

Changes in Macroeconomic Policies and Volatility of Chinese Stock Market

Qi'an Chen*

School of Economics and Business Administration, Chongqing University, Chongqing400030, China
Email: chenqi_an33@163.com

Pengyu Fang

School of Economics and Business Administration, Chongqing University Chongqing400030, China
Email: 1050154730@qq.com

Yuan Zhang

School of Economics and Business Administration, Chongqing University Chongqing400030, China
Email: aliciaalicia@163.com

Abstract—Based on a comprehensive investigation on Chinese Stock Market and macroeconomic policies, analyzing samples of the SSE Composite Index and relevant monetary and fiscal policies during the period from January 2000 to June 2008, this paper uses GARCH-type models and EVIEWS5.1 software to study effects of changes in macroeconomic policy on conditional volatility of Chinese Stock Market and analyzes the economic significance and reasonability of empirical results. The results show that, when the government adopts the compound policies of money supply, interest rate, stamp duty and fiscal expenditure to regulate the stock market, changes in monetary policies (including money supply and interest rate) have significant effects on the conditional volatility of Chinese Stock Market, while effects of changes in fiscal policies (including stamp duty and fiscal expenditure) on the conditional volatility of Chinese Stock Market are not statistically significant. This finding, to a certain extent, verifies the fund-pulled features and weak-form efficient features of Chinese Stock Market.

Index Terms—Macroeconomic policy; Conditional volatility; GARCH-type model; Chinese Stock Market

I. INTRODUCTION

Chinese Stock Market is a typically immature and emerging capital markets. There exist many disparities between Chinese Stock Market and mature capital markets of developed countries and regions with respect to their backgrounds of establishment, modes of operation and developing processes etc., and the respective regulatory roles and effectiveness of national macroeconomic policies on the two types of markets are

also very different. Not to mention the recurring phenomena of large fluctuations seriously deviating from China's economic development in Chinese Stock Market, but Chinese Stock Market also reacts oppositely from expectations of macroeconomic regulatory policy makers. Macroeconomic policies such as adjusting bank deposit reserve ratios, deposit and lending interest rates and stamp duty etc., which have been proved to be effective in regulating stock prices in capital markets of developed countries and regions, have had little positive effect in Chinese Stock Market, and sometimes they even have exact opposite impacts from what was expected. For example, during the period from January to October of 2007, when the People's Bank of China raised the bank deposit reserve ratio eight times, Shanghai Stock Exchange (SSE) Composite Index dropped only once on the first trading day after the news was released, and for the other seven times the SSE Composite Index went up. During the same period, when the People's Bank of China raised the deposit and lending interest rate five times, the SSE Composite Index went up on the first trading day after the news of raised interest rates was released. Moreover, a substantial increase in stamp duty (from 1 % to 3 ‰) on May 18, 2007 did not reverse Chinese Stock Market's upward trend from January to October of 2007. Uncertainties about effect of macroeconomic policies on movements of Chinese Stock Market undoubtedly make it more difficult for government relevant economic administrative departments to regulate the stock market, and reduce the government's capacity and efficiency of regulating the stock market through economic means. Therefore, systematically and deeply researching effects of changes in macroeconomic policies on Chinese Stock Market has very important theoretical and practical implications for strengthening management and controlling on Chinese Stock Market, and improving the government's regulation and supervision effectiveness on the stock market, and then ensuring healthy and stable

*corresponding author: Qi'an Chen is a Doctor of management and economics professor in the School of Economics and Business Administration,

Chongqing University, Chongqing, China. Email: chenqi_an33@163.com

Tel: +86-13983972296(China P.R.).

Mailing address: School of Economics and Business Administration, Chongqing University

174 Shazheng Street Shapingba District, Chongqing 400030, China

and sustainable developments of Chinese Stock Market.

