

The Relationship between the Fluctuating Stock Market and the Macro-Economy: Taking the Shenzhen Index as an Example

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Abstract

Foreign research on the stock market and macroeconomics has always believed that the two have a relatively strong correlation, but the domestic research results are completely irrelevant or weakly correlated. This article uses the Shenzhen Index as an example to analyze its relationship with the macro economy, and combines the irrational investment theory to analyze the reasons for the weak correlation between the macro economy and the stock market.

Keywords

Stock Market, Economy, EG Analysis

1. Introduction

Many literatures in the past have studied the relationship between GDP and macroeconomics. Relevant foreign literature all shows that the relationship between the stock market and the economy is relatively strong, but domestic research is not the case. Chen Shoudong and others analyzed the relationship between industrial added value and variables such as the Shanghai Stock Exchange Index and Industrial Index through a co-integration model and found that the real economy and the stock market are weakly correlated (Chen, Yi & Liu, 2014). Li Yanhong and He Zhanghua analyzed the relationship between GDP and the amount of funds raised in the stock market through co-integration and error correction models, and concluded that the stock market and the economy are deviating (Li & He, 2009). Liu Shaobo and Ding Juhong analyzed the relationship between GDP per capita and the Shenzhen Chengcheng and Shanghai Composite Indexes through a typical analysis method and concluded that the stock

market is not only closely related to the macro economy, but also can be used to predict the macro economy (Liu & Ding, 2005). Zhang Peiyuan analyzed the correlation between the stock market return rate and some macroeconomic variables, and believed that the causality between economic variables and the stock market fluctuations was not obvious (Zhang, 2013).

In recent years, the economy has continued to develop and the stock market has been turbulent. Using Eviews9 to draw a comparison chart of GDP and Shenzhen Index is as follows:

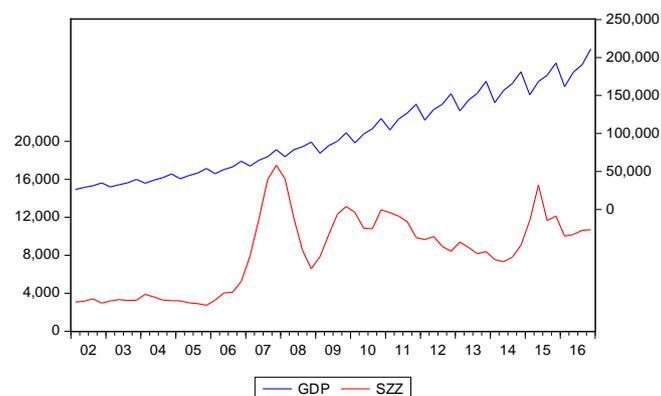
From **Figure 1**, we can find that GDP shows a steady upward trend of fluctuations with the seasons, while the Shenzhen Component Index shows irregular fluctuations. “The stock market is risky, and you need to be cautious when entering the market.” This just confirms the above figure, but from the overall trend, both are both. It is showing an upward trend, so an important hypothesis of this article is proposed: the two are relatively weakly related, but the economic development is still relatively affected by other factors.

2. Data and Its Sources

Since China’s accession to the WTO in 2001, the economic model has changed from a closed planned economy to a more prosperous trade model. Therefore, the data selects quarterly data from 2002 to 2016.

In the past literature, GDP is often used as the only indicator to measure the macroeconomics, but this ignores the influence of factors such as inflation. Therefore, this article selects an indicator that can reflect both the degree of GDP fluctuations and the economy, namely the GDP index (GDP index).). In addition, the Shenzhen Component Index (SZZ) is used to indicate the degree of volatility of the stock market, and total trade volume (TAR) and industrial value added (INDU) are selected as control variables.

The data on GDP index, total trade volume and industrial added value are all from the China Statistical Yearbook, and the data on the Shenzhen Index comes from the Guotaian Data Network.



Note: The scale of GDP in the figure is on the right, and the scale of Shenzhen Index is on the left. Unit: GDP: 100 million yuan; Shenzhen Index: yuan.

Figure 1. Comparison of GDP and Shenzhen component index data from 2002 to 2016.

3. Empirical Research

3.1. Stationary Test

The most important assumption implied by the regression model based on time series is that the data is stable. Therefore, this paper uses the ADF test to verify the stability of the data and uses the AIC and SC minimization principles to determine the maximum lag order. In addition, in order to eliminate the influence of heteroscedasticity and make the regression results valid, the logarithm of each variable is processed, namely LnGDP, LnSZZ, LnTRA and LnINDU. The specific test results are shown in **Table 1** below.

From the statistical results shown above, the original data of GDP index, Shenzhen Component Index, total trade volume, and industrial added value are all unstable data, but the data after the first-order difference is stable, which means that these variables are the first-order difference is stable and satisfies the stationarity assumption of the regression model under the time series.

