International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

Can The Monetary Policy Control The Stock Market Bubble?

Caihong Jiang
School of Statistics and Applied Mathematics, Anhui University of Finance and Economics, Bengbu 233030, China

Abstract: From the very beginning, this article demonstrates the theory of the structure of stock price, and then divide the stock price into several parts to analyze the reaction on the impact of monetary policy and make an exploration on the reasons of its fluctuation. As to the empirical part, we establish the TVP-VAR model to analyze the volatility of the relevant variables and the stock price under the influence of the monetary policy by using the quarterly data from 2002 to 2017. The results show that the impact of monetary policy on stock price has time-varying characteristic and structural changes, and the impact depends on the extent to which the bubbles offset the intrinsic value under the policy. When there are bubbles in the stock market, the impact of the tight-money policy will bring about the appreciation of stock price, which is not consistent with the traditional view. In conclusion, we analyzed the reasons of the above phenomenon by combining with the actual circumstances in China and put forward the relevant suggestions.

Keywords: Monetary Policy, Stock Price, TVP-VAR Model, Bubble Price

Introduction

Economic bubble is an economic phenomenon in which asset prices are higher than their intrinsic prices due to speculative demand. As part of the stock market bubble of the bubble economy, the effect on the economy should not be underestimated. Some scholars consider that the impact of the stock market bubble on the economy is not all negative. When the stock market bubble is controlled within a reasonable range, it can play an active role in the stock market. However, when the stock market bubble is too high, it will increase the risk of financial markets. In other words, the impact of asset bubbles is unfavorable at the economic development. Therefore, the measurement of the bubbles and the control of the bubbles are urgent problems to be solved.

From the Japanese bubble economy in the 1990s to the subprime mortgage crisis in 2008 in the United States, the financial crisis has swept the global, and the world economy was facing unprecedented challenges. Since the late 1980s, due to the rapid development of financial derivatives, the gradual deepening of economic globalization and liberalization, and the relaxation of financial regulatory mechanisms, the frequency of the financial crisis and the nature of the financial crisis have escalated and the scope has been extended and destructive also more serious. In this regard, the major scholars in the economic field were trying to find out the causes and transmission mechanisms of the financial crisis, and found ways and means to control or even dissolve the financial crisis. However, there was still no recognized method and theory to predict and explain the financial crisis. In

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

this context, economists began to focus on exploring the root causes of the financial crisis through the own characteristics of the financial system. Some economists believed that the financial bubble was an important factor in triggering the financial crisis and it was the conduction path of the financial crisis. The financial bubble was becoming a serious obstacle to the sound development of the financial system and even the entire economic system. Cai Nan (2003) selected economic indicators from China's banking system, stock market and foreign exchange market, and quantified the degree of bubbles in China's financial system through the preparation of "bubble index". The empirical analysis showed that the bubble level was large in China's financial system, and the volatility of the stock market bubble level was higher than the banking system and the exchange rate market. It is to say that the stock market plays an important role in the financial bubble. So there were many scholars at home and abroad have been paying close attention to the stock market bubble since the 1980s. In particular, the study of the stock market bubble was gradually deepened because the econometrics has been fully developed.

1. Research status

It already proved the existence of bubbles in the stock market which was researched by the domestic and foreign stock markets. Cunado and Gilalana (2007)was conducted an empirical study of the US stock market by using nonlinear models and fractional integral tests, they found that there was a bubble in US stock markets. Wang Yugui (2005) was analysed the bubble formation mechanism in China's financial markets from theory and demonstration. Pan Guoling (2000)was studied the theoretical and quantitative methods of the stock market bubble's determining, analyzed the process and mechanism of the formation, expansion and rupture of the stock market bubble, and provided concrete measures and methods to eliminate the stock market bubble. Xu Ainong (2007)was used the residual income model to measure the degree of bubbles in the A-share market, then evaluated the rationality of the bubble in the Chinese A-share market based on the analysis of the US stock market bubble. The result shows that the stock price in China's A-share market deviates from its intrinsic value seriously, it is to say that the A-share market has a high degree of bubble and belongs to the extraordinary bubble.

There always disputed that whether the monetary policy has a regulatory role on the stock market bubble. Some scholars believe that monetary policy does not have a significant effect on the stock market, Willem Thorbecke (1997)was studied the impact of stock returns on monetary policy and found that expansionary monetary policy increased the expost rate of return of stock. Laopodis (2010) was using the Structural Vector Autoregressive (SVAR) model to conduct an empirical analysis of the data from 1970 to 2000 in the United States. The results show that the impact of interest rate shocks on stock prices is insignificant. Fischbacher, Hens and Zeisberger (2013)were studied the monetary policy impact on the stock market bubble and the trading behavior of asset market, they found that a great influence interest rate policy on liquidity of the stock market, but the effect on the foam was insignificant. Li Hongyan, Jiang Tao (2000)found

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

that there was cointegration relationship between money supply and stock price through the empirical test, but there is no Granger causality between the two, and the money supply almost has no impact on the stock price.

