

A STUDY OF CHINA'S HYBRID MONETARY POLICY ON THE STOCK MARKET



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ABSTRACT

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China's monetary policy has been progressively modified and transformed. In this study, the correlation between Chinese monetary policy and the stock market is investigated. The CSI 300 index, the trading volume of constituent stocks of the CSI 300 index, and M2 and R007 were selected to represent the stock market, quantitative monetary policy and price monetary policy, respectively. The transmission mechanism and regulatory effects of China's hybrid monetary policy on the stock market were studied. Stock prices and trading volume will rise when the People's Bank of China (PBOC) puts money into the market; if the central bank raises interest rates, stock prices and trading volume will decline, and the regulatory effect of price-based monetary policy will be more significant than that arising from quantitative monetary policy. China's hybrid monetary policy has a dampening effect on stock prices and trading volume and effectively restrains the bubble of the financial market.

Contribution/Originality: In this study, the transmission mechanism and time-varying effect of monetary policy on the stock market are investigated from the perspective of quantitative and monetary policies. Subsequently, the regulation effect of China's hybrid monetary policy, i.e., the combined effect of quantitative and price-based monetary policies on the stock market, is analyzed.

1. INTRODUCTION

Monetary policy has been reported as a vital tool for the central bank to carry out macro control. The central bank is capable of formulating monetary policy in accordance with monetary policy rules or discretionary choices. Monetary policy rules can fall into quantitative monetary policy rules and price-based monetary policy rules (Simons, 1936). As reported by Wu and Lian (2016) the central bank is required to select appropriate monetary policy rules based on the level of domestic, economic, and financial development. Nations with developed financial markets generally exploit price-based monetary policy tools to achieve macroeconomic regulation. Since China is an emerging market nation that is transitioning from a planned economy to a market economy, the PBOC employs quantitative and price-based monetary policy instruments jointly in its monetary policy practice. However, the weight given to both quantitative and price-based monetary policy instruments by the PBOC changes significantly in different periods. The hybrid monetary policy is considered the combined form of quantitative and monetary policies. Furthermore, it refers to the transition from quantitative monetary policy to price-based monetary policy.

In 1998, the PBOC used the quantity of money supply as the intermediate target of monetary policy. Moreover, the reform of the interest rate market in China continued. In this period, China implemented a hybrid monetary policy that was dominated by quantitative monetary policy and supplemented by price monetary policy. From 1998 to 2008, the above hybrid monetary policy rule was adapted to China's economic development and was of high significance to China's economic growth and price stability. As financial innovation and financial disintermediation were advancing, the share of direct financing in China's capital markets tended to rise, commercial banks undertook more off-balance-sheet business, while the regulatory capacity of quantitative monetary policy declined significantly. As China's interest rate market reform has been advancing continuously, the regulatory capacity of price-based monetary policy has tended to increase. After 2010, when China's economy entered the new normal, the PBOC has more significantly stressed the use of price-based monetary policy tools for macro control. In addition, the leaders of the PBOC have repeatedly mentioned in meetings and speeches the necessity of expediting the reform of the interest rate and boosting the transformation of China's monetary policy rules from a quantitative to a price-based policy. In 2013, the PBOC introduced several innovative monetary policy tools (e.g., standing lending facilities and medium-term lending facilities). In 2014, an interest rate corridor mechanism was established in China. China's monetary policy has shifted from a predominantly quantitative policy to a predominantly price-based policy. Since the transmission channels for interest rates have not yet been fully open, China's monetary policy has not been completely transformed into a price monetary policy, whereas the PBOC has repeatedly advocated the public to pay more attention to interest rates over the past few years.

China's stock market has been leaping forward over the past three decades. By December 31, 2020, there have been 177 million natural person investors, 4,154 companies in China's stock market, and the total market value has reached 79 trillion yuan. China's stock market has significantly changed in recent years since the Chinese government established the Science and Technology Venture Board (STB) to facilitate the development of small and medium-sized enterprises (SMEs) and high-tech enterprises, and it has implemented a registration system on the STB and the GEM (Growth Enterprises Market). In September 2021, the Beijing Stock Exchange was established. As revealed by the above changes, the stock market is of increasing significance to China's macroeconomic and social lives.

