

Investor's Behavior Biases and Stock Risk Return Relationship



BY

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Abstract

The previous literature suggests that like all emerging markets Pakistani market is inefficient. The Capital asset pricing model does not explain the stock risk-return behavior and there is need to add more attributes in addition to market return to explain risk return relationship of stocks. This study attempt to analyze whether by including the investors behavior overconfidence and risk aversion effect in to the CAPM model, the explanatory power of the model is increased in case of Karachi stock exchange. Sometime investors overestimate the reliability and accuracy of their private information and give it too much weight to it that exhibit the overconfidence effect. The overconfident investors avoid the regret and sense of guilt that's why they hold the losses and turnover is used as proxy for overconfidence. Another behavioral bias used in this study is disposition behavior in which investor's retain losing stocks and sell winning stocks too early in order to avoid loss. This behavior so far relates to loss aversion behavior. To find the effects of disposition behavior, sortino ratio and Sharpe ratio method are used. Sortino ratio is used to capture the downside risk of investors which is sometime neglected while assessing the level of risk. From the results of observing overconfidence behavior it is shown that there is positive association between returns and turnover and disposition behavior shows that intercept turns out to be insignificant and mispricing is also captured which is not done by CAPM. Thus this behavior bias also has positive effect on expected return. The results lead to main implication, first; resetting on evidences of loss aversion, disposition and overconfidence we find a method for improving investor's decision making. Second this study identifies specific behaviors biases in that explain the stock return. Third the behavioral biases must be considered while making investment decisions.

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DECLARATION

I declare that this research work is my own effort, the material is properly identified and source of information is reliable, referenced completely and it is acknowledged according to the guideline which is provided to do this research work.

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Chapter 1

Introduction

Background:

With the passage of time, financial market has become broadened, of electronic networks, floor of exchange and new stock pools, derivatives and bonds. There are many theories which have brought in this field. Stock exchange is the important component of stock market. at first the stock to get high returns were less such beta, supply and demand effect in free market and investor's more focus was on these either to invest in particular market or not to get high return. In recent years the benchmark has change with the arrival of different other trading system. Now the pool has become fast so that different companies are facilitated to raise their capital by selling share.

This study is an attempt to resolve the problem, associated with decision making of investors in stock market. It provides evidences which show the best possible solution for investors and also highlight two behavioral biases i.e. overconfidence and disposition effect that affect the changing decision making of investors.

The investors with different views such as heterogeneous investors have rational expectations and a Poor empirical support for representative agent model is purposed. Investors may be heterogeneous in their personality traits and in their views and also with respect to their investment opportunities or the information with which they are dealing in stock market. When we observe the complete market structure and homogenous investors under traditional asset pricing models, we find that trading volume does not provide any significant information about prices.

Traditional finance assumes that when mean variance analysis is done to define the risk and return most of the time investors become rational and will keep behaving rationally. But it is also important to understand that with varying psychological challenges how and why investors behave irrationally? The standard deviation is considered as a risk measure and when we analyze the investment, an average investor

might not know the meaning of standard deviation as a risk measure. Rather, he relies on his past investment experience and involves him in cost benefit analysis. This is the investor's overconfident behavior which does not lead to calculated and logical investment decisions most of the time. Such decisions reflect that investors have tendency to meet their investment objectives in the possible way which is easy to do.

The following discussion explores how many behavioral biases affect the investors' decision making process. These assumptions include expectations regarding risk and returns, a time horizon for investment and clear frictionless access to information. It is also assumed that investors have different personality, taste, emotions, feelings and assessment of investments which leads them to the irrationality zone of decision making.

The fundamentals of firm use to check the stock prices and other fundamental changes in market which shows the stock market efficiency than the stock prices are re-adjusted immediately to capture these fundamental changes. Another important thing which is focused in traditional finance is that the announcement of any firm specific news (whether good or bad) gets reflected in the stock prices instantly. Sometimes the financial performance measures back the market movement and announcements. This situation is different in other cases like investor's different opinion and different way of judgment regarding the market given information. In this way market efficiency become debatable.

The behavioral bias element in the investor's decision making process has given a key to different researches to evaluate the reason behind different styles of decision making in different investors which thing motivates them to trade in particular security or stocks and what is their post investment sentiment regarding their future investment. This field is gaining immense popularity among practitioners. The amalgamation of these behavioral approaches to understand market behavior will eventually lead to higher levels of market efficiency and correct decision making.

Financial analysts overlook the hidden factors which are need to be analyzed like personality traits (investor's aptitude, tastes, sentiments) and blame the theories and selected models when something goes terribly wrong. But reality is different as these factors influence the investor's final decision to invest in particular stock. This study will help practitioners, researchers, investors, portfolio managers in incorporating and studying the behavioral aspects in investment strategies to better capture the entry or exit points for an investment. It will also help financial analysts to evaluate the investors' psychological patterns how it is varied while developing financial models.

Broad Problem Area:

There has been little focus on the impacts of investor's information and experience on his decision making. To get the positive alpha is the target of a successful investor. For this he could adopt the successful market strategies. The focus of investors is to capture positive relation between risk and return and also to observe the behavioral biases effect on the decision making of investors. For this reason whether he should go for personal information gathering way or depend on market strategy?

Another important consideration is that either the investors is risk taker or risk averter. What is the duration of investment and in securities it is observed that short term securities are more risky as compared to long term. From the past year, the stock market investments have been important subjective. With the different studies it is understood that the stock market is mean variance inefficient. That's why the choice and perfect way for an investor to choose is not to track the broader market index to generate positive returns. As stated by Fama & French (1992) this bias behavior not only adds unique risk to portfolio but at the same time increase the probability to beat the market. Some intuitive decisions are most of the time accompanied by strong behavioral bias (Kahneman and Tversky). That's why many of the investors usually make irrational decision. The overconfidence bias is associated with self-esteem, ambition and success (Johnson, 2011). Thus shown that the irrationality in the decision making is due to

behavioral and cognitive biases vary in human being.

Research objectives:

The basic purpose of this study is to show that if the market return better explains the expected stock return as described by CAPM. Other part of this study will evaluate the impact of behavioral bias overconfidence and disposition which affects the decision making. Keep in view the whole study. The following objectives can be stated.

- Whether investor's behavior biases have some role to explain the risk and return relation.
- To understand the behavior bias i.e. overconfidence can positively or negatively affect the risk-return relationship and decision of investors.
- To show the behavior bias i.e. disposition and loss aversion effect can positively or negatively affect the risk-return relationship and decision making of investors.

Research questions:

- Do the behavioral biases have any specific role to explain the risk-return relation?
- What are the effects of behavioral bias overconfidence and disposition on stock market investor's decision?
- What are the effects of overconfidence bias on the risk-return relationship?
- What are the effects of disposition bias on risk-return relationship?

Significance of study:

As now, there is little work done on specific biases which influence the investor's behavior in KSE. This study will provide information about different behavior of people belonging to different group, age, preferences and financial sectors. The data is collected from the 50 enlisted companies of KSE. What are multiple biases that are revealed & two specific biases which strongly affect the decision making. Furthermore,

it will help in understanding whether the most active and experienced investors can make perfect decision making & can generate high return or the other who just rely on market given information. It will also act as a reference material and guideline for further research.

Another thing which this study makes addition to is the specific behaviors targeted from large number of behaviors biases. There are two biased discussed here. First is overconfidence bias which affects positively the amount of returns.

Another bias is disposition bias, same as the first bias is discussed this bias also show different results in different investors even when the characters and the qualities of such behaviors are same, still their impact varies because every person have different nature at some extent their decision match with each other when they take situation or any information in the same manner. As in disposition we will discuss afterward that how this behavior is important to take into consideration.

Thus the study is important because of market issues in economic growth of country which is the basic of success of a country.

Delimitation of study:

The attempt of this study is to increase incremental returns of investment by good decision making in stock market. Other studies conducted which used Fama & French three factor model. This model use CAPM model by simply applying OLS technique and data is targeted from 50 companies of KSE. There are many other characteristics like behavioral biases which are large in number are targeted and their effect on the risk-return relation is discussed in this study. The limitation of this study is that it focuses on two specific biases overconfidence & loss aversion effect. There are large numbers of behavioral biases present that affect the decision making of investors. Further studies explore the effect of other biases on decision making.

This study is using past historical data from year 1998 to 2008 from more than 50 companies. By simply observing the OLS techniques and implementing it on this we would find that what are the effects on the decision making of investors in the stock market? This study is not moving toward the broader aspects because it becomes confusing to observe the 1 bias which is of equally importance. This study is limited to specific biases e.g. overconfidence and disposition and further results are also drawn based on these two biases.

Large numbers of portfolios are not made; the study is concerned with estimating risk-return relation with specific targeted biases. The stock market shares of KSE are not in good position when we observe the multiple companies. The reason behind this is investors who don't trust those companies and don't take high risk.

The market condition is risky and the high risks lead to high returns. The economy of any country is the backbone of its success. Pakistan don't come in the list of developed countries because its economy is not strong and there are large number of reasons behind it. The investor's ratio is not so high and if it is present than still those investors don't prefer to invest in those companies. Outside investors or the other countries also don't trust too much on them because of their own reputation. This is also a big reason for downfall in the market of stock exchange.

This study is limited and just a lead for new upcoming investors to use these findings and further make understandings and recommendations for future.

Chapter 2

Literature review:

It is very difficult to choose specific factors that affect the decision making of investors. There are many investment models developed by evaluating the past experience of investors and these models were just limited to specific security only. Different strategies were there to increase the return for that specific security. The asymmetrical information such as investor's intentions, their ages, personality, gender their perceptions about anything such as risk effect the decision making (Markowitz, 1952, 1959) introduced the diversification concept. From this theory it is demonstrated that there is no single security out of multiple securities focused to maximize the return.

