

EMPIRICAL TESTING OF HEURISTICS INTERRUPTING THE INVESTOR'S RATIONAL DECISION MAKING

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Abstract

The study aimed to investigate the impact of behavioral biases on investor's financial decision making. Current research studies the behavioral biases including overconfidence, confirmation, and illusion of control, loss aversion, mental accounting, status quo and excessive optimism. The study is significant for the investors, policy makers, investment advisors, and bankers. Empirical data has been collected through administering a questionnaire. Correlation and Linear regression model techniques are used to investigate whether investor decision making is affected by these biases. The study concluded that the Confirmation, Illusion of control, Excessive optimism, Overconfidence biases have direct impact on the investor's decision making while status quo, Loss aversion and Mantel accounting biases have no impact according to data collected from financial institutions.

Keywords: Behavioral biases, Decision making, Regression model, Correlation,

Introduction

Human beings are sometime biased both intentionally and unintentionally in their routine life decisions. Psychology is an art in which we study the human behavior, nature and attitude and how human deviates from rational decision. Behavioral finance depends on the psychological decision of the investors. Current research will evaluate and extend the psychological phenomenon specially it 'ill analyze the influence of Overconfidence, Confirmation, Illusion of control, Excessive optimism,

Mental accounting, Status quo and Loss aversion on investor's decision . The purpose of the research was: (1) to identify the each above mentioned behavioral biases on the financial decision making process and (2) to empirically measure the strength of relationship between these behavioral biases and investor's financial decision making.

Overconfidence is bias that affects the decision of individual as well as corporate world. People have a propensity to overestimating their abilities and avoid taking the help of others in decision making process. These people are totally rely on their abilities. Therefore they search less help and direction during the decision making process. According to Shefrin “pertains how well the people understand their own abilities and the limits of their knowledge” (Shefrin 2007).

Confirmation bias is a cognitive bias or the ability of people to understand information in such a way that it confirms the previous ideas while avoiding explanation which disagrees with previously held beliefs (Shefrin 2007). If a consumer is attracted towards a specific brand so he/she will try to get information about this product which conjuncts to the current belief.

Illusion of control is defined as the propensity of people to believe that they can control or affects the outputs that in reality they have no affects over (Shefrin 2007). In Illusion of control the people gives wrong impression that his/her personal involvement influenced the outputs but the reality is quite different. Loss aversion or prospects theory related to the individual's desire to avoid losses than comparable profits (Tversky & Kahneman 1979). This theory represents the both business and the individuals.

Status quo is explained as the people prefer to maintain their current position rather than to improve their position. In status quo bias we listen the statement that “I prefer to maintain my current position of investment in market rather than high.” ‘Excessive optimism’ refers to the overconfident and overestimation of the favorable outputs rather than unfavorable outputs (Shefrin 2007). This bias presents in many variety of the fields, some companies are unintentionally engage in Excessive optimism. Mental accounting defined as the process in which the people code, categorize and evaluate the economic outputs (Thelar 1980).

Objective

- To identify the impact of overconfidence on financial decision making of investors.
- To investigate the influence of confirmation bias on individual's financial decision making.
- To study the effect of loss aversion on investment decisions.

- To analyze the influence of excessive optimism on the investor's financial decision making process.
- To investigate the relation of mental accounting with investment decisions.
- To examine the effect of status quo on investor's financial decisions.
- To identify the impact of illusion of control on investment decision.

Significance and contribution of study:

The aim of study is to explain the influence of behavioral biases on the investor financial decision making. The outcomes of study are helpful for the investors, policy makers, financial advisor, and students. The individual investor can take help from the findings of this study and can come to know which bias interrupted their decision making, by overcoming these biases they can make good investment decisions. The contribution of this study in the existing literature is that there was no study where all these biases i.e status quo, overconfidence, confirmation bias, illusion of control, excessive optimism, loss of aversion, and mental accounting have been discussed together. This study covers the knowledge gap of the previous studies.

Literature Review

Babajida and Adetiloye (2012) examined the effects of behavior biases in performance of stock market in Nigeria of last twenty years and the variables they studied were overconfidence, loss aversion, framing, anchoring and status quo bias. The research has been conducted through administrating a questionnaire by targeting 300 respondents. . The Pearson product moment coefficient method was used to analyze the survey, this paper concluded that every investor must engage in the service of investor advisor that may reduce the personal biases of management decision process, also found that there is negative relation between independent and dependent variables due to indirect involvement in trade activity.

