CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, ISLAMABAD

Effect of Overconfidence Bias on Investment Decisions: Mediating Role of Risk Perception and Moderating Role of Self-Attribution Bias and Illusion of Control

by

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To My Beloved Father

CERTIFICATE OF APPROVAL

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Abstract

Behavioral finance is one of the trending hot topics in today's research world because of the fact, that most of the investors show behavioral biases when making their financial investment decisions. So far over confidence is one the most important and researched topic in this field. This research is aim to find out; How overconfidence bias effect investment decision whether the relationship is positive or negative along with the mediating effect of risk perception and moderating effect of self-attribution bias and Illusion of control between Overconfidence bias and Investment decisions . For the purpose Interpretivist approach has been adopted to carry out the research so that objectivity of the research is maximized. Quantitative inquiry mode is used to collect data via a structured close ended questioner based on a Likert scale. Probability simple random sampling method is used to collect the data, making a cross sectional contact from a samples of 200 individual and institutional investors. Hypothesis are tested using regression analysis in SPSS and Hayes Process model 9 is used to study partial moderation mediation effect of risk perception, Illusion of control and self-attribution bias among overconfidence bias and investment decisions. The results proposed that there is positive and significant relation between overconfidence bias and investment decisions and risk perception fully mediates the relationship between the two and self-attribution bias act as moderator. Whereas the effects of Illusion of control as a moderator are insignificant.

Keywords: Overconfidence Bias, Investment Decisions, Illusion of Control, Self-Attribution Bias, Risk Perception.

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Chapter 1

Introduction

1.1 Background of the Study

Traditional finance expects investors to be rational and logical decision makers who follow expected utility theory. But from years it is observed that they don't actually act logically and rationally rather they follow their intuitions. Most of them make illogical decisions as they are likely to have certain psychological biases because humans don't have the ability to implement what traditional financial theory says about dynamic optimization.

Market efficiency is well-defined as the integration of accessible information into the rate of financial assets. The Efficient Market Hypothesis (EMH) is based on rational investor thinking and should be perfect. However, the results of many studies are relatively dissimilar from the estimates of efficient market theory, which may explain some anomalies in the financial market. De Bondt and Thaler (1985) challenged EMH and pointed to the development of behavioral finance theory. Their research shows that the market is inefficient due to false changes in investor sentiment such as pride, distrust, distress, and optimism. They also pointed out that the rapid development of events can lead to irrational investor behavior. In fact, investor sentiment can cause market volatility, causing various assets to be priced above or below their realistic value. Therefore, behavioral finance represents the basis of alternative finance theory, assuming that investor behavior is not

completely normal. Next, they found out that the advantage and challenge of modern finance needs to explain the phenomenon of behavioral bias.

Researcher argues that "limits to learning" is one of the reasons the people are biased. Sometimes they assume with available amount of information the whole picture even though they don't have all the available information (Kahneman 2011) and avoid the evidence which is not available (Slovic, 1981). Other time they use basic rules (heuristics) according to their needs and preferences to cope with overloads of information that they cannot analyze and evaluate. Thus, leading to biased behaviors while making investment decisions (Monitor, 2000). Our memories and accessible info shape the worldview that we embrace and often is deform. (Taylor, 1991).This results in change in behavior of investors which leads to take course of action by over reacting against big changes in market (Kudryavtsev, 2010) particularly for smaller and unpredictable markets (kudryavtsev, 2018). Two other important factors also explain why some of behavioral biases occur, these phenomena's are known as selective abstraction and over generalization. Selective abstraction is "a process based on contextual details that require special attention, overlooking other signs of the situation and intellectualizing the overall experience of the basics. While over-generalization is the course of "portraying overall inferences about their capability, performance or value based on a sole facts."

The theory of financial behavior is based on two simple rules. Foremost, investors are not completely rational, because their claim for risky financial assets is affected by sentiments and opinions. Though, economic fundamentals do not support the latter, which tends to distort outlooks. The second supposition is that the arbitrage effect of completely rational investor transactions is limited. Therefore, there is a dispute between EMH and the basics of behavioral finance.

Behavior economics also plays an important role explaining power of economics so that convincing psychological foundations are achieved (Camerer & Lowenstein, 2004).The few psychological factors that make the bases of these biases include herd behavior, overconfidence, risk appetite and optimism. Human beings have the tendency towards self-deception which leads them to optimistic delusions and individuals make this a path to confirm their intellectual well-being and welfare.

These Optimistic deceptions give birth to renowned prejudices of overconfidence, optimism, perception of control, perception of knowledge and self-control.

Economist asserts that by understanding psychological theories we can understand human behavior how they act in certain situations and how they behave in financial markets. They make their investment decisions and show irrational behavior while making decisions. Psychological factors play important role in behavior finance theory (kengatharan, 2014).These emotions and panic effect decision making powers of investors. Behavior finance suggests that the investors don't benefit themselves at all with those biased decisions that they make and it informs us how and why these investors make errors. Various economic dynamics are not handled with rational thoughts. That's why several theories have been used by the researchers to describe the association between psychological biases and their effect on investment. Cognitive theory, bounded rationality theories and prospect theory tries to explain these biased decisions. Prospect theory claims that people make their decisions on the basis of their perceptions about their success and failures. They are ready to take risk if they are assuming that they are going to face losses and they become risk averse in case they believe they are going to earn profits in future. (Tversky and Kahneman, 1979)They don't make their decisions on the basis of what finance theory says about maximizing expected utility. Another theory which is bound rationality theory,digs deeper in to the concept of maximizing utility and they try to explain it in more realistic way. That there are several factors that deviates investors both individual and institutional from rational decision choices. They argue that individuals have limited capacity to make decisions their decision making abilities are based on two aspects: Individuals inadequate cognitive abilities and limited access and understanding of information. Furthermore social and individual theories are used to understand how market works.

Economists have also assumed the laws of rational decision-making so that we can choose between several option estimations (Prince & Baye 2013), there the supposed worth of the result is related to the deviation Point (Nutter, 2010). Though, from the past events it proposes that the tendency of individual's choices or judgments diverges from expectations & norms of economic frameworks. (Stanovich

and west, 2008) Which indicates that all decision makers, including investors, fails to properly gauge the possibility of results; they don't always capitalize on utility; and they also apply their perceptions on others, somewhat because of dual process reasoning (Evans:2008).

Researcher so far has made many attempts to examine the behavior of investors to make understanding regarding investors investment decisions and the over confidence bias , which is most important phenomenon in behavior economics (Debondt &Thaller, 1994; Daniel & Hirshleifer, 2015). It is a cognitive prejudice, where individuals devote unnecessary confidence in intuitions, judgment & cognitive capabilities. (Wood & Pompian, 2006) Cognitive biases, or "unhelpful mindsets," are reasons behind biased thinking behaviors or styles. As sensible Individuals, we are constantly rendering the world around us and making an effort to understand what is happening. Sometimes our mind finds easy ways "short cuts" and produce somewhat precise results that are not completely true. Diverse cognitive abbreviations can lead to different types of prejudice or bias in our intellectual. Sometimes we may draw the nastiest of interpretations of our decisions, and sometimes we held ourselves responsible for something that is not our mistake. Cognitive biases occur unconsciously - we don't want to be imprecise. A reputable example of cognitive bias is what Baker formerly called "selective abstraction" but is now commonly referred to as "thought filter". It defines our propensity to pay attention to an element that is often out of context and disregard other additional significant fragments of the practice/ experience.

