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"Impact of Behavioral Biases on Investors Decision Making: Male Vs Female"

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Abstract: *This study aims to investigate the influence of behavioral biases on investment decisions made by students and employees. This objective was achieved by administering a questionnaire and collecting empirical data from graduate & post graduate students and employees about their own perceptions of biases. Questionnaire was distributed among the sample of hundred students/employees from which 45% were students and 55% were employees. Two statistical techniques were used to analyze collected data. Correlation was used to analyze the relationship of overconfidence bias with illusion of control bias, familiarity bias, loss aversion bias and confirmation bias. Chi-square was used to determine the significant difference between the responses of male and female about overconfidence bias. Results of this study reports weak negative correlation between overconfidence bias and other behavioral bias discussed in the study. This study concludes there is no significant difference between the responses of male and female decision making regarding overconfidence bias.*

Key words: *Confirmation bias (CF), Decision making, Familiarity bias (FB), Illusion of control (IOC), loss aversion bias (LAB), Overconfidence (OC).*

I. Introduction

In Everyday life people have to take variety of decisions, either large or small. Few choices are easy and appear straight forward, while others are complex and require a multi-step approach in making decisions. This study evaluates the existence and extent of behavioral biases that investors have to face at the time of decision making. Behavioral bias is defined as a pattern of variation in judgment that occurs in particular situations, which may sometimes lead to perceptual alteration, inaccurate judgment, illogical interpretation, or what is largely called irrationality. Decision making is the mental or cognitive process that results in the selection of a course of action among several alternative situations. Every decision making process comes to its end with a final choice. The output or final result can be categories as an action or an opinion of choice.

People are subject to behavioral biases during decision making. These biases prevent people from making rational (normal) decisions. Behavioral economists said that most human choice is not made intentionally and knowingly by evaluating all the variations and transformations. Investors can seriously harm their wealth by allowing the behavioral biases to affect their decision making. As a result of inherent biases built in our brains and bodies, human beings make suboptimal decisions (Gordon, 2011). Although emotional and cognitive weaknesses or biases affect all people but traditional and standard finance ignores these biases because it assumes that people always make rational decisions (Statman, 1995). According to behavioral finance investor is normal. Many researchers in the field of behavioral finance conducted research and suggest that investors do not always behave rationally when making investment decisions (Abiola Ayopo and Kehinde Adekunle, 2012). Behavioral finance observes how people actually behave in financial settings. Investors have to make variety of investment decisions. As defined by Hersh Shefrin, bias is nothing else but the inclination towards error. In other words bias is unfairness or propensity to make decisions while already being influenced by a fundamental belief. There are several factors or behavioral biases which affect decision making. This research paper presents overconfidence bias, illusion of control bias, loss aversion bias, conformity bias and familiriaty bias.

Overconfidence is the propensity for people to overestimate their knowledge, cognitive abilities and the precision of their information (Bhandari & Deaves, 2006). Illusion of control is defined as it is the propensity of people to believe they can control and/or influence outcomes but in reality they cannot control the outcomes of their decisions (Shefrin, 2007). Loss aversion bias was developed by Kahneman & Amos Tversky (1979) as part of the original prospect theory. It is the tendency that people generally feel a stronger impulse to avoid losses than to acquire gains. Confirmation bias also called confirmatory bias. People who are subject to confirmation bias, they always favor the information that confirms their believes and hypothesis. Familiarity heuristic is tendency of the people to predict the likely hood of occurrence of an event depends on how easily they can recall specific past information associated with that event (Shefrin, 2007).

1.1 Objectives of study

The objectives of this study were:

- To investigate the relationship between gender and overconfidence bias while making decisions among students and employees.
- To investigate whether behavioral biases affect graduate, post graduate and employees to the same degree.
- To investigate the difference between two groups with respect to loss aversion propensity, availability bias, confirmation bias in relationship with overconfidence bias.

1.2 Significance of study

This study examines the impact of behavioral biases in decision making that result from employing heuristics, and proposes solutions for reducing such errors. This study has relative importance due to lack of awareness in this area of Gujrat and little investor interaction. There is no stock exchange and people are not fully awarded about these kinds of biases that they are indulge in it but not known about these biases also Gujrat is an under developing area of Punjab so it will take time towards research but this paper will help out the upcoming researchers to get the theme of our results to be proceed.

