Proceedings of Business and Economic Studies, 2024, Volume 7, Issue 2
http://ojs.bbwpublisher.com/index.php/PBES
Online ISSN: 2209-265X
Print ISSN: 2209-2641

China's Monetary Policy Impacts on Money and Stock Markets

Fang Fang*

Glasgow University, Glasgow, G12, UK

Corresponding author: Fang Fang, 81266817@qq.com

Abstract: This study investigated the impact of China's monetary policy on both the money market and stock markets, assuming that non-policy variables would not respond contemporaneously to changes in policy variables. Monetary policy adjustments are swiftly observed in money markets and gradually extend to the stock market. The study examined the effects of monetary policy shocks using three primary instruments: interest rate policy, reserve requirement ratio, and open market operations. Monthly data from 2007 to 2013 were analyzed using vector error correction (VEC) models. The findings suggest a likely presence of long-lasting and stable relationships among monetary policy, the money market, and stock markets. This research holds practical implications for Chinese policymakers, particularly in managing the challenges associated with fluctuation risks linked to high foreign exchange reserves, aiming to achieve autonomy in monetary policy and formulate effective monetary strategies to stimulate economic growth.

Keywords: Chinese money market; Chinese stocks market; Monetary policy; Shanghai Interbank Offered Rate (SHIBOR); Vector error correction models

Online publication: April 29, 2024

1. Introduction

Numerous economists have emphasized the significant impact of monetary policy on financial markets and, ultimately, on the real economy [1]. Implementing an appropriate monetary policy is crucial for maintaining a healthy economy. An expansionary monetary policy may result in increased inflation, ultimately reducing economic efficiency and hindering economic growth, while a conservative monetary policy may lead to recessionary issues [2-4]. To achieve planned economic objectives, policymakers direct central banks to focus on the process of monetary transmission [5]. The mechanism of monetary policy transmission varies among countries, and the effects of monetary policy functions change over time and according to economic situations [6].

China has maintained a growth rate above 8% per annum for the last three decades, propelling it to become the world's second-largest economy after the U.S. With economic growth and financial system reforms, China's monetary policy execution has undergone significant transformations [7]. Despite slow economic growth during the financial crises in 1997 and 2008, the association between monetary policy and the financial market remains significant. However, there is a lack of comprehensive studies on this topic. Existing studies have focused on the response of macroeconomic and stock market variables to monetary policy shocks in isolation [8]. It would be valuable to examine the reactions of both money and stock markets, as the former significantly influences monetary policy, while the latter reflects macroeconomic growth.

This study aims to investigate the relationship between China's current monetary policy, the money market, and the stock market from an empirical perspective. Utilizing the VEC model, the study seeks to identify and understand the linkages among them. The findings of this research will provide valuable insights for China's policymakers in further refining the country's monetary policy.

The subsequent sections of this article are organized to include a detailed literature review, research methodology, data analysis, findings, discussion, and conclusion.

2. Theoretical framework and Literature review

2.1. Monetary transmission mechanism theory

The monetary transmission mechanism theory is traditional and well-established, as monetary authorities must implement suitable policies and strategies to maintain the economic health of a nation. This process involves a progression of monetary policy aimed at facilitating changes in macroeconomic variables [9]. Two core schools of thought regarding monetary transmission mechanisms exist. The first is the neoclassical channel, which centers on asset prices, while the second is the non-neoclassical channel, emphasizing credit views within the context of market constraints [10].

2.2. Monetary policy operation theory

Gray & Talbot defined "monetary operations" as the application of monetary policy confirming that it has the envisioned influence on financial markets and the economy [11]. Schaechter declared that an operating target is the most relevant factor in instigating monetary policy [12]. Particularly, the selection of an operating target is based on monetary policy strategies and the development phase of the domestic financial market.

2.3. Monetary policy in China

With the rapid and substantial development of the economy, along with the increasing evolution of the banking sector, China's monetary policy has undergone significant changes. According to the Law of the People's Republic of China on the People's Bank of China (1995), the primary objective of China's monetary policy is to maintain stability in currency value and subsequently promote economic development. Currency stability encompasses both domestic price stability and exchange rate stability. In line with the economic reforms of 1978, the People's Bank of China (PBOC) initiated a monetary policy in the 1980s. At that time, the monetarist view was prevalent and valued; the PBOC adopted quantity targeting as its operating target and selected money supply growth as its intermediate target. However, the monetarist view failed to control domestic inflation in the late 1990s, leading to changes in the country's economic circumstances. Consequently, the PBOC abandoned the intermediate target view of money supply [13]. In fact, in 1985, the PBOC began implementing relending programs instead of the existing national credit program [14]. The PBOC transitioned to relending interest rates intending to restrain system-led liquidity, along with variable credit ceilings and efficient managerial provisions. Since then, interest rate policy (IRP) has been implemented as a monetary instrument, and China's monetary policy has rapidly shifted from direct to indirect control. Furthermore, Dickinson & Jia noted major changes in China's financial system since 1997. As the PBOC swiftly adopted various indirect methods to control liquidity in the system, commercial banks came under the spotlight and were entrusted with greater responsibilities for their services and operations. With the development of China's domestic money markets and the increasing quantity of national bonds held by the PBOC in the 1990s, open market operations (OMO) emerged as an additional critical operating instrument [15]. In addition to these, the required reserve ratio (RRR) also plays an equally significant role in the implementation of China's monetary policy [16,17].

