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Research Article

Analysis on the Psychology and Behavior of Individual Investors under the Influence of COVID-19

Jialing Huang, Yixin He*

Sichuan University of Science & Engineering, Zigong 643000, Sichuan Province, China

Abstract: Due to the relatively short history of the development of the Chinese stock market, the investment philosophy and psychology of most individual investors are not particularly mature. Especially under the influence of public health emergencies, the individual investors' characteristic of the investment behavior in the stock market has become more obvious. This paper combines questionnaire and psychological experiments to study the factors that affect investment decisions of individual investors, and then takes COVID-19 as an example to analyze the impact of public emergencies on individual investors' investment decisions in the stock market.

Key words: COVID-19; Overreaction; Overconfidence; Herd effect

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****Corresponding author:*** Yixin He, hyx19920111@163.com

1 Introduction

The main force in the Chinese stock market is individual investors[1]. Investment experience and knowledge of the stock market are where individual investors are weak. Moreover, most individual investors make decisions based on their own understanding, and their investment psychology and investment philosophy are not particularly mature, which leads to deviations in investment[2].

Modern financial theory is based on the efficient market hypothesis[3]. Behavioral finance detects the investment psychology and behavior of individual investors through relatively microscopic individual behaviors, and provides professional technical guidance for the development of the stock market[4].

When individual investors invest in stocks, they often fail because of psychological flaws in making investment decisions. Common psychological characteristics of individual investors' investment are: (1) Overconfidence. When individual investors invest in the stock market, they trust their judgment too much[5]. Some investment consultants also have this kind of psychology, which causes huge economic losses when investing [6]. (2) Overreaction. Individual investors have excessive and irrational psychology to recent major events, which can lead to excessive investment. (3) The herd effect. It is also called herd mentality in the stock market. It refers to the behavior of individual investors who often imitate and learn from the investment behaviors of those around them and ignore their own unique ideas in the process of making investment decisions[7]. Most individual investors always think that other people's information is more accurate, and thus give up their own private information[8] and thus rashly follow the trend to buy stocks. Once the investment fails, the stock market will be severely affected in the short term [9].

The sudden outbreak of COVID-19 in January 2020 caused major changes in the Chinese economy over a period of time, and the stock market became unstable. Individual investors have also changed their investment psychology and behavior under this severe situation. Under this background, the paper analyzes whether the investment behavior of individual investors in the stock market shows the above characteristics in the context of public health emergencies such as COVID-19.

2 Literature review and theoretical basis

In the 1970s, Eugene Fama, a professor of psychology at the University of Chicago, constructed the effective market hypothesis (EMH)[10]. The more comprehensive introduction to behavioral finance in China is Behavioral Finance compiled by Xindan Li and Yulei Rao[11]. Li Liu systematically introduced the prospect theory of behavioral finance in his book, The Challenge of Behavioral Finance Theory to the Efficient Market Hypothesis, which is the earliest research on psychological characteristics in our country[12].

Later, there were more and more abnormal phenomena appeared in the financial market and many economists began to study and innovate on these phenomena. However, due to imperfections and imprecise conditions, many analysis work could not be realized [13], and behavioral finance came into being. Behavioral finance theory also evaluates traditional finance and believes that it has some biases in the description of individual behavior[14].

Behavioral finance is a new branch of learning that integrates psychology, behavioral science, sociology and other socially recognized knowledge with traditional finance[15]. From the psychological point of view, most investors' evaluations tend to be based on historical examples, combining with their own experience and judgments, and do not consider probability issues[16]. Behavioral finance covers the interpretation of various "abnormal phenomena" in the financial market, corrects the hypothesis of rational man in traditional financial theory, and focuses on analyzing the behavioral deviations of investors in the stock market, thus emphasizing the role of investor psychology and behavioral deviations[1].

3 Investigation and analysis of individual investors' investment under the influence of COVID-19

3.1 Survey design

3.1.1 Idea and method of the survey

This survey was conducted under COVID-19, and its online survey is mainly distributed to individual investors living in Sichuan. However, in order to obtain more accurate results, the results of questionnaires in a small group of individual investors are subject to telephone follow-up for in-depth investigations.