Scholars hold different views on whether central banks should intervene in asset prices. Scholars including [Bernanke and Gertler \(2001\)](#) and [Mishkin \(2007\)](#) argued that central banks should not intervene in asset prices, whereas [Cecchetti, Genberg, John, and Wadhvani \(2000\)](#), [Lowe and Borio \(2002\)](#) and [Christiano, Ilut, Motto, and Rostagno \(2010\)](#) hold opposite opinions about this issue. As indicated by the Monetary Policy Implementation Report released by the PBOC, the PBOC places stress on asset prices. In the practices of China's monetary policy, the PBOC has taken actions to rescue the financial market from the Asian financial crisis, the subprime mortgage crisis, as well as the 2015 stock market crash. For this reason, it can be argued that China has essentially intervened in asset prices. Likewise, the China Securities Regulatory Commission (CSRC) has been investigating the abnormal stocks in the stock market to avoid risky bubbles.

China's monetary policy has multiple objectives (e.g., promoting economic growth, increasing employment, stabilizing prices, as well as maintaining the balance of payments). [Zhou \(2016\)](#) stated in his speech at the Camdessus Academic Conference that the PBOC should boost financial reform by opening up and expediting the development of financial markets. The PBOC is required to organize the reform and opening up of financial markets, thus laying a solid foundation for building a healthy financial system and achieving financial stability, exploiting the role of financial markets as a channel for monetary policy transmission and enhancing the regulatory capacity of monetary policy.

This study is arranged as follows: In Section 2, the research progress in this field is presented; in Section 3, the TVP-VAR model and the Markov Chain Monte Carlo (MCMC) algorithm are introduced; data processing is explained in Section 4; in Section 5, the impulse response results are analyzed; and in Section 6, the research conclusion is drawn.

2. LITERATURE REVIEW

The correlation between the amount of money and the stock market in different economies has been investigated by several scholars. As reported by Mookerjee and Yu (1997), money supply, foreign exchange reserves and stock market had long-run cointegration effects in Singapore. Lastrapes (1998) investigated the correlation between monetary policy and stock prices in seven nations, including the US, Germany and Canada, and found a positive correlation between money supply and stock prices in general. Based on data from the US and Japan, Humpe and Macmillan (2009) reported that the US money supply was positively correlated with the stock index, whereas there was a negative correlation between the stock index and money supply in Japan due to the recession. According to Galí, Giusti, and Noussair (2021), stock markets continued to rise according to US data from 1996 to 2011. Yi and Wang (2002) reported that a long-term expansionary monetary policy in China could upregulate stock prices. Using the MS-VAR model, Fang, Ni, and Zhuang (2011) found that increasing the money supply or decreasing interest rates during the periods of stock market expansion could boost stock market liquidity.

Other scholars also analyzed the correlation between interest rates and stock markets. As reported by Bernanke using a VAR model, changes in the federal funds rate significantly impacted the stock market. Using a VAR model based on Eurozone data, Cassola and Morana (2004) identified a significant correlation between nominal interest rates and the stock market. In addition, they argued that the stock market should be considered during the formulation of monetary policy. Based on the data from 13 OECD nations, Ioannidis and Kontonikas (2008) indicated that central banks could have an effect on stock markets by changing interest rates. Bleich, Fendel, and Rülke (2013) examined the effect of monetary policy enacted by central banks in major economies (e.g., the US and Europe) on the stock market and found that fluctuations in interest rates could exert a systematic effect on prices, thus confirming that central banks could exploit interest rate instruments to regulate financial markets. As reported by Tang, Luo, Xiong, Zhao, and Zhang (2013), the PBOC's regulated benchmark interest rate and reserve requirement ratio could significantly impact both the money market and the stock market, and that changes in both monetary policy instruments could exert a noticeable effect on the stock market during bear markets. Dai and Yue (2015) tested the effect of monetary policy on the risk of stock price crashes at the macro level and indicated that tight monetary policy exacerbated the risk of individual share crashes. Zou (2020) recognized the interest rate and credit channels as the two major channels affecting the Chinese stock market, in which the interest rate mechanism was found to impact the stock market more significantly. Di and Wu (2021), based on Chinese data, found that the effect of an easing monetary policy signal released by the central bank on the stock market was greater than the effect of a tightening monetary policy on the stock market.

Over the past few years, scholars have progressively begun to study the hybrid monetary policy, and the research results have been limited. Wang, Wang, Peng, and Song (2017) reported that China's hybrid monetary policy was more suitable for national conditions, and it could also improve regulation efficiency and reduce social welfare losses. Long, Zhang, and Li (2021) examined China's hybrid monetary policy and found that it was conducive to stabilizing asset prices. Liu and Zhang (2018) indicated that in China's hybrid monetary policy, quantitative and price monetary policy could interact with each other to enhance the regulatory effect of monetary policy on the macro economy.

