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A Study on the relevance between psychological errors and investment behavior

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Abstract
Different people have different choices about the economic environment. People accumulate their own experience and knowledge rationally, and then make choices that they think are beneficial to them, which leads to the occurrence of various behavior patterns. In the process of selection, people's knowledge will change with time and become their own knowledge. Most financial theories are based on a rational economic individual, assuming that investors are rational, and that investors make decisions from the same source of information. The inevitable result of this theory is that a unified view of the market will be discovered immediately. But in fact, the real market produces all kinds of ideas every moment. It can be concluded that investors, especially retail investors, have some misunderstandings about market psychology and its sources. Therefore, the purpose of this paper is to explore the causes of investors' psychological errors and the impact of psychological errors on investors.

Keywords: behavioral finance, disposition effect, psychological account

1. Introduction
The number of Chinese investors accounts for the global share and is the second largest stock market in the world. The impact of such a complex group of investors on the stock market is immeasurable, so in order to better study the capital market, we should first do is to explore individual investors in depth. Traditional financial theories assume that people are rational. However, a large number of empirical research results point out that there are many anomalies in the stock market that traditional theories cannot explain. In the process of the continuous development of modern psychology, it is found that people's cognition will affect people's judgment ability, and different people's cognition and response to the same thing will be different because of their different backgrounds and characteristics. Through years of accumulation and analysis of different effects, the impact of cognitive imbalance on investment behavior has become the focus of behavioral finance. In reality, individual investors will be affected by psychological factors, which will inevitably affect their decision-making judgment. These psychological factors are the main reasons for cognitive imbalance and decision-making bias of investors. It can be concluded that proper handling of psychological errors is crucial in the process of individual investors' investment. In reality, collective investors and individual investors are different, but they are interrelated. The cognitive imbalance of collective investors is caused by the information exchange and contamination between individual investors. If collective investors have psychological errors because of the cognitive imbalance of individual investment, they will produce herding effect or collective unconscious behavior.

2. Literature review
1. Disposition effect
Disposal effect is one of the psychological errors. Disposal effect will show a "profit-and-loss" phenomenon. The reason for this situation is that individuals prefer the satisfaction of profit rather than the pain of loss, so they will continue to hold stocks in loss and sell stocks that have already made profits. The term disposition effect was coined by Shefrin and Statman (1985) they believe that when individuals invest in a situation where they may face losses, they are more inclined to sell profitable stocks and continue to hold the lost stocks until the next profit opportunity to avoid losses. For example, investors in the stock market will sell rising stocks to avoid risk and choose to keep falling stocks to avoid losses. This behavior is called disposition effect. Kahneman and Tversky (1979) [9] In order to understand the perpetrator, experiments were conducted to observe the human behavior of avoiding loss. This provides a strong theoretical basis for Shefrin and Statman (1985) to study the psychological bias of disposal effect of investors in the stock market in the future. Kahneman and Tversky (1979) [9] through a gambling game, we can observe the individual's decisions when loss and profit are uncertain. In the case of profitable games, individuals will choose to stop the game in order to ensure profitability, and will not take a risk for higher bets. On the other hand, when the game loses, individuals are more willing to take risks in order to avoid losses, but also unwilling to face the amount of their losses. Kahneman and Tversky (1979) [9] represent the actor as a value function. The central point is the individual's subjective view of things, a graph of value and results. When profit is made, the graph is downward, whereas when loss

occurs, the reverse is true. Among them, the value function is steeper in loss than in profit. This shows that in the face of profit, the investor's sense of value will be lower than the sense of value at the time of loss, that is, the marginal utility at the time of loss is greater than the marginal utility at the time of profit. In a word, investors are most satisfied with their initial profits, but their initial value will gradually decrease with the increase of the amount of profits. On the contrary, it will rise. From then on, it can be proved that individuals choose to avoid risks when making profits, but are more willing to take risks when losing.

2. Overconfidence

Overconfidence refers to people's psychological errors when they are familiar with things and believe that their judgments are correct. Lichtenstein (1982) [3] found that some interviewees consciously tended to answer questions that they thought were correct, but 20% of the 100% correct answers they thought were wrong. In the related psychological research, people's behavior decision-making in uncertain behavior events mostly contains overconfidence psychological bias. Odean (1998) [4] analyzed the relationship between overconfidence and market. When investors make psychological errors of overconfidence in investment decision-making, the market will change, the volume of transactions in the market will increase, and market price fluctuations will be affected. Odean (1999) [4] by searching and comparing the historical transaction records of the United States, pointed out that the investment transactions in the United States were frequent during that period. This is the time when investors have a psychological bias of overconfidence. Even though the investment returns are less than expected, investors are more confident that the future market will bring more returns, and the temporary depression is only temporary. According to Alpert (1982) [6] this kind of irrational behavior when overconfident will make investors face greater risks.

