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THE IMPACT OF PSYCHOLOGICAL FACTORS ON INVESTMENT DECISION MAKING OF INVESTORS: AN EMPIRICAL ANALYSIS

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ABSTRACT

In the traditional financial theory, the decision makers were assumed to be rational and stock markets were thought out to be the perfect markets i.e. whatever information is available in the market is fully reflected in share prices and nobody can earn extra profits just by having insider's information. On the contrary, modern theory proposes that investors' decision-making is not always propelled by these thoughts.In fact, the decisions taken by them are unpredictable sometimes. Moreover, there are many studies which have shown that investors' decisions are influenced by numerous psychological factors. The present research aims at determining the various psychological factors that have an influence on investor's decision making in Indian stock market. In the present article, data was collected from 380 retail investors who are further segregated in two groups on the basis of their investment experience. Four behavioral biases namely loss aversion bias, regret aversion bias, herding bias and anchoring bias are considered and analysed using discriminant analysis and chi-square test. It was found that herding bias was exhibited by both the groups in an equally likely manner. Further, experienced investors were found to be more prone to loss aversion bias, regret aversion bias and anchoring bias as compared to that of less experienced investors.

KEYWORDS: *Behavioral Finance, Herd behavior, Regret Aversion, Anchoring Bias, Loss Aversion.*
JEL Classification: G02, G110, G12, O16

1. INTRODUCTION

The global markets in the past few years have witnessed rising volatility and fluctuations. Paleness of the markets has directed towards unnecessary volatility in asset prices which cannot be elucidated with the help of traditional financial theories.Numerous studies have shown that stock markets have done extraordinarily well in the past by presenting more than 15% returns. But, even today majority of the investors are of the view that stock market returns are uncertain and volatile. Even well-educated and experienced investors are not able to earn above average returns in stock market. Numerous researches across the world on investor's behavior have exhibited that decision makers do not act rationally all the time, instead their decisions are affected by various other factors. That's why academicians and researchers impelled investor's psychology for locating the causes for their irrational and illogical behavior and this gave a way for the generation of a new dimension known as Behavioral Finance.

Behavioral Finance explicates how investors analytically make faults and mistakes while making judgments and bring about various abnormalities. It displays how cognitive factors can have an influence on asset prices and results in separation of financial assets into safe and speculative ones. Usually, investors turned out to be the sufferer of their own and many a times of other's faults due to the immersion of feelings in financial decision-making. Further, overlooking these psychological factors leads to partial and faulty decisions. To have an intense understanding of investors' decisions, it is necessary to study whether psychological bias has an impact on the individual investor's decisions. Thus, the main purpose of the present article is to examine the level of influence of various psychological biases on the investor's decision making process in Indian stock market. The specific objectives of the study is:

(a) to examine various psychological biases affecting individual investor's behavior.

(b) to identify if any behavioral bias exist among investors group.

The paper is organised in the following sections. Section 2 provides review of literature and Section 3 discusses the data and explains the methodology used to achieve the objectives of this study.

2. REVIEW OF LITERATURE

Although, a lot of researches have been done on behavioral finance in the last few decades but it has gained a lot of interest only after financial crisis 2008. Behavioral finance is of the opinion that markets are inefficient and investors do not behave rationally always. Thus, there is a need to incorporate human behavior along with traditional finance to learn why investors sometimes behave irrationally or do not consider all of the available information while making financial decisions (**Razek, 2011).**On the other hand, **Agrawal(2012)** presented a detailed conceptual framework of various behavioral biases by explaining how they occur, their consequences and how they are interrelated with each other. He found that these biases cannot be studied in isolation; as they tend to originate from other biases and are likely to be active simultaneously.

As, it has been observed that despite of strong principles of Efficient Market Hypothesis, market experiences a number of anomalies that causes unnecessary volatility and results in irrational decision-making. These anomalies can be seen in the form of calendar effects, stock splits, contagious effect, investment after performance evaluation period, tax benefits and many more. **Ahmed (2006)** examined the Day-of-the-week effect anomaly in the Indian equity market during the period of July 1997 to March 2006. He found the Day-of-the-Week effect anomaly in both the movements of BSE and NSE indices.**Muhammad (2009)** carried out his research to check if investors take rational decisions or just base their decisions on emotions or sentiments. He found that most of the investors do not participate in all the asset categories rather they tend to avoid losses and follow others while taking investment decisions. Moreover, they use past performance of a stock as an indicator of its future performance and trade too aggressively including only familiar stocks in their portfolio. **Chandra(2011)** confirmed the presence of calendar effects in SENSEX for the period April 1998 to March 2008. He found that mean returns in early days of a month were higher than remaining days of the same month. **Kaur (2011)**also found the evidence of month-of-the-year effect in BSE 500 and S&P CNX 500 indices from January 2002 to December 2009. She found that returns in the month of December were higher as compared to other months in the year, but did not found any significant results for day-of-the-week effect in the Indian Stock Market. **Kumar (2012)**conducted his study during Diwali period and found that during post mahurat period, there is an increase in the amount of trading volume, as a result of which, level of returns and volatility increases.

