AN ANALYSIS OF BEHAVIORAL BIASES AGAINST VARIOUS PARAMETERS

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Abstract

Behavioral finance attempts to question the efficiency of the financial market. Several anomalies of human behavior are considered as interfering factors while investors makea financial decision, which leads to the criticism of the rationality of investors. Considerable evidence has been provided by psychologists and behavioral economists which demonstrates that investors are exposed to psychological and behavioral biases. Additionally, investors resort to shortcuts during the process of decision-making,and are affected by their past investment profits or losses.They make decisions within a framework of preference,and are influenced by the investment patterns of other investors. This study examines the relationship betweenbehavioral heuristics and biases such as overconfidence, self-attribution, and availability biasesand parameters such as age, gender, profession, and incomeof investors.

Keywords: Heuristics, Decision-making, Framework, Parameters, Behavioral Biases

Introduction

Behavioral biases that interfere in the financial decision-making process of an investor can be detrimental to long-term investment decisions. Although the advancement of technology has facilitated rational decision-making, investors are susceptible to make irrational decisions. The field of behavioral finance examines the financial market behavior, and consequently enables the investors to formulate better investment decisions by overcoming biases and avoiding potential hazards to their investments.

Psychologists Daniel Kahneman and Amos Tversky (Kahneman & Tversky, 1979) formulated the prospect theory without a comprehensive knowledge of classical finance, which marked the inception of behavioral economics/finance. Prospect theory explained the factual decision-making by people in contrast to the utility decision-making strategies provided by standard finance. Prospect theory states that people rely on the potential value of gains and losses while making decisions, and not on the basis of the utility of the decision.

In 1995, a vast comparative study of new behavioral finance vs. old standard finance performed by MeirStatman(Statman, 1995) concluded that human psychology and behavior affect the decision of investors and portfolio managers during their execution of suitable financial decisions.Additionally, the behavior of an investor affects their risk assessment and processing

abilities, and their utilization of information obtained from the market. A study conducted by psychologists has suggested that the primary emotions that determine risk-taking behavior are not greed and fear, but hope and fear (L. Lopes, 1987). Furthermore, although it is known that 'to err is human', financial practitioners from different backgrounds repeat the same mistakes.

Behavioral Finance is the study of the application of the psychological principles to determine the financial behavior of practitioners. According to Shefrin (Shefrin, 2002), practitioners should recognize and understand their own mistakes, and avoid repeating them in the future. Robert J. Shiller (Shiller, 2003) analyzed the evolution of behavioral finance through the decades. Shiller stated that markets might be efficient on the micro-level, but they are inefficient on the macro-level. Individual stock movements are significant than that of the movement of the entire market.

Rational investors accurately update their beliefs when they receive new information and make sane choices (Thaler, 2005). The foundation of standard finance is associated with the modern portfolio theory (MPT) and the efficient market hypothesis (EMH). MPT is a stock or portfolio's expected return, standard deviation, and its correlation with other stocks or mutual funds held within the portfolio ((Ricciardi & Simon, 2000). According to the academic perspective, an investor's behavior is related to finance, and is influenced by a combination of psychological, sociological, and financial variables which demonstrates the interdisciplinary nature of "behavioral finance" (Virigineni & Rao, 2017).

Literature Review

According to psychologists, human beings have an inclination to be overconfident while making judgments as they overestimate their skills and the accuracy of predictions. This overconfidence is the result of the illusion of knowledge. The human brain tries to gain maximum possible information from the resources at its disposal. However, they are unaware of the hidden risks of making a forecast using inadequate information under uncertain situations.

People often attribute their success to their own

skills and capabilities, and they attribute failure to reasons such as bad luck. Self-attribution bias (Heider, 1958) is an attribute that instigates over confidence in individuals. This theory states that people devote successful consequences of their decisions to their own actions, ability, or skills. Conversely, an unsuccessful result is attributed to external factors such as bad luck, or misfortune.