In current related research literature, the relationship between macroeconomic policies and the behavior of stock market has become an important research topic in academia and the financial industry. Stringham, Boettke and Clark (2008) found that excessive governmental regulation and supervision is unlikely to benefit the stock market after studying whether the government should regulate the emerging stock market[1]. Alper Çenesiz and Pierdzioch (2008) made use of a dynamic optimization model that characterizes frictions between two countries' markets to analyze the influence of financial market integration on macroeconomic policies in an open economy, and found that frictions in labor markets would greatly reduce the effect of financial market integration on macroeconomic policies[2]. Laopodis (2009) constructed a time-series model to study the relationship between fiscal policy and stock returns based on the datas from the United States, and his results showed that there was a negative correlation between fiscal deficit and the stock market lasting several months, and rational investors did not pay enough attention to fiscal policies, and fiscal deficit would affect welfare and long-term fiscal deficit would change investors' anticipation[3]. Basistha and Kurov(2008) studied an economic cycle's impact on the stock market and the impact of monetary policies on stock returns in certain economic environments, and found that the reaction of the stock market to changes in monetary policies was more significant during a economic recession, and the stock market reacts to monetary policies more strongly when credits are tightened[4]. Cassola and Morana (2004) investigated the impact of the monetary policy aimed at stabilizing prices on the financial system and the relationship between a monetary policy aimed at limiting inflation and the stock market based on the European stock market, and established a VAR Model to study the relationship between the policies and stock returns and found that price stability contributes to stability of financial markets[5]. Arin, Mamun and Purushothman (2009) established a semi-structural VAR model to study the influence of changes in various tax policies on financial markets using financial market datas in the United States, Germany and Japan, and discovered that labor income tax and output are negatively correlated with the stock returns, and indirect taxes have a greater impact on the stock market than labor income taxes[6]. Gao and Kling (2008) constructed a time-series model to study the relationship between market supervision policies and stock market liquidity using datas from Chinese Stock Market, and found that changes in policies can have only short-term impacts on liquidity and the effect of macroeconomic policies on financial markets is very small[7]. Green, Maggioni and Murinde (2000) set up a time-series model to study the relationship between transaction costs and volatility of stock market making use of approximately one-hundred years' monthly datas from the London Stock Exchange and calculation method of unconditional volatility, and their results showed that the volatility of stock market was highly related to market

conditions and transaction costs, and the long-term effects of transaction costs on various volatilities are significantly different, and then they proposed the policy recommendations that use stamp duty as a tool regulating stock market[8]. Guo and Li (2004) used quantitative analysis methods to study the interaction relationship between Chinese monetary policy and the stock market with respect to changes in interest rates, adjustments in money supply, investment and consumption[9]. Xiang(2008) set up an unary regression model to study effects of fiscal policies and monetary policies on stock price making use of monthly data from Chinese Stock Market, and taking stamp duty on behalf of fiscal policy, money supply on behalf of monetary policy and the stock closing price on behalf of income, and using the cointegration test to detect the long-term relationship among the three variables. His results showed that the Shenzhen stock index was not sensitive to changes in interest rates and is negatively correlated with the money supply, and the money supply was Granger cause of Shenzhen stock index; and there does not exist a stable long-term relationship of cointegration between money supply and the Shenzhen stock index[10]. Xu and Li(2001) set up an unary regression model to study the effect of macroeconomic policies on Chinese Stock Market returns both qualitatively and quantitatively using quarterly data and event analysis method, and found that the continuous policies can explain little about the stock market, while some non-continuous policies have a greater impact on the stock market[11].

