The case for price level or inflation targeting—What happened to monetary policy effectiveness during the Japanese disinflation?

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ABSTRACT

This paper examines whether price level or inflation targeting would have been appropriate policy choices for Japan during its disinflation and deflation period. We employ Markov switching and structural vector autoregressions, together with structural IS equations, to investigate monetary policy effectiveness during the Japanese disinflation. We find evidence of regime switching in the mid-1990s in a model including the nominal policy interest rate. When monetary policy shocks are identified by using the McCallum rule for monetary base, a monetary expansion is found to have a statistically significant impact on prices. Moreover, a lower real *ex ante* interest rate can still stimulate the economy despite the zero lower bound on nominal interest rates.

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1. Introduction

The protracted economic slump in Japan since the early 1990s raised the attention of economists worldwide and led to numerous policy proposals. This so-called "lost decade", lasting much longer than a simple cyclical downturn, brought to life economic phenomena that proved a veritable challenge for policy makers. Interestingly, even though inflation was almost continuously negative during 1999–2005 and the zero interest rate policy was first initiated in 1999, the Bank of Japan (BOJ) was unwilling to adopt either an inflation or a price level targeting strategy. Admittedly, the policy of quantitative easing bears some resemblance to price level targeting, as it was to be in place until CPI inflation stays at or above zero percent for a few months—a 0 percent inflation rate effectively corresponds to a price level target. Even so, the absence of an explicit price level or inflation targeting strategy may seem surprising given the potential benefits of either of these approaches and the widespread adoption of inflation targeting by central banks worldwide.

The aim of our paper is to examine whether price level or inflation targeting would have been appropriate policy choices for

Japan during its disinflation and deflation period. To this aim, we employ Markov switching and structural vector autoregressions (MSVARs and structural VARs, respectively), together with structural IS equations, to investigate monetary policy effectiveness during the Japanese disinflation. If the monetary transmission mechanism had broken down in the economy, neither inflation nor price level targeting would have been feasible policy alternatives for the Bank of Japan. We find evidence of regime switching in the mid-1990s in a model including the nominal policy interest rate. A structural VAR where monetary policy shocks are identified by using a McCallum rule, is not stable over the 1990s. While expansionary policy shocks in the McCallum framework still have an impact on prices in the late 1990s, the link from monetary policy to output does not seem to function. Nevertheless, a lower real *ex ante* interest rate can still stimulate the economy despite the zero lower bound on nominal interest rates, providing support for price level and inflation targeting.[1]

Numerous studies have been inspired by the Japanese deflation problem, covering fiscal, monetary and structural policy aspects, and Fujiwara (2006) has recently provided evidence from an

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[1] Of course, any change in the monetary policy strategy of a central bank is ultimately a political decision. Ito (2004) provided interesting political economy evidence on why the BOJ has been unwilling to adopt an inflation targeting strategy.

MSVAR system. Our contribution to the literature is the evaluation of policy effectiveness using three different indicators for policy (nominal and real interest rates, and money supply), for comparable estimation samples. Even if the effectiveness of nominal interest rates weakens after the mid-1990s simply due to the zero bound, other indicators for policy may still show signs of potency. The importance of the real *ex ante* interest rate is prominently emphasized in the theoretical literature about price level targeting, while a focus on money becomes especially attractive for policy when nominal interest rates have fallen to zero bound. To our knowledge, monetary policy shocks derived from a McCallum monetary policy rule for money supply have not been previously examined in the literature for Japan.

The recovery in the Japanese economy has recently lifted CPI inflation to positive territory after years of persistent deflation. Even so, the possibility of hitting the zero bound and the threat of deflation have recently been serious concerns in other big economies as well. After the Federal Funds rate was lowered to 1 percent in the US in June 2003, concerns arose about the constraint a lower bound on interest rates could pose on monetary policy. Moreover, even as the European Central Bank (ECB) has in public seemed to downplay the possibility of negative inflation rates in the euro area, it did indeed argue that the clarification in May 2003 of its inflation target of "under but close to 2 percent" was aimed at creating a sufficient safety margin against deflation (ECB, 2003).

This paper is structured as follows. In the next section, we discuss some of the previous literature about the Japanese slowdown and the monetary transmission mechanism in this economy, together with theoretical considerations that are prominent to the analysis. This is followed by a presentation of the methodology of the study. In Section 4, the empirical analysis in the form of vector autoregressions is performed. Furthermore, results from structural IS equations are investigated and analysed. The final section concludes.

