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**LOSS AVERSION, OVERCONFIDENCE AND SELF-  
ATTRIBUTION: IMPACT ON INDIVIDUAL  
INVESTMENT DECISION**

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***Abstract***

*The growing discipline of behavioural finance has emphasized the various biases that play an essential role in an investor's investment decisions or behaviour. Often, the investors are unknowingly under the influence of a bias while making an investment decision that can impact the quality of their choices. Through this research study, an attempt has been made to identify the biases that affect the decisions of individual investors. Further, the study focuses on understanding the inter-relationship between the identified biases, namely overconfidence bias, loss aversion bias, and self-attribution bias. Finally, an effort has been made to determine the impact of the three biases on the investment decision. The data has been collected through a structured questionnaire from 243 respondents. It was concluded that there is a significant level of relationship between all the three identified biases. The biases and the investment decisions are positively correlated, which means they move in the same direction. There is a positive impact of the identified biases on the investment decision of individual investors. The study can be elaborated further to study the effect of other biases on the investment decision of individuals.*

***Keywords:*** Behavioural Finance, Loss Aversion, Overconfidence, Self-attribution, Investment Decision Making.

## INTRODUCTION

It is a widely accepted fact that human beings are rational. This has also been the significant assumption of many economic theories. The underlying postulation of rational decision-making is that humans make use of their cognitive ability to process data, and also, they possess the required resources. Hence, decisions are taken after an objective assessment that benefits a person and reduces the loss. It is assumed that all human beings are logical in their approach while taking any decision. But this framework of rationality has no room for the emotional, ethical, social, and psychological concerns of human beings, leading to its criticism. The notion of bounded rationality is the most extensive critique of the assumption that humans are involved in rational decision-making (Simon, 1982). Their cognitive abilities often restrict the rationality of human beings. The base of traditional or standard finance is laid on the belief that investors are rational in their approach. Among all the theories of conventional finance, the efficient market hypothesis (EMH) is amongst the most prominent and noteworthy one. It states that all information is available in the market and is accommodated in the prices of the stocks. Thus, the markets are efficient, i.e., the stocks always reflect their correct market value (Fama, 1970).

But certain anomalies in the market play a significant role in questioning the various forms of EMH. Behavioural finance helps to eradicate these anomalies from the market by understanding individual investment decisions. Behavioural finance is quite interdisciplinary. It has originated from the interaction of the subjects like sociology, psychology, and finance. Another critical theory of traditional finance is that of utility, under which it is believed that all investors are risk-averse. But prospect theory of behavioural finance is contrary to it. It is thought that the investors place different values on gains and losses, respectively, determining whether an investor is risk-averse or a risk seeker. The emergence of behavioural finance challenged the very foundation of the

traditional finance theory that investors are rational. Behavioural finance explains how biases, whether cognitive or emotional, influence an individual's decisions and display irrationality by the investors.

Investment decisions are crucial to any investor as nobody wants to make losses and lose his/her hard-earned money. Every individual wants to decide the best for himself, but often falls prey to various biases arising due to psychological and emotional causes. Under the dominance of bias, investors can indulge in irrationality and decrease their returns. So it becomes essential to study the biases and their impact on the investment decisions of individuals.

The growing discipline of behavioural finance has emphasized the various biases that play an essential role in an investor's investment decisions or behaviour. Often, the investors are unknowingly under the influence of a bias while making an investment decision that can impact the quality of their choices. Through this research study, an attempt has been made to identify the biases that affect the decisions of individual investors. Further, the study focuses on understanding the inter-relationship between the identified biases, namely overconfidence bias, loss aversion bias, and self-attribution bias. Finally, an effort has been made to determine the impact of the three biases on the investment decision.

## LITERATURE REVIEW

The theory of "expected utility" is not an adequate "model" depicting economic behaviour. Prospect theory states that losses loom larger than gains (Kahneman & Tversky, 1979). The development of an investment portfolio is a complex task. Therefore, an investor should consider the general information available rather than pay attention to the behavioural aspects that influence decisions. By looking out for accurate data, the investor can maximize their return and overcome the various biases (Sukanaya & Thimmarayappa, 2015).

The scope of behavioural finance is expansive and growing because of biases being exhibited by individual investors. The salaried individuals working in IT organizations mostly show self-control, and representativeness, and there is minimal presence of frame dependence, aversion and ambiguity in case of inefficient markets (Imthiyas, Shayamasunder & Ramar, 2015).

