CHAPTER 6

RESULTS, DISCUSSION AND CONCLUSION

This study was undertaken to answer the following research questions

9. What is the role of the selected bias on investor’s decision making?/ Are the mutual fund investors influenced by the selected five biases?
10. Do demographic factors have an influence on the investor bias? If so, how significant is their influence?
11. Is there a relationship between the investor biases taken up for the study? If so how significant is their relationship?
12. Does one bias lead to the other?

The following hypothesis was set to test the statistical significance of the above relationships.

H1: There is significant difference in investor bias based on Gender.
H2: There is significant difference in investor bias based on Age
H3: There is significant difference in investor bias based on Marital Status
H4: There is significant difference in investor bias based on Level of Education
H5: There is significant difference in investor bias based on the Level of Income.

H6: There is significant difference in investor bias based on the Type of Investor

H7: There is significant difference in investor bias based on Investor’s Experience in investing

H8: There is significant difference in investor bias based on Investment Horizon.

H9: Self Attributive Investors are also Overconfident

H10: There is a significant association between Illusion of control and Self Attribution Bias

H11: There is a significant association between Herding Mentality and Illusion of Control Bias.

To test the above hypothesis and find the answers to the research questions, the collected data was analyzed using the following techniques.

1. ANOVA and t-tests were used to study the impact of demographic variables on selected investor bias
2. Correlation Analysis was done to find the degree of association between variables and investor biases.
3. Regression equation was estimated to understand if one bias influences and leads to the other.

The results of the study are summarised in this chapter in the following sequence

1. Findings of the Study describing the demographic profile and followed by results of inferential statistics.
2. Discussion and Conclusion of the Study
3. Recommendation and Contribution of the Study.
6.1 RESULTS OF THE STUDY

6.1.1 DEMOGRAPHIC COMPOSITION OF INVESTORS

**Gender:** 74.1 percent of investors are male and 25.9 percent of investors are females.

**Age:** 12.1 percent of investors are less than 25 years of age, between 25 years and 36 years it is 46.6 percent, between 37 years and 46 years it is 19.3 percent and above 46 years it is 22 percent.

**Marital Status:** 71.2 percent of investors are married and 28.8 percent of investors are unmarried.

**Education:** Majority of the investors are graduates (53.7%) followed by post graduates constituting 53.7 percent and investors who have completed high school education is 7.1 percent.

**Type of Investors:** 66.2 percent of investors are direct investors i.e. Investors who make their own investment decisions and 33.8 percent of investors are financial consultants who manage funds on behalf of others.

**Occupation:** 55.5 percent of sample investors are employed in areas not related to finance and 44.5 percent of investors have work experience related to finance.

**Experience:** 29.6 percent of investors are novice investors that is with less than 2 years of experience and 70.4 percent of investors are experienced meaning they have more than 2 years of experience.

**Income:** 18 percent i.e. 57 investors earn less than Rs. 2,00,000 per annum, 32.2 percent i.e. 99 investors earn between Rs. 2,00,001 to Rs. 4,00,000 per annum, 27.1 percent i.e. 83 investors earn between Rs. 4,00,001 to Rs. 6,00,000 per annum and 22.1 percent i.e. 68 investors earn above 6,00,000 per annum
**Investment Horizon**: 26.5 percent of investors have a short Investment time Horizon, i.e. they invest for less than 2 years and 73.5 percent have a Long Investment Time Horizon which says that their investment duration is more than 2 years.

**Monitoring Short and Long term Investment duration**: 57.5 percent monitor their short term investments and 42.5 percent do not monitor their short term investments. Similarly 76.9 percent of investors monitor their long term investments and 23.1 percent investors do not monitor their long term investments.

