



## China's monetary policy: Quantity versus price rules<sup>☆</sup>

Wenlang Zhang<sup>\*</sup>

Research Department, Hong Kong Monetary Authority, 55th Floor, II International Finance Centre, 8 Finance Street, Central, Hong Kong

### ARTICLE INFO

#### Article history:

Received 29 May 2007

Accepted 9 September 2008

Available online 23 September 2008

#### JEL classification:

E52

E58

#### Keywords:

Monetary policy rules

DSGE model

Taylor rule

### ABSTRACT

Two monetary policy rules, the money supply (quantity) rule and interest rate (price) rule, are explored for China in a dynamic stochastic general equilibrium model. The empirical results seem to indicate that the price rule is likely to be more effective in managing the macroeconomy than the quantity rule, favoring the government's intention of liberalizing interest rates and making a more active use of the price instrument. Moreover, the economy would have experienced less fluctuations had interest rate responded more aggressively to inflation.

© 2008 Elsevier Inc. All rights reserved.

### 1. Introduction

Compared with advanced economies, China's monetary policy appears to be more complicated, as can be seen at least in the following two aspects. First, although the Law of People's Bank of China (PBoC) states that the objective of monetary policy is to maintain price stability so as to promote economic growth, in reality China's monetary policy seems to have been assigned more goals than mandated by the law. According to a speech of the PBoC governor published in a recent issue of *Caijing Magazine* (in Chinese, December 25, 2006), not only should monetary policy ensure price stability and promote economic growth, it is also supposed to maximize employment and achieve balance of payments equilibrium. In addition, it is expected to help promote financial liberalization and reforms. Second, unlike advanced economies which employ mainly one policy instrument, short-term interest rate recently and money supply in the earlier period, China's monetary authority usually applies instruments of both quantity and price in nature in view of imperfect monetary policy transmission mechanism. Take the recent episode as example, in order to rein in fast growth in investment, the PBoC has raised benchmark interest rates, increased the reserve requirement ratio several times and issued a certain amount of one-year bills to selected banks whose loans were considered to have grown too fast since April 2006.

The main reason that money supply gave way to interest rate as a policy instrument in numerous countries is that the latter is usually difficult to control by monetary authority. The quantity rule is rooted in the Fisher quantity theory of money and the assumption that velocity of money is relatively stable in the short run. But, as shown by Mishkin (2003, chapter 21), the velocity of money has fluctuated too much to be seen as constant in the US from 1915 to 2002. China's velocity of money (M2) also seems to be unstable and has increased remarkably since the early 1990s. Another assumption of the money-supply rule is that there exists a close tie between inflation and nominal money growth. But this linkage has become looser

<sup>☆</sup> The views in this paper are solely those of the author and should not be interpreted as those of Hong Kong Monetary Authority.

<sup>\*</sup> Tel.: +852 2878 1830; fax: +852 2878 1897.

E-mail address: [wzhang@hkma.gov.hk](mailto:wzhang@hkma.gov.hk)

because money demand may experience large volatility. Numerous papers have addressed this issue, see [Wolters et al. \(1998\)](#) for example. In fact the tie between money and inflation in China has also become looser in the past few years, mainly as a result of financial deepening. In addition, as shown in [Laurens and Maino \(2007\)](#), the gaps between actual and targeted money growth have been relatively large between 1994 and 2004. Evidence in this line seems to indicate that money supply should be assigned a less important role than interest rate. Indeed, as stated in the monetary policy implementation report of 2006 Q4, the PBoC is inclined to make a more active use of price-based policies and interest rate liberalization has become a main task of monetary authority. [Ha and Fan \(2003\)](#), for example, find that China's investment was more sensitive to real lending rate during 1994–2002 than during 1981–1993.

The research below aims at exploring two important monetary policy instruments in China, quantity and price, studying their impacts and providing some advice for policy makers. Unlike most papers on China's policies in the literature, we will employ a dynamic stochastic general equilibrium (DSGE) model. A few macro models have been set up for China, most of which are macroeconomic models paying little attention to micro-foundations, see [He et al. \(2005\)](#) and [Scheibe and Vines \(2005\)](#) for instance. One may argue that DSGE models might not capture China's economy well since it is not yet a perfect market economy. As argued by [Scheibe and Vines \(2005\)](#) and [Chow \(2002\)](#), however, the Chinese economy has become marketised to such a degree since 1978 that it is not inappropriate to model China's economy in a framework of the advanced economies. In addition, as mentioned by [Chow \(2002\)](#), a theoretical-quantitative approach is as important as a historical-institutional one for China.

