

Study on the Influence of Economic Policy Uncertainty on Food Price Volatility

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Abstract: According to the uncertain data of China's economic policy from March 2008 to September 2016, it is known that the uncertainty of China's economic policy has caused a fluctuating impact on the price of grain futures such as potatoes, wheat and rice in China. Especially in the financial crisis of 2008, the crisis era of 11 years and the stock market disaster of 15 years, the uncertainty of economic policy at these three time points has had a huge impact on the fluctuation of food futures price, which has affected for several years in a row.

1. Causes of Food Volatility

In the last two decades, China's grain (figure 1) futures prices as a whole have fluctuated greatly. During 2008, the potato futures index rose 15 per cent, the rice futures index rose 24 per cent, while the wheat futures index fell 44 per cent, with a large margin for three types of food. In terms of the number of fluctuations, China's rice and potato futures prices have at least three major fluctuations, divided into 2008 to 2009, 2010 to 2013, 2014 to 2016. From 2008 to 2009, the potato's futures price index rose 15% in six months from March 2008 to September 2008, with the effect of a huge drop. In the year after September 2008, the potato futures value index fell by 31 per cent; however, the rice futures price index rose by 85 per cent between April 2010 and May 2011, followed by a 36 per cent drop in the rice price index in five months from June 2011 to November 2011. The wheat futures price index is different from the potato futures price index and the rice futures price index, the wheat futures price fluctuation belongs to the decline type, although there are several small increases, but in general, the wheat futures price fluctuation form is in the downward state. The grain futures price fluctuation is the grain spot price barometer, if the grain futures price produces the fluctuation, our country spot market grain price must produce the fluctuation, therefore stabilizes the grain futures market to have the very important significance to stabilize our country grain spot market[1].



Figure 1 Food

According to the comparison of relevant data, it is found that when the fluctuation of grain futures price index in China is large, it is precisely when the uncertainty index of economic policy is

high, so the uncertainty of economic policy will have a great influence on the price stability of grain. So what is the impact mechanism of the uncertainty of economic policy on food prices, and what is the meaning contained therein, this paper analyzes in detail.

Research based on relevant information shows that economic, policy uncertainty is measured using what indicators have not been specifically defined. Some scholars provide two measures of uncertainty: one is macroeconomic uncertainty based on hundreds of macro and fiscal quarterly data. The second is to measure macroeconomic uncertainty based on two hundred common indicators of profit growth at the corporate level. Other scholars use a large number of indicators to construct economic policy uncertainty index, according to the actual policy uncertainty quarterly index data of each country, get the corresponding verification.

For the fluctuation of grain futures price (Fig .2), it is necessary to understand the characteristics of grain futures price fluctuation, and use this fluctuation characteristic to analyze the reasons of price fluctuation in detail. According to the analysis, Chinese potato futures prices have cluster characteristics, and wheat futures have asymmetric characteristics, and according to the long memory of wheat futures fluctuations, targeted research on different directions. According to the research, the fluctuation of futures market mainly has the following three points: first, the interaction between different products in futures market. Second, the futures market and other markets have a conduction effect. Third, the impact of macroeconomic factors. The above three aspects analyze the reasons of grain futures price fluctuation from different angles. From the point of view of economic policy uncertainty, we can find that the change of economic environment, macro policy and other uncertain events have an impact on the fluctuation of food price to a certain extent. Because the agricultural product futures price fluctuates very quickly, so it is easy to appear the structural mutation, if uses the traditional fixed coefficient model to carry on the research, will certainly produce the certain deviation to the research result, this kind of result is often unable to be adopted. A time-varying parameter vector regression model with time-varying characteristics should be used to analyze the causes of structural mutations according to the whole process of structural mutations, so the vector autoregressive model, that is, T VP-VAR model, will be used to analyze the effect of economic uncertainty on the fluctuation of grain prices in China.

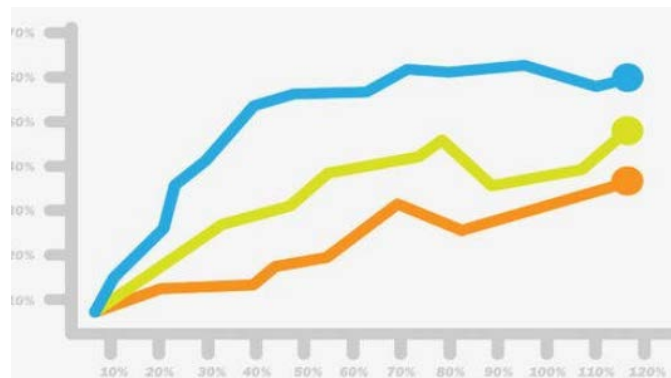


Figure 2 Fluctuations in food prices

2. Construction and Data of Model

Vector autoregressive model early rise is mainly used in macroeconomic research. such as: the relationship between economic growth and monetary policy, this model evolved from the vector autoregressive model proposed by Sims, and the time-varying parameters need to be imported into the VAR model first.