Existing studies have investigated the effect of money supply or interest rate on stock prices; however, there are very few studies on the correlation between hybrid monetary policy and stock market. In terms of research methodology, most scholars used traditional econometrics (e.g., cointegration and linear VAR models). Since China is an emerging market nation in transition, the monetary and industrial policies implemented by the Chinese government are evolving and changing. The linear vector autoregressive model may fail to find the true correlation between monetary policy and the stock market due to the strong linearity assumption. In this study, a TVP-VAR model is adopted to investigate the effect of China's hybrid monetary policy on stock prices and trading volume, and then a comprehensive comparison is drawn to reveal the transmission mechanism and moderating effect of China's hybrid monetary policy on the stock market.

3. TVP-VAR MODEL

TVP-VAR model was developed by Primiceri based on the SVAR model by adding the Markov chain Monte Carlo (MCMC) algorithm. It was first adopted to study how American monetary policy affects unemployment and inflation. Nakajima considers that the TVP-VAR model has no constraint of the same variance assumption and exhibits more sensitive time-varying characteristics. It is capable of expressing the correlation and characteristics of variables in different periods, as well as fitting the economic impact more accurately at different time points than the conventional VAR model. Accordingly, it can increase the estimation accuracy and express the time-varying relationship between variables more truly.

Normally, the equation for the vector autoregression is expressed as:

$$Ay_t = F_1y_{t-1} + F_2y_{t-2} + \dots + F_s y_{t-s} + \mu_t, t = s + 1, \dots, n \quad (1)$$

In Equation 1, y_t denotes a vector of observed variables. A_t, F_1, \dots, F_s represent the coefficients matrices, which are $k \times k$. μ_t is disturbance, which is a $k \times 1$ vector $\mu_t \sim (0, \Sigma)$. Notably, A_t is lower-triangular.

$$A = \begin{bmatrix} 1 & 0 & \dots & 0 \\ a_{21} & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ a_{k1} & \dots & a_{k,k-1} & 1 \end{bmatrix}, \Sigma = \begin{bmatrix} \sigma_1 & 0 & \dots & 0 \\ 0 & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ 0 & \dots & 0 & \sigma_k \end{bmatrix}$$

Equation 1 can be written in a reduced form, when $B_i = A^{-1}F_i$, for $i = 1, \dots, s$:

$$y_t = B_1y_{t-1} + \dots + B_s y_{t-s} + A^{-1}\Sigma\varepsilon_t, \varepsilon_t \sim N(0, I_k) \quad (2)$$

If $X_t = I_k \otimes (y_{t-1}, y_{t-2}, \dots, y_{t-s})$ is defined, where \otimes represents the Kronecker product, Equation 2 is rewritten as:

$$y_t = X_t\beta + A^{-1}\Sigma\varepsilon_t \quad (3)$$

At present, all the parameters in Equation 3 are time-invariant, so the TVP-VAR model with stochastic volatility is written as:

$$y_t = X_t\beta + A^{-1}\Sigma\varepsilon_t, t = s + 1, \dots, n \quad (4)$$

In Equation 4, the vector of coefficients β_t , and the parameters A_t and the Σ_t are time varying. As Primiceri did, we defined $a_t = (a_{21}, a_{31}, a_{32}, a_{41}, \dots, a_{k,k-1})$, which is a stacked vector of the lower-triangular elements in A_t and $h_t = (h_{1t}, h_{2t}, \dots, h_{kt})'$, $h_{jt} = \log \sigma_{jt}^2$, for $j = 1, 2, \dots, k, t = s + 1, \dots, n$.

$$\begin{matrix} \beta_{t+1} = \beta_t + \mu_{\beta t} \\ \alpha_{t+1} = \alpha_t + \mu_{\alpha t} \\ h_{t+1} = h_t + \mu_{ht} \end{matrix} \begin{pmatrix} \varepsilon_t \\ \mu_{\beta t} \\ \mu_{\alpha t} \\ \mu_{ht} \end{pmatrix} \sim N \left(0, \begin{pmatrix} I & O & O & O \\ O & \Sigma_{\beta} & O & O \\ O & O & \Sigma_{\alpha} & O \\ O & O & O & \Sigma_h \end{pmatrix} \right), t = s + 1, \dots, n.$$

For $t = s + 1, \dots, n$, where $\beta_{t+1} \sim N(\mu_{\beta}, \Sigma_{\beta 0}), \alpha_{s+1} \sim N(\mu_{\alpha 0}, \Sigma_{\alpha 0}), h_{s+1} \sim N(\mu_{h 0}, \Sigma_{h 0})$.

