Academic Journal of Business & Management
ISSN 2616-5902 Vol. 2, Issue 4: 113-120, DOI: 10.25236/AJBM.2020.020415

The Influence of Investor Attention on Stock Price Performance: an Emperical Study on Real Estate Cooperations

Yikun Huang[1] , Xiaoyu Du[2]

1.Tsinghua University, Beijing, 100084, China
2.Sun Yat-Sen University, Guangzhou, Guangdong Province, 510275, China

ABSTRACT. *Influence of investors' attention on stock performance is a topic that evokes scholars interest for long. However, measurement of investors' attention is rare so that studies using direct measure are not quite popular in previous researches. Our study analyzes how investors' attention influences the stock's return rate and the volatility using the Baidu Searching Index. We select 20 stocks, from real state industry, with different total share capital, and we found the significant positive influence form investor attention to stock's return rate and the volatility rate. Moreover, small companies are more sensitive to the change of investor attention no matter on investment return or on price change range.*

KEYWORDS: *Investor attention, Investment return, Stock size, Baidu index*

1. Introduction

The influence of investors' attention on stocks on stock volatility has been a topic of constant concern. Huge changes in stock prices seem to be driven solely by investor attention. This attention refers to investors' reactions to corresponding stocks that deviate from their fundamentals due to specific events. In the context of the new economy, with the development of the Internet and information technology, on the one hand, search engines have become an important channel for investors to obtain information (Antweiler and Frank, 2004[1]). On the other hand, web search data can quickly record users' searches hotspots, timely capture market changes, and reflect user interests and attention intensity, map user behavior trends and rules in real life, and provide the basis for constructing the investor's concern index.

When an investor searches for information on a certain stock, it means that the investor is paying attention to the stock, and this action is likely to translate into stock investment behavior, which in turn affects market indicators such as trading volume and price of the stock. The more searches, the higher the attention of investors in the market, the more active the buying and selling market, and the greater the volatility of the stock market. The high level of investor attention may also attract the attention of external investors. This "herd effect" will also cause the

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stock price to rise, which will have a certain impact on the stock market.

This article examines the impact of investor attention on the stock market from two dimensions. First of all, the real estate sector of the A-share market is selected as the research object. Considering the policy changes of the real estate market and the performance of housing prices in the past two years, real estate is an easy target for investors. Due to their lack of experience and expertise, individual investors can easily choose investment strategies by receiving external information, which will inevitably affect the stock market. Therefore, individual stocks in the real estate sector are more suitable as the object of research about investor attention. Furthermore, this article selects 20 stocks with different total equity sizes to further empirically analyze whether their impact will be asymmetric. These stocks have been listed for a long time, have formed a certain scale, have higher visibility and attention, and investors have more channels to obtain information, so the data has greater reference value.

This article mainly studies the impact of investor attention on the stock market. The full text is divided into five parts: The first chapter mainly introduces the research background, puts forward the research purpose and significance. The second chapter reviews the research literature of scholars, summarizes domestic and foreign research methods and research results on the impact of investors' attention on stocks, and provides theoretical and methodological guidance for the following research. The third chapter is the analysis of the impact mechanism. It will study the impact of investor attention on stock performance and volatility for companies of different sizes. The fourth chapter is model construction and empirical analysis. It will propose research hypotheses, select and define variables. After the model is constructed, an empirical analysis is performed. Finally, the overall research situation of the article is summarized.

2. Literature Review

2.1 Quantitative Research on Investor Attention

Faced with a wealth of information, investors in the investment market need to screen, identify and understand on their own. Even people who respond to the same message will react differently. It is precisely because investor attention is related to human psychology, which is difficult to measure and observe, so it becomes very difficult to measure the attention. The proxy variable that reflects investor attention needs to reflect the degree of investor's active attention to a certain stock information under the premise that it corresponds to various changes and time in the financial market. Therefore, the proxy variable of investment attention determines the rigor of empirical research. Many scholars at home and abroad have constructed this proxy variable in literature research and studied the impact of investor attention on the stock market.

2.1.1 Proxy Variables Based on Market Information and Media Coverage

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Quantify investor attention from the perspective of stock market indicators and the attention of investors from news reports. Barber and Odean (2008)[2] find that investors are more inclined to buy stocks that they often pay attention to and show higher returns, and to sell stocks with excess returns in their hands. Grullon *et al.* (2004)[3] finds that investors pay more attention to stocks that invest a lot of advertising costs, and advertising costs are positively related to stock liquidity. Therefore, advertising costs are used as proxy variables for investor attention. The amount of news media coverage of an event is often used by scholars to study investor attention. Engelberg et al. (2012)[4] found that stocks will generate higher trading volume after TV program recommendation, but this situation will reverse in the following months, so the number of TV station stock recommendations is selected as the proxy variable. Daniel Andrei and Michael Hasler (2015)[5] choose the degree of attention to news as a proxy variable and find that when investors pay little attention to news, the volatility of stock returns is low. Conversely, when investors pay close attention to the news, the volatility of stock returns is very high.

