

Empirical Study on the Relationship between Investors' Attention and Individual Stock Returns in the Chinese Stock Market

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Abstract

Investors' attention to information plays an important role when investors make investment decisions. Individual investors analyze and judge the information that attracts their attention and adjusts their investment behavior, which leads to temporary pricing deviation. This paper uses abnormal trading volume as an indicator to measure the degree of investors' attention to individual stocks, and uses panel data model and vector autoregressive model (VAR) to study the relationship between investors' attention driven trading and stock return volatility. The empirical study finds that investors' attention has a significant positive impact on the current stock returns. When the investors pay more attention to the specific stocks, it will cause the net buying behavior, and the stock price will rise, leading to the increase of the current stock yield. Unlike the short-term effect of investors' attention on stock returns, the impact period of stock returns on investors' attention is relatively long. The influence period of stock returns on investors' attention lasts about three weeks according to the empirical study.

Keywords

Investor's Attention, Stock Returns, VAR, Chinese Stock Market

1. Introduction

Behavioral finance believes that people's attention in cognitive process is limited, and it is difficult for people to process large amount of information simultaneously. Under the condition of lots of information, people tend to focus on significant stimulus and ignore fuzzy ones. According to the efficient market hypothesis, the stock price should not react to the information content that can af-

fect the stock price itself. However, in reality, the financial reports of the major media have received great attention from the market. In the era of network development, investors can easily access the information of stock market growth through Internet and other media platforms. Stocks with abnormal returns often attract more attention of investors. With the development of modern financial market theory, it usually focuses on the effect of prominent effect on investors' attention when they use information to make investment decisions. When facing a large amount of information for reference, restricted by limited cognitive ability, ordinary investors usually pay more attention to some stocks with prominent characteristics, such as stocks with abnormal returns or abnormal trading volume. Thus, a set of limited concerns is formed. Even if the stocks in the considered set are not all to be purchased, the final stocks purchased must come from the considered set. Investors also need to use attention to analyze stocks when they sell stocks. However, most investors have enough energy to analyze these stocks because their stocks are limited to a small number of stocks. Therefore, the amount of information that needs to be processed when buying and selling stocks is asymmetric, as well as the difference in the consideration set of stocks that investors need to pay attention to, resulting in the imbalance of purchase and sale orders in the stock market (Hur & Singh, 2017).

Individual investors dominate China's securities market, and their emotions are easily affected by events. Especially in the network era, the phenomenon of individual investors following the trend is prominent. As people pay more attention to information, with the spread of information more and more widely, investors are easy to form group behavior, which leads to the phenomenon of stock price rising and falling sharply. Limited attention makes the behavior of investors deviate, and eventually leads to the deviation of asset prices. Therefore, the research on whether investors' attention to the stock can cause the stock price fluctuation and how to cause the price fluctuation has theoretical and practical research value, and has also become a hot issue in the field of behavioral finance.

2. Literature Review and Research Hypothesis

2.1. Literature Review

Researchers have been trying to explain the phenomenon of financial market by introducing limited attention in recent years. In the process of investors' decision-making, limited attention will affect the reaction of investors to information, and then affect the stock price (Ying et al., 2015; Ungeheuer, 2017; Peng et al., 2016). Limited attention makes investors attention-driven trading behavior in the securities market, that is, investors' attention is limited, and the result will make investors tend to trade stocks which have significant characteristics. For individual investors, stocks that have experienced abnormal returns and abnormal trading volume, and have been reported in the news, are more likely to become investors' investment targets and increase their purchase probability. But

for the professional institutional investors, due to the relatively professional research institutions and personnel, the effect of limited attention is less.

Some scholars have made enlightening research on the impact of limited attention on asset prices. [Kahneman \(1973\)](#), a Nobel Laureate in economics, pointed out that attention is a scarce cognitive resource, and attention to one thing must be at the expense of attention to other things. People's attention is limited, and the obvious stimuli and information usually attract people's attention more. [Hirshleifer et al. \(2006\)](#) believe that investors with limited attention tend to pay attention to significant information, which leads to excessive reaction of stock price to significant information, while may not react enough to other information, resulting in price drift. [Rosa and Durand \(2008\)](#) have shown through experiments that the subjects are obviously affected by limited attention when making investment decisions. They do not have the ability to treat all kinds of information equally. Instead, they tend to pay attention to the information that can significantly attract their attention, and ignore the insignificant but valuable information, which eventually leads to the deviation of decision-making. [Barber and Odean \(2008\)](#) used extreme daily return, excess trading volume and news volume as proxy variables of attention to study the relationship between attention and individual trading behavior. In addition, [Hou et al. \(2006\)](#) found that the higher the degree of investors' attention, the more significant the momentum effect of stock price. Yuan found that attention has an impact on the stock market everywhere. When the market is at a high level, high attention will cause individual investors to reduce their holdings. When the market is at a low level, high attention will lead to individual investors to increase their holdings. Grossman and others believe that the increase of investors' attention will lead to more information value, which is conducive to the market to absorb more information and has a positive significance for the effectiveness of the market.