Chira, Adams & Thornton (2008) studied how cognitive biases and heuristics make distortion in the decision making of the business students. In this paper student behavior was investigated through questionnaire that included 45 questions which were presented to limited graduate and undergraduate students of Jacksonville University in United States of America and design to check the behavior mistakes that they make during both financial and non-financial decision making. There were number of biases and heuristics found after getting the questionnaire but this paper focuses on overconfidence, excessive optimism, loss aversion, familiarity, sunk cost, illusion of control and confirmation biases. This paper found that generally student rationality is bounded in their decision making behavior, when they are asked to show driving ability and school performance they

react overconfident and extremely optimistic on the other hand they are less optimistic about investment ability and athletic ability.

Poluch (2011) analyzed the impact of overconfidence biases on different level of management and also that cognitive ability can explore the relationship between overconfidence biases and level of management. The managers of professional services organizations of South Africa used as sample. Online survey was conducted and some individuals were also personally approached and 30 managers were targeted at each level. This study concluded that middle managers has the least level of overconfidence due to difficulties faced by them and lower level managers feel more overconfidence due to unique and specific task required by middle managers. The upper level managers are more overconfident due to authority and self-independency.

Bogan and Just (2008) investigated the existence of confirmation bias in mergers particularly in the behavior of actual corporate executives. For this purpose he did experimental study at Ivy League University used frequency technique that included observations from 2333 respondent's i.e. 2034 students and 299 higher executives. This research concluded that higher executives were less likely to absorb the new information in contrast to non-executives.

Park and Konana et. al. (2010) analyzed the impact of stock message boards on investors trading decision and investment performance. This research included 502 respondents from the largest message board operator in South Korea. The data set came from a field experiment on the participants of the largest online portal website "Naver stock message boards". The frequency technique used in this research paper and concluded that the investors exhibit the confirmation bias when they get information from the message board.

According to Thaler (1999) mental accounting was used by the individual to managing, evaluating and financial activities in household. Investor of Indonesia tend to be neutral choosing a positive frame, if turn into negative frame then it would be risky. Indonesian investors mostly choose risky alternatives as compare to less risky. Mental accounting suggested to Indonesian investors, they are not able to incorporate financial information separately.

Seppala (2009) examined the effects of three behavioral biases hindsight, overconfidence and self-attribution. This paper examined the effect of individual thinking style and cognitive ability on investment advisors. The survey was created by three separate groups of people, financial professionals, university students and employees of engineering company and also creates two-pronged structure for recollect and repeat the issues. Asset selection effect, sign of return effect, drift of return effect and

strange of views were used to analyze the hindsight biases. Commonly behavior biases were shown by people but it varies individual to individual due to experience and characteristics. They found that all people including investment advisors are suffered to hindsight bias. Findings on overconfidence indicated that people are confident and results on self-attribution bias also showed that people suffer from it.

Ofir and Wiener (2011) investigated the performance of behavior biases among professional investors in the case of structured products investment for this purpose they picked a population of 573 subjects as a sample out of which 75% were investment advisors and 25% portfolio managers by using the logic probit model and linear probability model. The purpose of this study was to test the possible impact of each behavior bias on decisions pertaining to investments in structured products. They found that even professional investors make major systematic errors even they were not immune to behavioral biases.

Moore, Kurtzburg et. Al (1999) examined the portfolio allocation decisions of 80 business students through a computer based investing simulation. The purpose of study was to better understand why investors spend so much time and money on actively managed mutual funds. They created a simulated market based on the real performance data of nine largest mutual funds in 1985 plus and S&P 500 index fund. An experiment was conducted for this and the data was organized into a computer based environment in which investors were able to invest a set amount of money over the 10-year period. Every participant could review the performance of its investment and could move it to new mutual fund. Investor could allocate its investment in 10 mutual funds. They concluded that investment decisions are susceptible to positive illusions and overestimation of inter temporal consistency. These biases influence judgment, satisfaction and behavior in some consistent ways that can cost investor dearly.

Chen, A. Kim et. al (2010) studied investment decision making in an emerging market. They found that Chinese investors make poor trading decisions suffering from three behavioral biases (i) They tend to sell stocks that have appreciated in prices, but not those that have depreciated (ii) they seem to be overconfident (iii) they seem to believe that past returns are the indicative of future returns. For this purpose they selected the Chinese market and investors. The dataset came from a brokerage firm of SHSE & SZSE in China. The complete dataset included 74960 investor accounts out of which 27779 were deleted due to some reasons leaving a final sample of 46969 individual investors and 212 institutional investors. They used regression relation for this purpose and concluded that Chinese investors make trading mistakes, they are reluctant to realize their losses, they tend to be overconfident and they exhibit a representativeness bias.

