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Gender Differences in Behavioral Bias and Influencing Investment Decisions

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Abstract: This study explores the impact of behavioral biases in gender differences on investment decisions through a literature review and case study. The traditional theoretical assumption in finance is that investors are rational. They are able to make optimal decisions based on all available information. However, real investors are often influenced by emotions, biases, and cognitive errors that lead to irrational decisions. Therefore, researchers have introduced psychological studies into traditional finance. Psychological studies have shown that people are often influenced by cognitive biases in the decision-making process. These biases are particularly significant on investment decisions, such as overconfidence bias, overreaction bias, regret avoidance bias, self-attribution bias, framing effect bias, and reference point bias. Behavioral finance assumes that individual investment decisions are imperfectly rational. It has been found that gender differences have a significant impact in behavioral biases, thereby affecting the behavioral decisions of investors. Among these common cognitive biases, risk aversion, overconfidence, anchoring effect, and loss aversion are more significant for gender differences in investment decisions.

Keywords: Investment decisions, Overconfidence bias, Anchoring effect, Risk aversion, Loss aversion.

1. Introduction

The efficient market hypothesis (EMH) is the cornerstone of traditional finance, which argues that market prices reflect all available information [1], and therefore markets are always efficient and investors cannot easily obtain excess returns through informational advantages. Behavioral finance challenges the EMH by pointing out that irrational behaviors of market participants (e.g., emotionally driven, cognitive biases) can cause market prices to deviate from their intrinsic value [2]. Behavioral finance explains market inefficiencies, such as market bubbles and crashes, by studying these deviations.

In the past decades, different scholars have found that behavioral finance can explain some irrational investor behaviors that traditional finance could not explain in the past.

The second difference between men and women in terms of psychological factors is that there are differences in brain structure and function between the two, which may lead to gender differences in cognitive abilities, emotional processing, and behavior. The second point, psychological traits, some studies have proved that men and women differ in certain personality traits, which can affect the development of behavioral personality of an individual [3]. Investment decision is the process by

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which an investor chooses to sell or buy an asset in a financial market or other investment field based on his or her financial goals, risk tolerance, market analysis, and related factors. The key to investment decision is to evaluate the potential return and risk of various investment opportunities and then make a choice that will achieve the financial goals.

The main objective of this study is to emphasize the impact of gender differences in cognitive biases on investment decisions. This study aims to enhance individuals' understanding of the gender differences in cognitive biases, enabling them to avoid these biases and make more informed decisions.

2. Intellectual explanation of behavioral biases

The term behavioral bias emerged due to the questioning of traditional finance and finance modelling. Traditional finance assumes that people are rational and can always make optimal decisions to realize their personal utility; however, this assumption is not true [4]. People are subject to cognitive limitations in the decision-making process, as Herbert Simon's theory of "limited rationality" suggests. Simon argued that humans cannot be fully rational in decision-making but can only make decisions that are "good enough" [4]. Additionally, cognitive biases, emotions, and other influences lead to decisions that deviate from rationality. Therefore, behavioral finance studies the psychology of investors to understand how they make investment decisions and how behavioral factors influence them. In addition to this, Daniel Kahneman and Amos Tversky were the pioneers of behavioral finance and studied cognitive biases and decision psychology to lay the foundation for behavioral finance and proposed prospect theory [5]. Prospect theory states that people's decision-making behavior is not always rational due to behavioral biases and psychological factors, which is different from the traditional expected utility theory. People's decision-making behavior in the face of risk and uncertainty is significantly different from the rational behavior predicted by the traditional expected utility theory, and the common behavioral biases are as follows:

