

Analysis of the Formation Path of Investors' Risk Perception Bias and Its Impact on Decision-Making Efficiency

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Abstract: In the capital market, the efficiency of investor decision-making is directly related to the efficiency of resource allocation and the smooth operation of the market. Risk perception bias, as a common systemic phenomenon in investor decision-making, is not an accidental product, but the result of the interaction between individual cognitive traits and external environmental factors. This article is based on the theoretical frameworks of behavioral finance and cognitive psychology, systematically deconstructing the formation logic and evolutionary path of this bias, analyzing the core driving mechanism from the dual dimensions of individual cognition and external environment, and exploring its multidimensional impact on decision-making timeliness, accuracy, and rationality. Research has shown that individual cognitive limitations, information asymmetry, and social interaction effects are the core driving factors for bias formation, and this bias significantly weakens investor decision-making efficiency by distorting the risk assessment system, interfering with the internal logic of decision-making, and exacerbating market irrational behavior. The research conclusion of this article provides theoretical reference and practical inspiration for investors to optimize decision quality and regulatory authorities to improve market mechanisms.

Keywords: Investor risk perception bias, formation path, decision-making efficiency, cognitive bias, market environment.

1. Introduction

The effective operation of the capital market relies on rational decision-making by investors, but in reality, both mature and emerging markets commonly exhibit irrational behavior caused by decision-making biases. The high proportion of individual investors and differences in professional competence in China's capital market make the impact of risk perception bias on decision-making efficiency more prominent. Common behaviors in the market, such as sector speculation and price chasing, are essentially irrational decision-making results driven by this bias, which not only harms the interests of individual investors but also affects market pricing efficiency and stable operation.

Risk perception bias is a subjective judgment made by investors based on their own cognition and external information, which deviates from the objective reality of the risk of the investment target. The assumption of "rational person" in traditional financial theory is difficult to explain this universal phenomenon, and the rise of behavioral finance provides a new perspective. The prospect theory and cognitive bias theory proposed by Kahneman and Tversky reveal the impact of individual cognitive limitations on risk assessment [1]; Domestic scholars' research on the A-share market has also confirmed a significant correlation between risk perception bias and decision-making efficiency.

The current academic research on risk perception bias mostly focuses on a single influencing factor, lacking a systematic sorting of the formation path, and its impact mechanism on decision-making efficiency also needs to be further deepened. Based on this, this article focuses on the formation logic of risk perception bias, deconstructs the formation path from both individual and external dimensions, deeply analyzes its specific impact on decision-making efficiency, and proposes optimization solutions. This study can not only enrich the application of behavioral finance in

the field of investor behavior, but also provide practical guidance for rational decision-making of investors and healthy market development, with both theoretical value and practical significance.

2. The Core Connotation and Theoretical Basis of Investors' Risk Perception Bias

2.1. Definition of Core Connotation

Investor risk perception bias is the deviation between subjective risk perception and objective risk level, which is not a random error, but a systematic and regular cognitive bias. Essentially, risk perception is the subjective judgment process of investors towards uncertain factors in the investment environment, influenced by multiple factors such as individual cognitive structure, information processing ability, and emotional state. Unlike objective risks, subjective risk perception has significant individual differences, and the same investment subject may present vastly different levels of risk in the eyes of different investors. These differences will directly affect subsequent decision-making behavior.

Risk perception bias is not an absolute 'cognitive error', but a simplified cognitive pattern formed in human information processing to adapt to complex environments. In the context of information overload in the capital market, investors find it difficult to conduct comprehensive and rational analysis of all information, and can only simplify the decision-making process through intuition, experience, etc. This "cognitive shortcut" inevitably leads to bias while improving decision-making speed [2].

