

Anchoring Heuristic, Disposition Effect and Overconfidence Bias in Investors: A Case of Pakistan Stock Exchange

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Abstract

Investors are thought of as rational individuals, who carefully take all economic decisions every time. But irregularities were noticed in the behavior of investors when economy of the world was shaken by the Financial Crisis of 2008 that started off in the USA and resulted in global recession. The news of international financial crisis affects investment strategies and help to estimate the shock absorbing abilities of capital market. Investors use heuristics in their financial decisions whenever they are faced with uncertain situation. For this study we have collected data of ten years (2005-2014) of 229 companies listed in all sectors of Pakistan stock exchange to find out the impact of behavioral heuristics on investment decisions of Pakistani investors. We have used Logit regression to find the relationship between disposition effect, anchoring heuristic and overconfidence bias of investors in Pakistani stock market. We have found that disposition effect and anchoring heuristic is used by Pakistani investors in their financial decision making and it helps them to generate positive returns. Overconfidence has negative but significant effect on investment returns for the investors.

Keywords: Heuristics, anchoring, overconfidence, disposition effect, EMH, Logit regression

Financial markets are analyzed by using different models which shows investors as rational being. Many different traditional financial theories with application have existed and been modified over the past few years. Most important of these theories are Efficient Market Hypothesis (EMH) and Capital Asset Pricing Model (CAPM). Efficient market hypothesis was introduced by Eugene Fama. He was of the view that stocks are traded at fair value and investors cannot purchase or sell shares at low or high prices. It is not possible to beat the market by vigilantly selecting stocks or timings of the markets and getting high returns by investing in riskier stocks (Fama, 1965).

The CAPM was developed by Treynor (1961), Sharpe (1964) and Lintner (1965) and it was based on the work of Markowitz (1959) and modern portfolio theory. It built the foundation of modern finance which focus on risk-free borrowing, lending and rational decision-making. CAPM model is applied to find out suitable required rate of return of an investment in finance. That asset is added to diversified portfolio and that asset is riskier one. This model determines the asset's sensitivity to systematic risk which is denoted by beta (β) in the financial

industry. It also considers the expected return for risk free asset and market (Markowitz, 1952).

For a long period of time theory and observations showed that CAPM, EMH and other financial theories did a great job of forecasting and explaining specific situations. With the passage of time, academicians in the field of finance and economics started to explore anomalies and behaviors that were unexplainable by the present theories. These theories could explain specific situations but the real world was very different and disorganized place in which the behavior of the market participants was random. The financial crisis of 2008 has given numerous financial specialists enormous loss as a consequence of applying and using these two theories in their investment. EMH and CAMP models are theoretically strong models but empirically these models were challenged by supporter of behavioral finance like Warren Buffet (1984) and other researchers like Amos Tversky and Daniel Kahneman, (1974), Richard Thaler (2015) and Paul Slovic et al., (2002). Behavioral finance focuses on the psychology of investors and its impact on their financial decision making (Statman, 2014). It says that humans make irrational decisions in the financial markets and are affected by emotions like overconfidence, herding, anchoring, mental accounting, loss aversion etc. Cognitive biases and heuristics play an important role in the decision making process of individuals. Cognitive biases and emotions can lead people and investors into bad investment decisions. These biases occur because of different processes that are hard to differentiate at times. These include quick way of information analysis and problem solving (heuristics), mental noise, and the mind's limited information processing capacity, emotional and moral motivations, and social influence (Tversky & Kahneman, 1974).

Problem Statement

Pakistani investors are short term investors because of political and economic condition of the country. They also have financial knowledge about utilization of their money. They do not want to take risk by putting their money in long term ventures and investments. There is another important point to mention is that Pakistani stock market is developing market and its information system is not strong. Information and data is not easy to obtain. This also makes harder for investors to do estimation on the basis of data available. They do not have proper understanding of financial instruments (Rasheed & Arshad, 2009). All these above mentioned factors make it important to study the efficiency of Pakistani capital market and decision making patterns of its investors. We need to know whether the Pakistani capital markets are efficient and investors are rational or not. How much these factors are affecting their financial outcome and investment performance.