The remainder of the paper is organized as follows. The second section presents some empirical evidence on China's monetary policy. Section 3 presents the DSGE model and shows the consequential first order conditions engendered by households' and firms' optimization behaviors. The fourth section undertakes some numerical study of alternative monetary policies, and section five concludes the paper.

## 2. China's monetary policy

Although money supply has been supposed to be a dominant policy instrument in China in the past decades, as the economy becomes more market-oriented over time, the quantity rule seems to be less operable as China's money velocity (the ratio of nominal GDP to nominal M2) and multiplier (the ratio of M2 to reserve money) have increased significantly in the past 15 years.<sup>1</sup> This evidence has at least two implications: First, it is increasingly hard to determine money demand and as a result, hard to determine money supply. Second, it challenges China's practice of controlling broad money by controlling base money (reserve money). In addition, the tie between money growth and inflation has loosened in the past years, with the correlation coefficient between CPI inflation and broad money growth decreasing from over 0.8 during 1992–1999 to about 0.16 during 2000–2006. In contrast, the tie between inflation and interest rate seems to have become closer, as the correlation coefficient between CPI inflation and one-year benchmark lending rate changed from 0.16 during 1992–1999 to –0.676 during 2000–2006.

### 2.1. Quantity rule

[Burdekin and Siklos \(2005\)](#) claim that China seems to have followed the so-called McCallum rule.<sup>2</sup> Assuming the annual target nominal GDP growth to be 12% (target real growth of 8% plus target inflation of 4%), [Liu and Zhang \(2007\)](#) find that the McCallum rule cannot capture China's money supply well during 1991–2006, especially before 1997. The differential between the money supply simulated with the McCallum rule and the actual one was relatively large during 1991 and 1997, exceeding 40% points around 1993–1994. In fact, a main drawback of this monetary policy rule is that it does not take into account forward-looking behaviors. In addition, it does not consider inflation pressure explicitly. In the literature of DSGE models, economists usually assume money growth to be a function of technology shock, see [Walsh \(2003, chapter 2\)](#), for example. This assumption is probably inappropriate for China as its money growth has been employed as an active instrument to manage the economy and can not be determined by one exogenous variable such as technology shock. Defining  $v_t$  as the deviation of nominal money growth from its long-run value, we will employ the following quantity rule for China:

$$v_t = I_1 v_{t-1} - I_2 E_t \pi_{t+1} - I_3 \hat{Y}_t + \chi_{v,t} \quad 0 < I_1 < 1, I_{2,3} > 0 \quad (1)$$

where  $\chi_{v,t}$  is assumed to be an AR(1) process

$$\chi_{v,t} = \lambda_v \chi_{v,t-1} + \epsilon_t, \quad 0 < \lambda_v < 1$$

where  $\epsilon_t$  is white noise,  $\pi_t$  denotes inflation rate,<sup>3</sup>  $\hat{Y}_t$  is output gap and  $E$  is expectation operator. Such a rule dates back to [Taylor \(1979\)](#). Employing a dynamic macroeconomic model and taking money supply as policy instrument, [Taylor \(1979\)](#) finds that the optimal money supply can be set as a function of inflation and output gap. In a recent paper, [Taylor \(2000\)](#) states that

<sup>1</sup> While the former increased from about 3 to 6, the latter rose from 2.5 to 5 in the same period.

<sup>2</sup> This rule reads:  $q_t = g_t^* - \Delta vel_t + 0.5(g_t^* - g_{t-1})$ , where  $q_t$  denotes the growth rate of nominal money supply,  $g_t^*$  the target growth of nominal GDP,  $g_t$  the actual growth of nominal GDP and  $\Delta vel_t$  the growth of velocity of money.

<sup>3</sup> One may assume it has a constant or zero target for simplicity.

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