But there is combination of large number of securities that increase the return. Larger the securities, greater will be the result of returns. It can also maximize risk.

An empirical study conducted by Shyan, Gow and Hui (2010) demonstrate that investors usually affected by their past experiences and this thing determine that how they would behave in any risky situation in future. From this research, somehow the risk taking and risk avoiding attitude of an investor depend on his past personal investment experience.

The capital asset pricing model is used in this study it is first developed by Sharpe (1964) and Lintner (1965) and regarded as a most widely used approach for the evaluation of assets. This CAPM theory predicts that an asset expected return is proportional to non-diversifiable risk and it is measured by covariance of asset return. When the result come non normal and investors have non quadratic utility, it shows that investors are concerned with overall return, not just with mean and variance (Rubinstein 1973, and Scott & Phillip 1980). In this theory quadratic function shows the risk aversion, but in usual case the risk aversion decrease with increase of wealth. In

different models the skewness shows the asymmetric characteristics of distribution of mean. If the skewness results are positive it is shown with tail extended towards positive value and negative when tail is extended towards negative value. In case of observing kurtosis, frequency of distribution with its extended tail is measured. The investors usually prefer to invest in that stock which have positive skewness and small kurtosis.

The stocks which are independent of each other are better to choose for investors because with this, the recession in one stock will not affect the other stock. (Philmore and Tracey, 2010) study found that investors intentions are predicted or perceived by different behaviors attribute such as norms, attitude, personality etc. Thus the individuals with varying nature and attitude have different perception about risk and returns. (Fama, 1970; Hakansson 1970, 1974) studies explain that there is difference in results of portfolios constructed on the basis of single period data and multiple period data. It is shown from study that at different time period, the security returns are different. (Robert A.N), study suggests a single criterion for investors to make decision making is enough that is of wealth maximizing, instead of multiple other criteria. (Suleyman Gokhan Gunay, 2011) in their research explained that financial behavior factors such as cognition, herding and overreaction have interaction with the gender of specific investor or with personality that effects the decision making power of him. Irrational thinking and overconfidence & level of individual saving have interaction with overreaction, herding, and cognitive bias. Thus it was concluded that gender and saving level are those demographic factors which influence the behavioral finance in the investment decision. To solve the Markowitz theory obstacles the efficient input calculation of covariance matrix was required. Index models technique best suited to solve covariance problems. It depends whether that model would be single index model or multi index model according to the data.

The single index model developed by (Sharpe, 1967) also called as market index.

$$R_i = \alpha_i + \beta_i R_m + e_i$$

R_i is the specific security return, α_i is the expected return. β_i shows the sensitivity of stock i , R_m is the long market return & e_i is the error term which shows the risk in returns of securities.

This index model has made it easy to estimate the performance. Before this it was difficult to compute the complex mathematical data. These index models also give the more realistic results by using the historical data. Moreover with the help of this model, the covariance calculation for large number of historical data becomes easy. According to Elston, 1997, the portfolio index model is estimated by different subjective estimates and they provide the better forecast about the future which is helpful for investors. These index models not make comparison of a single company or industry with other company but also comparison is with the overall broader index. For example analyst can easily understand the relation of fabric industry with overall stock market other than its comparison textiles, cement to other industries specifically. Within the single index model the researcher started work on multi index as well. That multi index is given as.

$$R_{it} = \alpha_i + \beta_{ij} I_{jt} + e_{it} \quad i=1,2,3,\dots,n$$

Beta shows the sensitivity of securities. I_j mean the index and j means the total number of indexes. With the passage of time this multi index model got importance with within the single index model. The problem with multi index model was to choose index. The analysis patterns are multiple and it depends on scholars that which analysis they implement on their study, some of them use factor analysis technique and other used variance-covariance matrix of returns, (Roll and Ross, 1980; Brown and Weinstein 1933). Much type of approaches is used to select index for investors.

After that later studies conducted and technique drawn, which include risk factors in performance evaluation. Another important factor which is included in the

modern portfolio theory is the risk factor according to (Markowitz, 1992). All models which are given by other researchers are important but our discussion also reflects the importance of Jensen alpha for understanding of risk-return relationship. The equation for Jensen is:

$$R_{pt}-R_{ft} = \alpha_p + \beta_p(R_{mt}-R_{ft})+E_{pt}.....(i)$$

R_{pt} is the return of portfolio, R_{ft} is the risk free rate, R_{mt} is the return on market beta show sensitivity of stock and α_p is the abnormal return, E_{pt} show error term.

The significance of Jensen alpha is that we can't rely on single index such as KSE 100 index or S&P 500 index only or not only risky and riskless assets. But it also focuses on negative returns. Because the negative return can also create the extra return in long period of time. To understand the return ratio concept, the Sharpe developed generalized Sharpe ratio formula which uses time series data of historical returns. In multi index model the Sharpe ratio formula is given as

$$\text{Sharpe ratio} = \alpha_p / \sigma_p$$

From research it is concluded that this Sharpe ratio and Jensen alpha measure are used to know the investors decision priorities which depend on superior portfolio performance. Another point of discussion is focused that how the positive alpha is generated to attract the investors by making good performance measure. (Markowitz, 1959) states that risk is positively associated with return. With the recent studies, the new measures have drawn to find the risk except beta. Beta is not considered as an appropriate measure in the long run this thing is demonstrated by (Reinganun 1981). Thus focusing on multivariate relation, it increases as compared to univariate relation with beta and also the size effect and B/MV effect on stock returns. The significant support for book to earnings ratio is not present (Fama & French, 2012). Thus many of literature studies failed to discuss such problems in Pakistan stock market particularly

This study differentiates itself from previous ones by explaining the decision making pattern of investors both rationally and irrationally. And use the KSE 100 index model data historically. Moreover this study investigates the effect of changing decision by behavior bias of investor. As a researcher, the appropriate rate of return on the investment decision cant properly collected by beta. The 70% deviation is grasped by beta. There are some other important factors focused. The small size securities have high chances of risk that's why the returns associated with it also kept large in this way the investors are attracted to invest in that security (Fama & French,1992).

In this way small securities are risky with irregular return while large stocks are stable as compared to it. As compared to market capitalization, the small stocks generate high returns even when they have high chances of risk as well (Fama & French 1992; 2004; 2012).

Market is wide there are many alternatives present to invest for individual in different stocks. And there is no big problem for investors to generate normal return, but the focus of them is to maximize wealth by increasing return. There are different type of decision maker such as individual and institutional whose aim is to outperform the market as demonstrated by (Shah & Raza, 2012).

The risk aversion and risk taker depend on age and psychology. As explained, with the increase of age; the investors stop taking high risk.

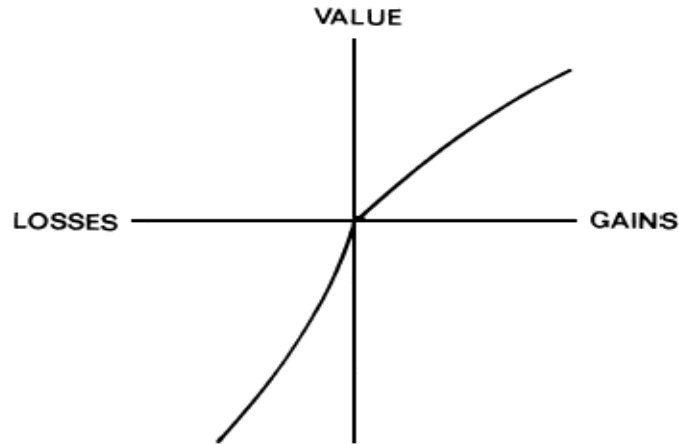
Merikas, Andreas, George, and Prasad (2004) studied the related fact that in all aspects the wealth maximizing is the key variable in all decision making factors. To understand the investor's behavior the factors are multiple such as the financial needs personality, attitude, neutral information etc. Hoffmann, Eije, and Jager (2006) researched the behavior attributes including conformity and needs of investors. He finds that within the financial needs, the fulfillment of social needs is also important for the investors. Hoffmann, et al. (2006) also verifies this statement of investor's behavior of giving importance to financial gains. They are risk taker and focus is to get

high return thus their investment focus is also dependent on satisfying financial need more than other needs.

Most of the time the decision making of investor based on behavior biases. As compared to gain investors are more sensitive to losses and utility function represent this asymmetry between losses and gains. As the explanation of utility function in graph below demonstrate its effect that the graph become more concave in case of gains, become convex when loss occur. (Kahneman and Tversky).

If we see the explanation of prospect theory, it clearly founds that irrespective of utility theory, the carrier of value is not final assets but the gains and losses. (Tversky and Kahneman, 1992), it shows that as compared to final outcomes, individuals' value wealth more. In recent economic and psychology theories it is observed that people are motivated more to minimize losses than to maximize gain. This behavior bias is the loss aversion. In another aspect, the investors don't usually value the market given (Odean, 1998; Kyle & Wang, 1997). These types of investors make change in their decision making by giving time and spending money on the collection of exact type of information to make decision making (Debondt & Thaler 1995). Due to this, the investors overestimate their own collected information. This type of behavior bias is called overconfidence bias. And this behavior also affect the decision making process.

This idea of loss aversion states that as compared to gain and advantages, the losses and disadvantages has greater impact on preferences. This behavior is seen in the graph that deviation of line is concave in case of gain which shows risk averse behavior and become convex in case of losses which shows risk seeking behavior; this is usually steeper in case of losses than for gains.