2.2. Theoretical Support System

Behavioral finance provides core theoretical support for explaining investors' risk perception bias, breaking through the traditional financial theory's assumptions of "rational

people" and "efficient markets", and incorporating cognitive psychology research results into the financial decision analysis framework. Prospect theory proposes that investors tend to be risk averse when facing returns, and risk averse when facing losses. This "loss aversion" mentality can induce risk perception bias, which in turn affects decision-making choices. The relevant theories of cognitive psychology further explain the mechanism of bias formation from a micro level: the theory of cognitive dissonance points out that when investors' cognition and behavior conflict, they will alleviate the psychological conflict through cognitive adjustment, which may lead to a deviation of risk perception from objective reality; The bounded rationality theory holds that human cognitive abilities have inherent limitations, making it difficult for investors to obtain complete information and achieve absolute rational logical reasoning when making decisions. They can only pursue "satisfactory decisions" within a limited range, which leads to interference in investors' risk assessments and ultimately forms systematic perceptual biases. These theories complement each other and together form an analytical framework, providing solid support for exploring the formation path and impact mechanism of deviations in the future.

3. The Formation Path of Investors' Risk Perception Bias: An Analysis at The Individual Cognitive Level

3.1. Cognitive Biases in Information Processing

Investors' risk perception begins with information processing, and cognitive psychology has long pointed out that human processing of information is inherently limited and prone to various biases. Selective attention is one of the key incentives, as investors are more willing to focus on information that meets their expectations and turn a blind eye to opposite risk signals - for example, when the market situation is good, they will continue to receive positive news and completely ignore risks such as macroeconomic downturns and intensified industry competition, thereby underestimating investment risks.

Inexperienced investors are often more prone to overconfidence, overestimating their information analysis ability and decision-making accuracy, believing that they can accurately grasp market trends, and their perception of risk is also overly optimistic. There is a common overconfidence effect among individual investors in trading, who always feel that their investment level is higher than the average, and then make investment behaviors that exceed their risk tolerance [3].

The anchoring effect can also distort risk perception. When investors evaluate risk, they often treat a certain initial information as an "anchor" and ignore other related influencing factors. For example, they may use the historical highest price of stocks or recent market returns as a reference, mistakenly believing that the current price is at a low level or overestimating future returns, ultimately ignoring potential investment risks.

3.2. The Influence of Memory Retrieval and Experience Dependence

Memory is an important reference for risk perception, but deviations in memory mechanisms can lead to perceptual distortion. The availability of inspiration makes investors tend

to evaluate risks based on easily retrievable memory information. Low probability, high impact risk events are often overlooked because they are not frequently mentioned. For example, after the capital market stabilizes for a long time, investors' memory of extreme risks such as financial crises will fade, thereby reducing their perception level.

Experience dependence can easily lead to a "path dependent" bias, where investors tend to judge current risks based on past investment experience: past gains may lead to lower risks in similar investments, while losses may lead to overestimation of similar risks. This dependence can lead to a disconnect between risk perception and objective reality when the market environment changes, such as applying traditional industry investment experience to emerging industries while ignoring their unique risks such as technological iteration and business models.

Emotional memory also affects risk perception, and negative emotional memory is more persistent. After significant investment losses, it may form a "risk aversion" mentality, leading to overestimation of risk in subsequent investments; And sustained profits may give rise to a "risk appetite", leading to blind risk-taking.

4. The Formation Path of Investors' Risk Perception Bias: External Environment and Social Interaction Level

4.1. Market Information Asymmetry and The Impact on Information Quality

Asymmetric information in the capital market is an important external cause of risk perception bias. Insufficient and untimely information disclosure makes it difficult for investors to obtain comprehensive information about the subject matter, and relying solely on limited public or second-hand information to assess risks can lead to perception bias. Some listed companies do not disclose information in a standardized manner, conceal risks or exaggerate performance, causing investors to misjudge real risks and form a bias of "risk underestimation".

The uneven quality of information exacerbates deviations, and the channels for information dissemination in the capital market are complex. The information released by self media, financial bloggers, and others lacks strict scrutiny, and there is no shortage of false, one-sided, or misleading content. Due to insufficient professional discernment ability, investors are easily misled by false positive news and underestimate risks, or excessively amplify risks under the influence of extreme negative information, forming a "panic" perception.

