



Emotional Biases in Investment Behaviour

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Abstract : Investors make investments not only based on the available information but also on their perceptions and personal beliefs which sometimes leads to biasness. There are various kinds of biases on which researchers have already worked in the past. The paper studies emotional biases as the term which may influence the decision-making of investors while making investments. This paper is a continuation of Behavioural Bias Scale paper by Naval Kishor and Ritika (2020) where the experiment is done on two other emotional biases - Hindsight Bias and Judgement Bias other than the five emotional biases on which the researchers - Naval Kishor and Ritika have already worked in the year 2020. Data was gathered through a primary survey with convenient sampling to understand the effect of these biases on investment behaviour. The gathered data was then examined utilising procedures for central trends, correlation, and regression. The IBM-SPSS programme and MS-Excel were used in the analysis to get results for the factors being taken into consideration.

IndexTerms - Emotional Biases, Investment Behaviour, Investment Decisions, Behavioural Biases, Financial Performance.

I. INTRODUCTION

Traditional investment methods assume that investors and markets are fully rational. Financial decisions are based on the required set of information that is available to investors and marketers, who are assumed to have all the necessary knowledge. Sentiment controls the market, and investors make financial decisions based on their preferences and past experiences.

Emotional biases refer to the tendency of individuals to make decisions and judgments based on their emotions and feelings, rather than objective information or rational thinking. Emotional biases can reveal in various ways that can affect different aspects of our lives, including our relationships, decision-making, and perceptions of the world around us. These biases can result in people's decision-making that are not necessarily in their best interest or the interest of others e.g., a person may be more likely to invest in a company because they have an emotional attachment to its products or brand, rather than objectively evaluating its financial performance and potential for growth.

Emotional biases can be particularly challenging to overcome because they are often rooted in our subconscious and can be difficult to recognize. However, understanding these biases and learning how to manage our emotions can help us make more informed decisions and improve our overall well-being. There are many different types of emotional biases that can impact our thinking and decision making.

The paper aims to identify the factors of emotional biases in investment behaviour, to determine whether Hindsight Bias and Judgement Bias have an effect on investment behaviour and to understand the degree of relation and dependency of the emotional factors on investment behaviour. The relationship of Hindsight Bias and Judgement Bias on Investment Behaviour has also been explained.

II. LITERATURE REVIEW

D. Kahneman and A. A. Tversky (1981) published a major study titled "The framing of decisions and the psychology of choice," which revolutionised our understanding of decision-making processes. The research investigated the topic of framing, emphasising how the presentation of information can have a substantial impact on decision-making results. This seminal work laid the groundwork for subsequent studies on cognitive biases and their consequences on human judgement and decision-making.

Robert East (1993) published "Investment decisions and the theory of planned behaviour", which studied the application of shares in private British industries. The study's goal was to look at how friends, family, easy access to money, and financial considerations like profit and investment security affected the parts of previously planned behaviour theory. The goal was to show how these features have a substantial impact on people's behaviour and decision-making processes.

The study "Evolutionary understanding of corporate foreign investment behaviour: US foreign direct investment in Europe," by Rajneesh Narula (1995), focuses on analysing the foreign direct investment strategies of US corporations after World War II in Europe. The study examines the relationship between corporate investment strategies and changing international economic environments through time using a paradigm of "lagged co-evolution." The article delves at the fluid nature of corporate foreign investment behaviour and how it adapts to changing economic conditions.

Benedetto Matarazzo (1996) wrote "Rough Set Approach to Stock Selection: An Application to the Italian Market." This study emphasises the practical importance of using organised data for stock selection. It highlights how the availability of long duration series data and advances in computation technology have aided in the thorough formalisation of portfolio selection techniques. The importance of these aspects in increasing the efficacy and efficiency of stock selection procedures is emphasised in the study.