1.3 Contribution of study

In this study behavioral biases within decision making of employees and students by using field survey are identified. Majority of behavioral finance articles focus on one bias only (e.g. Barber and Odean 2001). In addition, the use of experimental or survey method is still relatively infrequent in financial research. Typical experimental or survey studies on behavioral biases use samples that include only students (Buksar and Conolly 1988) or only professionals (Montier 2006). Studies comparing financial market professionals and other people are rare and typically concentrate on differences between two types of respondents (Kaustia et al 2008 and Torngren and Montgomery 2004). This study uses a sample consisting of separate groups of people; university students and employees of business and finance and social sciences teachers as well. In addition to the diversity, the data of this study is also rare due timing. The survey of this study is conducted during the period of historically high uncertainty in markets, at the start of year 2013. To demonstrate behavioral biases we developed the correlation among behavioral biases. Overall, the results of this research paper provide valuable new information on behavioral biases and investment decision making.

II. Literature Review

Behavioral finance studies how behavioral elements introduce variation in the individual's decision-making process. In a study the researchers examine the cognitive biases and heuristics to which business students are subject which was achieved by administrating a questionnaire and collecting empirical evidence about the own perceptions of bias of business students. The psychological fact known as bias and its presence in human decision making provide the additional insight on the subject of investor irrationality and broaden the ideals of rationality (Chira, Adams & Thornton, 2008).

In broader term behavioral biases describes irrationality in decision making or a replicable pattern in perceptual distortion, illogical interpretation and inaccurate judgment. In a study the researcher examine the effects of behavioral biases on security market performance in Nigeria and find out the strong evidence that behavioral biases exists but not prevailing in the Nigeria security market because the results of study shows a weak negative relationship exists between behavioral biases and stock market performance in Nigeria. The study concludes that investors should be aware of the impact of behavioral biases on investment decision making process (Adetiloye, 2012).

The findings of this study disclose that, to varying degrees, the examined behavioral biases affect professional investors. As the experiment results show that even professional investors are not really protected to behavioral biases and there are certain personal characteristics which may influence the magnitude of the bias. By using logic, probit and linear probability models show that in human behavior the tested behavioral finance patterns are so deeply rooted and they are difficult to overcome by any one of the personal characteristics which are analyzed. In demonstrating the impact of these behavioral biases on investors, the results can support the institution of specific regulation for structured products to improve investor protection (Moran Ofir, Zvi Wiener, 2008).

The main finding of this study is that people in general are exposed to the studied behavioral biases but the degree and impact are affected by experience and other characteristics. The results indicate that in addition to capability the thinking style of individual explains behavioral biases. People who have high faith in intuition are more exposed to behavioral biases. Overall the results of this paper provide valuable new information on

behavioral biases and investment advisors. The exposure to any of the studied biases alone deteriorates decision making. However, the biases are not independent to each other (Seppala, 2009).

Psychology systematically explores human behavior, well-being, and judgment. In the study someone discuss a selection of psychological findings which are relevant to economics and standard economics assumes that each person has stable and well-defined preferences and everyone want to rationally maximize those preferences. Even people make systematic errors in attempts to maximize those preferences (Xiaofeng Wu, 2009).

This article outlines findings from the Judgment and decision making and behavioral economics literature that highlight the many behavioral impediments to saving that individual may encounter on their way to financial security. This study discuss how behavioral and psychological issues such as self-control, emotions, and choice structural design can help policymakers understand what factors may affect individual savings behavior. (Knoll, 2010)

This article shows investment simulations with Brazilian MBA students and physicians indicating that the process of making investment decisions is based on the "Behavioral Economics" theory which uses the fundamental aspects of the Prospect Theory developed by Kahneman and Tversky (1979). The conclusion of this study demonstrates that the behavioral biases have great impact on the investment of physicians and business students (Frota Decourt, Accorsi, MAdeira Neto , 2007).

H1: *Behavioral biases effect decision making of students/employees.*

This research has found that people overestimate their control and also find that when their real control is zero or low then they overestimate their control. However, when their actual control is high, we find that they tend to underestimate it (Gino, Sharek and Moore, 2011).