The literature has identified two types of over confidence, overconfidence in individual's knowledge and individual's capabilities (Varrey & Griffin, 1996). Overconfidence in individual's knowledge has been defined as belief that one knows more than it actually does. While the second type of is a belief of better than median effect which is also known as better than average effect. Both of these type lead investors to some positive illusions which leads them to make biased or some time wrong decisions. HO and HANG in 2009, claim that two kinds of investors are present on financial market. The first alarms financiers who dispose of private information and may create effect of overconfidence bias. The second investors are those who make use of only public information and are expected to be logical. It is

indicated that overconfidence approves the overestimation of investors related to the precision of accessible verification. These overconfident investors miscalculate risk by perceiving it to be lower than it actually is and thus tend to take part in risky investments (Guth, Ditrich and Macijovesky, 2006). Overconfident investors believe that they will achieve higher margins of profit and minimum risk (Ainia and Lutfi, 2018). This deviates from well-known fact of Markowitz theory about risk and return, where there is always tradeoff between risk and return you either have to compromise on returns and play safe with low level of returns or you can earn higher returns only at higher level of risks. The risk taking behavior depends on the investment objectives and investors approach toward risk.

The evidence provided by Chuang and Susmel (2011), shows that private investors are more confident than institutional investors. Institutional investors are types of investors who work on behalf of others and make choices for their money. They are not a person they are legal entities who works under an organization (Celik and Issakson, 2014) while individual investors are those who make investments for their own they are usually on a smaller scale and are custodian of their own money. Taking Taiwan as an example, they showed that in the bull market, rising market, rising momentum market, and low certainty market, retail and institutional investors are more active in transactions, and only individual investors' transactions rise after the market rises. More importantly, under the three-condition market and the high unpredictability market, the trading activity of individual investors is higher than that of institutional investors.

In this study we will be focusing on how overconfidence bias affects Investment decisions of both individual and institutional investors and the mechanism in which other variables like self-attribution bias, illusion of control and risk perception contribute to it .In this study it is assumed that both self-attribution bias and illusion of control adds to the effect of overconfidence bias and thus investors tend to take higher risk leading to wrong investment decisions.

In self-attribution bias people attribute success to them and attribute external factors for their failure the researchers argue that investors after successful events become more confident and because of overconfidence they trade more aggressively and over confidence grows. (Deniel, Hirshliefer & Subhramanyam, 1998) Often,

in attribution unclear situations are affected by one's needs and desires. Precisely speaking, self-attribution bias is a self -perfection bias, which is related to people's propensity to unreasonably attribute success to themselves; and self-protection bias, which is related to irrational refutation of accountability for distress. This bias is properly announced into representative awareness models through certain behavior models, which try to deliver a theoretic frame for the pragmatic performance and abnormalities recorded in the financial works of Gervais and Odean (2001), Chuang and Li (2006). Research also shows that there is a strong correlation among the both biases, attribution bias & overconfidence bias.

Investors love to consider of themselves as rational decision-makers, who make decisions that are carefully centered on statistics & rationality. The illusion of control is one of the several cognitive prejudices that hamper this idea. This illusion occurs in situations where things are obviously hit and miss, like lotteries, and where we obviously can't control the results, like sports games. However, we are sensitive to the feeling of having some impact. "Control illusion" was invented by Harvard University psychologist Alan Lange. From her studies, she directed six diverse experimentation to understand when and where this prejudice would occur. In each experiment, participants were asked to take part in some type of gamble, with cutting cards and entering the draw.

The perception of control defines how we feel? Do we think we have more control over actions than we really do. Even though if something is accidental, individuals frequently think that they can impact it in some way or another. For example when choosing their lucky number that will make them win. When narrowed down to individual levels, individuals believe that they have more control over something than what they actually have, they may end up picking a simple strategy to achieve something instead of rationalizing about it and predicting potential difficulties. Where validity is that these effects will not transform our state, it can also allow individuals to pin their expectations on superstition and fairy-tale thinking. Anytime investors feel they have more control over the event than they actually do, they might risk making bad decisions. This can lead to many harmful behaviors. A case of this is gambling habit. People who continue to gamble even though they have lost a lot of money to do so, in part since they have

faith in that in some way they have extraordinary skills or understanding that can help them achieve great victories. Daniel Kahneman, is the utmost leading personality in behavior finance, discusses this propensity in his book, Thinking, Fast and Slow. This work is devoted explanation of two aspect of thinking which he named in his book as system that defines that way individuals think. System 1, is involuntary and spontaneous where individuals have no control, whereas system 2 has complex thoughtful process involved in it and are intentional mindful. He explained that it is the job of system that equips individual with effortless random clarifications. That means individuals derive outcomes without having enough of rational thinking about them

In Previous studies, researchers has identified certain relationship between these variables which argues that the perception of control drives the ability of market forecasters, a stronger perception of control has an evident and negative effect on individual investment decision because they result in higher level of overconfidence(Stotz & Nitzsch,2010).There is close link between perception of control; and overconfidence bias in a situation we can say that overconfidence exists when there is a stronger perception of control (Hilary and Menzly ,2000) However this relationship is more pronounced when forecasting earning as compare to prices (Stotz & Nitzsch,2010).

Over confidence also effects the risk perception of investors which in return effect their investment decisions. These perceptions are projection of human mind in which they comprehend risk associated to their investment that is far from reality. This bias is inversely proportional to the investors risk perception, higher the bias lower will be their perception of risk (Simon, 2000). Usually investor's decisions are reflection of their past performance which affects their risk-taking behavior as compared to technical investors or those who are not exposed to overconfidence bias. For example investors with past good performance are optimistic about future gains and as a result they are willing to take more risk. Similarly if they have poor performance recently they become more risk averse and thus invest in less risky investments. These investors make decisions on the basis of their past performances rather than making their investment decisions on the basis of Market information. This relates to the argument of Victor Ricciardi about psychology of

risk, where he explained the phenomena “it won’t happen to me” where people are so overconfident that they take risk regardless, which they don’t consider taking in any other social circumstance. This happens because these investors believe that they are better than other people in doing what they are doing. They are simply optimistic about their own skills & capabilities and certain gains. Generally speaking, people prefer positivity, they are biased about positive outcomes this effect is called optimism bias, sometimes called the ”Poliana principle.” They are positive about the entire world and themselves. This prejudice is so deep that it really has impact on our view of the world and the means we think and concentrate. Human beings pay more attention to positive information than negative information; they recall happy things rather than sad things; when making choices, and place more emphasis on optimistic forecasts than pessimistic forecasts. This optimistic bias is probable to lead to an illusion of control: where individuals want to believe that everything will be fine, even if it is impractical. Investor’s positive illusions lead them to make biased or some time wrong decisions.

