

The Impact of China's Monetary Policy on Stock Prices

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Abstract. The topic of this paper is the impact of Chinese monetary policy on stock price, and the importance of this study is mainly reflected with capital market gradually becomes a crucial feature of China's future economic development, the stock market, as a vital component of the capital market, is attracting more and more attention from the monetary authorities for its importance. In light of the aforementioned, this paper uses the M0, M1 and M2 data from 2010-2021, THE closing price of CSI 300 and the Shanghai interbank lending rate to build the VAR model to investigate how monetary policy affects stock prices. and the data in this paper are obtained from the CSMAR database and the Flush database. The study finds that although the money supply has a positive effect on stock prices and interest rates have a negative one, stock prices are still mostly controlled by their own fluctuations. This research offers some policy ideas based on this result.

Keywords: Monetary policy; money supply; interest rate; stock price.

1. Introduction

The fast growth of the Chinese economy has caused the stock market to progressively grow in size and take up the largest portion of the country's capital market, which will have an impact on all facets of the Chinese economy. It is noted in the report of the 19th National People's Congress of China that an economic system should be established with efficient market mechanisms, dynamic micro topics, and reasonable macro control. Therefore, a key component of China's economic development in the future will be the creation of regulatory tools and a monetary and financial system that is driven by the market. The capital market, particularly stock prices, will be impacted by monetary policy, one of the primary tools used by the government to influence macroeconomic factors. Investigating the effect of monetary policy on stock prices is therefore important from a practical standpoint.

First and foremost, anomalous swings in stock prices would have a substantial influence on the stability of the macro economy, making it crucial to investigate how monetary policy affects stock prices. It is crucial to comprehend how monetary policy influences stock prices because stock prices are impacted by a variety of market elements and because changing stock prices will have a complicated effect on a variety of issues. Since the stock market is the core of China's capital market, which is now undergoing vigorous development, its expansion is essential. The study of the impact of monetary policy on stock prices also plays an important role in the stable development of the financial market, so the study has a greater application value, especially in light of the role of capital market response to monetary policy in improving the effectiveness of monetary policy.

2. Literature review

Recent years have seen an increase in studies examining the relationship between monetary policy and stock markets, partly as a result of the stock markets' rapid ascent. Stock prices and monetary policy indicators are said to be negatively correlated, according to Challe and Giannitsarou [1]. Ki-Hong and Seong-Min find a tenable link between the two when they use models like GARCH to examine the consequences of unstable monetary policy on the Korean stock market [2]. Yun-Peng Zhao builds a model of money supply and stock prices using the SVAR model and discovers a significant and enduring association between the two [3]. Yuan Jarey built a VEC model to study the connection between the money supply and inflation using an impulse response function. Inflation and the money supply both have an influence on stock prices, but he found that the changes in stock prices are mostly brought on by their own shocks [4]. The ADF test and Granger causality were used in

study by Sun, Wenjie et al. to determine if the money supply and stock prices are correlated [5]. When Huang Xirui and Wu Huihui investigated how monetary policy's mediating factors affected stock prices, they found that the money supply had some bearing on prices but that the impact of interest rates was negligible [6]. Using the SVAR model, Yuan Yan investigated the link between stock prices, macroeconomic performance, and monetary policy. He discovered that in the short term, both the stock market and monetary policy had a considerable impact on macroeconomic performance [7]. Using M0, M1, and M2, Senchun Ren and Zhengben Dai looked into how the money supply affected stock prices. They discovered that all three had varying impacts, with M0 having the least influence and M2 having the greatest [8]. Monetary policy has an effect on the stock market, with the Shanghai Interbank Offered Rate having the most influence among interest rate measures, according to research by Deng Liubao and Chen Yunhua [9].

In summary, the international research on monetary policy and stock market is still in the development stage, and studies have been conducted on various aspects such as monetary policy indicators and transmission channels, and the factors considered are gradually comprehensive. Internationally, the influence of monetary policy on stock prices is generally viewed favorably, but there are ongoing debates about whether certain indicators are accurate and whether the research methodology is sound. This is largely because the indicators chosen for the current monetary policy research are a mess and the research methodologies differ, which causes the conclusions to vary slightly from article to article. The M0, M1 and M2 indicators of the money supply and SHIBOR indicators of the interest rate are used in this work in consideration of the research methodologies and indicators used in comparable studies [8-9]. Additionally, the VAR model is used to examine how monetary policy affects stock prices.

3. Method

3.1 Variable Selection

3.1.1 Dependent variables

In this paper, the monthly closing price of CSI 300 index is used as the response indicator of stock price, which is denoted by HS. The data from January 2010 to December 2021 are selected for the study, and the data in this paper are obtained from the CSMAR database and the Flush database.