Research Gaps

In our previous research work (Parveen et al, 2016), we used disposition effect and overconfidence to find out the decision making patterns of Pakistani investors in capital markets of Pakistan. Our findings did support the impact of these two biases on the decision making of investors of Pakistan. In this study, we have introduced another variable that is “*anchoring effect*” to find out the impact of these three variables on the investment decisions of investors of Pakistan stock exchange.

Anchoring effect is also called anchoring heuristic which is used by the investors in their decision making under uncertainty. It is defined as a propensity to make decisions by using a reference point which has no logical connection to the decisions. Investors use unrelated facts and figures for investment decisions (Tversky & Kahneman, 1974). We see that some investors invest in the companies with stocks falling in prices. This fall in price is short term but investor think that after reaching to the high price, the stock will fall and they will be able to purchase the stock at low prices than before. Investors are anchoring on the current high prices. This practice causes them loss on their investment as this condition does not last long (Northcraft & Neale, 1987). This is the reason that we have focused on anchoring heuristic, disposition effect and overconfidence bias and their impact on investment decisions in this study. These are human emotions and these have significant impact on the decision making of individuals (Sloman, 2002).

Our study has helped to fulfil gaps in literature on anchoring, disposition effect and overconfidence with reference to Pakistan. The first research gap is this that anchoring factor with disposition effect and overconfidence and their impact on investment decisions has not been investigated before in Pakistan according to Author’s knowledge. It is important to see the contribution of this behavioral heuristic whether it is positive or negative. Heuristics are important to study specially anchoring as these can play an important role in spurring the overconfidence (Kahneman & Tversky, 1982). Heuristics are important to consider as they affect individuals and generate overconfidence and optimism. According to Benartzi and Thaler (1995) it shows that estimation can be made on the basis of external reference point (anchoring). Result or outcomes of such estimations are judged on the basis of gains or losses depending upon whether you have set higher or lower reference point than before. Investors are effect by anchoring and they are more prone to under-react or over-react to the new information. They trade on the basis of new information in the market. Overtrading leads to the disposition effect and investors sell the winner stocks quickly and keep the losers with them (Mussweiler et al, 2000). Investors who are risk taker are more likely to sell the stock that has increased in value since purchase. Zuchel and Weber (2001) found that more risky activities result in loss that conforms to the disposition effect. Researcher (Odean,

1999; and Barber & Odean, 2000) who were trying to measure overconfidence, found the disposition effect with it. Overconfident investors carry riskier portfolios than rational investors Odean (1998). Overconfidence leads the disposition effect (Barber & Odean, 2005) and overconfidence is generated through heuristics (Chitra & Jayashree, 2014).

It is therefore important to include anchoring heuristic in the study as it predominates overconfidence and overconfidence leads to disposition effect. Combining anchoring with overconfidence and disposition effect will give more accurate and reliable results. It will give a broader perspective to the investors for financial decision making. Researchers have explored individual impact of overconfidence, disposition effect and anchoring effect on investment decisions. We have incorporated all these three linked variables in a single study to give more accurate information and output for investors. So this study will contribute to the body of knowledge with respect to these factors especially in case of Pakistan.

The second research gap is this that previous researchers (Sarwar & Afaf, 2016; Ishfaq & Anjum, 2015; Asif et al, 2015) have applied only primary data to find out the impact of cognitive biases on investment decisions. We have also operationalized the qualitative variables into quantitative variables for the first time. The estimation model and technique applied in this research is also used first time in case of Pakistan. The estimation model applied by our research provides more accurate results in estimation of anchoring heuristic, disposition effect and overconfidence as it is based on secondary data and personal biases have been removed. So this will also contribute to the body of knowledge. This research study has also methodological implication.