Overconfidence causes investor to misinterpret the accuracy of their own information and overestimate their skills in analyzing them. Thus, due to high initial confidence they misinterpret the information transferred via market signals (Camargo, Sade, Schnitzlein & F. Zebder; 2015). This can lead investors to poor investment decision, excessive trading, risk taking and ultimately loses overconfidence leads investors tolerate more risks, minimum diversification and increased trading activity (Merkle,2017).

Over confidence also causes abnormalities and bubbles in the market (Merkle, 2016). Year 2008 was year of the historical economic crisis, accompanied by the downfall of the real estate market, again sparked concern among economic marketplaces and financial instabilities. This financial crisis played a very important role for the identification of how emotions and sentiments can bias the behaviors of investors and not how acknowledging them can be so dangerous for the financial world.

Politicians and financial experts ignored the big bubbles that existed previously in the history before the financial crisis of year 2008-2009, believing that they do not happen or that they can’t be discovered. , Or may or may not do anything,

or there may be accidental outcomes and other justifications. After that crisis, it was difficult to ignore the actual financial impacts of asset bubbles on economy, particularly when the economy is wrongly assessing these resources. This bubble eruption will prolong the downturn of the financial world and a recession will be faced as outcome. And will cause huge monetary damages. (Jorda 2015). So it is derived that investors sentiments makes them overoptimistic for their returns and in these hopes of high return they take part in investments activities without giving enough of thought and reasoning into it thus creating bubbles in the marke.They don't only damage investors personal wealth but the overall economy.

Individual's emotions play an evident role in emergence of biased emotion in investors and these emotions in return encourage bubbles, but due to various reasons, the stock price cannot be forced to hold the ground rules and participate in the bubble to avoid this. Both individual investors and fund managers has the tendency to contribute to the bubble formation because they don't want to feel left behind other investors and thus follow their foot print without logically thinking about it and show herd behavior. The possibilities explained for institutional investors contributing to herd behavior is time constrains and lack of resources for example available information (Schiler, 2002).

A thorough review of each security was carried out, and after realizing that the investment decision is based on private information, they can also choose a competitor. Also researcher give emphasis to the fact that short selling by emotional investors is expensive and dicey, so rational investors will not trade at stock prices that reset their actuals, these are investors who take advantage of arbitrage thus they do pay more attention. Set the price (bubble size) before the bubble reaches a local high. Bubbles will not provide arbitrage investors with an opportunity to rise during the bubble, but tend to fall within a short period of time after investor biases emotions touches its top.(Vishney & Schleifer, 1997)

Investor sentiment clearly predicted the use of the bubble, and the contents of the bubble rate were higher after elevated emotions by both individual and institutional investors In addition, more confident stakeholder sentimentality have also fueled the stock market bubble. According to observations, these emotions

heightened before the bubble reached its top. These feelings can predict when the bubble will burst.

There are enough of evidence to support this hypothesis that these feelings can predict returns and where how bubbles will be created So, financier sentiment has a strong ability to predict the eruption of a bubble, and this ability will be made for a long time in the future. The results of this study complement existing research as investor sentiment can predict stock returns and the expansion and penetration of the bubble (Pan ,2019). Overconfidence and optimism are the prime factors behind these market bubbles and unconsciously investors are willing to take risk that is way beyond their risk appetite due to these optimistic perceptions about return .

As Overconfidence increases the risk perception of the investors also increases and rather than collecting all the available information and properly evaluating them they make illogical decisions and take more risk than they actually think they are taking. These behaviors were also explained by barber and Odean (2001), that overconfidence leads investors to aggressive trading decreasing expected efficiency. There are also few studies who believe that this increase in risk perception due to overconfidence has positive effects on investment decisions as there is a positive relationship between expected risk and return.

The volatility of the asset marketplace is carefully linked to market emotion. Index use to measure investor sentiments was founded by Wurgler and Baker that affects returns on investments from stock market. They designed it using five variables and named it as Investor sentiment index. This index was used to study how investors are affected by their emotions and feelings and in return how it affects the assets. While other researchers were focused on market investors' attitudes towards achieving equal returns on capital flows.

Index was created by Huang (2015) to study investor's sentiments in the market place that remove the effects of market noise. This index is better measure of market sentiments as compare to the previous one discussed. Consumer confidence index is also considered to be a useful measure of market sentiments and is commonly used among researchers. This measure was used in the studies of Welch

& QIu , (2004), Schemling (2009) and they found evidence that these sentiments negatively affects the investors return in future.

Summarizing the outcomes of the operational framework, it is understandable that individuals who do not pay attention to accurate substitute valuations may be affected by behavior biases, namely self-attribution and overconfidence. If they suffer losses, they become careful and re-examine the basics of their investment. In general, it is strongly evident that individuals avoid rationality due to cognitive biases such as self-attribution and overconfidence, and instead strive to get used to market changing aspects.

To date, many researches has been done to find out the effects of over confidence bias on investors investment decisions but there still remains questions and needs to dig further into it. What are factors behind the effect of over confidence bias? In past researches it has been identified that we should further explore to understand investors risk-taking behavior in the presence of overconfidence bias understand psychology of analysts (Lew, Sean & Combrink, 2019). Emmanuel, Orly, Charles & Jaimein (2015) also suggest further studies on overconfidence so that we can generalize the studies.

Few more researchers called for research to find out whether overconfidence and illusion of control lead to sub optional trading performance & studies should be done to see what techniques are most effective in reducing Biases in decision making calibration and feedback techniques should be considered first (Meier, chris, Demello, 2019).To answer these questions we aim to find out in this research. Whether overconfidence bias is directly related to investment decision and this relationship is mediated by risk perception of investors?

Additionally this study urges to find out whether illusion of control and self-attribution bias moderates the relationship between risk perception and overconfident bias. This moderation is known as partial moderation –mediation effect (Hayes, 2018). The model for the study was selected from Hayes's Process model 9. For the purpose a survey based on Likert scale consisting of six sections is conducted. These are highly structured questionnaire. The very first portion is about respondents back ground consisting of seven questions.

Second one is about investment decision the dependent variable (Y) consisting of twelve questions, third section consist of independent variable (X) the overconfident bias, it has ten questions. Fourth and fifth section comprises of two moderators the self-attribution bias (W) and illusion of control (Z) with four and five questions. The very last portion includes Risk perception with seven questions in it. Data is collected from both individual and institutional investors.

1.2 Research Gap

In past researches it has been identified that we should further explore to understand investors risk-taking behavior in the presence of overconfidence bias understand psychology of analysts (Lew, Sean & Combrink, 2019). Emmanuel, Orly, Charles & Jaimein (2015) also suggest further studies on overconfidence so that we can generalize the studies. Few more researchers called for research to find out whether overconfidence and illusion of control lead to sub optional trading performance & studies should be done to see what techniques are most effective in reducing Biases in decision making calibration and feedback techniques should be considered first (Meier, chris, Demello, 2019.

Subsequently, to meet the need to measure the effect of how these biases like overconfidence bias, risk perception, illusion of control, self-attribution bias in developing market and the reasons behind overconfidence bias. This research is going to find out whether overconfidence bias is directly related to investment decision and relationship between them is mediated by risk perception of investors. Additionally this study urges to find out whether moderation effect of illusion of control and self-attribution bias exists between risk perception and overconfident bias.

