

Relationship between Excessive Stock Price Fluctuations and Investors' Attention—Based on Over-attention Underperformance

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Abstract. China A-share market is a stock market without shorting mechanism where the individual investors play an important role. The study attempts to find out the relationship between the attention of individual investors and the excessive fluctuation of the share price in Chinese stock market. Also, the research objective is to identify the existence of Over-attention Underperformance in Chinese stock market. The research is based on Multiple Linear Regression with the samples comprising behavioral data from Xueqiu.com, the biggest online stock forum in China. The research result confirms the existence of Over-attention Underperformance. Besides, the result shows that it's individual investors, rather than institutional investors, that dominate the Over-attention Underperformance in stock markets. The innovation of this paper is distinguishing individual investors from institutional investors in analysis.

1. Introduction

Nowadays, because of the development of society, when investors build portfolios, they are incapable to process a large amount of information. Therefore, their incapability results in a risk premium in stock market (Chapman, 2018). Investors in financial markets are often limited by time and effort, without noticing and understanding all the information on the market (Aboody, Lehavy and Trueman, 2010). Investors' knowledge and understanding of market information can influence financial markets (Yung and Nafar, 2017) That often leads to deviations in the asset value. It seems to be a trading dilemma: what you want to buy is more likely to deviate its normal value (often be overestimated).

2. Literature Review

At times, the huge in stock prices seem to be driven by investors' attention (Zhang and Wang, 2015). Because of the existence of Limited Attention (Li and Yu, 2012), those significant information concerned can often attract more attention. Investors' concern over stock can directly lead to "attention-driven buying" (Engelberg, Sasseville and Williams, 2005), which often bring about excessive fluctuation.

Attention-driven buying refers to the fact that investors' attention is prone to be influenced by the media, resulting in over attention of certain hot market news and buy those relevant stocks.(Hleifer, 2008) This overreaction to new information and an overestimation of the value of stocks in the short term, as a result of excessive attention, with the subsequent long-term reversal of share price, are known as “Over-Attention Underperformance”(Wang, Long and Wei, 2018). It is important to note that such the price performance is not caused by the content of the information, because the information is neutral in a long term. So, this short-term rise and subsequent reversal is more likely to come from net buying resulting from attention-driven buying.

3. Research Objectives

Investors' concerns are bound to cause share prices to rise. But in theory, due to the existence of Over-attention Underperformance, investors' concern will give upward pressure to the share price shortly. But this pressure will be reversed over the long term. Based on this, this study put forward the first research objective:

1)This study tried to explore whether the excessive fluctuation of stock price in the short term is related to Over-attention Underperformance.

Barber and Odeon(Barber and Odean, 2012a)used abnormal rate of return, excess volume and number of news to represent events attracting investors' attention. They found limited attention would affect investors trading behavior. Based on empirical analysis, limited attention is more common to individual investors. But many researchers did not separate individual investors from institutional investors. Therefore, this paper presented the second research objective:

2)This paper attempted to spin off the attention of institutional investors, to find out whether individual investors or institutional investors have dominated the Over-attention Underperformance.

4. Research Ideas

This Study would explore whether the excessive fluctuation and inversion of share price on the cross section can be Over-attention Underperformance explained. The study will be divided into two parts. Firstly, this paper would create several indicators that could reflect the level of individual investors' attention. Secondly, this paper would examine the correlation between those indicators and price of stocks undergone excessive fluctuation.

With interaction between users and Internet growing stronger, users are not only participants but also providers of Internet content. Based on that, this study used the behavioral data of users registered in Xueqiu.com as research example. The number of users' comments and their transaction sharing were chosen as proxy variables for individual investors' concerns.

Selecting this site as the proxy variable has several advantages:1) The construction of these indicators is based on the real and initiative behavior of the user;2) Xueqiu.com is currently China's most active online investment forum, with a strong representativeness;3) Users in Xueqiu.com are mainly made up of individual investors. The site's user data is better able to focus this study on the behavior of individual investors.

