Exploring the Role of Gender and Educational Background on Cognitive Biases in Investing Habits: A Study on Postgraduate Students

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Abstract- This paper explores the influence of cognitive biases, as identified in the Behavioral Finance literarure, on investment decision-making among postgraduate students of St. Xavier's University Kolkata. Based on a questionnaire-based methodology, the paper studies three primary cognitive biases: Mental Accounting Bias, Anchoring Bias, and Overconfidence Bias among postgraduate students with a view to uncovering the role of gender and educational background (Commerce, Economics, or Psychology) in influencing these biases. The study further goes on to explore any possible inter-relationships between the biases studied. Responses were collected from students of M.Com., M.A. Psychology, and M.A. Economics. The analysis reveals that male students exhibit higher levels of overconfidence bias compared to their female counterparts, while no significant gender-based differences were found for mental accounting and anchoring biases. Additionally, significant variations in overconfidence bias were observed among students from different departments, whereas mental accounting and anchoring biases remained consistent across disciplines. Correlation analysis indicates that the three biases studied do not show strong interrelations, suggesting they operate independently within the decision-making processes of the participants. This research contributes valuable insights into the cognitive biases affecting young investors in an academic setting, highlighting the need for targeted educational interventions to facilitate informed financial decision-making and mitigate the impact of these biases.

Keywords: Cognitive biases, Investment Decision-Making, Behavioral Finance, Mental Accounting, Anchoring Bias, Overconfidence Bias

1. INTRODUCTION

The field of finance has long been dominated by the assumption of rational behavior, where investors are believed to make decisions based purely on logical analysis and available information. This perspective, central to traditional finance theories such as the Efficient Market Hypothesis (EMH) and the Capital Asset Pricing Model (CAPM), presupposes that individuals act in a manner that maximizes their utility, processing information in an unbiased and efficient manner. However, the emergence of Behavioral Finance has challenged this notion by incorporating insights from psychology to better understand how cognitive biases and emotional factors influence financial decision-making.

Cognitive biases are systematic patterns of deviation from rationality in judgment, which often lead individuals to make decisions that are suboptimal. These biases arise from the inherent limitations in human cognition and are often exacerbated by emotions and social influences. Among the myriad of cognitive biases identified, this study focuses on three prominent ones: Mental Accounting Bias, Anchoring Bias, and Overconfidence Bias.

1. Mental Accounting Bias: This bias involves the tendency of individuals to categorize and treat money differently based on arbitrary labels rather than considering it fungible. People often create separate accounts in their minds for different expenses, which can lead to irrational decision-making. For example, they might splurge using a "bonus" while being frugal with their "salary," despite both being part of their overall income.

2. Anchoring Bias: Anchoring Bias refers to the undue influence of an initial piece of information on subsequent judgments and decisions. An individual might rely too heavily on the first piece of information (the "anchor") encountered when making decisions, such as the initial price of a stock, which can skew their perception and lead to biased investment choices.

3. Overconfidence Bias: Overconfidence Bias is characterized by an individual's inflated confidence in their own knowledge and abilities, often leading to riskier financial behaviors. Overconfident investors might overestimate their predictive abilities and underestimate risks, resulting in more frequent trading and suboptimal investment performance.

Understanding these biases is particularly crucial in the context of investment decision-making, where even minor deviations from rationality can have significant financial consequences. Young investors, such as postgraduate students, represent a unique demographic whose investment behaviors are still being shaped and who are more susceptible to these biases due to their relative inexperience and evolving financial acumen. Moreover, behavioral finance as a body of knowledge lies at the intersection of Finance, Economics, and Psychology.

Thus, the research problem addressed in this study is the prevalence and impact of cognitive biases on the investment decisions of postgraduate students at St. Xavier's University Kolkata. The study aims to explore how gender and academic discipline may influence these biases. The findings are expected to provide valuable insights that can inform the development of strategies to mitigate the adverse effects of these biases on investment decision-making.

2. REVIEW OF LITERATURE

Traditional finance theory posits that investors are rational actors who make decisions based on objective assessments of risk and return to maximize profit. However, behavioural finance challenges this assumption by introducing the idea that psychological factors and cognitive biases significantly influence the decision-making process. Key behavioural biases identified in the literature include overconfidence, anchoring, regret aversion, herding effect, and home bias, all of which can impact investment decisions (Sattar, Toseef, & Sattar, 2020).

