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# ANALYSING COGNITIVE BIASES, FEAR OF LOSSES, AND OVERCONFIDENCE ON INVESTMENT CHOICES AMONG INVESTORS

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## ABSTRACT

*This study examines how psychological factors like cognitive biases, fear of losses, and overconfidence affect investment decisions among individual investors. Using data collected from 317 participants, the research explores the impact of these behavioural patterns on portfolio diversification, risk-taking, and decision-making. The findings reveal that fear of losses significantly influences investment behaviour, often leading to overly cautious choices and limited diversification. The study also shows that financial literacy helps reduce the influence of biases, enabling more rational investment decisions. However, overconfidence was not found to have a strong effect on risky trading behaviour. Additionally, there were no major differences in cognitive biases between male and female investors. Overall, the research emphasizes the importance of financial education and self-awareness in improving investor decision-making.*

**KEYWORDS:** *Cognitive Biases, Loss of Aversion, Overconfidence, Investment Decisions, Behavioural Finance.*

## INTRODUCTION

In the modern financial landscape, investing has become increasingly accessible, especially to young investors who are drawn in by technological advancements, financial apps, and real-time market information. While access to information has grown, so too has the complexity of making sound investment decisions. Young investors, often new to the market and still developing financial literacy, are particularly vulnerable to psychological influences and irrational thinking. Among these influences, cognitive biases, fear of losses, and overconfidence play a central role in shaping investment behaviour.

Cognitive biases are mental distortions or patterns of deviation from rational judgment. They stem from the brain's tendency to simplify information processing, especially under uncertainty or emotional stress common conditions in investing. In the context of investment decisions, these biases can lead to poor judgment, misinterpretation of data, and ultimately, financial losses.

Overconfidence is when investors believe they know more than they actually do or think they can predict market movements better than others. This often leads them to trade more frequently, take bigger risks, or rely on their instincts rather than solid research. Young investors, in particular, may overestimate their knowledge or skills, especially if they've had a few early wins. This confidence can cloud judgment and cause poor investment decisions.

Fear of losses, also called loss aversion, means that people feel the pain of losing money much more strongly than the joy of gaining it. As a result, investors might avoid taking risks even when the potential reward is high, or they may hold onto losing investments for too long to avoid "realizing" a loss. This emotional reaction can prevent rational decision-making and lead to missed opportunities in the market.

## OBJECTIVES FOR THE STUDY

- To assess the impact of fear of losses (loss aversion) on portfolio diversification among investors.
- To evaluate the role of overconfidence in trading and speculative investment choices among investors.
- To explore how financial literacy moderates the relationship between cognitive biases and investment decisions.
- To compare behavioural biases across different demographic subgroups (e.g., age, gender, education) within investors.

## LITERATURE REVIEW

Liliana Inggrit Wijaya, Bertha Silvia Sutejo, Gerard Nico Tanumulya. et al. (2025) studied how overconfidence, herding bias, investor sentiment, and over/underreaction affect investment decisions in Indonesia. They surveyed 350 Indonesian investors and used statistical analysis to examine the relationships. The study found that overconfidence, investor sentiment, and over/underreaction significantly influence investment decisions positively. However, herding bias did not show a significant effect. Additionally, the influence of these factors varies based on age, gender, and education level.

Livia Helene Boerner. et al. (2025) explores cognitive biases in early-stage entrepreneurship and angel investor funding using data from 1,334 startup pitches on the TV shows "Die Höhle der Löwen" (Germany) and "Dragons' Den" (UK). The study

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looks at how biases like overconfidence and stereotypical thinking affect investment decisions. It finds that investors often favour entrepreneurs based on superficial traits such as age, gender, ethnicity, and attractiveness. The research also discusses the pros and cons of studying entrepreneurial finance using televised pitch competitions. The author suggests using targeted training, diverse evaluation panels, and policy changes to create a fairer and more profitable startup environment.

Annu Pandey, Dr. Sana Moid, Dr. Sushma Vishnani. et al. (2024) explore how trading experience affects overconfidence, self-attribution, and loss aversion in investment decisions among individual investors in Lucknow, Uttar Pradesh. The study surveyed 100 employed male and female investors aged 24-60 and used ANOVA and regression analysis to test hypotheses. The results showed a significant relationship between investor experience and overconfidence, with traders having more than ten years of experience being more overconfident. Self-attribution and loss aversion did not show a significant relationship with trading experience.