- **Loss aversion :** Loss aversion refers to the phenomenon where people are significantly more sensitive to losses than to gains of the same magnitude. Kahneman and Tversky observed that the psychological impact of a loss is approximately 2 to 2.5 times greater than the satisfaction derived from an equivalent gain. This concept was demonstrated through their controlled experiments [5].
- **Attributional bias :**Attributional bias refers to the systematic errors people make in interpreting their own behavior or that of others. This bias can be divided into internal attributions, where behaviors are attributed to personal qualities such as ability and effort, and external attributions, where behaviors are attributed to external factors such as situational influences. A common attribution error is the tendency to overestimate the role of internal factors in others' behaviors while underestimating external factors [6]. Self-interest bias specifically involves attributing personal successes to internal factors and failures to external circumstances [7]. These two are commonly used in finance.
- **Overconfidence bias :** People overestimate their own knowledge, intelligence, ability, and judgment, believing that they are capable of more than they actually are. Overconfidence causes people to overestimate their abilities, underestimate risks and exaggerate their ability to control things. In the psychological literature, overconfidence has been studied as the tendency to overestimate the accuracy of one's decision-making and the precision of one's knowledge [8,9], while the overconfidence bias has been studied as a general tendency of men to be more overconfident than women. Financiers Brad Barber and Terence Odean have found in their research that single men have the highest turnover of investments, married men the next highest, married women the next highest, and single women the lowest so overconfidence can lead investors to be too sure of their own ability to make frequent transactions to increase the loss of

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income (turnover fees) and thus reduce the return of the portfolio [10]. In behavioral economic and financial models, overconfidence usually manifests itself as a false perception of signal reliability and leads to an over-emphasis on private information.

3. Review of Related Literature

Numerous literatures have addressed the impact of gender on investment behavior and behavioral biases in decision-making. D.Srijanani & T.Vijaya's study proved that males and females behave differently in investment decision-making [11]. Zuckerman and Kuhlman found that males are involved in more overall risky behavior than females in financial matters [12]. Prince found that males tend to perceive themselves as more capable [13]. Mishra and Metilda conducted a study involving 309 mutual fund investors and concluded that men exhibit higher levels of overconfidence compared to women [14]. This overconfidence was strongly linked to self-attribution bias, where individuals attribute success to their own skill while dismissing external factors. Prasad, Hanuman, and Mohta observed that men are more overconfident in their investment decisions, while women exhibit higher levels of loss aversion [15]. Similarly, Bajtelsmit and Bernasek found that women's investment strategies are generally more risk-averse than men's, leading to different portfolio outcomes [16].

3.1. Gender differences in overconfidence bias and implications for investment decisions

There are gender differences in overconfidence, with a general trend that men are overconfident, and women are more cautious. Barber and Odean used account data from a large discount brokerage firm, covering the period 1991-1997, to provide empirical evidence that men are more likely to exhibit overconfidence than women, which affects investment behavior and decision making [10]. In addition, Indian researchers experimentally found that overconfidence is a person's overestimation of his or her actual abilities, which can have a greater impact on investment decisions. Due to capacity constraints, this analysis relies on real-world examples to illustrate the argument. In 2015, Bill Ackman, the founder of the hedge fund Pershing Square, heavily invested in Valeant Pharmaceuticals, aiming to boost its value through aggressive mergers and acquisitions. Although the market questioned Valeant's business model and financial situation, Ackman maintained confidence in his decision, citing the company's aggressive growth strategy and its potential to generate long-term value. The investment ultimately failed and resulted in a significant loss. The second story is about Bill Ackman's attempt to short Herbalife. Bill Ackman publicly announced in 2012 that he had shorted Herbalife and accused the company of being a pyramid scheme and was very confident that regulators would shut Herbalife down, so he invested a lot of money in the program to the tune of billions of dollars [17]. Despite market performance and opposition from other investors, Ackman persisted in showing jealous confidence in his judgment. In the end, Herbalife operated well after regulatory scrutiny and Ackman's 2018 admission of failure resulted in hundreds of millions of dollars in losses. Common to both cases, Ackman showed overconfidence in himself, ignoring warning signs as he invested large sums of money and publicly promoted his investment ideas, resulting in his failure to reflect on unfavorable situations and make strategic adjustments in a timely manner. Why men are more likely to be overconfident is worth thinking about; due to the patriarchal society, society will often think that men are the masters of the family and the workplace, and society has a certain bias towards men, men's success is very easy to be recognized, which will stimulate the self-confidence of the boys so that they are too sure and believe in themselves.