Anchoring bias, a cognitive bias where individuals rely excessively on initial information when making decisions, is a well-documented phenomenon. Kansal et al. (2015) expanded on Tversky and Kahneman's work, examining anchoring bias over the past 15 years specifically in the context of stock market investments. Their review highlights anchoring's significant role in various financial market contexts, such as price estimation, credit market behaviour, foreign institutional investment, and analysts' earnings forecasts. Despite fewer recent studies on anchoring in stock markets, its impact remains critical, warranting further focused research.

Research has demonstrated varying degrees of correlation between different behavioural biases, such as overconfidence and anchoring, with some studies highlighting a weak negative correlation between them. It is noted that behavioural biases affect individuals' wealth and decision-making processes, underscoring the need to understand these biases to mitigate their negative impacts (Bashir et al., 2013). Additionally, some studies suggest the need to explore other psychological biases like herding, loss aversion, and mental accounting (Zaiane, 2015). Another study showed that anchoring bias significantly impacts risky investment decisions, emphasizing the need for investors to recognize and control these biases for better decision-making and higher returns (Ishfaq & Anjum, 2015).

Studies indicate that both men and women exhibit anchoring biases, with financial knowledge having only a marginal impact. While traditional finance assumes rational decision-making, behavioural finance underscores the emotional and cognitive influences on investors (Matsumoto et al., 2013). Gender differences in investment behaviour have been observed, with men generally being more impulsive and egoistic, while women tend to be more patient and seek expert advice (Yashaswini & Nagarathnamma, 2023). Male investors often exhibit more overconfidence than female investors, leading to more rapid trading and less reliance on fundamental or technical analysis, which contributes to market inefficiency and anomalies (Qadri & Shabbir, 2014; Alsabban & Alarfaj, 2019).

Mental accounting, a concept established by Richard Thaler, affects how individuals divide their assets into separate portions, influencing investment decisions. For instance, students have been shown to exhibit mental accounting bias by treating monthly and bonus money differently when investing (Santi et al., 2019). Generation Y investors also exhibit various cognitive biases, including overconfidence and mental accounting, which lead to deviations from rational economic behaviour as per traditional finance theory. Kahneman and Tversky's Prospect Theory provides a

framework for understanding these psychological factors (Sukamulja et al., 2019).

3. RESEARCH OBJECTIVE

1. To identify the prevalence of cognitive biases (Mental Accounting Bias, Anchoring Bias, and Overconfidence Bias) among postgraduate students at St. Xavier's University Kolkata.
2. To examine gender-specific differences in the manifestation of cognitive biases among postgraduate students.
3. To explore variations in cognitive biases across different academic disciplines.
4. To analyze the relationship between the different cognitive biases.

4. HYPOTHESES OF THE STUDY

Based on the objectives enlisted above, following hypotheses have been tested –

4.1. H_1: Mental Accounting Bias
- H_{1a}: There is a significant difference in the levels of mental accounting bias between male and female postgraduate students.
- H_{1b}: There is a significant difference in the levels of mental accounting bias among postgraduate students from different academic disciplines.

4.2. H_2: Anchoring Bias
- H_{2a}: There is a significant difference in the levels of anchoring bias between male and female postgraduate students.
- H_{2b}: There is a significant difference in the levels of anchoring bias among postgraduate students from different academic disciplines.

4.3. H_3: Overconfidence Bias

- H_{3a}: There is a significant difference in the levels of overconfidence bias between male and female postgraduate students.
- H_{3b}: There is a significant difference in the levels of overconfidence bias among postgraduate students from different academic disciplines.

4.4. H_4: Interrelation of Biases
- H_{4a}: There is a significant correlation between the levels of mental accounting bias and anchoring bias among the participants.
- H_{4b}: There is a significant correlation between the levels of mental accounting bias and overconfidence bias among the participants.
- H_{4c}: There is a significant correlation between the levels of anchoring bias and overconfidence bias among the participants.

5. RESEARCH METHODOLOGY

The study is based on exploratory research, examining the levels of cognitive biases prevailing among the post-graduate students of St. Xavier's University, studying in (a) the Department of Commerce, (b) the Department of Economics, and (c) the Department of Psychology, enrolled as of the academic session 2023-24. A structured questionnaire was circulated among the target group of respondents based on convenience sampling in March 2024. Of the 174 students of M.Com., M.A. Economics, and M.A. Psychology, responses were received from 114 students from the said programmes, thereby constituting an overall sample of 114 participants.