The design questions in the questionnaire are clearly targeted. The theoretical basis is the results of investment psychology and behavior-related research in behavioral finance. At the same time, special attention is paid to the impact of the current COVID-19 epidemic in China on investor psychology and behavior.

3.1.2 Survey design

In order to ensure the general principles of the questionnaire, the questionnaire sentences are concise and clear. At the same time, the questions are multiple choice questions so that the respondents can easily fill in. And the standard principle of the questionnaire is ensured. According to the type of questionnaire, the theory related to the survey content is adopted when designing the questionnaire. In addition, the principle of voluntary and objectivity is guaranteed, and every individual investor participating in the survey is guaranteed to participate voluntarily.

In order to optimize the questionnaire, the frequently-used questions from online questionnaire survey were used as references with selective additions and deletions. In addition, relevant professionals in the securities industry have been consulted, and opinions have been fully adopted before selective additions and deletions.

3.1.3 Sample selection

This paper mainly studies the psychology and behavior of individual investors under the current situation of COVID-19, and examines whether the relevant theories of financial behavior are consistent with the specific conditions of individual investors. The survey subjects were randomly selected, and the online questionnaire was distributed and collected. In-depth interviews were made after filling out the online questionnaire. A total of 300 questionnaires were sent.

3.2 Survey results and analysis

3.2.1 Basic information of individual investors

Due to the impact of COVID-19, this questionnaire survey was only conducted online. A total of 240 questionnaires were received, with a recovery rate of 80%, which can support the conclusion analysis. The results of the survey showed that in the 240 received questionnaires, the gender ratio was equal. The total number of male individual investors was 124, accounting for 51.67% of the total; the total number of female individual investors was 116, accounting for the total The ratio is 48.33%.

In terms of age: 24 respondents were under 20 years old, accounting for 10%; 143 were 21 to 30 years old, accounting for 59.58%; 62 were 31 to 45 years old, accounting for 25.83%; 10 were 46 to 55 years old, accounting for 4.17%; only one person was over 56 years old, accounting for 0.42% of the total.

In terms of occupations of the individual investors: Due to the impact of COVID-19, most of respondents are college students. There were 119 college students, accounting for 49.58%; 8 individual investors working in state agencies, accounting for 3.33%; 45 individual investors working in joint-stock enterprises, accounting for 18.75%; 61 individual investors working in enterprises and institutions, accounting for 25.42%; 6 professional investors, accounting for 2.5%; and there is only one retiree, accounting for 0.42%.

In terms of stock investment year: 138 people with years within 2 years, accounting for 57.5%; 70 people from 2 to 5 years, accounting for 29.17%; 22 people from 6 to 10 years, accounting for 9.17%; 10 people had over 10 years of stock investment year, accounting for 4.17%.

In terms of learning finance, psychology, and behavioral finance related knowledge: 54.17% of individual investors have studied, and 45.83% of individual investors have never learned relevant theoretical knowledge.

From the analysis of the above survey results, it can be known that this questionnaire survey is effective. It can be seen from the results that more people under the age of 30 have entered the stock market for the first time. From the perspective of age and occupation, it can be judged that a large part of individual investors are college students, followed by individual investors of enterprises and institutions. It can be seen from the results that more people under the age of 30 have entered the stock market for the first time. From the perspective of age and occupation, it can be judged that a large part of individual investors are college students, followed by individual investors of enterprises and institutions. Then it can be concluded that most individual investors enter the stock market within 2 years. However, in terms of whether they have studied finance, psychology, and behavioral finance related knowledge, the ratio of respondents is also close to 1:1, indicating that a considerable number of individual investors participate in the stock market without having learned relevant knowledge.