Generally, it is seen that investors hurt themselves by keeping losers for too long in the hope of selling them at profit than selling profitable stocks too soon. Investors associate regret more with holding losers than with selling winners too soon. Moreover, investors does not show any regret on negative outcomes when it involves advices from brokers, across both buying and selling (**Fogel and Berry, 2006**). Moreover, a loss incurred after having a gain is less painful, whereas a loss coming after incurring a loss appears to be more painful **(Barberis and Huang, 2001).**Sometimes, investors fail to take decision due to the fear that it will result in poor outcome. This type of behavior is known as regret aversion bias. **Siddiqui (2008)**investigated the impact of disposition bias on investment decision making process and found that investors considered security of the investment as first priority and they believe that whatever profits they made, it is because of their own analysis and evaluation and held other persons responsible for the losses.**He and Shen (2010)**investigated if investors use prior share returns while forecasting for future returnsand found that there is a positive relationship between anticipated returns and prior returns for both market based portfolios and single stocks.

Hirshleifer et.al (1998) found that overconfident investors have a tendency to overweigh their private information as compared to available public information, thus exaggerating the stock prices. Investors also tend to become overconfident when their private information reconcile with the available public information, but when these information contradicts, it does not have any impact on their confidence level. Overconfident investors tend to think that they are superior than they actually are. **Qian (2009)** investigates the time varying optimism of analysts related to time-varying investor emotions after regulating macroeconomic factors (GDP) and found that analysts were highly optimistic for small firms as compared to the large firms. He also found that when economy expands, it reduces analyst confidence and increases in case of low book-to-market firms as earnings for these firms are hard to predict by investors then in the case of firms having high book-to-market values.

Barber and Odean (2000)conducted their study to examine the performance of investments in stocks held by households and found that investor's likes to trade only in those stocks with which they were familiar and average households change more than 75% of their portfolio stocks every year. **Barber and Odean (2001)** tests if overconfidence causes excessive trading and low returns. They found difference in trading patterns of single men and single women and married women were less experienced than married men. Moreover, investors who trade in an interactive environment are more confident and optimistic and as a result of which their performance generally falls than investors who trade in a lonely environment **Cheng (2007)**. In this context the present study will provide further insights from Indian investor's perspective.

3. DATA AND RESEARCH METHODOLOGY

For present research, primary data was collected through questionnaires which were distributed in person to individual investors investing in stock market. For this purpose, data of individual investors was collected from reputed brokerage houses and financial websites and segregated in two groups on the basis of their investment experience.Questionnaires which were completely filled in all respect were only taken for analysis purpose. Further,the questionnaire comprises straightforward questions related to investors' personal information and various behavioral biases so as to evade any misunderstanding on respondent's part. All questions related to behavioral biases were designed on five point likert scale. Finally, 419 responses were received and amongst them 380 were chosen after rejection of incomplete questionnaires.

In the present study, Statistical Package for Social Sciences (SPSS) version 21.0 has been used for analysing the data. The process of data analysis starts with entering of data collected, separating in different bias groups and then analysing them to extricate some relationship amongst them. Subsequently, Discriminant Analysis and Chi-squared test was used for analysing the data. The discriminant analysis is an appropriate tool when the total sample is to be segregated into two or more mutually exclusive groups on the basis of some clearly defined independent variables and establishing a linear combination among them. It starts with the observations wherein both the group membership and interval variables values are known. A Discriminant function (also known as canonical root), is a latent variable which is formed as a linear combination of predictor variables. In discriminant analysis, the dependent variable investor-type (1 for less experienced investors and 2 for experienced investors) was selected as the discriminator. The objective behind this analysis is to test whether the less experienced investors and experienced investors could be classified as two mutually exclusive groups evincing behavioral biases in dissimilar manner.Further, Chi-squared test was used to check which investor group is more prone to a behavioral bias.