Psychological research conducted by Barber and Odean (2001) that men are more overconfidence than women and theoretical models predict that overconfident investors trade excessively that is hazardous to the wealth. The result of their study suggests that men trade 45 percent more than women and as a result reduce their returns due to over confidence bias.

H2: *There is a significance difference between gender and overconfidence while making decisions.*

In this study the researcher find that overconfidence generally improves market efficiency over rationality provided overconfidence is not too high because it introduces information into the market while having a comparatively small effect in generating mispricing. This study also find out that a market with very high overconfidence can also have superior price quality to a rational market when there is a high amount of private information acquired relative to publicly available information (Jeremy KO, 2007).

In a study a researcher reveal that the cognitive biases such as overconfidence bias impact on different level of managerial decision making. Different level of management requires different level of skills, values and decision making processes and styles. By using statistical techniques this study found that there were differences in overconfidence bias between levels of management (Paluch, 2011).

This research paper investigates a different type of behavioral bias that also may influence merger and acquisition decisions. By using a unique experimental data set, this research provide evidence in support of the existence of confirmation bias in the merger decision making behavior particularly with respect to the behavior of actual corporate executives (Bogan, 2008).

The study conducted by J. Park and Kumar (2010) demonstrates that investors with stronger confirmation bias exhibit greater overconfidence. Confirmation bias leads investors to form higher expectations from their stocks performance.

Findings in a study reveal that reproducing causes selectively erased loss aversion in men and in contrast the self-protective causes led both men and women to become more loss-averse. Overall loss aversion come into sight to be sensitive to evolutionarily-important reasons, telling that it may be a domain-specific bias operating according to an adaptive logic of recurring threats and opportunities in different evolutionary domains. Research shows that the classic bias of loss aversion make worse, erased, and even reversed when the decision context is the evolutionarily-important domain of mate-seeking (Jessica Li, 2006).

In a study the large extent of loss aversion revealed by the loss adverse choices, the average loss premium is positive for most choice situations. Female subjects exhibit both a more frequent occurrence and a larger extent of loss aversion. This study finds a systematic relationship between loss attitude and assessment probability (Schmidty, Traub, 2001).

The results of another study reveal that the pattern predicted by the loss aversion assertion emerges only under very specific conditions. Losses appear to loom larger than gains in some environments but not in others. These and similar results can be captured with the assertion that the exact effect of losses is not a result of a stable value function rather than the effect of losses might depend on the similarity of the current decision environment to past experiences (Ert and Erev, 2010).

III. Methodology

3.1 Data collection and sample

The data for this paper was collected using questionnaire. The population of this study was all the people who are above the age of 20 years having qualification from intermediate to post graduation and who have to encounter the decision making in their lives. Total sample size consisted upon 100 respondents. This study was restricted to gather the data about decision making and effect of behavioral biases on it, from 55 employees of University of Gujrat, 45 graduates and post graduate students, 44 of them were males and 56 of them were females of Management and Administrated Sciences of University of Gujrat in January 2013. In the survey, questions were asked by giving different situations and respondents are asked to choose among the choices that which type of decision they will take and through their responses to the questions study judged the behavioral biases prevalent among their decision.

3.2 Data analysis technique

Data collected for this study was analyzed by using Pearson correlation Coefficient technique and Pearson Chi-square test. Pearson Chi-square technique was used to analyze the relationship between gender and overconfidence bias on decision making. And correlation coefficient was used to find out the relationship between over confidence bias and other biases like illusion of control, confirmation bias, availability bias and loss aversion bias.