Significance of the Research

This study has its importance for individual investors as well as a contribution to literature. We know that human biases affect their financial decisions and they play a strong role in future financial outcome of the investors (Baker & Nofsinger, 2010). In Pakistan most of investors are not educated and they are financially illiterate. They do not know how to make investment strategies for themselves and how to get maximum profit from their investment. They are dependent on the advice of financial experts in the capital market. They sometimes follow their social group when they make decisions about money and investment. They also display herd behavior which leads them to follow what everybody else is following. They do not compare their financial condition, environment, situation and timing of investment with other investors. They blindly try what other investors are doing. It causes the loss of investment and earns negative returns. They sometime go for the companies whose shares are rising in prices with the hope that they will earn good amount of profit in future from these shares. They do not make

estimates by using technical and fundamental analysis (Butt et al., 2011). This research will be useful to explain and understand the influence of anchoring heuristic, disposition effect and overconfidence on the financial decision making of investor not only in the capital markets of Pakistan but also around the world as these variables have not been studied together with this methodology and this much huge data to the best of our knowledge. It will also help investors in their financial decision making and policy makers to design policies regarding stopping of insider trading, availability of information and efficiency of the markets.

Literature Review

Behavioral psychology has provided different approaches to stock market that are promising choices to EMH and it challenges EMH and existence of CAPM models. It says that people are not rational decision makers. Their decisions are affected by their behavior and biases and lead to poor performance. Decisions are based on emotions, feelings and sixth sense and do not follow systematic pattern. Traditional financial economics focuses on utility maximization and rationality of the individuals (Masomi & Ghayekhloo, 2011). Daniel Kahneman found that investors can beat the market and earn good returns by using heuristics. Investors are not rational and markets are not perfectly efficient. Supporters of EMH say that behavioral finance has strengthened the case of EMH by introducing biases on individual level and not in competitive market. For example diversification and hedging strategies lessens the possible mispricing from loss aversion of investors. But behavioral economists like Richard Thaler has found herd behavior in his study on cognitive biases based on funds management. This herd behavior was seen in global financial crisis of 2008. According to Shefrin (2002), the irregularities present in behavior of investors and decision making have taken us to re-examination of the efficient markets hypothesis and market efficiency concept.

Masomi and Ghayekhloo (2011) explored the impact of behavioral factors on the investment decision making of investors in Tehran stock exchange. They also explored the cost of human behavior on the result of investment. The sample size was 23 institutional investors. The behavioral factors included in the study were representativeness, *overconfidence*, *anchoring*, gambler's fallacy, loss aversion, regret aversion and mental accounting. The results of this study showed that behavioral factors do manipulate the decision making of investors. It was also found that heuristics like *anchoring* and gamblers' fallacy were strongly controlling the behavior of institutional investors trading in Tehran stock exchange.

The study of Qureshi and Hunjra (2012) explained that *Overconfidence*, representativeness, Gambler's fallacy, availability bias, and *anchoring heuristic* are the elements that effect the decision making

of investors. Waweru et al. (2008) conduct a study to check the impact of behavioral factors and psychology of investor in decision making in investment. The sample size of the study was 23 institutional investors operating in Nairobi Stock Exchange. They conclude in the study that decision making of the institutional investors was affected by behavioral factors like representativeness heuristic, *anchoring heuristics*, *overconfidence*, loss aversion, availability bias, regret aversion, gambler's fallacy, and mental accounting. Restricted time and information may be viable clarification for employing a heuristic choice procedure. However, use of heuristics might bring about poor choices (Kahneman & Tversky, 1979).

People start with a certain value which they know under uncertainty and they change their decisions accordingly. It is called *anchoring effect or heuristic*. Tversky and Kahneman (1974) explained anchoring as a situation where people estimate the future by focusing on the basic value which they know and gradually adjust it to get final result. Sometimes these adjustments are insufficient and give different stating points with different results and these are biased in relation to basic value. They additionally extended that in *anchoring effect* unrelated information is used as a reference for the estimation of some unknown value.

