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Analysis Factors of Affecting China's Stock Index Futures Market

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Abstract: Before the introduction of stock index futures, the trading mechanism of China's stock market has always been a single-dollar form. With the development of China's capital market, the single stock market has been unable to meet the requirements of all investors and cannot be hedged by short selling. The risk of the stock market. The introduction of stock index futures introduces a short-selling mechanism, which can well hedge risks, avoid systemic risks in the stock market, and create a better stock investment market. In particular, the emergence of the Shanghai and Shenzhen 300 stock index futures marks a new chapter in China's financial market. There are more and more new stock index futures on the market. The stock index futures market is getting more and more attention from investors. Currently, stock index futures trading has been the first variety of financial futures trading. Therefore, it is of great practical significance to empirically analyze the factors affecting China's stock index futures market.

Keywords: Stock index futures, VAR model, impulse response function

I. Introduction

The so-called stock index futures, referred to as SPIF. First, full name stock price index futures. Refers to the standardized futures contract with the stock price index as the target. The two parties agree to conduct the underlying index trading according to the predetermined size of the stock index trading in a certain period of time in the future.

The essence of stock index futures trading is the process of transferring the expected risk of the entire stock market to the futures market.

In the 21st century, with the attention of regulators and market participants, the Chinese futures market has developed rapidly and steadily. Industry risk management capabilities are affected as a whole. The integration of futures and stock markets, the growth of the physical industry, and the gradual development of market functions. However, the potential of China's futures market in rapid development is still far from being fully utilized. Only China in the commodity futures market still needs strong development. The introduction of stock index futures is of great significance to the development of China's futures market.

There is no short selling mechanism in China's stock spot market, and investors can only make a profit in the bull market. However, stock index futures have a two-way trading mechanism, and investors can not only benefit from rising markets, but also profit from falling markets. The introduction of stock index futures has improved the market trading ability, and by shortening the market structure of China, it has increased the depth of the domestic capital market.

II. The factors affecting China's stock index futures.

The stock price index is used to reflect the change in the overall price of the sample stock. However, the determination of the stock index futures price is affected by many factors, including macro factors and micro factors, and some factors come from investors' speculative psychology and subjective factors.

(1) The price of the subject matter of the stock index futures contract

The price of the subject matter of the stock index futures contract varies with the price of the subject matter. The closer the delivery date, the more obvious the change.

(2) China's macroeconomic situation

In general, there is a positive correlation between macroeconomic operations and stock price indices. If the macroeconomic performance is good, it is a bull market. The index will continue to climb. On the contrary, if the macroeconomic performance is not good, the stock index will decline. And macroeconomic indicators will affect China's fiscal and taxation policies as well as monetary policy, and these policies are also direct or indirect factors affecting the price of stock index futures.

(3) Implementation of monetary policy and fiscal policy

Both monetary policy and fiscal policy are measures to influence variables such as interest rates and money supply in order to achieve specific economic goals, such as rediscount rate, statutory deposit reserve ratio, open market operations, and increased tax reduction. Regardless of the policy that can affect China's money supply, its implementation will have an impact on the flow of funds in China's stock market and the price of stock index futures.

(4) International financial development

With the development of economic globalization, capital freedom flows internationally, and the process of economic integration continues to deepen. As the world's second largest economy, China's economic development has long been unable to protect itself. Therefore, in order to study the trend of the Shanghai and Shenzhen 300 stock index futures, we must fully consider the state of international economic and financial development.

(5) Investors' psychological expectations

Because China's stock market is a semi-strong and effective market, investors are affected by various psychological factors in decision-making and cannot make reasonable choices.

All in all, in the risky futures market, in order to obtain income, investors must be familiar with and grasp the development trend of stock index futures. To this end, investors need to understand what factors affect the price of stock index futures. China's CSI 300 stock index, stock index futures contracts are highly correlated with the development of domestic and foreign financial and economic, the fluctuation of stock index is affected by a variety of factors. These factors interact, and the overall trend of price changes in the futures index is always determined by those that are more focused and more critical. Therefore, in the study of the Shanghai and Shenzhen 300 stock index futures, whether to grasp these major influencing factors, pay attention to the changes of these major influencing factors, and use this to measure and predict the future trend of the Shanghai and Shenzhen 300 stock index futures is an effective method.

III. Empirical analysis

(1) Selection of variables and source of data

In order to ensure the conciseness and accuracy of the empirical research process, this paper constructs a dependent variable (CSI 300 stock index futures) and five influencing factors (CSI 300 Index, CPI, Money Supply (M2), RMB to US dollar exchange rate, The VAR model of the 500 stock index futures. The time interval for the above data selection was from April 2015 to June 2018. CPI, money supply (M2) was selected from the National Bureau of Statistics, the exchange rate of RMB against the US dollar was selected from the Yingbifu website, the Shanghai and Shenzhen 300 stock index futures, the Shanghai and Shenzhen 300 index, and the CSI 500 stock index futures were selected from the CHOICE financial terminal. database.