3. Psychological account

Thaler (1985) [8] believes that psychological accounts are the same as an internal accounting system and affect investors'judgment on investment. Investors will divide psychological accounts according to different factors, and divide their expenditures and gains in the process of investment into different psychological accounts, and then make judgment plans in different psychological accounts. Since Tverskey and Kahneman (1981) [9] and Thaler (1985) [8] put forward the concept of psychological account successively, more and more studies on psychological account have been carried out. They believe that different mental accounts operate in different ways because the corresponding decision-making behavior is different. As a prospect theory Thaler (1999) the value function analyses three indispensable factors for psychological accounts. First, the investor's profits are correlated in the value function. Secondly, the emergence of psychological accounts makes investors' profits less sensitive to the value function. Third, loss aversion. Shafir and Thaler (2006) explored the rules governing the operation of psychological accounts among investors. When many years later, considering the cost of giving away or using them for themselves, most people would think that they did not spend much, because after many years, the feeling at that time had been very weak, or that they actually saved money. In this way, individuals will expand their consumption unconsciously. Benartzi and Thaler (1995) [8] believe that when investors make judgments, they will use psychological accounts to set up corresponding reference points for long-term investment problems and set up investment plans, and divide them into one part after another, and then evaluate and analyze each part. Investors' decision-making behavior and the value of expenditure and harvest will be affected by psychological accounts. Investors make irrational judgments because they attribute similar expenditures to a mental account and do not allow budgets to flow between each mental account. So a rational investor can manage every mental account properly and measure the gains and losses as a whole.

4. Loss aversion

Loss aversion means that when investors face losses and profits, losses are more unacceptable to investors. When investors intend to introduce income and expenditure into the balance of payments, loss aversion will make the difference between income and expenditure slowly appear. When investors make investment judgments, there will be disgust and regret. Investors need to expect that this utility is greater than other expected utility. It is not enough that this option may bring about utility. This is another cognitive biased "regret aversion effect" associated with loss aversion. Investors are reluctant to exchange better goods with others and stick to their existing goods, just as some people are reluctant to exchange the same lottery tickets with some cash (Shiller, 2000).

III. The results of empirical analysis

This study divides the psychological errors of the tested samples into four aspects: disposal effect, overconfidence, regret trend and psychological account.

1. Disposal effect

Table 1: Q1. For the following situations, please choose which one is more acceptable to you:

Option	Total	Percentage
A. You have 50% chance of losing $5000, but 50% chance of losing $0.	102	79.68%
B. You confirm the loss of $4000	26	20.32%

Among them, 102 people of them chose option A, accounting for 79.68% of the total sample; 26 people of them chose option B, accounting for 20.32% of the total sample. From this we can see that 79% of the investment is rational in terms of investment.

Table 2: Q2. Generally speaking, as long as the stock in hand is profitable, it will be sold regardless of future trends. But when losses occur, they will continue to hold?

Option	Total	Percentage
A. Yes	89	69.53%
B. No	39	30.47%

In the sample, 89 people of them chose option A, accounting for 69.53% of the total sample, and 39 people of them chose option B, accounting for 30.47% of the total sample. This shows that most investors have a strong profit preference for investors who have already made profits, while those who have lost money tend to continue to hold these profits. That is to say, investors like to make profits and avoid selling losses. This is a further improvement, which shows that most of the investment has disposal effect.

Table 3: Q3. Suppose you have 10,000 shares now, and you buy them at $20 a share. Company A is currently trading at $30 a share. So if you sell all your shares now, you will make a profit of $100,000. Suppose you don't have a clear judgment about the future market, what do you usually do?

Option	Total	Percentage
A. Keep buying	37	28.91%
B. Sell immediately	69	53.91%
C. Keep holding stocks and wait to rise	22	17.18%

In the sample, people of them 37 choices accounted for 28.91% of the total number of samples, 69 people of them choices B accounted for 53.91% of the total number of samples, and 22 choices C accounted for 17.18% of the total number of samples. As can be seen from this, most investors are eager to profit from a single stock. 53% chose to sell immediately when they made a profit, suggesting that 69 people had psychological errors in their investments.

Table 4: Q4 Assumes that you now own 10,000 shares, and you buy them at $30 a share. Company A is currently trading at $20 a share. So if you sell all your stocks now, you will lose $100,000. If you don't have a clear judgment about the future market, what do you usually do?