3.2. Cointegration Test

First, make a regression model of the variables. If the residuals of the residual series are stationary, it means that it has a long-term cointegration relationship, so that the following Granger causality analysis can be performed. The regression model is as follows:

$$\text{LnGDP} = 4.012 + 0.021\text{LnSZZ} - 0.141\text{LnINDU} + 0.098\text{LnTRADE}$$

Second, we need to run a cointegration test. The regression model is as follows:

$$\text{LnGDP} = 4.012 + 0.021\text{LnSZZ} - 0.141\text{LnINDU} + 0.098$$

If the residual of the residual sequence is stable, then it shows that it has a long-term co-integration relationship, so that we can carry out the subsequent Granger causality analysis of Percy Grainger. The cointegration test results are shown in **Table 2**.

Finally, we do the Percy Grainger test. The Percy Grainger causality test is a

Table 1. ADF test results of each variable.

variable	ADF test	Tcritical statistics		P value	in conclusion
		5%	10%		
LnGDP	-2.461	-2.913	-2.606	0.506	unstable
LnSZZ	-2.062	-2.913	-2.606	0.261	unstable
LnTRA	-1.839	-2.913	-2.606	0.261	unstable
LnINDU	-1.954	-2.913	-2.606	0.306	unstable
Δ LnGDP	-6.723	-2.913	-2.594	0.000	stable
Δ LnSZZ	-4.449	-2.913	-2.594	0.007	stable
Δ LnTRA	-7.789	-2.913	-2.594	0.007	stable
Δ LnINDU	-14.337	-2.913	-2.594	0.000	stable

Note: (a, 0, 2) means that the intercept item is selected and there is no trend item, the maximum lag order is 2; (a, 0, 0) is the same, but the lag order is 0.

Table 2. ADF test results of the residual sequence of the regression equation.

ADF stationarity test result	t critical statistics		P value	test result
	5%	10%		
-3.2702	-1.9467	-1.6131	0.0015	smooth

Table 3. Granger causality test.

Null hypothesis	Number of samples	Lag order	F statistics	possibility
LnSZZ is not a Granger reason for LnGDP	58	2	10.7284	0.0001
LnGDP is notLnSZZ reason for LnGDP			0.3006	0.7416
LnINDU is notLnGDP reason for LnGDP	58	2	2.8027	0.0697
LnGDP is not LnINDU reason for LnGDP			0.8707	0.4245
LnTRADE is not LnGDP reason for LnGDP	58	2	3.0882	0.0539
LnGDP is not LnTRADE reason for LnGDP			1.9033	0.1591
LnINDU is not LnSZZ reason for LnGDP	58	2	2.6281	0.0816
LnSZZ is not LnINDU reason for LnGDP			1.3824	0.2599
LnTRADE is not LnSZZ reason for LnGDP	58	2	4.4527	0.0163
LnSZZ is not LnTRADE reason for LnGDP			2.5453	0.0880
LnTRADE is not LnINDU reason for LnGDP	58	2	23.8997	0.0000
LnINDU is not LnTRADE reason for LnGDP			11.0348	0.0001

causal prediction based on stationary time series data, which has some reference significance in the econometrics. Percy Grainger, the results of the causality test are shown in **Table 3**.

3.3. GRANGER Inspection

Granger causality test is a causal relationship prediction based on stationary time series data, which has certain reference significance in econometrics. The results of Granger Causality Test are shown in **Table 3**.

It can be seen from the above test results that the total trade volume and the industrial added value have a two-way Granger causality, which means that they have a positive effect on each other. The Shenzhen Component Index has a one-way Granger causality relationship to the macro economy, and from the above regression equation we can know that the relationship is relatively weak. In addition, the total trade volume also has a certain promotion effect on the macro economy, and although the industrial value added is likely to affect the macro economy, the coefficient of the industrial value added in the regression equation is negative, so it will have a negative effect on the macro economy influences.

4. Conclusion

The stock market is an emerging market in my country, and its development is

not perfect. Although GDP can affect the stock market, the stock market does not have a complete structural system, which makes the information transmitted by the macro economy to the stock market untrue and unreliable. Disconnected, investors have no specific investment orientation, and irrational investment behaviors have appeared. Investors have a “gambling” mentality to set foot in the stock market, and there are more retail investors, and the phenomenon of stock speculation has intensified, which has made the stock market more turbulent and bubbled very serious.

In addition, in my country, private manufacturing and Sino-foreign joint ventures contribute to the GDP to a relatively large extent, while the listed companies are mostly state-owned enterprises, which are not the main contributors to my country’s economy, so their stocks cannot objectively reflect my country’s economy situation. Even though most of the foreign literatures have a strong correlation between the analysis results of the two, they do not regard the stock market as the most important factor reflecting the economy, which shows that the relationship between the two is not far-reaching and stable.

The pricing of stocks depends to a large extent on interest rates. As interest rates rise, the stock price becomes lower, and when interest rates decrease, the stock price rises. However, the impact of interest rates on the economy is not significant, leading to a disconnect between the two.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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