Barber, B. M., & Odean (2000), published "Trading is hazardous to your wealth: The common stock investment performance of individual investors." This study examined the trading behaviour of the individual investors and found evidence of overconfidence bias, among other biases.

Jenny Jordan and Klaus P Kaas conducted a large-scale experimental investigation involving 499 participants in their paper "Advertising in the mutual fund business: The role of judgmental heuristics in private investors' evaluation of risk and return" (2002). The study sought to investigate how specific components in print advertisements influence private investors' estimation of risk and return.

Rohit Kishore (2004), published "Theory of behavioural finance and its application to property market: a change in paradigm", it examines Development of behavioral finance, analysis of stock market and housing behavior data, and identification of real estate market issues that can be better understood using behavioral models.

Shefrin, H., & Statman (2005), published "Behavioral Portfolio Theory." This paper presented a framework for understanding how psychological biases can impact investment decisions and suggested ways to mitigate these biases.

De Bondt, W. F., & Thaler (2007), published "Financial decision-making in markets and firms: A behavioral perspective." This paper reviewed existing research on behavioral finance and discussed the implications of this research for investment behaviour.

Abhijeet Chandra (2008), published "Decision Making in the Stock Market: Incorporating Psychology with Finance", which explores the effect of the entrepreneur's behavior and psychology on the decision-making process and the relationship between the entrepreneur's risk-taking behavior and the decision-making process character.

Enrico Uliana (2008), published "The Effects of behavioural factors in investment decision-making: a survey of institutional investors operating at the Nairobi Stock Exchange", which explores the role of investors' financial behavior and sentiment in investment decisions at Nairobi Stock Exchange, especially for companies. The study found that behaviors such as representation, overconfidence, competition, gambling mistakes, indecision, indifference, and companies listed on the Nairobi Stock Exchange have psychological effects on decision-making.

Hartzmark, S. M., & Solomon (2011), published "The mutual fund industry worldwide: Explicit and implicit incentives to closet indexing." This study examined the behaviour of mutual fund managers and found evidence of herding bias and other biases that can lead to suboptimal investment choices.

Ritter, J. R., & Warr (2015), published "Investor Sentiment and the IPO Market." This paper examined the impact of investor sentiment on Initial Public Offering (IPO) activity and found evidence of herding bias and other biases that can impact investment behaviour.

N Goyal (2016), published "Evidence on rationality and behavioural biases in investment decision making", which investigates the relationship between entrepreneurs' decision making and unethical behavior in India. It also examines the impact of demographic differences on effective decision making and how these differences can be aggregated into behavioral biases.

Shalini Kalra Sahi (2017) published "Psychological Biases of Individual Investors and Financial Satisfaction" in 2017. By studying people's actual behaviour, it was possible to learn crucial facts about investor behaviour and financial satisfaction that were not first predicted by the theory. The results showed a positive and significant association between levels of financial happiness and variables including overconfidence bias, dependence on expert opinion, and self-control bias. These findings provide insight on the intricate factors affecting people's financial choices and general satisfaction with their financial outcomes.