This study aimed to investigate the relationship between China's present monetary policy, the money market, and the stock market from an empirical standpoint. Additionally, utilizing the VEC model, the study sought to identify and understand the connections among these variables. This research will provide valuable insights for policymakers in China to further refine the nation's monetary policy [18].

3. Research methodology

3.1. Equations

Data analysis in this research work was done by using Vector Error Correction Models (VECMs) based on Vector Autoregression (VAR). VAR can be used for estimations without depending on the "incredible identification restrictions" intrinsic to structural models. According to previous studies, a representative VAR can be written as:

$$y_t = \Phi_1 y_{t-1} + \ldots + \Phi_1 y_{t-p} + Hx_t + \varepsilon_t (t = 1,2,\ldots,T) \quad (1)$$

Here, **Equation (1)** is called unrestricted VAR. We obtained a reduced-form VAR that does not have a simultaneous correlation:

$$y_t = \Phi_1 y_{t-1} + \ldots + \Phi_1 y_{t-p} + \varepsilon_t (t = 1,2,\ldots,T) \quad (2)$$

or **Equation (2)** also can be expressed as:

$$\Phi(L) y_t = \varepsilon_t (t = 1,2,\ldots,T) \quad (3)$$

In this work, reduced-form VARs have been used to deliberate and derive our model.

If the VAR is stable, **Equation (3)** can be written as a vector moving average (VMA):

$$y_t = A(L) \varepsilon_t (t = 1,2,\ldots,T) \quad (4)$$

Now, if all variables in **Equation (2)** are integrated with order 1 [I (1)], then subtracting simultaneously from both sides of **Equation (2)**, the following equation can be obtained:

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \varepsilon_t (t = 1,2,\ldots,T; i = t = 1,2,\ldots,p) \quad (5)$$

Accordingly, Δy_t and Δy_{t-i} were vectors stationary at level. So, whether long-term associations subsist or not, it was dependent on matrix rank and value of rank. This value was between 0 and full rank (Cochrane, 2005), and the same has been taken into consideration. Hence, **Equation (6)** can be rewritten as:

$$\Delta y_t = \alpha \beta' y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \varepsilon_t (t = 1,2,\ldots,T; i = t = 1,2,\ldots,p) \quad (6)$$

In this work, the VEC model was used as a long-term trend depiction and would be lost if VAR was run with different data. Consequently, **Equation (6)** is the error-correction representation form.

3.2. Empirical model

To examine our following research questions, various proxy variables have been adopted.

RQ1. To select suitable proxy variables to epitomize the Chinese monetary policy.

RQ2. To frame a precise outline of the empirical model.

3.2.1. Proxy variables

Dependent variables: The People's Bank of China (PBOC) utilized three instruments: Interest Rate Policy (IRP), Required Reserve Ratio (RRR), and Open Market Operations (OMO). For IRP, the interest rate on commercial deposits was chosen as a proxy and labeled as X1. This selection was made because the short-term interest rate on commercial deposits significantly impacts the market. For RRR, the reserve requirement ratio of large financial institutions was chosen as a proxy and labeled as X2. For OMO proxies, two new data series were created. One represented the increase in monetary aggregates resulting from liquidity injection by the PBOC, labeled as X3, and the other represented the increase in monetary aggregates resulting from liquidity absorption by the PBOC, labeled as X4. It is worth noting that X3 was a foreign exchange reserve value, which plays a crucial role in China's monetary policy to maintain local currency and exchange rates.

Independent variables: The response of the money market (RMM) and the response of the stock market (RSM) were considered independent variables. For RMM, the Shanghai Interbank Offered Rate (SHIBOR) was chosen as a proxy because it is comparable to the London Interbank Offered Rate (LIBOR) in China, labeled as Y1. For RSM, the Chinese stock market index 300 (CSM300) was selected as a proxy, labeled as Y2. CSM300, which includes stocks from both Shenzhen and Shanghai, effectively reflects the behavior of the Chinese stock market [19]. Two models were constructed based on these proxy selections, one with SHIBOR and the other with CSM300.