1.3 Problem Statement

Overconfidence so far is one of the most important concepts in the field of behavioral finance (Debontg.Thaller1994: Daniel & Hirshleifer, 2015). Those who

acquire wealth through successful investment may become more overconfident and because of overconfidence they trade more aggressively and over confidence grows.(Deniel, Hirshliefer & Subhramanyam,1998).Here investors are not able to know the extent of their knowledge thus results in overrating their skills and knowledge .They believe that they can anticipate future better than others (Grave & Ranguest, 2018).

They take the credit of success to themselves. Investors are not completely rational, because their claim for risky financial assets is affected by sentiments and opinions. Investor's positive illusions lead them to make biased or some time wrong decisions. Positive illusions can lead them to well-known biases of overconfidence, optimism, illusion of control, illusion of knowledge and self-control.

Thus the expression of the problem is overconfidence bias is directly related to investment decisions and how risk perception affects the relationship between the two. Additionally whether self-attribution bias and perception of control has an indirect effect between risk perception and overconfidence bias by acting as a moderator between them and changes the way they effect investment decision of both individual investor and institutional investors.

1.4 Research Questions

This study tries to answer these following Questions:

Research Question 1

Does overconfidence bias have direct and significant impact on investment decision?

Research Question 2

Is there a relationship between risk perception and investment Decisions?

Research Question 3

Is there a relationship between overconfidence bias and risk perception?

Research Question 4

Is there mediating effect of risk perception between overconfidence bias and investment decisions?

Research Question 5

Is there a moderation effect of self-attribution bias between overconfidence bias and risk perception?

Research Question 6

Is there a moderation effect of illusion between overconfidence bias and risk perception?

1.5 Research Objectives

Objectives of the study are following;

Research Objectives 1

To identify relationship ship between overconfidence bias and investment decision.

Research Objectives 2

To identify effect of overconfidence bias on risk perception.

Research Objectives 3

To identify effect of risk perception on investment decisions.

Research Objectives 4

To identify mediation effect of risk perception between overconfidence bias and investment decision.

Research Objectives 5

To identify moderation effect of self-attribution bias between overconfidence bias and risk perception.

Research Objectives 6

To identify moderation effect of illusion of control between overconfidence bias and Risk perception.

1.6 Research Model

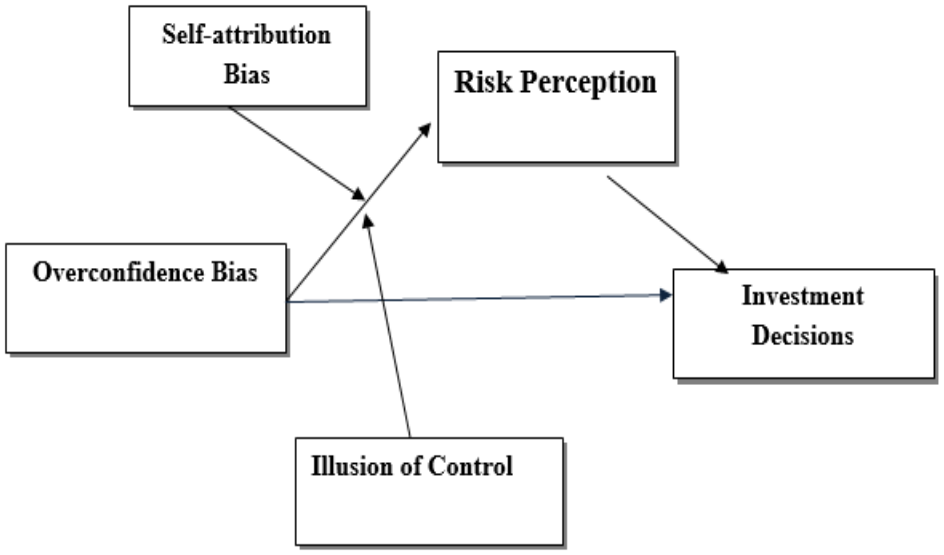

FIGURE 1.1: Research Model

1.7 Theoretical Framework

In behavior sciences ,researches use mediation to make sense of mechanism by means of which relationships between variables are operated and moderating factors are used to recognize the contingent factors or boundary circumstances of impacts, means when they happen (Hayes and Rockwood, 2020). In this study we have used conditional process analysis to study moderation mediation of role of variable between overconfidence bias and investment decisions. **Figure 2.1** shows conceptual framework of this research. This is derive to empirically examine the role of overconfidence bias, the independent variable (X) on the dependent variable (Y) the investment decision with the mediating role of risk perception and moderating role of self-attribution bias and illusion of control.

Where Path a shows direct relation of overconfidence to risk perception the mediator (M) and this mediator is then directly related to investment decisions Via path b. The path C shows direct relation of overconfidence bias to investment decisions. The two moderators both self-attribution bias (W) and illusion of control (Z) are indirectly related to Risk perception and overconfidence bias. This model is known

as partial moderation mediation model where the two W and Z are independent of each other which mean in the absence illusion of control; self-attribution bias will still act as moderator and vice versa. This Frame work is taken form Hayes process model 9 (Hayes, 2018).

1.8 Significance of the Study

This study makes several important contributions. To begin with this research will be able to find out whether overconfidence bias has actually a negative effect on investment decisions. In addition we can find out what are the reasons behind overconfidence bias and what actually strengthens it. Whether illusion of control and self-attribution bias actually strengthens the effect of overconfidence bias on risk perception of the investors by acting as a catalyst between the two? Also we will be able to comment on that, whether to be bias will always have negative effects only? It will also have contextual contribution because as these biases are needed to be study in emerging markets. Last but most important would be, once this study finds out the reasons behind these biases and mechanism they follow we can acknowledge investors about these biases to avoid them or will able to minimize its effect on their investment decisions. To make investors aware of any bias in terms of their own knowledge, so as to make better use of information sources in decision-making.

1.9 Scheme of the Study

Rest of the study is arranged in following manner: chapter 2 includes literature review regarding all the aspects of the research .Third and fourth chapter consists of methodology & result and analysis used for the research. The very last chapter consists of conclusions where the results of study have been discussed in details and answers for research questions and objectives are provided. Also limitation and future direction for further studies are provided in the same chapter.

Chapter 2

Literature Review

2.1 Investment Decisions and Behavioral Biases

Behavioral economics didn't emerge until the mid-twentieth century when the study of seemingly illogical humanoid behaviors began. Despite the fact that several discrete experimentations with extraordinary models have been recognized, Tversky and Kahneman proposed the first integrated economic decision making model in a revolutionary theory called Prospect theory in 1979. It provides a consistent framework that defines some of the heuristics of decision-making errors. Their assumptions show that financial decision-making depends on the framework (in terms of effectiveness) and that people avoid losses ((losses are significantly more unpleasant than profits).

Till the early 2000s, behavior and neuroscience economics grew separately, with research in the same discipline beginning to integrate methodologies and insights from psychological perspective and other domains. In recent financial markets, the confluence of psychology and neurology with economics and finance has provided new paths to financial marketplaces. This facilitated the development of neuroeconomics. Neuroeconomics, as the name implies, integrates aspects of these different domains and use neuroscientific approaches to demonstrate how choices are formed by precisely monitoring cognitive function when financial rewards are involved.