Primary data collected from the respondents were analyzed in line with the research hypotheses using tools such as independent samples t-test, One-way Analysis of Variance (ANOVA), and Pearson's Product-Moment Correlation Coefficient (1948).

6. RESULTS AND DISCUSSION

6.1. Gender Impact on Mental Accounting Bias

Table 1: Group Statistics of Mental Accounting Bias on Gender Differences

Gender	N	Mean	Std. Deviation
Male	58	3.6078	0.66904
Female	56	3.6563	0.69668

Table 2: Independent Sample t-Test

Levene's Test for Equality of Variances	t-test for Equality of Means	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference

Equal variances assumed		0.086	0.770	-0.379	112	0.705	-0.04849
Equal variances not assumed			-0.379	111.360	0.706	-0.04849	0.12800	0.30213

An independent t-test showed no significant gender differences in Mental Accounting Bias among PG students (p = 0.705).

6.2. Gender Impact on Anchoring Bias

Table 3: Group Statistics of Anchoring Bias on Gender Differences

Gender	N	Mean	Std. Deviation
Male	58	3.1810	0.50174
Female	56	3.2768	0.53657

Table 4: Independent Sample t-Test

Levene's Test for Equality of Variances	t-test for Equality of Means	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed		0.395	0.531	-0.985	112	0.327	-0.09575
Equal variances not assumed			-0.983	110.839	0.328	-0.09575	0.09737	0.28871

An independent t-test revealed no significant gender differences in Anchoring Bias among PG students (p = 0.327).

6.3. Gender Impact on Overconfidence Bias

Table 5: Group Statistics of Overconfidence Bias on Gender Differences

Gender	N	Mean	Std. Deviation
Male	58	3.0517	0.67661
Female	56	2.6875	0.48206

Table 6: Independent Sample t-Test

Levene's Test for Equality of Variances	t-test for Equality of Means	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed		6.291	0.014	3.300	112	0.001	0.36422
Equal variances not assumed		3.319	0.014	3.319	103.143	0.001	0.36422

An independent t-test indicated a significant gender difference in Overconfidence Bias, with males showing higher scores than females (p = 0.001).

6.4. Department Impact on Mental Accounting Bias

Table 7: Descriptive Statistics of Mental Accounting Bias across Departments

Mental Accounting	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean (Lower Bound)	95% Confidence Interval for Mean (Upper Bound)
M.Com	83	3.6355	0.68554	0.07525	3.4858	3.7852
MA Psychology	28	3.6161	0.68205	0.12890	3.3516	3.8805
MA Economics	3	3.6667	0.76376	0.44096	1.7694	5.5640
Total	114	3.6316	0.68016	0.06370	3.5054	3.7578

Table 8: ANOVA

Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.012	2	0.006	0.988
Within Groups	52.265	111	0.471	

A one-way ANOVA showed no significant departmental differences in Mental Accounting Bias (p = 0.988).

6.5. Department Impact on Anchoring Bias

Table 9: Descriptive Statistics of Anchoring Bias across Departments

Anchoring	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean (Lower Bound)	95% Confidence Interval for Mean (Upper Bound)
M.Com	83	3.2771	0.54102	0.05938	3.1590	3.3952
MA Psychology	28	3.0446	0.41418	0.07827	2.8840	3.2052
MA Economics	3	3.5833	0.38188	0.22048	2.6347	4.5320
Total	114	3.2281	0.51906	0.04861	3.1318	3.3244

Table 10: ANOVA

Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.520	2	0.760	0.058
Within Groups	28.925	111	0.261	

A one-way ANOVA indicated no significant departmental differences in Anchoring Bias (p = 0.058).

6.7. Department Impact on Overconfidence Bias

Table 11: Descriptive Statistics of Overconfidence Bias across Departments

Overconfidence	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean (Lower Bound)	95% Confidence Interval for Mean (Upper Bound)
M.Com	83	2.9819	0.58926	0.06468	2.8533	3.1106
MA Psychology	28	2.5446	0.57354	0.10839	2.3222	2.7670
MA Economics	3	2.9167	0.80364	0.46398	0.9203	4.9130
Total	114	2.8728	0.61440	0.05754	2.7588	2.9868

Table 12: ANOVA

Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.009	2	2.005	0.004
Within Groups	38.646	111	0.348	

A one-way ANOVA revealed significant departmental differences in Overconfidence Bias (p = 0.004).