While the other scholars hold the opposite opinion, they were all thought that monetary policy has a regulating function on the stock market. Chatziantoniou and Duffy (2013)were studied the effects of monetary and fiscal policy shocks on the stock market performance in the United States, the United Kingdom and Germany by using a SVAR model. The results indicate that both monetary policy and fiscal policy have an impact on the stock price.Gali and Gambetti (2015) were used Time-Varying Parameter Vector Autoregressive model to analyze the impact of the monetary policy shock on the stock price, and found that the tightening monetary policy will lead to the stock price rising, which is different from the traditional currency policy experience theory contrary. Rifat(2015)was used an empirical examine in Bangladesh to analyse the impact of various monetary policy instruments on stock prices. The results show that the price volatility in the stock market in Bangladesh could be explained by monetary policy tools. Bissoon (2016)was conducted an empirical study of five open countries and found that there is a negative correlation between stock returns and interest rates, it is revealed a direct link between money supply and stock returns. The results confirm that no matter in the long-term or short-term, monetary policy variables can explain the changes in stock returns. Guo Wenwei and Chen Fengling (2016) dynamically monitored the duration of the bubble and the degree of foam on the main stock market, the small and medium-sized board market and the GEM market in China based on the BSADF test. The empirical results show that the intrinsic persistence of the stock market bubble in China was more significant, and runs counter to macroeconomic trends. On the one hand, the impact on the stock market bubble was more significant by monetary policy and fiscal policy, but the directions of influence were different. On the other hand, the introduction of the short-selling mechanism can restrain the outstretched tide of the stock bubble well. By using the TVP-VAR model, Hu Yibo (2016)was conducted an empirical analysis of the dynamic linkages between interest rates, stock prices and stock market volatility. He found that the impact of interest rate changes on the fluctuations of China's stock markets was significant at short-term, and the extent of each period was different. Pan Changchun (2017) used the time- varying parameters vector autoregressive model to build the model between interest rates and asset prices in China, and discussed the time-varying characteristics of the impact of interest rates on stock prices.

It can be seen that the bubble phenomenon is widespread on the stock market by read the aforesaid literature. For the study of the influence of monetary policy on the stock market, in the part of theoretical research, most ofliterature focuses on the impact of interest rate, exchange rate or money supply on the stock market volatility.However, it was very seldom that the research from the level of the stock market bubble to analyze the actual reasons for the stock price changes under the impact of monetary policy.On the research methods, there were many

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

choices, like Cointegration Test, BSADF Test, VAR and SVAR model and so on. Due to the differences of the models, the perspective of observation and the data selected, which may lead to inconsistencies in the final conclusion. Therefore, the effectiveness of monetary policy on the stock market bubble has been controversial in the academia.

This article is based on the theories of our predecessors (Chen Ying, Zhao Chengguo and Li Xindan 2010), firstly, in the theoretical part, reasonable decomposition of the stock price, and analyzes the influence of the monetary policy impact on the stock price. Secondly, in the empirical part, because of Nakajami (2011) introduced the TVP-VAR model with time-varying parameters established by random fluctuation factors, which can capture the possible changes of economical structure in a more flexible and robust way. Therefore, we choose the TVP-VAR model to analyze the selected data in the empirical analysis in this paper, and obtain the corresponding empirical results. Finally, through the empirical results to objective evaluation of macro-control to help the relevant agencies monitor the effectiveness of macroeconomic policies.

2. Theoretical model

2.1. Asset price decomposition

It is generally assumed that investors are risk-neutral and rational, and we choose the same hypothesis at here. We divide the stock price into the intrinsic price and the bubble price, and define P_t as the stock price in period t, B_t as the price in period t, and the intrinsic value of stock in period t as P_t^*. According to the above relationship, we can get the equation

$$P_t = P_t^* + B_t. \quad (1)$$

That is to say

$$B_t = P_t - P_t^*. \quad (2)$$

Therefore, we can calculate the bubble price of the stock through equation (2).

We need to consider the estimation of stock intrinsic value in this case. Feltham and Ohlson (1995) proposed a residual income model (F-O model) based on book value and residual income,the F-O model verified the rationality of dividend discounting. It is to say that the intrinsic value of the stock P_t^* is the present value of the risk-free discount of future dividends. It satisfies the formula

$$P_t^* = \sum_{i=1}^{\infty}(1+\theta_t)^{-i}D_{t+i} = \sum_{i=1}^{\infty}(1+\theta_t)^{-i}(\delta P_{t+i}). \quad (3)$$

Where D_{t+I} is the expected dividend for the period $t+i$, $\theta_t(0<\theta_t<1)$ is the risk-free discount rate for period t and δ is the dividend yield (we generally assume that the company's dividend yield remains unchanged at here). Obviously$0<\delta<1$, P_{t+i} Is the stock price of period $t+i$. The empirical part of this article will be in strict accordance with the asset price decomposition model to decompose the stock price.