In order to make the results more comprehensive and convincing, in addition to the above information, this survey also examines the way individual investors choose their individual stocks, whether there is a stop-loss line, preferences of the individual investors, the importance of market information to individual investors' decision-making, and the risk degree of investors, which are shown as follows:

Table 1. Ways for individual investors to choose individual stocks (multiple choices)

Items	Number of people	Ratio（%）
Recommendation from stockbrokers	52	21.67
Recommendation from financial news	92	38.83
Recommendation from friends	148	61.67
Personal analysis	112	46.67

According to the above survey results, it can be seen that individual investors, who account for 61.67%, choose individual stocks through recommendation of friends, which has the largest ratio. Some individual investors, accounting for 46.67%, like to make choices based on their own analysis, while broker introductions and financial news recommendations account for 21.67% and 38.83% respectively. Investors recommended by brokers and financial news account for 21.67% and 38.83%, respectively, which are smaller than the above-mentioned two ways. Due to the impact of COVID-19 and the majority of the respondents being students, the number of individuals who choose the channels of individual stocks introduced by brokers is relatively small.

It can be seen from the above results that among the 240 people who participated in the questionnaire, 65.42% of individual investors have their own stop-loss line, which means that they will withdraw their capital in time when the loss of their stock assets reaches the stop-loss line. It shows that most individual investors have a strong awareness of risk and know how to protect themselves when the market is at a disadvantage. However, there are still some people who do not have a stop-loss line and will not choose to withdraw their capital in time when they may face a large amount of losses, indicating that the awareness of risk of this type of individual investors is weak.

Table 2. Investment preferences of individual investors (multiple choices)

Items	Number of people	Ratio（%）
information preferences	118	49.17
personal habit	126	52.5
follow others	91	37.92
others	53	22.08

Based on the above results, it can be analyzed that the investment preferences of individual investors tend to be personal habits and information preference, and these two investment preferences account for 49.17% and 52.5% respectively. When conducting in-depth telephone follow-up with some individual investors, it can be learned that investors have formed a unique way of analyzing stock prices during long-term investment. Therefore, most individual investors invest with their own unique personal habits. The investment preference of most other people is information preference. There are many individual investors in the Chinese stock market. When they conduct fundamental analysis of stocks, they need more information to make better investment decisions, which also belongs to information preferences.

Table 3. The importance of market information to individual investors' investment decisions

Items	Number of people	ratio（%）
Very important	129	53.75
Quite important	71	29.58
Less important	31	12.92
Unimportant	9	3.75

Based on the above survey results, it can be concluded that market information is very important for individual investors' investment decisions. Among the 240 individual investors who participated in the survey, 53.75% felt that market information is very important for individual investors' investment decisions, which contains more than half of the respondents. 71 people think that market information is quite important for individual investors' investment decisions, accounting for 29.58%. 31 people think that market information is less important to individual investors' investment decisions, accounting for 12.92%, while only 9 people think that market information is unimportant, accounting for 3.75%. On the whole, it is also in line with the information preference of individual investors mentioned above.

Table 4. Degree of individual investor's risk tolerance (grade zero means minimum tolerance, grade ten means maximum tolerance)

Items	Number of people	Ratio（%）
Grade ten	13	5.42
Grade nine	8	3.33
Grade eight	12	5
Grade seven	23	9.58
Grade six	32	13.33
Grade five	40	16.67
Grade four	33	13.75
Grade three	39	16.25
Grade two	17	7.08
Grade one	11	4.58
Grade zero	12	5

According to the degree of risk that investors can bear, individual investors are divided into eleven grades from zero to ten, and these eleven grades are divided into five types. The first type is the most conservative type including grade zero to grade two, accounting for 16.66%; the second type is relatively conservative type including grade three and four, accounting for 30%; the third type is the moderate type, including grade five and six, accounting for 29.93%; the fourth type is a relatively active type, including grades seven and eight, accounting for 14.58%; the fifth type is the most active type, including two grades of nine and ten , accounting for 8.75%. From the analysis of the above results, it can be concluded that the relatively conservative type accounts for the highest proportion, reaching 30%, followed by the comparable moderate type, which accounts for 29.93%. It shows that most individual investors can bear the risk to a certain degree but not a higher degree.