There are some specifications for the TVP-VAR model. First, A_t denotes a lower-triangular matrix, i.e., a recursive identification for the VAR system, which is a simple specification but has been extensively employed. Second, it is assumed that the parameters follow a random walk process instead of a stationary process. Third, variance and covariance are governed by parameters $\Sigma_{\beta}, \Sigma_{\alpha}$ and Σ_h . In accordance with Primiceri, Σ_{α} and Σ_h are assumed to be diagonal on the matrix. Fourth, the priors should be carefully selected for the TVP-VAR model, which has numerous states variables, and they follow a random walk process. Last, also following Primiceri, we specified the prior of the initial state of the time-varying parameters. One way is to choose the means and variance from a constant parameter VAR model based on the pre-sample period; the other way is setting reasonable prior for the initial state.

Next, samples are drawn with the MCMC algorithm. Let $y = \{y_t\}_{t=1}^n$ and $\omega = (\Sigma_\beta, \Sigma_\alpha, \Sigma_h)$. It is assumed that the prior probability density of ω is $\pi(\omega)$. Given data y , the sample will be drawn from the posterior distribution, $\pi(\beta, \alpha, \omega|y)$, in the following procedure:

- (1) Initialize β, α, h and ω .
- (2) Sample $\beta|\alpha, h, \Sigma_\beta, y$.
- (3) Sample $\Sigma_\beta|\beta$.
- (4) Sample $\alpha|\beta, h, \Sigma_\alpha, y$.
- (5) Sample $\Sigma_\alpha|\alpha$.
- (6) Sample $h|\beta, \alpha, \Sigma_h, y$.
- (7) Sample $\Sigma_h|h$.
- (8) Go to (2).

For the details of the procedure, please read (Nakajima, 2011).

4. DATA DESCRIPTION AND PROCESSING

In this study, we build a TVP-VAR model with four variables, which are CSI 300 index (noted as HS300), trading volume of constituent stocks of CSI 300 index (noted as volume), M2 and R007. Data were extracted from the Wind Database and ranges from January 2006 to December 2020. Figure 1 shows the trend of M2, R007, HS300 and volume during the sample period.

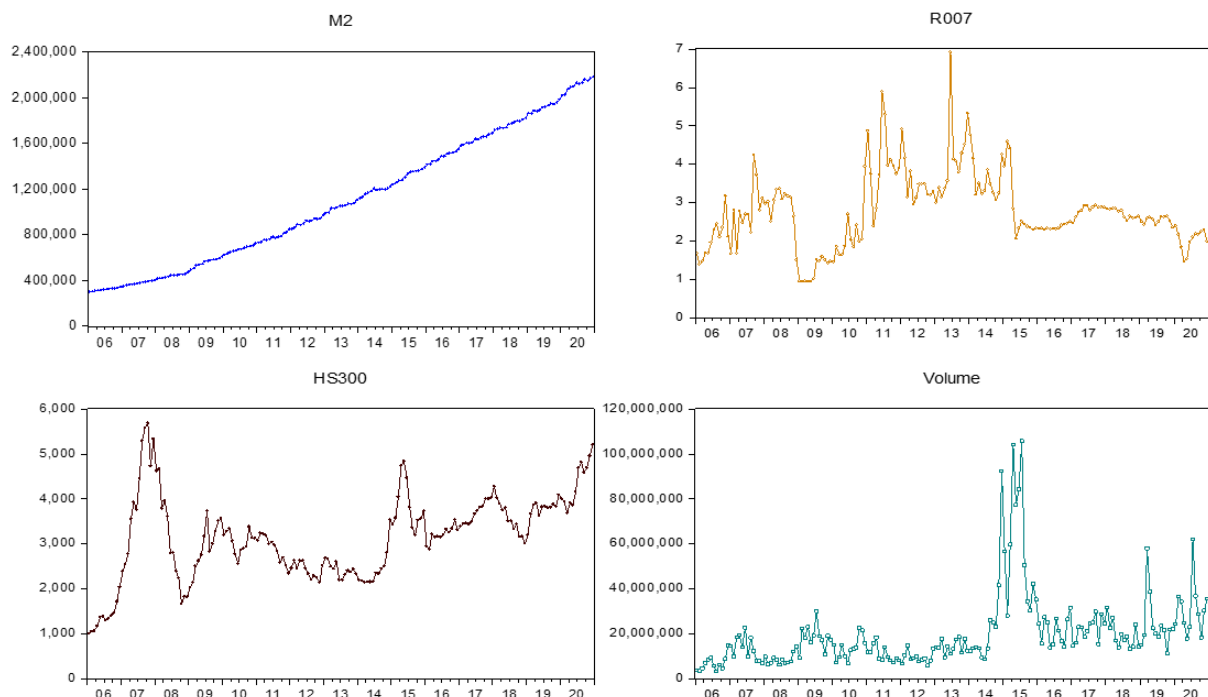


Figure 1. The trend of M2, R007, HS300 and volume.