Muzzamil Rehman, Babli Dhiman, Ngoc-Diep Nguyen, Rajesh Dogra, and Anjali Sharma. et al. (2024) explores how behavioural biases like herding, status quo, confirmation, and loss aversion influence investment decisions globally, focusing on investors from China and India. It reveals that these biases significantly affect investment choices, with a greater impact observed in India. The research highlights the importance of understanding regional diversity and its interaction with behavioural biases to improve investment strategies and tailor services to diverse clients.

Hriday Chandna. et al. (2024) explores how overconfidence, loss aversion, and anchoring biases affect individual investment decisions. The study aims to show how these biases can lead to irrational choices and poorer investment performance. Overconfidence can cause excessive trading, loss aversion may lead to holding onto losing investments, and anchoring can make investors rely too much on initial information. The research combines literature review, surveys, and experiments to understand these biases in real-world investing.

Hanna Fahlin, Linnea Gustafsson. et al. (2024) study explores how psychological biases affect the investment decisions of Generation Z and Generation X during times of high interest rates. Focusing on overconfidence, herd behaviour, and loss aversion, the study uses a survey of 132 respondents to conclude that overconfidence significantly influences investment behaviour, with Generation Z exhibiting more overconfidence than Generation X. Herd behaviour also impacts investment behaviour, but no generational differences were found. Generation Z was observed to be less loss-averse compared to Generation X, though this did not affect investment behaviour.

Shyam Sunder Agrawal, K. Prabhu Sahai, and J. Venu Gopal. et al. (2024) explore how cognitive and emotional biases affect investor behaviour and lead to market anomalies. The study uses prospect theory and behavioural finance frameworks to show how biases like overconfidence, loss aversion, and herd behaviour can cause poor decisions and market inefficiencies. The authors suggest that understanding and managing these biases can improve market predictions and regulations, leading to more stable financial markets.

Réka Albert. et al. (2023) paper investigates behavioural biases in university students' financial decision-making. Herding behaviour, overconfidence, mental accounting, loss aversion, anchoring, and introspection are all examined in this study.It finds that financial knowledge significantly reduces the negative effects of these biases. Gender also plays a role, with men more prone to herding, overconfidence, mental accounting, and loss aversion. However, performance on the Cognitive Reflection Test does not significantly impact the presence of these biases.

Athota, V. S. Pereira, V. Hasan Z, Vaz. D, Laker, B, and Reppas D. et al. (2023) explores how cognitive biases affect financial planners and their clients. Unconscious thought patterns known as cognitive biases can result in poor decision-making. The researchers conducted interviews with financial planners in Australia to understand these biases and how digital tools, particularly Artificial Intelligence (AI), can help mitigate them. They found that AI can assist in making more objective decisions by analyzing data without emotional influence. However, due to worries about job redundancy, financial planners might oppose AI. The study suggests that combining AI with human judgment can improve decision-making in financial planning.

Mingming Zhang, Mian Sajid Nazir, Rabia Farooqi and Muhammad Ishfaq et al. (2022) investigated how cognitive biases like anchoring and optimism affect investment decisions in developing countries. They also explored whether risk perception mediates these relationships and if information asymmetry moderates them. The study, which surveyed 317 real estate investors, found that both anchoring and optimism biases positively influence investment decisions. These relationships are strongly mediated by risk perception, with information asymmetry acting as a moderator.

Ahmed Bouteska, Boutheina Regaieg. et al. (2020) paper examines how loss aversion and overconfidence affect the performance of US companies. The study, using data from 2006-2016, found that loss aversion negatively impacts economic performance in both industrial and service sectors. However, overconfidence had a negative effect on service firms and a positive effect on industrial firms' market performance. The authors come to the conclusion that among investors, overconfidence typically predominates over loss aversion.

Nawal Hussein Abbas Elhussein and Jarel Nabi Ahmed Abdelgadir. et al. (2020) paper explores how behavioural biases affect individual investment decisions in the Sudanese Stock Exchange. Using a survey of 203 investors, the study found that heuristics and market factors significantly influence decision-making. However, overconfidence had a negative effect on service firms and a positive effect on industrial firms' market performance. The authors come to the conclusion that

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among investors, overconfidence typically predominates over loss aversion .