People are habitually optimistic and overconfident. Overconfident individuals are adjudged to be prone to make errors in decision-making as overconfidence and optimism are considered to be a forceful combination (Lichtenste in, Fischhoff & Phillips, 1982). Overconfident investors actively trade in such a way that the difference between the stock they buy and those they sell does not cover the transaction costs (Odean, 1998).

Overconfidence leads to an increase in trading in financial markets. Psychological studies have observed that almost everyone displays overconfidence to a certain degree. "Many people discover naïve patterns in past price movements, share popular models of value, are not properly diversified, and trade in suboptimal ways" (Bondt, 1998), thus evading the broader factors prevailing in the market.

Overconfident behavior is predominant in all categories of professionals. Barber and Odean stated that the tendency of human beings to be overconfident causes the first bias in investors, and the human desire to avoid regret prompts the second (Barber & Odean, 1999). Barclays Wealth Management emphasizes this as an inclination of individuals to assign considerable confidence in their own investment decisions, beliefs, and opinions.

Gervais and Odean (Odean & Gervais, 2001) established that success strengthens the overconfidence of an individual. Success is accredited to their own skills and capabilities, and it is observed that people suffering from self-attribution bias become increasingly overconfident as they succeed further.

Self-attribution bias (SAB) emanates from human traits of self-protection and self-enhancement, i.e., a yearning for positive self-image. Self-attribution

is a far-reaching cognitive and social phenomenon that is embedded in the larger human search for meaning (Malle, 2004).

Availability bias is another kind of favoritism according to which decisions made by individuals are based on recent information evading the detailed study of past events. In investment field, investors with availability bias take decisions according to conveniently available information, and avoid performing a detailed analysis. When people are asked to assess the frequency of a class or the probability of an event, they do so by the ease with which instances or occurrences can be brought to mind (Sewell, 2007). Availability is a cognitive heuristic, where in a decision maker relies upon knowledge that is readily available rather than examining alternatives or different procedures.

Choi and Lou (Choi & Lou, 2008) observed that self-attribution bias is a significant channel that hinders people to link their successes to internal factors, e.g., personal capabilities, and their losses to external factors. Investors who are unaware of biases make rational decisions and enjoy favorable outcomes. Rational investors make optimal decisions and generate desired results. This proves that self-attribution increases overconfidence and hinders the investors from being rational.

Overconfidence causes investors to overestimate their knowledge, underestimate risks, and exaggerate their ability to control events (Hirschey & Nofsinger, 2010). Schneider, et al. (Schneider, et al., 2012) established that individuals exposed to self-attribution bias are under the impression that they have enhanced abilities than that of an average individual, which is known as the "better than average effect". Self-attribution bias boosts the overconfidence of an individual, which affects their decisions and judgments. Behavioral finance states that investors are overconfident with respect to making gains and oversensitive to losses (Byrne & Utkus, 2013).

Although the studies conducted on behavioral finance are extensive, a few empirical cases of behavioral finance based on psychology have attempted to understand the effect of behavioral biases and cognitive errors on their investment decisions (Chaudhary, 2013). A study on self-attribution bias conducted by Hoffmann and Post (Hoffmann & Post, 2014) demonstrated that high returns in previous transactions enables the investors to believe that their performance is the result of their investment skills.

Objective and Research Methodology

Descriptive research was conducted to investigate the effect of biases on the behavior of investors. The demographic variables selected for the research were gender, profession, age and income and its association with different biases: overconfidence, self-attribution and availability heuristics were examined. The sample size consisted of 39 participants, and their answers were obtained and examined using a questionnaire. The association between the demographic variables and heuristics and biases was tested by Chi-Square method.

