Uncertainty of Economic Policy, Macro Impact and A-share Market ——An Empirical Study Based on LSTVAR Model

Lu Zhou

School of economics, Jinan University, Guangzhou 510632, China.

Abstract

This paper uses the economic policy uncertainty index provided by Baker and others, combines our country's macroeconomic variables (broad money supply and industrial added value) data over the period of July 1998 to July 1998, and uses Weise's Logistic smooth migration of vector autoregressive (LSTVAR) model for China's a-share market stock returns and volatility in the empirical analysis, and by using the generalized impulse response function to explore under the uncertainty of different economic policies, macroeconomic impact effect on the stock market.

Keywords

EPU, Macroeconomic, Variables, LSTVAR model.

1. Introduction

This paper uses the economic policy uncertainty index provided by Baker and others, combines our country's macroeconomic variables (broad money supply and industrial added value) data over the period of July 1998 to July 1998, and uses Weise's Logistic smooth migration of vector autoregressive (LSTVAR) model for China's a-share market stock returns and volatility in the empirical analysis, and by using the generalized impulse response function to explore under the uncertainty of different economic policies, macroeconomic impact effect on the stock market.

The empirical results show that in both cases that economic policy uncertainty is higher and lower, A unit standard deviation of the macro variables are impact effect on the a-share market returns and volatility exist obvious asymmetry. In addition，the study found that in the condition of different economic policy uncertainty, economic policy uncertainty, itself A unit of the impact of the standard deviation of returns and volatility of a-share market the influence of asymmetry exists. So the central government should be enhanced for forward-looking policies, avoid a large shift in economic policy; At the same time, in the implementation of the policy to maintain A gradual, step of the implementation of the strategy, avoid causing market investors panic or excessive speculation, thus affecting the a-share market healthy and stable development of China.

2. Empirical analysis

In this paper, the logistic smooth transfer vector autoregression (lstvar) model proposed by Weise (1999) is used to analyze the stock return and volatility of China's A-share market. Lstvar model can describe the calculation of generalized impulse response function, and describe the impact of economic policy uncertainty and macro shock on the asymmetric form of A-share market return and volatility under positive and negative shocks. According to Weise (1999), this paper establishes the lstvar model,

$$X_t = \beta_0 + \beta(L)X_{t-1} + [\theta_0 + \theta(L)X_{t-1}]F(z_{t-d};\gamma,c) + v_t$$
$$F(z_{t-d};\gamma,c) = (1+\exp\{-\gamma(z_{t-d}-c)/\sigma_{(z_t)}\})^{-1}$$

After estimating the lstvar model, this paper will use impulse response function to investigate the response of macro variables to policy shocks. The generalized impulse response function is defined as follows:

$$\mathrm{GI}_Y(n, v_t, w_{t-1}) = E[Y_{t+n} \mid v_t, w_{t-1}] - E[Y_{t+n} \mid w_{t-1}], n = 0,1,....$$

After LM linear test confirms the existence of nonlinear characteristics in the lstvar model, we use the generalized impulse response function to describe the asymmetric impact of macro shock on the return and volatility of China's A-share market under the background of different sizes of economic policy uncertainty.

3. Results and discussion

Under the condition of low degree of economic policy uncertainty, the increase of economic policy uncertainty in a short period of time will make the return rate of A-share market decrease in a short period of time at the beginning of the impact, and then, the return rate shows an upward trend, with the largest growth in three months or so, and tends to be stable in the later period. This is because, in the case of low degree of economic policy uncertainty, the impact makes the expectation of the market in a very short period of time not clear enough, which leads to the negative volatility of A-share market return. After the impact, market participants will regain their confidence in the market and devote themselves to the market again because of their speculative nature. Compared with the low uncertainty of economic policy, the impact of the impact shows an obvious asymmetric situation. Under the condition of high degree of policy uncertainty, the positive impact of economic policy uncertainty makes the yield of A-share market fall rapidly in a very short period of time, and tends to zero gradually in the later period. In the case of high degree of policy uncertainty itself, it is difficult for stock market participants to grasp the development trend of the future market. The new impact directly leads to the market participants' wait-and-see attitude towards the stock market, which indirectly leads to the short-term straight-line decline of the stock market yield.