Overconfidence is an overestimation of what individuals can do, which makes them feel better about themselves, the reality might be different. Overconfidence bias can cause investors to move on a path of irrationality. It makes an investor lose his/her objective assessment of situations. Ignorance of important information is one of the results of this bias. Moreover, since an overconfident investor believes that his choice of investment options or stocks is the best, he often lands up with highly undiversified portfolios, thus exposing himself to higher risk.

Certain factors lead to overconfidence among the investors. Knowledge regarding selection and holding of stock, excess optimism influences the confidence of an investor. Overconfident investors have an illusion of control which compels them to indulge in excessive trading. This was shown in the study conducted on investors in Lucknow. The data collection was completed through questionnaires, and descriptive statistics were made use of to analyze the data (Trehan & Sinha, 2016).

The behavioural factors influence the investment decisions of investors. The supreme factors that shape the decision-making of any investor are the herding bias and self-attribution bias. Most of the investors are likely to invest in traditional options and are therefore risk-averse. The study was conducted by collecting data from individual investors (Patil & Chavan, 2020). Self-attribution means giving credit to oneself. Human beings usually credit themselves with the success of an event and blame others for the failure.

Loss aversion bias shows how negative thoughts impact the decision of an individual. A loss-averse investor

usually invests in those assets that promise assured returns even when the return is low compared to other opportunities. There is a relationship between overconfidence and gender of an individual investor, self-attribution, and education. The study conducted on mutual fund investors showed that men are comparatively more overconfident than women. The degree of self-attribution has a meaningful relationship with the level of education. It increases with the increment in the latter. With the increase in experience and education, overconfidence also grows (Mishra & Metilda, 2015). The experience factor, incongruity factor, inducement factor, and dogmatic factor significantly influence investment decisions made by individual investors (Chopde & Kulkarni, 2017).

Locus of control, emotional intelligence, risk attitude, herding, heuristics, and prospect theory is the behaviour-related factors that correlate with investment decisions. The demographic characteristics also have an association with investing decisions (Pankajam, 2017). The behavioural biases that influence the decisions of individuals and institutional investors are now being deeply studied. The issuers of securities should pay attention to behavioural finance concepts before floating the issues in the market to better understand why the market behaves in an unplanned or undesired manner (Zahera & Bansal, 2017). In order to achieve medium or long-term financial goals, a disciplined investment approach is required. Self-control bias is exhibited by investors while investing in mutual funds (Bobde, Bagde, & Goje, 2017).

Individual investors are influenced by various psychological factors while making investment decisions. While confirmation bias, heuristics and pessimism might positively impact a person's rationality (Joo & Durri, 2018). The way a choice is presented has a bearing on how a person responds to it. It is referred to as the framing bias. In order to control the negative result of the bias, its identification is essential as when it can be recognized, the investor is less likely to fall prey to the misleading information presented to him by any stock market

professional. Exercising emotional control is a key to reduce this bias, thus lessen the irrationality in the decisions (Konstantinidis, Spinthiropoulos, & Kokkonis, 2018).

The overconfidence bias and herding bias significantly influence the "investment decisions" taken by the investors. There is overconfidence bias, herding bias, anchoring bias and disposition effect among the investors (Madaan & Singh, 2019). The "individual" investors are irrational, and there is an influence of "behavioural biases" on investment decisions. Biases like emotional bias, overconfidence bias, anchoring, familiarity, prospect theory, mental accounting, herding, and framing are exhibited by investors while making investment decisions (Upadhyay & Shah, 2019).

Herd instinct, representativeness, regret aversion, and herd instinct have notable influences on individuals' decisions. Investors should reduce cognitive biases in order to increase their return from investments (Ramalakshmi, Pathak, Jos & Baiju, 2019). Biases like status quo, mental accounting, gambler's fallacy, disposition effect, herding, anchoring, optimism, narrow framing, availability, overconfidence, representativeness, and loss-aversion have a significant impact on the investment decisions of individuals (Sharma & Kumar, 2019). The investment choices are significantly impacted by the years of experience in investing, financial literacy, disposition trait, gamblers fallacy, and familiarity trait. While familiarity bias positively impacted the investment decision, the rest of the factors negatively impacted (Patni & Choubey, 2019).