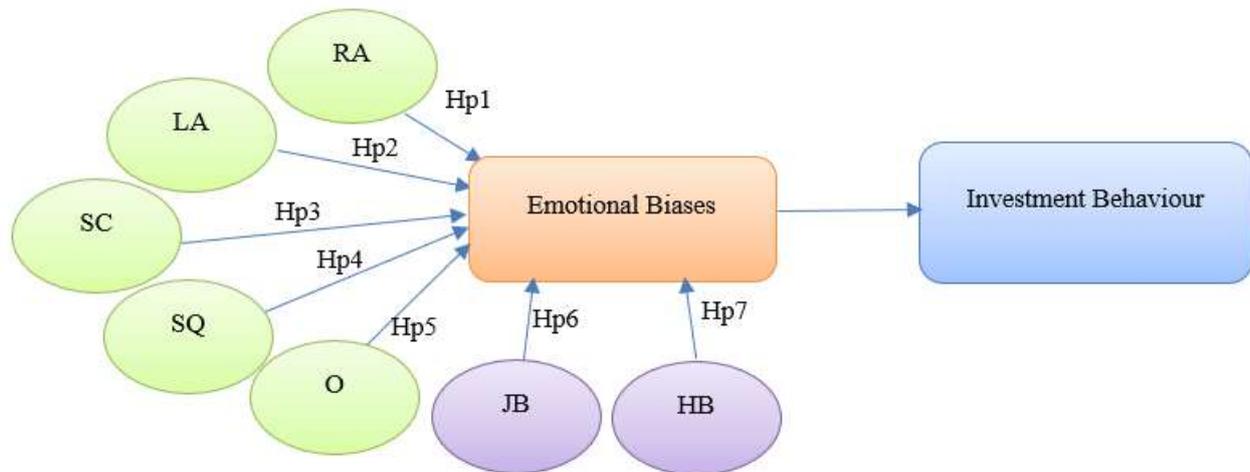
Barberis, N., Huang, M., & Thaler (2018), published "Indebtedness and household financial behavior." This study examined how household indebtedness can impact investment behaviour and found evidence of loss aversion bias, among other biases.

In a report that was published in 2020, Nawal Kishor used the SEM methodology to establish a behavioural bias scale. For the purpose of detecting biases in investor behaviour, the scale was created and verified. Factor analysis was done on the information gathered from 274 investors in the financial markets.

How financial literacy mediates the link between unhealthy behaviors and investment decisions is a subject of study by Mohd. Shamim Ansari (2022). The study looked at how behavioural biases (such as overconfidence, risk aversion, herding, and inclination) affected investing choices, with a particular emphasis on how financial literacy moderated the influence of gender disparities. The results showed that overconfidence had a favourable and significant influence on male investors' investing decisions, whereas risk aversion and herding had a negative and significant impact. For female investors, these relationships, however, were statistically negligible. The study focused on the possible impact of financial literacy in modifying the link between behavioural biases and investing choices while taking gender differences into account.

III. CONCEPTUAL MODEL

Figure 3.1: Conceptual Model



Note(s): LA = “Loss Aversion bias”, SQ = “Status Quo bias”, O = “Overconfidence bias”, SC = “Self Control bias”, RA = “Regret Aversion bias”, HB= “Hindsight bias”, JB= “Judgement Bias”

IV. HYPOTHESIS

- Hp1: “Regret Aversion Bias” has relationship with “Emotional biases” in “investment behaviour”
 Hp2: “Loss aversion bias” has relationship with “Emotional biases” in “investment behaviour”
 Hp3: “Self-control bias” has relationship with “Emotional biases” in “investment behaviour”
 Hp4: “Status quo bias” has relationship with “Emotional biases” in “investment behaviour”
 Hp5: “Overconfidence bias” has relationship with “Emotional biases” in “investment behaviour”
 Hp6: “Hindsight bias” has relationship with “Emotional biases” in “investment behaviour”
 Hp7: “Judgment bias” has relationship with “Emotional biases” in “investment behaviour”

V. RESEARCH METHODOLOGY

Emotional biases can lead to suboptimal investment decisions, resulting in financial losses or missed opportunities for gains. Understanding and identifying emotional biases in investment behavior is important for investors, financial advisors, and researchers to develop strategies to mitigate their impact. By recognizing and addressing these different biases, the investors can make more informed investment decisions, potentially leading to better long-term outcomes.

A detailed study of papers on “Psychological biases in Investment Behaviour” revealed that there can be other emotional biases about which analysis can be done to find its relationship with investment behaviour. In the research paper of Ritika and Naval Kishor (2020), five emotional biases were shown that affect financial investment decisions. These are “Regret Aversion Bias”, “Loss Aversion Bias”, “Status-quo Bias”, “Self-Control Bias” and “Overconfidence Bias”. This paper discusses the relationship of specially two emotional biases- “Hindsight Bias” and “Judgement Bias” along with other five biases discussed above.

