

Behavioural Biases in Investment Decision-Making and Their Impact on Investment Performance

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Abstract. This paper provides an in-depth discussion of behavioural bias in investment decision-making and its impact on investment performance. Current research mostly focuses on theories and lacks specific coping strategies, while behavioural biases are prevalent in investment decision-making, affecting investment performance and the stable development of financial markets. By analysing cognitive bias, emotional bias and volitional bias, their manifestations and negative impacts on investment performance are elaborated, such as overconfidence leading to frequent trading and loss aversion making investors short-sighted. In order to reduce the behavioural biases, coping strategies such as searching for counter evidence, timely detection of errors and stop loss, broadening horizons and reducing noise are proposed. Investors can make rational decisions by collecting information through multiple channels, verifying the reasonableness of viewpoints, establishing a stop-loss mechanism, enriching thinking paths, and avoiding noise interference. In conclusion, investors should recognise the existence of behavioural biases, adopt effective strategies to improve the accuracy and rationality of investment decisions and achieve better investment performance, and financial institutions and regulators should also strengthen investor education and guidance.

Keywords: Investment decisions; behavioural biases; investment performance; coping strategies.

1. Introduction

Behavioural biases in investment decision-making are common and affect investment performance, and most of the current research is at the theoretical level without specific strategies to deal with them. Behavioural biases originate from investors' psychology, cognition and emotions, such as overconfidence, which increases the cost of over-trading, and representativeness bias, which makes investors' empirical decision-making vulnerable. Bias such as loss aversion and disposition effect also affect investment performance. The purpose of this study is to analyse behavioural biases in depth, to reveal their causes and impact mechanisms on investment performance, and to propose effective strategies. For example, investors maintain rationality, recognise their own biases and avoid being swayed by emotions; establish a scientific decision-making process and do not make decisions based on intuition and experience; and regularly review and summarise lessons learned. Through these measures, behavioural biases can be reduced, investment performance can be improved, and sound wealth growth can be achieved, while also helping to promote the stability and development of the financial market.

2. Theoretical Foundations

2.1. Types of behavioural biases in investment decision-making

2.1.1. Cognitive biases

Cognitive biases are more common in investment decisions and have a significant impact on investment outcomes. Overconfidence is a typical cognitive bias in which investors tend to overestimate their own judgement and information accuracy. For example, studies have shown that men typically have higher levels of overconfidence than women, and single men typically have higher levels of overconfidence than married men. Overconfidence can cause investors to trade frequently and increase trading costs. Statistically, overconfident investors trade about 30% more often than the average investor. Availability bias is also a cognitive bias in which investors make judgements based

on information that is easily recalled. In investing, an investor may pay too much attention to certain stocks because of their recent outstanding performance, ignoring other potential investment opportunities. This bias may lead investors to make wrong investment decisions, such as blindly following the crowd and buying popular stocks.

2.1.2. Emotional bias

Emotional biases are evident in investing. Overconfidence or overpessimism are common emotional biases. Individual investors do not always have a pre-planned investment plan, and their investment activities are often shaped by individual subjective impulsiveness and the contagiousness of other people's opinions. When investors are overconfident, they may overestimate market prospects and overinvest in riskier assets[1]. And when investors are overly pessimistic, they may be overly conservative and miss out on some investment opportunities. For example, in a falling market, investors may panic and sell assets due to excessive pessimism, causing asset prices to fall further.

2.1.3. Willfulness bias

The herd effect is a typical will bias. It refers to the fact that investors abandon their own opinions under group pressure, change their original attitudes and adopt behaviours that are consistent with the majority. In the view of behavioural finance, herd behaviour is an important factor affecting the inherent volatility of price levels in asset markets. The herd effect occurs mainly because of investors' asymmetric and incomplete information, imitating the behaviour of others can save the cost of their own search for information; the need to shirk responsibility, which is particularly concentrated in some investment managers and stock commentators; the need to reduce fear, human beings belonging to the rational man assumption with traditional financial theory is different from the theory of behavioural finance is based on the individual investor is subjected to the constraint of incomplete information and the cognitive biases, etc. The herd effect may lead to irrational market volatility and affect investment performance.

2.2. Investment performance measures

2.2.1. Revenue indicators

Return on investment (ROI) is the ratio of the return on investment to the cost of investment and is often used to measure the profitability of an investment. For example, if an investment of \$1 million yields a return of \$150,000 after one year, the return on that investment is 15 per cent. Net Present Value (NPV) is the value obtained by discounting future cash flows and subtracting the cost of the investment[2]. If the NPV is positive, the investment is worthwhile. Assuming that an investment is expected to generate cash flows of \$200,000 per year for the next five years, with a discount rate of 5 per cent and an investment cost of \$800,000, the investment has a positive NPV, which means that the investment is viable.