2. Previous literature and theoretical considerations

This section is divided into two main parts. Firstly, we discuss some previous work that has examined the Japanese slowdown and the monetary transmission mechanism in that economy. Due to the large number of studies concerned with the Japanese deflation problem and in line with our chosen methodology, in what follows we primarily mention research that has applied vector autoregressions to examine Japanese monetary policy. Secondly, we mention some topics of interest in the theoretical literature that concern the conduct of policy near or at the zero interest rate floor. Other studies of relevance for our work are mentioned in later parts of the text, as appropriate.

2.1. VAR analysis of Japanese monetary policy

Studies employing vector autoregressions to investigate Japanese monetary policy have focused on various issues, such as the slowdown of the 1990s, a general identification scheme to examine monetary policy shocks, and special features of the deflationary period, including an investigation of structural breaks in the monetary transmission mechanism. The study by Bayoumi (2001) belongs to the first category. The author examined the growth slowdown of the 1990s in Japan, testing for the significance of different explanations for the slump. These included the absence of a bold fiscal policy, the limitations of monetary policy, falling domestic asset prices and disruption of financial intermediation. According to the study, all the above explanations could have some validity; however, banking system problems seemed to be the main reason for the weakness in growth. In a similar vein, Morsink and Bayoumi (2000) found that

banks play a crucial role in transmitting monetary shocks to economic activity. The authors argued that policy measures to strengthen banks would be a prerequisite for enhancing monetary policy effectiveness in Japan.

Regarding the identification of Japanese monetary policy shocks, Sims (1992) examined many countries – Japan included – using a recursive model where shocks to short-term interest rates were identified as those of exogenous monetary policy. Similarly, the analysis of Kim (1999) was conducted in a multicountry framework for the G-7 economies, using common identifying assumptions across countries. While the restrictions imposed in the paper were of a contemporaneous nature, they differed from a simple recursive form. Shioji (2000) extended the nonrecursive system examined by Kim (1999) by including some additional variables, such as Bank of Japan loans and high-powered money. In contrast, Jang and Ogaki (2003) used a structural vector error correction model and focused on the effects of Japanese monetary policy shocks on exchange rates.

The paper by Kasa and Popper (1997) studied the objectives and operating procedures of the BOJ during 1975–1994. The authors found that the BOJ weighted both variation in the call money rate and in nonborrowed reserves, with the emphasis on the interest rate increasing over time. Miyao (2002) used a recursive VAR model to study the effects of monetary policy on aggregate activity and found that monetary policy shocks had a persistent effect on real output especially during the boom-and-bust economy of the 1980s. In another paper, the author found a break in the reduced form VAR system in the mid-1990s. More specifically, a persistent effect of a monetary policy shock on real output disappeared in the subsample of the 1990s (Miyao, 2000). This was also supported by stability testing that yielded a break date of 1995. Intuitive explanations for this finding included the appreciation of the yen, very low levels of short-term interest rates and problems in the banking system at that time.

Kimura et al. (2002) took into account the regime change to quantitative easing and the possible non-linearity of money demand at low interest rates, and accordingly estimated a VAR with time-varying parameters. While the positive effect of monetary base on inflation and output still existed in the mid-1980s, it was found to have disappeared by 2002. Similarly to Jang and Ogaki (2003), Kimura et al. (2002) and Miyao (2000), who examined dynamics within a vector autoregressive model with a monetary aggregate, Arai and Hoshi (2006) focused on the long-run relation between broad money M2 + CDs, prices and output. Even if a cointegrating relation between broad money and real GDP was found to exist under the low interest rate regime, a break was found in the long-run relationship in the mid-1990s.

In the first part of our analysis, we adopt a very similar methodology to Fujiwara (2006). The author estimated Markov switching VAR models in order to evaluate whether there is a structural break in the effectiveness of monetary policy in Japan. The study compared pre- and post-break monetary policy with the use of regime-dependent impulse response analysis. The author's results supported the existence of a break when the zero interest rate policy was resumed, and the study reported evidence of weaker monetary policy effectiveness at that time.

Arguments about structural breaks have also been made in other estimation frameworks. Fujiki and Shiratsuka (2002) and Okina and Shiratsuka (2004) examined the duration effect of the zero interest rate policy, derived from the central bank's commitment to maintain interest rates low for a considerable time to the future, by estimating forward rate curves with Japanese money market data. The authors found that the policy had indeed stabilized market expectations of the future course of short-term interest rates, bringing longer-term interest rates down. However,