Option	Total	Percentage
A. Keep buying	27	21.10%
B. Sell immediately	33	25.78%
C. Keep holding stocks and wait to rise	68	53.12%

In the samples, 27 people of them chose option A, which accounted for 21.10%, 33 people of them chose option B, which accounted for 25.78% of the total samples, and 68 chose option C, which accounted for 53.12% of the total samples. 53% of the people choose to hold shares to go up after the individual stocks are damaged, which shows that they have the psychological bias of disposal effect when they invest.

Table 5: Q5. Under normal circumstances, I will sell profitable stocks as soon as possible, while unprofitable stocks will continue to hold?

Option	Total	Percentage
A. Yes	89	69.53%
B. No	39	30.47%

In the samples, 89 people of them chose option A, which accounted for 69.53% of the total sample, and 39 people chose option B, which accounted for 30.47% of the total sample. This shows that because individuals prefer the satisfaction of profit to the pain of loss, they are willing to take a risk to avoid loss when faced with possible loss.

Table 6: Q6. Under normal circumstances, I will continue to buy stocks with losses as long as they are not severely locked up?

Option	Total	Percentage
A. Yes	68	53.12%
B. No	60	46.88%

In the samples, 68 people of them chose option A, which accounted for 53.12% of the total sample, and 60 chose option B, which accounted for 46.68% of the total sample.

2. Overconfidence

Table 7: Q13. Generally, I will continue to increase my warehouse after continuing to make profits.

Option	Total	Percentage
A. Yes	70	54.68%
B. No	58	45.31%

In the samples, 70 people of them chose option A, which accounted for 54.68% of the total sample, and 58 people of them chose option B, which accounted for 45.31% of the total sample. There are 70 respondents who will continue to make profits, I will continue to increase positions, indicating that more than 50% of investors will become overconfident after making profits, and then will have a psychological tendency to increase confidence, thereby increasing overconfidence in investment.

3. Regret trend

Table 8: Q10. Generally, when the stocks sold continue to rise, will the heart feel regret?

Option	Total	Percentage
A. Yes	84	65.63%
B. No	44	34.37%

In the samples, 84 people of them chose option A and 44 people of them chose option B, accounting for 65.63% and 34.37% of the total sample respectively.

Table 9: Q11. Generally, in order to avoid loss of profits, would you sell profitable stocks?

Option	Total	Percentage
A. Yes	84	65.63%
B. No	44	34.37%

As can be seen from Q10 and Q11, 84 people will regret when they sell stocks and continue to rise in regret trend. 84 people will sell stocks that have been profitable so as not to lose the money they have earned, accounting for 65.63% and 65.63% respectively. It shows that regret mentality will occur at the time of profit and loss.

Table 10: Q14. When a stock is recommended on a TV or professional website, if I agree with myself, I will not hesitate to buy it?

Option	Total	Percentage
A. Yes	69	53.91%
B. No	59	46.09%

In the samples, 69 people of them chose option A and 59 people of them chose option B, accounting for 53.91 and 46.09% of the total sample respectively. Sixty-nine people would buy a stock without hesitation when they recommended it on TV or on professional websites and agreed with themselves. In this kind of psychological prejudice, in order to reduce the inner regret, the general investors will refer to the opinions of others and show a kind of obedience psychology.

4. Psychological account

Table 11: Q7. Under normal circumstances, the stock will set a base price as a reference value. If the price is lower than the base price, I will resolutely sell it?

Option	Total	Percentage
A. Yes	75	58.59%
B. No	53	41.40%

In the samples, 75 people of them chose option A and 53 people of them chose option B, accounting for 58.59% and 41.40% of the total sample respectively. More than 58% of investors will choose to set a reference point for stock decision-making. This shows that most investors will have a reference point. The optimal decision-making scheme is selected by reference points. Each reference point can be used as a psychological account for investors.

Table 12: Q8. Generally, when the stock goes up, you are willing to sell it

Option	Total	Percentage
A.0-5%	6	4.68%
B.6%-10%	54	42.19%
C.11%-20%	47	36.72%
D. 21%-30%	16	12.50%
E. More than 30%	5	3.91%

The vast majority of respondents will sell their stocks in a 6% to 10% profit margin to achieve profits. Six people choose to sell when the increase is 0-15%, while 47 people will make profits between 11-20%, and 16 investors will insist on 20-30% profit before they sell.

Table 13: Q9. Generally, how much time does it take for the stock you buy to fall before you are willing to sell it?