The cognitive biases guide or regulate the investors' decision-making power, influencing their financial risk tolerance (Samal & Mahopatra, 2020). It was found that conservatism and self-attribution bias have a significant relationship with financial risk tolerance and have a different impact on different types of investors (Jain & Kesari, 2019). The stock market anomalies like rising or fall in prices of extreme nature can be explained with the help of behavioural finance. Most studies found the

presence of overconfidence, herding, disposition effect, anchoring, loss aversion, mental accounting, and representativeness (Shukla, Rushdi & Katiyar, 2020). Emotional biases like overconfidence, loss aversion, home bias, and endowment effect impact investors' investments. Thorough knowledge of these biases will help investors understand the market better (Khilar & Singh, 2020).

### Research Objectives

- To identify various behavioural biases impacting individual investment decisions.
- To examine the relationship between the identified behavioural biases.
- To study the impact of identified biases on individual investment decisions.

## RESEARCH METHODOLOGY

This research is based on a quantitative research design. Primary data has been collected for the study. A structured questionnaire was used for the collection of the data. The link to the Google form was forwarded to the respondents. Descriptive questions and a five-point Likert scale were used in the questionnaire, one being "Strongly disagree" and five being "Strongly Agree". Data for this research was collected from NCR (National Capital Region). The questionnaire was sent to 283 investors, out of which responses could be obtained from 250 investors. Out of 250, the number of inappropriate responses was 7, which were discarded. The research data was collected with a response rate of 85.6 percent.

For the collection of data, the purposive sampling technique has been used. The sample size for the study consisted of 243 individual investors. The sample of the survey represented the age scale of 20 years to 70 years and above. The sample comprised 167 males and 76 females. Most of the investors were earning a monthly income between Rs. 25,000 – Rs. 50,000.

The analysis of the data was done with the aid of descriptive statistics and inferential statistics. Cronbach

Alpha, Correlation coefficient, and Regression have been used to undertake the research. Cronbach alpha coefficient has been used to assess the reliability of the variables used in the study. The coefficient of correlation has been used to understand the relationship between the variables, and regression analysis has been used to study the impact of the independent variables on the dependent variable.

### Hypothesis Formulation

- There exists no significant relationship between the three identified biases.
- There exists no significant relationship between the three identified biases and investment decisions.
- There is no significant impact of the three identified biases on individual investment decisions.

## DATA ANALYSIS

Demographic profile of all the respondents (n=243) is presented in table 1. As can be seen that almost half of the respondents belong to age group of 20-30 years, more than 60 percent of the respondents are male and 30 percent of total respondents lies between Rs. 25000-50000 income level.

**Table 1: Demographic Profile**

Groups	Sub-groups	Frequency	Percentage (%)	Total
<b>Age (years)</b>	20-30	111	45.7	243
	30-40	109	44.9	
	40-50	6	2.5	
	50-60	9	3.7	
	60-70	8	3.3	
	70 and above	0	0	
<b>Gender</b>	Male	167	68.7	243
	Female	76	31.3	
<b>Monthly Income (Rs.)</b>	Below 25000	71	29.2	243
	25000-50000	74	30.5	
	50000-75000	49	20.2	
	75000-100000	14	5.8	
	100000 and above	35	14.4	

**Source:** Authors' Calculations

Table 2 shows a descriptive value of mean and standard deviation for various variables being studied in the study. After the descriptive analysis, a reliability test was done for all the variables. For reliability, Cronbach's alpha (as shown in Table 3) has been used to measure the variables' internal consistency to see how the selected items behave

as a group. It is a gauge of scale reliability. The results show that Cronbach alpha is above the widely accepted 0.7 threshold for high reliability for different variables.

**Table 2:** Descriptive Statistics

		Investment Decision	Overconfidence	Loss Aversion	Self Attribution
N	Valid	243	243	243	243
	Missing	0	0	0	0
Mean		2.955	3.235	3.490	3.019
Std. Deviation		0.9011	0.8531	0.9806	1.0106

Source: Authors' Calculations

**Table 3:** Reliability Analysis

Variables	Number of items	Value of Cronbach's Alpha	Adapted from
Over confidence bias	4	0.765	Pan, C. & Statman, M (2012)
Loss aversion bias	4	0.735	Khan (2017)
Self- attribution bias	4	0.768	Seppälä, A. (2009)
Investment decision	7	0.761	Cao, M. M. & Nguyen, N. (2020)

Source: Authors' Calculations

### Relationship between Loss Aversion, Overconfidence and Self-Attribution

*H0: There exists no significant relationship between the three identified biases.*

*H1: There exists a significant relationship between the three identified biases*

Table 4 depicts the correlation among overconfidence bias, loss aversion bias and self-attribution.