4. EMPIRICAL ANALYSIS

4.1 DISCRIMINANT ANALYSIS

4.1.1 Group Statistics Table

Group Statistics Table (Table 1) and Equality of Group Means (Table 2) are examined to check if any difference exists between the two groups in dependent variable on all independent bias variables. If difference did not prevails, then investor type (less experienced and experienced investors) could not be premeditated as an eloquent discriminator, and it would not be possible to carry on further analysis. But this is not the case here. In table 1, it can be noticed that the mean differences between the behavioral biases of investor-type group were different with the exception of herd behavior.

Table 1: Group Statistics					
Investment Experience		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
less experienced investors	Lossaversion	3.069	.6305	175	175.000
	Regretaversion	2.806	.7326	175	175.000
	Herd	2.880	.7446	175	175.000
	anchoring	2.674	.7048	175	175.000
experienced investors	Lossaversion	3.551	.6594	205	205.000
	Regretaversion	3.185	.6965	205	205.000
	Herd	2.927	.7273	205	205.000
	anchoring	3.302	.6464	205	205.000
Total	Lossaversion	3.329	.6889	380	380.000
	Regretaversion	3.011	.7372	380	380.000
	Herd	2.905	.7347	380	380.000
	anchoring	3.013	.7425	380	380.000

For example, mean of regret aversion bias of less experienced investors is 2.806 whereas it is 3.185 for experienced investors; thus, indicating in the direction that this behavior is exhibited by both the investor groups in a difference manner. On the other hand, looking at the mean of herd behavior of less experienced investors (2.880) and of experienced investors (2.927); it shows both the groups are exhibiting this bias in an equally likely manner.

Table 2 shows tests of equality of group means of various behavioral biases to check which independent variable is contributing majorly to the discriminant function. For this purpose, Wilks' Lambda test statistic is used to test the null hypothesis that both investor-type groups have identical means. The below table shows that F-Test are high for all the bias independent variables with an exception of Herd Behaviorwhich is in confirmation with the result revealed by Group Statistics. This means that both investor-type groups exhibiting Herding bias in an equally likely manner. Further, If we look at P-values in table 2, loss aversion, regret aversion and anchoring bias are significant at 0.05 levels, thus, confirming that these biases are exhibited by both the investor-type groups differently and affecting one investor type category more than the other.

Table 2: Tests of Equality of Group Means					
	Wilks' Lambda	F	df1	df2	Sig.
Loss aversion	.878	52.651	1	378	.000
Regret aversion	.934	26.741	1	378	.000
Herd	.999	.383	1	378	.536
anchoring	.822	82.017	1	378	.000

4.1.2 STEPWISE STATISTICS

In Stepwise statistics, a model of discrimination is build step-by-step. In other words, at each step all variables are reviewed and evaluated to determine which one is contributing most to the discrimination between groups. That variable will then be included in the model, and the process starts again. Based on table 3, anchoring bias is the best single predictor followed by loss aversion bias and regret aversion bias as the next-best one and herd behavior is the last variable contributing in the discrimination of the groups.

Table 3: Variables Entered/Removed[a,b,c,d]									
Step	Entered	Wilks' Lambda							
		Statistic	df1	df2	df3	Exact F			
						Statistic	df1	df2	Sig.
1	anchoring	.822	1	1	378.000	82.017	1	378.000	.000
2	Lossaversion	.731	2	1	378.000	69.324	2	377.000	.000
3	Regretaversion	.715	3	1	378.000	50.062	3	376.000	.000
4	Herd	.706	4	1	378.000	39.068	4	375.000	.000
At each step, the variable that minimizes the overall Wilks' Lambda is entered.									
a. Maximum number of steps is 8.									
b. Minimum partial F to enter is 3.84.									
c. Maximum partial F to remove is 2.71.									
d. F level, tolerance, or VIN insufficient for further computation.									

4.1.3 SUMMARY OF CANONICAL DISCRIMINANT FUNCTIONS

The eigenvalue (Table 4) reveals the percentage of variance explained by the discriminant function. The larger the eigenvalue, the greater amount of variance explained by the linear combination of independent variables. Canonical correlation provides the correlation coefficient of each discriminant function. Canonical correlation is the value between discriminant scores and the levels of dependent variable where high value shows that function is discriminating well. In Table 4 there is only one discriminant function and the canonical correlation value is 0.547 which is not very high as 1 is considered as perfect. In other words, it shows that 54.7% of the discrimination is explained by the function.

Table 4: Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.427[a]	100.0	100.0	.547
a. First 1 canonical discriminant functions were used in the analysis.				