Option	Total	Percentage
A.0-5%	13	10.16%
B.6%-10%	50	39.06%
C.11%-20%	47	36.72%
D. 21%-30%	12	9.38%
E. More than 30%	6	4.68%

Thirteen people can bear a loss range of 0-5% when losing money, 50 people are willing to choose to sell when losing money of 6-10%, 47 people are willing to sell when losing money of 11-20%, 12 people are willing to sell when losing money of 20-30%, and 6 people are willing to sell when losing money of more than 30%. According to Q8 and Q9, we can see the existence of the phenomenon of "profit and loss".

Table 14: Q12. Generally, profit and loss will be calculated for each stock held separately?

Option	Total	Percentage
A. Yes	81	63.28%
B. No	47	36.72%

Eighty-one people of them chose option A, which accounted for 63.28% of the total sample, and 47 people of them chose option B, which accounted for 35.72% of the total sample. Eighty-one people will calculate the profit and loss of each stock separately, instead of all the stock portfolios, which shows that most investors have psychological account investment errors.

IV. Conclusions and suggestions

1. Conclusions

This paper conducts an integrated study through a questionnaire survey of 128 respondents. We can not only understand the various investment behaviors of investors, but also, more importantly, we can directly understand the psychological bias behind investors' behavior, so as to analyze the relationship between internal cognition and external behavior. After comparing these 128 samples, we draw the following conclusions:

1. Take Q3 and Q4 for example, in the case of profit, 69 people choose to sell their stocks to ensure profit and avoid the risk of loss very well; in the case of loss, 68 people choose to continue holding their stocks, they are willing to risk loss in order to avoid loss. This shows that these investors have significant disposal effect psychological bias. Individuals choose to avoid risks when making profits, but are more willing to take risks when losing. In the case of insuring losses, 50% of Q6 people choose to continue to buy losses in the absence of a complete hold on the stock market. This further shows that investors have disposal effect psychological errors when they invest in the market.
2. More than 50% of investors will become overconfident after earnings, which will increase the amount of investment in the market, resulting in an increase in the volume of market transactions, but the resulting returns are not as high as expected. This is like the gambling effect, people tend to increase their gambling after winning money, which is caused by psychological errors of overconfidence.
3. It was found that more than 65% of investors regretted selling rising stocks or not buying when they agreed with experts.
4. Most investors will have a reference point, through the

reference point to choose the best decision-making scheme, each reference point can be used as a psychological account of investors. Eighty-one out of 128 samples surveyed calculated the profit and loss of each stock separately rather than the profit and loss of all stock portfolios, indicating that two-thirds of the investors had psychological account investment errors.

2. Suggestions

Most individual investors have cognitive bias on the market, which leads to irrational decision-making judgments in the case of some recognition imbalance in the investment process. At the same time, the cognitive imbalance of individual investors may also cause irrational decision-making behavior of group investors, herding effect. Therefore, in order to improve investment performance, we must strengthen the mitigation of investors' cognitive imbalance. Recognize investors' disadvantage in the securities market, strengthen the basic knowledge of securities investment, and pay attention to the improvement of their comprehensive quality. On the basis of mastering their own psychological identification bias, we consciously correct good investment habits in investment practice. In the securities market, we should abandon the investment psychology of becoming a lender one day and one night, maintain tension, reduce the deviation of psychological awareness, and reduce the loss of investment. In particular, the impact of psychological preference on small investors and older investors with weak risk-bearing capacity reduces the impact of investment decisions and deploys rationally. China's financial market is affected by policy. Investors need to understand the intention of the new policy rationally, adjust the policy discipline, ensure investment returns, and the policy has a far-reaching impact on the financial market. In order to achieve the goal of improving investment returns, it is not enough for investors to just conform to the policy. We must have the awareness and knowledge to safeguard their investment rights and interests from infringement. Securities companies that infringe on the interests of individual investors and listed companies bravely report and protect their rights and interests. Most investors believe that the scientific fixed point of non-filial market is reasonable investment behavior. That is to say, it is necessary to avoid affective factors that may influence the operation strategy. Investors, in particular, should adjust the psychology of individual investors. When they suffer losses, they should immediately stop losses, take risks and arrange reasonably so as to avoid stronger losses. Investors forget the reference point of the purchase price and decide when to stop according to the market itself. The subjective feeling of oneself. Don't influence the objective judgment of the market by the curriculum. Investors are the intrinsic factors of investment damage caused by their inherent cognitive psychological bias. From a large number of conclusions of psychological research, people's cognitive bias is the result of long-term learning. Through practice, it can be effectively built. Individual investors regard learning as a vulnerable group in terms of capital, information and technology. Only by improving their quality can they effectively prevent market risks.

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