To sum up, in most of related foreign literatures, research findings about the relationship between macroeconomic policies and stock market are based on the western social and economic and political context, and may not reflect the actual situation of Chinese Stock Market. Relevant Chinese literatures mostly use unconditional volatility (namely, using variance to measure the volatility) to study the relationship between a single policy and the behavior of stock market. However, there is not literature about effects of changes in compound macroeconomic policies on conditional volatility of Chinese Stock Market. It is clear that factors causing the stock market to fluctuate are very complex, and fluctuations caused by an event (such as changes in related policies) often have a significant impact on fluctuations in later periods. Thus, using conditional volatility to measure the volatility of stock market should be more appropriate. Based on the above reasons, according to a comprehensive investigation on Chinese Stock Market and the macroeconomic policies, using changes of the stamp duty and fiscal expenditure as indicators of changes in fiscal policies, changes of the money supply and interest rate as indicators of changes in monetary policies, this paper makes use of GARCH-type models and EViews5.1 software to empirically study effects of changes in macroeconomic policies on conditional volatility of Chinese Stock Market.

Our main findings can be summarized as follows. when the government adopts the compound policies of money supply, interest rate, stamp duty and fiscal

expenditure to regulate the stock market, changes in monetary policies (including money supply and interest rate) have significant effects on the conditional volatility of Chinese Stock Market, while effects of changes in fiscal policies (including stamp duty and fiscal expenditure) on the conditional volatility of Chinese Stock Market are not statistically significant. This finding, in turn, verifies the fund-pulled features and weak-form efficient features of Chinese Stock Market.

The remainder of the paper is organized as follows. Section II describes variable design and data collection. Section III selects empirical model. Section IV makes descriptive statistics and tests. Section V empirically studies effect of changes in macroeconomic policies on conditional volatility of Chinese stock market. Section VI concludes.

II. VARIABLE DESIGN AND DATA COLLECTION

Main variables included in this empirical research are weekly return rate of SSE Composite Index and relevant variables that measure changes of fiscal policies and monetary policies.

A. SSE Composite Index's Weekly Return Rate

The SSE Composite Index is commonly used to measure the behavior of Chinese Stock Market, and it is strongly related to the Shenzhen component index. Thus, the return rate of the SSE Composite Index is used as a measure of return rate of Chinese Stock Market in this paper. According to the research purpose and data availability, the sample data are from January 2000 to June 2008. In (1), $s r_t$ is the return rate of SSE Composite Index in t^{th} week, calculated from continuous compound interest, and Y_t is average closing index of the SSE Composite Index in t^{th} week.

$$s r_t = \log(Y_t) - \log(Y_{t-1}) \tag{1}$$

All data come from CSMAR Database..

B. Variables of Changes in Fiscal Policy

As public information, change of stamp duty affects volatility of stock market by affecting investors' transaction costs and psychological expectations. Fiscal expenditure, as an important tool to regulate the economy, also affects volatility of stock market by affecting economic vitality. This paper uses change of the stamp duty (sd) and change of fiscal expenditure (E) as indicators of changes in fiscal policies. All data come from the website of Statistics Bureau of China.

C. Variables of Changes in Monetary Policy

Monetary policy includes adjusting money supply and interest rate etc.. In many related research literature, money supply is viewed as an important factor that affects stock prices. It affects the stock market in the following two ways: one is expectation effect—changing investors' expectations about the future through contractionary and expansionary policies. The other is money supply effect—change in money supply affects supply of funds in stock market. In addition, interest rate, as a part of public information, is

closely monitored by media and investors. In developed stock markets, interest rate is one of the most important and sensitive factors that affect the trend of stock market. Theoretically, the intrinsic value of stock equals the sum of present value of earning of per share in the future. Change of interest rate cause substitution effect of investment portfolios and affect the return rate of financial assets. When investors make selection between investing in stocks and other financial assets, the interest rate would affect the supply of funds in the stock market. Moreover, change of interest rate would affect operation of listed companies and investors' evaluation on listed companies. Thus, according to the research purpose and data availability, this paper chooses change of money supply (M2) and Change of one-year deposit interest rate (r) as indicators of changes in monetary policies. All data come from the website of People's Bank of China.