6.8. Correlation between Mental Accounting Bias and Anchoring Bias

Table 13: Correlation between Mental Accounting Bias and Anchoring Bias

Correlations	Mental Accounting	Anchoring
Mental Accounting	1	0.043
Anchoring	0.043	1

Correlation analysis showed a negligible, non-significant positive correlation between Mental Accounting and Anchoring Biases (r = 0.043, p = 0.648).

6.9. Correlation between Anchoring and Overconfidence Bias

Table 14: Correlation between Anchoring Bias and Overconfidence Bias

Correlations	Anchoring	Overconfidence
Anchoring	1	-0.021
Overconfidence	-0.021	1

Correlation analysis showed a negligible, non-significant negative correlation between Anchoring and Overconfidence Biases (r = -0.021, p = 0.825).

6.10. Correlation between Mental Accounting and Overconfidence Bias

Table 15: Correlation between Mental Accounting and Overconfidence Bias

Correlations	Mental Accounting	Overconfidence
Mental Accounting	1	-0.015
Overconfidence	-0.015	1

Correlation analysis revealed a negligible, non-significant negative correlation between Mental Accounting and Overconfidence Biases (r = -0.015, p = 0.873).

6.11. Hypothesis tests

Based on the above analysis, the results of the hypothesis tests have been tabulated in Table 16.

Table 16: Correlation between Mental Accounting and Overconfidence Bias

Hypothesis	Test Type	Result
H1a: Mental Accounting Bias between Male and Female	Independent t-test	No significant difference (p = 0.705)
H1b: Mental Accounting Bias among Academic Disciplines	One-way ANOVA	No significant difference (p = 0.988)
H2a: Anchoring Bias between Male and Female	Independent t-test	No significant difference (p = 0.327)
H2b: Anchoring Bias among Academic Disciplines	One-way ANOVA	No significant difference (p = 0.058)
H3a: Overconfidence Bias between Male and Female	Independent t-test	Significant difference (p = 0.001)
H3b: Overconfidence Bias among Academic Disciplines	One-way ANOVA	Significant difference (p = 0.004)
H4a: Correlation between Mental Accounting Bias and Anchoring Bias	Correlation Analysis	No significant correlation (p = 0.648)
H4b: Correlation between Mental Accounting Bias and Overconfidence Bias	Correlation Analysis	No significant correlation (p = 0.873)
H4c: Correlation between Anchoring Bias and Overconfidence Bias	Correlation Analysis	No significant correlation (p = 0.825)

7. FINDINGS AND CONCLUSION

7.1. Findings
7.1.1. Prevalence of Cognitive Biases
The study identified the prevalence of three cognitive biases among postgraduate students at St. Xavier's University Kolkata. The biases examined were Mental Accounting Bias, Anchoring Bias, and Overconfidence Bias. The results indicated varying levels of familiarity and prevalence of these biases among the students.

7.1.2. Gender-Specific Differences
The study examined gender-specific differences in the manifestation of cognitive biases among postgraduate students. The findings revealed no significant gender differences in Mental Accounting Bias (p = 0.705) and Anchoring Bias (p = 0.327). However, a significant difference was observed in Overconfidence Bias, with males exhibiting higher levels than females (p = 0.001).

7.1.3. Variations Across Academic Disciplines
The study explored variations in cognitive biases across different academic disciplines. The results showed no significant differences in Mental Accounting Bias (p = 0.988) and Anchoring Bias (p = 0.058) among the disciplines. In contrast, significant differences were found in Overconfidence Bias among students from different academic backgrounds (p = 0.004).

7.1.4. Relationship Between Cognitive Biases
The study analyzed the relationship between the different cognitive biases. Correlation analysis revealed no significant correlation between Mental Accounting Bias and Anchoring Bias (p = 0.648), Mental Accounting Bias and Overconfidence Bias (p = 0.873), and Anchoring Bias and Overconfidence

Bias (p = 0.825). This suggests that the presence of one bias does not significantly predict the presence or absence of the other biases among the participants.

7.2. Conclusion

In conclusion, this study provides insights into the prevalence and variation of cognitive biases among postgraduate students at St. Xavier's University Kolkata. While gender-specific differences were significant only for Overconfidence Bias, academic disciplines showed significant variation in Overconfidence Bias. No significant correlations were found between the different biases, indicating that each bias may operate independently in influencing students' decision-making processes. These findings highlight the need for further research to understand the underlying mechanisms and implications of cognitive biases in educational settings.

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