Anchoring effect or heuristic can be viewed as the investors depends on past experience, past prices, pay no attention to recent information, prices are fixed before buying or selling stock and being in search of suitable time to buy/sell stock, leaded by the moods. Different components are seen as influencers of anchoring. There is an extensive variety of literature found that has connected sad or discouraged moods with more broad and precise assessments of issue (Bodenhausen et al. 2000). As an aftereffect of this, prior research theorized that individuals with more discouraged state of mind would be apt anchoring less as compared to those with pleasant state of minds. Anyhow, later researchers have demonstrated different effect: depressed individuals will probably exercise anchoring effect than individuals with pleasant and impartial mood (Englich & Soder, 2009).

Luppe and Favero (2012) in their study about *anchoring heuristic* and estimation of financial indicator found that most of the work is explaining positive accounting in Brazil and overlook the aspects that show impact of a certain set of variables on the behavior of the investors. The results showed the existence of anchoring bias in the estimation of this indicator. Investors are also affected by disposition factor. The *disposition effect* is defined as the propensity to trade those stocks the prices of which is increasing and keeping the ones with decreasing prices in the market. First one is called winner and latter is called losers. Two points of prospect theory explained the *disposition effects* as the concept that for investors' gains and losses has great significance. Investors compare gains and losses with some benchmark.

This is called reference point. It is the opening price of the stocks in the market. They also avoid losses and try to earn gains whenever it is possible for them. They avoid risk. An experimental study was conducted by Weber and Camerer (1998) to find out the *disposition effect* in the decision making of the individuals. Individuals who were part of the study sold stocks into 6 risky categories of assets. Changes in the prices of assets were observed which change every time. These individuals sold the stocks with high prices and keep the stocks with decreasing prices. These results were opposite to Bayesian optimization concept. The disposition effect was decreased by selling shares constantly after each period.

Ngoc (2014) found in a study the investors in the stock market and their behaviors in different situations. The focus of this study was individual investors of Vietnam's securities companies. Herding behavior, *disposition effect*, *overconfidence*, *anchoring heuristic* and gambler's fallacy were prominent in the decision making of investors of Vietnam. Kudryavtsev et al. (2012) conducted a research on behavioral biases. These biases include *disposition effect*, herding, availability bias, hot hand and gambler's fallacy. It was found that male investors were more affected by these biases. Tehrani and Gharehkooolchian (2012) conducted a study on the *disposition effect and overconfidence* and their impact on financial decisions. The results of the study showed that there is no relationship between disposition effect, overconfidence and mental accounting. Level of education was also negatively related to disposition effect. On the basis of this literature we have proposed following hypothesis:

H1= Overconfidence heuristic has negative impact on decision making of investors in Pakistan stock exchange listed companies

H2= Disposition effect has positive impact on decision making of investors in Pakistan stock exchange listed companies.

H3= Anchoring heuristic has positive impact on decision making of investors in Pakistan stock exchange listed companies.

Research Methodology

We have collected the data of all listed companies at Pakistan stock exchange. Time period for this study is 2005-2014. We have taken end of day daily prices data and market capitalization of the listed companies at Karachi stock exchange. There are total 577 companies registered with Karachi stock exchange and out of which 458 companies were registered before or on year 2005. Out of these 458 companies we have chosen 229 companies with complete data. This data has shown variability in different years. We have dropped other companies with incomplete data or with zero or less variation. The reason for this is that we want to see the increase and decrease in investment cause by changes in returns. So sample size for this study was 229 companies from all sectors listed with Pakistan stock exchange. The sources of data

collection are business recorder website, Karachi stock exchange and yahoo finance.