During the sample period, China's economy changed from high-speed growth to medium and high-speed growth. China's monetary policy also experienced many rounds of easing to tightening, but the amount of M2 shows a trend of continuous growth.

R007 displayed a highly volatile trend before March 2015, whereas after April 2015, it became highly stable and the volatility decreased significantly. In the first half of 2015, the PBOC adjusted the deposit reserve ratio many times,

injected sufficient money into the market, and alleviated the money shortage. Moreover, the PBOC restrained the abnormal fluctuation of interest rate through the interest rate corridor and standing lending facilities, cutting peaks and filling valleys.

As indicated by the CSI 300 index (HS300), China's stock market experienced three bull markets in 2007 (5891 points), 2015 (5380 points) and 2020 (5215 points), but they did not last long. The stock market stays in a state of consolidation for most of the time. The HS300 is highly correlated with the Shenzhen Composite Index and the Shanghai Composite Index. It is estimated that during the sample period, the correlation coefficients between HS300 and the Shanghai Composite Index and Shenzhen Composite Index account for 0.91 and 0.78, respectively. A considerable number of scholars adopted HS300 to represent the operation of China's stock market.

The trading volume of constituent stocks of the CSI 300 index (volume) displayed a volatile trend from 2006 to 2014, and it was higher in 2007 and 2009 than in other years during this period. In 2015, the trading volume increased significantly to 11 million. From 2016 to 2020, the volume increased rapidly in 2019 and 2020 and then fell back. The rapid expansion of trading volume is often accompanied by the emergence of a bull market. We logarithmicize the M2, volume and HS300. The descriptive statistics of the processed data are shown in Table 1.

Table 1. Descriptive statistics.

Variable	No. of Obs.	Mean	Median	Max.	Min.	S.D.	Skewness	Kurtosis	J-B Stat.
M2	180	13.757	13.867	14.597	12.623	0.593	-0.384	1.893	13.604
R007	180	0.028	0.0265	0.069	0.009	0.958	0.864	4.819	47.223
HS300	180	8.005	8.065	8.646	6.917	0.328	-0.917	4.227	36.500
Volume	180	16.583	16.547	18.477	15.002	0.637	0.382	3.524	6.439

The empirical research ideas are presented below. First, a unit root test is performed based on the logarithm of variables to verify the stability of the data and avoid pseudo regression. Subsequently, the Johansen cointegration test is performed to determine whether the variables have a long-term stable cointegration relationship, and the optimal lag order is determined in accordance with the AIC, SC and HQ information criteria. If the variables have a long-term stable cointegration relationship, the MCMC algorithm is adopted to sample the data multiple times to ensure that the model takes sufficient uncorrelated samples. Last, the impulse response function is employed in the TVP-VAR model to study the time-varying effect of monetary policy on the stock market.

4.1. Unit Root Test

In this study, the augmented Dickey–Fuller (ADF) test is performed to determine the unit root of the variables. The null hypothesis proposes that a unit root exists in the time series. If the hypothesis is rejected, no unit root exists in the time series and the time series is confirmed as stationary. Table 2 lists the unit root inspection results.

Table 2. Results of unit root test.

Variable	(C,T,L)	ADF Value	P-Value	Confidence Interval	Results
M2	(C,0,12)	-2.7505	0.0678	90%	Steady
R007	(C,0,0)	-4.4618	0.0003	90%	Steady
HS300	(C,T,4)	-4.0096	0.0101	90%	Steady
Volume	(C,0,2)	-2.938837	0.0430	90%	Steady

As revealed by the results of the unit root test, the four variables have no unit root at the significance level of 10%, so the time series is stable.

4.2. Johansen Cointegration Test

The Johansen cointegration test is performed on M2, R007, HS300 and volume. Table 3 lists the test results.

Table 3. Results of Johansen cointegration test.

Hypothesized No. of CE(s)	Eigenvalue	Trace	0.05 Critical Value	P-Value
None	0.129643	Statistic	47.85613	0.0011
At most 1	0.096345	38.32447	29.79707	0.0041
At most 2	0.073980	20.49435	15.49471	0.0081
At most 3	0.038813	6.967111	3.841466	0.0083

The results of the cointegration test show that there are three cointegration relationships between the variables, indicating that a long-term stable cointegration relationship exists between the economic variables.