Wilks' Lambda is used to check if the discriminant function is statistically significant. Its value ranges from 0 to 1 where a value close to 0 indicates that variables are contributing more towards discriminating function and a value of 1show that means of the observed groups are identical. The below mentioned table (Table 5) also provide a chi-square statistic value to test the statistical significance of Wilks' lambda.

Table 5: Wilks' Lambda				
Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.701	133.571	4	.000

The value of Wilks' Lambda 0.706 (Table 5) suggested that 70.1% of the variability is not explained by the discriminator. The p-value of chi-square statistic is 0.000. If the p-value is less than 0.05, it indicates that the discriminant function explains the group membership strongly.

4.1.4 STANDARDIZED CANONICAL DISCRIMINANT FUNCTION COEFFICIENTS

The Standardized Canonical Discriminant Function coefficients are similar to the beta coefficients of multiple regressions. These coefficients are used to point out the relative importance of the independent variables in anticipating the dependent variable (investor-type). A higher value shows the increasing importance of the variable which means that the groups vary a lot on that particular bias independent variable. However, the sign of the coefficients signifies the direction of the relationship and can be avoided for now. From table 6, it can be seen that Anchoring Bias has the highest coefficient thus confirming that this bias is contributing more in discriminating the groups. This is similar to the results advocated by the Wilks' lambda coefficients followed by loss aversion and regret aversion.

Table 6: Standardized Canonical Discriminant Function Coefficients	
	Function
	1
Lossaversion	.624
Regretaversion	.320
Herd	-.265
anchoring	.727

4.1.5 STRUCTURE MATRIX

It is another method used for examining the relative importance of independent variables and is considered as more reliable than standardized canonical discriminant function coefficients. Structure matrix shows the correlation between independent variables and discriminant function. Any variable having a value of 0.30 or more is taken up as important in predicting the differences between the groups. Table 7 shows the correlation between predictors and the discriminant function.

Table 7: Structure Matrix	
	Function
	1
anchoring	.713
Lossaversion	.571
Regretaversion	.407
Herd	.034
Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions Variables ordered by absolute size of correlation within function.	

It can be seen from the above table that Anchoring bias has the highest coefficient, which is identical with the results of other tests performed earlier followed by loss aversion bias with a value of 0.571 and regret aversion with a value of 0.407.

4.1.6 CANONICAL DISCRIMINANT FUNCTION COEFFIEICNTS

Canonical Discriminant Function Coefficients are unstandardized scores of independent variables. They are interpreted in the same manner as the beta coefficients of multiple regressions and are used to create discriminant function equation. Further, they are also used to categorize the new cases in the investor-type groups. Table 8 can be written as:

D =0.965 Loss Aversion + **0.461**Regret Aversion **– 0.301** Herding **+ 1.079** Anchoring – 6.984

'D' is the discrimination function showing the independent variables in the equation. The coefficients of independent variables show the extent to which they are contributing to the discrimination function.

Table 8: Canonical Discriminant Function Coefficients	
	Function
	1
Lossaversion	.965
Regretaversion	.461
Herd	-.301
anchoring	1.079
(Constant)	-6.984
Unstandardized coefficients	

For example, Anchoring Bias has the highest coefficient of 1.070 which indicates that one investor category was exhibiting this bias in a much more manner than the other.

4.1.7 FUNCTIONS AT GROUPS CENTROIDS

The following table shows the group centroids value for each investor-type group. 'Functions at Group Centroids' indicate the discriminant score for respondents belonging to the investor-type group. If the groups are of identical size, the respondents can be segregated using the halfway between the values of the functions at group centroids. But if the groups are not of equal size, the best way of segregating the respondents is by using weighted average of the values of functions at group centroids.

Table 9: Functions at Group Centroids

Investment Experience	Function
	1
Less Experienced	-.705
Experienced	.602
Unstandardized canonical discriminant functions evaluated at group means	

Table 9 is used to segregate the respondents in investor-type groups. Thus, the mean for group 1 (less experienced investors) is -0.705and the mean for group 2 (experienced investors) is 0.602. In this case, the cutting point of the two groups is -0.0515 {i.e. (-0.705 + 0.602)/2}. This helps in taking a decision for segregating the new case in different investor-type groups. If the discriminantscore of the respondent comes to the right of the mid value, that can be classified as experienced investor and if the discriminant score of the respondent comes to the left of the mid value that can be classified as less experienced investor. In other words, any value greater than -0.0515 will head the respondent as experienced investor and any value less than -0.0515 will head the respondent as less experienced investor.