The discipline of neuroeconomics arose from the combination of brain processes with economic decision-making. Because the decision-making mechanism will take place in the brain, it's critical to comprehend the neurological mechanisms involved. Certain brain regions are linked to many elements of human behavior (Sharma and Srivastva, 2017). Marketing dynamics, which is a part of neuroeconomics, are also explained using neuroscience approaches by NueroFinance. "Neurofinance is a new discipline that examines capital markets via the use of neurotechnology to assess investment behavior patterns" (Sabastian & VAsile, 2010) .In the finance market, decision-making is often referred to as a process because it incorporates preferential selection, inconsistent behavior, and complicated judgment call in a changing context (Srivastav, Deep kumar, and Achal kumar, 2019). Financial decision-making may also be characterised as a "social science" topic.

Erkut advocated in 2018 that financial knowledge, personal psychology, and the human mind can be combined to better understand economic stance behavioral patterns. The human psyche, as we already understand, is the most complicated part of the human body, therefore it is regarded as a black box. The brain's sophisticated processes are in charge of ultimate decision and human natureand engages in the process of decision-making. In his investigation, Rangel (2008) identified numerous stages in the decision-making process, including learning, categorization, appraisal, choosing, and action delivery. To create well-defined judgments, these steps are interconnected in some way. Every phase of the decision-making process takes place in separate parts of human mind.

Various regions of the brain are intertwined, and their connections are mirrored in human behaviour. Details regarding projected returns or costs enter the limbic system, which uses linked movement and cognition networks to build the foundations of essential motion and mental plans, and then translates it into final decision-making. These anatomical structures, on the other hand, embody the fundamental concepts of the decision-making process, and they are the consequence of significant judgments dependent on desire to select among many plausible alternatives and expected outcomes (incentives/ punishment) (Pirtoek et al., 2009).

In another study, Knuston & Kuhnein, (2005) who are experts of finance and neural science stated that emotional states influence decision making significantly

through a similar channel. They indicated that the divergence of economic decision from rationalism is founded on a neurological process: this mechanism begins in the brain region when the nucleus accumbens (NAcc) is engaged for risky choice. Furthermore, research have demonstrated that two distinct neutral circuits, including the NAcc and pre-exogenous positive or negative stimulation, might influence risk seeking and aversion, with enhanced neurogenesis in the NAcc and AI areas. High risk seeking or aversion behaviour is the outcome.

The researchers assessed the exaggerated, inappropriate, and average likelihood of selecting stocks over bonds by providing highly stimulating positive pictures, negative perceptions and neutral images before each trial. Even though such explicit activation level indications are difficult to find in the actual life, implied volatility of options and other mood indicators might offer an indication of investors' overall emotional state. This model backs up the bullish and bearish market phenomena that happen during times of heightened and reduced fluctuation, as well as the conditional variance model, which shows a negative connection between volatility and residuals. Investor sentiment, in reality, employs market forces to establish commodity values and, as a result, financial market conducts. Economists, in particular, are divided on whether human behaviour is "unstable" (Shiller, 1999).

As a result, intellectuals and behaviorists propose distinct conceptual approaches. Simultaneously, rationalism's central assumption is that people are capable of evaluating the likelihood probabilities of prospective occurrences in order to discover the secret of creating economic value. People will act rationally (or totally reasonably) under the direction of this theoretical premise of human behavior (Morganstern & Neuman, 1953). The last decade, however, has revealed the second kind of behaviorists, offering a different theoretical perspective on financial markets, embracing human (investor) irrationality or bounded rationality. (Kahneman and Tversky, 1979; Zeng, 2006). Ultimately, limited human rationality does not mean human irrationality (Tseng, 2006), but explains how people make decisions based on the behavior of others (Zak & Sepra, 2008). It is important to note that individuals tend to be emotional (rather than rational) when facing stressful environments. (Zehndorfar, 2018). Numerous financial plans have a significant influence on human beings 's lifestyles, and they are decided at several levels of

the economy. A family's fiscal borrowing decision, for example, might have a substantial influence on their economic standing. Government regulation frequently restricts the terms of accessible loans and how these agreements are described.

Loan borrowing costs and accessibility will be influenced by the effective collaboration of hundreds of individuals' lending selections, as well as government regulations and business actions about lending aggregation and processing techniques. From the owners' ambiguity or credulity to public sentiment affecting legislation to whether the financial institutions accurately comprehend (and "rate") our system, the operation of this fintech industry is susceptible to all levels of expertise. The global financial crisis of 2008, which resulted from the system's faults and moral hazard, was an example of how the system's flaws and economic incentives resulted in tragedy. Until lately, few were known about the psychological and neuroscientific systems that govern financial choices.

Authors explained some recent studies involving cognitive concepts at each of the four levels of economic decision-making: (i) domestic monetary decisions on reserves, borrowing, and expenditure (ii) individual financial asset transactions (iii) how participants' marketplace judgments are pooled to establish asset values; (iv) managerial choices linked to the acquisition and investment of business money . They looked at a number of quantitative data to see how psychological processes influence financial choices. At all levels of operation, these departures occur (from family to CEO). (Frydman & Camerer, 2016). Equity investment market pricing, and administrative regulations are all affected by these strong decision-making anomalies, according to the behavioral economic research. What is less obvious from a brain research viewpoint is the neuroscience behind the observed relationships of savings, investing, and trade behavior. Significant development has been achieved in the rigorous understanding of the cognitive activities that lead to the observable finance decision-making framework thanks to the productive collaboration among behavioral theory of economics.

How specific concepts may be utilized to describe protracted impacts is one place where this fresh information, when paired with neuroscience ideas, might help to behavioral finance. There are a number of way this works that are inconsistent with the reasonable suse of knowledge and the optimum risk-reward ratio, as

academics have already demonstrated. Understanding the interconnected pattern of multiple biases is a crucial next step in synthesizing this information. Many of these apparently disparate biases, according to research, may be produced by comparable neurological and cognitive processes.

The literature says people are likely to have psychological bias when investing, because humans don't have ability to implement what traditional financial theory says about dynamic optimization. Therefore they use basic rule (Heuristics) according to their beliefs and preferences to cope with overload of information that they control, analyse and evaluates thus leading to biased behavior (Monitor,2002). Bias refers to the improper use of information or incorrect anticipations about self and decision-making context. (Combrink &Lew, 2019). Individuals has wide range of beliefs and preferences that bias their investment decisions. They use various filters to make sense of information available to them which reflect how human mind works when they are going to make investment decisions. These can be affective influence and emotions, inflating processing strategies perceptual organizational principle or psychological motives (Sahib, Arora & Dhameja, 2013). These perception and beliefs together bias the investors to take a particular course of action. Some of these biases come from emotional point of view while other from logical point of view. Also the positive relationship of many biases with the individual's sense of satisfaction and with their financial planning management further elaborates these investor biases as a normal phenomenon. They are systematic behaviors that guide the process of investor decision making "To be Bias is not necessarily bad as long as it leads to result that the decision maker wishes" (Oslen, 2007).

