



IMPACT OF BEHAVIOR BIASES ON INVESTORS' DECISIONS: EVIDENCE FROM PAKISTAN

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ABSTRACT

The current study aimed to investigate the relationship between the behavioral biases of the investors and the performance of their investment decisions. Behavioral biases mean how an individual acts in a particular situation. Most of the investors take their decisions on the basis of their intuitions rather than relying on the information available from different sources. Furthermore, some investors don't even try to get information regarding the movements of stock prices. Investment decisions involve psychological illusions which have two dimensions, one is Heuristic rules (such as Overconfidence, representative bias, Gamblers' Fallacy, Anchoring, Availability bias) and the other is Prospect rules (such as Regret Aversion, Loss Aversion and mental accountability). These two rules have been taken as independent variables while investment performance has been taken as a dependent variable in this study. Data is collected from 100 investors of Pakistan's Stock exchange through a self-designed questionnaire. Structural Equation modeling is used for the analysis. An insignificant relationship between the Prospect variables and the investors' decisions was found while there was a significant relationship between the Heuristic variables and the investors' decisions. The results of the study may be helpful for investors in order to take rational, reliable and profitable decisions.

Keywords: Heuristic Rules, Prospect Rules, Stock Exchange Prices

INTRODUCTION

Recently, several studies have been done to determine various factors affecting entrepreneurs' behaviors in the world of business. And, developed countries are seeking knowledge that can provide economic benefits for them (Keshavarz et al., 2017). Karaca (2017) conducted a study to define the personality traits of strategic entrepreneurs. Pompian (2006) described Behavioral biases as organized errors in judgments, while Shefrin (2007) stated that bias is nothing more than tendency towards the error taken by the investors towards irrational decisions. According to Chira, Adams, & Thornton (2008) the behavioral finance deals with how behavioral factors establish differences in the investors' decision making process. For a long time, it has been assumed that the investors think rationally and take accurate and rational decisions based on the traditional finance theories. But after a number of the investigations, it was found that most of the decisions are based on the intuitions, emotions and cognitive biases. Humans are known to take decisions on the basis of their intuitions and hunches rather than collecting information regarding that particular event. Many studies have shown that as these decisions are based on intuitions and hunches, most of the time, investors took wrong decisions (Tversky & Kahneman, 1974). Behavioral Finance is the study that how

psychology influences the behavior of the investors. Behavioral finance deals with a group of possible approaches to purify the definition of the economic rationality in classical finance. It concerns with the literature available in psychology and cognitive sciences to investigate that why an investor diverges from taking rational decisions.

Markowitz (1952) stated that the investors are rational, and they prefer low risk over high risk for the same level of the returns on two different investments. However, in reality, the situation is a little different. The investors mostly take irrational decisions based on their intuitions and past performance. Tversky & Kahneman (1974) explained that those investors usually rely on mostly heuristic rule which is useful in some cases, but sometime it leads them towards severe biased and irrational decisions. According to Brabazon (2000) in financial markets, most of the decisions are irrational because these are affected by the investors' own emotions. (Hirshleifer & Luo, 2001; Daniel, Hirshleifer, & Teoh, 2002; Subrahmanyam, 2007) stated that the investors are irrational, and the markets may also be inefficient so, the investors in market places may deviate from their real values.

Huberman (2001) declared that the investors' psychological states have impacts on the investors' decision making process. Fan & Xiao (2005) have found that investors from different societies may have different behavioral biases, and so their financial decisions may be different from one another. Singh & Ranjit (2010) have explored the features of market contributors and the types of information which impact the investors' decisions and market returns. According to Babajide & Adetiloye (2012), behavioral finance claims the investors as normal, but many researchers found that the investors may not behave rationally while taking decisions all the time. A lot of literature is available on the behavioral biases and the investors' decision making, but less attention has been given to developing countries like Pakistan. Thus, the current study has examined the impact of the behavioral biases on the investors' decisions at Pakistan's Stock Exchange (the developing/emerging stock market). This study may be useful for individual investors to take rational decisions and analyze stock market trends before taking any decisions. This study also sheds a light on the impact of two different behavioral biases which impact the decisions of the investors at Pakistan's stock exchange.

LITERATURE REVIEW

Tversky & Kahneman (1974) stated that the investors usually rely on heuristic rules which are useful in some cases but sometime they lead them towards severe biased and irrational decisions. Yates, Lee, & Bush (1997) investigated the investors' behavior of Asian and the USA investors, and the findings revealed that as compared to the USA investors, Asian investors commit more behavioral biases. Lin H.-W (2011) investigated that how demographics and psychological traits can impact decisions of the investors at Taiwan's stock market. A sample of 554 investors was selected for the study, and the structure equation modeling was used. The results showed the personality traits and the demographics of the investors' impacts on the decision making of the investors. Babajide & Adetiloye (2012) conducted a study in order to find out the relationship between the stock market performance and the behavioral biases in Nigeria. The researcher found a weak negative relationship between Nigerian stock market performance and the behavioral biases. The researchers concluded that the investors must have the knowledge about the effects of the behavior biases (feelings, intuitions and emotions) on the investors' decisions.



In the field of finance, heuristic rules are not reliable, and these rules lead the investors towards the wrong decisions. Heuristic is a rule of thumb, making decisions on the basis of heuristic rules is very easy, but under varying conditions it may lead towards irrational decisions. Heuristics include many different biases like: Torngren & Montgomery (2004) in a study found that the professionals are mostly overconfident about their ability to choose the better stocks from different alternatives. (Barber & Odean, 2000; Glaser & Weber, 2007; Paluch, 2011) in their studies described that the overconfidence can increase too much trade volume in stock markets. The majority of the investors' decisions are based on anchoring when they compare two similar items. Shiller (2003) claims that anchoring leads the investors towards the wrong decisions. It also enhances the risk level because the decision is based on the wrong judgment. Chen, Kim, Nofsinger, & Rui (2007) investigated Chinese investors' style of decision making. By including 46969 individuals and 212 institutional investors in their study, they concluded that Chinese investors are poor decision makers because they are suffering from behavioral biases like first of all they don't sell those stocks which prices are depreciated, they just sell those stocks which prices are appreciated, secondly, the researcher found them overconfident, and thirdly they consider that the past situation (representative Bias) is an indicator for future results. Barber & Odean (2008) stated that when individual investors have to decide which stock they should buy; they usually consider the stock that has gained their attention these days. They also found this behavior leads them to the biased decisions. Likewise, Shefrin (2002) suggested that the experiences of the investors have an important role in decision making, i.e. the less experienced is prone to the extrapolation (representativeness), while the more experienced investors commit "gamblers' fallacy". The investors while investing rely too much on pieces of information. People excessively rely on strength of information rather than the weight of information (Hirshleifer, 2001). Human beings try to estimate the end results by initiating from the beginning values about different events (Slovic & Lichtenstein, 1971). The different initiating points come up with the different estimates which lead to the initial values (Tversky & Kahneman, 1974). Sometimes, the investors inappropriately predict the events. The incorrect assumptions about the events due to the lack of understanding and poor information is sometimes referred to as Gamblers' fallacy. The investors give excessive weights to the information available which force the human being to overestimate the probabilities of the events, and cause the overreaction by the investors to investment outcomes (whether positive or negative). Therefore, Gamblers' fallacy leads towards poor decisions.

Prospect theory states that the investors take less risk to realize gains than to avoid losses. Tversky & Kahneman (1974) found that people have different levels of emotions towards losses than towards gains. Individual investors feel more stressed when they suffer losses than to happiness which they feel in case of gains. Loss aversion refers the investors want to hold their losing stocks because they believe that today's losers may soon exceed today's winners. Money outflows from the underperforming stocks is lower than the money inflows from the high performance funds. McGraw et al. (2010) stated that the investors usually reject those investment projects in which the chances of gains and losses are equal. Shefrin & Statman (1985) found that the individual investors' behavior to sell or hold their stock is based on the regret emotions due to which the investors intend to hold losing stocks for a too long time, and sell the winning stocks too early. According to Pieters & Zeelenberg (2007), when an investor



feels himself responsible for a worse decision which cannot be justified, then the investor experiences regret. Langer & Weber (2001) declared that people have the ability to differentiate between the events into various sections of their minds which have their impacts on their behavior. Furthermore, they found that the investors feel hesitated to sell those stocks on which they once gained higher returns, and now has a smaller gain. They don't want to sell their stocks at very low profit margins and this behavior compels them to wait until they would get the return as they earned during the boom period. On the basis of the literature review, the study has developed the following null hypothesis;

H1: Heuristic Biases have no impact on the investors' decisions at Pakistan's stock exchange.

H2: Prospect Biases have no impact on the investors' decisions at Pakistan's stock exchange.

METHODOLOGY

In the study, the investment performance has been taken as a dependent variable, while Heuristic and prospect behavioral biases of the investors have been taken as independent variables. The main objective of the study is to investigate the impact of the behavioral biases on the investor's decisions, and their investment performance. In order to achieve the objectives, 100 investors of Pakistan' stock exchange have been selected as the sample for this study. The majority of the respondents were aged between 20 to 60 years. Data is collected through the questionnaires employing Likert scale to test all the variables. The Questionnaire is divided into two parts: personal information and behavioral factors impacting the investment decisions. The variables are presented in a theoretical framework (fig. 1).

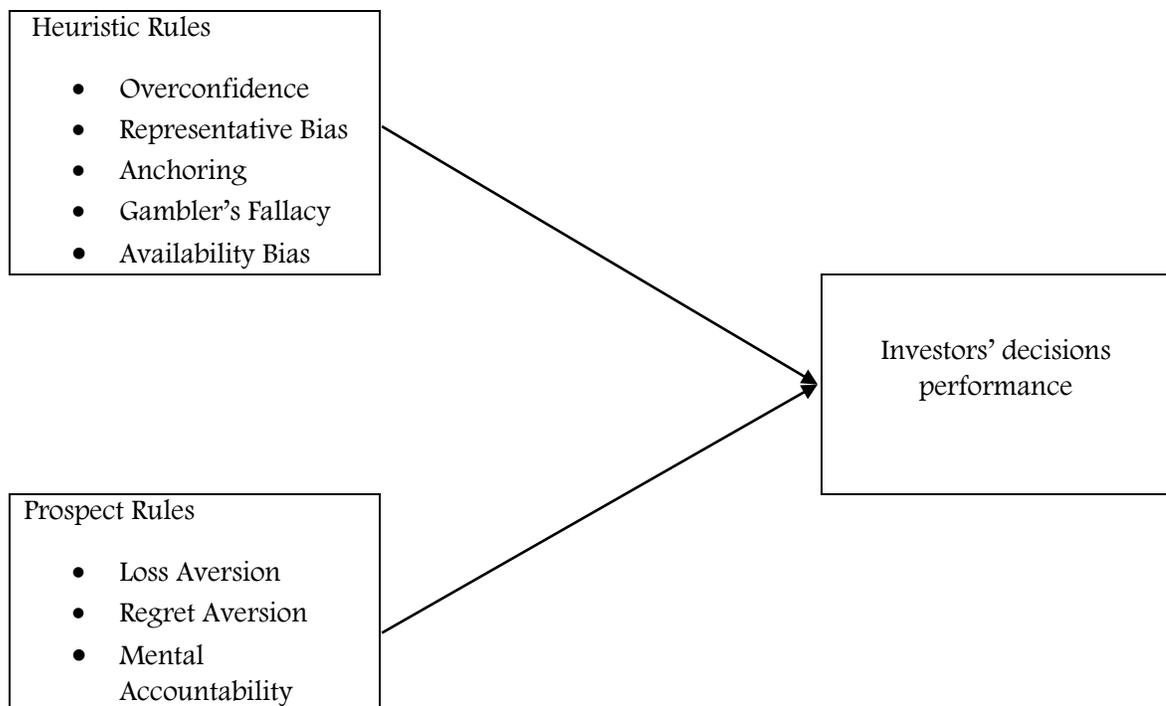


Figure 1. The research model of the behavioral factors' impacts on the investment decision performance at Pakistan's stock exchange (source: The Authors)

EMPIRICAL RESULTS AND DISCUSSION

In this research sample, more than 95% of the respondents are male, from which 42% respondents are above 40 years of age, 31% lie between 30 to 39 years of age and, the rest belongs to less than 30 years of age. 77% of respondents are married, and only 23% are single. 56% of the respondents having graduate degrees, and 51% of the respondents have 10 years of working experience, out of these respondents, 44% have invested Rs. 50,000 to Rs. 250,000, 26% have invested Rs. 251,000 to Rs. 500,000, and 21% have invested more than RS 750,000 in Pakistan's stock exchange. The majority of the respondent's incomes ranges from Rs. 50,000 to Rs. 250,000. The complete information about the demographics of the respondents have been kept with the authors, and would be provided on the demand.

Furthermore, the table 1 shows the frequency of the respondents regarding the questions asked in the structured interview (Questionnaire), 78% (42% + 36%) investors agreed that they prefer hot stocks and ignore stocks that have executed poorly in the latest past. 84% (56% + 28%) respondents agreed that they use trend investigation in order to make their investment decisions. 72% (34% + 38%) respondents agreed the services and information related to stock market can support them to outperform in the stock market. 84% (50% + 38%) investors agreed they consider their prior knowledge in the stock market for their following investment decisions. 69% (57% + 12%) investors agreed they predict the fluctuations in the stock prices in the future on the foundation of the current stock prices. 72% (31% + 41%) respondents agreed they are clever to anticipate the positive or negative market returns at Pakistan's stock exchange. 72% (31% + 41%) investors agreed that they prefer to buy local stocks comparing with international stocks because information related to local stock is more and easily available for them. 48% (42% + 6%) research respondents agreed they consider the materials they receive from their close friends and relatives for their investment decisions at Pakistan's stock exchange. 78% (50% + 28%) respondents agreed that after gain in their previous investment they take more risk in their next investment. 69% (42% + 27%) of research respondents agreed that after loss in their previous investment, they take less risk in their next investment. 81% (54% + 27%) of the investors agreed they avoid to sell those shares that have reduced in their worth and they try to sell those shares that have improved in their worth. 75% (50% + 25%) of the investors agreed they feel extra-sad in holding trailing stocks for a long time period comparing to selling appealing shares too quickly. 48% (43% + 5%) of the respondents agreed they have tendency to analyze their investment portfolios separately while the rest of the respondents have no idea with the analysis of the portfolios. 22% (18% + 4%) are not sure that whether they overlook the linking among various investment potentials. 48% (45% + 3%) agreed that the current investment in stock market meets their hopes. 61% (28% + 33%) of the investors agreed that they are not sure if the return rate of their recent investment is equivalent with or greater than the normal stock market rate of the return. 49% (36% + 13%) were satisfied with their last year performance at Pakistan's stock exchange.

Table 1 also shows that among five heuristic variables (Representative, Overconfidence, Anchoring, Gambler's fallacy and availability biases), Anchoring, Representative Bias and Overconfidence have greater impact on the performance of the investors' decision having mean values of 4.24, 4.10 and 4.09, respectively, showing that the investors at Pakistan's stock exchange rely more on their previous knowledge while investing, prefer to buy hot stocks, and



they think they can outperform in the stock market by their skills and knowledge related to the stock market. Due to this overconfidence and bias in their decisions, they are not getting the results they were looking for. While Gamblers' fallacy and Availability bias have moderate impacts on the investment performance.

Table 1 also shows among prospects variables; Loss aversion has a moderate/reasonable (Mean= 3.96) impact on the investment performance at Pakistan's stock exchange. It means that the investors in Pakistan's stock exchange would love to invest heavily after prior gain and vice versa. Regret aversion has a great impact on the investment performance (Mean= 4.04), showing the investors want to sell more of those stocks which are increasing in their value as compared to those stocks which are showing a decreasing trend in their values. The results showed that the mental accounting has a moderate impact (Mean= 3.42) on the investment performance. Rockenbach (2004) stated that the investors overlook the linking between the various investment potentials, and they have a habit of treating each element of their investment portfolio separately. These results are favoring this phenomenon. The study observed that the return rate moderately meets the expectations of the investors (Mean= 3.42) at Pakistan's stock exchange, and the investors are moderately satisfied with their last year performance (Mean= 3.82)

Table 1. The frequencies and the impacts of behavioral Biases on investment performance
(Source: The authors)