On the other hand, the limited attention of investors directly leads to the neglect of some useful information, which makes the stock price less responsive. The interaction between attention and some behavioral biases such as overconfidence leads to overreaction of stock price. When investors pay less attention to the company's stock, the more likely they are to ignore the company's earnings announcement, so it is difficult for the company's information to be fully reflected in the stock price. As the information gradually being reflected in the stock price, the phenomenon of drift after earnings announcement will appear. The drift after earnings announcement refers to the upward or downward drift of excess return rate after the announcement of earnings. Some scholars have also found that limited attention can lead to earnings post announcement drift. [Dellavigna and Pollet \(2009\)](#) studied the impact of earnings announcement on investors' attention on Friday and other weekdays, and found that investors' attention-driven trading occurred on Friday, and the earnings announcement on Friday had low market response and delayed response. [Aboody et al. \(2010\)](#) found that in the five trading days before the release of earnings announcement, companies with good earnings performance in the past 12 months had higher

excess return rate, but the situation would reverse in the five trading days after the announcement.

The theoretical research of investor's attention is an emerging field. At present, there are few research literatures. One of the difficulties is that it is difficult to measure the investor's "attention". The existing proxy variables of investor attention include excess return, trading volume, media coverage, turnover rate, advertising expenditure and Internet search probability. However, media reports, advertising spending, Internet information and so on can not directly correspond to the degree of investors' attention. They can only be converted into investors' attention when they are listened to or read by investors. In China and abroad, some researches use the weekly data of Google trend to measure speculators' attention, or use Baidu Index as the index of attention to test the correlation between Baidu Index and the stock market performance. These applied researches provide new ideas for the study of limited investor attention. However, this method of using Internet retrieval records to measure investors' attention also has shortcomings. First, at present, most trading platforms can provide the latest information about relevant stocks, so traders will not choose to enter stock codes on search engines such as Google or Baidu to query the stock information of a single company. Second, individual traders are more likely to be limited by their ability to collect and process information, so they are more likely to focus their attention on the index provided by institutions rather than the stock information of individual companies. The index data provided by trading platform also limits the majority of retail investors to retrieve relevant information on search engines such as Google or Baidu. All of these affect the effectiveness of search engine's retrieval probability as the proxy variable of investors' attention.

2.2. Research Hypothesis

Different from the existing research, this paper uses the index of "abnormal trading volume" which is more closely related to the degree of investors' attention to individual stocks. Two of the most famous behavioral financial researchers, Barber and Odean, believe that the trading volume is relatively stable. The sudden increase of trading volume will attract the attention of individual investors in the stock market, and then affect the investment behavior of investors. Compared with other proxy variables, abnormal trading volume can be used to study the degree of investors' attention to individual stocks, which is convenient to study the price change characteristics of individual stocks when they are driven by attention. In addition, some scholars believe that the increase of attention has an upward pressure on prices, and some studies have found that investors are more willing to buy than sell when the attention increases. Compared with this kind of research, this paper uses the abnormal trading volume index to measure the investors' attention to the stock, which can help us to study whether the investors' attention has an upward or downward driving force on the price. Based on the above analysis, this paper puts forward the following research hy-

pothesis:

“Investor attention is positively correlated with market index and individual stock returns.”

This paper will use panel data model and vector autoregressive model to study the interaction between stock returns and investors’ attention. This empirical study is helpful to reveal the trading behavior characteristics driven by investors’ attention.

3. Research Design

3.1. Data Sources

The research sample is from 944 shares of stocks listed in Shanghai Stock Exchange, and the sample range is from July 1st, 2019 to June 30th, 2020. The sample period of each stock is one year, with about 260 records. In addition, because the average trading volume needs to be calculated according to the trading data of the first half-year of the sample period, the records with no corresponding relationship between the yield and the average trading volume during this period need to be eliminated.