3.1.2 Independent variables

The money supply is commonly used by monetary authorities for monetary policy to regulate the macroeconomy. When the money supply increases, investors tend to put money into the stock market to gain more profit. The stock market may be impacted by inflation as well as price increases that result from a rise in the money supply. When the level of inflation is low, the rise in prices will increase the profitability of companies, which in turn will promote the rise in stock prices. In contrast, if inflation is excessive, business profitability declines and stock prices drop. Therefore, from a theoretical standpoint, it is impossible to predict with accuracy how the money supply, or a monetary policy, affects stock prices [10]. For the purpose of the future empirical investigation, this paper chooses the monthly data of M0, M1, and M2 as the reaction indicators of the money supply.

Interest rate, as a monetary policy of the monetary authority, can have an impact on stock prices at various levels [11]. According to the expectation effect, when interest rates increase, investors will often have a tendency to sell stocks right away and invest in the bond market in order to reap greater rewards. As a result, rising interest rates will cause a decline in stock values. In addition, a rise in interest rates signals that the economy is doing better, which encourages investors to buy stocks now in order to resell them at a higher profit when the price of those stocks rises in the future. As a result, a rise in interest rates will result in an increase in stock prices. Therefore, it is impossible to judge the impact of interest rates on stock prices from a theoretical point of view, so this paper uses the printed interbank rate, which is called SHIBOR, as an interest rate indicator for the subsequent empirical study.

3.2 VAR model

A VAR model can be used to describe the dynamic relationships among multiple variables. In order to estimate the dynamic associations of the joint endogenous variables without any prior restriction, the model regresses data on the explanatory, explanatory and control variables for the present period and lagged variables in a unified manner.

For the vector Y_t of $n \times 1$ consisting by the n time series variables, $Y_{1t}, Y_{2t}, \dots, Y_{nt}$, a VAR model of order p can be constructed as follows.

$$Y_t(n) = C + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \dots + \Phi_p Y_{t-p} + \varepsilon_t \quad (1)$$

where C represents the $n \times 1$ dimensional constant vector, Φ_i ($i = 1, 2, \dots, p$) denotes the $n \times n$ dimensional autoregressive coefficient matrix, and ε_t represents the $n \times 1$ dimensional vector white noise. In this article, $Y_t = [M_{0t} \ M_{1t} \ M_{2t} \ SHIBOR_t]$.

3.3 Impulse response function

The impulse response function reflects the trajectory of the variables within the model interacting and impacting each other as the time point moves when the system is subjected to some external shocks, and by performing impulse response analysis it is possible to find out the formation of a variable after being impacted by other variables dynamic path and persistence after a variable is shocked by other variables.

The VAR model constructed for an $n \times 1$ dimensional vector Y_t can be transformed into the form of MA (∞) as follows

$$Y_t = \varepsilon_t + C_1 \varepsilon_{t-1} + C_2 \varepsilon_{t-2} + \dots + C_q \varepsilon_{t-q} + \dots \quad (2)$$

Where $C_q = \frac{\partial Y_{t+q}}{\partial \varepsilon_t}$, make $C_{ij}^{(q)} = \frac{\partial Y_{i,t+q}}{\partial \varepsilon_{jt}}$, it denotes the impact of the error term corresponding to the j th variable on the i -th endogenous variable at time $t+q$ after a unit shock at time t , when all other error terms are held constant at any time.

4. Result

4.1 Stability test

In this study, the time series of the chosen variables are subjected to a stationarity test using the ADF technique. The findings are displayed in Table 1.

Table 1. ADF test results

variate	ADF test statistic	1% critical values	5% critical values	10% critical values	Prob	state
M0	-3.7018	-3.4804	-2.8834	-2.5785	0.0051	Stationary
M1	-0.5908	-3.4808	-2.8836	-2.5786	0.8677	unsteady-state
DM1	-2.4341	-3.4808	-2.8836	-2.5786	0.0164	Stationary
M2	-3.4394	-3.4808	-2.8836	-2.5786	0.0113	Stationary
SHIBOR	-2.9816	-3.4765	-2.8817	-2.5776	0.0390	Stationary
HS	-1.1254	-3.4765	-2.8817	-2.5776	0.7048	unsteady-state
DHS	-10.5025	-3.4768	-2.8818	-2.5777	0.0000	Stationary

Based on the test results of Table 1, it can be found that all sequences are stationary sequences at the 5% significance level after first-order difference, so granger causal tests and VAR models can be established.

4.2 Granger's Causal Test

The Granger causal test is used in this study to determine if the chosen monetary policy indicator has an effect on the stock market closing index. The experimental findings are displayed in Table 2.