(2) Data stationarity test

First, the data was processed. The Shanghai and Shenzhen 300 futures contracted prices, the Shanghai and Shenzhen 300 Index, the CPI, the money supply (M2), the RMB against the US dollar, and the CSI 500 stock index futures were named Y1, X1, X2, X3, X4, respectively X5.

In this paper, the ADF was used to check the stability of the data. The data was input into the Eviews7.2 system. The results showed that the values of the ADF statistic of the variables X1, X2, X3, X4, and X5 were greater than the critical value, and the data was non-stationary. Therefore, the first order of the variables needed to be performed. Differentially, and renamed the variables after the first-order difference to DY1, DX1, DX2, DX3, DX4, DX5. The processed data was re-entered into the system, and the variable data was displayed to be stable. The results were shown in Table 1.

Table 1

变量统计	ADF统计值		临界值		
	t统计值	p值	1%	5%	10%
DY1	-4.5786	0.0008	-3.6268	-2.9458	-2.6115
DX1	-4.4290	0.0012	-3.6268	-2.9458	-2.6115
DX2	-8.0568	0.0000	-3.6210	-2.9434	-2.6103
DX3	-6.5541	0.0000	-3.6210	-2.9434	-2.6103
DX4	-4.0645	0.0031	-3.6210	-2.9434	-2.6103
DX5	-5.1466	0.0002	-3.6268	-2.9458	-2.6115

(3) Establishment and inspection of VAR model

1. The VAR model was builted.

The VAR model was based on the statistical properties of the data. It constructed the model by using each endogenous variable in the system as the hysteresis value of all endogenous variables in the system, thus extending the univariate autoregressive model to the composition of multiple time series variables. Vector" autoregressive model.

According to the content discussed in this paper, the establishment of a dependent variable (CSI 300 futures price, DY1) and five independent variables CSI 300 Index (DX1); CPI (DX2); money supply (DX3); RMB against the US dollar exchange rate (DX4); VAR model consisting of CSI 500 stock index futures (DX5).

2. etermination of the order of the optimal lag term.

In order to ensure that the constructed VAR model is optimal, it is necessary to determine the optimal lag order. According to the results in Table 2, the LR, FPE, SC and HQ criteria all choose the VAR model to be optimal when the lag order is 1 and 2 Therefore, the optimal lag order is determined to be 1 and 2 orders, and the model is established using lags 1, 2.

Table 2 Test of the selection criteria of the optimal lag order

Table 2

VAR Lag Order Selection Criteria
Endogenous variables: DY1 DX1 DX2 DX3 DX4 DX5
Exogenous variables: C
Date: 07/20/18 Time: 09:18
Sample: 2015M04 2018M06
Included observations: 35

Lag	LogL	LR	FPE	AIC	SC	HQ
0	105.0773	NA	1.40e-10	-5.661560	-5.394929	-5.569519
1	196.4971	146.2717	6.10e-12	-8.828407	-6.961989*	-8.184120*
2	239.0654	53.51441*	5.07e-12*	-9.203738	-5.737533	-8.007204
3	284.7791	41.79534	5.10e-12	-9.758803*	-4.692812	-8.010024

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

3. The stationarity test of the VAR model.

Use the obtained optimal lag order 1 2 input Eviews7.2, re-establish the VAR model, and get the simplified equation as:

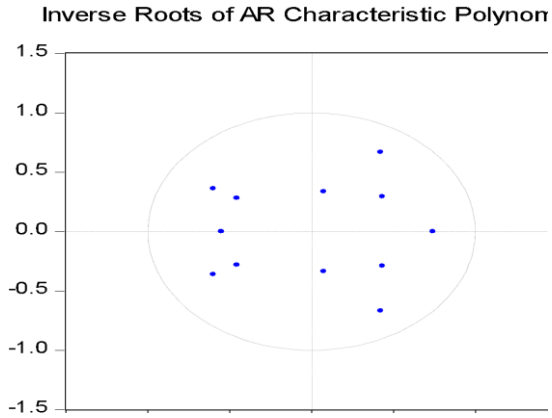
DY1=-0.992215*DY1(-1)-0.322402*DY1(-2)+6.64E-05*DX1(-1)-0.000181*DX1(-2)+0.007349*DX2(-1)+0.004574DX2(-2)-4.260948*DX3(-1)-2.076607*DX3(-2)-2.202409*DX4(-1)-1.416918*DX4(-2)+0.345337*DX5(-1)+0.245864*DX5(-2)-0.756203

It was worth noting here that because the model variables are limited, the above equations need to be combined with the analysis described later. The equation coefficients cannot be directly used as the basis for measuring the price of the Shanghai and Shenzhen 300 stock index futures contracts.