Charness and Gneezy (2003) studied basic intuition during decision: how investment split between risky lottery and assets having fix return by using three biases ambiguity aversion, illusion of control and myopic loss aversion. This paper replicated the previous result related to basic intuition and then tests the participants by paying small sum of money with line of bias (less ambiguity, more perceived control). The experimental research is conducted in University of California and graduates school of business in University of Chicago, which included 275 students, pages that having 10 treatments one of them is given to each student. This paper studied how portfolio choice depends on above biases and concluded the illusion of control was eliminated when investors want to gain more control, in less or more control investors always face fractions if they invest in risky options. This paper discussed there was no influence on investment against the level of ambiguity but people always want to pay for less ambiguity. In loss aversion people less invested where more freedom to change their investment.

Bashir and Rasheed, et. Al (2013) investigated the influence of behavioral biases on investment decisions. The study was conducted through questionnaire. About 100 respondents were targeted out of them 55% were employees and the remaining students. They took female and male as dependent variable and confirmation biases, illusion of control, overconfidence, loss aversion as independent. The methodology used in this study was chi-square. The finding concluded that there is no significant difference between decision making regarding overconfidence bias of male and female.

San and Phuachan investigated whether loss aversion affects the investment or not...? Questionnaire and non-parametric tests were applied on the employees of Stock exchange of Thailand for this purpose. The results showed that SET's employees mostly use media reports for their decisions on stock trades. It was also discovered that some personal factors like gender, education and investment experience are related to loss aversion. The targeted sample of the study was 260. Non-parametric and Chi square test were used to find out the relationship. And significant relationship was found between them.

Yahyazadehfar and Shams et. al (2012) investigated people who are subject to a Status quo bias (SQB) tend to choose an alternative that they have chosen previously even if that is not a right option for them anymore. The purpose of this study was to investigate Status Quo Bias (SQB) in behavioral finance. SQB in this study was investigated using Ruenzi & Kempf model & Stata 10.0 software package from the companies listed in Tehran Stock Exchange from 2003-2010. The data was collected quarterly from investment companies. They concluded that people who are subject to a

SQB tend to choose an alternative that was chosen previously even if it is not optimal choice anymore.

Shiller (1997) explained that investors place their investments into haphazardly separate mental compartments, and in different ways to the investment based on which compartment they are in. In the study researcher investigated that people of India save money for some specific purpose, like for children education and they borrow money from other people for other needs and desires of their lives like for buy car. Even the interest rate on the borrowed money was higher that the interest rate which they receive on saving for the education purpose of children's. Ultimately this bias of people effect their decision making process.

Thaler (1999) reported that mental accounting was consisted on three components. The first section of mental accounting was how outcomes were experienced and perceived, how decisions were made and evaluation of decisions. The second components of mental accounting assigned the actions to specific accounts. It maintained the way how inflow and outflow of funds was done from each specific activity. The third component was concerned with the rate at which account were evaluated. Investors were can be balanced accounts on a daily, weekly, monthly, or yearly basis. Each component of mental accounting violated the economic principle of balance. Due to the mental accounting the decision of investors were influenced.

Kosnik (2007) investigated the confirmatory bias behavior in tax policy and established effect on aggregate outputs. Primary data was collected from 284 participants through confidential survey in the United State. The Descriptive state and Frequency distribution technique was used to investigate the confirmatory bias behavior within investor's decision making. The study concluded that the confirmatory bias affected the evidence related losses strongly as compared to evidence related gains.

Hypothesis

H1: There is an impact of overconfidence on investor's financial decision making.

H2: There is an influence of illusion of control on investor's financial decision making.

H3: There is an effect of confirmation bias on investment decision making.

H4: Excessive optimism has effect on investor's financial decision making.

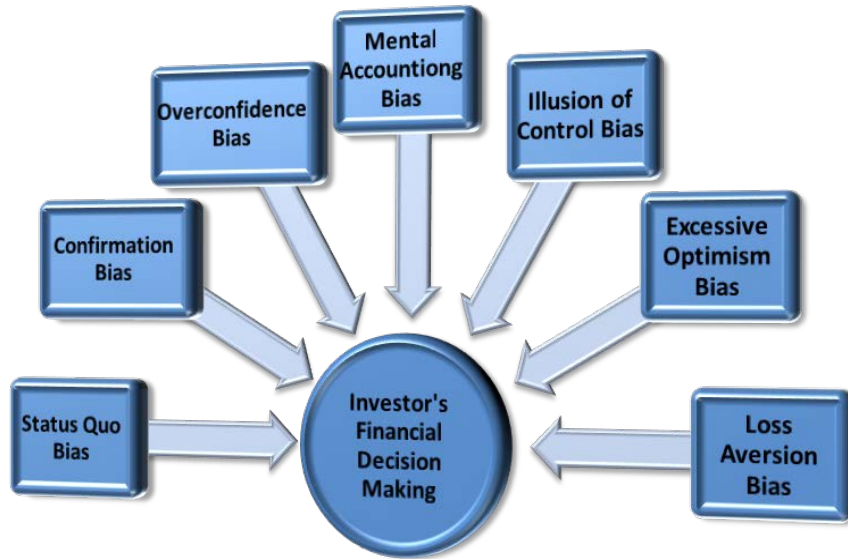
H5: There is an impact of status quo bias on investor's financial decisions.