3.2. Variable Definition and Model Design

The abnormal trading volume index involved in the empirical study refers to the abnormal trading volume of a stock on the same day, which can reflect the high attention of investors to the stock (Barber & Odean, 2008). The specific measures are as follows:

$$AV_T^j = \frac{V_T^j}{\bar{V}_T^j} \quad (1)$$

where AV_T^j is the abnormal trading volume index of the stock j on the T day, \bar{V}_T^j is the average trading volume of the stock j in the six months before the t day. It is generally believed that trading volume is a relatively stable process. The sudden increase of trading volume will attract the attention of individual investors in the stock market, and then affect the investment behavior of investors.

In this paper, we establish a vector autoregressive (VAR) model. Firstly, we study the interaction between investors’ attention and stock returns of different industries and sizes. Vector autoregressive model is usually used to predict the time series system and the dynamic influence of random disturbance on the variable system. The model avoids the problem of modeling the lag value function of each endogenous variable in the system. The model is an effective prediction model for interconnected time series variable system. The VAR model is as follows:

$$A_t = \mu + \sum_{i=1}^p \Phi_i A_{t-i} + \varepsilon_t \quad (2)$$

where $A_t = [AV_T^j, R]^T$, AV_T^j is the abnormal trading volume index of stock j and R is the return level of stock j .

3.3. Empirical Results

1) The relationship between investors' attention and index returns based on VAR model

First of all, the statistics of ADF test in the Chinese stock market in the sample period reject unit root at the significant level, indicating that the return series are stable. Secondly, according to the minimum AIC criterion, the lag period of regression model is determined to be two. Taking the industrial index as an example, the descriptive statistics of investors' attention and index returns are shown in **Table 1**.

The empirical results in **Table 2** show that the lagged one period income of industrial index has a significant impact on investor's attention. This means that investors focus on recent income level of stocks. But there is no significant evidence shows that investors' attention has any impact on the income of industrial index. Furthermore, we will test the relationship between investors' attention and stock returns for different size of firms based on VAR model.

The empirical results in **Table 3** show that, the coefficient of lagged attention for big companies is 0.0086, which means investors' attention has a significant positive influence on stock returns. But there is no such an evidence for medium or small scale of companies. The coefficients of lagged attention for big-scale companies are 0.6931, 0.1825 and the coefficient of lagged returns is 4.5172. These results show that both lagged attention and lagged returns have a significant positive impact on investors' attention. This impact shows no differences for different scale indexes. People pay more attention to yesterday's stock returns level, and the high level of attention lasts at least two days.

2) The relationship between investors' attention and individual stock returns based on Panel Data Model

Table 1. Descriptive statistics of investors' attention and the income level of industrial index.

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
<i>ATT</i>	1.1543	1.0644	2.3204	0.6372	0.3816	0.8747	3.0510
<i>R</i>	0.0022	0.0021	0.0391	-0.0506	0.01148	-0.4268	7.0056

Note: *ATT* is the degree of investors' attention; *R* is the income level of industrial index.

Table 2. Results of vector autoregression estimates.

	<i>ATT</i>	<i>R</i>
<i>ATT</i> (-1)	0.6145***	0.0054
<i>ATT</i> (-2)	0.2826***	-0.0025
<i>R</i> (-1)	5.7502***	-0.0076
<i>R</i> (-2)	-0.2056	0.0262
<i>C</i>	0.1102***	-0.0001

The abnormal trading volume index constructed in this paper is more suitable for the study of individual stocks to measure the degree of investors' attention to stocks. The panel data of the return level and attention degree of different individual stocks in the sample are formed. 30 stocks are randomly selected as sub samples by computer, and the regression of fixed effect model and random effect model is carried out for the sub samples. The empirical results are shown in **Table 4** and **Table 5**.

The random effect model can describe the incomplete information of the

Table 3. Comparison of test results for different scale indexes.

	<i>ATT</i>	<i>R</i>
<i>BIGATT</i> (-1)	0.6931***	0.0086**
<i>BIGATT</i> (-2)	0.1825**	-0.0054
<i>BIGR</i> (-1)	4.5172***	-0.0100
<i>BIGR</i> (-2)	-0.0888	0.0358
<i>MEDATT</i> (-1)	0.6338***	0.0026
<i>MEDATT</i> (-2)	0.2642***	0.0001
<i>MEDR</i> (-1)	5.1524***	-0.0705
<i>MEDR</i> (-2)	0.1078	0.075
<i>SMAATT</i> (-1)	0.5363***	0.0018
<i>SMAATT</i> (-2)	0.3477***	0.0003
<i>SMAR</i> (-1)	5.8778***	-0.028
<i>SMAR</i> (-2)	0.5412	0.083

Note: *BIGATT* refers to the investors' attention for large-scale companies; *MEDATT* is the level of investors' attention for medium-sized companies; *SMAATT* is the level of investors' attention for small-scale companies. *BIGR* is the stock return level for big-scale companies; *MEDR* is the stock return level for medium-scale companies; *SMAR* is the stock return level for small-scale companies.