2.2.Monetary Policy Effect without Bubble

When there are no bubbles in stock market, we make a concrete analysis through the impact of exogenous monetary policy on the stock price. The variable ε_t represents the impact of monetary policy. We calculate the derivative for ε_t at the same time on both sides of equations when the bubble price is zero, then we can get the following formula

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

$$\frac{\partial P_t^*}{\partial \varepsilon_t} = \delta \sum_{i=1}^{\infty} [\frac{(-t)(1+\theta_t)^{-i-1} P_{t+i} \partial r_t}{\partial \varepsilon_t} + \frac{(1+\theta_{t_t})^{-i} \partial P_{t+i}}{\partial \varepsilon_t}]. \quad (4)$$

The traditional economic theory holds that the impact of monetary policy will cause the real interest rate to change in the opposite direction, while the dividend will changein the same direction, it is to say that

$$\frac{\partial \theta_t}{\partial \varepsilon_t} < 0\,, \quad \frac{\partial P_{t+i}}{\partial \varepsilon_t} > 0\,, \forall i = 1,2,\ldots \quad (5)$$

If the above inequality is established, the asset price will change in the same direction under the impact of monetary policy. That is to say the price of assets will be rising when adoptedthe expansion monetary policy. When the monetary policy is tightening, the price of assets will be lower.

2.3. The effect of monetary policy when there has bubble

Define R_t is the return on total assets during period t, then

$$R_{t+1} = \frac{P_{t+1} + D_{t+1}}{P_t}\,. \quad (6)$$

To analyze the effect of monetary policy impact on the price of the stock bubble, we will mainly refer Calí (2014) on asset prices.According to the equation (1), under the equilibrium of rational expectations, the asset price and its intrinsic price satisfied the following equations, respectively

$$P_t * R_t = E(P_{t+1} + D_{t+1}), \quad (7)$$

$$P_t^* * R_t = E(P_{t+1}^* + D_{t+1}), \quad (8)$$

Where $E(.)$ represents the expected value of the variables in the bracket. It follows from equations (7) and (8) that

$$B_t * R_t = E(B_{t+1}). \quad (9)$$

By taking the logarithm on both sides of the equation can get that

$$\mathrm{E}(b_{t+1}) - b_t = r_t, \quad (10)$$

Where r_t=log R_t, and b_t=logB_t. From equation (10), we can see that increasing the interest rate will increase the expected growth rate of the bubble part of the asset price. Therefore, if the monetary policy which is adopted plays the role of raising the interest rate, the monetary policy may increase the growth rate of the bubble price, and cause the asset bubble price to further increase at last.

3. Data Processing and Empirical Models

3.1. Data selection and processing

This paper uses the quarterly data of China's related variables from the first quarter of 2002 to the third quarter of 2017. The selected variables include GDP, the year-on-year growth rate of M2, the weighted average of inter-bank lending rates, the composite index of Shanghai, and the Dividend Yield on the composite index of Shanghai. Calculate the intrinsic price and the bubble price of the stock through the known data, then take the logarithmically of the GDP, M2, the Shanghai Composite Index, the intrinsic price and the bubble price respectively. The original data was mainly from the "National Statistical Yearbook", CSMAR database, Sina Finance, and the Shanghai Stock Exchange.

3.2. The choice of monetary policy tools

In order to improve the scientificity of this article, we select the appropriate monetary policy tools according to the theoretical ideas put forward by Bernanke and Blinder[19] in 1992.Literature on

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

foreign studies generally uses the federal benchmark interest rate as the main monetary policy instrument in the model. As the marketization of interest rate in China is not perfect at this stage, and the interest rate of bank loans is still not fully marketized. Although the mechanism of bond market is relatively perfect, the scale has not reached the goal of guiding the overall situation, so that itcannot be used as a benchmark interest rate in the model. However, after several decades of development, the interbank interest rate has been basically marketized to reflect the supply and demand in the capital market. Therefore, we use the weighted average of interbank lending interest rates as the benchmark interest rate to introduce the model in this paper. Since both practical and theoretical circles pay more attention to the money supply M2, we choose M2 as the variable of money supply in the model.

3.3. Empirical model

Due to the asset bubble changes over time, the impact of the corresponding monetary policy shock on asset prices may be changed in differently over time. The traditional VAR model cannot meet the needs of the analysis, so we introduce the variable-parameter vector auto regression (TVP-VAR) model to analyze the variables. We will introduce the derivation process briefly from the traditional VAR model to the TVP-VAR mode below.

