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Japan's quantitative monetary easing policy: Effect on the level and volatility of yield spreads☆

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ABSTRACT

We examine the effects on the level and volatility of yield spreads of the Quantitative Monetary Easing Policy (QMEP) of the Bank of Japan (BoJ) implemented from March 19, 2001 to March 9, 2006. We adopt an Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model to analyze daily data for the five year duration of QMEP. The purpose of QMEP was to reduce short-term interest rate expectations with the goal of bringing down long term interest rates to stimulate the economy. Under QMEP, the operational target of monetary policy was taken as the current account balances (CABs) of financial institutions held at the BoJ. In support of QMEP effectiveness, we find that the policy to raise CABs was indeed associated with a decrease in yield spreads across all maturities. At the same time, the policy may have increased the volatility of yield spreads at short and medium time horizons, perhaps due to unevern demand for government security issues that nevertheless left confidence in the future of low interest rates intact. Preserving liquidity at or above the CABs target range was found to decrease yield spreads.

1. Introduction

The sluggish growth of the Japanese economy since 1990 has prompted ongoing government policy action on both fiscal and monetary fronts. A number of fiscal stimulus programs have been implemented, but these appeared to be ineffective, resulting mainly in a widening budget deficits. Monetary policy meanwhile has taken increasingly expansionary forms. In 1995 the Bank of Japan (BoJ) pushed its policy rate, the uncollateralized overnight call rate, below 0.5 percent, then in February 1999 adopted the Zero Interest Rate Policy (ZIRP). Under the ZIRP, the BoJ guided the policy rate down to virtually zero by supplying ample funds in excess of required reserves. To achieve yet further easing, from March 2001 to March 2006 the Quantitative Monetary Easing Policy (QMEP) was implemented. Under QMEP the BoJ switched its operational target to the current account balances (CABs) held by financial institutions at the BoJ and purchased large quantities of long-term securities to maintain these balances well above required reserves. With this, the short-term interest rate was brought down to less than one percent. The Japanese economy has thus been stuck in a liquidity trap for a very long time.

Longer term interest rates have proven more difficult to manipulate. The expectations hypothesis of the term structure of interest rates states that the yield spread reflects the expected future course of short term rates. In principle, this should hold

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even when the authorities commit to maintaining the short-term rate at zero. Indeed, Laurent (1988, 1989) argued in support of a relationship between the stance of monetary policy and the yield spread. However, Benati and Goodhart (2008) found weak evidence for such a relationship. More important in shaping the yield spread, according to Estrella and Hardouvelis (1991), are expectations about future economic conditions.[1]

The BoJ implemented QMEP specifically to encourage changes in expectations, not only due to the expansion of liquidity but also to the announcement of its policy intentions. Under ZIRP, medium and long term nominal interest rates did not declined to zero. With QMEP, the BoJ sought to credibly stimulate the economy, thereby increasing expected inflation and hence lowering short-term interest rates in real terms. As a result, a decline in long term rates might finally be achieved. The yield spread is thus an important indicator of the success of QMEP.

The purpose of this paper is to examine relationships between: (i) commercial bank CABs at the BoJ and yield spread levels and volatilities; and (ii) CAB targets and yield spread levels and volatilities; and (iii) BoJ monetary policy statements and yield spread levels. We employ an exponential generalized autoregressive conditional heteroskedasticity (EGARCH) model to analyze daily data for the full duration of QMEP implementation, March 19, 2001 to March 9, 2006. Since the yield spread varies in connection with market expectations and risk, it is a volatile variable suited to analysis with EGARCH techniques.