Table 4. Results for fixed effect model.

Variable	Coefficient	Std. Error	T-statistic	Prob.
<i>C</i>	-0.0064	0.0011	-5.6434	0.0000
<i>ATT</i>	0.0063	0.0000	7.8956	0.0000

Note: *C* is constant, *ATT* is investor's attention; in addition, all individual coefficients are not listed in the table.

Table 5. Results for random effect model.

Variable	Coefficient	Std. Error	T-statistic	Prob.
<i>C</i>	-0.0061	0.0011	-5.4583	0.0000
<i>ATT</i>	0.0060	0.0000	8.0745	0.0000

explained variable in the fixed effect model by decomposing the error term. It is found that individual effects are related to regression variables by Hausman statistic test. It is suggested to establish a regression model of individual fixed effects.

According to the fixed effect model, the coefficient of attention is 0.0063 (Prob. 0), which means that investors' attention has a significant impact on stock returns. A high level of stock returns accompanies investors' high degree of attention.

Investors' attention has a significant positive impact on the current stock returns. When investors' attention is high, it will lead to net buying behavior, rising stock price and increasing current stock returns. Attention affects investors' asset selection behavior, and this influence is ultimately transmitted to the stock price through the trading behavior of the stock market. Excessive public attention leads to attention driven buying behavior. Investors showed a net buying of the attention grabbing stocks. And this kind of excessive attention can easily lead to overreaction to new information and overestimation of value in the short term.

3) The influence period of investor's attention on individual stock return

In order to test the influence period of investor's attention to income, the following model is further established.

$$R_{i,t} = C + \sum_{\lambda=1}^{\lambda=n} \gamma_{i,\lambda} R_{i,t-\lambda} + \beta_1 ATT_{i,t} + \beta_2 ATT_{i,t-1} + \varepsilon \quad (3)$$

where $R_{i,t}$ is the yield of the t -period of stock i ; $Att_{i,t}$ is the investor's concern about the t -period of stock i , and $ATT_{i,t-1}$ is the investors' attention to the stock i for period $t-1$. AR term is used to reflect the historical information of the market, and it is used to test whether the investor concern of the lagged period contains information not shown in other market indicators. The lagged period of AR term is determined as lagged period according to AIC and SBIC criterion.

The results in **Table 6** show that the coefficients of $ATT(-1)$, $ATT(-2)$, are 0.0018 and -0.004 , which means that the investors' historical attention has a significant influence on stock returns. This means that historical investors' attention can predict the future performance of stock at a certain level. However, the result of attention lagging behind the third order is not significant, which indicates that the influence of attention on yield is short-term.

Unlike the short-term effect of investors' attention on stock returns, the impact

Table 6. The effect cycle of investors' attention on stock returns.

Variable	Coefficient	Std. Error	T-statistic	Prob.
C	0.0039	0.0013	2.9345	0.0034
$ATT(-1)$	0.0018	0.0010	1.6854	0.0921
$ATT(-2)$	-0.0040	0.0012	-3.1412	0.0017
$ATT(-3)$	0.0001	0.0012	0.0890	0.9290

period of stock returns on investors' attention is relatively long. The results are shown in **Table 7**.

Taking stock return as an independent variable, the result shows that the lag period of return is not significant from the 15th day, which indicates that the influence period of stock return on investors' attention is about three weeks. The influence period of stock returns on investors' attention is significantly longer than that of attention on returns.

4. Conclusion

With the development of behavioral finance theory, people gradually realize that with the increase of available information resources, investors' attention has become a scarce resource, which increases the cost of investors to collect information and has a significant impact on asset pricing and investment decision-making. Due to the limited attention of investors, people tend to pay attention to the more significant information. Investors' asset selection behavior is influenced by their attention, and this influence is ultimately transmitted to the stock price through the trading behavior of the stock market.