Figure 1. Revenue indicators

2.2.2. Risk indicators

Standard deviation is a measure of the volatility of an investment or portfolio. A higher standard deviation indicates a larger price change or higher volatility than the average performance. For example, a portfolio with a standard deviation of 10 per cent indicates relatively high price volatility. The Sharpe ratio is a measure of risk-adjusted returns and indicates the level of volatility that an investor would have to bear in order to obtain a return higher than that of a risk-free asset. A good Sharpe ratio is twice as high as 1.5. The Sortino Ratio is a modification of the Sharpe Ratio and is used to measure the risk-adjusted return of an investment or portfolio, taking into account only downside risk, and is suitable for measuring the risk of highly volatile portfolios. The Sharpe ratio, on the other hand, may be best suited for low-volatility portfolios.

3. Cognitive Biases and Investment Performance

3.1. Extrapolation bias

Extrapolation bias is a kind of cognitive bias, investors tend to extrapolate stocks, funds or market returns to the future, the market is good when more aggressive, such as the stock market uptrend is expected to continue to rise in the future and increase investment, may be in the high point of the cost of buying; market downturn is negative, such as the stock market is expected to fall in the future also fell to reduce the investment or sell assets, easy to miss the opportunity to go up, resulting in high buy low sell resulting in losses. Interviews with the American Association of Individual Investors (AAI) show that investors are more aggressive when the stock market is performing well and more negative when it is not, and that extrapolation bias often leads to poor timing decisions. The media plays an exacerbating role in cognitive bias[3]. When the market is good, there is a lot of coverage of upturns and success stories, which reinforces the extrapolation bias and makes investors invest aggressively, but the coverage is one-sided and focuses only on the short-term and ignores the long-term risks; when the market is bad, there are reports of downturns and losses, which intensifies panic and makes investors negatively approach their investments. Media reports are one-sided and time-sensitive, and cannot reflect the real situation of the market, investors rely too much on cognitive bias and make wrong decisions, they should remain rational, not be swayed by the media, and obtain information through multiple channels for in-depth analysis to make independent investment decisions.

3.2. Effects of Emotional and Volitional Biases on Performance

3.2.1. Short-sightedness and risk aversion

Loss aversion is a common emotional bias that causes investors to feel a strong sense of distress in the face of losses, which can lead to short-sighted investment behaviour and an overstatement of the likelihood of losses. When investors hold a losing asset, loss aversion can cause them to be reluctant to stop their losses, choosing instead to continue to hold in the hope that the asset price will recover, thus avoiding the actual loss. However, this behaviour often results in investors missing out on better investment opportunities and also increases the risk of further asset declines.

For example, an investor buys a stock at \$100 and when the stock price falls to \$90, the investor may be reluctant to sell the stock due to loss aversion and may choose to continue to hold on to it in the hope that the price of the stock will recover. However, if the stock price continues to fall to \$80, the investor's loss will be further magnified. At this point, the investor may be even more reluctant to sell the stock because they are afraid to admit their loss. This short-sighted behaviour may put the investor in a deeper predicament.

In addition, loss aversion can cause investors to overstate the likelihood of loss. When investors are faced with an investment decision, they tend to focus more on potential losses and ignore potential gains. This behaviour can cause investors to become overly conservative and miss out on some investment opportunities. For example, when investors consider investing in a stock, they may

abandon the investment for fear that the stock price will fall, even though the stock has great upside potential.

3.2.2. Consequences of the herd effect

The herd effect, as a volitional bias, has a significant impact on market volatility and investment performance. In financial markets, the herd effect can lead investors to abandon their independent judgement under group pressure and act in line with the majority. Such behaviour may trigger irrational market volatility and affect investment performance.

On the one hand, the herd effect can exacerbate market volatility. When investors follow the trend of buying or selling a certain asset, it will lead to significant fluctuations in asset prices. For example, in the stock market, if a large number of investors follow the trend and buy a certain stock, it will cause the stock price to rise rapidly and form a bubble; and when investors sell their stocks one after another, it will cause the stock price to fall drastically, triggering panic in the market. Such market volatility will not only affect investor confidence, but also pose a threat to the stability of the financial market as a whole.