2.1.2 Proxy Variables Based on Web Search

With the development of the Internet, scholars have gradually started to use the Internet search engine to measure the attention of investors, which is more direct and accurate. The increase in the number of searches necessarily reflects the increased attention of investors. Siganos (2010)[6] found that the increase in the stock price of most of the acquired companies is directly related to the Google search data of UK listed companies. Cedric *et al.* (2018)[7] selected Google search probability as the proxy variable. For large companies, they chose the Dow Jones Industrial Average. For medium companies, they chose the S&P 500 Index. For small companies, they chose National Association of Securities Dealers Automated Quotations. For the first time, Baidu search index was used to find that the attention of investors was positively related to the stock price, and this relationship would soon reverse. As a result, they found that the stock returns of the high attention group were significantly higher than those of the low attention group, and changes in attention will not have a systemic impact on the stock market.

2.2 The Impact of Investor Attention on Stocks

The earliest link between investor attention and the stock market is the efficient market hypothesis theory, which believes that the price of stocks is the result of the investor's supply and demand for stocks to achieve a balanced result. The price can reflect the value of the company and all the information in the market. However, Grossman and Stiglitz (1980)[8] pointed out that when the arrival of new information cannot be predicted and the cost of information production is high, a fully efficient capital market is not possible. Research by Lee, Shlerfel, and Thaler (1991)[9] found that the more pessimistic investor sentiment, the more violent stock price fluctuations. Fang and Peress (2009)[10] used news about stocks as a proxy variable, and research proved that the more keywords about stocks in the number of news, the worse the stock's performance in terms of returns next month. The common point

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that ordinary investors and institutional investors focus on is the stock that pays more attention to extreme returns. What's more, high levels of attention cause buying pressures and sudden price reactions (Barber and Odean 2008[2], Barber, Odean, and Zhu 2009[11]), whereas low levels generate underreaction to announcements (Dellavigna and Pollet 2009[12]).

3. Hypothetical Inference and Research Methodology

Based on the above theoretical analysis, this article will infer based on the following three assumptions, investigate the impact of investor attention on the stock market from two dimensions, and select daily data for 20 stocks with different total equity sizes for empirical analysis:

3.1 Investor Attention Has a Certain Correlation with the Performance of the Stock Market.

To prove the correlation between the two, it is especially important to find accurate proxy variables. Investor's attention will cause short-term pressure on the stock price, so stocks with high investor attention will get excess returns in the short term, and the liquidity of the stock will also increase.

3.2 Investor Attention Has a Certain Impact on the Stock's Volatility.

The high attention of investors will lead to the result that the more active the buying and selling market, the greater the volatility of the stock market. For a portfolio with a large market value, the greater the volatility of the stock market index, the greater the return on the stock portfolio, and the current attention will increase the stock price volatility, and the lagging attention will slow down the volatility.

3.3 Investor Attention Has a Greater Impact on Small Companies Than on Large Ones.

Due to the influence of "over-focusing on the disadvantaged", small companies are more sensitive to investors 'attention. As the company's market value increases, investment attention is growing at a rate that is less than the company's market value. As a result, the marginal utility of increased media attention on large companies is not significant. The "attention-driven" utility has little effect on investors' buying behavior and rising stock prices.

4. Empirical Analysis

The proxy variable based on the search engine directly measures investor

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attention and has become a proxy variable commonly used in recent years. This article selects the keyword search volume provided by the Baidu Index as an index of investor attention. The Baidu Index is a data sharing platform based on Baidu's massive netizen behavior data. Here, you can research keywords to focus on trends, gain insights into changes in netizen needs, monitor media sentiment trends, locate digital consumer characteristics, and analyze market characteristics and insight into brand performance from an industry perspective. Therefore, it can be an indicator of investor attention.

The research in this article uses the monthly data of 20 real estates in the past three years (from October 2016 to September 2019) as the research sample, in which the monthly rise and fall of each transaction in the sample within the research interval is used as the market rate of return. A negative growth means a decline in stock yields. In addition, the monthly fluctuation range of a stock is calculated by computing the difference between the highest price and the lowest price relative to the initial value.

Table 1 below shows the results of correlation analysis of the basic data. First of all, there is a certain correlation between investor attention and the performance of the stock market. The correlation between the performance of stock prices of large enterprises and the attention of investors is low, and that of small companies is higher, reaching 0.35. When the attention of a certain stock increases, the market will experience the phenomenon of attention-driven trading behavior. Investors purchase a large number of stocks, which will cause the stock demand to rise rapidly in the short term and increase the yield. This is especially obvious. This is especially true for small business stocks. Investor attention has a significant correlation with stock price fluctuations, and small companies are more sensitive to investor attention than large companies. Therefore, stocks with high investor attention will get excess returns in the short term, and the stock's volatility will also increase.