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3.2. Gender differences in loss aversion and the impact on investment decisions

Behavioral economists Daniel Kahneman and Amos Tversky suggest that loss aversion is when people make decisions in which the pain of a loss is much greater than the pleasure of an equal amount of gain. Powell and Ansic showed that women are more reluctant to take risks, especially when facing the risk of loss, by giving experimental participants choices in simulated financial decision-making tasks [18]. It was shown that women preferred low-risk choices when faced with financial decisions, while men were more willing to take risks. The studies are all based on experimental results to show that. Their experiments are straightforward in the information they are based on. The researchers provided decision-making scenarios for the participants to choose investment options with different levels of risk and then analyzed the decision-making differences.

Jianakoplos and Bernasek in a study on household financial decision-making used data from the 1992 American Consumer Survey and found that single women's portfolios were more skewed toward low-risk assets, suggesting that women are more loss averse and risk averse [19]. The data for this study was targeted by selecting single male and single female households from the 1992 SCF data to ensure that the analysis focused on independent decision-makers without a partner and was modeled using regression analysis. Prasad and Mohta found that women are more loss averse than men.

Barber and Odean, who teach at the University of California, published a study in which they surveyed 35,000 brokers' accounts over a period of nearly six years and found that women tend to invest in less risky stocks in their common stock portfolios, indicating that women are more cautious in their investment decisions [10]. This is because the social and environmental culture has always influenced women. The social environment usually tells men that they need to be successful in life, while women are expected to be cautious, not to stand out, and to take care of their families. These beliefs influence women to be more conservative in their behavioral choices and investment decisions, which tends to make women more successful than men. Women are naturally excellent investors (Warren Buffett).

3.3. Gender Differences in the Anchoring Effect and the Impact on Individual Investment Decisions

The anchoring effect refers to the tendency to rely on initially acquired information or a number and use it as a reference point to adjust in the decision-making process, even though the number or information is irrelevant or inaccurate to the actual decision. For example, when buying a product, the actual value of the product is $420, but the merchant marks the original price at $920 and the discounted price at $580, so people will only compare the original price and the discounted price rather than the actual value [20,21]. This is called the anchoring effect. There are relatively few studies on the differences between genders in the anchoring effect, so there are limited literature references and examples.

Jetter and Walker explored the performance of the anchoring effect across genders by asking participants to estimate the value of a number of unknowns to provide different anchors and then observing the results of the participants' estimations [22]. It was found that both males and females experience the anchoring effect when confronted with an anchor point, but females adjust more, making them more susceptible to the anchor point.

The anchoring effect is obvious in financial markets. For example, in 2011, the stock price of Bank of America fell sharply in comparison with its historical high [22]. Many investors saw the past high as an anchor point, so they were pessimistic about the future, while Warren Buffett thought the stock had great potential and bought it decisively, which proved to be a correct decision. This example shows the influence of the anchoring effect on the decision of the average investor. Ordinary investors

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are very susceptible to behavioral biases such as the anchoring effect that affect investment decisions. Once these common cognitive biases are breached, it can lead to unexpected success.

4. Conclusion

This study summarizes much of the literature as well as shows many examples exploring the existence of gender differences in behavioral biases and influencing individual financial decision-making behavior. This study can help explain why men and women differ in investment strategies, and risk preferences, and can better explain the psychological factors behind financial decisions. In addition, financial advisors can better provide more personalized investment advice based on gender. For women, there is a need to focus more on risk management and minimize the effects of anchoring. For men, there is a need to invest rationally and control overconfidence. This can be better served. Financial products could be designed to better meet gender-specific investment needs, with more conservative portfolios likely to be more attractive to women and higher potential returns more attractive to men. Financial education can also be improved to promote market efficiency to better understand and apply gender differences and diversify investment behavior. For society, by studying gender differences, financial institutions can better support and encourage women's participation in the financial market and incorporate more female power into the financial market. This study also hopes to enable ordinary investors to better avoid cognitive bias and make correct investment decisions. Personal limitations prevent this study from conducting quantitative research, but additional literature on this topic can aid in further analysis.

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