4. Results

4.1. ADF Unit Root Test

Adjusted Dickey-Fuller (ADF) test was used for checking data stationarity. **Table 1** shows the ADF results, and as per **Table 1**, variable IRP and RRR were non-stationary at level, whereas all the variables were stationary at 1st difference, denoted as I (1).

Table 1. Adjusted Dickey-Fuller result statistics from Glasgow University

Variables	Level		1st Difference	
	T- Statistic	Prob.	T- Statistic	Prob.
X1	-2.115642	0.2392	-5.54152***	0.000
X2	-2.573108	0.1027	-3.195926***	0.0017
X3	-5.036301***	0.0001	-10.60268***	0.0000
X4	-4.781746***	0.0012	-11.42859***	0.0000
Y1	-4.819308***	0.0010	-10.57238***	0.0000
Y2	-8.404431***	0.0000	-10.5401***	0.0000

Sample period: 2007–2013; n = 84, *** P < 0.01.

4.2. Cointegration test

The selection of a correct lag length was imperative for the accuracy of cointegration tests and VEC models as its description is based on its lags and the lags of the other model variables. For selection, there are various statistical criteria like the Likelihood Ratio (LR), Akaike information criterion (AIC), and Schwarz Criterion (SC). Here, all criteria were compared according to multiple criteria. **Tables 2** and **3** show the optimum lag selection for the two models. Both Model 1 and Model 2 have selected two lags for most criteria. Data was applied for the cointegration test and the VEC model was post-difference, consequently, one lag order was selected.

Table 2. Optimum lag test for Model 1 from Glasgow University

VAR Lag Order Selection Criteria

Endogenous variables: X1_IRP X2_RRR X3_INJ X4_ABS Y1_SHIBOR

Exogenous variables: C

Sample: 2007M01 2013M12

Included observations: 78

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-428.7982	NA	0.046591	11.12303	11.27410	11.18351
1	17.94549	824.7576	9.39e-07	0.309090	1.215517*	0.671949
2	54.63007	63.02224*	7.01e-07*	0.009485*	1.671267	0.674727
3	71.08147	26.15350	8.91e-07	0.228680	2.645818	1.196305
4	89.99182	27.63821	1.08e-06	0.384825	3.557318	1.654832
5	105.4014	20.54611	1.48e-06	0.630733	4.558581	2.203123
6	123.8934	22.28523	1.93e-06	0.797605	5.480808	2.672377

*indicates lag order selected by the criterion. Abbreviation: LR, Sequential modified LR test statistic (each test at 5% level); FPE, Final prediction error; AIC, Akaike Information Criterion; SC, Schwartz Information Criterion; HQ, Hannan-Quinn Information Criterion

Table 3. Optimum lag test for Model 2 from Glasgow University

VAR Lag Order Selection Criteria

Endogenous variables: X1_IRP X2_RRR X3_INJ X4_ABS Y1_SHIBOR Y2_CSM300

Exogenous variables: C

Sample: 2007M01 2013M12

Included observations: 77

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-342.2152	NA	0.000341	9.044551	9.227185	9.117603
1	109.9838	822.1800	6.91e-09	-1.765813	-0.487374*	-1.254449*
2	154.3214	73.70405*	5.66e-09*	-1.982374*	0.391870	-1.032697
3	175.7802	32.32749	8.62e-09*	-1.604680	1.865370	-0.216690
4	206.8091	41.90918	1.07e-08	-1.475560	3.090294	0.350741
5	237.7762	36.99973	1.40e-08	-1.344838	4.316822	0.919777
6	274.7332	38.39688	1.72e-08	-1.369694	5.387770	1.333232

*indicates lag order selected by the criterion. Abbreviation: LR, Sequential modified LR test statistic (each test at 5% level); FPE, Final prediction error; AIC, Akaike Information Criterion; SC, Schwartz Information Criterion; HQ, Hannan-Quinn Information Criterion

Equation (5) shows that the rank of a matrix and the number of non-zero eigenvalue constraints the long-term association, and the Johanson test was also a series of tests based on non-zero eigenvalues of and test static are shown in **Tables 4** and **5**. As per the results of **Table 5**, both trace and max-eigenvalue tests indicate 1 cointegration equation at the 0.05 level because they reject the null hypothesis. It means that there was a long-term association between SHIBOR and monetary policy indicators (for Model 1), and amongst CSM300 and of monetary policy and money market indicators (for Model 2).

5. Conclusion

This work focused on examining the effects of China's Monetary Policy on the Money market and Stock Markets. According to the test results, data was stationary and gave stable models based on VEC. This work mentions that the responses of the stock market and money market are weak in the long term although short-term relationships are comparatively firm, it does not last long. However, this work has two limitations. First is the unavoidable subjectivity in choosing proxy variables [20]. The second is the sample size and study period. The probability of encountering the bias would increase due to a lack of observations.

