TITLE	AUTHOR
4/14	06-07	Security Analysts and Regulatory Reform	Marquez
4/21	06-08	Job Matching: Evidence from the Beveridge Curve	Valletta/Hodges
4/28	06-09	Prospects for the Economy	Yellen
5/12	06-10	Bank Diversification, Economic Diversification?	Strahan
5/19	06-11	Central Bank Capital, Financial Strength, and the Bank of Japan	Cargill
6/2	06-12-13	Monetary Policy in a Global Environment	Yellen
6/23	06-14	International Financial Integration and the Current Account Balance	Cavallo
6/30	06-15	Residential Investment over the Real Estate Cycle	Krainer
7/7	06-16	A Monetary Policymaker's Passage to India	Yellen
7/21	06-17	Labor Markets and the Macroeconomy: Conference Summary	Dennis/Williams
7/28	06-18	Property Debt Burdens	Doms/Motika
8/4	06-19	Performance Divergence of Large and Small Credit Unions	Wilcox
8/11	06-20	Would an Inflation Target Help Anchor U.S. Inflation Expectations?	Swanson
8/25	06-21	New Uses for New Macro Derivatives	Wolfers
9/1	06-22	Inflation Targets and Inflation Expectations: Some Evidence...	Trehan/Tjosvold
9/15	06-23	The Exchange Rate–Consumer Price Puzzle	Valderrama
9/22	06-24	Oil Prices and the U.S. Trade Deficit	Cavallo
9/29	06-25	Health Insurance Costs and Declining Coverage	Buchmueller/Valletta
10/6	06-26	Safe and Sound Banking, 20 Years Later	Kwan
10/13	06-27	Inflation Persistence in an Era of Well-Anchored Inflation Expectations	Williams

Opinions expressed in the *Economic Letter* do not necessarily reflect the views of the management of the Federal Reserve Bank of San Francisco or of the Board of Governors of the Federal Reserve System. This publication is edited by Judith Goff, with the assistance of Anita Todd. Permission to reprint portions of articles or whole articles must be obtained in writing. Permission to photocopy is unrestricted. Please send editorial comments and requests for subscriptions, back copies, address changes, and reprint permission to: Public Information Department, Federal Reserve Bank of San Francisco, P.O. Box 7702, San Francisco, CA 94120, phone (415) 974-2163, fax (415) 974-3341, e-mail sf.pubs@sf.frb.org. **The *Economic Letter* and other publications and information are available on our website, http://www.frbsf.org.**