4.1.8 CLASSIFICATION TABLE

The last table of discriminant analysis provides the classification results displaying the rate of success in predicting the respondent's category in various investor-type groups using discriminant function. Table 10 shows that discriminant function is capable to categorize 76.3% of the respondents correctly. Moreover, original count is shown in rows and predicted group membership is shown in columns. More explicitly, the table has two parts- original and cross-validated classification. In the original classification, 175 cases are predicted to be in less experienced investor group (group1) out of which 133 are already in group 1 and 42 belongs to the group 2. Similarly, 205 cases are predicted to be in experienced investors group (group 2) out of which 157 are already in group 2 and 48 belongs to the group 1. So, on the whole, only 90 cases out of 380 cases are not classified by the model correctly.

Table 10: Classification Results[a,c]

		Investor Type	Predicted Group Membership		Total
			Less Experienced	Experienced	
Original	**Count**	**Less experienced**	133	42	175
		experienced	48	157	205
	%	**Less experienced**	76.0	24.0	100.0
		experienced	23.4	76.6	100.0
Cross-validated[b]	**Count**	**Less experienced**	131	44	175
		experienced	48	157	205
	%	**Less experienced**	74.9	25.1	100.0
		experienced	23.4	76.6	100.0
a. 76.3% of original grouped cases correctly classified.					
b. Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.					
c. 75.8% of cross-validated grouped cases correctly classified.					

The second part of the table shows cross-validated classification which is more authentic. In this method, one independent variable is kept out and the discrimination function is constructed using other variables. After that the variable which is kept out is categorized using these results and then the same process is replicated for other variables also. Looking at the cross-validated results, it is showing that 75.8% of the cases are classified correctly as shown by the results of original classification.

4.2.BIAS SPECIFIC ANALYSIS

4.2.1 Loss Aversion Bias:-

Loss aversion is the tendency of people to strongly prefer refraining losses than having gains. Some researchers have also advocated that losses affect people as much as twice, psychologically, as gains. For example, if a person gains Rs.20 it will make him feel better but if he loses Rs. 10, it will make him feel worse. In the present research, respondents were asked three questions designed on five point Likert scale. They were asked if they feel happy when their investments start making profit or feel low when they incur losses. They were also asked if given an option they will prefer to invest in equity or FD. The answers of these questions were aggregated, averaged and assembled in 5-point likert scale and analysed using SPSS software. Table 11 shows the cross tabulation of loss aversion bias and investment experience. When both the investor groups were asked if they feel happy or sad when their investment start making profit or loss, 16.6% of the less experienced investors and 3.4% of the experienced investors disagree with the above statements.

Table 11: Investment Experience and Loss Aversion

			Loss Aversion Bias				Total
			Disagree	Neutral	Agree	Strongly Agree	
Investment Experience	Less experienced investors	Count	29	105	41	0	175
		% within investexp	16.6%	60.0%	23.4%	0.0%	100.0%
	Experienced Investors	Count	7	90	96	12	205
		% within investexp	3.4%	43.9%	46.8%	5.9%	100.0%
Total		Count	36	195	137	12	380
		% within investexp	9.5%	51.3%	36.1%	3.2%	100.0%

On the other hand, 60% of the less experienced investors and 43.9% of the experienced investors were neutral in their decision making. Whereas 23.4% of the less experienced investors and 52.7% of the experienced investors agree with the statements. This shows that 39.3% of the total respondents might be prone to Loss Aversion Bias. Now, it has to be further checked if experienced investors are more prone to loss aversion bias as compared to less experienced investors. For this the following hypothesis has to be tested:

H0: Both investor-type groups are likely to exhibit loss aversion bias in a similar manner.

H1: Experienced investors are likely to be more prone to Loss Aversion Bias than less experienced Investors.

Table 12: Chi-Square Tests (Loss Aversion Bias)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	46.601[a]	3	.000
Likelihood Ratio	52.574	3	.000
Linear-by-Linear Association	46.336	1	.000
N of Valid Cases	380		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.53.

The low p-values given by all the tests (Table 12)indicated that null hypothesis can be rejected at 1% significance level confirming the fact that experienced investors are likely to be more prone to loss aversion bias than less experienced investors. This further confirms the results provided by discriminant analysis where loss aversion bias was on second position in contributing to the discrimination of groups.