III. SELECTION OF MODEL

To choose an appropriate model to investigate effects of changes in macroeconomic policies on conditional volatility of Chinese Stock Market, it is necessary to look at the trend and behavior of prices in Chinese Stock Market (see Figure1). In the Figure1, SSE Composite Index's volatility before 2005 is much less than that after 2006, and the volatility of Chinese Stock Market shows an apparent time-varying feature. In order to solve the possible heteroscedasticity, using the following GARCH model to study effects of changes in macroeconomic policies on Chinese Stock Market should be reasonable and appropriate.

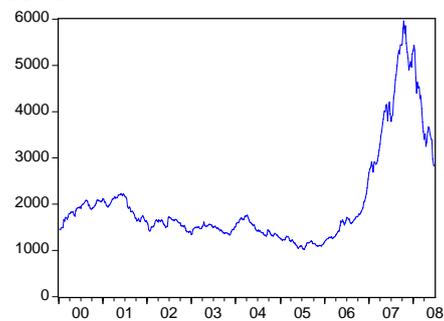


Figure1. Trend of weekly average SSE Composite Index from January 2000 to June 2008

$$s r_t = \phi_0 + \sum_{j=1}^J \eta_j s r_{t-j} + \varepsilon_t + \sum_{n=1}^N \gamma_n \varepsilon_{t-n} \tag{2a}$$

$$\varepsilon_t | \varphi_{t-1} \sim N(0, h_t) \tag{2b}$$

$$h_t = \alpha_0 + \sum_{m=1}^q \alpha_m \varepsilon_{t-m}^2 + \sum_{l=1}^p \beta_l h_{t-l} + \sum_{k=1}^K \zeta_k X_{kt-1} \tag{2c}$$

In the above model, parameter j represents the lag periods of return rate and parameter n represents the lag order of moving average. The mean equation (2a) means that the return rate at period t linearly depends on previous J periods return rates and previous N periods moving averages. Let h_t be conditional volatility and φ_{t-1} be period $t-1$ information set. In the volatility equation (2c), m denotes the lag order of residuals squared and l means the lag order of auto-regression. X_k

represents the k^{th} macroeconomic policy adopted to regulate the stock market. Choosing one lag policy variable can avoid the time lag effect of policy. Parameter ζ_k represents the effect of the k^{th} policy at period $t-1$ on the conditional volatility of stock market at period t .

To ensure that the conditional volatility stays positive and has a stable structure, the parameters of GARCH model must satisfy the following restrictions:

$$\alpha_m > 0, \beta_l > 0, \alpha_0 > 0, \sum_{m=1}^q \alpha_m + \sum_{l=1}^p \beta_l < 1 \tag{2d}$$

IV. DESCRIPTIVE STATISTICS AND TESTS

A. Descriptive Statistics

Figure2 shows weekly return rate of SSE Composite Index from January 2000 to June 2008. The volatility is relatively low between 2003 and 2004, and it becomes much greater after the second half of 2006. It means that the behavior of Chinese Stock Market is time-varying to some extent and the assumption of constant variance of residuals is problematic. In addition, as shown in TABLE I and TABLE II, the skewness and kurtosis of SSE Composite Index's weekly return rate and various policy variables are significantly different from that of normal distribution (the skewness and kurtosis of normal distribution is 0 and 3 respectively). Moreover, Jarque-Bera statistics of all variables also refuse the hypothesis of normal distribution. These mean that the distribution of return rate of SSE Composite Index has a sharp peak a fat tail. The above description is evidence that using a GARCH model is appropriate.