3.3.1. VAR model:

The basic description of VAR model is that:

$$\boldsymbol{A}\boldsymbol{y}_{\boldsymbol{t}} = \boldsymbol{F}_1 y_{t-1} + \boldsymbol{F}_2 y_{t-2} + \cdots + \boldsymbol{F}_s y_{t-s} + \mu_t, \quad t = s+1, s+2, \ldots, n, \qquad (11)$$

where$\boldsymbol{y}_{\boldsymbol{t}}$ is a k×1-dimensional vector; $\boldsymbol{A}$, $\boldsymbol{F}_1$, $\boldsymbol{F}_2$, …, $\boldsymbol{F}_S$ is the k×k dimensional coefficient matrix; $\boldsymbol{\mu}_t$ is a k×1-dimensional structural shocks.

Assuming that $\mu_t \sim N(0, \sum^2)$, $\sum = \begin{pmatrix} \sigma_1 & \cdots & 0 \\ \vdots & \vdots & \vdots \\ 0 & \cdots & \sigma_k \end{pmatrix}$, and$A$ is a lower triangular matrix whose main diagonal is all 1, then equation (11) can be rewritten as follows

$$\boldsymbol{y}_{\boldsymbol{t}} = \boldsymbol{B}_1 \boldsymbol{y}_{\boldsymbol{t-1}} + \boldsymbol{B}_2 \boldsymbol{y}_{\boldsymbol{t-2}} + \cdots + \boldsymbol{B}_s \boldsymbol{y}_{\boldsymbol{t-s}} + \boldsymbol{A}^{-1} \sum \boldsymbol{\varepsilon}_{\boldsymbol{t}}, \boldsymbol{\varepsilon}_{\boldsymbol{t}} \sim N(0, \boldsymbol{I}_{\boldsymbol{k}}), \qquad (12)$$

where $\boldsymbol{B}_{\boldsymbol{i}} = \boldsymbol{A}^{-1}\boldsymbol{F}_{\boldsymbol{i}}$, i=1,2,…,s.

Stack $\boldsymbol{B}_i$by rows to get the matrix $\boldsymbol{\beta}$, then define $\boldsymbol{X}_{\boldsymbol{t}} = \boldsymbol{I}_{\boldsymbol{k}} \otimes (\boldsymbol{y}_{\boldsymbol{t-1}} \boldsymbol{y}_{\boldsymbol{t-2}} \ldots \boldsymbol{y}_{\boldsymbol{t-s}})^T$, where ⊗ as the product symbol of Kronecker. Thus get the following model:

$$\boldsymbol{y}_{\boldsymbol{t}} = \boldsymbol{X}_{\boldsymbol{t}} \boldsymbol{\beta} + \boldsymbol{A}_{\boldsymbol{t}}^{-1} \sum \boldsymbol{\varepsilon}_{\boldsymbol{t}} \qquad (13)$$

3.3.2. TVP -VAR model:

Expand (13) to a TVP-VAR model with time-varying coefficients

$$\boldsymbol{y}_{\boldsymbol{t}} = \boldsymbol{X}_{\boldsymbol{t}} \boldsymbol{\beta}_{\boldsymbol{t}} + \boldsymbol{A}_{\boldsymbol{t}}^{-1} \sum_{\boldsymbol{t}} \boldsymbol{\varepsilon}_{\boldsymbol{t}}, \quad t = s+1, s+2, \ldots, n, \qquad (14)$$

where the coefficient $\boldsymbol{\beta}_{\boldsymbol{t}}$, parameters $\boldsymbol{A}_{\boldsymbol{t}}$ and $\boldsymbol{\Sigma}_{\boldsymbol{t}}$ are all changes over time. The accumulation vector of the lower triangular elements in $\boldsymbol{A}_{\boldsymbol{t}}$ is $\boldsymbol{\alpha}_{\boldsymbol{t}}$, the logarithmic stochastic volatility matrix $\boldsymbol{h}_{\boldsymbol{t}} = (\boldsymbol{h}_{1t} \boldsymbol{h}_{2t} \ldots \boldsymbol{h}_{kt})^T$, and for any j=1,2,…,k, t=1,2,…,n, $\boldsymbol{h}_{jt} = \log \sigma_{jt}^2$.

Assuming that all the coefficients in equation (14) obey the random walk process, $\boldsymbol{\beta}_{\boldsymbol{t}}$, $\boldsymbol{\alpha}_{\boldsymbol{t}}$and $\boldsymbol{h}_{\boldsymbol{t}}$ is irrelevant on informational impact, and $\boldsymbol{\beta}_{\boldsymbol{t+1}} \sim N(\boldsymbol{\mu}_{\boldsymbol{\beta_0}}, \sum_{\boldsymbol{\beta_0}})$, $\boldsymbol{\alpha}_{\boldsymbol{t+1}} \sim N(\boldsymbol{\mu}_{\boldsymbol{\alpha_0}}, \sum_{\boldsymbol{\alpha_0}})$, $\boldsymbol{h}_{\boldsymbol{t+1}} \sim N(\boldsymbol{\mu}_{\boldsymbol{h_0}}, \sum_{\boldsymbol{h_0}})$, t=1,2,…n. So