It was then that economists realized people are not rational, but our abilities are limited solving complicated problems (Simon, 1995), researchers have explored this limitation, especially when making a decision that investors can't utilize maximum out of the available choices, but just satisfy it, and Make the best decision within the limits. Also Rather than thinking logically and analytically the decision makers make decisions instinctively using their instant reflection which results in heuristic behavior. They find short cuts to reach to a decision or find conclusions and ultimately results in biased decisions (Kahneman, 2011) and evaluation errors

(Iqbal, 2013). Heuristics helps investors to solve complex problems into simpler ones making the decision making process easier to cope with overload of information. Which otherwise they are not able to process or don't want to go through these extensive processes of evaluating information These results in biased decisions most of time when used improperly in diverse situations (Kahneman ,2011).

Further these biases make investors believe that high risk is not correlated with high returns which finance theory believes in. (Mitroi & Opriou, 2014). Emotions can conceal the risk of the circumstances or instinct and irrational thoughts may prevail. (Slovic & king, 2014) Overconfidence causes investor to misinterpret the accuracy of our information and overestimate our skills in analyzing them. This can lead investors to poor investment decision, excessive trading, risk taking and ultimately loses. A stronger perception of control also has an evident negative impact on individual investment decision because they result in higher level of confidence (Stotz & Nietzsch, 2010) because of close connection between overconfidence and contextual control, we can say that feeling of control is stronger when there is overconfidence. In excessive trust one can make a bad or aggressive decision about one's investments. Thus we believe to view that our investment decisions as less risky than they actually are. Overconfidence leads investors to "overweight their own private information at the expense of publicly available information" (Chaung & Lee, 2006). They mistakenly attribute market gains to their own ability of picking winning stocks which leads to underestimation of risk. One of the main concerns is that overconfident clients may believe that they possess more knowledge and understanding than they actually do.

From the perspective of Social Comparative Theory (SCT), we know that individuals will frequently gauge their own good or bad, but this is not entirely the case. A recent 60-year meta-analysis showed that we rank ourselves above those who are not equal to our status or below our status and lower than those above us so we compare ourselves to other rather than embracing our adapting behaviors or characteristics. (Gheeber,Wheeler and Sur 2018). Therefore, Social Comparison Theory suggests that we often make poor self-assessments of our own performance, or misjudge the quality of our own skills and achievements-especially when we compare our capabilities and performance to that of others. If investors

overestimate their performance relative to others, rather than seeking information and guidance from other investors which results in less than ideal investment decisions. There are also few studies who argue that overconfidence has a positive impact on investment decisions.

2.2 Overconfidence Bias and Investment Decision

Overconfidence so far is one of the most important phenomena in the field of behavioral finance (Debondt & Thaller, 1994; Daniel & Hirshleifer, 2015). Overconfidence is a cognitive bias in which people have unwarranted faith in their intuitive reasoning, judgment and cognitive abilities (Pompian and wood, 2006). Overconfidence is the gap between the individual's belief about their capabilities and actual competence that they have in financial area.

(Pikulina Reneboog, Tobler, 2017) While Tversky and Kaheman (1974) define overconfidence as people précising themselves better than they are. While overestimation, over placement and over precision is treated as same concept when overconfidence measure them (Moore and Healey,2008) Over estimation is when one is over optimistic about one capability while over placement refers 'better than average' effect where individuals think of themselves to be better than others. Over precision is where investors tends to be too optimistic about accuracy of their beliefs, few people are very confident about their investment abilities of making better decisions as compare to their peers.

They consider their knowledge equal to that of financial experts if not above them. These type of investors has a strong belief of optimism and the confidence that they can make profit above average and attribute their success to themselves (abilities), by using statements I invested where I felt I should, I know my investment will rise and grow in future and my investments has always outperformed compare to the market (Sahib,Arora & Dhameja, 2013).

Researchers also found that investors believe in their own skills rather than trusting on others for their investments they think others can't decide the best for their

investments. They believe in having control over their investment decisions because they have more faith in their own judgment and intuitions. Overconfidence is actually the perception of a person's about one's performance to be better on average than others (Guenther & Alicke, 2010).

Likewise, overestimating oneself leads to overestimating one's ability to assess the risks of the situation and to reduce risk measures (Penning,Post ,Hoffman ;2013) Overconfidence investors assume the best circumstances(Lovallo & kahnemnan, 2003) and risk appetite of the investors increases collectively with the with perception / sense of control over risk (Gilovich & Doughlas, 1986). Individuals with prior trading experience are usually more confident than the ones who are not experienced, irrespective of the feedback and their performance. This is not significantly better and consistent with their initial self-assessment. Thus, due to high initial confidence they misinterpret the information transferred via market signals (Camargo, Sade, Schnitzlein &F. Zebder, 2015).

Literature Review indicates irrational thoughts leads to overconfidence, then irrational behavior and ultimately the irregularities in financial market. For instance, it leads investors tolerate more risks, minimum diversification and increased trading activity (Merkle, 2017). Overconfidence is also associated with Investment forecast which is manipulated by investors as they overvalued the precision of their own knowledge and the ability to predict the upcoming events better than others (Graves and Ringuest, 2018). Work has been done to explain to mechanism that how positive and negative feedback works with overconfidence. Meire and De Mello (2019) in their article aims to explore the issues that force experts and non-experts market participants to decide to buy or sell stocks and make decisions once they receive feedback for their performance in the market. They tried to find out how overconfidence impact decisions powers of investors and did so by experimenting. They asked the individuals to define confidence interval about pricing of securities This was done by asking some informational questions with a define confidence level.

Though, this method has dual restrictions not everyone usually is indifferent on the required question and the subsequent one is that repetitive inquiry afterwards getting opinion are not possible, because participants are required to know the

true value of the knowledge question, no confidence interval is necessary.The first-hand technique helps to assess variations in overconfidence once reviewed, because stock price predictions can be computed by multiple iterations. Using the fresh technique, they checked the adjustment route for overconfident people after providing strong or conflicting suggestion for previous judgments. They found evidence for overconfidence tendency to vanish after the emergence of solid review, which challenges the early decision-making procedure and leads to a collapse of overconfidence. After these collapse, confidence can be restored once the signals of feedback are restored, excessive confidence will reappear and past decisions will be reinforced. This result adds to the literature by explaining the phenomena for the overconfidence readjustment procedure. The proposition that both individual and institutional are victims of biases like self-attribution and overconfidence causes investors to become overconfident after the arrival of comments supporting previous judgments.. On the other hand, due to the self-attribution bias, the confidence level does not adjust after the emergence of proofs which challenges their decision, so over time investors learn to be overconfident. Results show that when enormously contradictory evidence comes in, overconfidence disappears, so there is definitely a procedure of restoring the average confidence adjustment at the experience.

Overconfidence is one of the reasons for higher price volatility and trading activity therefore a lower expected utility. These investors over trade and consequently give poor performance. (Barber and Odean, 2006) In 2016 an experiment performed by Mikhailova and Schmidt showed that overconfident investors increases the frequency of market bubbles.