Weighted Scoring:-

Weights from 1 to 3 were allotted to the different columns (1 for Disagree and 3 to Agree). The computation was carried out in Microsoft Excel to obtain the following results depicted in table 13:

Table 13:Weighted Scoring Method (Loss Aversion Bias)

Investor Type	Weighted Score	Mean	Reference Score	Outcome
Less Experienced	362	60.33	58.33	Loss Aversion Bias
Experienced	511	85.17	68.33	Loss Aversion Bias
Total	873	72.75	63.33	Loss Aversion Bias

It can be seen from the above table that both the group have mean score above their reference score, which indicated that respondents in general had the propensity to be susceptible to Loss Aversion Bias while taking financial investment decisions. Further, it can be seen that the mean score of experienced investors is more than that of less experienced investors, thus confirming the fact that experienced investors are susceptible to this bias in a much more manner as compared to that of less experienced investors.

4.2.2 Regret Aversion Bias:-

Regret aversion appears when an investor wants to forego the pain of discomfort arising from a bad investment decision. For example, if an investor purchasessome stocks of a company on his friend's recommendation and subsequently it falls down; in order to avoid regret of loss he will hold on to the stock till it comes up to reach the purchase price. Similarly, if an investor didn't purchase a stock that his friend has recommended and it rises subsequently; in order to forego the regret of opportunity missed, he will become less risk averse and buy the stocks that his friend will recommend in near future. When asked whether they avoid selling shares if their value comes down, 30% of the respondents were against the statement, 48% of the respondents admitted that they do it often. And when they were asked if they regret of losing an opportunity of not buying or selling a stock at right time, 46% of the respondents admitted that they regret the missed opportunity. Responses of both the questions were aggregated and analysed.

Table 14: Investment Experience and Regret Aversion

			Regretaversion Bias					Total
			Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	
Investment Experience	Less Experienced Investors	Count	5	62	75	30	3	175
		% within investexp	2.9%	35.4%	42.9%	17.1%	1.7%	100.0%
	Experienced Investors	Count	4	30	99	64	8	205
		% within investexp	2.0%	14.6%	48.3%	31.2%	3.9%	100.0%
Total		Count	9	92	174	94	11	380
		% within investexp	2.4%	24.2%	45.8%	24.7%	2.9%	100.0%

It can be seen from the above table (Table 14) 28% of the respondents agree with the questions statements and seem to be the respondents exhibiting this bias, while 46% of the respondents can be considered as probable ones exhibiting the bias. Now it has to be further checked if experienced investors are more prone to regret aversion bias as compared to less experienced investors. For this the following hypothesis has to be tested:

H0: Both investor-type groups are likely to exhibit Regret Aversion Bias in a similar manner.

H1: Experienced investors are likely to be more prone to Regret Aversion Bias than less experienced investors.

Table 15: Chi-Square Tests (Regret Aversion Bias-I)

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.922[a]	4	.000
Likelihood Ratio	27.367	4	.000
Linear-by-Linear Association	22.685	1	.000
N of Valid Cases	380		
a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 4.14.			

The results revealed in table 15 could not be justified as the necessary minimum count in cell is 5, and 2 cells has below 5 responses. If we see at table 15, cells having minimum count less than5 are in minority. These categories (strongly disagree and strongly agree) are merged with Disagree and Agree Categories. After that the chi-square test is repeated to check the above mentioned hypothesis.

Table 16: Chi-Square Tests (Regret Aversion Bias-II)			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.374[a]	2	.000
Likelihood Ratio	26.771	2	.000
Linear-by-Linear Association	25.040	1	.000
N of Valid Cases	380		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 46.51.			

The low p-values of all the tests (Table 16) suggested that null hypothesis can be rejected at 1% significance level validating the fact experienced investors are likely to be more prone to regret aversion bias than less experienced investors. This is in confirmation with the results given by discriminant analysis.

Weighted Scoring:-

Results in below table advocated that investors in general were undeniably susceptible to Regret Aversion Bias. It was also found that experienced investors had a mean score of 74.67, higher than the mean score of 52.67 for less experienced investors, suggesting that they are more likely to prone to this bias as compared to their less experienced counterparts. The results are shown in the following table:

Table 17: Weighted Scoring Method (Regret Aversion Bias)				
Investor Type	Weighted Score	Mean	Reference Score	Outcome
Less Experienced	316	52.67	58.33	No Bias
Experienced	448	74.67	68.33	Regret Aversion Bias
Total	764	63.67	63.33	Regret Aversion Bias

4.2.3 Herding Bias:-

Herd behavior is the tendency of respondents to imitate the actions of a large group. In this bias, an investor confides more on information confirmed by the crowd, rather than using his own common sense. This may happen because investors are living in a society and have an innate longing to be acknowledged by the group, rather than labelled as an unwanted person. Moreover, an investor tends to follow the group as it is a common perception that large group cannot be wrong. This generally happens where investors are likely to have little experience and knowledge. Two questions were put forward to respondents in which they were asked whether they tend to follow majority of investors, if they don't have information of a stock. 33% of the respondents disagree with the statement and trusted their own knowledge and analysis whereas 42% of the investors seemed to give preference to others opinions.