4.3. Sample Through the MCMC Algorithm

EViews 10 software was used to test the lag criterion. In this study, the order of variables is set as M2, R007, HS300 and Volume. According to the minimum criterion of AIC, SC and HQ, the VAR lag number is 4. The results are shown in Table 4.

Table 4. Lag criterion.

Lag	Log. L	LR	FPE	AIC	SC	HQ
1	531.71	NA	3.13e-08	-5.93	-5.64*	-5.81*
2	545.63	26.56	3.21e-08	-5.90	-5.32	-5.67
3	566.30	38.49	3.04e-08	-5.96	-5.08	-5.60
4	592.57	47.70*	2.71e-08*	-6.08*	-4.91	-5.60
5	604.94	21.89	2.83e-08	-6.03	-4.58	-5.44
6	617.97	22.46	2.93e-08	-5.99	-4.26	-5.29

Note: * Indicates lag order selected by the criterion.

We assume that Σ_{β} is a diagonal matrix for simplicity, though it may be less sensitive for results in a non-diagonal matrix. Also, we assume:

$$(\Sigma_{\beta})_i^{-2} \sim \text{Gamma}(40, 0.02), (\Sigma_{\alpha})_i^{-2} \sim \text{Gamma}(4, 0.02), (\Sigma_h)_i^{-2} \sim \text{Gamma}(4, 0.02)$$

The initial state of the time-varying parameter is set to be flat priors, $\mu_{\beta_0} = \mu_{\alpha_0} = \mu_{h_0} = 0$, $\Sigma_{\beta_0} = \Sigma_{\alpha_0} = \Sigma_{h_0} = 10 \times I$.

Using MATLAB 2016 software, the data was randomly sampled 10000 times through the MCMC algorithm to calculate the posterior estimation of parameter values in the TVP-VAR model, and the initial 1000 samples were abandoned. The simulation parameter estimation results are shown in Table 5 and Figure 2.

Table 5 Results of sampling.

Parameter	Mean	S. D.	95%U	95%L	CD	Inefficiency
Sb1	0.0023	0.0003	0.0018	0.0028	0.700	8.59
Sb2	0.0022	0.0002	0.0018	0.0027	0.802	8.02
Sa1	0.0055	0.0014	0.0034	0.0091	0.467	29.85
Sa2	0.0056	0.0015	0.0034	0.0095	0.019	35.81
Sh1	0.0054	0.0017	0.0034	0.0097	0.087	62.47
Sh2	0.6516	0.1289	0.4259	0.9300	0.787	38.09

As shown in Table 5, the CD values are all less than the 5% critical value of 1.96, and all parameter values fall between the 95% upper bound and the 95% lower bound, which indicates that the Markov chain Monte Carlo

simulation sampling is effective. The maximum value in the inefficiency column is 62.47, indicating that 160 irrelevant samples can be obtained, which is enough for a posteriori inference.

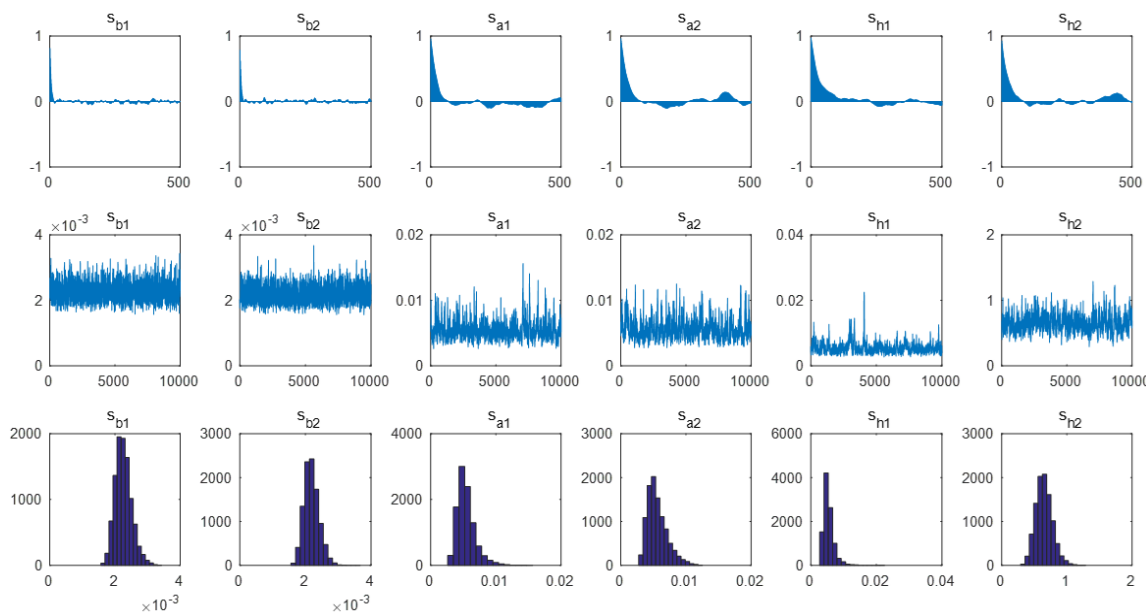


Figure 2. Estimation results of selected parameters in the TVP-VAR model.