This paper studies the relationship between investors' attention and stock price. Through the establishment of fixed effect model for empirical research, the research hypothesis is verified. The results show that investors' attention has a significant impact on individual stock returns. The high level of stock returns accompanies the high degree of investors' attention. Investors' attention has a significant positive impact on the current stock returns. When investors' attention is

Table 7. The influence cycle of stock returns on investors' attention.

Variable	Coefficient	Std.Error	T-Statistic	Prob.
$R(-1)$	10.7099	1.3338	8.0294	0.0000
$R(-2)$	7.5542	1.3387	5.6426	0.0000
$R(-3)$	6.9123	1.3408	5.1555	0.0000
$R(-4)$	4.6204	1.3394	3.4494	0.0006
$R(-5)$	4.6807	1.3422	3.4871	0.0005
$R(-6)$	4.3002	1.3405	3.2077	0.0014
$R(-7)$	4.3075	1.3411	3.2117	0.0013
$R(-8)$	4.5627	1.3392	3.4068	0.0007
$R(-9)$	3.4341	1.3463	2.5507	0.0109
$R(-10)$	4.2669	1.3475	3.1665	0.0016
$R(-11)$	3.5911	1.3464	2.6670	0.0077
$R(-12)$	3.0871	1.3466	2.2925	0.0220
$R(-13)$	3.3223	1.3554	2.4511	0.0144
$R(-14)$	4.2570	1.3537	3.1445	0.0017

high, it will lead to net buying behavior, the rise of stock price and the increase of current stock returns. Attention affects investors' asset selection behavior, and this influence is ultimately transmitted to the stock price through the trading behavior of the stock market. Excessive public attention leads to attention driven buying behavior. Investors show a net purchase of those stocks that attract attention, and this kind of excessive attention can easily lead to overreaction to new information and overestimation of value in the short term. The empirical results also show that investors' historical attention has a significant positive influence on stock returns. This means that historical investor attention can predict the future performance of stock in a short term.

Unlike the short-term effect of investors' attention on stock returns, the impact period of stock returns on investors' attention is relatively long. The influence of stock return on investors' attention lasts about three weeks according to the results.

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Conflicts of Interest

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

References

- Aboody, D. et al. (2010). Limited Attention and the Earning Announcement Returns of Past Stock Market Winners. *Review of Accounting Studies*, 15, 317-344. <https://doi.org/10.1007/s11142-009-9104-9>
- Barber, B. M., & Odean, T. (2008). All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors. *Review of Financial Studies*, 21, 785-818. <https://doi.org/10.1093/rfs/hhm079>
- Dellavigna, S., & Pollet, J. M. (2009). Investor Inattention and Friday Earnings Announcements. *The Journal of Finance*, 64, 709-749. <https://doi.org/10.1111/j.1540-6261.2009.01447.x>
- Hirshleifer, D. et al. (2006). Feedback and the Success of Irrational Investor. *Journal of Financial Economics*, 81, 311-338. <https://doi.org/10.1016/j.jfineco.2005.05.006>
- Hou, K. W. et al. (2006). *A Tale of Two Anomalies: The Implication on Investor Attention for Price and Earnings Momentum*. Working Paper, Baruch College, Ohio State University, Princeton University. <https://doi.org/10.2139/ssrn.923146>
- Hur, J., & Singh, V. (2017). Cross-Section of Expected Returns and Extreme Returns: The Role of Investor Attention and Risk Preferences. *Financial Management*, 46, 409-431. <https://doi.org/10.1111/fima.12145>
- Kahneman, D. (1973). *Attention and Effort*. Prentice-Hall.
- Peng, D. F. et al. (2016). Do Top 10 Lists of Daily Stock Returns Attract Investor Atten-

tion? Evidence from a Natural Experiment. *International Review of Finance*, 16, 565-593. <https://doi.org/10.1111/irfi.12091>

Rosa, R. D. S., & Durand, R. B. (2008). The Role of Saliency in Portfolio Formation. *Pacific-Basin Finance Journal*, 16, 78-94. <https://doi.org/10.1016/j.pacfin.2007.04.008>

Ungeheuer, M. (2017). *Stock Returns and the Cross-Section of Investor Attention*. March 11, Working Paper. <https://doi.org/10.2139/ssrn.2931547>

Ying, Q. W. et al. (2015). Investor Attention, Institutional Ownership, and Stock Return: Empirical Evidence from China. *Emerging Market Finance and Trade*, 51, 672-685. <https://doi.org/10.1080/1540496X.2015.1046339>