Tversky and Kahneman (1992) somehow match the prospect theory as cumulative with the original prospect theory. In the study, shown that assumptions made from CAPM are further explained by the sharpe ratio and sortino ratio (Treyner 1962; Sharpe 1964; Lintner 1965; Mossin 1966)

$$\text{Sharpe ratio} = E[r_p - r_f] / \sigma$$

Where r_p is the asset or portfolio return, r_f is the return on a benchmark asset, such as the risk free rate of return, $E[r_p - r_f]$ is the expected value of the excess of the portfolio return over the benchmark return, and $\text{Var}[r_p - r_f]$ is the standard deviation of the excess return.

In understanding of loss aversion effect it is seen that this is the psychological characters of individual that after realizing loss relative to gain enforce them not to sell the losing (Kahneman and Tversky, 1979, DeBondt and Thaler, 1995). From different analysis, it is argued that previous losses increased risk aversion and previous gain reduce sensitivity to risk. To check the low probability of large losses, the modification form of sharpe ratio is used that is sortino ratio. Which use the downside risk, where

investors are analyzing high volatility portfolio? The large sortino ratio indicates the low probability of large losses.

$$\text{Sortino Ratio} = \frac{\langle R \rangle - R_f}{\sigma_d}$$

Where,

$\langle R \rangle$ = Expected Return

R_f = The Risk Free Rate of Return

σ_d = Standard Deviation of Negative Asset Returns

This implies that investments with lower Sortino ratio are inherently more risky and will incur greater losses. Depending on the risk aversion of investors the Sortino Ratio can become very important criteria for investors to choose funds.

Black (1976) founds that volatility is not directly proportional to returns; it has inverse relation which shows that when the market turns down, the volatility increase. This is equivalent to leverage effect somehow that debt to equity ratio increase when prices of equity decrease. Thus the volatility increases automatically.

Investor's psychology has significant effect on asset pricing model and most of the time fails to grasp true aspects of behavioral change just because of their psychological traits (Hirshfeifer, 2001). Tversky and Kahneman (1981) found in their study that how the individuals react to certain situation depends on their reaction what they represent during situation of gain and loss. It also depends on the way; the situation is presented to them.

When positive frame is shown them they don't take risk, as compared to other condition that negative frame leads them to take high risk. It is derived from study that people respond to the situation, depend on the way; particular situation is framed to them and also numbering of choice effect their decisions. Samuelson and Zeckhauser (1988) conducted their research to find the way how the individuals become stiff to any particular situation when the chance is to be changed. This is status quo bias which makes them stiff to their decisions

They follow their own believe and own gathered information for any decision making. Hong, Lim and Stein (2000) studies that market returns is correlated with the market given information, for example if the general public is made aware by bad news about the market, the result would be negative and vice versa case for good news. In this way stock returns fluctuate. This also comes in behavior effect of market on decisions of investors. Shiller (2004) also exemplified that investors have heterogeneous character they are not homogenous and have varying objectives, that is why their psychological and sociological behavior have a large impact on their decision making process. They all have homogenous expectation in case of returns, risk and variance of stocks.

Due to this financial model become less accurate for investors, they start creating their own expectations. It leads to market inefficiency. Another problem arise when every investor don't have equal access to market information, it distort the investment pattern and cause deviation from efficiency. Barber and Odean (2000) founds that the investing in particular stock is a sensitive decision, if the investors make wrong decision, the other gets benefit from it and after the time passed they realize their mistake. Stock market is saturated and a single mistake of investor in decision making may lead him to big loss.

The investors need to follow the concept of equilibrium, but they follow the fear and hope syndrome. Due to this, sometime prices become irrational and efficiency just becomes a text book trick. It is explained that a person who is risk-averse always show different attitude, he while making decision making; focus on the downside risk as well and opposite case is with the risk love, he will keep venturing to take high risk in greed of becoming rich early.

In this study risk aversion is calculated with downside risk with sortino ratio. Shefrin and Statman (2000) argued that usually the person trust more on the company with which he is already linked or who about he already knows so that no future loss would be made. He avoids losses and don't indulge himself in a risky situation. At some

extent investor's activity dominated by their personality and behavioral aspect which results in large and acute inefficiency in market. Friedman and Savage (1948) explained the way investors use method to protect them by other tactics such as purchasing lottery tickets or insurance in order to avoid them from any downside risk. It is also observed that they follow the layer and ladder system so that they become rich in the first place. The investor's wealth also determines the way they behave while making the decision making.

He will use conservative approach if the wealth is generated in a passive way. While the person who generated wealth in sudden windfall, behave differently depending on the wealth. It is observed from different studies that within the change in wealth level, investors willingness change and they completely trapped in behavioral dilemma where they don't rely on actual market information but on their own situational profile. It leads to inefficiency and false decision making.

It is concluded from different researches that the most common behavior, investors do when making investment decision are:

1. Investors very often do not participate in all asset and security categories
2. Individual investors mostly show loss-averse Behavior
3. Investors as an indicator use past performance data to predict future performance in stock purchase decisions
4. Investors trade aggressively at times
5. Investors behave on status quo
6. Efficient portfolios, not always formed by investors
7. Investors behave parallel to each other
8. Historical high or low trading stocks influence the investors

Here we are focusing on many behavior biases such as herding behavior, regret aversion, pride, loss aversion, risk aversion, familiarity bias etc and two behavior biases such as overconfidence and disposition effect are specifically explained with their effect on decision making of investors.

Overconfidence bias:

Individual decision making is affected by overconfidence bias. The problem occurs when the one investor thinks that he is better than other in his judgment while in reality he is not. This thing makes difference. It is observed from many studies that mostly overconfident investors think so that they are far better than other.

This often results in overconfidence behavior bias. It is observed that, under the influence of this behavior bias, most of the time the investors make excessive trading and investing and the ultimate result of it comes in the form of loss when they deduct their transaction cost from the returns they got. Sometime the investors don't learn from past experiences they call it bad luck in case of loses or good luck in case of high return. The overconfidence sometime leads to terrible situation when we make judgment about the factors influencing the false decision making of investors.

This bias leads to failure in decision making of investors so far. Because the overconfident investors rely more on their own ability and they make bold decision and they underestimate the risk which is linked with their decision. Shefrin and Thaler (1988) explained the factors which are psychological, that influence the investors when they become experienced. He concluded that investors often become more over confident due to their past successful experiences in stock investments and thinks that they know more than the average investor in the market and their knowledge is more reliable. They highlight the dilemma that investors misjudge the high risk linked with investing in a certain stock. They identified that investors create a identified benchmark based on their past investment experience and their own gathered information and then they start comparing results with that benchmark even if the new information and new

strategies enters the market So, they become confident with their prediction capabilities about the future outcomes and don't rely on the models' predictions which might have predicted contrary to what they think. It is maintained by researchers that psychological and sociological factors do impact the investors' decision making process as every investor holds varying investment objectives and heterogeneous expectations. The investors psychology is different from each other they have their own expectation their own way of judging the market given information and their own way of observation.

It is argued that sometime investor realize their mistake late when they have already made the decision of investment. They have sometime correct information but they mistrust it and spend more money and time by creating their own way of information which leads to regret many of the time and they don't have time to go back and to cover that loses which they have made due to their overconfident behavior. It is concluded that due to overconfidence behavior and bad results, the investors develop the sense of regret, guilt and embracement but they don't show it they try to create a situation where they don't show the people that they made wrong decision. It is their psychological need to do so. Most of the time their wrong decision making due to that psychological factors brings them to the situation where they no more rely on all that and they in order to avoid another regret they keep themselves away from actively managed type of investments. This can create harm and leads to wrong results in many cases.

Canner, Mankiw and Weil (1997) stated that in order to diversify risk, the financial advisor recommend to make portfolio with high correlation, but usually investor don't follow it they try to invest in stock with low risk and also focus on the downside risk this is ladder system which they adopt to avoid those factors which are crucial and hurdle for their survival in the market. Sometime the investor don't follow the recommendation and if they see correlation is important factor to diversify their risk they still don't do this they make their own pyramid in this way it become easy for them

to avoid downside risk. They avoid the high risk assets and usually invest in less risky in their planned pyramid. The reason for this behavior is that they keep the chances of their survival safe in market. So argued that a person usually become more interested to buy a company's stock with which he is more familiar or the company with which he has some association.

They avoid riskier assets and new investors usually follow this strategy they invest in the assets having more familiarity in the market or known by many of already existing investors.

It is seen that what are other tactics and how investors use insurance and lottery tickets to protect themselves from downside risk. It shows that investors maintain their financial stability. The way investors justify their feeling and the emotions on the decisions they have made which didn't bring expected result is of focus by many researchers. Investor's psychology is that they are influenced by their emotions and this thing is also seen in their investment decision. The more emotional or pessimistic an investor is, the more chances of taking the wrong decision. So pointed out by the studies that investors' wealth has an impact on the approach they have towards the investment at most of the time.

These all above factor are related to behavioral finance which shows that when the investors show irrational decision making they ignore the assumption of traditional finance which focus on the fact of utility maximizing. He has added further that there are two main streams which pull up the essence of this field what investors think when market is not behaving efficiently. The investors become more rational where they observe that market is going efficient and the past performance of market is good. At that time they have prediction of getting low level risk because of good condition of market. Somehow their decision become reliable and they make less risky investment decision and chances of any downside risk also become less. Lo (2005) suggested a method in which value is given to irrationality of market, because of behavior biases of

situation of market and also of investors affects the investment decision. Either his decision is rational or irrational it depends on the situation. The results further drawn are according to the change in decision.

Thus this behavior bias better explain the reason why most of the investors fail in their decision making due to misperception in hope of better return.

Disposition bias:

Another bias in behavior which affect on decision making of investor is disposition effect. In order to make profit and avoid loss, in period of high market return investor change their portfolio by selling winners to early and holding loser for too long.