All the variables were tested for stationarity by the ADF method above. After the VAR model is re-established, the station's stationarity needs to be tested.

Table 3 Characteristic Root Test Value

Table 3



It can be seen from Table 3 that the model has 12 eigenvalues and all eigenvalues are within the unit circle, indicating that there was no one or more eigenvalues in the model, ie the model was stable.

After the basic model is established, the application of the VAR model can be further carried out, that was, the influence and influence degree of the corresponding variables of each influencing factor are discussed.

(4) Application of VAR model

1. Granger causality test.

The Granger causality test is performed on DY1 and DX1, DX2, DX3, DX4, and DX5 respectively to determine whether the independent variable and the dependent variable were mutually causal. The results are shown in Table 4:

Table 4 Granger causality test results

Table 4

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 07/20/18 Time: 09:17
Sample: 2015M04 2018M06
Included observations: 36

Dependent variable: DY1

Excluded	Chi-sq	df	Prob.
DX1	10.81845	2	0.0045
DX2	0.170736	2	0.9182
DX3	8.920942	2	0.0116
DX4	5.987653	2	0.0501
DX5	0.226232	2	0.8930
All	26.39486	10	0.0032

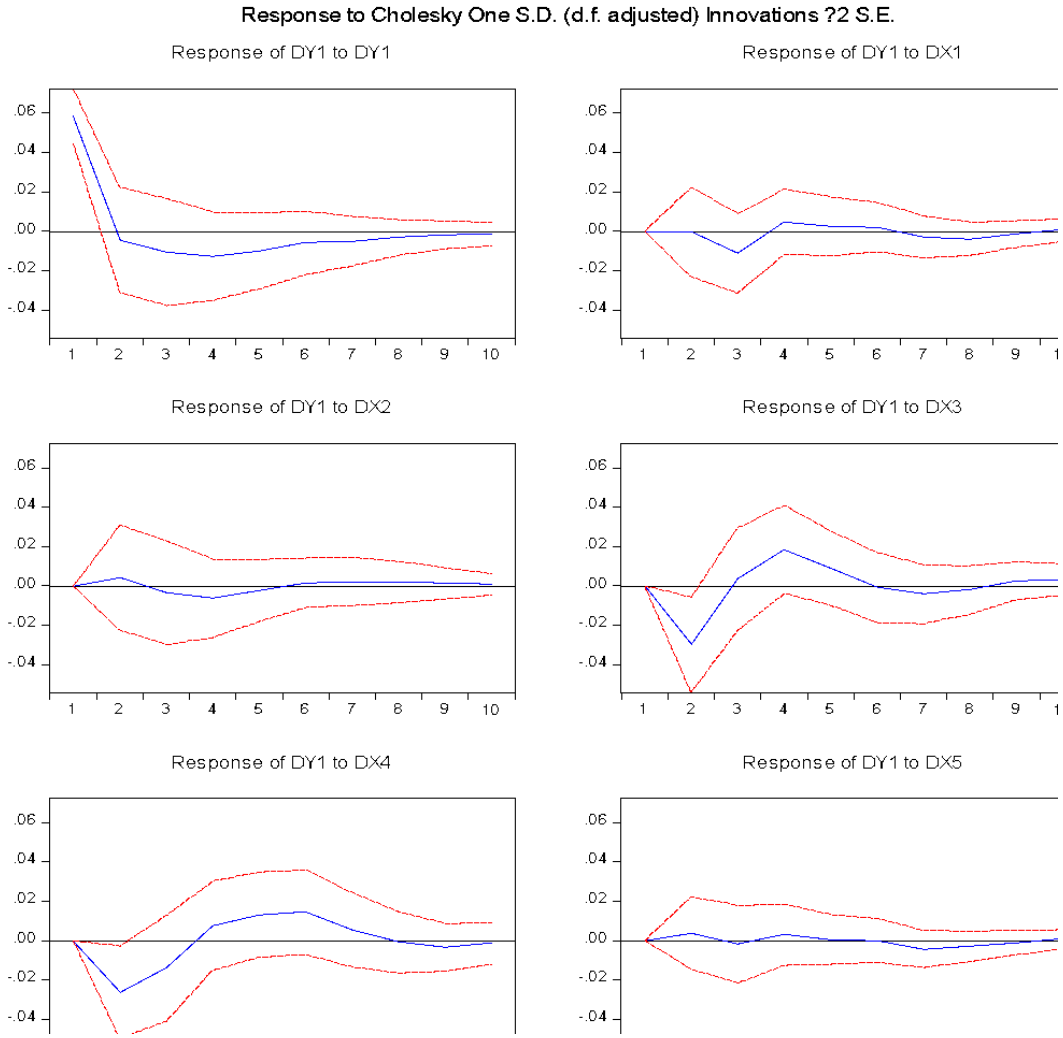
The data in Table 4 represents the probability of accepting the hypothesis. The smaller the number, the stronger the causal relationship between the independent variable and the dependent variable. This shown that the CSI 300 stock index (DX1), money supply (DX3) CSI 300 stock index futures price (DY1) Granger reason. The Granger causality relationship between other variables and the CSI 300 stock index futures was not significant, but it cannot be said that there was no causal relationship between them. The reason for this phenomenon may be that the variables are processed first-order differentially. Because the Granger causality test is more biased towards the variables with more causal relationship, if the causal relationship itself was not very significant, then the first-order difference will be less significant.