$$\begin{bmatrix} \boldsymbol{\varepsilon}_{\boldsymbol{t}} \\ \boldsymbol{\mu}_{\boldsymbol{\beta}_{\boldsymbol{t}}} \\ \boldsymbol{\mu}_{\boldsymbol{\alpha}_{\boldsymbol{t}}} \\ \boldsymbol{\mu}_{\boldsymbol{h}_{\boldsymbol{t}}} \end{bmatrix} \sim N \left[0, \begin{matrix} \boldsymbol{I} & \boldsymbol{0} & \boldsymbol{0} & \boldsymbol{0} \\ \boldsymbol{0} & \sum_{\boldsymbol{\beta}} & \boldsymbol{0} & \boldsymbol{0} \\ \boldsymbol{0} & \boldsymbol{0} & \sum_{\boldsymbol{\alpha}} & \boldsymbol{0} \\ \boldsymbol{0} & \boldsymbol{0} & \boldsymbol{0} & \sum_{\boldsymbol{h}} \end{matrix} \right],$$

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

where $\boldsymbol{\beta_{t+1} = \beta_t + \mu_{\beta_t}}$, $\boldsymbol{\alpha_{t+1} = \alpha_t + \mu_{\alpha_t}}$,

$\boldsymbol{h_{t+1} = h_t + \mu_{h_t}}$.

Because of the large number of coefficients to be estimated in the model, we use the Markov-Monte Carlo simulation (MCMC) method to estimate the state variables.

4. Empirical analysis

In order to understand the fluctuation of economic variables in the economic system under the impact of monetary policy much better, we verify the impact of currency shock on each variable by using the traditional VAR model at first. The research object includes the GDP, the year-on-year growth rate of M2, the composite index of Shanghai Stock and the price of bubbles for the composite Index of Shanghai Stock from the first quarter of 2002 to the third quarter of 2017. And there will be using impulse response function to monitor the impact of monetary policy on the various variables in the system.

4.1. The monetary policy effect under the VAR model

Figure 1 reflects the response of various variables under the impact of the tightening monetary policy. The horizontal axis represents the number of different lag periods after the impact (the unit is the quarter), and the vertical axis represents the percentage deviation between the corresponding variable and the original under the impact of monetary policy. The solid line represents the obtained impulse response function value, and the red dashed line represents the deviation area of plus or minus two standard deviations.

Under the tightening of monetary policy, the real interest rate will be rising. From Figure 1 we can see that the growth rate of GDP will have a slight upward trend under the tightening monetary policy, then there had a gradual downward trend, the overall change is not significant. Which means theGDP not change basically or the change is very small under the impact of the currency. This may be because the fact that China is under the new normal of the three phases of superposition on economic growth, the effect of monetary policy on the real output is not stable. The year-on-year rate of increase of money supply M2 is more significant than the rate of decline in GDP under this impact, however, in the long run, its own volatility is lower than that of the short term.

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

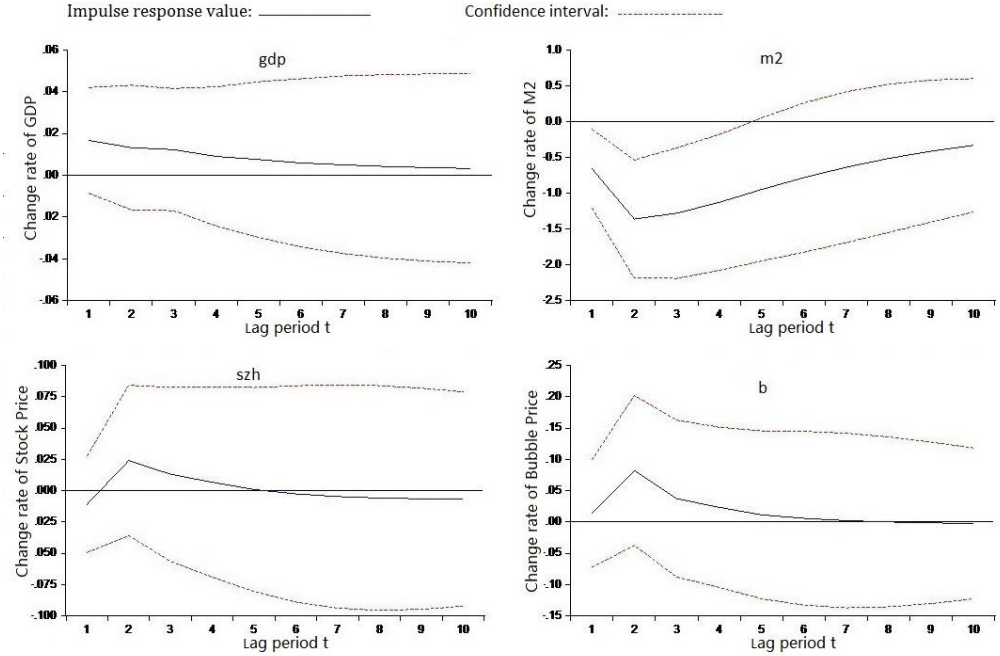

Fig.1 Impact of Monetary Policy Shocks on Variables under the Traditional VAR Model