Risk aversion and risk avoidance is one of the possible examples of disposition effect (Shefrin & Statman, 1985). Another explanation for disposition effect is regret theory in which individuals are influenced by psychological fear of regret. Those investors avoid the regret and any future guilt in their decision making. Thus from all researcher studies it is concluded that when there is uncertainty in stock price than disposition effect is high.

This effect is usually augmented when the investors can't reach benchmark and there are chances of regret for him. These two tendencies overconfidence and disposition effect are studied together because they are most likely linked with investment decision together.

Risk tolerance varies across different people. The risk taking and risk avoiding behavior also depends on multiple factors such as wealthy, highly educated, heavy drinker, immigrant, Jewish, Hispanics and mostly Asian take risk with the expectation of getting high return. If we compare them with the people of middle class, average education, average wealth, average income and people below age of sixty tend to avoid risk because they have low level of income and they can't bear high loss. By comparing

the people of different locations, the investment decision varies, Such as Chinese take risk higher than American in the investment domain.

The reason is that Chinese often show probabilistic thinking and have positive thinking that's why they make riskier decision as compared to American.

From the study of different investors it is explained that investors try to secure their gain by selling the winning stocks and retaining losing investments or stocks. The carrier of value is not final assets but the gain and losses this theory shows that wealth is valued more by the investors as compared to final assets. Indeed, as it is pointed out that usually investors are motivated to minimize losses more than they value maximizing gains.

According to him people are more concerned about minimizing the number of losses. They usually don't sell stocks with riskier assets because they avoid large losses. Maximizing gain is their target as well but it come on second priority first is to reduce losses. Indeed, Gintis (2007) demonstrate that loss aversive investors are sensitive to their private property while making long term decision making of investment. The investors are loss averse when the investments are related to their private property they become more active and avoid losses and high risk.

Irrational ground to invest is most probably prioritized by investors. There is another bias known as self control bias, in which investors are unwilling to realize losses. It shows that some investors have another psychological bias they avoid losses because of their self control they don't make emotional or sentimental decisions in investments. They are optimistic and realistic. The researchers also suggest that investor's mood have a wide effect on its irrational decision making. Most of the time investors show irrational decision making. The decline in the value of utility after realizing the losses, usually induce investors not to sell losing stocks and retain them and in opposite case they sell winning stock earlier.

This loss aversion is broader aspect of disposition behavior which occurs when the investors realize losses more as compared to gains. Thaler and Johnson (1990) show that losses of high magnitude make the investors willing to accept the prior gain through gambles. This show their high desire and motivation toward the achieving of high returns. It is observed from their study findings that as the investors are sensitive to losses and when they feel it's risky to invest in certain stock they avoid it. In this way when they realize prior gain they become willing to accept gamble as well. In the behavioral finding of some investors the pattern of equity premium and stock volatility is explained. Their study argues that previous gains make them sensitive to other losses and they don't take risk while previous losses make them completely risk averse. Barberis and Huang (2000) have suggested that investor's behavior regarding the gain and loss is separate for different stocks. It is observed that the investor's behavior with different stocks is different. They behave differently with holding stocks and their reaction to investments having large or small number of gain and losses is totally different. It is again their psychology which varies. This behavior creates disposition bias in investor's decision.

Theoretical framework:

The study main objective is to highlight the rationality and irrationality behind investment decisions. The CAPM is most cited and used model to study risk-return analysis for investment decision. It is based on testing the hypothesis. First is higher the risk, higher the return indicating that beta is positive. Second joint hypothesis is market is efficient that mean only market is sufficient to explain the risk and return relationship. The previous literature (Jawed and Ahmad 2008, 2009, 2011) and others shows that CAPM don't hold in case of Pakistan, it means in addition to market return there are other factors that explain risk-return relationship.

$$R_{it} = \alpha^o + \beta R_{mt} + E_{it}$$

Here $i=1, \dots, 50$ and $t=1998-2008$

Where R_{it} is excess stock return R_{mt} is excess market return $\beta = \text{cov}(R_{it}, R_{mt})$

Therefore in this study, behavior biases of the investors are included, motivated by Sheller (2014). The CAPM is extended by first including overconfidence bias. The reason is that as overconfidence makes investor to take more trading decision of investment. Because it generates more returns for them which attract them to invest more in stocks.

The extended CAPM will be rewritten as:

$$R_{it} = \alpha + \beta_1 R_{mt} + \beta_2 OC + E_{it} \quad \dots\dots 2)$$

Here other variables are same as shown above mentioned CAPM model but OC measures the overconfidence behavior.

These behavioral aspects influence the decision making of investors strongly. These effects check for change in composition of investment of historical data on monthly bases and uncertainty of decision making. In this theoretical framework the intention to change in decision making of investors is effected by two behavioral biases as shown i.e. overconfidence and disposition effect and further these biases have impact of other variables. Such as overconfident investor over place the investment or over estimate it, he most probably rely on his own gathered information and over precise it. These are the factors which generate overconfident behavior of investors.

In the next step disposition bias is included in model 1. Thus the model takes the following form

$$R_{it} = \alpha + \beta_1 R_{mt} + \beta_3 DE_{it} + E_{it} \quad \dots\dots 2)$$

Here DE shows disposition effect on investor's behavior.

As we look towards this second bias which is disposition it is affected with other factors such as regret aversion. In disposition, the investor sells the winning stock too early in order to avoid regret he retain the losing stocks. That becomes the investor's psyche because he avoids risk and regret in his decision making. Another thing the investor do is the tax evasion, to escape from large number of taxes which are implied on the retained assets or owner assets, the investor sell these stocks for which the prices increase in market than the purchased price.

He just retains those assets which lose their value due to change in market price and wait until the prices again increase just to avoid from losses. Investor's pressure is another factor which impacts the disposition bias behavior. The market demand and pressure from different sides as the chances to get lose with retained stock and many other factors influence the investor's decision.

He can't take high risk with some inventories and need to avoid regret as well for this he show disposition behavior. These all factors directly influence the change in decision making. So change in investor's decision is a dependent variable and disposition and overconfidence is independent variable in this study. It is shown clearly in the framework given below that how the investment decision change is affected by behavioral factors. Somehow it is affected with many factors but here we are more focusing on two of them and other variables which have influence on these two behavioral biases. So it becomes easy with theoretical framework to understand the whole concept and linkage of variables with each other in study.

This theoretical framework is already used by some of other investors with same dependent and independent variables. But this study is used to find the different results by using the historical data and large number of multiple companies to find out the impact of this model on them either it goes in negative side or in positive side. The independent variables of disposition and overconfidence are in large numbers and here some of them are mentioned because this study is a limited edition. Further researches are made and still working on it in broader aspects because this is a need to understand the stock market in broader aspects by investors and by researchers.

Some evidence from history suggests that recently observed market situation; own knowledge or experienced events strongly influence decisions of investors. Psychologists refer to this as the 'availability biases. Which is another bias except two of above mentioned as overconfidence and disposition. Researchers found that individuals were most likely to overestimate reality behind the large number of the chances of being in a car crash if they had seen a car crash with their own eye on a recent journey. This is a clear example of psychological trait which is mostly present in many of individuals. The recent memory made the prospect more clear – available – and therefore more likely to happen. To give a financial example, investors are more likely to be fearful and avoidance of a stock market crash when one has occurred in the recent past or one has seen or experienced it already.

There is also another bias 'representativeness bias' which reflects the case where investors decisions are based on a superficial situation having showy characters (what it looks like) rather than a detailed evaluation of the reality and clear glimpse of the facts. Another way of putting this would be the exact words for it that decisions are made based on stereotypes of any situation. A common financial example is for investors which shows that how they predict or assume the company's profile good or to assume that shares of that particular company is in a high-profile, well-managed and good past history of company will automatically be a good investment. This idea sounds reasonable and accurate at some extent, but ignores the chances of possibility that the

share price reflects the quality and image of the company and thus future return prospects may be moderate for such investors. Another example is that the past performance evaluation of an investment is an indication of its future performance.

Investors also suffer from another bias which is representativeness bias when they evaluate investor's performance in their decision making. Investors are often indulging to be with that company and with that manager having short track record of beating market averages over a few years. Meanwhile they usually show less interest in that company and manager with a much longer track record which has exceeded averages with small margin. Statistically, those companies with the long-term track record have the stronger case to make about skill and about performance in stock market. But we tend to look at the manager and the companies with the short-term track record, believing that the record of superior performance will continue in future.

One bias is 'Conservatism bias' describes the reality fact that the decision maker or many investors stick with an initial judgment despite new contradictory information which has brought in market and progresses. Or they do not completely or sometimes only partially adjust their view in light of the new information and new theories and strategies. Taking the example above, investors who buy shares or invest his wealth in a high profile company having good reputation in stock market may be slow to adjust or change their view of the company's prospects even after the company's profitability deteriorates in near past.

The biases discussed so far relate to investors decision making. An important question is how these and other specific biases affect decisions made by groups of investors. A group situation varies and it may counteract a particular bias or it may strengthen it or weakened it. Equally, the group situation could create new biases. Here the main focus was two biases from all of them. Overconfidence and disposition and there affects are also shown in this theoretical framework. Finally CAPM extended by both biases is extended as given below:

$$R_{it} = \alpha + \beta_1 R_{mt} + \beta_2 O_{ct} + \beta_3 D_{Et} + E_{it}$$

The estimation of extended model tells how in addition to market return, two biases affect the expected returns of stock. This allows analyzing rational behavior, captured by market return and irrational by behavioral biases.