Secondly, they were asked if their attitude for a stock will change if their colleagues starts buying/selling that stock. 32% said that they will follow their own instinct and will not change their decision whereas 41% of the respondents were likely to change their decision immediately after seeing what their colleagues are doing. Responses of both the questions were aggregated, analysed and presented in the below table:

Table 18: Investment Experience and Herd Behavior								
			Herd Behavior Bias					Total
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Investment Experience	Less Experienced Investor	Count	7	53	76	35	4	175
		% within investexp	4.0%	30.3%	43.4%	20.0%	2.3%	100.0%
	Experienced Investor	Count	12	50	96	40	7	205
		% within investexp	5.9%	24.4%	46.8%	19.5%	3.4%	100.0%
Total		Count	19	103	172	75	11	380
		% within investexp	5.0%	27.1%	45.3%	19.7%	2.9%	100.0%

It can be seen from the above table (Table 18) 34% of the less experienced investors and 30% of the experienced investors rely on their own judgment and knowledge than believing on crowd. Whereas 22% of the less experienced investors 23% of the experienced investors give importance to others opinions/decisions and seem to be the respondents exhibiting this bias. 44% of the less experienced investors and 47% of the experienced

investors said they do it sometimes and can be considered as the probable ones exhibiting the bias. Now it is to be checked further if experienced investors are more prone to Herd Behavior bias as compared to less experienced investors. For this the following hypothesis has to be tested:

H0: Both investor-type groups are likely to exhibit Herd Behavior Bias in a similar manner.

H1:experienced investors are likely to be more prone to Herd Behavior Bias than less experienced investors.

Table 19: Chi-Square Tests (Herd Behavior)			
	Value	**df**	**Asymp. Sig. (2-sided)**
Pearson Chi-Square	2.528[a]	4	.640
Likelihood Ratio	2.541	4	.637
Linear-by-Linear Association	.191	1	.662
N of Valid Cases	380		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.07.			

The p-values from Pearson Chi-Square test and Likelihood Ratio test is 0.640 and 0.637, suggesting that null hypothesis could not be rejected at 95% confidence interval. Thus, confirming the fact that both investor-type groups are exhibiting Herd Behavior in an equally likely manner. The results are in confirmation with the results shown by Wilks' Lambda test in discriminant analysis.

Weighted Scoring:-

Results in below table advocated that investors in general are not prone to Herding Bias as it is visible from the fact that mean score of 60.33 is less than reference score of 63.33. Further, looking at individual group means score, it is found that mean scores of both the investor groups, 54.83 for less experienced and 65.83 for experience investors are less than their respective reference scores. Thus, confirming the fact that no group is prone to herding bias in a more manner as compared to the other group. This is confirmation with the results of discriminant analysis where herding behavior was found to be variable exhibited by both the investor groups in an equally likely manner. The results are shown in below table:

Table 20: Weighted Scoring Method (Herding Bias)				
Investor Type	**Weighted Score**	**Mean**	**Reference Score**	**Outcome**
Less Experienced	329	54.83	58.33	No Bias
Experienced	395	65.83	68.33	No Bias
Total	724	60.33	63.33	No Bias

4.2.4 Anchoring Bias:-

In anchoring bias, investors have a tendency to hook up their thoughts to a reference point which might not have any importance for the present decision making. They generally to stick to a price level on the basis of recent past information before buying/selling a stock, and because of this they end up buying it at a high price or selling it at a low price. It may also happen that in the process of fixing the price, which may not be reached, they might miss a good investment opportunity. For example, if a stock has gone up subsequently in a series of trading sessions and then falls in multiple sessions, investor will anchor on its recent high that the stock has achieved and consider the fall in price as a chance to purchase the stock at low price. Respondents were asked whether they will hold on to the stock, which they have purchased, that has reached its highs and then fall down in subsequent sessions. 29% of the respondents said they will not wait for the stock to reach its high again. Rather they will sell off their positions to minimize further losses. 42% of the respondents said yes will hold the stock till it reaches its highs again.