Table 2. Granger Causality Tests

Null Hypothesis	F-Statistic	Prob.
M0 does not Granger Cause HS	4.5966	0.0117
M1 does not Granger Cause HS	4.2186	0.0167
M2 does not Granger Cause HS	3.5960	0.0301
SHIBOR does not Granger Cause HS	2.3447	0.0997

According to the results of Table 2, it can be found that at 95% confidence levels, the three indicators M0, M1 and M2 are granger causes of HS, while SHIBOR is granger causes of HS at 90% confidence levels. Therefore, the preliminary judgment, M0, M1. Both M2 and SHIBOR have a significant effect on HS.

4.3 Analysis of the Impact Process

Impulse response analysis and variance decomposition are performed on the basis of the VAR model in order to better investigate the process of how the money supply and interest rates affect stock prices.

4.3.1 Impulse response analysis

This article sets M0, M1, M2, and SHIBOR to impulses and HS to response for the construction of the impulse response graph, as shown in Fig. 1.

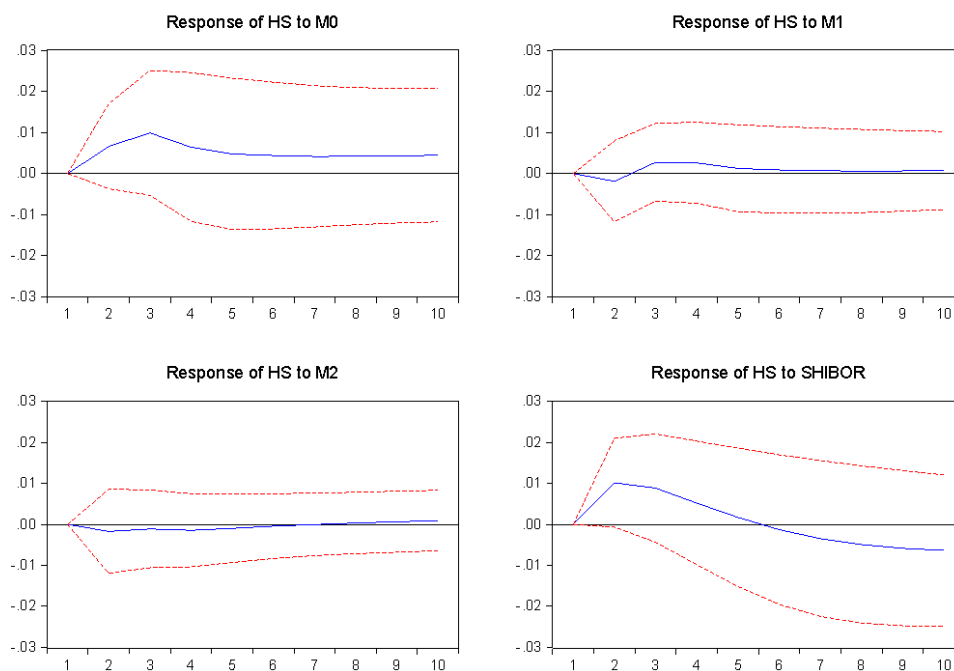


Fig. 1 Impulse response plot

According to Fig 1, when M0 is given a positive shock, the stock price index will rise rapidly, fall slightly after reaching the maximum value in the 3rd period, and finally flatten out. When M1 is given a positive shock, the stock price index will drop slightly, then rise, reaching a maximum in the 3rd period. When M2 is given a positive shock, the stock price index will first decline slightly, then slowly rise, and the overall change will not be much. When given a positive shock to SHIBOR, the stock price index rises rapidly, falling rapidly after reaching its maximum in phase 2 and reaching a minimum in period 9.

4.3.2 Analysis of the decomposition of variance

In order to more clearly explore the extent of the impact of different indicators on the stock price index, this paper further decomposes the variance on the basis of the VAR model, as shown in Table 3.

Table 3. Variance decomposition results

period	HS	M0	M1	M2	SHIBOR
1	100.0000	0.0000	0.0000	0.0000	0.0000
2	98.2088	0.5132	0.0414	0.0336	1.2030
3	97.2584	1.1514	0.0901	0.0332	1.4670
4	97.2814	1.2012	0.1162	0.0405	1.3607
5	97.4718	1.1762	0.1104	0.0409	1.2007
6	97.5889	1.1685	0.1045	0.0381	1.1000
7	97.6059	1.1748	0.0998	0.0356	1.0841
8	97.5334	1.1968	0.0963	0.0342	1.1392
9	97.3948	1.2326	0.0942	0.0347	1.2436
10	97.2146	1.2780	0.0935	0.0370	1.3770

M0 and SHIBOR have a stronger influence on the stock price index, with maximum values of 1.278 percent and 1.467 percent, respectively, according to the data in Table 3. Among them, the effect of M0 on the stock price index will steadily grow over time, while the effect of SHIBOR will immediately reach its peak, then fall, then start to recover in the eighth period, and eventually reach 1.377 percent in the tenth. M1 and M2 have a smaller impact on stocks, not more than 1%.