Hypothesis:

H1: higher the risk, higher the return indicates that beta is positive

H2: efficient market is sufficient to explain the risk and return relationship

H3: over confidence bias can positively affect investment decision of investors

H4: disposition effect can positively affect investment decision of investors

Hypothesis illustration:

H1: higher the risk, higher the return indicates that beta is positive

In order to choose a portfolio or stock to choose for investment, the investors need to understand it properly. This depends on the investor's active approach to find what is best thing which needs to be added in a portfolio to make it worth investing for? The size of investment portfolio is important to make correct decision making. Small portfolio or stock has less number of risks and large size of portfolio has high risk. Thus observe that the risky stocks have high chances of generating high return. The beta would be positive which clearly demonstrate that chances of getting high return are more.

The stocks which are new at market, small stock have more chances to create extra returns but they have high risk as well & these investors who usually avoid high

risk averse they avoid to invest in such stocks. Somehow it becomes difficult for authorities generate finance for carrying out new projects. That's why they make strategy by offering high returns to such investors to attract them

H2: Efficient market says beta is sufficient to explain the risk and return relationship

Another important thing to discuss is the efficiency and inefficiency of stock market. The investors observe that is that particular market is sufficient or not where they are investing their money. The choice of such market depends on the past performance of it and future recommendation how well it has performed in the past and how much chances are there for that particular stock to increase its value in future.

The investors don't usually invest in such stocks which have risk, or which has not made any large number of profits in future. They usually avoid such stocks. In this way the new entrants or the already existing investors always check this thing, they see what the value of the stock is or how much that particular stock has already made profit in the market. These things affect the decision making of investors.

The stocks having high book to market value always show financial distress that's why the stock return would be high. The financial distress influenced companies mostly need to offer high returns as compared to other solvent companies. This study somehow related to study of famous academics (Fama & French 1992). In this study the risk factor added. Thus they explained successfully the historical equity performance at 96 percent. Thus it is proved that efficient stock market better explains risk-return relationship.

H3: over confidence bias can positively affect investment decision of investors

The behavior of investors is the important concept of this study. The investment is usually affected with the behavior biases and the personality clashes of investors. Each person have different attitude, different way of understanding the situation, different way of reviewing the observed information and also different way of

implementing the strategies from those of other investors. This thing add value to his or her decision making regards any long term or short term investment decisions. Here the behavior bias overconfidence is mentioned which affects the investment decision of investors positively and significantly.

The investors think that they can predict future more accurately which influence their decision.

Another reason of this behavior is positive perception about their self. One of possible reason is they have control on their decisions making skills and also on the comparison of their assets.

Such investors spend time and money to generate own information and remain active throughout the process. The overall market situation is always in under consideration by small investors. In this way the overconfidence bias understanding is important for researches in order to make correct observation of behaviors impact.

The investors involvement in the searching of exact information and reviewing the exact strategies which those of other investors adopted in past in order to make high returns and large number of profit is of great value. The number of alphas determines the amount of returns ratio and profit margin.

H4: disposition effect can positively affect investment decision of investors

Like the above mentioned behavior bias there are large number of other biases as pyramid, regret, loss aversion, pride etc. here the target or focus is on another type of bias which is known as disposition bias which shows the personality of such investors who sell the winning stock too early and retain the loosing stock for too long. Their mission is to avoid from large number of losses and if they retain such winning stocks for too long time than it become a reason for them to pay large number of taxes. For this reason they usually don't hold the stocks which value increase in market and just retain those stocks which create chances to make the large number of losses in market. They wait until the price of these stocks increase in market after than they sell it.

Sometimes the investors ignore the information about bad performance of a stock and keep on going with that stock. This behavior also relates with the disposition effect. The last reason behind holding or retaining losing stock for so long is that the investors have high risk associated with selling of losers. They can't afford high lose prices. They negate regrets and wait until the prices fluctuate and again raise their value in market for such stocks.

Chapter No 3

Research methodology:

To write a research paper, an important part is to choose research methodology. The appropriate methodology is critical for reliable outcomes of research. An organized and systematic methodology is needed. Systematic methodology helps the researcher to complete the overall task of exploring the topic stepwise (Lewis & Thornhill 2003).

There should be flexibility in methodology, thus the reliability of outcomes increase. Beyond flexibility, there are many other factors needed to increase the reliability of results. Those factors include clear and enough data and clear objectives. The researcher must be aware about exact problems, objectives and hypothesis which he is going to test. It is also important to write the properly understood and meaningful report. Proper report writing also increases the reliability of paper (Chisnall 2001).

This part of research focused on data, nature and pattern of paper and analysis which is required to test hypothesis. CAPM model is used in this research

$$R_{it} = \alpha + \beta m_{it} + E_{it} \quad \dots(1)$$

Extended the model by including two behavioral biases, First overconfidence of investors is included. The volume of trade is used as a proxy to capture overconfidence. The model (1) can be written as:

$$R_{it} = \alpha + \beta_1 r_{mit} + \beta_2 OC_{it} + E_{it}$$

In second stage the model is extended by including disposition effect captured by sortino ratio in which downside risk is included. . To check the low probability of large losses, the modification form of sharpe ratio is used that is sortino ratio. Which use the downside risk, where investors are analyzing high volatility portfolio? The large sortino ratio indicates the low probability of large losses.

$$\text{Sortino Ratio} = \frac{\langle R \rangle - R_f}{\sigma_d}$$

Where,

$\langle R \rangle$ = Expected Return

R_f = The Risk Free Rate of Return

σ_d = Standard Deviation of Negative Asset Returns

The sharpe ratio can also be used but in stock market investors are more concerned about downside risk related to investments. This implies that investments with lower Sortino ratio are inherently more risky and will incur greater losses. Depending on the risk aversion of investors the Sortino Ratio can become very important criteria for investors to choose funds.

The (2) model for calculating the effect of second bias disposition effect can be written as

$$R_{it} = \alpha + \beta_1 r_{mit} + \beta_2 OC_{it} + \beta_3 DE_{it} + E_{it}$$

Rational behind the study:

Basic purpose of this study is to check rationality and irrationality of investors behind investment decision. Risk and returns are two main factors behind rational decision making of investors.

Larger the risk, increase the chances to get larger return. The investors who want to get return must take high risk beyond just mimicking the market. I.e. index tracking strategy has zero probability to beat the market. The investors must select portfolio that mimic the market up to some limit and having higher riskier factors more which increase the returns.

This study is focusing on two biases disposition and overconfidence effect. How these biases increase positive alphas. The results further draw the visual effect of these biases.

The concept of market efficiency and investors correct decision making about a particular stock investment remains still debatable among different researchers. When check the evidences reliability supporting market efficiency and investors behavior in academic literature it proves that these concepts are realistic and practical somehow. However, while going through the performance of investors and other financial agencies in recent past, one may be skeptical about the validity behind it in many stock markets of the world. From last few decades the investment decisions in market individuals and new entrants have shown tremendous progress which is shown by their large increase number and growth of financial market. Their level of trust about particular stocks and their behavior bias which strongly influence the decision making.

The concept of Fama and French (1970) about Market Efficiency has been supported by many studies but still academic researcher has objection and strong varying questions on this idea of treating every investor in similar manner. The arguments which are given by opposing theories and many other researchers opposing are that how a knowledgeable and experienced investor can behave accordingly to his/her psychological behavior in spite of having complete understanding about market, its downs falls and future recommendations and future predicted changes. Some time he/she behaves in the similar manner in which an ordinary and inexperience investor does. According to Fama and French (1970) future stock prices are not predictable and not accessible. They support this idea with certain assumptions and theories like access

to information is costless and large number of investors responds to information which they get from market and already existing investors quickly and large numbers of investors engage themselves in the equity market.

The another purpose of this study is to show its importance on the basis of the idea mentioned that if information is equal and nobody can make himself superior in terms of information and if nobody show behavior bias in term of overconfidence and disposition then it is practically almost impossible for him/her to get abnormal benefits from the market and the number of returns usually can't be high. Because it is understood that high risk leads to high returns. It looks real that if everyone in the stock market knows the same what others know then buyers and sellers are looking at the same picture from different sides. No investor can take high return and no competition may exist in the market as well.

It looks real and clear that if all investors are equal in terms of information and their personality don't vary then nobody will be ready to put his/her money in the pocket of the other and nobody will be ready to invest any stock. Prices in such type of financial market will adjust so quickly in response to new information that any of investor will not find the time gape to invest in any undervalued share. According to the concept of market efficiency and to check how the particular market is more efficient than the other markets their stock prices are already reflecting all available information. Simply saying, in an efficient market any abnormal return earned by an investor is a successful gamble which may be just because of their luck or it may be due to any Sharpe act of them.

But on the other side of the picture shows that is it possible for every investor to have the same information as the others investor have? Is it rational to expect similar type of behavior from investor in the market and their psychological behavior is avoided? Is it really possible to treat every investor to always respond in a right and similar way in making decision of their investment in any of stock in market? These may be questions in minds of the most of the critics to market efficiency concept and to

observe how the market would be efficient either with the correct decisions of investors or with the any outstanding change in prices or strategies behind it. If we consider that investors do have equal information but it still never proves that they will use that given information in similar way because of their different understanding and knowledge which is necessary to understand it. Studies proves that many investors behave in similar manner when observe their liquidity needs, risk preference and time horizon. Expecting every investor behaving rationally would not be possible every time.

However, it might look real and acceptable in some particular situations where information becomes a common perception behind the decisions of every investor. But it's not rare and the percentage behind such fact is also very low. However, the question behind this is that either it may be a possible situation when many of the irrational investors are kicked out of the market due to the high loss and their irrational decision making which don't suits the market in long run and remaining are the rational ones or those investors who become rational after losing parts of their wealth due to their wrong irrational decision. If we consider that investors value securities and stocks on the basis of some predetermined formulas and information given and methods then using the same information and same theories with similar kind of tests, investors would not be reacting differently their decisions would be same as of other investors and then the chances of loss are also high.