This article focuses on the impact of monetary policy shocks on the stock price volatility. We can see from the figure that the growth rate of stock price will drop slightly under the impact of the tightening monetary policy at first. But it was raised rapidly to a maximum, then dropped to a slightly less than zero rate of growth slowly. The stock bubble price showed a strong growth trend, then slowly decline, and stayed in zero growth point at last. In other words, the impact of monetary policy will have different effects in different periods, instructions that the phenomenon of price fluctuations was existent. Under the traditional VAR model, the growth rate of the stock price rapidly increases and the growth rate more than zero under the impact of the tightening monetary policy, and then slowly drops to less than zero. In other words, the intrinsic price of the stock and the bubble price shows different trends under the impact of the tightening monetary policy, it is contrary to the traditional theory.

4.2. TVP-VAR model of the monetary policy effect

In the TVP-VAR model, due to the huge number of parameters need to be estimated, we refer to the practice of most documents and choose to directly examine the impulse response function in this paper. This paper was test the impulse response functions of different lag periods by using TVP-VAR model, investigate the process of dynamic evolution on various related variables in different lag periods, and the difference of impulsive effect under the different conditions on economic background. We selected the second quarter of 2006, the third quarter of 2008 and the second quarter of 2015 in this paper. They correspond to the three periods of economic boom, the financial crisis and the over-economic period respectively in China.