According to Figure 2, the top row of charts represent sample autocorrelations, the middle row represents sample paths, and the bottom row represents posterior densities. This indicates that the algorithm works well.

5. TIME-VARYING IMPULSE RESPONSE ANALYSIS

The impulse response is a useful tool to study the relationships between variables in a VAR system. In the TVP-VAR model, the responses are calculated at every point with the estimated time-varying parameters. In this part, the impulse response method is used to study the time-varying response of the stock market to the regulation of the central bank's monetary policy. First, the effect of the two monetary policies on stock price and trading volume is studied from the perspectives of quantitative monetary policy and price monetary policy, and then a comprehensive analysis is conducted to obtain the effect of hybrid monetary policy on the stock market.

5.1. The Effect of Monetary Policy on the HS300 in Different Periods

Figure 3 illustrates the time-varying responses of the HS300 to the shocks from M2 and R007 in four-period (dotted), eight-period (dashed) and 12-period (solid). In this paper, four-period is four-quarter, that is, one year, representing the short term. Similarly, eight-period represents eight-quarter, representing the medium term. 12-period is 3-year, representing the long term.

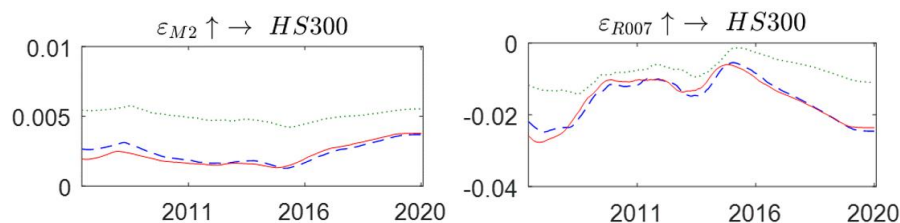


Figure 3. Time-varying impulse response of the CSI 300 index components of M2 and R007.

Figure 3 presents the impulse responses of HS300 to a positive M2 shock ($\epsilon_{M2} \rightarrow HS300$) and R007 shock ($R007 \rightarrow HS300$). The impulse response to the shock from M2 stays positive in the sample period, and the four-

period response is more significant than that from eight-period and 12-period. The time-varying impulse response intensities of the eight- and 12-periods are similar. From the impulse response intensity value, the four-period value fluctuated around 0.005, while the values for the eight-period and 12-period fluctuated around 0.0025 between 2006 and 2015, then they climbed to 0.004 in 2020. Economic theory tells that when central banks put money into the market, the stock price will rise. During the sample period, China's M2 continued to grow, and the HS300 had a positive response to the effect of M2.

In the positive impulse response diagram of the HS300 index to R007, the time-varying impulse response is negative during the sample period. From 2006 to 2015, the impulse response of HS300 to R007 gradually declined, the minimum value appeared in 2015, then the impulse response became more significant after 2015. The response of the four-period is weaker than that of the eight-period and 12-period. According to monetary theory, when the central bank raises interest rates, this often indicates that it will adopt a tightening monetary policy, the amount of money circulating in the market will drop, and the stock prices will fall.

In contrast, the effect of R007 on HS300 is more significant than that of M2 on HS300. On the whole, China's hybrid monetary policy has an inhibitory effect on stock prices.

Figure 4 presents the effects of the two monetary policies on volume. M2 improves the volume of the stock market, and R007 suppresses the volume of the stock market in the four-period and eight-period and has a complex impact in the 12-period level. In terms of response strength, M2 has the most significant impact in the eight-period level, then the 12-period level; the four-period impulse response is the weakest. R007 has the most significant impact in the four-period, then the eight-period. The 12-period impulse responses are positive between 2006 and 2009 as well as the period from 2014 to 2015.

It is concluded by numerical comparison that the hybrid monetary policy suppressed the four-period and eight-period trading volumes and improved the 12-period trading volume from 2006 to 2009, and from 2014 to 2015.