However, their reactions to such given information are subject to the situation and timing of their decisions which usually based on their risk preference, needs of high returns, trust on their own self, regret and fear of loss, or loss aversion behavior and liquidity needs. But the problem here is that how an investor will get to know that how the situation in market is varying and what other investors would be doing with the same information which they already have and when they will be doing this and how much time a security and stock takes to get it accurately priced in market and how much time he needs to wait for its prices fluctuations. Point here is that if investors are using same kind of tools and same kind of test for their valuations and estimations then one

cannot avoid thinking of the future price movements in the same direction and of high changes in price at least in future.. However it would become difficult and overwhelming to end up the discussion supporting one kind of opinion and same kind of information in light of mixed thoughts and mixed valuations. In next part of this study few studies have been mentioned which have tested this concept and the behavioral factors which are totally influencing the decision making of investors and mixed results are found.

Research approach:

Understanding the methodology of research is important for researchers before proceeding further as collection of data and analysis. The approaches to research methodology vary such as positive or interpretive paradigm. The researcher can approach the problem through a subjective approach or objective approach depending on the nature of study (Saunders, 2003).

These objective and subjective paradigm are change in nature. In objective approach reality is fragmented and measurable. To increase the objectivity of process, knower and known must be independent of each other. Another approach is subjective approach also called interpretive paradigm. In subjective approach reality is multiple and holistic. This is not necessary for knower and known to be independent. They are interactive and correlated. The reality is transferable, dependable in nature. So in subjective approach, inductive method of investigation is used. In this approach researchers involve him personally and individual ideas and results are preferred. From all discussions, it is understood that positive approach is to test the theory while subjective or interpretive approach is to build the theory. I just want to check whether behavioral biases and change in decision making can increase the return of investors or not?

So this study is using positive approach. Behind choosing of this approach, there are different reasons behind choosing this subjective approach. Firstly this study focus

on relationship between risk and extra return generated. The impact of overconfidence and disposition based on changing decision is investigated. The data for these objectives is collected from secondary source. After than hypothesis is tested to check either the results are accurate or not?

Study design:

This research study is carried out in two steps. In first one the rationality in investment decision is discussed, and then irrationality behind changing decision is focused.

The secondary data is used and testing through CAPM model is done. After than simple regression analysis is carried out to test the irrationality in decision making of investors. In order to check the effect of behavioral factor and its impacts on the investments and risk-return relationship this study use OLS model.

The secondary data is used for different behavioral biases that is overconfidence and also used to calculate downside risk for observing the effect of second bias that is disposition.

Target population:

Keep in view the main objective of study. Target population for this study is Karachi stock exchange of Pakistan. KSE is wide market consist of large number of companies. Target s all listed stocks at KSE. Their turnover, volume of stocks is gathered for eleven years period. And further this data is used for the estimation and observing effects of behavioral biases.

Sample selection process:

Firstly stocks are selected and the criteria active and continuous listing through the period under the study. From the biases two are selected which can be estimated by secondary data. After the selection of research approach, the next important step is the

selection of sample for the study. Correct sampling approach and its selection procedure is fundamental of good research. No fixed standard are determined for the sample size selection. It varies with the approaches of different studies, their target objectives and focus material. The reliability and availability of samples affects the sample size usually. Somehow research approach determines the process of sample selection. In order to find solution with positivist approach, a researcher must have to collect data from large sample size.

In case he is using interpretive approach than he focuses on some reliable source rather than large sample with ambiguity.

Probability sampling is used for the data estimation of small and reliable source. While non probability sampling is use for large population set. This non probability sampling is known as judgmental sampling. The target population for this study is stock exchange industry of Pakistan. Due to many limitations it is not possible for researcher to study all behavioral biases and collect wide data because it become costly and time consuming. For this, the study focus basically on two behavioral biases i.e. overconfidence and disposition. Moreover the data is collected from secondary source of 50 companies' data for the period of 11 years.

Data collection:

The basic objectives of this study demonstrate that secondary data is focused. The data is collected from website of KSE. The first objective is to test the hypothesis for risk-return relationship estimation and then change in investment decision. For this the secondary data is used the returns are calculated from the turnover of closing prices for multiple companies. These closing prices and turnover are KSE 100 index data. For specific period of 1998 to 2008 is downloaded from KSE website of business recorder. The volume of trade is used as proxy to capture the overconfidence bias.

The second part of this research is to test the effect of behavioral biases as overconfidence and disposition effect through returns and downside risk calculated

through data. For checking the effects of bias overconfidence, returns are needed which are calculated through turnover values on monthly bases for different companies which are collected through business recorder, after than its analysis take place.

Returns are calculated for stocks and market index by taking log first difference of closing price

$$R_{it} = \ln P_t - \ln P_{t-1}$$

For overconfidence trading volume of 50 stocks is obtained and log of turnover is used for overconfidence behavior estimation.

The sortino ratio is calculated to find the disposition effect. In this way the study has monthly data from 1998 to 2008. This study uses all financial sector firms listed on Karachi stock exchange 100 indexes. These companies are selected to find their returns, in order to check the behavioral biases effect. For non financial firms high leverage is an indicator of distress (Fama & French 1992). Different securities return is calculated using the historical data of stocks sorted.

For the analysis of second bias the data is also collected from secondary source, in which the target returns as risk free return, portfolio returns which are separately given for each company investment is needed after than downside risk is calculated with the data given. All these things are necessary to be accumulated for the calculation of reliable results with the implications of tests. After that data is also used to test the hypothesis which is made to check the reliability of research findings. To get the accurate results, the data should be measurable, reliable and consistent and need to be properly gathered.

Chapter No 4

Data analysis and empirical results:

The data analysis begins with the descriptive statistics of data to examine the nature of data. First of all the stock returns are calculated by clearing log first difference. OC is calculated by taking the log of turnover. The DE is calculated by calculating the sortino ratio by extracting expected return from risk free rate of return and dividing with downside risk.

In steps data analysis is carried out. In first step of analysis, the rationality behind the investment decision making is occurred. In order to test the model, many steps are carried out. Firstly, the analysis is done to demonstrate the effects on investment decision by CAPM. The study uses the cross sectional regression model of (Fama & Macbenth, 1973). For this purpose, the monthly returns on stock are used on hypothesized variable.

The literature shows that portfolios are used based on (Fama & Macbenth, 1973) model. In this model, the market beta is calculated which depends on over all single portfolio. This study calculate returns for observing overconfidence as first bias and moreover beta is also calculated on individual basis, allow us to use individual stocks as demonstrated by (Fama & French,1992). Downside risk with expected return and risk free rate is calculated which helps us to observe the second bias disposition.

Regression analysis is used to used to test the hypothesis made showing that whether the investors are affected by these two behavioral biases or not. If yes than at what extent and these results are shown further. Investors have been usually documented to prefer investing in familiar assets and about which they have knowledge and understanding. Investors' associate familiarity with low risk and in this way the returns are also low. This manifests itself in home bias which is also a behavioral bias of investment decision and it shows the high portfolio weights in assets from an investor's

own country if the currency of that country is strong. Institutional and individual investors around the world mostly enforced to bias portfolios and stocks towards familiar local markets and away from big international markets. In these cases, the danger is one of inadequate diversification. In the UK in recent years, after survey it is observed that the people over there usually show the familiarity of property and it may have caused many investors to underestimate the risks involved in their decision making, although recent market falls may have changed this perspective in totally different way.

Managing Researchers have enlisted a number of biases in the way in which we filter the exact way and use information when making investment decisions. In some cases, we use basic mental shortcuts and own brain storming process to simplify decision-making in complex situations which is not understood. Sometimes these shortcuts are helpful and bring fruitful results, in other cases they can mislead and bring large losses. Underestimate the risks involved and take high risk in order to get high return, although recent market falls may have changed this perspective.

Summary statistics: table1

The descriptive statistics is given in table. The mean stock returns are 0.3% and mean market return is 0.6%. The correlation table shows that there is correlation but not so high so there is no problem of multi co linearity.

Descriptive statistics show mean value of 4.75 for overconfidence. Most of the time many of investors rank their answer high and they argue that they overestimate their abilities as compared to others. Mean value for disposition is 17.4 it shows that many investors are willing to sell their winning stock too early and hold the losing stock for long.

The mean value of dependent variable R1 and RML is near to one which shows that most of the investors are influenced by the behavior factor as mentioned

overconfidence and disposition. The skewness and kurtosis values show the normality of data.

Date : 11/06/14 Time : 12:05				
Sample : 1 6500				
	DEL	OCL	R1	RML
Mean	17.46031	4.751605	0.006805	0.000360
Median	21.19053	5.064190	0.000000	0.009827
Maximum	31.30507	8.476996	1.490780	0.340218
Minimum	-0.417615	0.000000	-6.920000	-1.798660
Std. Dev.	8.809932	0.977782	0.182071	0.192522
Skewness	-1.335277	-1.245577	-9.775597	-6.444129
Kurtosis	3.087477	4.124005	361.6230	60.35512
Jarque-Bera	999.2334	1810.045	33581095	899494.2
Probability	0.000000	0.000000	0.000000	0.000000

Panel data regression results:

First the CAPM is estimated by using common effect model on pooled OLS. The results reported in table 3 shows that β is positive and significant but mean CAPM holds during 1998 to 2008 period for the 50 sample stocks. R square is 0.26 or 26% which means that model explains 26% of the variation in stock return due to market return. In model 2 CAPM is used where OC is included. The results indicates that the β remain positive and significant. The OC has also positive and significant effect on stock returns. This implies overconfidence explain the expected stock returns as R square increase to 36%. In the first model OC and DE are incorporated in CAPM model.