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

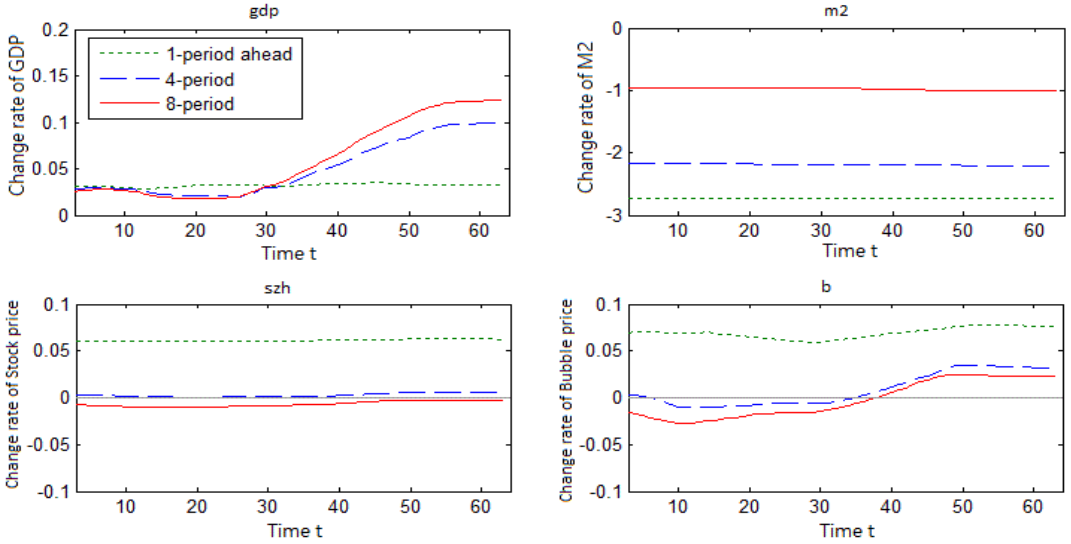

Fig. 2 The impulse response of the various variables in different lead time

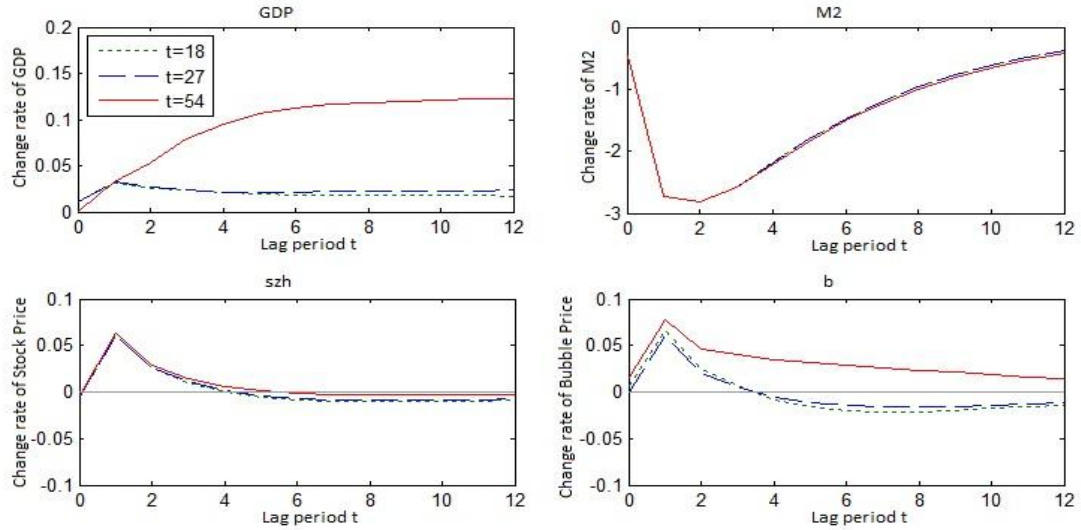

Fig.3 Impulse response of each variable at different time points

Figures 2 and 3 show the impulse response of each variable under the monetary policy shock on the TVP-VAR model. Figure 2 shows the dynamic evolution of the impulse response results at first, fourth and eighth period.The horizontal axis represents the time (the unit is the quarter), and the vertical axis represents the deviation percentage between the value of variable and the original value under the impact of monetary policy.Figure 3 shows the impulse response at three different time points; it is used to analyze the structural mutations of the variables in different economic stages. The horizontal axis response the number of difference lags (the unit is the quarter) after the shock, and the vertical axis represent the deviation percentage between the value of variable and the original value

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

under the impact of monetary policy.

The empirical results show that the growth rate of GDP still behaving a gradual upward trend under the impact of the tightening monetary policy, and the growth rate has obviously increased after a certain period of time. From Figure 2 and 3, we can see that it is started to increase significantly in the transitional period. While the year-on-year rate of increase on the money supply M2 has been showing a downward trend under the impact of the tightening monetary policy, and the short-term decline is higher than the long-term, it is indicating that the short-term impact on M2 was more than long-term impact under the impact of monetary policy.

From the impulse responses of variables in Figure 2 and Figure 3, we can see that the reaction of stock prices has time-varying features and structural mutations under the impact of monetary policy during the sample period. Specifically, from Figure 2, it can be seen that the impulse response of the monetary policy shock is generally positive in the lag phase 1, but the impulse responses are changed from positive to negative on lags 4 and 8, and the growth rate of stocks in each lag period is different. The growth rate of lag period 1 is higher than lag period 4, and the growth rate of lag period 4 higher than lag period 8.In other words, the short-term impact of monetary policy shock on stock price volatility is higher than the long-term impact. From Figure 3, we can see that in the 18th, 27th and 54th periods, the reflection of the stock price on monetary policy shocks is different. That the response to the impact of the monetary policyon stock price is the smallest during the economic boom, while the response during the economic transition period is the largest; it is indicating that there is a structural mutation.

By observed Figures 2 and 3, we can find that the impact of monetary policy shock on stock prices is not the same as the traditional economic theory. According to the traditional experience, both the intrinsic price and the bubble price of the stock will be reduced when the tightening monetary policy is implemented, so the price of the stock will inevitably decrease under double stimulation. However, from Figure 2 and Figure 3, we can see that the intrinsic price of the stock behaving a downward direction and the price of the bubble showing an increasing trend under the impact of the tightening monetary policy in the short term. So that the impact of the tightening monetary policy on the stock price depends on how much its bubble price offset the intrinsic price. That is to say, when the level of bubbles on the stock market was higher, the tightening monetary policy may be caused the stock price to rise. The reason for this phenomenon is that the positive impact of the tightening monetary policy on the bubble price excess the effect on the intrinsic price. The empirical result in this paper is that the change in the market price of stock was contrary to the conventional view, it is consistent with the empirical results obtained by Gali and Gambetti (2015) based on the US data, thus challenging the traditional viewpoints. In the long term, the tighter monetary policy will play a role in reducing the growth rate of the stock price. As can be seen from Figure 3, the growth rate of the stock price will drop below zero after 6 lag period, it is indicating that the monetary policy effect has a Time lag.

The impulse response of the Shanghai

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

Composite Index under the impact of monetary policy (Figures 2 and 3) shows that the result is in line with China's reality. The reason for this change may be that the average price-earnings ratio of China's stock market is abnormally high before the financial crisis, lead to the stock market bubble to accumulated a high level. In the period of financial crisis, the degree of bubbles dropped rapidly with the collapse of the stock market bubble, but still existed, which is made the stock market bubble relatively low in the later period of economic transition.

5. Conclusion

This paper constructs a theoretical framework to discuss how monetary policy affects stock price, and discusses the impact of monetary policy on stock price from internal price and bubble price respectively. In the empirical analysis, we analyze the influence of the tightening monetary policy on the stock price and other economic variables in the economic system respectively from the traditional VAR model and the TVP-VAR model. The empirical results confirm that the impact of tightening monetary policy on the stock price has time-varying features and structural mutations. The monetary policy will not affect the conditions of production of the bubble, but will affect the expansion path of the bubble. In the short term, the impact of monetary policy will affect the size and extent of the bubble, so that it will lead to a change in stock prices, and the impact of the tightening monetary policy will cause the stock price to further expand at here, this conclusion is obviously different from the traditional concept. There are many reasons for this phenomenon, mainly due to China's IPO system, prop up the market by government, arbitrage mechanism, short selling mechanism and speculative psychology and so on.