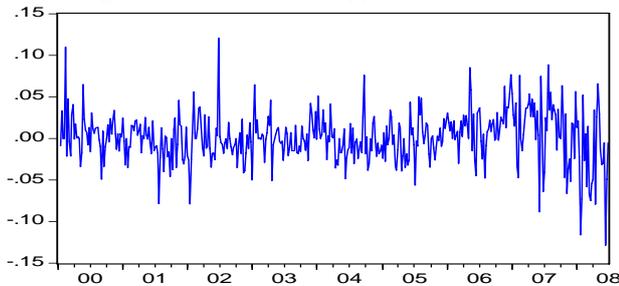


Figure2. Weekly return rate of SSE Composite Index from January 2000 to June 2008

TABLE I. DESCRIPTIVE STATISTICS ABOUT SSE COMPOSITE INDEX FROM JANUARY 2000 TO JUNE 2008

Return Rate	Average	Standard Error	Skewness	Kurtosis	Jarque-Bera	Prob.
sr	0.14%	2.99%	-0.09	5.08	80.10	0.0000

TABLE II. DESCRIPTIVE STATISTICS ABOUT VARIOUS POLICY VARIABLES FROM JANUARY 2000 TO JUNE 2008

Policy Variable	Skewness	Kurtosis	Jarque-Bera	Prob.
M2	2.89	13.53	2659.21	0.0000
r	6.79	47.13	39267.13	0.0000
sd	-3.93	127.92	288549.7	0.0000
E	-1.70	42.09	28348.39	0.0000

B. Stationary Test

To avoid spurious regression and to further determine the model, it is necessary to use ADF test method to test stationary of all variables. The test results are in TABLE III.

TABLE III. STATIONARY TEST OF RETURN RATE OF SSE COMPOSITE INDEX AND VARIOUS POLICY VARIABLES

	ADR test statistic	Test critical value 1%	Prob.
Sr	-16.7416	-3.444991	0.0000
M2	-3.721143	-3.445373	0.0041
r	-8.725827	-3.445059	0.0000
sd	-20.98530	-3.444957	0.0000
E	-11.67779	-3.445232	0.0000

In TABLE III, the series of return rate of SSE Composite Index, change of money supply, change of interest rate, change of stamp duty and change of fiscal expenditure are stationary. It means that an ARMA model is appropriate.

C. GARCH Test

- Determining lag order

As shown in TABLE IV, the autocorrelogram and partial autocorrelogram have features of tail and first-order single peak, which show that an ARMA(1,1) model can be build. Meanwhile, autocorrelation and partial autocorrelation coefficients lagged two and three orders are relatively big, so an ARMA(3,3) model can be used. Additionally, the random-walk model AR(1) is also commonly used to describe return rate of stock in previous related research literature. Thus, it is necessary to use Goodness of fit and AIC criterion to compare ARMA(1,1), ARMA(3,3) and AR(1). Comparison results are displayed in TABLE V.

TABLE IV. AUTOCORRELATION AND PARTIAL AUTOCORRELATION COEFFICIENTS OF WEEKLY RETURN RATE OF SSE COMPOSITE INDEX

Order	Autocorrelation coefficient	Partial Autocorrelation coefficient	Q-stat	Prob.
1	0.219	0.219	21.254	0.0000
2	0.124	0.080	28.099	0.0000
3	0.119	0.081	34.458	0.0000
4	0.008	-0.043	34.490	0.0000
5	0.071	0.063	36.727	0.0000
6	0.085	0.057	40.010	0.0000
7	0.022	-0.013	40.234	0.0000
8	0.099	0.079	44.698	0.0000
9	0.041	-0.003	45.470	0.0000
10	0.029	0.009	45.855	0.0000
11	0.070	0.040	48.057	0.0000
12	-0.042	-0.073	48.856	0.0000

TABLE V.
COMPARISON OF ARMA(1,1), ARMA(3,3) AND AR(1)

Model		Coefficient	t-Statistic	Prob.	R-squared	AIC
ARMA(1,1)	AR(1)	0.914331	18.88529	0.0000	0.062730	-4.238332
	MA(1)	-0.812430	-11.81143	0.0000		
ARMA(3,3)	AR(1)	-0.5555668	-5.288718	0.0000	0.104722	-4.263874
	AR(2)	0.668029	8.314853	0.0000		
	AR(3)	0.654530	7.227524	0.0000		
	MA(1)	0.745036	7.056015	0.0000		
	MA(2)	-0.547798	-4.934614	0.0000		
	MA(3)	-0.672449	-7.937753	0.0000		
AR(1)	AR(1)	0.221662	4.763140	0.0000	0.046681	-4.225899