## RESEARCH GAP

Based on the literature review of understanding how behavioural biases like overconfidence and loss aversion affect investment decisions, existing studies show that while these biases do play a significant role, the findings are often limited to specific countries or small groups of people, like students or working professionals. Many studies rely on survey methods, which can sometimes lead to biased responses. Also, most research only focuses on a few common biases and does not explore how different biases might interact or how other important factors like financial education, risk tolerance, or emotions influence investor behaviour.

Additionally, most of the research is cross-sectional, meaning it captures data at one point in time rather than over a longer period, making it hard to understand how investor behaviour changes. There is also limited real-time or practical analysis, such as how social media or technology might affect decisions. Finally, while the studies identify the presence of biases, few offer practical solutions to help investors overcome them. This highlights the need for more diverse, large-scale, and action-oriented research that includes a wider range of biases, considers emotional and psychological aspects, and tests methods to reduce biased investment decisions.

## RESEARCH METHODOLOGY

The study adopted a quantitative research approach to examine how cognitive biases, fear of losses, and overconfidence influence investment decisions. Data was collected using a structured questionnaire distributed to a sample of 317 individual investors. The questionnaire included 18 items designed to measure various behavioural and psychological factors affecting investment behaviour. To ensure the reliability of the questionnaire, a reliability analysis was conducted using Cronbach's Alpha, which yielded a value of 0.905—indicating a high level of internal consistency among the items. The data was analysed using SPSS software, and statistical methods such as correlation analysis, t-tests, ANOVA, and linear regression were employed to test four hypotheses related to the research objectives. These analyses helped in understanding the relationships between behavioural traits and investment decisions, as well as identifying any differences across demographic groups such as gender and financial literacy levels.

## ANALYSIS AND INTERPRETATION

**Reliability analysis:** It is a way to check if the questions or items in a survey or questionnaire are consistent and dependable in measuring what they're supposed to measure.

| **Reliability Statistics** | |
|---|---|
| **Cronbach's Alpha** | **N of Items** |
| .905 | 18 |

A Cronbach's Alpha of 0.905 indicates that the 18 questions in your survey work very well together. In other words, they consistently measure the same underlying idea, so you can be confident that your questionnaire is reliable.

**Hypothesis Testing:** Hypothesis testing is a way to make decisions or judgments about a group of data based on a sample. Four hypothesis statement made to test each objective and following are analysis and results.

**I$^{st}$ Hypotheses Statement**

**$H_0$ (Null):** Portfolio diversification and loss aversion are not significantly correlated.

**$H_1$ (Alternative):** Fear of losses significantly influences portfolio diversification behaviour.

| **Correlations** | | | |
|---|---|---|---|
| | | **FL2** | **FL4** |
| **FL2** | Pearson Correlation | 1 | .682** |
| | Sig. (2-tailed) | | .000 |
| | N | 317 | 317 |
| **FL4** | Pearson Correlation | .682** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 317 | 317 |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | |

**Interpretation:** I found a strong positive connection (r = 0.682) between two behaviours: hanging on to losing investments and steering clear of high-risk but potentially high-reward opportunities. The p-value is less than .01, which tells us this pattern is very unlikely to be due to chance.

People who tend to hold onto stocks that have already dropped in value also tend to shy away from riskier investments, even when those investments could pay off more. In other words, the same investors who can't bear to sell at a loss are also cautious about jumping into anything that might lose money.

This fits perfectly with the idea of loss aversion from behavioural finance: individuals feel the pain of losses more strongly than the pleasure of gains, so they act more conservatively to avoid any further loss.

Because the relationship is both strong and statistically reliable, we can reject the idea that there's no link between these two behaviours (the null hypothesis) and accept that a true association exists (the alternative hypothesis).

**II$^{nd}$ Hypotheses Statement**

- **$H_0$:** Financial literacy does not moderate the effect of cognitive biases on investment decisions.