During the same year, Merkles investigated links between risk and overconfidence in form of over precision and over placement of trades for sample of UK base where overconfidence is related to some kind of risk Receptive behaviors Studies have also claimed that people in isolation are less confident as they are not affected with opinions of others like the ones trading on digital platforms as compare to those trading in interactive environments.

It has a negative effect on trading performance and also traders in an interactive environment are more over confident and poorer as compare to those in isolated

environment (Philip & K. Cheng, 2007). Hindsight bias provides us understanding of overconfidence bias. It is one of the reasons behind overconfidence bias where people relate their future profits or success on the basis of their past performances.

In the Famous book of Black Shawn (Taleb, 2007) warned that the past is not a good indicator of the future, although we tend to build foundation of the future on the basis of past events. Furthermore authentic and professed knowledge is expected to escalation of the bias.

Knoll and Arkes, (2017) This predicts the faith of professionals on their knowledge, resulting in impracticable/ unrealistic confidence and leads them to perceive that that they will perform the same as they performed in past and keep securing their gains in future. Also Charlene and Lew in 2019 found that, the expert investors ranked themselves above mediocre when compared to their co-workers while parallel to experts and confirms the presence of overconfidence bias but for a given level capability. When we analyze the relationship between risk perception and overconfidence bias we observe that overconfidence leads to risk taking behavior where no benefits are realized. (Lovallo & Kahneman, 2003).

They also found in their study that overconfidence can also lead to best case scenarios (Lovallo & Kahneman, 2003). This argument is also supported by other researches who believe that confidence is a valued individual attribute because it motivates and encourages individuals to achieve rewarding long-term objectives even in the face of adverse short-term results. This research demonstrates about how people's confidence in their skills affects their investment decisions. They found out regardless of solid financial rewards to precisely assess their abilities, many test subjects in their experimentation, systematically misunderstood their skills higher and participated in more investment activities due to higher confidence levels. They also argued that very high levels of overconfidence and under confidence adversely effects investments decision. As under confident investors are afraid of failure thus they don't participate in investing activities and losses the chance to win. While exceedingly overconfidence is dangerous because investors take risk beyond their capacities and damage is irreversible. Too much overconfidence is always dangerous.

2.2.1 Types of Overconfidence Bias

There are two types of overconfidence, overconfidence in one's knowledge and in one's abilities (Griffin & Varey, 1996).

- Overconfidence in one's knowledge can be defined as a belief that one knows more than it actually does which is sometimes labeled "miscalibration or over precision. The confirmation for this type of overconfidence comes from an experiment where student were asked a few questions and they had to guess how correct were they in their answers (Yates, 2002). Fischer and Philips (1982) Griffin and Tversky (1992)) also performed a study and proved that subjects were 100% urging that they did right answers whereas only if actually 80% did while research shows that only 60, 70% of people give right answers and this type of overconfidence is also known as "standalone overconfidence" because it is another type of self-appraisal which doesn't need to be compared with others (Acker & Duck, 2007). This is a very strong form of overconfidence and also a broader one.

- The second type of overconfidence is the confidence in ones abilities. Which is a belief that a person's is better than a median person and has been labeled as "better than average" according to research conduct by several researchers to find out level of confidence in drivers sevens (1981) McCormick, Walkey and green (1986) and Delhomme found that of course only 50% of drivers are actually better than regular drivers. This type of overconfidence is also is described as referential overconfidence (Acker and Duck, 2007).

Researchers are interested to find out how much these two types of overconfidence are related to each other. It's not possible to distinguish between these two types of overconfidence. However when overconfidence is defined as false belief of a person in accuracy of their information adds to the literature of Miscalibration. It indirectly considers that the accuracy is being evaluated comparative to the accuracy of the data stored by others. This relates to referential judgment. T Glaser and weber didn't found a link between "better than average" and Positive illusions. Finally, one study found evidence for positive correlation among two types

of overconfidence (Stankow and Crawford, 1997) While Grinbalt and Keloharju in (2009) found that finish investors with an inflated sense of their abilities tend to trade more.

There is strong evidence for both stand alone and referential overconfidence. But researcher also stated that different measure of Overconfidence are not necessarily correlated, confirming to the study of Glaser and weber 2007 that we can't use evidence of one type of over confidence to justify the existence of other. (Acker and Duck, 2007) The propensity to overemphasize the chances that one's ideal results will be achieved may become inflated due to better than average effect, sense of control and idealistic optimism. (Ggriffin & Brenner, 2004) These factors add to the overconfidence of the investors and in return these overconfident investors make decision like higher trading activities and price fluctuation in market.

2.3 Overconfidence Bias and Illusion of Control

The Perception of control defines how we feel when we have more control over actions than we really control. Even though something is accidental, we frequently think that we can impact it in some way or another. People desperately need to feel in control of their situation. This need is so strong that any how the perception of control has physiological consequences (Schulz & Aderman, (1973); Slelar and Anisman (1981)). Individual feel happier as they feel themselves in control and go to any extents to get that perception of control which they actually are not and this is referred as illusion of control. (Stotz and Nitzsch 2010). In content of financial markets one can find strongest form of perception of control is unrealistic if a person believes that he/she has significant impact on the market event. In this case there is hardly any illusion of control there is very little perception of control when market participants thinks that they can explain why something happened. Experience has shown human access to its contented system over estimate the correctness of their judgment (Fischaf;1975).Anytime we feel we have more control over the event than we actually do, we risk making bad decisions.

In a study done by stotz and Nitzsch in 2010 they tried to found out that over-confidence is dependent on perception of control when doing projections. In these

cases, "Perceptual control" refers to the ability to perceive correctly and evaluate all significant influencing aspects and the ambiguity in specific conditions. The former research try to find out how perception of control drives the ability of market forecast, a stronger perception of control has an evident effect on investment decision negative one because they result in higher level of confidence . Kahneman in his famous book "Think, Fast and slow" in 2011 talked about how illusion of control works and he found out two types of system 1 and system 2. Where he informed us that illusion of control is explained by system 1, which is illogical and comes up with casual explanation to reach a conclusion. Unlike system 2 which is more logical and a complex process to find explanations to events happening.

Overconfidence is expected to be obvious in a condition which allows a person to have stronger perception of control. In simpler form higher the confidence when there is more sense of control. This hypothesis was confirmed in 2000 by Hilary and Menzly. They point out that market analyst who gave above average forecasts in past failed to do better forecasting in future. The reason behind this was enhanced sense of control & reason for there poor forecasting were found to be overconfidence and rating their capabilities above average.

Further in the same study when analysts were asked to estimate earnings of a firm because of the fact that these experts have a lot of information about company and close contacts with a managing board of members and other representatives. These factors lead them to be in perception of control because they considered themselves to have better estimates of firm because they thught they know the firm. Along with these factors they also have knowledge of different sectors because of their expertise in the field which further inflated their sense of control.

When they examined the result on average analysts, they ranked their forecasting to be better than their colleagues. These experts argued unlike price a change which is result of irrational investors and happen by chance or by general market moments, it is based on detailed knowledge of company and sector experience and hard work. This confirmed that there is kind of intense overconfidence which is result of increased perception of control. And also they qualify their research above average compared to others (Stotz and Nitzsch, 2010).