Method for statistical analysis was Logistic regression which is a binary dependent variable model. It is advance statistical model of Maximum Likelihood and it is also called Logit model for non-linear data. Binary Dependent Variable Models have been used in this study. This equation is for one independent variable and for more than one predictor, we can write this model as:

$$L_i = \ln \left(\frac{P_i}{1 - P_i} \right) = \beta_1 + \beta_2 X_i + u_i \dots\dots\dots$$

(Gujarati, 2004, p.597)

In above equations $P_i/(1 - P_i)$ is the odds ratio and \ln is the natural the log of the likelihood ratio. From the estimation point of view it is linear for X as well as linear in parameters. L stands for **logit** and consequently the name of the model is **logit model**. For this model, we have computed dummy variables for disposition effect and investment decisions. For this study, the Logistic regression model is as follows:

$$L_i = \ln \left(\frac{P_i}{1 - P_i} \right) = \beta_1 + \beta_2(ovrcnf) + \beta_3(dispa) + \beta_4(anchr) + \mu_i$$

L_i =If L, the logit, is positive, it means that when the value of the regressor (s) increases, the odds that the regressand equals 1 (meaning some event of interest happens) increases and vice versa.

β_1 = intercept

β_2 = the slope, measures the change in L for a unit change in X_2

β_3 = the slope, measures the change in L for a unit change in X_3

β_4 = the slope, measures the change in L for a unit change in X_4

$\frac{P_i}{1 - P_i}$ = refers to investment decisions

Where (P_i is current price, $1 - P_i$ is previous price)

Ln= natural logarithm

Ovrcnf(X_2) = refers to Overconfidence

Dispa(X_3)= refers to Disposition effect

Anchr(X_4) = refers to anchoring heuristic

μ_i = Residual term

Our dependent variable is investment decisions and independent variables are anchoring heuristics, disposition effect and overconfidence.

Anchoring heuristics is defined as a propensity to make decisions by using a reference point which has no logical connection to the decisions. Investors use unrelated facts and figures for investment decisions. We see that some investors invest in the companies with stocks falling in prices. This fall in price is short term but investor think that after reaching to the high price, the stock will fall and they will be able to purchase the stock at low prices than before. Investors are anchoring on the current high prices. It is measured by focus of investor on popular stocks and seasonal price cycles while making purchase or sell decisions. For calculation of **anchoring heuristic**, we have

calculated the highest return in the week time for all five days. Using this value as reference, we have calculated the series by using the following formula:

$$\frac{R_i}{R_{highest}} \text{ where } i = 1,2,3,4,5(\text{days return})$$

Each day’s return will be divided by the highest return.

Overconfidence is a tendency to overestimate one’s understanding, abilities and the accuracy of one’s information. It is measured by self-confidence, market knowledge and risk attitude of investor. For calculation of **overconfidence** GARCH (1,1) variance series is used to determine the overconfidence. After calculating the series we have taken the square root of it to get a better picture of the variations. If the investment is increasing despite the increase in sigma σ that clearly indicate the overconfidence of the investors. Calculation of data of both market and individual securities is included in it.

Disposition effect is defined as inclination of the investors to sell the share whose prices are increasing and holding the shares whose prices are decreasing. It is measured by selling and purchasing of shares by investor with changes in their market price and a lack of awareness about the basics of stocks investment. For the calculation of **disposition effect**, change in price has been calculated i.e $\frac{p_2 - p_1}{p_1}$. After this we have applied dummy variables to it. Positive change is equal to 1 and negative change is equal to zero where 1 indicates investors’ disposition to sell and zero to represent retain or buy.

Investment decisions are related to put your money in stocks or bonds to earn return on them. It is measured by profit or loss earned by investor in stock market. For the calculation of **investment decisions**, we have used market capitalization data. We have taken differential log of change in market capitalization data where $D=1$ where differential log is positive and zero otherwise. For differential log of change in market capitalization= $dln(\frac{mc_2}{mc_1})$.