Hindsight bias and judgment bias are two related cognitive biases that can influence decision-making processes, including investment behaviour. Hindsight bias refers to the tendency to perceive events as more predictable than they were after they have occurred. In the context of investment, investors may look back on a past investment decision and believe that they should have seen the outcome coming, leading them to overestimate their ability to predict future market movements. Judgment bias, on the other hand, refers to the tendency to make judgments based on incomplete or ambiguous information. This bias can lead investors to make suboptimal investment decisions based on limited or biased information. Both biases can be influenced by emotional bias, which is the tendency to make decisions based on emotions rather than rational thinking. Research has found that individuals who are experiencing negative emotions may be more likely to exhibit hindsight bias (Wells & Gavanski, 1989), and that emotion regulation can reduce the influence of judgment bias (Zaki et al., 2008). Thus, understanding the relationship between these biases and emotional bias is crucial for effective investment decision-making.

Data was collected from investors aged 18 and up to investigate the relationship between hindsight bias, judgement bias, and emotional biases in investment practices. To collect replies, an internet survey was done, and a questionnaire was distributed. The

questions about five emotional biases, namely “regret aversion”, “loss aversion”, “status quo”, “self-control”, and “overconfidence bias”, were drawn from Ritika and Naval Kishor's 2020 study. The poll sought to investigate the interaction of these biases in investing decision-making.

Questions on Hindsight bias were referenced from the paper- "Hindsight Bias and Outcome Bias in Decision Making" by Fischhoff (1975). This study investigates hindsight bias and conclusion bias in decision making and includes questions such as "How likely were you to have predicted the outcome beforehand?" and "How confident were you in your decision at the time?" and "The Effects of Hindsight Bias on Auditors' Evaluations of Client Information" by Salterio and Thorne (1997). This study examines the impact of hindsight bias on auditors' evaluations of user data and includes questions such as "How likely were you to have identified the issue beforehand?" and "How confident were you in your evaluation at the time?"

The judgement bias questionnaire used in this study was modified from the work "The Cognitive Bias Task: Validation of a Novel Task for the Measurement of Risk Taking and Rational Decision Making" by Tybur et al. (2019). This study presents a new task for measuring cognitive biases related to risk taking and rational decision making, which includes questions related to judgment bias, such as "Do you tend to overestimate the likelihood of negative outcomes?" and "The Judgment Bias Inventory: Development and Validation of a Measure of Interpretive Bias" by O'Toole et al. (2017). This study presents a measure of interpretive bias, which includes questions related to judgment bias, such as "Do you tend to interpret ambiguous situations in a negative way?" and "Do you tend to focus on the negative aspects of a situation?"

Analysis of the data was done using the IBM-SPSS tool through the correlation, regression, Cronbach alpha, skewness, and kurtosis.

IV. RESULTS AND DISCUSSION

The content in Table 1 shows reliability statistics with the help of Cronbach’s Alpha, a measurement which helps to understand internal consistency. The value obtained is 0.893 which is satisfactory.

4.1 Reliability Statistics

Table 4.1: Reliability statistics of the variables

Reliability Statistics	
Cronbach's Alpha	N of Items
.893	8

Table 4.1 provides an overview of reliability statistics. The table demonstrates that the study's initial premise is correct. It shows that all the factors have a similar influence on the research variable, with Social Skills having the next-highest mean (11.42) and Self-Awareness having the highest mean (11.45). Motivation has the lowest mean (9.97), although it does not differ significantly from the other variables.