Table 1 Correlation Analysis

Stocks of large company	Index vs monthly growth	Index vs amplitude	Stocks of small company	Index vs monthly growth	Index vs amplitude
Lvdi	0.24	0.42	Dagang	0.44	0.20
Baoli	0.02	0.26	Shenwuye	0.34	0.28
Wanke	-0.11	0.31	Guangyufazhan	0.40	0.47
Xinhu	0.22	-0.01	Hefeichengjian	0.69	0.20
Zhaoshang	0.28	0.22	Guochuanggaoxin	0.28	-0.12
Jinke	0.01	0.12	Konggang	0.21	-0.08
Fanhai	0.31	-0.11	Hagaoke	0.50	0.28
Jindi	0.09	0.04	Yataishiye	0.08	0.17
Yangguangcheng	0.06	0.20	Yatong	0.16	0.04

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Rongshengfazhan	0.35	0.29	Shahe	0.44	0.19
Mean	0.147	0.174	Mean	0.354	0.163

Furthermore, this paper uses panel data from 20 companies and uses models to detect the relationship between stock performance and investor attention. The regression model is established as follows:

$$return_i = \beta_0 + \beta_1 * index + \beta_2 * hot_i + \varepsilon_i$$

Where i is the identity of each company, the response variable *return* is the monthly growth rate of the stock price, the explanatory variable *index* is the monthly growth rate of the broad market index (Shanghai Composite Index), and the core explanatory variable *hot* is Baidu Index (investor attention) for the month.

Table 2 and Table 3 show the eatimation of model above for different sizes. The coefficient of variable *hot* of small companies is significant within the 1% or 5% confidence interval, and large companies need to be significant within the 10% confidence interval. At the same time, the coefficient of variable *hot* of small companies is much larger than that of large companies. Because of the "over-focusing on the disadvantaged" theory, investors only buy stocks that attract their attention, while small companies are more sensitive to investor attention. A large amount of attention in the short term means a large number of purchases, which leads to the rise in stock prices, making investor attention positively related to stock prices. As the company's market value increases, investment attention is growing at a rate that is less than the company's market value. As a result, the marginal utility of increased media attention on large companies is not significant.

Table 2 Results of Ten Large Companies

Variable	Coefficient	T-Stat.	Prob.
β_0	-0.003356	-0.454740	0.6496
$index$ ***	1.171246	10.82719	0.0000
hot_i *	5.77E-06	1.738713	0.0830
Adj. R-squared	0.252678	F-Stat.	60.00055

Table 3 Results of Ten Small Companies

Variable	Coefficient	T-Stat.	Prob.
β_0 ***	-0.086914	-8.281494	0.0000
$index$ ***	1.347909	9.471099	0.0000
hot_i ***	0.000175	8.986712	0.0000
Adj. R-squared	0.323246	F-Stat.	84.34843

In order to use the model to detect the relationship between stock volatility and investor attention, this article still uses panel data from 20 companies. The

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regression model is established as follows:

$$rang_i = \beta_0 + \beta_1 * index + \beta_2 * hot_i + \varepsilon_i$$

Where i is the identity of each company, the response variable *rang* is the monthly fluctuation of the stock price, the explanatory variable *index* is the monthly growth rate of the broad market index (Shanghai Stock Index), and the core explanatory variable *hot* is Baidu Index (investor attention) for the month.

Table 4 and Table 5 show the esttimation on the volatility of stocks forf different company sizes. Whether it is a large company or a small company, the coefficient of variable *hot* is significant within the 1% confidence interval, but the coefficient of variable *hot* of small companies is still much higher than that of large companies. Most individual investors tend to focus on small company stocks, while social security, QFII and public offerings are more inclined to blue chip stocks. Because the information resources of individual investors and institutions are asymmetric, and individuals are susceptible to buying or selling stocks due to emotional fluctuations, causing continuous skyrocketing or continuous skyrocketing, which has caused small companies to have much higher volatility than large companies' stocks.

Table 4 Results of The Ten Large Companies

Variable	Coefficient	T-Stat.	Prob.
β_0 ***	0.072980	7.192670	0.0000
$index$ ***	0.977926	7.897472	0.0000
hot_i ***	1.23E-05	4.808037	0.0000
Adj. R-squared	0.175596	F-Stat.	39.23305

Table 5 Results of Ten Small Companies

Variable	Coefficient	T-Stat.	Prob.
β_0	0.058508	4.317966	0.0000
$index$ ***	1.281423	7.942699	0.0000
hot_i *	0.000169	11.01524	0.0000
Adj. R-squared	0.321616	F-Stat.	86.09924

5. Conclusion

We use the Baidu index as a proxy variable to measure investor attention, select stocks in the real estate sector for correlation analysis, classify 20 companies according to size, and examine the impact of investor attention on the stock market.

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The results of empirical analysis show that there is a significant impact from investor attention to stock performance.and volatility, and those small companies are more sensitive. This means that, due to the asymmetry of information resources, investors are easily affected by emotional fluctuations, causing short-term continuous surges or falls, which will affect the stock market.

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