This study took all listed company in China A-share market during June 1,2015-Jan. 1,2018 for Subjects of study. Trading data for each stock came from Wind Database. The sample is filtered as follows: 1) The maximum increase in share price from the lowest price was more than 200%; 2) From the highest point of the share prices, the maximum decline was more than 50%; 3) The duration of the surge fluctuation was in one year (260 days); 4) Excluding stocks with transaction days less than 1 years (260 days). After the above screening process, 30 samples were acquired (excluding the exception value).

5. Empirical analysis

5.1. Indicator settings

5.1.1 Investors' attention level

This study is divided into 2 dimensions to build investors' attention. The study defined the XQAF($Xq_acmfollowers$) as the accumulated number of followers of the stock i at the day T in the Xueqiu.com. And the XQAS($Xq_acmshares$) was defined as the cumulative number of users' sharing of their transactions of the stock i at the day T . After that, the RF was defined as the growth rate of the XQAF. Likewise, the RS was also defined as the growth rate of the XQAS.

$$RF_i = \frac{XQAF_{T_h} - XQAF_{T_l}}{XQAF_{T_l}} \quad (4)$$

$$RS_i = \frac{XQAS_{T_h} - XQAS_{T_l}}{XQAS_{T_l}} \quad (5)$$

T_l is the day when the share price is at the lowest point. Similarly, T_h is the day when the share price is at the highest point.

The RF and RS depict the growth rate of investors' interest in stocks, which helps observing the level of investors' attention in a long-time span.

Since users can cancel their "follow" of a certain stock at any time and delete the transactions they share, these two proxy variables are of variability that can lead to a weaker regression result than expected.

5.1.2 Control variables

5.1.2.1 Average daily volatility

Wayne proposed the change in investor sentiment could lead the variation of volatility. (Lee, Jiang and Indro, 2002) So in order to get a better regression result, the volatility should also be included into the model.

Average daily volatility in the model (σ) was defined as:

$$\sigma_i = \sqrt{\frac{\sum_{t=1}^N (r_{it} - \sum_{t=1}^N r_i / N)^2}{N - 1}} \quad (6)$$

$$r_i = \ln\left(\frac{P_t}{P_{t-1}}\right) \quad (7)$$

N is the number of transaction days within the interval. P_t is the closing price of the stock i at the day t.

5.1.2.2 Times of ranking on the Special List of Dragon & Tiger (S.L.D.T)

Bikhchandani (Bikhchandani, Hirshleifer and Welch, 1992) brought the concept “information cascade” into the financial market, pointing out that people’s reverie and speculation were based on unusual changes in share prices or trading volumes, which would influence their own buying or selling behavior. So on the basis of three factors, raised by Barber and Odean (Barber and Odean, 2012b), which can attract investors’ attention, the number of times of ranking on the S.L.D.T should also be taken into account. It was defined as the variable NUM.

THE S.L.D.T is a list in the Shanghai and Shenzhen exchanges. The stock on the list should meet one of the following conditions: 1) Daily deviation of price reaches $\pm 7\%$; 2) Daily turnover rate reaches 20%; 3) The daily price amplitude reaches 15%. The top three shares of each screening condition will be included in the Dragon & Tiger List. This list is watched by many investors in China., including institutional investors and individual investors. So, this control variable needs to be introduced and be used to separate some institutional investors’ focus on shares.

5.2. Model building

In order to study the correlation between Over-attention Underperformance and investors’ attention, the rate of return should be taken, when the share price is excessively fluctuating, as the explained variable. R_i is defined as the rate of the return from the lowest to highest point of each stock.

$$R_i = \frac{P_{ih}}{P_{il}} \quad (8)$$

P_{ih} is the highest share price of the stock i and P_{il} is the lowest share price.

Investor attention level should be taken as explanatory variables. Volatility and times of ranking on the special

list of Dragon & Tiger, however, should serve as control variables. These variables were constructed as a Multiple Linear Regression (MLR) model:

$$R_i = f(RS_i, RF_i, \sigma_i, NUM_i) \tag{9}$$

In search of the appropriate regression equation, the study used various forms of variables, such as logarithm (stationary handling), square, to fit the optimal MLR equation. After variables that failed t-value test were rejected, the study got the following MLR model.

$$\ln(R_i) = \beta_0 + \beta_1 RS_i + \beta_2 \ln(RS_i) + \beta_3 RF_i + \beta_4 \ln(\sigma_i) + \beta_5 NUM_i^2 \tag{10}$$

6. Regression results Analysis

6.1. Variance analysis

After the final collation of the model and data, the final regression results emerged. F-statistic is 13.83073 and it is far greater than F (5,24). Therefore, the (10) equation was effective when significance level is below 0.01. At the same time, the goodness of fit was 0.742361 and the adjusted goodness of fit was 0.688686, which indicates that the model has good reliability and good regression effect.