3.2.2 Analysis of overconfidence

Table 5. Do investors have their own stop-loss line

items	number of people	ratio（%）
yes	157	65.42
no	83	34.58

Table 6. When the stock trend is contrary to their original judgment

items	number of people	ratio（%）
trust their own judgment and take no action	61	25.42
wait and see first, take no action temporarily	152	63.33
take action immediately	27	11.25

Table 7. When the investment information obtained by themselves is inconsistent with the information obtained by other individual investors in the background of COVID-19

items	number of people	ratio（%）
trust themselves	110	45.83
adopt others'	57	23.75
uncertain	73	30.42

In the above survey of individual investors, it can be found that among 240 individual investors who participate in the questionnaire, 157 have a stop-loss line, accounting for 65.42%. It shows that in the process of making investment decisions, most individual investors will stop loss on the stocks they own when it is about to reach the stop-loss line.

In the second question, when individual investors find that their stocks are contrary to their original judgments, 63.33% of them will choose to observe first, because they cannot accurately judge whether their investment behavior is wrong. But there are still 25.42% of individual investors who choose to trust their own judgment, which is overconfidence.

In the third question, when the information obtained by individual investors does not match the information of others, 110 individual investors believe the information they have obtained, accounting for 45.83%; 57 individual investors adopt other people's information, accounting for 23.75%. Investors who choose uncertain options accounted for 30.42%. It can be seen from the above that 45.83% of individual investors are overconfidence.

From the above three questions, it can be concluded that under the background of COVID-19, most individual investors in the stock market are still overconfident, and they always tend to believe their own judgments, and therefore cannot make accurate judgments when the market tends to be contrary to their own judgments, which leads to deviations in investment behavior.

3.2.3 Analysis of overreaction

Table 8. Judgments on the value of Chinese stocks in the context of COVID-19

items	Number of people	Ratio（%）
It has investment value.	73	30.42
It has speculative value.	38	15.83
Its speculative value is greater than investment value.	62	25.83
It has investment value combining with speculative value .	67	27.92

Table 9. The impact of COVID-19 on the stock market

Items	Number of people	Ratio（%）
Great short-term impact	75	31.25
Great short-term and long-term impact	61	25.42
The short-term impact is great but will not affect the long-term trend.	88	36.67
Not sure	16	6.67

Table 10. Whether to buy and sell stocks in accordance with government policies in the background of COVID-19

Items	Number of people	Ratio（%）
Yes	170	70.83
No	70	29.17

The survey of the above three questions is an test and analysis of individual investors' overreactions in the background of COVID-19 in China: The first question is the judgment of the value of Chinese stocks. Among them, 30.42% of investors think that the value of Chinese stocks is great; 29.92% of them think that Chinese stocks have speculative value, and the above two account for 60.34%, indicating that more than half of individual investors feel that Chinese stocks have investment value in the background of COVID-19.

The second question is to investigate whether individual investors believe that COVID-19 has an impact on the stock market. A total of 31.25% of them feel that the short-term impact is great; a total of 61 people feel that both the short-term and long-term impacts are great; individual investors who feel that the short-term impact is great but will not affect the long-term trend account for 36.67%; and only 6.67% choose the option of unsure. It can be seen that most people tend to believe that due to the impact of COVID-19, the stock market will be affected more or less, and only a few people are not clear about the situation.

The survey result of the third question shows that most people will choose to buy and sell stocks in the direction of government policies, indicating that they are all information-loving investors and will overreact when the government issues related policies.

Through the analysis of the above results, it can be seen that when making stock investment decisions, most individual investors will make some overreactions based on current major events such as COVID-19. In their view, once a major event occurs, it cannot be subdued in the short term and the stock market will have an impact, so there will be opportunities for investment or speculation. If the government issues relevant policies, it will certainly give individual investors more opportunities. Therefore, individual investors often overreact to make investment behaviors when encountering such situations.

3.2.4 Analysis of the herd effect

Table 11 Do they follow when everyone around them buys and sells one or several promising stocks at the same time with the influence of COVID-19

items	number of people	ratio（%）
yes	103	42.92
no	76	31.67
unsure	61	25.42

The above survey is a test and analysis of the herd effect of individual investors under the influence of COVID-19:

According to the analysis of the survey results, it can be concluded that most individual investors have a significant herd effect under the influence of COVID-19. These individual investors believe that since everyone is optimistic about buying, the final loss will be the same regardless of whether it is profitable or not. Therefore, most individual investors are willing to follow the surrounding investors to buy and sell stocks.