H6: Loss aversion bias has effect on investor's decision making process.

H7: There is an influence of mental accounting on investment decisions.

H8: Behavioral biases have significant relationship with investor's financial decision making.

Theoretical Framework:



Methodology

The aim of the study is to identify the effect of behavioral biases (overconfidence bias, confirmation bias, mental accounting bias, loss of aversion, illusion of control, and status quo bias) on investor's decision making. In the study primary data was used and collected through questionnaire from sample size of 150 respondents including teachers and students of finance and psychology disciplines and bank managers. 150 questionnaires were distributed, out of which 130 were received back, the rest uncollected.

Questionnaire consists of two sections 1st for demographic variable and 2nd of question related to behavioral factors. Questionnaire consists of 25 questions, 3 question for measuring of each bias. Sample size in the study included 85 male and 45 female, in which 55 respondents were married and 75 were single. Out of 130 respondents, 70 belong to the age group 40-50 and remaining belongs to the age less than 50 years. Educational level of 40 respondents is MBA, 35 from M.Com, 30 Msc in psychology while remaining has education level of Graduation.

SPSS software has been used for data analysis and run the Kolomogrov Simirnov Test for measuring the normality of variables.

Pearson Correlation and Linear regression equation test were implemented to measure the strength and direction of the relationship between investor's decision making and behavioral biases through SPSS 16.

Table 1: Reliability of Data

| # | Behavioral Biases | Cronebach Alpha |
|---|-----------------------|-----------------|
| 1 | Overconfidence Bias | 0.795 |
| 2 | Confirmation Bias | 0.663 |
| 3 | Mental Accounting | 0.771 |
| 4 | Excessive of Optimism | 0.767 |
| 5 | Illusion of Control | .620 |
| 6 | Status Quo | .693 |
| 7 | Loss Aversion | .532 |

Cronbach alpha is used to measure the reliability and validity of data. The results of Table 1 showed that all variable cronbach alpha was greater than 0.5 i.e. overconfidence bias has 0.795, confirmation bias has 0.663, mental accounting has 0.771, excessive optimism has 0.767, illusion of control has 0.620, status quo has 0.693, and loss aversion has 0.532.

Analysis and Results:

The results of table 2 showed that overconfidence and excessive optimism has extremely high positive and significant relationship with investor decision making at 0.01 level with points 0.491 & 0.355 respectively, whereas illusion of control (0.206) and mantle accounting (0.250) good positive significant relation at 0.05 level and confirmation with 0.062, status Quo with 0.69 and Loss aversion with 0.101 has positive relation. It's mean that all behavioral biases has positive and significant relationship with the investor's decision making.

Table 2: Pearson Correlation

| # | Behavioral Biases | Investor's Decision Making |
|---|---------------------|----------------------------|
| 1 | Overconfidence | .491** |
| 2 | Illusion of control | .206* |
| 3 | Confirmation bias | .062 |
| 4 | Excessive optimism | .355** |
| 5 | Status Quo | .69 |
| 6 | Loss Aversion | .101 |
| 7 | Mantle accounting | .250* |

** Correlation is significant at the 0.01 level

*Correlation is significant at 0.05level

Linear Regression Model:

For the analysis of data in the study we used SPSS 16 version and measure the relationship of behavioral biases on decision making of

investors of Pakistan. The impact of behavioral biases on investor's decision is calculated through linear regression model. In the equation Investor's decision making take as dependent variable and denoted by Y and behavioral biases take as independent denoted by X. Following is the linear regression equation

$$Y = \alpha + \beta (\text{Overconfidence}) + \beta (\text{Confirmation Bias}) + \beta (\text{Excessive Optimisms}) + \beta (\text{Mental Accounting}) + \beta (\text{Loss Aversion}) + \beta (\text{Status Quo})$$