Overconfidence bias has a significant relationship with loss aversion bias, and self-attribution bias.

**Table 4:** Correlation Coefficient between the identified biases

		Overconfidence	Loss Aversion	Self Attribution
Overconfidence	Pearson Correlation	1	0.508**	0.399**
	Sig. (2-tailed)		0.000	0.000
	N	243	243	243
LossAversion	Pearson Correlation	0.508**	1	0.627**
	Sig. (2-tailed)	0.000		0.000
	N	243	243	243
SelfAttribution	Pearson Correlation	0.399**	0.627**	1
	Sig. (2-tailed)	0.000	0.000	
	N	243	243	243

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' Calculations

Loss aversion bias has a meaningful relationship with overconfidence bias, and self-attribution bias and self-attribution bias positively correlate with overconfidence bias and loss aversion bias. All the three selected preferences are positively related to each other. Thus, H1 is accepted.

Table 5 depicts the correlation between the three identified biases: overconfidence, loss aversion and self-attribution, and investment decision. The relationship of

all the identified biases with investment decisions is significant with a p-value of 0.01.

*H0: There exists no significant relationship between the three identified biases and investment decisions.*

*H1: There exists a significant relationship between the three identified biases and investment decisions.*

**Table 5:** Correlation coefficient between identified biases and investment decision

		<b>Investment Decision</b>
	<b>Pearson Correlation</b>	0.465**
	<b>Sig. (2-tailed)</b>	0.000
	<b>N</b>	243
<b>LossAversion</b>	<b>Pearson Correlation</b>	0.578**
	<b>Sig. (2-tailed)</b>	0.000
	<b>N</b>	243
<b>SelfAttribution</b>	<b>Pearson Correlation</b>	0.670**
	<b>Sig. (2-tailed)</b>	0.000
	<b>N</b>	243

**Note:** \*\*. Correlation is significant at the 0.01 level (2-tailed).

**Source:** Authors' Calculations

All the determined variables and investment decisions are positively related to each other, signified by the positive sign of the correlation coefficient. Thus, H2 is accepted.

*H0: There is no significant impact of the three identified biases on individual investment decisions.*

*H1: There is a significant impact of the three identified biases on individual investment decisions.*

**Table 6:** ANOVA Results

<b>Model</b>	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
<b>Regression</b>	29.136	3	9.712	35.575	0.000 <sup>a</sup>
<b>Residual</b>	29.757	109	.273		
<b>Total</b>	58.893	112			

a. Predictors: (Constant), Self Attribution, Over Confidence Bias, Loss Aversion

b. Dependent Variable: Investment Decision

**Source:** Authors' Calculations

From the table 6, the overall fitness of the model can be inferred. It can be deduced that model is overall fit as the significance value is less than 0.05. Table 7 presents the results of regression analysis considering investment decisions as the dependent variable and the three

identified biases as the independent variables. The value of R is 0.703, which is high enough to indicate a significant level of correlation. The value of R square and Adjusted R square is close to each other, thus indicating the absence of non-significant variable.

**Table 7:** Regression Analysis between the variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	0.703 <sup>a</sup>	0.495	0.481	0.52249	.0495	35.575	3	109	0.000	1.449

**Note:** a. Predictors: (Constant), Self Attribution, Over Confidence Bias, Loss Aversion

b. Dependent Variable: Investment Decision

**Source:** Authors' Calculations

Table 8 shows the significance of each of the individual variables selected for the study. From the table, we can deduce that the three identified biases, i.e. "overconfidence" bias, "loss aversion" bias, and "self-

attribution" bias, have a significant impact on the dependent variable Investment Decision as their significance values are less than 0.05.

**Table 8:** Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	$\beta$	Std. Error	Beta		
<b>(Constant)</b>	0.679	0.238		2.846	0.005
<b>Over Confidence</b>	0.169	0.074	0.182	2.286	0.024
<b>Loss Aversion</b>	0.167	0.076	0.205	2.185	0.031
<b>Self Attribution</b>	0.370	0.073	0.449	5.098	0.000

**Note:** a. Dependent Variable: Investment Decision

**Source:** Authors' Calculations

The results reject the null hypothesis, which stated no significant relationship between the three identified biases. The research found that there is a substantial relationship between the identified biases. Overconfidence bias is positively associated with self-attribution bias and loss aversion bias. Similarly, the latter is having a significant relationship with overconfidence bias. The correlation was positive, which means that the identified biases move in the same direction. The results also reject the null hypothesis, which stated no significant

relationship between the Identified biases and investment decisions. The identified biases have a substantial relationship with the investment decision. It was revealed by the study that the investment decision is closely and remarkably associated with the overconfidence bias, loss aversion bias, and self-attribution bias.



