



# Estimating monetary policy effects when interest rates are close to zero<sup>☆</sup>

Shigeru Iwata\*, Shu Wu

*Department of Economics, The University of Kansas, 213 Summerfield Hall, Lawrence, KS 66045, USA*

Received 4 April 2005; accepted 19 May 2005

Available online 2 June 2006

---

## Abstract

Using a nonlinear structural VAR approach, we estimate the effects of exogenous monetary policy shocks in the presence of a zero lower bound constraint on nominal interest rates and examine the impact of such a constraint on the effectiveness of counter-cyclical monetary policies based on the data from Japan. We find that when interest rates are at zero, the output effect of exogenous shocks to monetary policy is cut in half if the central bank continues to target the interest rate. The conditional impulse response functions allow us to isolate the effect of monetary policy shocks operating through the interest rate channel when other possible channels of monetary transmission are present.

© 2006 Elsevier B.V. All rights reserved.

*JEL classification:* E52; E55

*Keywords:* Zero lower bound; Monetary transmission; Nonlinear VAR

---

## 1. Introduction

Since nominal interest rates cannot be lower than zero, one implication of the monetary transmission through the interest rate channel is that a liquidity trap would eliminate the

---

<sup>☆</sup>We are grateful to an anonymous referee and the editor, Robert King, for valuable suggestions and comments. We also like to thank the seminar participants at the 2003 North American Summer Meeting of Econometric Society, the Midwest Econometric Group, the IMF, and the University of Kansas for helpful comments. All errors are ours.

\*Corresponding author.

*E-mail addresses:* [iwata@ku.edu](mailto:iwata@ku.edu) (S. Iwata), [shuwu@ku.edu](mailto:shuwu@ku.edu) (S. Wu).

effect of monetary shocks on the real economy. This possibility is not just a purely theoretical concern in the face of the recent experience of Japan, Europe and the United States. In the case of Japan, the overnight call rate, which is the policy instrument for the Bank of Japan, has been below 50 basis points since mid-1995, accompanied by economic stagnancy and deflationary pressure.

In this paper we propose a structural vector autoregression (VAR) model with a censored variable and use the data on Japanese economy to obtain empirical estimates of the monetary policy effects when nominal interest rates hit the zero bound, and to investigate the extent to which such a constraint might affect the ability of a central bank to conduct its policy.<sup>1</sup> There are three distinct contributions of our study to the analysis of the modern Japanese experience, which is a major historical period of substantial interest to monetary and financial economists. First, we show that macroeconomic responses to a standard measure of policy shocks are different at low levels of interest rates. Second, our analysis suggests that the zero bound constraint was important for the evolution of the Japanese economy. Third, we show that a quantitative monetary policy may have effects that are quite strong at these low levels of rates and indeed, which look very similar to monetary policy variations brought about by interest rate movements at higher levels of rates. These results are useful in evaluating different policy options for the Japanese economy and allow us to draw lessons for other countries regarding the impact of the zero bound on monetary policy. The study can also help us evaluate empirically the relative importance of different monetary transmission mechanisms.<sup>2</sup>

## 2. Empirical methodology

### 2.1. Data

Since the collapse of the speculative asset price bubble in early 1990, Japan has suffered prolonged deflation and economic stagnancy. Fig. 1 exhibits (a) log industrial production and log wholesale price, (b) money growth rate together with (c) the inter-bank call rates in Japan during the 1990s.<sup>3</sup> It can be seen clearly that output has failed to grow during the past decade while price level has been continuously declining (Fig. 1(a)). Such economic distress has prompted the Bank of Japan (BoJ) to adopt an expansionary monetary policy by lowering nominal interest rates. By September 1995, the inter-bank call rate, which has been the policy instrument for the BoJ, was pushed down to below 50 basis points and remained at that low level until the end of 2001 (Fig. 1(c)). The experience of the Japanese

---

<sup>1</sup>Using structural models of the U.S. economy, several authors perform numerical simulations to examine the extent to which the zero bound prevents real rates from falling and hence affects the central bank's ability to optimally respond to adverse macroeconomic shocks, Fuhrer and Madigan (1997), Orphanides and Wieland (1998), Reifschneider and Williams (2000), Rotemberg and Woodford (1997), Wolman (1998). In contrast, our study is based on direct empirical evidence on macroeconomic performance in a "zero interest rates" environment.

<sup>2</sup>Many monetarist economists, such as Meltzer (1995), have emphasized the importance of the monetary transmission mechanism operating through other asset prices. Some economists also view frictions in the credit markets due to asymmetric information as playing an important role in the process of monetary transmission, e.g. Bernanke and Gertler (1995). See also Mishkin (1995) and Taylor (1995).

<sup>3</sup>Data on the price level and the interest rate are obtained from the BoJ. Data on industrial production and M1 are obtained from International Financial Statistics of the IMF.

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات