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Investors' Behavioral Biases and the Stock Market Development: An Empirical Study of the Pakistani Stock Market

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Abstract

The objective of this study is to investigate the relationship between human biases and stock market development of Pakistan. I have used primary data analysis; data was gathered through well administrated questionnaire which consists of 20 items covering seven human biases and stock market development developed by Mercer Consulting in 2006. Biases include overconfidence, confirmation bias, loss aversion, anchoring bias, framing bias, status quo and myopic loss. 250 questionnaires were sent to respondents of Iqra University and Sukkur IBA which include teachers, students and other professionals, only 178 questionnaires were worth full and were used in analysis. Data was analyzed through SPSS using one sample t-test and Pearson correlation coefficient techniques. Results show that the most of biases are significant but they have positive relationship with market development, it suggests that despite biases of investors market perform well and market keep developing, which is contrary to behavioral theories, only one bias that of loss aversion has negative relationship with market but that relationship is insignificant, so on the basis of that we cannot conclude that biases have an impact on market development.

Key words: Behavior biases, stock market development, Pakistan

1. Introduction

Classical economic, investment and finance theories are based on the assumption that individuals are rational and they always choose those alternatives that maximizes their total utility and

returns. But literature reveals that individuals are not always rational in their decision making. An individual can be considered as rational when he keeps getting new information to update his beliefs and make choice among available alternatives that are acceptable (Thaler 2005). Past evidences prove that human beings are inconstant, irrational and incompetent in their decision making under uncertainty (Bernstein 1998), so individuals are not always rational and markets may not always be efficient (Bondt and Thaler, 1985). Classical economic models suggest what we should do, where as behavioral finance investigates what we really do. Behavioral finance emphasizes on the fact that our decisions are effected by human psychology, and also describes that when, how and why individuals behave irrationally. Behavioral finance emphasizes on anomalies which make investors to hold securities when they should not (Huckle, 2005). Behavioral finance identifies human biases as major cause for irrationality in investment decisions. While making decisions investors are biased and their emotions compel them to make irrational decisions and preferences of most of the investors are inconsistent (Huckle 2004).

Recent studies show that the most of the investors make their decisions based on emotions, not logic; majority of investors buy more on speculations and sale low in panic. Psychological research shows that the pain of losing money from investment is always greater than the joy of earning. Emotions such as fright and greed often play a critical role in investors' decisions; other factors also contribute to irrational investor behavior. Fluctuations in stock prices on daily basis are common in stock market even without any major change in macro economy. Herding effect also affects the prices of stock. Theories suggest that markets are efficient but it never happens in real world. For example, if a well reputed corporation announces an investment in a mega project over next few years, then its stock price suddenly starts moving up without focusing on the return or amount of investment needed for project. This the way stock prices are affected by investors' behavior.

Tversky and Kahneman (1992) argue that behavioral finance complements traditional financial theories which are important in decision making, but individuals are affected by their emotions and heuristics. Tversky and Kahneman (1981) identified that there are many anomalies in behavioural finance which arise from the way particular information is framed, viewed and interpreted before decision making.

Our study attempts to examine the situation in Pakistan and provide empirical evidence on the relationship between human behavioural biases and stock market development. This is the overall purpose of this study. The specific objectives of this study are to: (a) find out the extent of behavioural biases in the Pakistani stock market; (b) find out the type of relationship that between human behavioural biases and the stock market development (c) examine the effects of human behavioural biases on stock market development in Pakistan.

As Pakistani stock market is facing ups and downs in last two decades but now it looks that it's moving in increasing trend. In 2008-09 stock market faced crisis and was badly affected. So this study will provide a basis for understanding of impact of behavioral biases on decision making of Pakistani investors. Even though there are so many studies which are already done in Pakistan where individual biases are tested but in our study we try to incorporate seven biases simultaneously, which will not only help to understand the impact of individual biases but will also help to know the collective effect of biases on decision making. So it will provide good approach as an individual can be having more than one biases at same time.

2. Literature Review

Seldon (1912) was first who emphasized the impact of human behavior on the performance of stock market. He proposed that price fluctuations in stocks are dependent on the mental processes and attitudes of public involved in investment decisions. Later on Pratt (1964) worked on individuals' perception of risk and determinants of their trading volume with respect to their overall earnings on stock exchange. This study concludes that individuals' perceived risk and inner fear determines the investors' trading volume not necessarily by market risk.

Tversky and Kahneman (1973) first time gave the concept of judgment heuristic and called it "availability heuristic", according to this probability of events by people is evaluated by availability. This results in systematic bias, according to which individuals rely more on their mental thoughts than

market performance indicators to make decisions. This proves that individuals neither always make the decisions rationally nor they utilize all available information for decision making.

Kahneman and Tversky (1979) presented prospect theory, which opposes the utility theory that individuals value their losses different from their gains, furthermore utility theory do not explain the reason for investors' simultaneous attraction towards both gambling and insurance. They empirically found that individuals make their decisions based on perceived gains instead of perceived losses, so if a person is given with two choices, one is presented in terms of possible gains and other choice in terms of possible losses, person will select the option expressed in possible gains despite yielding same utility from both options. This theory also focuses on the disposition effect, which tells that individuals hold the stocks on which they suffer losses and sell those on which they get higher returns. This behavior suggests that winning stocks are sold to get more returns and losing stocks are sold to prevent losses.

Tversky and Kahneman (1981) found that individuals' reaction to a given choice depends on its presentation as loss or gain. This refers to framing which suggests that individuals change their mind when similar problem is given to them in different ways. It was proved that people do not take risk when positive frame is given but go for risk when they are presented with negative frame. They revealed that people's response to particular question depends on the way question is asked or framed, even numbering of given choices affect their decisions.

Bondt and Thaler (1985) discovered people's response to unexpected events. They found that people overreact to these events and news which results in market inefficiencies in stock markets. Samuelson and Zeckhauser (1988) conducted some experiments of individual decision making to know the reason for stiffness of people's views when they should be changed. They found that people do not change due to status quo bias.

Poterba and Summers (1988) found a positive serial correlation in returns over short term and negative a negative serial correlation over long period of time. Tversky and Kahneman (1992) gave a new version of prospect theory known as 'cumulative prospective theory'. In this model they used cumulative probability distribution function to apply weights to losses and gains.

Lakonishok, Shleifer and Vishny (1994) recommend value strategy related to investment life cycle, purchase stocks with low prices relative to its earnings and other fundamental value measures; as a result investor will get higher return by exploiting investor's suboptimal behavior. Barberis et. al (1998) presented a model representing investor sentiment, which shows under reaction of share prices with news related to earnings announcements and over reaction of share prices with good or bad news.

Hong, Lim and Stein (2000) investigated the relationship between firm specific information and stock returns and argue that any firm specific information spread among public and leads to fluctuations in stock returns; good news has positive relationship with returns and bad news has negative relationship with stock returns.

Shefrin (2002) studied and identified three aspects of behavioral finance; (a) heuristics suggesting that individuals make their decisions based on rule of thumb, (b) framing: decision maker's reaction to a problem is affected by the way it is presented to him and (c) market inefficiencies: represent irrational behavior, prices of stock do not reflect available information to decision maker, these also include return anomalies.

Mercer Consulting (2006) identified seven biases affecting the behavior of stock market participants on routine basis;

- i. Overconfidence- is the feeling of knowing more than you actually do or of possessing abilities that you do not possess. It results in overestimation of people's knowledge and underestimation of risks associated with decision.
- ii. Loss aversion- people want to avoid losses to do so they sell their winning stocks quickly and keep losing stocks with intention to regain their losses with the hope that prices will increase.
- iii. Confirmation bias- is the tendency to find and interpret information to confirm existing beliefs. The confirmation bias leads people to seek information that confirms expectations and interpret ambiguous information in line with expectations.
- iv. Framing bias- individuals' reaction to a given choice depends on its presentation as loss or gain. Due to this bias individuals change their mind when similar problem is given to them in different ways, people do not take risk when positive frame is given but go for risk when they

are presented with negative frame. So people's response to particular question depends on the way question is asked or framed, even numbering of given choices affect their decisions.

- v. Anchoring-tendency to make judgments and decisions by heavily relying on a familiar reference point (the anchor) that may be incomplete or unrelated to the decision.
 - vi. Status quo bias- people do not move to new positions, rather they tend to maintain their present positions.
 - vii. Myopic loss aversion- investors are more focused on short term performance of their investments rather than long term.
- Our study is based on these seven biases.

3. Research Methodology

This study is based on primary data. Data was gathered from people from Karachi and Sukkur. Data was gathered through well administrated questionnaire which consists of 20 items covering seven human biases and stock market development developed by Mercer Consulting in 2006. Biases include overconfidence, confirmation bias, loss aversion, anchoring bias, framing bias, status quo and myopic loss. To test the reliability of questionnaire respondents were randomly split into two equal groups. Then reliability measures of two groups were calculated and compared. The reliability coefficients alpha for two groups were 0.832 and 0.814 respectively show that questionnaire was reliable. 250 questionnaires were filled by respondents but only 178 were considered as worth full. Data was analyzed through SPSS using one sample t-test and Pearson correlation coefficient techniques.

4. Analysis of Results and Discussions

4.1. Descriptive Statistics of Some Variables

Table 1 represents the mean values, standard deviation and standard error for all the seven biases which include overconfidence, confirmation bias, loss aversion, anchoring bias, framing bias, status quo and myopic loss. Each variable represents perception of people and identifies whether people are biased or not. I have used statistic value to from the opinion based of scale of each variable. Respondents showed their perception based on scale where 5 was used for strongly agree to 1 which showed strongly disagree. Mean value of 3.6011 for overconfidence bias suggests that on people of Pakistan are overconfident where they rate their skills high and believe that their decisions will bring them higher returns. Table 3 shows one sample test where t statistic of 70.109 for overconfidence shows that results are highly significant. Mean of 3.47 loss aversion bias shows that on average people are more loss avers; they tend to avoid losses to acquire gains. This variable is highly significant at significance level of 0% with t statistic of 76.92. Mean value of 3.4981 for confirmation bias suggests that on average people tend to acquire the information that matches their previous beliefs or they want the things to see as they expect. This variable is also significant with t value of 79.537. Framing bias has a mean value of 4.0478 and is highly significant at significance level of 0%. For framing bias most people are highly agreed on the fact that their decision on investment is mainly dependent on the way information is presented to them, they tend to avoid risk when they are provided with positive frame and they assume the risk when things are presented to them with negative frame.

Table-1. One-Sample Statistics

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overconfidence	178	3.6011	.68529	.05136
Lossaversion	178	3.4700	.60187	.04511
Confirmation_Bias	178	3.4981	.58678	.04398
Framing_Bias	178	4.0478	.82285	.06168
Anchoring_Bias	178	3.6067	.91587	.06865
Status_Quo_Bias	178	3.7528	.56310	.04221
Myopic_Loss_Bias	178	3.5506	.91301	.06843

Among all biases anchoring bias has the highest standard deviation of 0.91587 and a mean value of 3.606. Although on average people are having anchoring bias but some people strongly agree and some strongly disagree. This bias is also significant at a level of 0%. Status quo bias has a mean value of 3.75 , again people are biased with status quo not changing when they should change and continuing with their normal success formula. Finally myopic loss bias has mean value of 3.55 and it is also highly significant with t value of 51.88, which suggests that investors tend to make their decisions on recent performance and then try to avoid losses.

Table-2. One Sample Test

One-Sample Test						
Test Value = 0						
	t	Df	Sig. (2-tailed)	Mean Difference	95% Interval Difference Lower	Confidence of the Upper
Overconfidence	70.109	177	.000	3.60112	3.4998	3.7025
Lossaversion	76.920	177	.000	3.47004	3.3810	3.5591
Confirmation_Bias	79.537	177	.000	3.49813	3.4113	3.5849
Framing_Bias	65.630	177	.000	4.04775	3.9260	4.1695
Anchoring_Bias	52.540	177	.000	3.60674	3.4713	3.7422
Status_Quo_Bias	88.916	177	.000	3.75281	3.6695	3.8361
Myopic_Loss_Bias	51.884	177	.000	3.55056	3.4155	3.6856

4.2. Behavioral Biases and Stock Market Performance

This part of the paper examines the relationship between human biases and market development. Pearson correlation is used to identify the direction between market development and biases. Results for correlation are presented in table 4. The first variable that is tested is overconfidence; correlation coefficient of 0.452 implies that there is high correlation between market development and overconfidence, this suggest that when investors display high level of overconfidence, higher the market performance. This variable is highly significant at 0% and thus null hypothesis of there are no relationship between overconfidence bias and market development is rejected. Here it is concluded that there is positive relationship between market development and overconfidence in Pakistan. Correlation coefficient of -0.029 between market development and loss aversion implies that there is weak and negative relationship between these two variables and higher the loss aversion behavior of investors higher the market development.

Table-3. Behavioral Biases & Stock market Development in Pakistan

Correlations

		Overcon fidence	Loss Aversion	Confirmat ion Bias	Framing Bias	Anchoring Bias	Status Quo Bias	Myopic Loss Bias	Market Developm ent
Overconfid ence	Pearson Correlation	1	.430**	.281**	.725**	-.149*	.438**	.058	.452**
	Sig. (2-tailed)		.000	.000	.000	.047	.000	.442	.000
	N	178	178	178	178	178	178	178	178
Loss Aversion	Pearson Correlation	.430**	1	.002	.492**	-.326**	.198**	-.018	-.029
	Sig. (2-tailed)	.000		.983	.000	.000	.008	.814	.697
	N	178	178	178	178	178	178	178	178
Confirmatio n Bias	Pearson Correlation	.281**	.002	1	.543**	.191*	.437**	.364**	.320**
	Sig. (2-tailed)	.000	.983		.000	.011	.000	.000	.000
	N	178	178	178	178	178	178	178	178
Framing Bias	Pearson Correlation	.725**	.492**	.543**	1	-.027	.632**	.533**	.607**

	Sig. (2-tailed)	.000	.000	.000		.716	.000	.000	.000
	N	178	178	178	178	178	178	178	178
Anchoring Bias	Pearson Correlation	-.149*	-.326**	.191*	-.027	1	.687**	.639**	.484**
	Sig. (2-tailed)	.047	.000	.011	.716		.000	.000	.000
	N	178	178	178	178	178	178	178	178
Status Quo Bias	Pearson Correlation	.438**	.198**	.437**	.632**	.687**	1	.816**	.847**
	Sig. (2-tailed)	.000	.008	.000	.000	.000		.000	.000
	N	178	178	178	178	178	178	178	178
Myopic Loss Bias	Pearson Correlation	.058	-.018	.364**	.533**	.639**	.816**	1	.762**
	Sig. (2-tailed)	.442	.814	.000	.000	.000	.000		.000
	N	178	178	178	178	178	178	178	178
Market Development	Pearson Correlation	.452**	-.029	.320**	.607**	.484**	.847**	.762**	1
	Sig. (2-tailed)	.000	.697	.000	.000	.000	.000	.000	
	N	178	178	178	178	178	178	178	178

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

But this relationship is insignificant which implies that there is no significant relationship between market development and loss aversion bias in Pakistan.

Next bias that is tested is confirmation bias; correlation coefficient of 0.32 implies that there is low correlation between market development and confirmation bias, this suggests that when investors display high level of overconfidence, higher the market performance. This variable is highly significant at 0% and thus null hypothesis of there are no relationship between confirmation bias and market development is rejected. Results show that there is high correlation of 0.607 between market development and framing bias. More the subjectivity in investors decisions more the market development. This variable is also highly significant at 5% significance level. Anchoring bias has also positive significant relationship with market development. It has a correlation coefficient of 0.484 and it is also significant at 0% significance level. Status quo bias is also positively related to market development with a correlation coefficient of 0.847 this is highly significant and it implies that higher the status quo bias of investors, higher the market development. Finally myopic loss bias; correlation coefficient of 0.762 implies that there is high correlation between market development and myopic loss bias, this suggests that when investors display high level of myopic loss behavior, higher the market performance. This variable is highly significant at 0% and thus null hypothesis of there are no relationship between myopic loss bias and market development is rejected.

5. Summary and Conclusion

Field of behavioral finance is emerging in world due to its importance. There is some work already done in Pakistan but here I have tried to test seven biases with market performance to know whether there are empirical evidences for behavioral biases or. In this study although most of biases are significant but their positive relationship with market development suggest that despite biases of investors market perform well and market keep developing, which is contrary to behavioral theories, only one bias that of loss aversion has negative relationship with market but that relationship is insignificant, so on the basis of that we cannot conclude that biases have an impact on market development.

6. Limitations and Recommendations

Sample size and limited geographical area are major limitations of this study. On the basis of only 178 investors we cannot generalize the results to entire Pakistan. As different investors are having different preferences, so data from large sample might have given better results. So if we increase the

sample size then we can improve our results. Secondly we can get data from more relevant people, who are actually dealing with investment decisions such as brokers, individual investors, fund managers etc.

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