Heuristics Biases	Abbreviations for Questions	Frequencies					Descriptive	
		S.D.	D	N.S	A	S.A	Mean	Std. Deviation
You have hot stocks and avoid stocks that have performed poorly in the recent past	X1		4%	18%	42%	36%	4.10	.835
You use trend analysis of some representative stock to make investment decisions.	X2		2%	14%	56%	28%	4.0	.704
You believe that your skills and knowledge of stock markets can help you to outperform the marker.	X3		1%	27%	34%	38%	4.09	.830
You rely on your previous experiences in the marker for your next investment.	X4		2%	10%	50%	38%	4.24	.712
You forecast the changes in stock prices in the futher based on the recent stock prices.	X5		7%	24%	57%	12%	3.74	.760
You are normally able to anticipate the end of good or poor market returns at the Pakistan stock exchange.	X6		16%	60%	23%	1%	3.09	.653
Tou prefer to buy local stocks than international stocks because then information of local stocks is more available.	X7	1%	20%	7%	31%	41%	3.91	1.173

You consider the information from your close friends and relatives as the reliable reference for your investment decisions.	X8	2%	21%	29%	42%	6%	3.29	.935
Prospect Biases								
After a prior gain, you are more risk seeking than usual.	X11	3%	4%	15%	50%	28%	3.96	.931
After a prior loss, you become more risk averse.	X12		9%	22%	42%	27%	3.87	.917
You avoid selling shares that have decreased in value and readily sell shares that have increased in value.	X13		4%	15%	54%	27%	4.04	.764
You feel more sorrow about holding losing stocks too long than about selling winning stock too soon.	X14		6%	19%	50%	25%	3.94	.827
You tend to treat each element of your investment portfolio separately.	X15	3%	5%	44%	43%	5%	3.42	.794
You ignore the connection between different investment possibilities.	X16	5%	28%	45%	18%	4%	2.88	.902
Performance								
The return rate of your recent stock investment meets your expectations.	Y1	4%	29%	19%	45%	3%	3.14	1.005
The rate of return is equal to or higher than the average rate of return of the market.	Y2	7%	32%	33%	28%		2.82	.925
You feel satisfied with your investment decisions in the last year.	Y3	9%	16%	26%	36%	13%	3.28	1.155



Figure 2 and table 2 show the results of the structure equation modeling (SEM). SEM is a combination of the multiple regression analysis and Confirmatory factor analysis. Figure-2 shows the approximations of the factor loadings, the variance of each variable clarified by other variables and the regression weights, as well. The impacts of two different behavioral factors Heuristic (X1 to X8) and prospect (X11 to X16) on the investment performance were estimated. The majority of the variables have factor loadings above .05, which shows the convergent validity of the data capacities. Both Heuristic and prospect variables individually have significant impacts on the investment performance as table-2 shows. The regression weights of the independent variables heuristics (x1, x2, x3, x4, x5, x6, x7, x8) and Prospects (x11, x12, x13, x14, x15, x16) have a highly significant relationship with the Dependent variables as the p-values= 0.000 for each variable.