Judging from the actual situation in China's stock market, the tight monetary policy may have a certain restraining effect on the stock market price in the short run, but it can not eliminate the stock market bubble. On the contrary, the volatility of the stock market was aggravated due to the lag of monetary policy. For bubble-capped capital markets, tighter monetary policy tends to increase the expected return on bubble-driven assets, which resulting in further price increases. When the bubble is large enough, the asset bubble to further expand due to the reduction in the intrinsic price of the asset by the tighter monetary policy is less than the increase in the price of the bubble. Therefore, relevant departments need to take into consideration the circumstances while implement a monetary policy, and take into account the lagged impact of policy measures, so that need to use countercyclical economic policies prudently. This paper hopes to provide a new perspective for the departments concerned to study the impact of monetary policy on the asset prices, which conducive to enhance the central bank's macro-control ability in the process of marketization of interest rates. However, there are still some shortcomings in this article. Because not all investors are rational and risk-neutral, we can continue to expand the research from these two aspects.

References:

1. Bernanke B S, Blinder A S. The Federal Funds Rate and the Channels of Monetary

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

Transmission, The American Economic Review, 1992, 82(4):901-921.
2. Bissoon R, Seetanah B, Bhattubabajee R, Gopyramdhany N, Seetah K. Monetary Policy Impact on Stock Return: Evidence from Growing Stock Markets, Theoretical Economics Letters, 2016, 6(5):1186-1195.
3. Cai Nan. Financial Bubble: Theory and Empirical Analysis Based on China, World Economic Research, 2003 (09):57-62.
4. Chatziantoniou I, Duffy D, Filis G, et al. Stock market response to monetary and fiscal policy shocks: Multi-country evidence, Economic Modelling, 2013, 30:754-769.
5. Cunado J, Gilalana L A, De Gracia F P, et al. Testing for stock market bubbles using nonlinear models and fractional integration, Applied Financial Economics, 2007, 17(16):1313-1321.
6. Feltham G A, Ohlson J A. Valuation and Clean Surplus Accounting for Operating and Financial Activities, Contemporary Accounting Research, 1995, 11(2): 689-731.
7. Fischbacher U, Hens T, Zeisberger S, et al. The Impact of Monetary Policy on Stock Market Bubbles and Trading Behavior-Evidence from the Lab, Journal of Economic Dynamics and Control, 2013, 37(10):2104-2122.
8. Gali J, Gambetti L. The effects of monetary policy on stock market bubbles: some evidence, American Economic Journal: Macroeconomics, 2015, 7(1):233-257.
9. GuoWenwei, Chen Fengling. Measurement of Multi-level Stock Market Bubbles in China - Also on the Impact of Capital Market Reform, Science in Finance and Economics, 2016 (08):25-36.
10. HU Yibo. Time-Varying Relationship between Interest Rate Change and Stock Market Volatility Based on TVP-VAR Model, Management Modernization, 2016, 36 (01):7-9.
11. Laopodis N. Dynamic linkages between monetary policy and the stock market, Review of Quantitative Finance & Accounting, 2010, 35(35):271-293.
12. Li Hongyan, Wang Tao. An Empirical Analysis on the Relationship between the Price of Chinese Stock Market and the Money Supply, Prediction, 2000 (3):37-40.
13. Nakajima J. Time-Varying Parameter VAR Model with Stochastic Volatility: An Overview of Methodology and Empirical Applications, Monetary and Economic Studies, 2011, 29:107-142.
14. Pan Changchun. The time-varying impact mechanism of interest rate policy on asset pricesempirical study based on tvp-var model, Study and Exploration, 2017 (02): 123-128.
15. Pan Guoling. Study on the stock market bubble, Financial Research, 2000 (07):71-79.
16. Rifat A. Impact of Monetary Policy on Stock Price: Evidence from Bangladesh, Journal of Investment Management, 2015, 4(5):273-284.
17. Thorbecke W. On Stock Market Returns and Monetary Policy, Journal of Finance, 1997, 52(2):635-654.
18. Wang Yugui. The formation mechanism of financial bubbles and empirical research of China's stock market and real estate bubble, Renmin University of China, 2005.
19. Xu Ainong. Research on bubble measurement

International Journal of Management and Economics Invention ISSN (e): 2395-7220
||Volume||4||Issue||02||Pages-1660-1672||February-2018||
Index Copernicus ICV: 72.76, DOI: 10.18535/ijmei/v4i2.05

and rationality of Chinese stock market, Financial theory and practice, 2007(01):34-39.