Data Analysis

After applying the Logit model to the data, we got following results for all listed sectors sector:

Table 1. Behavioral heuristics and investment decisions

Dependent Variable: INSTD
 Method: ML - Binary Logit (Quadratic hill climbing)
 Sample: 1 562831
 Included observations: 562831

Variable	Coefficient	Std. Error	z-Statistic	Prob.
ANCHR	3.008102	0.270355	11.12651	0.0000
DISPA	10.82100	0.042691	253.4732	0.0000
OVRCNF	-0.002501	0.000883	-2.832317	0.0046

C	-7.645658	0.261617	-29.22457	0.0000
McFadden R-squared	0.957235	Mean dependent var		0.620254
S.D. dependent var	0.485324	S.E. of regression		0.067666
Akaike info criterion	0.056801	Sum squared resid		2577.000
Schwarz criterion	0.056881	Log likelihood		-15980.67
Hannan-Quinn criter.	0.056823	Deviance		31961.34
Restr. Deviance	747371.8	Restr. log likelihood		-373685.9
LR statistic	715410.5	Avg. log likelihood		-0.028393
Prob(LR statistic)	0.000000			

All independent variables have significant effect on investment decisions at less than 5% level of significance. We can see here that all heuristics are significantly affecting investment decisions. “ANCHR” and “DISPA” are highly statistically significant and positively affecting the decision process of investors in Pakistan. This shows that there is a probability that increase in “ANCHR” (anchoring heuristic) will increase profits in investment and financial decisions will bring positive results. Use of anchoring heuristic will affect the returns and gains on investments. “DISPA” has positive value and is highly significant at less than 5% level of significance. This is indicating that there is probability that positive increase in disposition effect will increase the value of investment and returns for investors. If investors use this effect then their chances of getting good returns will increase. The “OVR CNF” (overconfidence) has negative value of coefficient that is significant at less than 5% level of significance. This tells us that there is a chance that when investors will be overconfident in making their investment decisions then they will lose money and returns. So overconfidence has negative impact on returns for investors. It generates risk taking attitude for investors when they are overconfident about any situation in the market. They also believe that they have complete information about the securities market. They think that their analysis and information is reliable and this leads them into taking risk on their investments. So from our findings we can also conclude this fact that overconfidence can lead investors to negative returns.

When analyzing data with a logistic regression, an equivalent statistic to R-squared does not exist. The model estimates from a logistic regression are maximum likelihood estimates arrived at through an iterative process. They are not calculated to reduce variance, so the OLS approach to goodness-of-fit does not apply. However, to evaluate the goodness-of-fit of logistic models, several pseudo R-squared have been developed. These are "pseudo" R-squared because they look like R-squared in the sense that they are on a similar scale, ranging from 0 to 1 (though some pseudo R-squared never achieve 0 or 1) with higher values indicating better model fit. McFadden R-squared has value of 95% and it shows soundness of our estimated model. So our dependent variables are causing 95% variation to dependent variable.

Akaike's Information Criterion (AIC) is defined as an index used to estimate the quality of each model, relative to each of the other models and provides a means for model selection. The preferred model is the one with the minimum AIC value. In our case value of AIC is **0.056801** and it shows that our model is preferred one and it has statistical goodness of fit. The Schwarz Criterion (SC) is a measure to help in the selection between different models. Using this criterion, the best model is the one with the lowest SC. In our case its value is **0.056881** which is less and again it shows fitness of our estimated model. The Hannan–Quinn information criterion (HQC) is also criterion for model selection. Again lowest value of HQC indicates best model. In our case the value of HQC is **0.056823** and it is showing the reliability of our model. In our study we have value of LR statistic which is highly significant at less than 5% level of significance. So we can say this that we accept the alternative hypotheses that behavioral heuristics affect investment decisions of investors in capital markets of Pakistan. In Pakistani capital markets investors are irrational and they use heuristics in their investment decisions. This also leads us to the conclusion that Efficient Market Hypothesis does not exist in Pakistani capital markets in their full form. Pakistani financial markets are not efficient. Investors do not have complete information and knowledge of market and its changes. Here is summary of all hypotheses:

Table 2. Summary of Hypotheses

Hypothesis	Impact	McFadden R ²	Coefficients	P-value	Hypothesis supported
H1	Ovrcnf –ve on decision making	0.957235	-0.002501	0.0046	Yes
H2	Dispa +ve on decision making	0.957235	10.82100	0.0000	Yes
H3	Anchr +ve on decision making	0.957235	3.008102	0.0000	Yes

Note. *p < 0.05. Overconfidence bias(overcnf), Disposition effect (dispa), Anchoring heuristic (anchr)

Discussion

Karachi stock exchange was declared the best performing emerging market in 1990 but still it is considered a thin market. It is a volatile market and help to raise funds but on limited basis. This market has seen ups and downs from year 2000 onwards. The main causes of this could be poor distribution of information among investors, lack of support from authorities and lack of observance of rules and regulations of trading. Insider trading is high in KSE and this causes volatility in stock prices. Stock market members are given importance for their role

as market makers. Foreign investors cannot invest without their approval of the government and regulations are not strictly followed. There are restriction on movement of foreign exchange, low liquidity, less trading and limited use of technology have created hurdles in development of this market (Mustafa, 2008).

As we have witnessed that in Pakistani stock market, investors are affected by heuristics and other biases in their investment decisions. They are more focusing on disposition effect for gaining returns on their investment. All proposed models have been converged after 7 to 9 iterations which show the statistical significance of proposed model. All models have high LR ratio and R^2_{MAC} values. Other heuristics have also shown their contribution towards determination of investment decisions. Overconfidence has less contribution towards response variable in KSE listed sectors. This shows that investors are not risk takers in this market. Anchoring has small effect on investment decisions in Pakistani market. But investors can rely on high weekly returns to decide about buying and selling of shares. Representative heuristic has also shown contribution towards investment decision determination. Investors in this market can rely on past performance of a company, its share prices, news and returns for making profitable use of their money. We have tested all variables form different perspective and got the idea of investors' interests in Pakistani market. They want to gain quick returns and focus on short term profits. They are risk takers but their numbers are less in the whole market as results suggested. They rely on historical prices, P/E ratios, market capitalization ratio, returns to make their decisions related to purchasing and selling of shares.

EMH and CAPM theories assume that investors are rational and they act rationally in the market. But we can see that in case of Pakistani stock market, investors have chances to earn high returns than other investors by using these heuristics and biases in their decisions making, which mostly they use. According to CAPM, investors can generate more returns by taking more risks. Investors are not rational in stock market of Pakistan and they heavily rely on their intuitions, estimations and historical data for stock buying and selling. In this market, investors want to generate high and quick returns. They mostly focus on short term returns. All sectors in KSE market have shown the presence of these heuristics and biases in investors' decisions. We have also witnessed that investors cannot take risks in every sector to generate income. Risk has some contribution in generating gains from investment but this percentage is not that much high to consider in all sectors listed at KSE. Investors do not behave rationally always as we have seen in case of stock market crisis in Pakistan of 2008-09. In that uncertain situation, they invested more so the prices were increased in the market. So we can say that basic assumptions of EMH are not applied in this market. Irshad and Sarwar (2013), Naz et al., (2014), Sultan et al., (2013), Haque et al., (2011) and Anwar et al., (2013) have conducted the studies on the

efficiency of Karachi stock exchange and found that this market is not efficient and investors are not informed investors. Information is not available to all investors at the same time. So our study has confirmed that investors of Pakistan use behavioral heuristics to get more profits and take experts advice for investment in different sectors.

Future Research Directions

In future market anomalies can be included to see the impact on investment decisions of investors in Pakistani stock markets. Other cognitive biases can also be used to determine investment decisions.

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