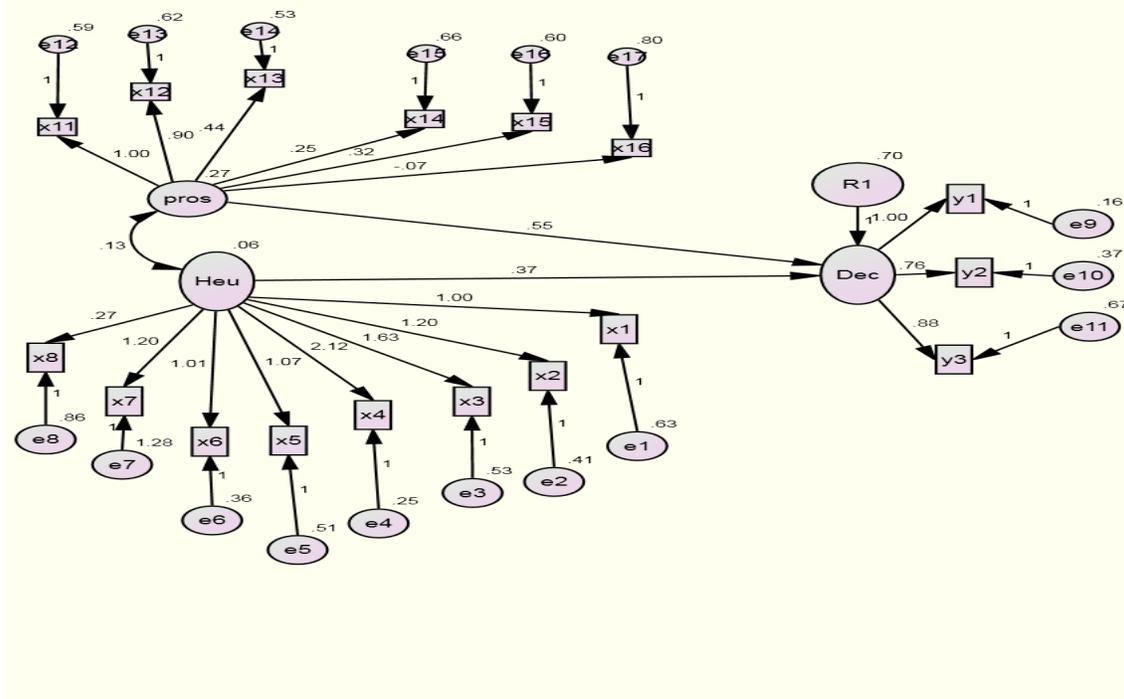


Figure 2. Structural Equation Modeling for Behavioral Factors and Investment Decision Performance. Numbers above the arrows showing estimates of regression weights and factor loadings, while the Numbers above the objects showing estimates of variances e_1, e_2, \dots, e_n : the estimates of errors. (Source: The Authors)

As for as the overall relationship is concerned, a positive (0.270) & significant ($P=0.012$) relationship between Heuristic Bias and Investors decisions was found, so H1 is rejected and Heuristic Biases have no impact on the investors' decisions at Pakistan's stock exchange, while a positive (0.56) but insignificant ($P=0.200$) relationship between Prospect Biases and the investors decisions was found, so H2 is partially accepted, and therefore Prospect Biases have no impact on the investors' decisions at Pakistan's stock exchange (table-2).

CONCLUSION

The study found that the investment decisions of the majority of the investors at Pakistan's stock exchange have been influenced by their behavioral biases. Every facet of Heuristic and Prospect behavioral biases have significant impacts on decision making of the investors at Pakistan's stock exchange. But the study found an overall highly significant relationship between heuristics biases and the investment performance therefore (H1) was rejected while an insignificant relationship between Prospect biases and the investment performance was found, so (H2) cannot be rejected. The current study was confined to few behavioral factors impacting the decision making of the investors at Pakistan's stock exchange. So, a wide range of the behavioral factors and a large sample are more appropriate to elucidate the impact of the behavioral biases on the investors' decisions, and the approach in this study could be adapted, and helpful to examine other different stock markets around the globe for accomplishing the future research.

Table 2. Regression Weights of Structural Equation Modeling

	Estimate	S.E.	C.R.	P	Label
Dec < --- Prospect	.056	.044	1.282	.200	Par_18
Dec < --- Heuristic	.270	.107	2.519	.012	Par_19
X1< --- Heuristic	.701	.151	4.640	***	Par_20
X2< --- Heuristic	.634	.092	6.859	***	Par_21
X3< --- Heuristic	.409	.062	6.636	***	Par_22
X4< --- Heuristic	.533	.082	6.468	***	Par_23
X5< --- Heuristic	.284	.053	4.726	***	Par_24
X6< --- Heuristic	.508	.075	6.782	***	Par_25
X7< --- Heuristic	.364	.054	6.718	***	Par_26
X8< --- Heuristic	1.280	.185	6.909	***	Par_27
Y1< --- Decision	.862	.123	7.026	***	Par_28
Y2< --- Decision	.159	.085	1.869	.062	Par_29
Y3< --- Decision	.368	.071	5.204	***	Par_30
X11< --- Prospect	.666	.115	5.776	***	Par_31
X12< --- Prospect	.589	.103	5.728	***	Par_32
X13< --- Prospect	.616	.101	6.121	***	Par_33
X14< --- Prospect	.525	.077	6.850	***	Par_34
X15< --- Prospect	.660	.094	6.995	***	Par_35
X16< --- Prospect	.597	.086	6.959	***	Par_36

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