4.3.3 Summary

M0 has a considerable positive influence on the stock price index when combined with the findings of impulse response and variance decomposition. M1 and M2 also have a tiny but significant positive impact on the stock price index. According to the final data, it is thought that SHIBOR has a considerable negative influence on the stock price index. SHIBOR initially has a huge positive impact, then a large negative impact.

5. Discussion

5.1 The Effect of Money Volume on Stock Prices

The monetary authorities' key instrument for adjusting the macroeconomy is regulating the money supply. It may be inferred that an increase in the money supply has a positive impact on stock prices since it raises the trading volume on the stock market, which in turn causes the stock market to increase. Additionally, it can be deduced from the empirical findings that a growth in the money supply does not result in an excessive amount of inflation, which in turn has a detrimental effect on stock values. Due to the distinct meanings that M0, M1, and M2 reflect, there is a variance in the influence on the stock market. Since M0 represents the currency in use in the market, its impact on stock prices is more obvious, which is consistent with the theoretical approach shown above.

The results of the impulse response study contradict the conclusions of the previously cited theoretical research, which found that the effects of M1 and M2 shocks on the stock market were less significant. This is primarily caused by the strong endogenous nature of the money supply in China, which means that the amount of money required is passively distributed based on other economic factors rather than being determined by the monetary authority. As a result, the money supply primarily affects over-the-counter funds in the stock market, weakening the impact of M1 and M2 on stock prices. Term deposits, which are less liquid, are less dangerous than the stock market because more money flows into less risky markets, such as bank savings, and less money is in the stock market, given that the majority of Chinese citizens are risk averse. Even while term deposits make up a sizable portion of M1 and M2, their lack of liquidity further reduces their influence on the stock market.

5.2 The Impact of Interest Rates on Stock Prices

Normally, interest rates have a negative effect on stocks. An increase in interest rates leads to lower expected returns on stocks, so the public is more willing to put money into the bond market when interest rates are equal to the dividend yield. However, a rise in interest rates usually implies a better economic situation in the future, so investors' confidence in stock market returns will increase, all in the case of rising interest rates, which may also cause a rise in stock prices. Based on the previous empirical results, it can be argued that in the case of rising interest rates, in the short run it will cause stock prices to rise due to investors' confidence in the economic situation, but in the long run, investors will be more reason to transfer their funds out of the stock market, causing stock prices to fall.

6. Conclusions and Policy Recommendations

6.1 Conclusion

According to the findings of impulse response and variance decomposition, M0, M1, and M2 all have positive effects on stock prices, with M0 having the most significant effect and M1 and M2 having weaker effects. This is primarily because of the endogeneity of the Chinese stock market and the level of risk aversion among investors, and it can be concluded that these effects are driven by the three models: M0, M1, and M2. Additionally, interest rates have the potential to significantly harm stock prices. Stock prices are still primarily affected by their own volatility, though.

6.2 Policy Recommendations

First, the formulation as well as the application of monetary policy should be further improved. First, the transparency of monetary policy should be further improved, and the public's understanding of monetary policy and effective communication can be enhanced by adopting forms such as policy previews or policy interpretations to play a role in stopping excessive volatility. At the same time, monetary policy should pay more attention to the playbook market and make Xujin's stable financial development and prevention of abnormal capital market fluctuations one of the objectives of monetary policy formulation, and the impact on the financial market should be considered while setting the policy. Finally, the expectations of monetary policy should be further managed, and other impacts of monetary policy should be fully considered to implement policies that directly reach economic entities, and thus better guide the development of the real economy and capital market.

Second, further attention should be paid to the development of the capital market. First, we should detect the transmission effect of the capital market impact, timely assess the impact of monetary policy on the capital market, as well as the measurement of indicators such as investor sentiment, pay attention to abnormal market fluctuations and timely risk alert. Secondly, the information disclosure of listed companies should be strictly implemented and supervised to further improve the transparency of the market, so that the transmission channel between monetary policy and the stock market can be smoothed. Finally, we should continue to strengthen the supervision of the capital

market, monitor and interpret the changes in monetary policy in a timely and comprehensive manner, protect small and medium-sized investors in the market, and avoid abnormal market fluctuations.

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