As shown in TABLE V, autoregressive terms and the moving average terms in all of three models are statistically significant. However, the ARMA(3,3) model has the best goodness of fit and the smallest AIC value among three models, which denotes the ARMA(3,3) model is the best selection for empirical research. So, the mean equation (2a) can be described as follow more specifically.

$$sr_t = \eta_1 sr_{t-1} + \eta_2 sr_{t-2} + \eta_3 sr_{t-3} + \varepsilon_t + \gamma_1 \varepsilon_{t-1} + \gamma_2 \varepsilon_{t-2} + \gamma_3 \varepsilon_{t-3} \quad (3)$$

• ARCH-LM test

The residuals of mean equation (3) are displayed in Figure3.

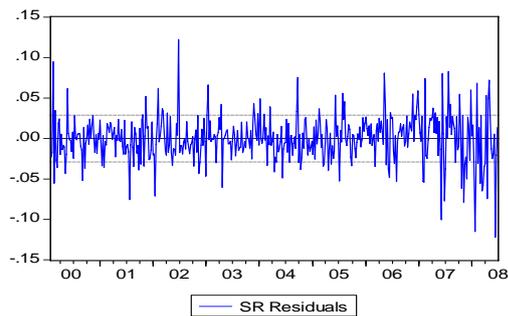


Figure3. Regression residuals of mean equation (3)

As displayed in Figure3, the volatility of residuals of ARMA (3,3) appears time-varying. However, in TABLE V, all coefficients of lag terms in ARMA (3,3) are statistically significant. It means that there may be an ARCH effect in the residuals of ARMA (3,3), which can make the model imprecise. To see whether there is ARCH effect in the residuals, we should use ARCH-LM test on the weekly return rate of SSE Composite Index. Its results are displayed in TABLE VI.

TABLE VI.
ARCH-LM TEST RESULTS

	Value	Prob.
F-statistic	4.671620	0.031210
Obs*R-square d	4.643233	0.031176

The results refuse the hypothesis that it does not exist heteroscedasticity at the 5% level. It means that there is an ARCH effect in the residuals of Equation(2). Thus, an ARCH model is appropriate.

V. EMPIRICAL RESEARCH

A. Determining Specific Empirical Model

To choose an appropriate model to investigate effects of changes in monetary policies and fiscal policies on conditional volatility of Chinese Stock Market, it is necessary to compare different types of ARCH models corresponding to changes in monetary policies and fiscal policies (see TABLE VI).

TABLE VI.
COMPARISON OF THREE KINDS OF ARCH MODELS

	ARCH(1)	ARCH(2)	GARCH(1,1)
η_1	-0.529406*** (0.0000)	-0.309901*** (0.0000)	-0.482359*** (0.0000)
η_2	0.688497*** (0.0000)		
η_3	0.659990*** (0.0000)	0.610859*** (0.0000)	0.623152*** (0.0000)
γ_1	0.743496*** (0.0000)	0.605348*** (0.0000)	0.659435*** (0.0000)
γ_2	-0.554634*** (0.0000)	0.394643*** (0.0000)	0.220148*** (0.0002)
γ_3	-0.690154*** (0.0000)	-0.387773*** (0.0000)	-0.437983 (0.0000)
α_1	0.126745** (0.0153)	0.095825** (0.0156)	0.005071 (0.7287)
α_2		0.314634*** (0.0000)	
β_1			0.929618*** (0.0000)
AIC	-4.290619	-4.316850	-4.367600
R ²	0.102804	0.051371	0.096115
ARCH-LM	0.462345 (0.496892)	0.163733 (0.685941)	0.441413 (0.506793)