Both have positive and significant effect indicating that overconfidence and disposition effect has positive impact on expected stock returns. it is already shown that investors are influenced by these behavioral factors while making decision making. The explanatory power of the model has also increased to 38% and beta remains positive and significant. This leads us to conclude that investor's behavior has role in explaining the risk-return relationship.

Assumption of OLS:

The models based on secondary data and empirical results of summary statistics test assumptions of OLS shown with correlation table and regression results. The simple OLS technique is applied in this study to check the data results. **ordinary least squares (OLS)** or **linear least squares** is a method for estimation of an unknown parameters with the goal of minimizing the differences between the observed responses in some arbitrary database and the responses predicted by the linear approximation of the data (visually this is seen as the sum of the vertical distances between each data point in the set and the corresponding point on the regression line - the smaller the differences, the better the model fits the data).

This OLS model gives minimum variance and unbiased estimation as well. If we see the assumptions of OLS we see that in independent variable, there is always zero or negligible error. In order to reduce mean square error in dependent variable, this OLS method is used. OLS model have correct specification, no linear dependence and normality is found. The observations of OLS are independent and identically distributed. OLS estimator is a most likelihood estimator.

Ordinary Least Squares (OLS) is a statistical technique which attempts to find the function which most closely approximates the data (a "best fit"). What are the approximate results drawn with that data and in this study I used the historical data from period of 1998 to 2008. In order to check the normality and to see how the data best fit and how the approximate results are drawn I implied the OLS technique. If all the data points would fall on the line, it would be easy to identify the slope and the intercept, and thus easy to find the line of best fit. However, that is not usually the case and it's not an easy task either. In order to minimize the distance between the line and the actual data point (or the sum of squared residuals) we then have to use the **Ordinary Least Squares** method (the line is also called **least squares line**). The formula for OLS is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 D + \hat{\epsilon}$$

The OLS estimates are unbiased, having minimum variance, consistent, and are normally distributed. The testing of hypothesis and theory and to predict future by evaluating the current performance can be done easily with this model. That's why this technique is used here to check the normality of historical data and to see whether it is good for investors to invest in particular stock or not and what are the performance this data has showed in past and how much chances are there to increase outperformance

in future. In this way from the results the investor are clear about their future decision making.

Model 1:

Testing for risk-return relation Using CAPM

It can be observed that high number of beta shows the more positive returns and this situation attracts investors. Here is data of stock returns for 50 firms for period 1998 to 2008. Therefore panel data estimation technique is more suitable. The panel data estimation observes the effect of change in behavior of investors with the historical data.

It is shown in table below that what the results of our α and the significance of data after than the behavior such as overconfidence and disposition significance and their effects on return is calculated on the bases of which investors take decision. There are 3 types of model given below which show significance of market return and generate α . The probability of significance that how much significant results achieved while dealing with specific behavior biases. It is clearly shown in the table for each model there are different results but each shows that behavioral biases overconfidence and disposition has positive effect on returns. Which encourage investors to take positive decision in their investments?

Here are the practical implications of all three models are given. How the probability and chances of significant and positive results are increased by understanding these models. The tests are also applied on them to find the results beyond just simple observation. These results are discussed above.

	Model 1	Model 2	Model 3
α	0.014 [*]	0.027	0.001
p	(0.006)	(0.000)	(0.656)
MR	0.014 [*]	0.010 ^{**}	0.152 [*]
p	(0.005)	(0.050)	(0.002)
OC		0.09 [*]	0.010 [*]
p		(0.000)	(0.000)
DE			0.020
p			(0.000)
R Square	0.2	0.36	0.38

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Note: The p-values are reported below the coefficients. The * indicates significance at 1%, ** at 5%

The analysis starts with estimating the CAPM. The panel data estimation technique using OLS is applied, as the sample consist of 50 stocks from 1998 to 2008.

The results show that β which is estimating the market risk which is positive and significant indicating investor is getting positive market risk by investing in stocks.

The intercept is α that is also positive and significant at 1%. This implies that there are some mispricing which are not captured by CAPM. Therefore CAPM doesn't hold in this case.

This motivates to include other variables sharpe and sortino theories are used to explain nature of investment for those investors who most probably prefer the mean variance. Mostly those investors who take investment decision based on mean variance efficiency. It can be explained by sharpe ratio:

$$S = E(R) / \sqrt{V(R)}$$

Or the sortino ratio with downside risk is calculated as:

$$S = \text{portfolio return} - \text{expected return} / \text{downside risk}$$

In case market is mean variance efficient than jenson alpha is equal to zero. If the incremental change in behavior give positive benefit than jenson alpha would be greater

than zero. Sortino ratio is used to gauge the behavioral effect in worst condition. This sortino ratio somehow shows that how the investor behaves in sudden decrease in value of stock or downside risk. This study is using CAPM and sortino ratio and turnover to evaluate the performance of investors while making investment decision. The sortino ratio and turnover are used to calculate the effects of two behavior biases that are overconfidence and disposition. The risk is estimated through CAPM and returns level associated with it is also observed with it. It shows significant results that behavioral biases have positive and significant impact on the investment decision of an individual in case of KSE stocks.

Model 2:

Effect of overconfidence & irrationality behind investment decision:

In today's world mostly investors are effected by their emotions, due to this they make irrational decision. According to behavioral finance, this irrationality in decision making is due to cognitive psychology of investors. This cognitive process drives the human behavior in different occasions. The uncertain decision making is usually govern by prospect theory. While making decision making, individuals are affected by personal likes, dislikes and their own perception about the reality. Due to many factors, investors show misperceptions about the reality.

The overconfident investors don't go in line with the basic investment policies. They are totally engage and full time act as an active investor to make decision based on their own collected or observed information. The best results for overconfidence behavioral biases show that in model2 α and β_1 are significant as in model1. But the β_2 is also positive and significant showing that increase in overconfidence of investors, increase the expected return of stock.

The least square technique is implied here and observed that market returns MR show significance of 5% and overconfidence behavior is also positive and significant at 1% shows that increase in positivity of behavioral bias increase the return of stocks

which is good for investors. In this model investor's psychology involve in their decision making, due to this many of the time they make false decision or too much cost implies due to their own way of getting information. Some time that source is not reliable and false information leads them to wrong decision making.

But this case implies at some of cases, not everywhere. Sometime investor decision is significant due to accurate way of collecting data and observing information. As in this model the results are significant due to positivity of behavior of investors.

Model 3:

Effect of disposition behavior on investment decision:

In model 3 the interesting results are obtained. Not only market return, overconfidence and disposition effect have positive affects or expected return. But the intercept turns out to be insignificant. It means that bias capture the mispricing which is not estimated by CAPM. In addition R square which is coefficient of determination tells how much is explained by model. In Model1 R square is 26% which increase to 36% when overconfidence and disposition is included in CAPM. Therefore it can be concluded that investor's bias explain the expected return in a better way.

As we have studied about the disposition behavior we came to know that people are more concerned about minimizing the number of losses. They usually don't sell stocks with riskier assets because they avoid large losses. Maximizing gain is their target as well but it come on second priority first is to reduce losses. It is observed from their study findings that as the investors are sensitive to losses and when they feel it's risky to invest in certain stock they avoid it. In this way when they realize prior gain they become willing to accept gamble as well.

It is observed that the investor's behavior with different stocks is different. They behave differently with holding stocks and their reaction to investments having large or small number of gain and losses is totally different. It is again their psychology which

varies. This behavior creates disposition bias in investor's decision. Then from table we can better understand the effects of this behavioral bias on the investments decision.

Here in this table the t- statistics. Probability and coefficient is observed for both of behavior biases and also for market index. The probability value come in positive as it is 0.000000 which shows the positive and significant affects of these two behaviors. Durbin Watson test is also applied to check the probability of risk and returns. Value of R square is also positive which shows that chances of getting positive alphas are large and when the positive alphas gathered the number of returns also increase.

Dependent variable: R1

Method: least squares

Date: 11/06/14 Time: 12:08

Sample (adjusted): 76248

Included observation: 2970 after adjustments

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	0.041961	0.014303	2.933737	0.0034
RML	0.099764	0.017667	5.647017	0.000
OCL	0.006819	0.003040	2.242920	0.0250
DEL	-0.008777	0.000443	-19.79797	0.0000
R-squared	0.133062	Mean dependent var		-0.096872
Adjusted R-square	0.132185	S.D. dependent var		0.179177
S.E of regress	0.166916	Akaike info criterion		-0.741312
Sum squared resid	82.63513	Schwarz criterion		-0.733236
Log likelihood	1104.848	Hannan-Quinn criter		-0.738405
F-statistics	151.7459	Durbin-Watson stat		2.356503
Prob(F-statistics)	0.000000			

By observing this table completely it is seen that how the effect of particular behavior

changes the market risk and increase number of investments. Even when the other biases affect negatively but our observation result is proved from this study and test analysis. The results come positive and significant affecting the returns and the change in decision making of investors.

Dependent variable is R1 and here the last square or OLS technique is applied and the results can be observed from table given below.

The illustration of above results are mentioned above that how the change in decision making of investors is influenced by the particular behavior biases and how these two behavior biases, overconfidence and disposition affects the decision making of investors positively and significantly and increase the number of return which is the target for every investors behind investment decision.

Correlation Analysis: table2

To check the association b/w dependent and independent variable correlation analysis is used. Now the thing which is focused in this study is to check whether there is positive relation b/w overconfidence & disposition effect on investment decision making of investor and risk-return or the relation is negative. The values for correlation test mostly range from -1 to +1. This shows that either the relation b/w variables are strongly positive or strongly negative. Thus the test is implied to check what are the results come when we check the positivity & negativity of relation b/w the variable as overconfidence & disposition.

	DEL	OCL	R1	RML
DEL	1.000000	0.311651	-0.349096	-0.049300
OCL	0.311651	1.000000	-0.067672	0.032590
R1	-0.349090	-0.067672	1.000000	0.115699
RML	-0.049300	0.032590	0.115699	1.000000

We draw results from this table. There is a positive relation b/w the risk and return & overconfidence & disposition effects of investment decisions. This shows that association b/w behavioral bias & change in investment decision is positive.

Estimation technique:

The study has data of 50 stocks on monthly biases for the period of 1998 to 2008. Therefore panel data estimation technique is used that allows estimating time variability as well as crossing sectional variability between 50 stocks.

To deal with heteroskedasticity least square technique OLS is used.

Chapter No 5

Conclusion & Discussion

Major Findings

In order to test the historical data from KSE whether the investors are influenced by behavioral biases & what are the effects of two specific behavior bias overconfidence & disposition.

- Stocks with large number of beta create more returns and relation between risk and return is also positive.
- Most risk stocks have low R-square value that's why investors avoid investing in such stock which has low R-square value.
- Active investors with behavior bias mostly outperform the market in period of 1998-2008.
- Investors show irrationality in decision making but they are not hundred percent irrational in investment decisions.
- Investment decision is affected by behavioral aspects e.g. overconfidence & disposition.
- The investors mostly avoid those stocks which create short run positive alphas.
- Those stocks having great performance are liquidated earlier by investors.
- Mostly investors in Pakistan are affected by disposition behavior bias because of avoiding from regret they keep losing stocks for long period of time within them.

Discussion of Results:

The main objective of study is to highlight the risk and return association and impact of behavioral biases overconfidence and disposition on the investor's decision. It is also affected by the active & passive involvement of investors. The active investors somehow get better results in their decision making. The hypothesis related to these investment decisions are discussed below & large number of results are carried out.

H1: higher the risk, higher the return indicates that beta is positive

In order to choose the performance of large stock & small stocks investor mostly focus on number of positive alphas generated by small stock or long stock & it is seen that small stocks have more positive alphas. Small size securities add more risk to portfolio in this way the probability generating extra returns of investors.

The stocks which are new at market, small stock have more chances to create extra returns but they have high risk as well & these investors who usually avoid high risk averse they avoid to invest in such stocks. Somehow it becomes difficult for authorities generate finance for carrying out new projects. That's why they make strategy by offering high returns to such investors to attract them. That if the beta is positive, the returns would be high as well. Then the chances to increase overall returns of stocks would increase.

H2: Efficient market is sufficient to explain the risk and return relationship

Investing decision of investor rely on high returns in shape of positive alpha. In first hypothesis the relation between risk and returns is shown by more positive beta obtained after empirical tests & in 2nd hypothesis it is shown that market efficiency depends on how better its stocks performed in past and expected to perform in future. The high book to market value always has positive & significant on stock returns. It is observed that mostly positive alphas which are generated have high book to market value.

The stocks having high number of betas always show financial distress that's why the stock return would be high. The financial distress influenced companies mostly need to offer high returns as compared to other solvent companies. This study somehow related to study of famous academics (Fama & French 1992). The reason behind positive beta stock is not much clear, as reason is financial distress or sometimes the stocks need to be sold at low price because of investor's perception that in future, the prices will go down. Companies mostly supposed to give high returns on value stocks because of their low selling price thus at the end affect positively the overall market returns of investors.

H3: over confidence bias can positively affect investment decision of investors

There is not 100% rationality in decision making of investors. The behavior and cognitive bias effect on the decision making of investors is significant. The irrational decision making generates more positive alphas and high returns. The test results show that tilt in decision making is affected by overconfidence bias. The overconfident investors always rely on their own gathered information and for this they become willing to take high risk.

Their target is to differentiate their decisions in positive way from other investors by generating high returns and more positive alphas. Mostly they overestimate their abilities and their talent as previously discussed. The investors think that they can predict future more accurately which influence their decision.

Another reason of this behavior is positive perception about their self. One of possible reason is they have control on their decisions making skills and also on the comparison of their assets.

Such investors spend time and money to generate own information and remain active throughout the process. The overall market situation is always in under consideration by small investors.

The passively managed stocks don't often generate high returns. In order to get high returns and to beat the market, the investors need to remain active throughout the process. Most of the time passively managed fund generates negative alphas and market is underperformed by such stocks and the encouraging results are not drawn. While the active managed stocks performance is observed that most of the time they outperform the market.

The results of such actively managed stocks are somehow similar to (fama & French).

H4: disposition effect can positively affects the investment decision of investors

Another behavior bias is focused in this study. Most of the time investors sell their winning stocks and retain their losing stocks in order to avoid regret in future. This behavior is known as disposition effect. There are different aspects related to such behavior of investors which influence their investment decision.

The basic reason behind this is hope for high returns and avoiding regret. When they feel that chances are not in their favor and their stock price is getting low. They retain such stocks and those which are raising their values, sold earlier by them.

Another possible reason behind selling those stocks too earlier is the tax associated with holding securities. They can't hold such stocks for so long, in order to gain more return. Sometimes the investors ignore the information about bad performance of a stock and keep on going with that stock. This behavior also relates with the disposition effect. The last reason behind holding or retaining losing stock for so long is that the investors have high risk associated with selling of losers.

They can't afford high lose prices. They negate regrets and wait until the prices fluctuate and again raise their value in market for such stocks. Up till that time they keep on holding those stocks.

Conclusion:

For 50 stocks over the period of 1998 to 2008 the risk-return relationship is estimated to understand the investors. CAPM is used first give the positive beta level. Intercept is also significant indicating mispricing. Therefore following Sheller investors behavior variables are included. First overconfidence bias is added that increase the R square measuring explanatory power of model. Beta has positive effects on the expected stock return. Than disposition bias is added, the intercept turns out to be insignificant so mispricing is removed by adding behavioral variability.

The objective behind this study is to highlight the all aspects either these are rational or irrational behavior of investors while making investment decisions. The historical data of 50 companies from period of 1998 to 2008 is taken to observe the affect of behavior biases in past on the investors.

Strong evidence and significantly positive results are obtained in favor of active management or involvement of investors it comes in the definition of overconfidence bias at some extent that investors don't rely on the market given passive information but they actually themselves involve in this whole process in order to avoid from risk and regret.

Firstly this active management is observed after than risk and return relationship is calculated through CAPM and simple OLS technique is used to observe the behavioral biases impact such as overconfidence and disposition. The investors focus toward the high returns and more positive alphas. This study also observes that how they control their decision and how much implications and recommendation they do for the generating of more positive alphas.

The irrationality behind the decision making is focused with the help of two biases overconfidence and disposition.

Due to the overconfidence behavior how the investor make irrational decision making it is shown by the simple test and results are positive which shows that all the investors don't behave in similar manners they have personality clash and they don't rely on market given information all the time and mostly overconfident investors rely on their own created information either it take large time and money as well. They don't care about it. It is shown clearly above in the results of tests.

Another bias is disposition bias which is also tested in this study, in this behavior bias the investors' personality clash according to market given situation and according to the environment change. The reason behind this is again the risk aversion situation. The investor who show disposition effects in their behavior don't take high risk and don't invest in risky stocks if they own the risky assets which values fluctuated in market than they retake it or retain it so that it wouldn't get any big loss. They immediately sell those assets which values rises in the market. It's because they don't wait to increase in value future due to fear of price down in future.

Such type of behaviors is understood with this study and tests are also implied to check either the results are positive or these behaviors have positive or negative effects. It is clearly seen that these type of behavior leave positive effects on the investment decision making of investors.

Implications:

Risk-return relationship cannot be sufficiently explained by CAPM. This is due to market inefficiency. But behavioral biases have role to explain risk-return relationship. Researchers, academicians, investors, portfolio management, authorities must consider behavioral aspect in addition to market factors. The positive relation is observed between risk and return factors. Higher the risk, higher would be the results. Another important finding of this study is the investors remain active in order to generate the positive alphas. In this way they totally involve their subjectivity in the process. Thus their behavior biases and personality clashes also affect their decision making.

Results confirm that behavior biases, overconfidence and disposition affect the decision of investors positively and significantly. Based on these findings, this study has few implications for investors. One of the important thing or objective is to generate the sufficient returns. The investor needs to manage the stock investments in such a way that it fulfill the operation cost of process to get more from the amount he has invested or used in getting correct and reliable information as in case of overconfident investor.

The investors should not completely rely on their own gathered information if they don't have any market experience they should consult with that of other technical persons in their team. They must not place themselves median as compared to other investors. If they make large number of decision based on the overconfidence behavior than it is possible that their decision would be irrational at most of the time and this is not good for market.

In case of low performance in market or number of shares down in market they must hold their nerves because the disposition effect can bring positive affects if they wait until the prices or the stock values cover their purchased price in the market. They should make an efficient and fine strategy for this.

In this way these all are the implications for investors for the better results in future and to get high returns.

Future recommendation:

This study create a dilemma to understand the behavior biases even when there are large number of biases but this study is specifically studying two of them with details and this is also an addition for new researchers to study these biases effect completely.

This study also highlights the effects of risk and returns of stock on the results which are positive and significant. Further researchers can use different weights to investigate this phenomenon. This study is specifically observing two behavior bias e.g. overconfidence and disposition effect. Further studies must be conducted to further

investigate the more behavioral biases such as pride, representative bias, cognitive bias, dissonance bias, familiarity bias and anchoring and adjustment bias.

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