When they were asked if they fix a target price for buying/selling a stock, 27% of the respondents were of the view that they do not fix target price of their financial investments. Whereas 46% of the respondents said yes they do fix a target price of a stock which shows that investors have some price range in their mind before buying or selling a stock. The responses of these questions were combined, analysed and presented in the below table:

Table 21: Investment Experience and Anchoring Bias								
			Anchoring Bias					Total
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Investment Experience	Less Experienced Investor	Count	8	73	70	23	1	175
		% within investexp	4.6%	41.7%	40.0%	13.1%	0.6%	100.0%
	Experienced Investor	Count	4	17	101	76	7	205
		% within investexp	2.0%	8.3%	49.3%	37.1%	3.4%	100.0%
Total		Count	12	90	171	99	8	380
		% within investexp	3.2%	23.7%	45.0%	26.1%	2.1%	100.0%

Table 21 shows the cross tabulation of anchoring bias and investment experience. It can be seen that 46% of the less experienced investors and 10% of the experienced investors seems to be the investors not exhibiting anchoring bias. Whereas 14% of the less experienced investors and 41% of the experienced investors said they tend to hold and wait for the stock that has gone down, to reach its highs again. Additionally, they tend to fix a price in advance for buying/selling a stock. These respondents are seemed to be probable subjects exhibiting anchoring bias. Further, it has to be checked if experienced investors are more prone to anchoring bias as compared to less experienced investors. For this the following hypothesis has to be tested:

H0: Both investor-type groups are likely to exhibit Anchoring Bias in a similar manner.

H1: Experienced investors are likely to be more prone to Anchoring Bias than less experienced investors.

Table 22: Chi-Square Tests (Anchoring Bias-I)			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	72.756[a]	4	.000
Likelihood Ratio	77.152	4	.000
Linear-by-Linear Association	62.011	1	.000
N of Valid Cases	380		
a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 3.68.			

The results revealed in table 22 could not be justified as the necessary minimum count in cell is 5, and 2 cells has below 5 responses. If we see at table 15, cells having minimum count less than 5 are in minority. These categories (strongly disagree and strongly agree) are merged with Disagree and Agree Categories. After that the chi-square test is repeated to check the above mentioned hypothesis.

Table 23: Chi-Square Tests (Anchoring Bias-II)			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	71.524[a]	2	.000
Likelihood Ratio	75.381	2	.000
Linear-by-Linear Association	67.572	1	.000
N of Valid Cases	380		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 46.97.			

The low p-values of all the tests in table 23 suggested that null hypothesis can be rejected at 95% confidence interval. Thus, confirming the fact experienced investors is more prone to anchoring bias than less experienced investors. These results are in confirmation with the results shown by Wilks' Lambda test in discriminant analysis.

Weighted Scoring:-

Results in below table advocated that investors in general have a tendency to be prone to anchoring bias; visible from the fact that mean score of 63.75 is more than reference score of 63.33. Further, looking at individual group means scores, it is found that mean scores of less experienced investor group is 48.83 which is very less as compared to the mean score of experienced investors which is 78.67. It suggests the presence of anchoring bias in both the group but one group is more affected by the bias as compared to the other group. The results are shown in the following table:

Table 24: Weighted Scoring Method (Anchoring Bias)				
Investor Type	**Weighted Score**	**Mean**	**Reference Score**	**Outcome**
Less Experienced	293	48.83	58.33	No Bias
Experienced	472	78.67	68.33	Anchoring Bias
Total	765	63.75	63.33	Anchoring Bias

5. CONCLUSION

The results of Discriminant Analysisshows that there are three behavioral biases namely Loss Aversion Bias, Regret Aversion Bias and Anchoring bias that affect one investor type group more as compared to the other group; whereas both the investor groups tend to exhibit herding bias in an equally likely manner.Moreover, experienced investors group was found to be more influenced by loss aversion, regret aversion and anchoring bias as compared to the less experienced investor group. The results of the study show that ensuing various behavioral biases may lead to bad and faulty investment decisions. It is advisable to the respondents that they should carefully examine an investment before parking their money, but should not excessively worry about the possible losses. Additionally, the present research focuses on the behavioral aspect of individual investors' and not of institutional investors. This study has randomly selected a minor sample of investor's trading in Indian share market. Thus, it is needed to extend the research to a larger sample size to authenticate the results revealed by this research. Considering the prior few share market movement, it is likely that institutional investors do play a significant role. Thus, it becomes equally important to analyse the behavioral aspects of institutional investors also.

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