Note: numbers in parentheses are probability value

As shown in TABLE VI, in ARCH(1) model, the autoregressive terms and moving average terms in the mean equation and residual squared terms in the volatility equation are statistically significant at the 5% level at least, and the goodness of fit is more than 10%. When constructing the ARCH(2) model, we find that the second lag autoregressive term of in the mean equation is not statistically significant. After deleting this term and regressing again, we obtain ARCH(2) model shown in TABLE VI. Thus, the other autoregressive terms and all the moving average terms in the mean equation, and all residual squared terms in the volatility equation are significant at the 5% level at least, and the AIC value of ARCH(2) is smaller than that of ARCH(1). Thus, ARCH(2) is better than ARCH (1). However, the residual squared term of GARCH(1,1) model is not statistically significant. It means that GARCH (1, 1) cannot be used. According to the above analyses, we can construct the following ARCH(2) model (4) to research effects of changes in monetary policies and fiscal policies on conditional volatility of Chinese Stock Market:

$$sr_t = \eta_1 sr_{t-1} + \eta_3 sr_{t-3} + \varepsilon_t + \gamma_1 \varepsilon_{t-1} + \gamma_2 \varepsilon_{t-2} + \gamma_3 \varepsilon_{t-3}$$

$$\varepsilon_t | \varphi_{t-1} \sim N(0, h_t)$$

$$h_t = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \alpha_2 \varepsilon_{t-2}^2 + \zeta_1 M 2_{t-1} + \zeta_2 r_{t-1} + \zeta_3 sd_{t-1} + \zeta_4 E_{t-1} \quad (4)$$

B. Empirical Results and Analysis

Using the above-mentioned ARCH(2) model (4) and EViews5.1 software, we can obtain empirical results in TABLE VII.

TABLE VII
EFFECTS OF CHANGES IN MONETARY POLICIES AND FISCAL POLICIES ON CONDITIONAL VOLATILITY OF CHINESE STOCK MARKET

Policy Variable	Coefficient	Z-statistic	Prob.
<i>M2</i>	8.70E-08	3.021411	0.0025
<i>r</i>	-0.001595	-2.585977	0.0097
<i>sd</i>	0.403451	1.528869	0.1263
<i>E</i>	-4.57E-08	-0.480318	0.6310

As shown in TABLE VII, when the government adopts the compound policies of money supply, interest rate, stamp duty and fiscal expenditure to regulate the stock market, changes in monetary policies (including money supply and interest rate) have significant effects on conditional volatility of Chinese Stock Market, while effects of changes in fiscal policies (including stamp duty and fiscal expenditure) on conditional volatility of Chinese Stock Market are not statistically significant. The reasonability of this result for Chinese Stock Market is as follows. Firstly, since Chinese Stock Market is a typical fund-pulled market, the effect of change in fund supply from changes in monetary policies on Chinese Stock Market has a dominant position compared with the effect of changes in fiscal policies on Chinese Stock Market. Secondly, Chinese Stock Market is an emerging and weakly efficient capital market in which noise trading and speculation is severe, so prices of stock market cannot fully reflect fundamentals of economy. Change of trading cost from change of stamp duty is often neglected by a large number of noise traders who are over-optimistic or over-pessimistic in Chinese Stock Market. Meanwhile, since a large number of individual investors in Chinese Stock Market not only have no sufficient time and energy, but also lack enough knowledge and ability to collect and deal with the relevant information of change in fiscal expenditure, this makes them not to be concerned about the indirect effect of change in the economic fundamentals resulted from change in fiscal expenditure on the stock market. Therefore, effects of changes in fiscal policies on conditional volatility of Chinese Stock Market are in secondary position in the policy combination. The above-mentioned empirical result, in turn, shows the fund-pulled features and weak-form efficient features of Chinese Stock Market.