6.1.2 IMPACT OF DEMOGRAPHIC VARIABLES ON INVESTOR BIAS

1. Overconfidence Bias

   a. **Gender**: There is significant statistical difference in the overconfidence level between male and females. It is found that *Men are more Overconfident than women.*

   b. **Age**: There is significant statistical difference among investors of different age group. The results show that *Overconfidence among investors increases with age.*

   c. **Experience**: There is significant statistical difference between novice investors and experienced investors. The output shows that *experienced investors who have more than two years of investment experience are more overconfident than less experienced investors i.e. novice investors.*

   d. **Education**: There is a significant difference in the level of overconfidence bias among investors at different levels of education. The *level of Overconfidence increases with the level of education. Investors with graduate and postgraduate education are more overconfident than high school educated investors.*

   e. **Income**: The output shows that that there is a significant difference in investor’s overconfidence bias at different income levels. *The level of Overconfidence increases as the level of income of investors increases.*
f. Investment Horizon: The analysis shows that there is significant difference in the level of overconfidence among investors based on the investment time horizon. *Investors with long term investor horizon are more overconfident than investor’s with short term investment horizon.*

The above findings are significant from the financial advisors as well as the investor point of view. Male investors usually outnumber female investors at any given point of time. As majority of investors are male and overconfident, this needs to be considered by the financial advisor in setting the goals for their male clients and ensure that they are not swayed by their overconfidence. They need to be educated about the impact of overconfidence on the portfolio. The study also shows that overconfidence increases with age. This may be due to their experience in investment and the success associated with investment. Earlier studies show contradictory outcomes and so further studies can throw more light on its significance of age and experience in investment.

The fact that educated investors are more overconfident could be because of investor’s perceived knowledge and not relevant knowledge in investment. So it becomes important for the financial advisor and the client to understand investment related information in context, before deciding on investment. Generally, people with higher education and income tend to feel more knowledgable compared to people with lesser education and income. This creates a feeling that they are more competent in investment decision making, which may lead to overconfidence.

2. Self Attribution Bias
a. Education: The output shows that there is a significant difference in the level of self attribution bias between investors at different levels of education. *Investors with graduate and postgraduate education are more self attributive than high school educated investors.*

The self attribution bias does not show any statistical significance with other demographic variables taken up for the study.
Self Attribution leads to overconfidence bias. As already stated, educated investors are overconfident than their less educated counterparts. They attribute success to their own innate qualities and when they believe that they are knowlegalbe (perceived knowledge), this can prevent them from seeking relevant knowledge required for investment decision making. Also self attributive investors must be educated to view winning and losing investments as objectively as possible, so that they understand better the factors that could have lead to success or failure.

3. Illusion of Control Bias

a. Income : The output shows that there is significant difference in the illusion of control among investors at different levels of income. The level of Illusion of Control Bias increase with income. The Illusion of Control Bias does not show any statistical significance with other demographic variables taken up for the study.

It is important that the investors are made to understand that long term investments are not impacted by beliefs and emotions, but uncontrollable factors like corporate performance and general economic conditions

4. Herding Bias

Though the mean score for the demographic variables are different showing different levels of herding bias across demographic factors, the ANOVA and t-tests conducted for all the demographic variables and herding bias do not show any statistical significance.

5. Loss Aversion

Gender: The output shows that there is significant difference in the level of Loss Aversion between man and women and that women are more loss averse than men.

Experience: The analysis shows that there is significant difference in the level of Loss Aversion based on investor’s experience. Less experienced investors (Novice) are more loss averse than experienced investors.
Type of Investor: The results show that there is a significant difference in the level of Loss Aversion between direct investors and the financial consultants. The direct investors are more loss averse than financial consultants.

Investment Horizon: The results show that there is a significant difference in the level of Loss Aversion based on investor’s investment time horizon. Loss Aversion is higher for investors with short term investment time horizon than investors with long term investment horizon.

Loss averse investors are risk seeking when it comes to securities that haven’t performed well. They have a tendency to hold on to the securities hoping that it would rebound. On the contrary, when the company is performing well they have the urge to sell the securities rather than continue to assume risk. This instigates exact opposite of what investors want i.e. increased risk and low returns.

So keeping in mind the influence of socio-demographic variables and the consequences of loss averse behaviour, the advisor can educate the investor of the benefits of asset allocation and diversification and also discuss how their loss averse behaviour can lead to unbalanced portfolios and low returns for them.

6.1.3 ASSOCIATION BETWEEN INVESTOR BIASES.

1. Overconfidence and Self Attribution Bias: There is a significant positive relationship between Overconfidence Bias and Self Attribution Bias

2. Illusion of Control and Self Attribution Bias: There is statistically significant positive relationship between Self Attribution bias and Illusion of Control Bias.