Information overload also breeds bias. The capital market generates a massive amount of various types of information every day, making it difficult for investors to comprehensively screen and analyze in a short period of time. They can only rely on fragmented information to make decisions [4], which can easily lead to incomplete risk awareness. For example, judging market risks based solely on short-term fluctuations in macroeconomic data, ignoring long-term trends and industry differences.

4.2. Transmission Effect of Social Interaction and Market Atmosphere

Investors make non isolated decisions, and social interaction and market atmosphere generate group bias

through the "contagion effect", with herd behavior being the most typical. Investors are easily influenced by others and blindly follow the trend, distorting independent risk judgments. When popular market sectors are hyped up, a large number of investors will follow the trend and buy due to the low risk of being sought after by the public, ignoring potential risks such as overvaluation and lack of performance support, further strengthening individual bias.

The influence of media and public opinion guidance is significant. Financial media reports tend to directly influence investors' risk perception, and some media exaggerate hotspots and returns to attract traffic, leading to "risk underestimation"; When the market fluctuates, panic reports exacerbate risk aversion and encourage investors to overestimate risk excessively.

Interaction in investment communities also reinforces biases. Investors exchanging views in the community can easily form homogeneous cognition, and the biased judgments of "opinion leaders" may drive overall cognitive deviation. Community "cognitive resonance" will make investors more confident in their own judgments, further deviating from reality.

5. The Multidimensional Impact of Investors' Risk Perception Bias on Decision-Making Efficiency

5.1. Reducing Decision Timeliness: The Double Trap of Delay and Impulsiveness

Timeliness of decision-making is the core of decision-making efficiency, and risk perception bias undermines it from two aspects. On the one hand, excessive risk aversion leads to delayed decision-making: when investors overestimate risk, they adopt a wait-and-see attitude towards reasonable opportunities, and even during the current market window, they dare not take action. For example, when high-quality stocks experience short-term fluctuations and declines, excessive risk averse individuals misjudge the risk of wait-and-see and miss the opportunity to buy at a low price. On the other hand, excessive risk appetite triggers impulsive decisions: when investors underestimate risk, they are easily tempted by short-term returns and make hasty decisions without fully analyzing the market and their own tolerance. For example, when the market speculates on concepts, hasty buyers face losses after the speculation recedes. Both situations result in a misalignment of decision-making timing and a decrease in overall decision-making efficiency.

5.2. Distortion of Decision Accuracy: Mismatch of Risk and Benefit

Decision accuracy determines decision efficiency, while risk perception bias distorts risk reward matching and reduces its level. Overconfidence leads to risk underestimation, causing investors to ignore the principle of risk return symmetry and blindly pursue high returns. For example, investors overestimate their own abilities and frequently engage in short-term trading, ignoring short-term high risks and trading costs, resulting in significant deviations between decision results and expectations [5]. The risk overestimation caused by risk aversion leads investors to excessively seek stability, even if they have strong tolerance, they choose low yield targets, miss reasonable returns, and result in portfolio returns being lower than market levels for a long time. In

addition, biases such as anchoring effects and availability inspirations can distort risk return assessments, such as misjudging the risk return ratio of anchored stocks based on historical prices, excessive concentration of funds on a single target, and increased non systematic risk.

5.3. Aggravating Decision Irrationality: Circular and Amplifying Market Fluctuations

Risk perception bias amplifies market volatility and reduces overall decision-making efficiency through group behavior. Individual bias, when formed through social interaction, can lead to irrational market fluctuations, while volatility reinforces individual bias, forming a "bias volatility bias" cycle. In the bull market, the group underestimated the risk and pushed up the price to form a foam. After the foam burst, the collective selling intensified and fell, seriously distorting the market pricing mechanism; For individuals, after a market decline, they are prone to excessive aversion to risk and continue to be conservative. When the market rises, they underestimate the risk and increase high-risk investments, falling into the dilemma of "chasing after the rise and killing the fall", and their decision-making efficiency continues to be low.