Table 1: Biases and Heuristics Studied against Demographic Variables

Heuristics and Biases	Definition
Availability Heuristics	It refers to estimate and decisions based on subsets of information that are easily available
Self-Attribution	It refers to attribute the abilities to own actions and contrary evidence to external noise or sabotage
Overconfidence	It refers to the tendency to overestimate own skills and predictions for success and entails a miscalibration of subjective probabilities

Source : Primary Data

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Table 2 : Demographic Variables

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Gender	Profession	Age (in years)	Income (in rupees)
Male: 28	Student : 17	Under 25 : 20	Below 25,000 : 18
Female: 11	Business: 6	26 to 35 : 10	25,000 to 50,000 : 10
	Salaried: 12	36 to 45 : 3	50,000 to 75,000 : 3
	Home maker: 1	46 to 55 : 3	75,000 to 1,00,000 : 1
	Retired: 0	Above 55 : 3	Above 1,00,000 : 7
	Other: 3		

Source: Primary Data

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Table 3 : Frequency Table Based on Responses

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	Overconfidence Bias	Self - Attribution Bias		Availability Heuristics
Gender:		Loss	Profit	
Male	Yes: 44 No: 42	Self: 17 Other Factors: 36	Self: 17 Other Factors: 39	Yes:8 No:20
Female	Yes: 11 No: 24	Self: 3 Other Factors: 19	Self: 5 Other Factors: 21	Yes:3 No:8
Profession:				
Student	Yes: 27 No: 29	Self:9 Other Factors: 23	Self: 6 Other Factors: 27	Yes:5 No:12
Business	Yes: 12 No: 8	Self:3 Other Factors: 11	Self: 3 Other Factors: 10	Yes:4 No:2
Salaried	Yes: 13 No: 20	Self:7 Other Factors: 18	Self: 9 Other Factors: 20	Yes:1 No:11
Home maker	Yes: 1 No: 3	Self:0 Other Factors: 2	Self: 1 Other Factors: 1	Yes:1 No: 0
Retired	Yes: 1 No: 4	Self:0 Other Factors: 2	Self: 2 Other Factors: 1	Yes: 0 No:2
Other	Yes: 1	Self:1	Self: 1	Yes: 0

Age:				
Under 25 years	Yes: 31 No: 33	Self:11 Other Factors: 27	Self: 9 Other Factors: 30	Yes:4 No:16
26 to 35 years	Yes:12 No:16	Self:7 Other Factors: 17	Self: 6 Other Factors: 20	Yes:4 No:6
36 to 45 years	Yes:2 No:9	Self:1 Other Factors: 4	Self:3 Other Factors: 3	Yes:1 No:2
46 to 55 years	Yes:5 No: 6	Self:0 Other Factors: 5	Self: 3 Other Factors: 4	Yes:1 No:2
Above 55 years	Yes:5 No: 2	Self:1 Other Factors:4	Self: 1 Other Factors:3	Yes:1 No:2
Income (in Rupees):				
Below 25,000	Yes:19 No:33	Self:11 Other Factors:26	Self: 9 Other Factors: 29	Yes:4 No:14
25,000 to	Yes:16	Self:2	Self: 5	Yes:5

Source: Primary Data

Overconfidence Bias : Demographic factors such as gender, profession, age and income of the investors were selected to determine their association with the overconfidence of the investors while making investment decisions. The results of the Chi-square table are as follows. The values were checked at 5% significance level.

H_0: There is no relationship between thegender and overconfidence of investors in stock market.

H_1: There is a relationship between gender and overconfidence of investors in stock market.

Table 4 : Relationship between Gender and Overconfidence of Investor

Results of Independence (df=1)		
Critical Value	3.84	**Result :** There is a relationship between the gender and overconfidence of investors
Chi-Square Value	3.91	
P-Value	.048	
Reject the Null Hypothesis		

Source: Test Output

H_0 : There is no relationship between the profession and overconfidence of investorsin stock market.

H_1 : There is a relationship between the profession and overconfidence of investorsin stock market.

Table 5 : Relationship between Profession and Overconfidence of Investor

Results of Independence (df=5)		
Critical Value	11.07	**Result :** There is no relationship between the profession and overconfidence of investors
Chi-Square Value	4.53	
P-Value	.476	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the age and overconfidence of investors in stock market.