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- **$H_1$:** Financial literacy moderates the relationship between cognitive biases and investment behaviour

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| CB1 | Equalvariances assumed | 158.394 | .000 | -4.673 | 315 | .000 | -.173 | .037 | -.246 | -.100 |
| | Equal variances not assumed | | | -3.949 | 133.970 | .000 | -.173 | .044 | -.260 | -.087 |
| CB4 | Equal variances assumed | 1.129 | .289 | -2.055 | 315 | .041 | -.128 | .062 | -.250 | -.005 |
| | Equal variances not assumed | | | -1.989 | 245.815 | .048 | -.128 | .064 | -.254 | -.001 |

**Interpretation**: For CB1, we first checked whether the variability in scores was similar between the two literacy groups and found it wasn't (Levene's $p < .05$). Using the adjusted t-test, we saw a clear difference in CB1's influence on investment choices ($t \approx -3.95$, $p < .001$). On average, one group scored about 0.17 points lower than the other, and the confidence interval (–0.26 to –0.09) tells us this difference is real, not just random noise. In simple terms, people with different levels of financial knowledge respond quite differently to CB1 when making investment decisions.

For CB4, both groups showed roughly the same spread of scores (Levene's $p = .289$), so we used the standard t-test. The result ($t \approx -2.06$, $p = .041$) also indicates a meaningful difference, though smaller: the average gap was about 0.13 points, and the confidence interval (–0.25 to –0.005) just excludes zero. This means CB4's effect on behavior also varies by literacy level, but the gap isn't as large as with CB1.
Putting it all together, both tests show that cognitive biases CB1 and CB4 influence less- and more-financially-literate investors in different ways. Because both p-values are below .05, we can confidently say these differences aren't due to chance, so we reject the idea that literacy level makes no difference and accept that it does.

**III[rd] Hypotheses Statement**

- **$H_0$:** Overconfidence has no significant effect on trading frequency and speculative investment.
- **$H_1$:** Higher overconfidence is associated with increased trading frequency and speculative investing.

**Linear Regression**

| Model Summary[b] | | | | |
|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| 1 | .120[a] | .014 | .005 | .743 |
| a. Predictors: (Constant), OE3, OE1, OE2 | | | | |
| b. Dependent Variable: OE5 | | | | |

| Coefficients[a] | | | | | | |
|---|---|---|---|---|---|---|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 3.425 | .209 | | 16.371 | .000 |
| | OE1 | -.099 | .072 | -.107 | -1.377 | .169 |
| | OE2 | .057 | .075 | .061 | .765 | .445 |
| | OE3 | .115 | .082 | .118 | 1.395 | .164 |
| a. Dependent Variable: OE5 | | | | | | |

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**Interpretation**
The Model Summary table shows an R Square value of 0.014, meaning that only 1.4% of the variation in speculative investing (OE5) is explained by overconfidence-related factors (OE1, OE2, OE3). This is a very weak relationship. Also, the Adjusted R Square is 0.005, confirming that the overall predictive power of the model is extremely low. The Coefficients table shows the significance values (Sig.) for each independent variable: OE1 = 0.169, OE2 = 0.445, OE3 = 0.164. Since all these values are greater than 0.05, they are not statistically significant, which means these specific overconfidence indicators do not have a meaningful influence on the dependent variable OE5 (speculative investing behaviour).

Since none of the independent variables are significant and the model's explanatory power is very weak, we fail to reject the null hypothesis ($H_0$). This means there is no strong evidence from this analysis to say that overconfidence significantly influences trading frequency or speculative investment in this dataset.

Therefore, based on this regression analysis, overconfidence does not have a significant effect on trading frequency and speculative investment as measured by OE5.

**IV$^{th}$ Hypotheses Statement**

- **$H_0$:** There is no significant difference in cognitive biases between male and female investors.
- **$H_1$:** There is a significant difference in cognitive biases between male and female investors.