2. Analysis of impulse response function.

The impulse response function analyzes the influence of the independent variable and the degree of influence.

Figure 1 impulse response function diagram

Figure 1



As can be seen from the above figure, among the five influencing factors, DX1 (CSI 300 Index) and DX3 (Money Supply) had the greatest impact on the CSI 300 stock index futures. When DX1 gove a positive impact, DY1 immediately There was a reaction and it reached the peak in the second period, and the impact disappears in the eighth period. In addition, DX2 (CPI) and DX4 (the RMB exchange rate against the US dollar) had different degrees of influence on the Shanghai and Shenzhen 300 stock index futures; DX5 (The CSI 500 stock index futures had a weak influence on the CSI 300 stock index futures.

3. Analysis of variance decomposition.

The variance decomposition was to analyze the contribution of the impact intensity of different variables to the total change, so as to determine the influence of each influencing factor on the research results, so that the relative importance of any one of the variable impacts in the VAR model to the dependent variable can be analyzed.

Table 5 Decomposition of variance of Shanghai and Shenzhen 300 stock index futures

Table 5

Period	S.E.	DY1	DX1	DX2	DX3	DX4	DX5
1	0.058593	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.071141	68.22595	0.003407	0.350718	17.55480	13.56037	0.304758
3	0.074310	64.53265	2.333007	0.532516	16.31668	15.95213	0.333009
4	0.078479	60.44177	2.489378	1.131254	20.23701	15.24949	0.451092
5	0.080783	58.53893	2.444236	1.146032	20.35334	17.08307	0.434395
6	0.082346	56.85197	2.421712	1.146688	19.59717	19.56393	0.418537
7	0.082965	56.35876	2.495251	1.207236	19.56013	19.71350	0.665123
8	0.083206	56.16715	2.689189	1.258020	19.50633	19.61046	0.768850
9	0.083364	55.99819	2.705894	1.279623	19.54006	19.69595	0.780294
10	0.083465	55.88831	2.705050	1.286826	19.65336	19.67446	0.792005

Cholesky Ordering: DY1 DX1 DX2 DX3 DX4 DX5

As can be seen from Table 5, the influence of the Shanghai and Shenzhen 300 Index, CPI, money supply, exchange rate, and price changes on the Shanghai and Shenzhen 300 stock index futures are gradually increasing. Among them, the three factors with greater influence were the money supply and exchange rate. The relative contribution of the impact intensity of the money supply to the price variance of the Shanghai and Shenzhen 300 stock index futures has stabilized at 10.965.36% from the zero period in 10 periods. The relative contribution to the Shanghai-Shenzhen 300 stock index futures price variance has stabilized at 19.6746% from 0 in 10 periods. The other three variables had a small explanatory power, and the relative contribution to the Shanghai-Shenzhen 300 stock index futures price variance has remained at a stable level of 2.70%, 1.28%, and 0.79% after 10 periods.

IV. summary

In general, according to the results of the above empirical test, it can be seen that the five influencing factors will have an impact on the price of China's Shanghai and Shenzhen 300 stock index futures, and the degree and duration of the impact are different. The biggest impact on the price changes of China's Shanghai and Shenzhen 300 stock index futures is the change of the Shanghai and Shenzhen 300 Index. Therefore, for investors, to grasp the trend of the Shanghai and Shenzhen 300 stock index futures, we must pay close attention to the corresponding Shanghai and Shenzhen 300 Index. The trend situation, but also pay attention to China's macroeconomic growth, domestic and foreign stock index futures development. Mastering the characteristics of these major factors and making a reasonable analysis is of great significance for guiding the investment operation of stock index futures.

For investors, whether they are hedging in the stock index futures market or doing pure speculation, they must first be able to grasp the price changes of their corresponding stock indexes. At the same time, they should pay attention to the market liquidity of China's market in real time. The economic situation, and then have a certain understanding of the status of China's stock index futures market, through the analysis can more accurately predict the trend of China's stock index futures, in order to achieve the purpose of investors to avoid risk or arbitrage. At the same time, the relevant financial regulatory authorities should also cooperate with each other to ensure that the capital market information is more transparent, and only in this way can China's stock index futures market achieve long-term and stable development.

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