Table 3: Model Summary

| Model 1 | R | R Square | Adjusted Square | R | Std. Error of the Estimate |
|---------|-------------------|----------|-----------------|---|----------------------------|
| 1 | .852 ^a | .725 | .708 | | .32800 |

a. Predictors: (Constant), Status quo, Los Aversion, Overconfidence Bias, Illusion of Control, Confirmation Bias, Excessive optimism

The results of Table 3rd show that 72.5% change in the dependent variable is due to independent variable. The variation in the investor's decision making 72.5% is predicted due to behavioral biases (Overconfidence, confirmation bias, excessive optimism, mental accounting, loss aversion, and status quo). 27.5% change in the dependent variable is due to other variables which are not included the study. It is close to 1 so we can say that model is valid for prediction. The model is fit for the prediction of the investor's decision making.

Table 4: Analysis of Variance

| ANOVA ^b | | | | | | |
|---|------------|----------------|----|-------------|--------|-------------------|
| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
| 1 | Regression | 13.035 | 6 | 2.172 | 20.193 | .000 ^a |
| | Residual | 10.005 | 93 | .108 | | |
| | Total | 23.040 | 99 | | | |
| a. Predictors: (Constant), Status Quo, Loss Aversion, Overconfidence Bias, Illusion of Control, Confirmation Bias, Excessive optimism | | | | | | |
| b. Dependent Variable: Decision Making | | | | | | |

The 4th table of analysis of variance it shows that model is fit because the P-value is less than α . it means that all independent variables have impact on dependent variable.

Table 5: Coefficient Coefficients^a

| Model | | Unstandardized Coefficients | | Standardized Coefficients | T | Sig. |
|--|---------------------|-----------------------------|------------|---------------------------|--------|------|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | .150 | .206 | | .726 | .470 |
| | Overconfidence | .148 | .033 | .335 | 4.434 | .000 |
| | Illusion of control | .060 | .027 | .162 | 2.245 | .027 |
| | Confirmation | .099 | .029 | .255 | 3.367 | .001 |
| | Loss aversion | .050 | .035 | .110 | 1.446 | .152 |
| | Excessive optimism | .189 | .049 | .329 | 3.854 | .000 |
| | Status Quo | -.054 | .032 | -.118 | -1.697 | .093 |
| | Mental accounting | -.060 | .074 | -.059 | -.809 | .420 |
| a. Dependent Variable: Decision Making | | | | | | |

Findings of table 5 it shows that all independent variables play significant role in the change of investor's decision making. β is the rate of change in investor decision due to the change of 0.114, 0.57, 0.102, 0.53, 0.181, -0.52, and -0.60 in independent variable. On the basis of given data excessive optimism has more influence on the investor decisions and has positive relation the results showed that loss aversion, mantel accounting and status quo has no effect on investors decisions because P-value greater then α so 5th, 6th, and 7th hypothesis are rejected . And overconfidence, illusion of control, confirmation bias, and excessive optimism has impact on investor decision because their P-value less than α value so 1st, 2nd, 3rd, and 4th hypothesis are accepted.

Findings

The result of the Pearson correlation showed that there is a positive and significant relationship between behavioral biases and investor decision making. Overconfidence and excessive optimism have more affected the investor's decision making as compared to the mantle accounting, loss aversion, and status quo, illusion of control and confirmation biases. The finding of this study showed that there is a significant relation and impact of overconfidence, illusion of control, confirmation biases and excessive optimism on investor decision making and there is a significant relation of status quo, loss aversion and mantle accounting but having no impact on investor decision making. The finding of the study showed that hypothesis 1st, 2nd, 3rd, 4th and 8th are accepted, overconfidence, illusion of control, confirmation bias and excessive optimism has impact on investor's financial

decision making. All behavioral biases have significant relationship with investor's financial decisions.

Conclusion:

The study aimed to investigate the impact of behavioral biases on investor's financial decision making. The study concluded that confirmation bias, overconfidence bias, excessive optimism and illusion of control have impact on investor's financial decisions. And status quo, mental accounting and loss aversion has no effect on it according to given data. The previous literature support the findings of the study like studies of Bogan & Just (2008) findings showed that confirmation bias has impact on financial decisions of investors. Park and Konana et.al (2007) and Kosnik (2007) investigated that overconfidence influenced investor's decision making and excessive optimism also effect investor's decisions examined by Seppala (2009), and Poluch (2011).

It has been observed that Pakistani people mostly don't give their own opinion; they neither utilize the available resources nor the all information. The rigidity of believes found in Pakistan's people, they make their decisions following other's views instead of their own.

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