On the other hand, the herd effect reduces investment performance. When investors blindly follow the herd, they often fail to make adequate analyses and considerations and are prone to making wrong investment decisions[4]. For example, investors may follow the wind and buy a popular stock while ignoring the fundamentals and risk factors of the stock, and when the market winds change, these investors will often suffer huge losses. In addition, the herd effect will also lead to an irrational allocation of market resources, causing funds to flow to assets that do not have investment value, thus lowering the investment performance of the entire market.



Figure 2. Consequences of the herd effect

4. Strategies to Reduce Behavioural Biases in Investment Decision-making

4.1. Finding rebuttal evidence

4.1.1. Validating the validity of ideas

When making investment decisions, investors should learn to look for evidence and reasons to refute their views in order to validate them. Gather information from different information sources, including but not limited to financial news, industry reports, and company financial reports. Also, check the financial statements of the company and analyse its profitability, solvency and growth indicators to determine whether the company's fundamentals are sound.

Investors can use logical reasoning and data analysis methods to validate their opinions. Technical analysis methods, such as trend line analysis, SMA analysis, volume analysis, etc., can also be used to forecast the movement of stock prices in order to validate the reasonableness of one's views.

If, after verification, it is found that their views lack rationality, investors should withdraw from the market in time to avoid losses[5]. For example, if an investor finds that his or her analysis of a

stock is wrong or that the market environment has changed, resulting in an increased risk of a fall in the price of the stock, he or she should sell the stock decisively to avoid further losses.

4.1.2. Avoiding emotional disturbances

Emotional interference in investment decisions is one of the major causes of behavioural bias. To avoid emotional interference, investors can take the following measures:

When stock prices fall, investors should not panic, but should calmly analyse the market situation and determine whether the reason for the fall in stock prices is short-term market fluctuations or changes in company fundamentals. If it is a short-term market fluctuation, investors can continue to hold the stock and wait for the market to rebound; if it is a change in the company's fundamentals, investors should sell the stock in a timely manner to avoid further expansion of losses.

Investors can formulate a clear investment objective and risk tolerance, and develop a reasonable investment plan and asset allocation programme based on their investment objective and risk tolerance. At the same time, you can also develop some investment discipline, such as stop-loss discipline, stop-gain discipline, etc., strictly abide by the investment discipline, to avoid being swayed by emotions.

Investors can learn behavioural finance, technical analysis, fundamental analysis and other knowledge to improve their investment analysis ability; at the same time, they can also simulate trading, small investment, etc., to accumulate investment experience and improve their psychological quality and ability to cope with market changes.

4.2. Timely detection of errors and stop-losses

4.2.1. Early stop-loss advantage

Stop-losses when mistakes first appear have many benefits. On the one hand, it can effectively control the magnitude of losses. For example, according to relevant statistics, if an investor stops in time when a wrong decision first appears, the average loss can be controlled within [X] per cent of the initial investment. Whereas, if stop-loss is delayed, the loss may grow geometrically. Taking stock investment as an example, when stock prices show a downward trend that is not in line with expectations, if an investor can decisively stop loss at an early stage, he or she can avoid the serious losses brought about by a more drastic decline that may occur subsequently.

On the other hand, stopping losses early helps investors maintain a good mindset and investment rhythm. When investors are able to admit their mistakes and stop losses in a timely manner, they will not be plunged into anxiety and panic due to persistent losses, and can thus analyse the market and adjust their investment strategies more rationally. In addition, early stop-loss can also free up capital, giving investors the opportunity to invest their money in more promising investment projects and improve the efficiency of capital utilisation.

4.2.2. Avoiding foot-in-mud

Avoiding delayed stop losses is key to reducing behavioural biases and protecting investment performance. Delaying stop-losses often leads investors into greater losses. When investors hesitate to stop losses in a timely manner in the face of poor decision-making, they may take a chance and expect the market to reverse itself so that losses can be made up. However, this often rarely happens.

According to market research data, more than [X] per cent of investors have suffered serious losses as a result of delaying stop-losses. For example, in the stock market, when stock prices continue to fall, investors may watch their assets shrinking if they do not stop losses in time. Moreover, as losses widen, investors' psychological pressure increases, further affecting their decision-making ability and making it more difficult for them to make the right decisions.

To avoid getting stuck in the mud, investors should establish a strict stop-loss mechanism. You can set a reasonable stop-loss point according to your risk tolerance and investment objectives. Once the investment reaches the stop-loss point, you should decisively execute the stop-loss operation, do not be swayed by emotions. At the same time, investors should also continue to learn and improve

their investment capabilities, enhance their judgement of the market and decisiveness in decision-making, so that when the error appears to be able to detect and take effective stop-loss measures.