Data. China's grain futures development is relatively late compared with other developed countries in the West. After the introduction of potato futures commodities by the Sichuan Commodity Exchange in 2008, Hunan Commodity Exchange launched wheat and rice futures varieties one after another in 2009. In order to facilitate the calculation and systematic analysis of futures price fluctuations, this analysis data selected potato, rice, wheat three futures products

quarterly data. The data are mainly from March 2008 to September 2016. After obtaining the basic data again, using 12 seasons adjustment way to carry on the quarterly jump to Yuan Shu's data, removes the factor which can not produce because of the quarter, thus enhances the analysis data validity, the authenticity. The formula is: $R = 300 \times \frac{X_n(L)}{tL} \times \frac{tL}{t-1}$. The R is the grain futures price yield in the t period. XnFor grain futures price index, import data into the formula, after the calculation of rice, potatoes, wheat futures yield of S R WL PL..

3. Grain Futures Prices and Time-Varying Pulses

The vector autoregressive model can calculate the pulse change that has changed at each time point, so, in order to analyze the pulse other shore flower at different times, it is usually necessary to set a parameter to record this change, which is called "impact term".

Because the uncertainty of economic policy has an impact on the price of potato futures, we analyze the time-varying pulse value of potato futures price. After March 2008, uncertainty in economic policy created a constant time-varying pulse on potato futures prices. The main performance is positive, accompanied by partial negative impact. Overall, there are two directions of change, "up", "down" (Fig .3), and periodic characteristics are also included between the two changes. For example, in the first phase, from March 2008 to September 2008, the prices of potato futures at this point in time had a huge fluctuation, and after the fluctuation reached its peak, it fell sharply and produced a negative impact. Secondly, the impact of economic policy uncertainty on rice futures prices is analyzed. The impact of policy uncertainty on rice futures prices was mainly positive, but it also had a partial negative impact from October 2010 to 2011. From the change of time-varying pulse, the futures price impact of rice is positive and negative, and the faster the change, the greater the amplitude of the fluctuation, and the greater the impact force of the subsequent increase. Finally, the impact of policy economic uncertainty on wheat futures prices is analyzed. Unlike potato and rice futures price fluctuations, wheat futures price fluctuations experienced three "declines" and "rises" changes in August 2011, September 2012, and December 2015, among which 2012 was hit repeatedly.



Figure 3 Down, up

In view of the impact of the three products due to economic policy uncertainty, the futures prices of potato, rice and wheat have a very strong correlation to the uncertainty of economic policy. It can be understood that the uncertainty of economic policy affects the fluctuation of futures price.

4. Different Impacts of Economic Policy Uncertainty

To sum up, different futures products at different time points are also affected by economic policy uncertainty. The main reason is that the uncertain complexity of economic policy affects the supply of futures market, there are two changes, one is to sell more than buy, the other is to buy more than sell. Nowadays, the financialization of grain products has gradually become a new investment market, which has accelerated the impact of economic policies on grain products. This means that investment needs to be more cautious in order to face the economic crisis, stock crash

and other economic policy uncertainty conditions, bad changes, resulting in investment failure and other huge losses to the economy. In addition, the uncertainty of economic policy will not only have a fluctuating impact on food prices, but also have a huge impact on oil, coin exchange rate and so on, which will indirectly affect the price fluctuation of food futures markets. After the increase in oil prices, for example, the corresponding oil users will also increase their own income, resulting in the butterfly effect, which affects the various futures markets[2].

5. Summary

According to the analysis sample of this paper, the uncertainty of economic policy affects the price of futures index such as potato, rice, wheat and so on. The influence fluctuation of economic uncertainty in China between 2008 and 2016 is analyzed by using time-varying parameter vector autoregressive model, and the following two aspects are mainly obtained.

The first point: after the grain futures price is hit by the economic policy uncertainty, the impact is mainly manifested in three changes "rise ", " fall ", in addition to the alternation of positive and negative fluctuations between the upper and lower alternations.

The second point: the financial crisis of 2008, the crisis of the era of 2011, the global stock market in 2015 three disaster periods of economic policy uncertainty on food price fluctuations have had a different degree of impact, which has a huge impact on the rice futures price index.

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