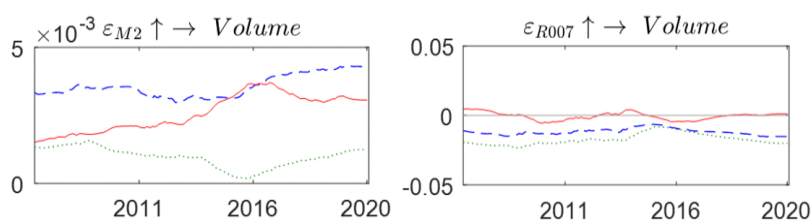


Figure 4. Time-varying impulse response of volume to shocks from M2 and R007.

5.2. Time-Varying Impulse Response Analysis in Different Time Points

To investigate the effect of monetary policy on the stock market at different time points, August 2007 (dotted), March 2015 (dashed) and August 2020 (solid) were used as samples. Figure 5 illustrates the impulse responses of HS300 to shocks from M2 and R007 at different time points.

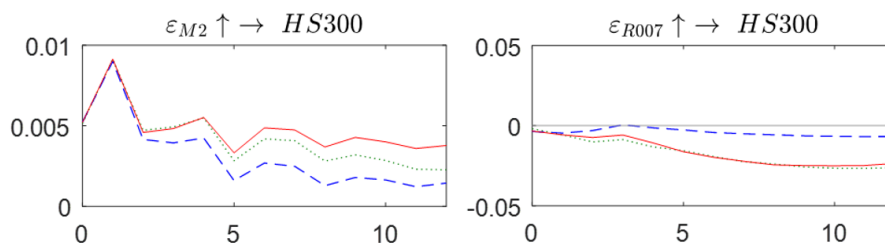


Figure 5. Time-varying impulse responses of HS300 to M2 and R007.

At three different time points, the HS300 shows positive responses to shocks from M2 with the most significant response in August 2020 followed by August 2007. The response in March 2015 was found to be the weakest. However, the impulse responses to R007 in three different time points are negative and declined during the sample

period. The response in March 2015 was weaker than in August 2007 and August 2020, which were highly consistent. As revealed by the comparison of the effect of M2 and R007 on HS300 at three different time points, R007 representing price monetary policy has a more significant impact than M2 representing quantity monetary policy. Overall, the hybrid monetary policy has a restraining effect on HS300.

According to Figure 6, the volume in different time points had a positive and negative response to the shocks of M2 and R007, respectively. The intensity of time-varying impulse responses is very similar, except that the response in March 2015 was a little weaker during period three to period eight. It is indicated that the hybrid monetary policy has restrained the trading volume of the constituent stocks of the HS300 in three different time points.

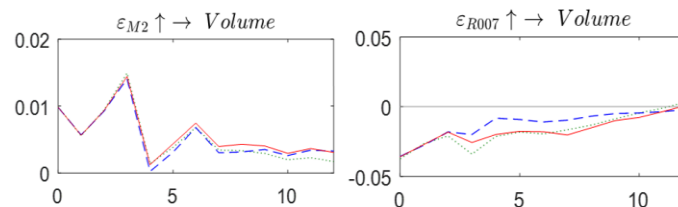


Figure 6. Time-varying impulse responses of volume for M2 and HS300.

6. CONCLUSIONS

In this study, the regulatory effect of China's hybrid monetary policy on the stock market is investigated. The quantitative and price monetary policies, and the regulatory effect of hybrid monetary policy on the stock market are analyzed, respectively. The results show that there is a long-term cointegration economic correlation between M2 and R007, and the CPI 300 index and the trading volume of constituent stocks of the CPI 300 index in the stock market. When the PBOC uses quantitative monetary policy to inject money into the market, the stock price and trading volume will rise. The short-term regulation effect of quantitative monetary policy on stock price is more significant than that of medium- and long-term regulation. The stock price and trading volume will decline if the PBOC exploits the price monetary policy and implements a tightening monetary policy by raising interest rates. The long-term regulation effect of the price monetary policy on the stock price is more significant than the short-term regulation effect. In contrast, the regulation effect of China's price monetary policy on the stock market is more significant than that of the quantitative monetary policy. In fact, China's hybrid monetary policy has a restraining effect on stock price and trading volume, and the regulation effect of monetary policy remains stable in different periods. This is consistent with the proposition put forward by the PBOC to prevent and resolve systemic financial risks and curb excessive speculation in the stock market. China's hybrid monetary policy has played a role in restraining the bubble of the financial market. Furthermore, China's stock market is highly sensitive to monetary policy and serves as a suitable transmission channel for monetary policy.

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