VI. CONCLUSION

Based on a comprehensive investigation on Chinese Stock Market and macroeconomic policies, using changes of the stamp duty and fiscal expenditure as indicators of changes in fiscal policies, and changes of the money supply and interest rate as indicators of changes in monetary policies, taking the datas of SSE Composite Index and relevant monetary and fiscal policies during the period from January 2000 to June 2008 for samples,

this paper uses GARCH-type models and EViews5.1 software to empirically study effects of changes in macroeconomic policies on conditional volatility of Chinese Stock Market and analyzes the economic significance and reasonability of empirical results. The results show that changes in monetary policies have significant effects on conditional volatility of Chinese Stock Market, while effects of changes in fiscal policies on conditional volatility of Chinese Stock Market are not statistically significant. This finding, in turn, verifies the fund-pulled features and weak-form efficient features of Chinese Stock Market. The above-mentioned research results tell us that, increasing the amount of rational investors, reforming the system of releasing government policies, lowering costs of obtaining information about policies, efficiently and scientifically formulating government policies are effective ways of ensuring healthy and stable and sustainable developments of Chinese Stock Market.

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REFERENCES

- [1] E. S tringham, P. Boettke and J.R. Clark, "Are regulations the answer for emerging stock markets? Evidence from the Czech Republic and Poland", *The Quarterly Review of Economics and Finance*, vol. 48, pp.541-566, 2008.
- [2] M. Alper Çenesiz, and C. Pierdzioch, "Financial market integration, labor market, and macroeconomic policies", *International Review of Economics and Finance*, vol.17, pp.467-476, 2008.
- [3] N.T. Laopodis, "Fiscal policy and stock market efficiency: evidence for the United States", *The Quarterly Review of Economic and Finance*, vol. 49, pp.633-650, 2009.
- [4] A.Basistha and A.Kurov, "Macroeconomic cycles and the stock market's Reaction to monetary policy", *Journal of Banking and Finance*, vol.32, pp.2606-2616, 2008.
- [5] N. Cassola and C. Morana, "Monetary policy and the stock market in the euro area", *Journal of Policy Modeling*, vol. 26, pp.387-399, 2004.
- [6] K.P. Arin, A. Mamun, and N. Purushothman, "The effects of tax policy on financial markets: G3 evidence". *Review of Financial Economics*, vol.18, pp.33-46, 2009.
- [7] L. GAO and G. Kling, "Regulatory changes and market liquidity in Chinese stock market", *Emerging Markets Review*, vol. 17, pp.162-175, 2006.
- [8] C. J. Green, P. Maggioni and V. Murinde, "Regulatory lessons for emerging stock markets from a century of evidence on transactions costs and share price volatility in the London Stock Exchange", *Journal of Banking and Finance*, vol. 24, pp.577-601, 2000.
- [9] Malin Song, Shuhong Wang, Jie Wu, Li Yang. "A New Space-Time Correlation Coefficient and its Comparison with Moran's Index on Evaluation", *Management Decision*, Vol. 49 No. 9, pp. 1426-43, 2011.
- [10] J.L. Guo and W.J. Li, "Empirical Analysis of the

- Interactive Relationship between Stock Market Development and Monetary Policy in China”, *Quantitative and Technical Economics (China)* , vol.21,pp18-27, June 2004.
- [11] Li Yang, Malin Song. Coal mine safety evaluation with V-fold cross-validation and bp neural network[J]. *Journal of Computers*, 2010,5(9):1364-1372.
- [12] Li Yang, Malin Song. Formation mechanism of green strategic alliances and its cooperative system for coal-mining eco-industrial parks based on synthetic decision support system [J]. *Journal of Computers*, 2009,4(11):1109-1117.
- [13] J.H.Xu and Q.Y. Li, “Empirical study on the effect of Macroeconomic policies on the Chinese Stock Market”, *Economic Research Journal (China)*, vol.36, pp19-26, September 2001.