IV. Analysis/ Results

4.1 Over Confidence bias

To analyze whether over confidence bias existed among the employees and students with regard to gender six questions were asked. In first statement students and employees were asked to categorize themselves "which type of students they are" 32% students/ employees categorize them self as above the average students/employees, only 2 % students/employees among the sample of 100 categorize themselves as below the average students/employees and the remaining 66% people categorize themselves as average employees/students. So the answer significantly reflects that only 32% of people are subject to overconfidence bias. To watch the difference between the answers given by the respondents on the basis of gender and its relationship with overconfidence, study uses the Chi Square test of independence. The results showed that among the total sample size of 100, 55 % were females and remaining 45% were males. The Pearson chi- square test value as overconfidence relationship with gender was 0.000 which states that gender is not related to overconfidence while making decisions among Students/employees which accept null hypothesis

Test Statistics

	Gender	performance OC
Chi-Square	1.000[a]	61.520[b]
Df	1	2
Asymp. Sig.	.317	.000

Second statement was asked from the students and employees "which type of performer they are when they come to school or job related activities" 39% students/employees categorize themselves as above average, 6% from the sample of 100 were categorize themselves as below average and 55% of them categorize themselves as average employees/ students. Only 39% respondents were subject to overconfidence bias. To watch the difference between the answer given by the respondents on the basis of qualification and its relationship with overconfidence in their performance on job/school related activities Pearson Chi-Square test and Pearson correlation coefficient was used and the value of Chi-square test is 0.000 which states that there is no difference between the answers given by the respondents on the basis of qualification. To analyze the relationship between gender, qualification and the type of performer the answer of Chi-square test was 0.000 which accept null hypothesis.

Test statistics

	Qualification	type of performer on job/school oc
Chi-Square	137.840[a]	37.460[b]
Df	3	2
Asymp. Sig.	.000	.000

In the third statement respondents were asked about the perception of their athletic abilities in comparison to their peer group. 26% respondents answer above the average, 26% respondents answer as below the average and 48 % respondents answer that they were average in their athletic abilities in comparison to their age group. In percentage answer suggest that only a small number of respondents among the sample of 100 are subject to over confidence bias. This study assumed that males were more inclined to consider themselves as above average when they were asked about their athletic ability. Among the sample of 100 that consisted on 45 males and 55 females who answered this question. The Pearson Chi-square test value was 0.008 which states that there was a no significant association between the levels of confidence displayed and gender which accept null hypothesis.

Test statistics

	Type of performer on job/school OC	Gender
Chi-Square	37.460[b]	1.000[c]
Df	2	1
Asymp. Sig.	.000	.317

A scenario was presented in front of respondents in which they were asked about "imagine that you have failed in the last exam and you were given an opportunity to replace last exam failing grade with whatever grade you get in next exam. Knowing this you have little time to study and small chance that your grade on next exam will be higher. Would you still take risk and hoping for higher grades?" 82% respondents answered yes and 18% respondents answered "no" that they were not willing to take risk as they have very little time to prepare again for the new replacing exam. It means more respondents were overconfident about their ability that they can perform very well if they have opportunity to replace the old exam with new one. The value of Pearson Chi-square test is 0.000. The result of study showed that there is no statistically significant difference between the gender and the way this question was answered.

Test Statistics

	gender	Failed in exam and opportunity to replace exam OC
Chi-Square	1.000[a]	110.420[b]
Df	1	2
Asymp. Sig.	.317	.000

Than respondents were asked question to get an idea of overconfidence among the respondents "perception about how much time they required to find a job that is closer to their current salary level if they lost their current job?" 18% respondents answered that they required 1-5 years to get job, 16% respondents answered that they required less than 2 weeks, 22% respondents answered up to 6 months and remaining 44% respondents answered that they required between 1-6 months time to find out a job whose pay level is closed to their current salary level. The value of Pearson Chi-square test is 0.000 which suggest that there is no statistically significant difference between the gender and the way this question is answered.

Test Statistics

	gender	perception about time required to find the new job OC
Chi-Square	1.000[a]	20.000[b]
Df	1	3
Asymp. Sig.	.317	.000

And the last statement to check the relationship between overconfidence and gender in financial decision making was "If you make an investment and you are excessively optimistic and confident about your investment decision than what is the reason of your confidence and optimism?" Respondents who are subject to overconfidence bias will more likely answer "own your skills and confidence" among the given other choices like Luck, Good advice, Strong market and Own your skill and intelligence. Among the sample of 100 respondents 16 were graduate, 8 were intermediate, 75 were post graduate and 1 respondent have qualification above the post graduation. 23% respondents answered that they are confident on their investment because of good advice, 16% respondent answered "strong market" 41% respondents answered "own their skill and intelligence" and remaining 20% respondent answered "luck" was the reason of their confidence on their investment decision. The value of Pearson Chi-square test was .002 which exhibit that there is no statistically significant difference in qualification and overconfidence on the basis of gender