4.2 Descriptive Statistics

Table 4.2: Descriptive Statistics of the factors of Emotional Biases

Descriptive Statistics										
	N		Mean	Median	Std. Deviation	Variance	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
	Valid	Missing								
RA avg	116	0	3.4500	3.6000	.76664	.588	-.768	.225	.961	.446
LA avg	116	0	3.3937	3.3333	.86096	.741	-.247	.225	.177	.446
SC avg	116	0	3.0862	3.0000	.67896	.461	.465	.225	1.180	.446
SQ avg	116	0	3.2874	3.3333	.71815	.516	.059	.225	-.020	.446
O avg	116	0	3.3043	3.2667	.49535	.245	.145	.225	1.830	.446
HB avg	116	0	3.2260	3.1715	.51710	.267	.486	.225	1.709	.446
JB avg	116	0	3.2260	3.1715	.51710	.267	.486	.225	1.709	.446
EBA avg	116	0	3.2521	3.2002	.49586	.246	.371	.225	1.890	.446

Table 4.2 provides an overview of the descriptive statistics where mean of Regret Aversion Bias is the highest and that of Self-control Bias is lowest. Median of Regret Aversion Bias is the highest and that of Self-control Bias is the lowest. Variance of Loss Aversion Bias is the highest and that of Overconfidence Bias is the lowest. Standard Deviation of Loss Aversion Bias is the highest and that of Overconfidence Bias is the lowest.

Standard Error of skewness is 0.225 for all the factors of emotional biases, which indicates that the tail of the distribution curve is slightly right because the value lies between -2 and +2. The standard error of kurtosis is 0.446 for all the factors of emotional biases, which indicates that normality can be accepted because the value lies between -2 and +2.

4.3 Correlation

Table 4.3: Correlation Analysis between the variables

Correlations		RA avg	LA avg	SC avg	SQ avg	O avg	HB avg	JB avg	EBAvg
RA avg	Pearson Correlation	1	.362**	.116	.119	.627**	.306**	.306**	.421**
	Sig. (2-tailed)		.000	.215	.203	.000	.001	.001	.000
	N	116	116	116	116	116	116	116	116
LA avg	Pearson Correlation	.362**	1	.176	.289**	.739**	.447**	.447**	.556**
	Sig. (2-tailed)	.000		.059	.002	.000	.000	.000	.000
	N	116	116	116	116	116	116	116	116
SC avg	Pearson Correlation	.116	.176	1	.337**	.586**	.781**	.781**	.738**
	Sig. (2-tailed)	.215	.059		.000	.000	.000	.000	.000
	N	116	116	116	116	116	116	116	116
SQ avg	Pearson Correlation	.119	.289**	.337**	1	.649**	.818**	.818**	.784**
	Sig. (2-tailed)	.203	.002	.000		.000	.000	.000	.000
	N	116	116	116	116	116	116	116	116
O avg	Pearson Correlation	.627**	.739**	.586**	.649**	1	.876**	.876**	.942**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	116	116	116	116	116	116	116	116
HB avg	Pearson Correlation	.306**	.447**	.781**	.818**	.876**	1	1.000**	.987**
	Sig. (2-tailed)	.001	.000	.000	.000	.000		.000	.000
	N	116	116	116	116	116	116	116	116
JB avg	Pearson Correlation	.306**	.447**	.781**	.818**	.876**	1.000**	1	.987**
	Sig. (2-tailed)	.001	.000	.000	.000	.000	.000		.000
	N	116	116	116	116	116	116	116	116
EBAvg	Pearson Correlation	.421**	.556**	.738**	.784**	.942**	.987**	.987**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	116	116	116	116	116	116	116	116

**Correlation is significant at 0.01 level (2-tailed)

Table 4.3 provides an overview of correlation analysis where all other factors (biases) have the significant relationship with each other except some cases- regret aversion with self-control and status quo bias, loss aversion with self-control bias and self-control with loss aversion bias.