3. Illusion of Control and Herding Bias: There is statistically significant positive relationship between Illusion of Control Bias and Herding Bias.
6.1.4 INFLUENCE OF BIASES & ESTIMATION OF REGRESSION EQUATION.

1. **Overconfidence and Self Attribution Bias**: Analysis show that the independent variable self attribution is a significant predictor of the dependent variable Overconfidence. The estimated regression equation is \[ Y = 2.161 + 0.183 \times X_1 + e \]

2. **Illusion of Control and Self Attribution Bias**: Analysis shows that the independent variable self attribution is a significant predictor of the dependent variable Illusion of Control. The estimated regression equation is \[ Y = 2.199 + 0.268 \times X_1 + e \]

3. **Herding and Illusion of Control**: Analysis shows that the independent variable Illusion of Control is a significant predictor of the dependent variable Herding Bias. The estimated regression equation is \[ Y = 1.801 + 0.188 \times X_1 + e \]

6.1.5 SUMMARY OF FINDINGS

1. Men are more Overconfident than women.
2. Overconfidence among investors increases with age.
3. Experienced investors are more overconfident than novice investors.
4. The level of Overconfidence increases with the level of education.
5. The level of Overconfidence increases as the level of income of investors increases.
6. Investors with long term investor horizon are more overconfident than short term investors.
7. Self attribution bias increases with education.
8. The level of Illusion of Control increases as the level of income of investors increases.
9. Women are more loss averse than men.
10. Novice Investors are more loss averse than experienced investors.
11. Direct investors are more loss averse than financial consultants.
12. Level of Loss Aversion is higher for short term investors than long term investors.
13. There is a significant association between Overconfidence Bias and Self Attributive Bias and Self attribution is a significant predictor of Overconfidence Bias.
14. There is a significant association between Self Attributive Bias and Illusion of Control Bias and Self Attribution is a significant predictor of Illusion of Control Bias.
15. There is significant association between Illusion of Control Bias and Herding Bias and Illusion of Control is a significant predictor of Herding Bias.

6.2 DISCUSSION AND CONCLUSION

The results of the study show the presence of all the selected five biases for the study. However, the level of biases is not statistically significant in all cases. The study also shows a significant relationship between overconfidence, self attribution, illusion of control and herding bias. While some of the results of the study are in line with the findings of the earlier studies, some are contradictory. The following paragraphs discusses the results of the study where the outcomes have shown statistical significance.

Gender: When it comes to the role of gender on overconfidence and self attribution bias, most studies confirm that men are overconfident and highly self attributive than women. Lawellen, Lease and Schlarbaum, (1977), Lundeberg, Fox and Punchochaf, (1994), Lenney, (1997) and Beyer and Bowden, (1997), Brad Barber and Terrance Odean, (2001) and Michael. M. Pompian and John M. Longo, (2004) have in their studies empirically proved that the men are more overconfident than women. This study also finds that men are more overconfident than women.

Studies of Deaux and Farris (1997), Meehan and Overton (1986) and Bayer (1990) show that men are more prone to self attribution bias than women. But this study shows a slightly higher mean value for women compared to men. But the difference is not
statistically significant. So, this study does not show any significant difference in the self attributive bias between men and women.

The study finds that there is significant difference in the level of loss aversion between male and female investors. Studies by Simon Gachter et.al. (2007) found that females are more loss aversive than their male counterparts. Peter Brooks, Horst Zank (2005) in their experiments on binary choices among lotteries involving students, observed a gender effect in which women were more loss averse than men. Also by Ulrich Schmidt and Stephan Taub (2002) also confirm that females exhibited higher degree of Loss Aversion than men. This study on Mutual Fund Investors in line with earlier studies also has confirmed that females are more Loss Averse than men. When it comes to the impact of gender, this study proves that men are more overconfident than women and women are more loss averse than men. The other biases do show differences in the level of bias among gender, but their difference is not statistically significant.