## CONCLUSION AND IMPLICATIONS

Classical decision theory, rational behaviour, risk aversion, model portfolio theory (MPT), CAPM, and EMH are the main themes in conventional finance, which have been the dominant paradigms for decades, implying that investors make rational decisions to maximize utility. However, actual research has demonstrated that standard finance assumptions do not uphold. Behavioural finance study began by observing investor behaviour to develop models that describe how investors make investment decisions. To understand the behaviour of investors, behavioural finance combines social science ideas. A total of 243 individual investors were approached to study the objectives of the research. This study is an addition to the current literature done on investment decision-making. The empirical data supports the suggested theory, demonstrating that individual investors on the Indian Stock Exchange who suffer from one or more of these biases, such as self-attribution, overconfidence, or loss aversion, make suboptimal judgments with results less than ideal.

The study has identified the presence of biases among the investors. The identified biases are overconfidence bias, loss aversion bias, and self-attribution bias. The study revealed a close association between the three identified biases, and therefore the null hypothesis was rejected. The authors can infer that there is a meaningful and intimate relationship between the "Overconfidence" bias and "Self-attribution bias", "Overconfidence bias" and "Loss aversion bias" and "Self-attribution bias" and "Loss aversion bias". The relationship between overconfidence bias and self-attribution bias agrees with the previous research conducted in this respect. A significant relationship between the biases leads us to conclude that the presence of one bias forces an investor to fall prey to another bias.

Moreover, it can be supposed that a person can be subject to many biases simultaneously. An essential objective of the study was to understand the impact of identified biases

on the investment decisions of individual investors. The authors were forced to reject the null hypothesis as a significant relationship was found between the three biases and the investment decisions. All three biases showed a positive association with investment decisions which was of a considerable level. The finding related to the impact of overconfidence bias on investment decisions is consistent with that of (Madaan & Singh, 2019).

This study utilizes behavioural finance and examines the impact of behavioural biases on individual investor decisions. Individuals can use the research findings to rationalize their decisions. Other financial corporations can also use it for an annual assessment of the organization's financial condition. On this basis, subsequent decisions regarding the continuation, termination, or reframing of strategies can be made.

As a result, financial advisors, brokers, consultants, and investors can recognize the fundamental reasons for irrationality and improve or increase their cognitive processes substantially. Consequently, individuals will be able to enhance their financial decision-making since they will be more conscious of their prejudices. This study can be a valuable contribution since it investigates bias affiliation and how one bias causes another prejudice. Individuals can identify biases and how to counter them with the help of this study. For example, if a broker notices that his investor has overconfidence bias, the broker can easily conclude that it is self-attribution bias that is causing the investor's overconfidence. The broker can then eliminate the self-attribution bias, and the investor's overconfidence bias will disappear.

## LIMITATIONS AND FUTURE SCOPE OF STUDY

The study's limitations include the fact that we solicited responses from investors, and it is well known that investors are often unfamiliar with modern financial terminologies. Although we attempted to minimize the impact of their lack of knowledge on their responses, it is

possible that it had an effect. Because the data was gathered from National Capital Region, it is possible that it does not apply to the entire country of India due to regional influences on other geographical regions. Behavioural finance is such a fascinating area of finance, it is recommended a thorough examination of behaviour finance theories should be done, bearing in mind that it is not an easy field to research and study. The recommendation for future studies is to do analogous studies while attempting to increase the sample size. It is suggested to utilize one of two possible exploration approaches to deal with this situation: 1: increase the sample size 2: confine exploration to a certain area. There are hundreds of more biases left to be discovered in the field of behavioural finance. Because this study found that these biases are interconnected, more biases might be combined with these biases for research reasons. Because the majority of investors in this study were male investors, one thing that could be viable in the future is to investigate the impact of prejudices on female investors. It would be a fascinating feature because mental psychology varies by gender. As a result, it will provide Indian scholars with a unique perspective for future research.

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