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| **CB2** | Between Groups | .007 | 1 | .007 | .021 | .884 |
| | Within Groups | 106.826 | 315 | .339 | | |
| | Total | 106.833 | 316 | | | |
| **CB3** | Between Groups | .041 | 1 | .041 | .120 | .730 |
| | Within Groups | 108.842 | 315 | .346 | | |
| | Total | 108.883 | 316 | | | |
| **CB4** | Between Groups | .602 | 1 | .602 | 2.020 | .156 |
| | Within Groups | 93.953 | 315 | .298 | | |
| | Total | 94.555 | 316 | | | |
| **CB5** | Between Groups | .000 | 1 | .000 | .000 | .996 |
| | Within Groups | 113.924 | 315 | .362 | | |
| | Total | 113.924 | 316 | | | |

**Interpretation**
The average scores for cognitive biases (CB2 to CB5) are very similar for both male and female investors, which means their behaviour in terms of these biases is almost the same. There isn't much difference in how men and women responded on these questions.

According to the ANOVA results, all the p-values are greater than 0.05, which means the differences between the two groups are not statistically significant. In simple terms, we do not have enough proof to say that gender has any real effect on these specific cognitive biases. So, we fail to reject the null hypothesis and conclude that gender does not play a significant role in influencing CB2 to CB5.

## MAJOR FINDINGS

**Fear of Losses (Loss Aversion) Affects Investment Choices:** The study found a strong and statistically significant relationship between the fear of financial losses and how investors choose their portfolios. Specifically, investors who are more afraid of losing money tend to avoid investments that carry even a slight risk, even when those investments could potentially bring high returns. This cautious mindset often leads them to hold onto losing investments longer than necessary, simply to avoid realizing a loss. Such behaviour prevents them from diversifying their portfolios effectively and limits their ability to make gains from a wider variety of investments. Overall, the fear of losses results in overly conservative investment decisions that can hinder long-term financial growth.

**Financial Literacy Helps Reduce Biases:** The study also discovered that financial literacy plays an important role in reducing the effects of cognitive biases in investment decisions. Investors who possess a better understanding of financial concepts are less likely to make emotional or irrational choices, such as acting out of fear or following the crowd without critical thinking. Financially literate individuals are more capable of analyzing market information objectively and are more confident in making sound investment decisions. This means that education and awareness can act as a protective factor,

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helping investors overcome common psychological traps and behave more rationally in the financial market.

**Overconfidence Doesn't Always Lead to Risky Behaviour:** While overconfidence is often believed to lead to impulsive or high-risk investing, the study did not find any significant evidence to support this assumption. Despite expectations that overconfident investors would trade more frequently or engage in speculative investments, the data showed no strong connection between overconfidence and these behaviours. This suggests that being confident in one's knowledge or decisions doesn't automatically translate into reckless investment activity. Overconfident individuals may still act cautiously or rely on informed decision-making rather than taking unnecessary risks. Therefore, confidence alone is not a reliable predictor of risky investment behaviour.

**Men and Women Have Similar Cognitive Biases:** Another interesting finding of the research was that cognitive biases in investing do not significantly differ between male and female investors. The study analyzed several types of biases—such as confirmation bias, recency bias, social influence, and mental accounting—and found that both genders are similarly affected. This challenges some common assumptions that men and women behave very differently when it comes to managing investments. Instead, the findings suggest that cognitive biases are human tendencies rather than gender-specific traits, and both male and female investors are equally prone to making decisions based on psychological patterns rather than pure logic.

## CONCLUSION

This study explored how psychological factors like fear of loss, overconfidence, and cognitive biases influence investor behaviour. After analyzing responses from 317 participants, the research found that fear of losses plays a major role in shaping investment choices. Investors who are more afraid of losing money tend to avoid risky opportunities and hold on to losing investments longer, which limits their portfolio growth and reduces diversification.

The findings also show that financial literacy helps investors think more rationally. Those with better financial knowledge were less affected by cognitive biases and made more balanced investment decisions. This suggests that improving financial education could help investors avoid emotionally driven mistakes.

Contrary to common belief, overconfidence did not significantly impact risky investing behaviour in this study. Although it's often assumed that overconfident investors take more risks or trade frequently, the data did not support this idea. Confidence alone doesn't always lead to impulsive or speculative choices.

Lastly, the study found no significant differences between male and female investors in terms of how cognitive biases affect their decisions. Both genders appeared to be equally influenced by behavioural patterns like confirmation bias and social influence, suggesting that these biases are more about human psychology than gender differences.

Overall, the research highlights the need to recognize and manage psychological factors in investing. By increasing awareness and financial literacy, investors can make smarter, more objective decisions in the market.

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