**Experience:** This study has indicated that investor’s experience in investment has an impact on overconfidence bias and self attribution bias among mutual fund investors. The findings of earlier studies are contradictory. Studies of Gervais and Odean (2001), Locke & Mann (2001), Menkhoff, Mark & Ulrich Schmidt (2010) and Oliver Gloede & Lukas Menkhoff (2011) show that the level of overconfidence decreases as an investor becomes experienced. However, studies of Heath and Tversky (1991), Frascara (1999), Maceiojovsky Kirchler (2002) Bhandari and Deaves (2006), Glaser et.al (2007), and Deaves, Luders and Schroder, (2010) show that overconfidence increases with experience. In line with these findings, our findings also suggest that overconfidence increases with experience. Self Attribution bias shows a slightly higher mean for experienced investors compared to novice investors. However, the difference is not significant. The findings of this study also suggest that Novice Investors i.e. investors with less than two years of investment experience are more Loss Averse than experienced investors. So this study proves that experience has a significant impact on
Overconfidence Bias and Loss Aversion. Overconfidence increases with experience and loss aversion decreases with experience.

**Level of Education and Income:** Bhandari & Deaves (2006) and Luders and Schroder (2010) studies have shown that overconfidence increases with education and level of income. This study also proves that both overconfidence and self attribution bias increases with the level of education. The level of self attribution is more or less equal for high school educated and graduates, and higher for post graduates. The level of overconfidence also increases with income, but the same is not significant in the case of self attribution. This study also shows that the level of illusion of control bias increases with increase in the level of income. There is no significant difference in their impact on other biases.

**Type of Investor:** Experiments show contradictory outcomes with respect to biases among Financial Advisors and their experience in investment decisions. For example Feng and Seasholes (2005) shows empirical evidence that indicate investor sophistication and market experience reduce behavioural biases. But Haigh & List (2005) found that professional traders exhibit Myopic Loss Aversion to a greater extent than students. Erikson and Kvaloy (2010) also confirm that financial advisors exhibit Myopic Loss Aversion. But this study on Mutual Fund Investors show that Direct investors who manage their own investments are more Loss Averse than Financial Consultants. There is no significant difference in the level of other biases between direct investors and financial consultants.

**Investment Time Horizon:** The results of this study also show that investors with longer investment horizon are more overconfident than investors who invest short term. Also short term investors are more loss averse than investors who invest long term.

**Relationship between Biases:** Odeon, T & Gervais, S (1997) studies show that repeated success among traders leads to overconfidence. Studies of Feng Li (2010) and Yenshan and Shiu Cheng-Yi (2007) also suggest self attribution bias leading to overconfidence.
Gervais and Odean, (2001) model shows that investor’s overconfidence arises from self serving self attribution bias. This study also shows significant level of correlation between self attribution bias and overconfidence bias. Also self attributive bias is a significant predictor of overconfidence bias. This could suggest that self attribution bias can lead to overconfidence bias. There is also a significant association between Self Attributive Bias and Illusion of Control Bias and Self Attribution is a significant predictor of Illusion of Control Bias. Similarly, there is significant association between Illusion of Control Bias and Herding Bias and Illusion of Control is a significant predictor of Herding Bias.

The study concludes that the retail mutual fund investors are influenced by Overconfidence bias, Self Attributive Bias, Illusion of Control Bias, Loss Aversion and Herding Bias. The impacts of demographic variables are significant specially gender, experience, education, level of income and type of investor. There is also evidence of significant relationship between biases taken up for the study.

6.3 RECOMMENDATIONS AND CONTRIBUTION OF THE STUDY

This study used the survey method of research, to explore the influence of bias among sample investors. Controlled experimental studies can throw further insights on the relationship between the variables. Studies on different groups of investors and further robust statistical techniques, can help in drawing conclusions, especially in areas where there are contradictory outcomes. This study contributes to the existing literature on bias especially the influence of demographic variables on overconfidence, self attribution bias, Illusion of Control, Loss Aversion and Herding Bias. The findings on the relationship between biases, increases the scope for further studies on how one bias can lead to the other. From the client advisor perspective, an understanding of the psychology and emotions underlying investment decisions, can mutually benefit both
the financial advisors and individual investors in formulating their financial goals better and making wise investment decisions.
QUESTIONNAIRE FOR DATA COLLECTION

Name: 

Contact No:

1. Gender:  
   Male  
   Female  

2. Age:  

3. Marital Status:  
   Married  
   Unmarried  

4. Level of Education
   a. High school  
   b. PUC  
   c. Graduate  
   d. Post Graduate & Above

5. Occupation (please write on dotted lines)
   a. Finance related .................
   b. Others .........................