4.4 Regression Analysis

Table 4.4.1: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	1.000 ^a	0.446	0.49583	0.00302	1.000	774474.000	4	111	0.000

a. Predictors: (Constant), JB avg, RA avg, LA avg, SC avg
 b. Predictor: (constant)

Table 4.4.1 provides the value of R, known as the multicollinearity coefficient. It shows the linear relationship between the obtained value of the variable and the value envisioned by the model. The R value in the table above is 1.000. It shows that there is a relationship between the independent variables and the dependent variable., i.e., when the value of independent variables, JB, RA, LA and SC increase, the value of EB (dependent variable) also increases.

Table 4.4.2: ANOVA

ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	28.271	4	7.068	774474.000	.000 ^b
Residual	0.001	111	0.000		
Total	28.272	115			

a. Dependent Variable: EBAvg
b. Predictors: (Constant), JB avg, RA avg, LA avg, SC avg
c. Predictor: (constant)

Table 4.4.2 shows the ANOVA test which shows the Analysis of Variance. Dependent variable is EB and independent variables are JB, RA, LA and SC. The value of F is 774474 (a very high value). This shows that the factors are considered statistically significant because higher difference shows statistical significance and existence of relationships.

Table 4.4.3: Coefficients

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	0.001	0.002		0.333	0.740		
	RA avg	0.067	0.000	0.103	165.023	0.000	0.828	1.208
	LA avg	0.066	0.000	0.115	168.323	0.000	0.690	1.449
	SC avg	0.001	0.001	0.001	1.268	0.207	0.347	2.884
	JB avg	0.866	0.001	0.903	839.231	0.000	0.279	3.589

a. Dependent Variable: EBAvg

Table 4.4.3 shows that EB is the dependent variable and RA, LA, SC and JB are independent variables. The values of Beta (standardized coefficients) for all the factors are positive, but less than one which shows that there is a relationship between the variable and the individual variable, but the change in the variable causes a small change in the variable. Also, p-value of RA, LA and JB shows statistical significance whereas the p-value of SC is 0.207 which shows that SC is statistically insignificant, but there is a scope of being SC statistically significant if the sample size is increased.

V. CONCLUSION AND FUTURE WORK

Research confirms that not only the thinking and calculation skills of investors influence investment decisions, emotions have a greater influence on investment decisions. The paper is a continuation of research work of the researchers- Naval Kishor and Ritika where they have worked on Behavioral Biases. This study continues to work on emotional biases only and test the significance and cause effect relationship of two other biases- "Hindsight Bias" and "Judgement Bias" apart from "Regret Aversion Bias", "Loss Aversion Bias", "Self-control Bias", and "Overconfidence Bias". After analyzing the collected data, it can be concluded that there is a relationship between all the factors and "Regret Aversion Bias", "Loss Aversion Bias" and "Judgement Bias" showed positive and statistically significant results.

This study makes a positive contribution to financial behavior and a measurement of various behavioral biases in making investment decisions. It will provide researchers to identify various opportunities for behavioral biases. The analysis of emotional biases in investment behaviour has several implications for investors, financial professionals, and policymakers. By understanding their emotional biases, investors can make more informed and rational investment decisions. For example, they can avoid making impulsive decisions during market fluctuations or overreacting to news that does not significantly affect the long-term prospects of

the investment. Financial professionals may provide better advice by identifying emotional biases in their investment behaviour and providing strategies to manage them. For example, they can suggest diversifying investments to reduce the impact of emotional reactions to market movements.

Policy makers can improve regulations. For example, they can require financial institutions to disclose more information to investors, thereby reducing the impact of emotional biases on investment decisions.

Research can inform better investment strategies that consider the impact of emotions on investor behaviour. Nowadays, researchers also design algorithms that reduce emotional biases' impact on investment decisions.

Therefore, by analysing emotional biases in investment behaviour can lead to more informed investment decisions, better advice from financial professionals, improved regulations, and more effective investment strategies.

The research work can be extended on sector-specific domains and ways can be explored to mitigate these biases for better decision-making of investors.

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