Acknowledgements

I would like to express my sincere appreciation to my supervisor Professor Richard Dennis who provided helpful suggestions on my dissertation. He offered me a chance to learn something new and different.

Disclosure statement

The author declares no conflict of interest.

References

[1] Sellin P, 2001, Monetary Policy and the Stock Market: Theory and Empirical Evidence. Journal of Economic Surveys, 15(4): 491–541. https://doi.org/10.1111/1467-6419.00147

[2] Mishkin FS, 2013, The Economics of Money, Banking and Financial Markets (10th ed). Pearson Education, New York.

[3] Chen SS, 2007, Does Monetary Policy Have Asymmetric Effects on Stock Returns? Journal of Money, Credit and Banking, 39(2–3): 667–688. https://doi.org/10.1111/j.0022-2879.2007.00040.x

[4] Doh T, Connolly M, 2013, Has the Effect of Monetary Policy Announcements on Asset Prices Changed? Economic Review-Federal Reserve Bank of Kansas City, QIII: 31–65.

[5] Podobnik B, Horvatić D, Kenett DY, et al., 2012, The Competitiveness Versus the Wealth of a Country. Scientific Reports, 2(1): 678. https://doi.org/10.1038/srep00678

[6] Sun R, 2013, Does Monetary Policy Matter in China? A Narrative Approach. China Economic Review, 26: 56–74. https://doi.org/10.1016/j.chieco.2013.03.003

[7] Tang Y, Luo Y, Xiong J, et al., 2013, Impact of Monetary Policy Changes on the Chinese Monetary and Stock Markets. Physica A: Statistical Mechanics and Its Applications, 392(19): 4435–4449. https://doi.org/10.1016/j.physa.2013.05.023

[8] Dickinson D, Jia L, 2007, The Real Effects of Monetary Policy in China: An Empirical Analysis. China Economic Review, 18(1): 87–111. https://doi.org/10.1016/j.chieco.2005.11.002

[9] Taylor JB, 1995, The Monetary Transmission Mechanism: An Empirical Framework. Journal of Economic Perspectives, 9(4): 11–26. https://doi.org/10.1257/jep.9.4.11

[10] Boivin J, Kiley MT, Mishkin FS, 2010, How has the Monetary Transmission Mechanism Evolved Over Time? in Handbook of Monetary Economic (Vol. 3). Elsevier, Amsterdam 369–422. https://doi.org/10.1016/B978-0-444-

53238-1.00008-9

[11] Gray S, Talbot N, 2006, Monetary Operations, in Handbooks in Central Banking. Bank of England Handbook, England, 1–80.

[12] Schaechter A, 2001, Implementation of Monetary Policy and the Central Bank's Balance Sheet. IMF Working Paper No. 01/149. https://ssrn.com/abstract=879959

[13] Yongding Y, 2014, Macroeconomic Management of the Chinese Economy Since the 1990s, in Routledge Handbook of the Chinese Economy. Routledge, London, 138–156. https://doi.org/10.4324/9781315767475

[14] Helfand SM, Sielawa VH, Singhania D, 2019, A Matter of Time: An Impact Evaluation of the Brazilian National Land Credit Program. Journal of Development Economics, 141: 102361. https://doi.org/10.1016/j.jdeveco.2019.06.004

[15] Rocheteau G, Wright R, Xiao SX, 2018, Open Market Operations. Journal of Monetary Economics, 98: 114–128. https://doi.org/10.1016/j.jmoneco.2018.04.012

[16] Xi N, Ding N, Wang Y, 2005, How Required Reserve Ratio Affects Distribution and Velocity of Money. Physica A: Statistical Mechanics and its Applications, 357(3): 543–555. https://doi.org/10.1016/j.physa.2005.04.014

[17] Hu X, Zhu B, Zhou H, 2024, Impact of Low-Carbon Monetary Policies on Climate-Related Systemic Risk: Evidence from China. Journal of Cleaner Production, 434: 139858. https://doi.org/10.1016/j.jclepro.2023.139858

[18] Wu S, Khan M, Legido-Quigley H, 2020, What Steps Can Researchers Take to Increase Research Uptake by Policymakers? A Case Study in China. Health Policy and Planning, 35(6): 665–675. https://doi.org/10.1093/heapol/czaa025

[19] Chen J, Xu L, 2023, Do Exchange-Traded Fund Activities Destabilize the Stock Market? Evidence from the China Securities Index 300 Stocks. Economic Modelling, 127: 106450. https://doi.org/10.1016/j.econmod.2023.106450

[20] Kong L, Zhou X, Duan M, et al., 2022, A Dataset of a Proxy Variable for the Poultry Trade Flows in China. Scientific Data, 9(1): 690. https://doi.org/10.1038/s41597-022-01793-6