H_1 : There is relationship between the age and overconfidence of investors in stock market

Table 6 : Relationship between Age and Overconfidence of Investors

Results of Independence (df=4)		
Critical Value	9.49	**Result :** There is no relationship between the age and overconfidence of investors.
Chi-Square Value	5.51	
P-Value	.239	
Accept the Null Hypothesis		

H_0 : There is no relationship between the income and overconfidence of investors in stock market.

H_1 : There is relationship between the income and overconfidence of investors in stock market.

Table 7 : Relationship between Income and Overconfidance of Investors

Results of Independence (df=4)		
Critical Value	9.49	**Result :** There is no relationship between the income and overconfidence of investors.
Chi-Square Value	2.67	
P-Value	.614	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no, relationship between the Profession of a investor and Self - Attribution for Loss in Stock Market.

H_1 : There is a relationship between the profession of an investor and self-attribution for loss in stock market.

Table 8 : Relationship between Profession and Self Attribution for Loss in Stock Market

Results of Independence (df=5)		
Critical Value	11.07	**Result :** There is no relationship between the profession of an investor and self - attribution for loss in stock market.
Chi -Square Value	2.28	
P-Value	.808	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the ageof an investor and self-attribution for loss.

H_1 : There is relationship between theageof an investor and self-attribution for loss in stock market.

Table 9 : Relationship Between Age of Investor and Self - Attribution for Loss in Stock Market

Results of Independence (df=4)		
Critical Value	9.49	**Result :** There is no relationship between the age of an investor and self - attribution for loss in stock market.
Chi Square Value	2.24	
P-Value	.691	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the income of an investor and self-attribution for loss in stock market.

H_1 : There is relationship between the income of an investor and self-attribution for loss in stock market.

Table 10 : Relationship Between Income and Self - Attribution for Loss in Stock Market

Results of Independence (df=4)		
Critical Value	9.49	**Result:** There is no relationship between income and self - attribution for loss in stock market.
Chi-Square Value	6.42	
P-Value	.169	
Accept the Null Hypothesis		

Source : Test Output

Findings

It was evident from the test that the self-attribution bias regarding loss making investments was independent of the demographic factors. The gender, profession, age, and income of an investor did not affect the self-attribution bias. However, the frequency table demonstrated that people often attribute factors such as advice of brokers, analysts, T.V. channels, friends, and weak market and timing as factors for their loss. They believed that their decision did not result in faulty investments.

Self-attribution Bias (Profit) : Demographic factors such as gender, profession, age and income of the investors were selected to determine their association with self-attribution bias for profit of the investors while making investment decisions. The results of the Chi-square table are as follows. The values were checked at 5% significance level.

H_0 : There is no relationship between the gender of an investor and self-attribution for profit in stock market.

H_1 : There is a relationship between the gender of an investor and self-attribution for profit in stock market.

Table 11 : Relationship Between Gender and Self - Attribution for Profit in Stock Market

Results of Independence (df=1)		
Critical Value	3.84	**Result :** There is no relationship between the gender of an investor and self - attribution for profit in stock market.
Chi-Square Value	1.12	
P-Value	.290	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the profession of an investor and self-attribution for profit in stock market.

H_1 : There is a relationship between the profession and self-attribution for profit in stock market.

Table 12 : Relationship Between Age and Self - Attribution for Profit on Stock Market

Results of Independence (df=5)		
Critical Value	11.07	**Result:** There is no relationship between the profession of an investor and self - attribution for profit in stock market.
Chi-Square Value	5.13	
P-Value	.400	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the age of an investor and self-attribution for profit in stock market.

H_1 : There is a relationship between the age of an investor and self-attribution for profit in stock market.

Table 13 : Relationship Between Age and Self - Attribution for Profit in Stock Market

Results of Independence (df=4)		
Critical Value	9.49	**Result :** There is no relationship between the age of an investor and self-attribution for profit in stock market.
Chi-Square Value	3.50	
P-Value	.478	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the income of an investor and self-attribution for profit in stock market.