In the case of high and low degree of economic policy uncertainty, when impacted by a unit standard deviation of economic policy uncertainty, the volatility of A-share market will decline in a short period of time and tend to be stable in the later period. Specifically, under the condition of high degree of policy uncertainty, the volatility of A-share market declines more in the early stage, and its recovery and growth speed is faster in the later stage. In the case of low degree of policy uncertainty, the volatility of A-share market has a slight decline at the beginning of the period. At the same time, the growth rate in the later period is faster than that in the case of higher policy uncertainty. In the figure, the tangent slope of discount is larger in the case of lower policy uncertainty in the same period.

When China's money supply increases in a short period of time, it will make the return rate of A-share market rise rapidly, and then slowly tend to be stable. In the positive impact of one unit standard deviation of M2, this paper does not find the obvious asymmetry of high and low uncertainty of economic policy. As can be seen from the figure below, in the case of high economic policy uncertainty, in the face of the increase of money supply, the rise of A-share market yield is less than that in the case of low economic policy uncertainty. The increase of money supply in the short term will increase the capital supply of the stock market, and the price and scale of the stock market will also be affected by this, and the expected effect is generally positive. When the economic policy environment is more stable, the market participants' expectations for the future are more positive and optimistic, which explains that the impact of one unit standard deviation of M2 is more obvious when the uncertainty of economic policy is lower.

Under the background of low economic policy uncertainty, the impact of broad money supply will lead to a large increase in the volatility of A-share market in the short term (three months), and in the case of high economic policy volatility, the volatility of A-share market will decline in the short term. Due to the difference of policy uncertainty, the volatility of A-share market has obvious asymmetry after the impact. That is to say, on the premise that the economic policy environment is relatively stable, the increase of money supply can stimulate the stock market in the short term, while in the case of unstable economic environment, the increase of money supply in the short term will only make investors choose to hold the form of money more steadily, rather than choose to allocate funds in the stock market.

4. Conclusion

On the premise of the difference of economic policy uncertainty, the impact of macroeconomic variables on the return and volatility of A-share market shows an asymmetric impact. Under the condition of higher policy uncertainty, the impact of macro variables and the positive impact of policy uncertainty itself will have a greater impact, mainly negative impact. Therefore, when formulating and implementing the economic policy, the central government should strengthen the foresight of the policy and avoid the great fluctuation of the economic policy; at the same time, it should keep the gradual and small-step implementation strategy in the implementation of the policy, so as to avoid causing the panic or excessive speculation of the market investors, thus affecting the healthy and stable development of China's A-share market.

References

[1] Abdullah，D.A.and Hayworth,S.C. 1993, “Macroeconometrcics of stock price fluctuations”, Quarterly Journal of Business and Economics,Vol.7,Jun.,P50-67.

[2] Avinash, K. Dixit and Robert , S. Pindyck, 1994, Investment ,Under Uncertainty, Princeton university Press.

[3] Chen, Nai-fu, Richard Roll, and Stephen A,1986Ross“Economic Forces and the Stock Market”,Journal of Business,59，Vol.24, Mar.,P383-403.

[4] Chor-yin（CY）Sin, 2015,“The economic fundamental and economic policy uncertainty of Mainland and China and their impacts on Taiwan and Hong Kong ”,International Review of Economics and Finance，Vol.11, Nov.,P228-311.

[5] Dewan A. Abdullah， Steven C. Hayworth， 1993,“Macroeconometrics of Stock Price Fluctuations”, Quarterly Journal of Business and Economics, Vol.10, Sep.,P50-67.

[6] G. William Schwert ,1990,“Alternative models for conditional stock volatility”,Journal of Econometrics,Vol.8,Aug.,P267-290.

[7] Imen Dakhlaoui,Chaker Aloui,2016,“The interactive relationship between the US economic policy uncertainty and BRIC stock markets”, International Economics，Vol.23, Nov.,P141-157.

[8] KA Aastveit,GJ Natvik, S Sola,2013，“Economic uncertainty and the effectiveness of monetary policy”, Norges Bank Working，Vol.Nov.21, P17-51.

[9] M Arouri,C Estay, C Rault,D Roubaud,2016,“Economic policy uncertainty and stock markets: Long-run evidence from the US”,Finance Research Letters,Vol.9，Feb., P136-141.

[10] Schwert G.W,1990,“Why Stock Market Volatility Change and the Crash of 1987”，Review of Financial Studies,3,Vol.1, Jul.,P77-102.

[11] V Sum,2013,“Economic Policy Uncertainty and Stock Market Returns”, Social Science Electronic Publishing,Vol.21, Mar.,P120-122.