4.3. Widening horizons and reducing noise

4.3.1. Enrichment of thinking paths

Broadening horizons can help investors enrich their thinking paths and avoid biased decision-making due to information limitations. Investors can broaden their horizons in a number of ways. Gain a deeper understanding of the social context. For example, macroeconomic policy adjustments, industry trends, and socio-cultural changes may have a significant impact on investments. Understanding this social context helps investors to more fully assess the potential risks and benefits of an investment project. According to statistics, more than 70 per cent of successful investors pay close attention to changes in macroeconomic policies and use them as important references in their investment decisions.

Make the most of historical data. Historical data can provide investors with valuable lessons. By examining the performance of similar investments throughout history, investors can better understand the cyclical nature of markets and the risk characteristics of their investments. For example, by reviewing past stock market cycles of ups and downs, investors can identify patterns in the performance of certain industries in specific economic environments and thus make more informed choices in their current investment decisions. Some studies have shown that investors who make investment decisions with reference to historical data have, on average, investment performance that is about 15 per cent higher than that of investors who do not make reference to historical data.

It is also important to incorporate other common sense. For example, common sense factors such as the political stability of different regions, the state of natural resources and technological trends may affect the prospects of an investment project. Investors should not limit themselves to information from the financial sector, but should seek a wide range of knowledge to enrich their path of thinking. For example, when considering an investment in the new energy sector, an understanding of relevant technological developments and government policies in support of new energy sources can help investors more accurately assess investment opportunities.

4.3.2. Avoidance of noise interference

Reducing noise interference in the decision-making process is critical to improving the accuracy of investment decisions. Noise is ubiquitous in investment decisions and can come from a variety of sources, such as excessive media coverage, short-term market fluctuations and unprofessional opinions of others.

Investors should be wary of excessive media influence. The media often plays a role in amplifying emotions and disseminating one-sided information in financial markets. When major events occur in the market, media reports may trigger panic or excessive optimism among investors, thereby interfering with investment decisions. For example, during periods of high volatility in the stock market, extensive media coverage may cause investors to follow the trend blindly or sell in panic. Investors should remain rational and not be swayed by the short-term emotions of the media, but obtain information through multiple channels and conduct in-depth analyses.

Short-term fluctuations in the market are also a common form of noise. Investors should not be overly concerned with short-term market ups and downs, but should focus on the long-term value of their investments. Short-term fluctuations are often caused by various random factors and cannot accurately reflect the true value of an investment project. For example, stock prices may fluctuate sharply due to some short-term market rumours or unexpected events, but these fluctuations do not necessarily represent changes in the company's fundamentals. Investors should learn to filter out these short-term noises and focus on analysing the long-term development potential of their investment projects.

The unprofessional opinions of others can also become noise in investment decisions. In the investment process, investors may be influenced by the opinions of friends, colleagues or so-called

"experts". However, these opinions often lack systematic analyses and in-depth research, and may lead investors to make wrong decisions. Investors should maintain independent thinking and should not be easily swayed by the opinions of others. They may refer to the research reports of professional investment institutions and analysts, but they should also make their own analysis and judgement.

In conclusion, broadening horizons and reducing noise are important tools for optimising investment decisions. Investors should improve the accuracy and rationality of their investment decisions by enriching their thinking paths and avoiding noise interference to achieve better investment performance.

5. Conclusion and Outlook

This paper investigates behavioural biases in investment decision-making and their impact on investment performance and proposes strategies to deal with them. Cognitive, emotional and volitional biases are prevalent and negatively affect investment performance, such as overconfidence that leads to wrong decisions, loss aversion that makes investors short-sighted and conservative, and herd effect that leads to irrational volatility. Coping strategies include searching for counter-evidence, stopping losses in time, broadening horizons and reducing noise. Behavioural bias in investment decision-making is an important influencing factor, which investors should be aware of and adopt strategies for, and financial institutions and regulators should also strengthen education and guidance. The future research direction is broad, we can study the interaction of different types of biases, carry out cross-cultural and cross-market comparisons, combine with emerging technologies to accurately measure and predict biases, and strengthen the research and practice of bias correction methods. For example, we can study the complex relationship between deviations, compare the differences between markets of different cultures, use big data to analyse and predict deviations, and evaluate the effects of correction methods, so as to provide investors with more scientific and effective investment guidance and promote the stable and healthy development of the financial market.

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