6. Annual Income
   a. Less than Rs. 2,00,000  
   b. Rs. 2,00,001 to Rs. 4,00,000  
   c. Rs. 4,00,001 to 6,00,000  
   d. Above Rs. 6,00,000

7. As an investor, you are
   a. A direct investor (you manage your funds)  
   b. Financial consultant/Advisor (you manage funds on behalf of others)

8. Experience (Investment)
   a. Less than 2 years  
   b. Over 2 years

9. Investment Horizon (duration for which you have invested)
   a. Short term : Less than 2 year  
   b. Long Term : Above 2 years
10. Do you monitor your investments with short term horizon?
   a. Yes □  b. No □

11. Do you monitor your investments with long term horizon?
   a. Yes □  b. No □

12. While making an investment decision which of the following factors do you consider as most important? Kindly rank them in the order of preference assigning 1 for most important to 6 for least important

   a. Information from the company’s annual reports
   b. Recommendations and advise from professional investors/consultants
   c. Information from newspaper/tv/internet
   d. Personal friend’s advise/opinion
   e. Information from colleagues
   f. Own intuition on future performance/own skill and intelligence

13. Below are some statements given. Please tick wherever appropriate

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Well Below Average</th>
<th>Below Average</th>
<th>Average</th>
<th>Above Average</th>
<th>Well Above Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative to other drivers, how good are you on road?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How good are you in your job?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How do you rate your personal level of investment knowledge?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative to other investors how good are you?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How do you rate your ability to have predicted the 2008 recession</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14. After making an investment, assume that you overhear a news report that has negative implications regarding the potential outcome of the investment you have just executed. How likely are you to then seek information that could confirm that you have made a bad decision?
   a. I will not search for any information because I have already invested
   b. May try to get some information
   c. Will definitely look for more information and try to understand the reason

15. When returns to your portfolio increases, to what do you believe the change in performance is mainly due to?
   a. Your investment skill
   b. A combination of investment skill and luck.
   c. Luck.

16. After you made a successful trade, how likely are you to put your profits to work in a quick, subsequent trade, rather than letting the money idle until you are sure you have located another good investment?
   a. When I sell a profitable investment, I usually invest the money again right away.
   b. May wait for sometime
   c. I will usually wait until I find something I really like before making a new investment.

17. Suppose your investment was less successful (did not give expected returns), what do you think is the reason?
   a. Incorrect recommendation/advise from other sources (friends, consultants, media etc)
   b. The market in general has performed poorly
   c. Own errors
18. Please answer to the statements below depending on how much you agree with the statements

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe that I have a good amount of control in picking the investments that outperform the market</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When returns on my investment increases, it is because of the control I have exercised over the outcome on my investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am more likely to win, if I choose the numbers while purchasing the lottery ticket than using a computer generated number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel more in control when I roll the dice, while participating in games of chance that involve dice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

19. Suppose you make a plan to invest Rs.70,000. You are presented with two alternatives. Which scenario would you rather have?
   a. Know that I’ll only be repaid Rs.60,000 for sure   
   b. Take a 50-50 gamble, knowing that I’ll get back either Rs.75,000 or Rs.50,000

20. Which of the following would you choose?
   a. A 100 percent chance of winning Rs.1,00,000
   b. An 80 percent chance of winning Rs. 1,40,000 and a 20 percent chance of winning nothing
21. Suppose you make a plan to invest Rs. 50,000. You are presented with two alternatives. Which scenario would you rather have?
   a. Be assured that I'll get back my Rs.50,000, at the very least, even if I don't make any more money.
   b. Have a 50 percent chance of getting Rs. 70,000 and a 50 percent chance of getting Rs. 35,000.

22. Choose one of the two outcomes
   a. An assured gain of Rs.5000
   b. A 25 percent chance of gaining Rs. 25,000 and 75 percent chance of gaining nothing

23. Opinion on investment (please indicate your response to each of the items below by putting a tick mark at the appropriate box to the right)

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My colleagues and friends are an important source of information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I make an investment, I generally follow the trend</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I consider most of the published economic and political information when I invest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>