Test Statistics

	gender	reason of confidence and optimism on investment decision OC
Chi-Square	1.000[a]	14.640[b]
Df	1	3
Asymp. Sig.	.317	.002

4.2 Illusion of control

` Even though this study did not explicitly focus on evaluating the existence of the illusion of control bias but this study desired to analyze whether illusion of control bias existed among students in accompany of overconfidence bias. To check this bias following question were asked: What do you think you are more likely to win the lottery if you pick the numbers yourself than a quick pick? Among the sample of 100, 8% respondents answered strongly agreed, 48% respondents answer was agree, 35% respondent answer was disagree and 9% respondents answered as strongly disagree. Pearson correlation coefficient value is -0.041 which exhibit weak negative correlation existed between overconfidence bias and illusion of control bias.

Correlations

		OCB	chance of winning in lottery is more by quick pick or by own self (ICB)
OCB	Pearson Correlation	1	-.041
	Sig. (2-tailed)		.971
	N	100	100
chance of winning in lottery is more by quick pick or by own self (ICB)	Pearson Correlation	.004	1
	Sig. (2-tailed)	.971	
	N	100	100

4.3 Confirmation Bias

Just like the illusion of control bias this study also asked a question from respondents to check the respondents who are prone to overconfidence bias were also subject to confirmation bias. The question was "how willing the students were to accept an idea that would probably result in a positive outcome if it was

contrary to the current beliefs held by them". 22% students/ employees were responded as not willing at all, 67% students were probably willing at all and 11% respondents were extremely willing to accept an idea. Pearson correlation coefficient between confirmation bias and overconfidence bias was -0.170 which showed that there is negative relationship between these two biases.

Correlations

		OC	willingness to accept an idea by positive outcomes or opposite to current belief(CB)
OC	Pearson Correlation	1	-.170*
	Sig. (2-tailed)		.023
	N	100	100
willingness to accept an idea by positive outcomes or opposite to current belief (CB)	Pearson Correlation	-.227*	1
	Sig. (2-tailed)	.023	
	N	100	100

4.4 Familiarity Heuristic

Two questions were asked to analyze that the respondents who were prone to overconfidence bias were also how much extent prone to familiarity/ availability bias in making their decisions. A statement designed to check the existence of availability bias was: "if students were to select a random word from the dictionary, would it be more probable they would have encountered a word that started with an R compared to the 3rd letter in the word being the R." Respondents who were subject to familiarity bias in decision making would more likely to select first option that was "start with R". 64% respondents answered start with R and 36% respondents answered that "R is the third letter". The Pearson Chi-square test value is 0.005 which showed that there is no statistically significant difference in the answers with regard to the qualification.

Another question about the availability bias was "if respondents frequently shop at the service shoes believe that buying stocks of the service shoes is a good investment?" Among the four possible answers were offered to the respondents to choose from: strongly agree, agree, disagree, and strongly disagree. 7% respondents answered as strongly agree, 60% respondents answered as agree, 28% respondents answer was disagree, and remaining 5% respondents answer was as strongly disagree. Correlation coefficient between availability bias and overconfidence bias is -0.094 which exhibit that respondents who are prone to over confidence bias were not necessarily also subject to same degree of overconfidence bias because there is weak negative relationship between overconfidence bias and familiarity bias in decision making of respondents.

Correlations

		OC	FB
OC	Pearson Correlation	1	-.094
	Sig. (2-tailed)		.283
	N	100	100
FB	Pearson Correlation	-.108	1
	Sig. (2-tailed)	.283	
	N	100	100