H_1 : There is a relationship between the income of an investor and self-attribution for profit in stock market.

Table 14 : Relationship Between Income and Self - Attribution for Profit in Stock - Market

Results of Independence (df=4)		
Critical Value	9.49	**Result :** There is no relationship between the income of an investor and self - attribution for profit in stock market.
Chi-Square Value	1.40	
P-Value	.850	
Accept the Null Hypothesis		

Source : Test Output

Finding

It was observed that the four demographic variables did not affect the self-attribution bias for profit of an investor. In contrast, the factors that were considered helpful by the investors for selecting winning investments were advices from brokers, analysts, T.V. channels, friends, and strong market and perfect timing for their profits. Additionally, self-decision was considered as a reason for their success in the market.

Availability Bias : Demographic factors such as gender, profession, age and income of the investors were selected to determine their association with availability bias of the investors while making investment decisions. The results of the Chi-square table are as follows. The values were checked at 5% significance level.

H_0 : There is no relationship between the gender of an investor and availability bias in stock market.

H_1 : There is a relationship between the gender of an investor and availability bias in stock market.

Table 15 : Relationship Between Gender and Availability Bias in Stock Market

Results of Independence (df=1)		
Critical Value	3.84	**Result:** There is no relationship between the gender of an investor and availability bias in stock market.
Chi-Square Value	.007	
P-Value	˙935	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the profession of an investor and availability bias in stock market.

H_1 : There is a relationship between the profession of an investor and availability bias in stock market.

Table 16 : Relationship Between Profession and Availability Bias in Stock Market

Results of Independence (df=5)		
Critical Value	11.07	**Result:** There is no relationship between the profession of an investor and availability bias in stock market.
Chi-Square Value	10.46	
P-Value	.063	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the age of an investor and availability bias in stock market.

H_1 : There is a relationship between the age of an investor and availability bias in stock market.

Table 17 : Relationship Between Age and Availability bias in Stock Market

Results of Independence (df=4)		
Critical Value	9.49	**Result :** There is no relationship between age and availability bias in stock market.
Chi-Square Value	1.47	
P-Value	.832	
Accept the Null Hypothesis		

Source : Test Output

H_0 : There is no relationship between the income of an investor and availability bias in stock market.

H_1 : There is a relationship between the income of an investor and availability bias in stock market.

people operate under biases and the reasons for different people acting under different biases in similar situation may prove to be other area of research in investment psychology.

Table 18 : Relationship Between Income and Availability Bias in Stock Market

Results of Independence (df=4)		
Critical Value	9.49	**Result:** There is no relationship between the income of an investor and availability bias in stock market.
Chi-Square Value	4.23	
P-Value	.375	
Accept the Null Hypothesis		

Source : Test Output

Findings

It was observed that the gender, profession, age and income of an investor did not affect availability biasness. The information available with the investors was analyzed by themselves or experts and a fundamental analysis was performed before investing.

Research Gaps and Problem Identification

Limited biases were covered in this study with less data collection. Additional biases can be included to investigate their relationship with the parameters. This study established the presence of biases while making investment decisions. Why

Conclusion

The behavioral biases and heuristic; overconfidence, self-attribution, and availability were checked against demographic variables gender, profession, age and income to determine their effect on the decision making of investors. It was observed that gender affected the confidence level of investors. Male investors exhibited an overconfident behavior while trading stocks. However, a coherent relation was not observed between the remaining demographic variables and behavioral biases. Furthermore, the frequency table derived from the responses demonstrated that investors consider factors such asadvice from brokers and analysts, information from media

reports and friends, and market performance to be responsible for their loss while trading stocks. Additionally, this was true to a certain extent for profitable transactions. They claimed that they were not responsible for their loss-making decisions, and other factors and self-decision were equally credited for profitable transactions.

The short coming of this study wasits small sample size. The data received was skewed. Additional data can probably lead to the normalization of the result. The samples were convenience sampling and based on snowballing.

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