



Factor-augmented VAR analysis of the monetary policy in China [☆]



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ABSTRACT

We investigate the transmission mechanism of monetary policy in China over the past decades with emphasis on the post-Asian crisis period. A factor-augmented VAR method is used to study the effectiveness of monetary policy instruments in stabilizing the Chinese economy. We find that repo rate, benchmark lending rate, and a market-based monetary stance have little impact on the Chinese economy, and are only mildly effective when the exchange rate is more market-determined. The non-market-based measures of People's Bank of China, such as growth rates of total loan and money supply, are effective in adjusting the real economy and price level. Given the slow pace of exchange rate reform, China is likely to continue employing non-market-based policies in the near future.

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1. Introduction

China has achieved remarkable economic growth over the past decades, with an average growth rate of 9%. The inflation rate (either measured by the GDP deflator or Consumer price index) has remained moderately below 3% during this period.¹ With the end of the official guidance on bank lending² in 1998, monetary policy plays an increasingly important role in macroeconomic stabilization (Green, 2005). However, the transmission mechanism of monetary policy remains unclear. Since 1998, a series of monetary policy instruments, such as base interest rates, open market operations, discount rate, and reserve requirement, have been adopted by the People's Bank of China (PBC) to fine-tune the economy. The effectiveness of these instruments is, however, open to question. With its increasing integration into the global economy, the independence and effectiveness of China's monetary policy have been challenged because of the rigidity imposed on the exchange rate (Goodfriend & Prasad, 2007).

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¹ Some studies have found that the Chinese economy has become more stable since the mid-1990s (Brandt & Zhu, 2000, 2002; Du, He, & Rui, 2010, 2011; He, Chong, & Shi, 2009; He, Wang, & Zhang, 2011).

² This administrative measure, also known as the approach of "direct lending", essentially determines the customer type and the amount of credit banks will lend. As borrowing is quantitatively restricted, the credit plan has hindered the price mechanism of credit allocation in China.

Although significant efforts have been devoted to investigating the effect of Chinese monetary policies, most of the previous studies focus only on a single policy measure. Mehrotra (2007) finds that interest rate, as a monetary policy tool, cannot influence the price movements in China. Using total loans and central bank lending rate as monetary policy instruments, Dickinson and Liu (2007) find that the economic restructuring has changed the way monetary policy affects the real economy. Sun, Ford, and Dickinson (2010) show that the inter-bank weighted average interest rate affects the real economy through the bank lending channel. As China often implements different market-based policy instruments simultaneously, the analysis based on a single monetary tool may not provide a good evaluation of its monetary policy. Moreover, most of these studies have employed VAR, which typically comprises few variables. The use of sparse information sets in VAR analysis may produce inaccurate estimates and impulse response patterns (Bernanke, Boivin, & Elias, 2005; Rudebusch, 1998; Sims, 1992).

To shed light on the transmission channels of monetary policy in China over the past decades, in this paper, we employ the factor-augmented vector autoregression (FAVAR) of Bernanke et al. (2005) to investigate the effectiveness of monetary policy instruments.³ The FAVAR model combines the standard VAR approach with factor analysis to properly identify the monetary transmission mechanism (Bernanke et al., 2005; Boivin & Giannoni, 2006). The FAVAR approach also enables us to assess the extent of the movements of real economies attributed to each policy instrument, separately or in combination.

In this paper, we comprehensively investigate the effect of monetary policy on real economy after the financial reform in 1998. We are interested in this sample period for the following reasons. First, the Asian crisis of 1997 deteriorated the performance of Chinese companies, which accelerated the accumulation of non-performing loans (NPL) in the banking system. Recognizing the seriousness of NPL, the PBC abandoned the directed lending policy in 1998, and expanded its monetary policy toolbox. Hence, the post-1998 period provides us with a unique opportunity to examine the effectiveness of the market oriented monetary policy tools in China. Second, although China switched the exchange rate regime in June 2005 from a fixed rate regime to a more flexible exchange rate arrangement, very few studies have examined the improvement in the effectiveness of monetary policies after this reform. This sample period allows us to investigate how monetary policies in China are implemented under a relatively more floating exchange rate regime. Finally, most monthly macroeconomic data are only available after 1998.

Our results show that China has effectively implemented monetary policy instruments to manage its economic growth and inflation. It is found that the Chinese economy is affected primarily by the growth rate of total loan and M2. Market-based policy instruments, such as repo and benchmark lending rates, are only mildly effective, when China moved to a more flexible exchange arrangement. We also find that the general monetary stance representing the overall effects of market-based instruments only plays a modest role in curbing inflation.

The rest of the paper is organized as follows. Section 2 provides an overview of the major monetary policies and the transmission mechanism in China. The FAVAR model is introduced in Section 3. Section 4 presents the empirical evidence. Section 5 discusses the results and policy implications. Section 6 concludes the paper.

2. Features of post-1998 monetary policy

The Asian financial crisis of 1997 increased the operational burden of Chinese enterprises, and accelerated the problem of direct lending policy. The rapid accumulation of non-performing loans has led Chinese authorities to terminate this policy. Since 1998, the PBC has expanded its toolbox to increase the effectiveness of monetary policy.⁴ Aside from the administrative instruments, reforms towards market-based instruments have also been implemented.⁵ This section briefly reviews several important monetary tools used by the PBC and their effects on the Chinese economy.

2.1. Monetary policy instruments

2.1.1. Open market operation

The PBC has been trying to build up the interbank market and improve the effectiveness of open market operation as a channel for transmission of monetary policy. Because open market operation is carried out on a repo basis, the repo rate is often considered as a major tool of China's monetary policy (Peng, Chen, & Fan, 2006). Following Green (2005), we use the 7-day repo rate as our benchmark. Fig. 1 shows that the repo rate was reduced from 8.6% in 1998 to barely 1% in 2005. This rate has been climbing since 2005, in order to curb the overheating and the escalating inflation in the economy. The decline of the repo rate in 2008 provided extensive liquidity for the economy.

2.1.2. Benchmark lending rate

The benchmark interest rate is the reference rate determined by the PBC, around which different financial institutions can set their respective commercial lending rates. As the restrictions of the benchmark interest rate were gradually removed, financial

³ The procedure has been widely used in the analysis of U.S. and European monetary policies.

⁴ For example, the credit quota control was scrapped in 1998. The ceiling of RMB lending rate of financial institutions was abolished in 2004 (except for the Urban Credit Cooperatives and Rural Credit Cooperatives). The floor of the deposit rate was also scrapped in 2004. The lending rate began to move unboundedly from 90% of the benchmark lending rate, whereas the ceiling on deposit rate continued to prevail. Shanghai Inter-bank Offered Rate was formally launched in 2007.

⁵ Market-based instruments include open market operation, central bank lending rate, rediscount rate, required reserve interest rate, excess reserve interest rate, required reserve ratio, and benchmark lending and deposit rate. Administrative instruments are the regulatory change and window guidance, which is a quantitative control of bank credit.

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