

Chinese Investor Sentiment and Stock Returns

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Abstract: To verify the relationship between Chinese investor sentiment and Chinese stock returns, this paper collects data from 2003 to 2015, using principal component analysis method to construct the monthly investor sentiment index, then using Granger test to examine whether Chinese investor sentiment and stock returns can influence each other. Finally, using the empirical analysis to get a conclusion that there is positive relation between investor sentiment and stock market returns.

Key words: Behavioral economics; Investor sentiment; OLS; Stock returns

1 Introduction

Traditional financial theory assumes that markets are efficient: the product's price can fully reflect its historical price. However, there are many anomalies cannot explain by this theory, behavioral finance has gradually appeared. Nowadays, more and more academic researches start focus on behavioral economics. Because market participants play an active role in stock market, making investor sentiment become a fashion word. Barberis, Shleffer and Vishny (1998), Daniel, Hirshleifer and subramanyam (1998) according to investor psychology cognition deviation to explain the formation of emotion and its impact on the stock price, BSV model and DHS model were constructed. These studies lay a theoretical foundation for testing the impact of investor sentiment on stock returns. Barberis, Shleifer, and Wurgler (2005) study the influence of investor sentiment on the overall stock market. The study shows that the stock returns can be explained by the investor sentiment. Investor sentiment has important influence on the valuation of assets.

2 Investor Sentiment Index Construction

In this paper, the main data gained from CSMAR database and the WIND information database. Reference to the existing researches, this paper selects four indexes: Discount of Close-end Fund(DCEF); Turnover rate(TURN); New account number(KNUM); Consumer confidence index(CCI) as an alternative variable of investor sentiment, using principal component analysis method to construct the monthly investor sentiment index(IS1).

As there may be lags, so a lag values of the four variables (LAG_DCEF, LAG_TURN, LAG_KNUM and LAG_CCI) are also included in the principle component analysis, to get the final monthly investor sentiment index(IS2).

Table 1 shows the basic statistics of the four monthly indicators. Table 2 shows the correlation between the four monthly indicators. It means: first, four indicators are of a huge difference, if added into the regression model directly, it will affect the significance of the date; second, the correlation between the four indexes is high, it will produce multiple linear. Therefore, using principal component analysis method is quite reasonable, it can eliminate the influence of the difference and the correlation.

Table 1 Four Indexes Basic Statistics

Index	N	Minimum Value	Maximum Value	Mean Value	Standard Deviation
DCEF	144	-40.63	-0.89	-16.5024	12.11403
TURN	144	3.59	35.38	14.7945	7.36971
KNUM	144	30543	9847062	845280.403	1507584.06
CCI	144	89.9	109.9	99.0903	5.58898

Table 2 Four Indexes Correlation

Index	DCEF	TURN	KNUM	CCI
DCEF	1			
TURN	0.151	1		
KNUM	0.090	0.440	1	
CCI	0.757	0.448	0.289	1

In the first stage, the principal component analysis method was made on the four indexed and their lag values (eight variables), and the initial investor sentiment index (IS1) was obtained. The principal component analysis results in the first stage are shown in Table 3 (after omitting latter four principal components' values and contribution rates).

Table 3 The First Stage Principal Component Analysis

	Total	% of Variance	Cumulative %
DCEF	4.109	51.362	51.362
TURN	2.158	26.981	78.343
KNUM	0.974	12.174	90.516
CCI	0.304	3.794	94.311

From the table we can see that the first two principal components' values are greater than 1 and the cumulative contribution rate is 78.343%, can be a good reflection of the overall situation. Therefore, select the first two principal components F_1 , F_2 , with their respective values as the weight, get the initial investor sentiment index IS1.

$$IS1 = (4.109 F_1 + 2.158 F_2) / (4.109 + 2.158) \quad (1)$$

Table 4 IS1 and Eight Variables Correlation

DCEF	TURN	KNUM	CCI	LAG_DCEF	LAG_TURN	LAG_KNUM	LAG_CCI
0.085	0.451	0.972	0.289	0.073	0.416	0.963	0.305

According to Table 4, we choose the final four variables: DCEF; TURN; KNUM; LAG_CCI. And second stage principal component analysis results show that the first two principal components' values are greater than 1 and the cumulative contribution rate is 81.334%, therefore take the first two principal components C_1 and C_2 .

$$C_1 = 0.347 DCEF + 0.315 TURN + 0.267 KNUM + 0.425 LAG_CCI \quad (2)$$

$$C_2 = -0.539 DCEF + 0.455 TURN + 0.569 KNUM - 0.254 LAG_CCI \quad (3)$$

With their respective values as the weight, get the final investor sentiment index IS2.

$$IS2 = (2.124 C_1 + 1.129 C_2) / (2.124 + 1.129) \quad (4)$$

3 Empirical Results

3.1 ADF Test

Due to the uneven data will lead to the error of regression, in order to ensure the accuracy of the results, first using ADF test. The results are as follows:

Table 5 ADF Test Results

Variables	t-Statistic	Prob.	Confidence level	Critical values
IS2	-14.0688	0.0000	1%	-3.4768
Returns(R)	-13.3157	0.0000	1%	-3.4775

According to the ADF test, unit root test results are as follows: IS2 and stock returns' t-statics are less than their critical values, therefore refused to null hypothesis. So we can draw a conclusion that the data is stable, can use statistics software to carry on the regression analysis research directly.

3.2 Granger Test

According to Granger test, we can clearly see whether IS2 can cause changes in Returns, thereby can be extended to explore the interaction problems. Results are shown in the table:

Table 6 Granger Test Results

Null Hypothesis	F-Statistic	Prob.
IS2 does not Granger Cause R	4.0031	0.0205
R does not Granger Cause IS2	4.4986	0.0128

Because 0.0205 and 0.0128 both are less than 0.05, so reject the null hypothesis, which means IS2 does Granger cause R, and R does Granger cause IS2. In order to test whether the impact of IS2 on R is positive or negative, we use follow model:

$$R_i = \alpha_0 + \alpha_1 \Delta IS_i + \mu_i \quad (5)$$

Using OLS method to get the regression equation between R and IS2:

$$R = 0.01093 + 0.01578 * IS + \mu \quad (6)$$

Table 7 Error Stability Test

t-Statistic	Prob.	Confidence level	Critical values
-3.6516	0.0059	1%	-3.4775
		5%	-2.8821
		10%	-2.5778

The results show, the ADF statistic is less than critical values in 1%, 5%,10% confidence level, therefore the inspection conclusion is stable. We can draw a conclusion that IS2 and R is co-integration relationship, there is a long-term equilibrium relationship between them. At the same time, it can be seen that IS2 has a positive impact on R. The coefficient of IS2 was 0.01578, indicating that IS2 rose 1%, R increased by 0.0157%.

4 Conclusion

To investigate the relationship between Chinese investor sentiment and stock returns, this paper proposes a new investor sentiment index and finds that investor sentiment is a positive predictor of stock returns: investor sentiment rise 1%, stock returns will increase by 0.0157%.

The revelations are as follow. We should make full use the relationship between Chinese investor sentiment and stock returns while avoiding disadvantages. In the aspect of information disclosure, information asymmetry which can lead to drastic changes in investor sentiment should be avoided.

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