6.2. Regression coefficient analysis

Results were analyzed by t-value test. The coefficient analysis results were in the Table 1. Table 1 showed that variables $RS, \ln(RS), RF$ passed the t-value test at 1% level, while variables $\ln(\sigma), NUM^2$ were less significant. Respectively, they could only pass the t-value test at 5% and 10% level.

Table 1. Analysis of regression coefficients of influencing factors on excessive fluctuation

Variable	Coefficient	Std. Error	t-statistic	Prob.
C	1.572992	0.170368	9.232913	0.0000
RS	0.026815	0.006551	4.092971	0.0004
ln(RS)	-0.247824	0.061952	-4.000283	0.0005
RF	0.052576	0.012535	4.194304	0.0003
ln(σ)	-0.309897	0.134013	-2.312439	0.0296
NUM ²	0.000244	0.000141	1.7322532	0.0960

6.3. Comparative analysis

After standardizing the data, the standardized coefficients were shown in the Table 2.

Table 2 Standardized coefficients of influencing factors on excessive fluctuation in share prices

Table 2. Standardized coefficients of influencing factors on excessive fluctuation in share prices

Explanatory variables	RS	ln(RS)	RF	ln(σ)	NUM ²
Standardized coefficient	1.084624	-1.108514	0.921280	-0.424000	0.320496

Table 2 demonstrated that variables RS, ln(RS) had the greatest impact on excessive fluctuations in share prices, followed by variable RF. The remaining variables ln(σ), NUM² had less impact.

7. The relationship between excessive fluctuation of stock price and individual investors' attention.

7.1. The impact of users' sharing of transactions on the share price

According to the analysis results, the growth rate of cumulative number of users' sharing of their transactions had the greatest impact on excessively volatile share prices. The regression coefficients of normal growth rate RS and logarithmic growth rate ln(RS) were 0.026815 and -0.247824. The positive correlation between RS and ln(R) demonstrated the existence of attention-driven buying in China A-share market. But there was a negative correlation between ln(RS) and ln(R), which means the presence of Over-attention Underperformance in China A-share market.

7.2. The impact of users' following on the share prices

The impact of the growth of the accumulated numbers of followers is also significant. The regression coefficient is 0.052576. In the same way, it also illustrates the existence of attention-driven buying. But it is less than the impact of the growth rate of transaction sharing. To explain under economic background, the following only shows the investor's focus on stocks, but it is the buying behavior from investors that drives the share price higher. Also, behind every transaction sharing, there is a real transaction made by a real investor. Therefore, the growth rate of users' focus can explain the stock yield, but its significance is clearly weaker than the growth rate of users' transaction sharing.

8. Individual investors dominate the Over-attention Underperformance.

The impact of stocks' times of ranking on the SLDT. on stock yield is minimal, and its regression coefficient is 0.000244. The variable NUM didn't explain the excessive fluctuation very well. It shows that it is individual investors who dominate the Over-attention Underperformance, because stocks' times of ranking on the SLDT. not only includes the concerns of institutional investors but also the individuals. This study chose stocks that

had skyrocketed and plummeted in a short period of time. And the result showed that most of them were largely influenced by individuals.

9. Conclusion

The study found the excessive fluctuation in market and tried exploring the relationship between share price and investors' attention from the perspective of Over-attention Underperformance. This study used the behavioral data of users registered in Xueqiu.com as an agent variable of investors' attention. In addition, the number of ranking on the SLDT was considered in the study to separate individuals and institutions. The regression result proved that, excessive fluctuation in share price over a short period of time is mainly related to Over-attention Underperformance and individual investors, rather than institutional investors, dominate the Over-attention Underperformance in stock markets.

10. References

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