4.5 Loss aversion bias

Five questions was asked to measure loss aversion bias among the respondents and to find out whether people who are over confident in making their decisions were also loss averse. A scenario was presented to check the lass aversion bias was "Choice of getting $500 without doing anything or having a fair coin and get $1000 if head comes up or lose the original $1000 in the case of tail". 69% respondents choose the option "you have choice of either receiving another $ 500 without doing anything" 31% respondents chose the option "flip fair coin and receive $1000 if head comes up or lose the original $ 1000 in case of tail. Most of respondents show the behavior of loss aversion because they have selected loss aversion bias. In second question respondents were presented a scenario and asked them to respond "the students to check a box at the end of the final exam and potentially get 10 extra points. If, however, the number of students who check the box is greater

than ½ of the class, the professor will deduct 10 points from the final score". 57% respondents choose option "yes" and remaining 23 % respondents choose option B that was "No". It means more respondents were willing to take risk. Third question was "If you presented a situation in which official sick day policy at company (in which you work) allows you not to go to work without calling in sick. If the boss happens to be away (who travels 80% of time), than you will not get penalized and stay home without using a sick day. If boss happens to be at work that day, you will be panelized 3 sick days. You have to make choice between coming to work even though you maybe forgoing free vacation time and not coming to work but take the risk of losing three sick days?" 71% respondents choose come to work and 29% choose take the risk of losing 3 sick days. Answers of respondents suggest that most of them were not willing to take risk. Fourth question about risk aversion was "If you are asked to choose between disposing of one stock in your profile, either the one that is 50% up or the one with 50% down than what would you choose?" 50% respondents answer was sell the gainer and remaining 50% respond that "sell the loser". Respondents who are prone to the loss aversion bias will more likely choose "sell the gainer". Last question about the loss aversion bias was "Would you prefer to build a guaranteed income from an investment even if the rate of return is low?" 18 % respondents answer was strongly agree, 57% agree, 21% disagree and 4% respondents answers were strongly agree. Answers reflect that most respondents were willing to take risk. The correlation between over confidence bias and loss aversion bias was 0.009 which very weak and positive relationship between these two biases. The results of study reflect that it is not necessary that respondents who are subject to overconfidence bias are also subject to loss aversion bias.

Correlations

		OC	LAB
OC	Pearson Correlation	1	.009
	Sig. (2-tailed)		.650
	N	100	100
LAB	Pearson Correlation	.046	1
	Sig. (2-tailed)	.650	
	N	100	100

V. Conclusion

This study aims to investigate the influence of behavioral biases on investment decisions made by students and employees. This objective was achieved by administering a questionnaire and collecting empirical data from graduate & post graduate students and employees about their own perceptions of biases. Questionnaire was distributed among the sample of hundred students/employees from which 45% were students and 55% were employees. Two statistical techniques were used to analyze collected data. Correlation was used to analyze the relationship of overconfidence bias with illusion of control bias, familiarity bias, loss aversion bias and confirmation bias. Chi-square was used to determine the significant difference between the responses of male and female about overconfidence bias. Results of this study reports weak negative correlation between overconfidence bias and other behavioral bias discussed in the study. This study concludes there is no significant difference between the responses of male and female decision making regarding overconfidence bias.

This study concludes that Only small percentage of students and employees were over confident when they were asked to assess their driving ability, athletic ability, type of student or employee and job/school performance but extremely optimistic about investment ability and opportunity to replace the last exam failing grades. As a result study concludes that students/ employees were subject to overconfident bias but not too much. As Barber and Odean (2001) study concluded that, males are more overconfident than females while making both financial and non financial decisions. But this study concludes that there is no significant association between overconfidence and gender.

From the sample of respondents most of them were subject to illusion of control bias. And there is weak negative relationship between illusion of control and overconfidence bias among respondents. Only few respondents were subject to confirmation bias and there is weak negative relationship between confirmation bias and overconfidence bias. Most of the respondents were subject to familiarity bias and there is weak negative relationship between familiarity bias and overconfidence bias. Respondents were subject to loss aversion bias when decisions are about investment or job related activities and not subject to loss aversion bias when decision was about grades in exam. There is weak positive correlation among loss aversion bias and overconfidence bias.

The result of this study refutes previous studies conducted on behavioral biases within decision making. This study has relative importance due to lack of awareness in this area of Gujrat

and little investor interaction. There is no stock exchange and people are not fully awarded about these kinds of biases that they are indulge in it. Gujrat is an under developing area of Punjab so it will take time towards research but this paper will help out the upcoming researchers to get the theme of our results to be proceed.

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