6. Optimizing Decision Efficiency Path Based on Forming Path

Improving individual cognitive abilities of investors requires shaping rationality from cognition to behavior: regulatory authorities, securities firms, and industry associations can jointly carry out systematic investor education, popularize knowledge of behavioral finance and cognitive psychology, help investors identify their own cognitive biases, clarify their formation mechanisms and hazards, such as explaining common biases such as overconfidence and anchoring effects to guide active avoidance [6]; Investors also need to actively improve their information processing capabilities, pay attention to the authority and comprehensiveness of information sources, verify the authenticity of information through multiple channels, and avoid relying on a single information source; At the same time, regularly review decisions, analyze the impact of cognitive biases, adjust cognitive models to reduce the interference of biases on decision-making efficiency.

Optimizing the external market environment can reduce external incentives for bias formation: regulatory authorities need to improve the information disclosure system, strengthen the supervision of information disclosure of listed companies, crack down on illegal activities such as false and concealed disclosure, and regulate the dissemination of financial and self media to combat false advertising and misleading reporting; We should also strengthen the supervision of market speculation, curb irrational behaviors such as subject matter speculation, guide the market to return to value investing, and encourage long-term investment concepts; In addition, it is necessary to establish a sound investor protection mechanism, smooth the channels for safeguarding rights, reduce the cost of safeguarding rights, ensure that investors receive compensation when they suffer losses, and force market entities to regulate their operations.

Making good use of investment tools and strengthening technical support can help investors make more rational decisions: institutions such as securities firms and fund

companies may consider developing diversified investment products such as index funds, ETFs, FOFs, etc., to provide investors with more asset allocation plans that can diversify risks; Using big data and artificial intelligence technology to analyze investors' risk preferences and investment habits, timely identify their cognitive biases, provide targeted risk warnings, and issue objective investment target evaluation reports; In addition, tools such as decision lists and risk assessment scales can also be promoted to guide investors to evaluate their risk tolerance step by step, analyze the risks of investment targets, avoid making impulsive decisions, and reduce the impact of cognitive biases through standardized processes.

7. Conclusion

Investor risk perception bias is a product of the interaction between individual cognitive traits and external environment, and its formation path is systematic and regular. At the individual cognitive level, information processing bias, memory dependence, and emotional influence constitute internal mechanisms; At the external environmental level, information asymmetry, media guidance, and social interaction are the core factors that lead to a deviation in risk perception from objectivity, resulting in multidimensional negative impacts on decision-making efficiency. This impact is mainly reflected in three aspects: firstly, it triggers decision-making delays or impulses, reducing timeliness; The second is to distort the matching of risk and return, which damages accuracy; The third is to amplify collective irrationality, exacerbate market volatility, lower decision-making efficiency, harm investor returns, and affect the allocation and stability of capital market resources. In response to the above issues, this article proposes three optimization paths: first, to enhance individual investors' cognitive abilities, reduce cognitive biases through education, information processing skills training, and decision-making review; The second is to optimize the external market environment, improve information disclosure, create a rational atmosphere, strengthen investor protection, and reduce external incentives; The third is to strengthen investment tools and technical

support, relying on diversified investment products, financial technology tools, and rational decision-making processes to assist in rational decision-making. It should be noted that risk perception bias is the result of the combined effect of human cognitive laws and market environment, and completely eliminating it is not feasible in reality. The optimization core lies in helping investors recognize and avoid bias, and controlling the impact within a reasonable range. Future research can combine specific market scenarios to explore the heterogeneity of bias among different types of investors, providing reference for formulating precise plans. In the context of the sustained development of the capital market, this has important practical significance in guiding investors to make rational decisions and promoting the healthy and stable development of the market. Only by working together at the individual and market levels can we effectively reduce the negative impact of deviations and improve the overall decision-making efficiency and resource allocation level of the capital market.

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