4 Conclusion and suggestions

4.1 Research conclusion

This paper studies the investment psychology and behavior of individual investors in the stock market under COVID-19, which mainly uses theories of overconfidence, overreaction, and herd effect to analyze the investment psychology and behavior of individual investors. The survey found that in the stock market and under the influence of COVID-19 in China, psychological phenomena such as overconfidence, overreaction, and herd effect are prominent in individual investors, which also have a great impact on their investment decisions. Moreover, most of the investors currently in the stock market of our country are individual investors, which has also caused a certain impact on the development of stock market in our country.

4.1.1 Structural characteristics of individual investors

From the perspective of gender, males account for 51.67%, while females account for 48.33%, indicating that there are more male investors. From the perspective of age, the total proportion of individual investors between the ages of 21 and 45 is as high as 85.41%, indicating that individual investors in this age range are the main force in the stock market our country. From the perspective of occupation, college students account for 49.58%, and workers account for 50%. From the perspective of stock age, more than half of investors have a stock age within 2 years, accounting for 57.5%. Among the 240 individual investors participating in the questionnaire survey, more than half of the individual investors have studied finance, psychology, behavior and other related knowledge.

4.1.2 Behavioral characteristics of individual investors

From the perspective of individual investors' investment preferences, more individual investors are accustomed to information preferences and personal habits. From the perspective of the importance of market information, more than half of individual investors believe that market information is very important. From the perspective of risk degree, most individual investors are relatively conservative and moderate, with a certain awareness of risk. From the perspective of the psychological characteristics of individual investors, most of them are still overconfident, resulting in investment errors. What's more, most individual investors in the stock market will have some overreactions. They believe that once a major event occurs, it will affect the stock market if it cannot be resolved in a short period of time, but they have not considered that the market is changing rapidly, which leads to mistakes in investment decisions. Last but not least, most individual investors have obvious characteristics of herd effect.

4.2 Suggestions

4.2.1 Suggestions to regulatory authorities

Standardize information disclosure. In the stock market, the information disclosure of listed companies directly affects investors' investment psychology and behavioral decisions. Untimely or untrue information disclosure will mislead investors and affect the correctness of their investment decisions. The information obtained by institutional investors and individual investors is often asymmetry. Therefore, it is very important for the regulatory authorities to establish and improve the information disclosure system. Only by ensuring the timeliness and authenticity of market information disclosure can the interests of individual investors be protected and the development of the stock market be more stable.

Formulate reasonable policies. Judging from the current situation in China, most individual investors make investment decisions relying on government policies, and they buy and sell a large number of stocks in a short period of time, causing stock market turbulence. Therefore, it is necessary to formulate reasonable policies to protect individual investors' investment in the stock market. In addition, timely explanations should be made to newly introduced policies to protect individual investors' confidence in the stock market.

4.2.2 Suggestions to individual investors

Develop healthy psychological quality: In the stock market, if investors can not analyze problems rationally when dealing with some loss-making stocks, they will often make wrong decisions and fail to invest. Therefore, if individual investors want to succeed in investment, they must develop good psychological quality, improve their investment cultivation, fully understand all kinds of information without any emotional or habitual interpretation, and always keep a clear mind to make rational analysis and correct judgment.

Improve personal investment literacy: There is an old saying that it takes a good blacksmith to make good steel. Individual investors who invest in the stock market must always keep in mind that there are risks in the stock market. In addition to risk awareness, they also need to learn more knowledge about securities, investment psychology and behavioral theories, and relevant industry laws and regulations. They can stand the test of the market after knowing these knowledge and putting them into practice.

Overcome psychological limitations: Every individual investor in the stock market has his own investment habits and preferences. However, most individual investors fail because of psychological limitations such as overconfidence, overreaction and herd effect. Information changes rapidly, and various temptations and traps are everywhere in the stock market, all of which require individual investors to overcome their psychological limitations to avoid investment mistakes.

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