Previous research on QMEP has focused on the relationship between the supply of liquidity or BoJ policy statements and the level of the yield curve. Baba, Nakashima, Shigemi, and Ueda, 2006, Fukuda (2010), Hanabusa (2011, 2012), Kobayashi, Spiegel, and Yamori, 2006 and Oda (2002), investigated the financial system under QMEP and suggested that the policy lowered financial and liquidity risks. Ugai (2006) explained that "the portfolio rebalancing effect affects the premium portion of the yields of financial assets that are imperfect substitutes for the monetary base" and "the signaling effect affects the private sector's expectations for the future path of short-term interest rates". Oda and Ueda (2007) examined the portfolio rebalancing and signaling effects finding support for the latter but not the former. Honda, Kuroki, and Tachibana, 2007 and Kimura and Small (2006) also found support for the portfolio rebalancing effect. Fujiki and Shiratsuka (2002), Okina and Shiratsuka (2004), and Oda and Ueda (2007) found support for the policy duration effect through the flatness of the yield curve. Hayo and Ono (2015) examined the behavior of the inflation rate in consideration of monetary shocks to the supply-side and demand-sides of the money market.

Our study yields a number of illuminating findings. First, under QMEP, an increase in CABs appears to have been successful in reducing the magnitude of yield spreads at all maturities. This finding is supportive of the effectiveness of the policy in lowering expectations of short term interest rates as translated into yield spreads. Second, the increase in CABs was associated with higher volatility of yield spreads at short and medium term time horizons, although not a long horizons. This may have been due to the effect on shorter term rates of uneven demand for government securities issues that nevertheless did not undermine market expectations that low short-term rates would be sustained into the future. Further, preserving liquidity at or above the CABs target range was found to decrease yield spreads. Finally, increases in the target range were not generally associated with changes in yield spreads with the exception of one period from May 20, 2003, to January 20, 2004.

The remainder of the paper is organized as follows. In Section 2 we explain the Quantitative Monetary Easing Policy. In Section 3 we describe our dataset and present a model of the relationship between QMEP and the level and volatility of yield spreads. Section 4 presents the empirical results. Finally, the last section summarizes and concludes.

2. Quantitative monetary easing policy

The BoJ implemented QMEP from March 19, 2001, to March 9, 2006, adopting current account balances as its operational target.[2] The BoJ notes that "Current account deposits at the Bank serve three major roles: the payment instrument for transactions among financial institutions, the BoJ, and the government; the cash reserves for financial institutions to pay individuals and firms; and the reserves of financial institutions subject to the reserve requirement system.&#8221[3]; During the fiveyear duration of QMEP, the target value of CABs at the BoJ was raised many times. The policy was initiated with a CAB target of 5 trillion yen which amounted to a 1 trillion yen increase over the average balance of 4 trillion yen in February 2001. Ultimately, the target range of CABs reached 30–35 trillion yen in January 2004, a level sustained until the termination of the policy in 2006. Fig. 1 plots actual CAB values and BoJ target values. QMEP policy events involving increases in CAB targets and bond purchase magnitudes are shown in Table 1. Until late 2001, the target was specified at a single value level, with targets from 2002 defined by a range. Prior to 2005, actual CAB values were maintained above the lower bound of target ranges. In 2005, CAB levels dipped below the lower target bound a number of times.

Whenever the BoJ increased the target level of CABs, authorities explained why there was a need for a liquidity injection to secure financial market stability. For example, the increase in March 2003 was justified in connection with the war in Iraq. The following three points are considered pillars of the QMEP.[4] First, the BoJ provides ample liquidity by increasing the level of CABs as the operational target of monetary policy and realizes the CABs target in excess of required reserves. Second, the

[1] Other studies that examine the relationship between the yield spread and future economic activity include Estrella and Mishkin (1997) and Kung (2015).
[2] Hanabusa (2012) and Ugai (2006) discuss in detail Japan's low interest rate policy which includes QMEP.
[3] CABs are a component of the monetary base which is defined as banknotes in circulation + coins in circulation + current account balances (current account deposits with the Bank of Japan). See BoJ homepage (https://www.boj.or.jp/en/index.htm/).
[4] See Ugai (2006).