Hence, their study shows that analyst and experts overconfidence is more pronounced when they are forecasting earning as compare to prices because analyists have stronger perception of control when forecasting earnings than prices rather than future prices. This also supports hypothesis that perception of control, significantly influences the level of overconfidence thus it is said that stronger the perception of control higher the level of overconfidence.

2.4 Overconfidence Bias and Self-Attribution Bias

Researchers have tried to explain why overconfidence is so dominant among people and more strangely why people don't learn from past mistakes. It is believed that many people possess certain behavioral biases that contribute to permanence of overconfidence bias. One of these is self- attribution bias where people tend to attribute success or good outcomes to their abilities, while blaming failures on circumstances or plain bad luck. For example, a lot of people think highly of their investing ability they believe they can time the market or pick the next hot stock. What actually happen is when the market is raising most stocks will do well, including those that they pick and most people take that as conformation of their judgment. On the other hands when they drop in price they will generally blame it on circumstances on which they had no control. Such as, general condition of market or economy as it was. People will learn to be overconfident (Codean & Gervais, 2001) .Overconfident investors overvalue the precision of their own knowledge and the ability to predict the upcoming events better than others (Graves and Ringuest, 2018).

Biased Self-attribution is the propensity of one's thinking and superior capabilities as indication of extraordinary skills while attributing actions challenging them to disrupt. Gervais & Odean found evidence in their study that self-attribution bias feeds overconfidence through a circular process. Also Daniel in 1998, found evidence in their model "outcome dependent confidence" for presence of self-attribution bias while Fischoff in 1992, found via their experiment evidence for

co-existence of overconfident and self-attribution bias and to the limits they are linked. In the phases of logical decision making usually three stages are involved. The first stage consists of information seeking and the second one involves alternative evaluation among the available choices.

During these two stages investors are vulnerable to self-attribution bias and overconfidence because after investors gather evidence through numerous channels, they can take a risky stance and figure out taking risks as unavoidable option. A large number of investors correctly apprehend the relationship between risk and return, and increase investor confidence, it creates the prejudice of overconfidence and self-attribution. After carefully reading this information, the decision makers can carry on estimating another course of action grounded on transaction costs, technical analysis, and fundamental analysis. Furthermore those who acquire wealth through successful investment may become more confident and because of overconfidence they trade more aggressively the confidence of investor grows when public information is agreement with investors information (Denil, Hirshelieiefer & Subhramanyam; 1995).

When investors face self-attribution bias they are influenced by their necessities and requirements precisely speaking, self-attribution bias is a self -perfection bias, which is related to people's propensity to unreasonably attribute success to themselves; and self-protection bias, which is related to irrational refutation of accountability for distress. This bias is properly announced into representative awareness models through certain behavioral models, which attempt to provide a theoretic frame for the pragmatic performance abnormalities recorded in the financial works[Gervais and Odean (2001), Chuang and Li (2006)]. Research also shows that there is a strong correlation among the both biases, attribution bias & overconfidence bias.

Other researchers also found during their study of checking cross- cultural overconfidence that not all the participants were overconfident but they found strong evidence that Asians were more confident then British participants. The reasons for Asian over confidence was not self-attribution but they stated that the possibility is that this overconfidence in Asians was raised because of over optimism

and unweighting the risk. Also they found strong and positive relation between strong overconfidence and skill attribution. (Acker and Duck; 2007).

The Psychological evidence indicates that people tend to credit themselves for past success and blame external factor for future Fischoff (1982) Langer and Roth (1975) Taylor and brown (1988) found that few investors put it in a way that "Heads I win, Tails its chance" these individuals are exposed to self- attribution bias they think that they more abilities than average "Known as Batter than Average." (Taylor and Brown1988).As self-attribution enhances overconfidence, so the subject who suffers from bias will be overconfident in their decision and judgments. From past literature it was also found that individuals having self-attribution bias become more overconfident after a success. This affect's conception about own capabilities as it hinder evolution of past performance and this lead to overconfidence. (Seppala, 2009).

2.5 Overconfidence Bias and Risk Perception

Perception is way of mental procedure which provides us sense of sight, hearing , sensations effected by facts and in return these sensations affect our decisions (Ainia & Lutfi,2019) Definition of risk is different for different people , something perceived as risky investment might be considered a minor risk by another one. Risk perception is a way how someone feel or act towards a situation, threat or vulnerability. It attempts to explain valuation of an uncertain occurrence or situation on the basis of intuitions, available information , one own experience, complex decision making process (V.Ricardi, 2008). Making investment decisions Investors has to trade off between risk and return and the investors outlook on risk influences their decisions (Pompian, 2012; Nofsinger, 2017). Now individuals who perceives high risk tends to invest in less riskier assets compare to the one who perceives risk to be lower, invests in riskier assets to have low risk portfolio or investment (Roger, Broihane, Marli, 2014).

Risk appetite is Considered "...the general capacity that how much an investor or decision maker can bear risk" (Sitkin & Pablo, 1992) which makes the basis of

risk taking behavior. This Show the basics of perspective theory where decision makers may avoid taking risk and preferring secure profits for beginning, then shift to become risk takers when potential losses threaten. (Kaheman & Tversky, 1979) while Markowitz, (1952) who is a believer of efficient market hypothesis , argues that investors are consistent that they have a defined risk appetite they either have high risk appetite , invest in risky assets or will have a low risk profile, assets with low risk.

It is a well-known fact that circumstanional and personal factor factors determine risky behavior of decision makers. (Iqbal, 2013) And these investors who are guardians of their shareholders wealth have to transfer value for their investments / money. For the purpose they have to maximize return and diversify the risk fully. Risk behavior of different investors varies (king and Slovic, 2014) a kind of investment considered to be risk by one investors might not be considered as risky by other investors, because perception of risk is different for different investors. It also depends on the knowledge and information they have about different investments options.

Sometimes an investment considered to be risky by investors might not be actually as risky as they perceived it to be or sometime they may perceive an investment to be less risky than it actually is. The reasons behind these can be the limited amount of information they have about that particular asset or some of the biases that they face during risk evaluation for their investments.

Also Stanovich & west in 2000 found that otherwise deficiency of information may result in risk ignorance investors. So, it is very important for investors that they have knowledge of the risk to facilitate them during their decision making process to avoid foul and unwise decisions. More or less all kind of assets have some kind of risk associated to them. Investors have to bear risk if they desire to have high returns. Overconfidence Bias is itself a heuristic bias where people make fast decisions with whatever information available to them which leads to cognitive biases and errors. These investors fail to process the information that is available to make a rational investment decision for example, making decisions on the basis of past performance. This can be sometimes difficult due to limited knowledge of the investors where they fail to analyze the available data. According to

prospect theory "Individuals make their investment decisions on the basis of their past performances i.e. Profits or loss rather than the final product.(Kahneman and Tversky, 1979) These decisions lead to error in judgments. Likewise, overestimating oneself leads to overestimating one's ability to assess the risks of the situation and to reduce risk measures.(Penning, Post, Hoffman; 2013) In 2015 in a study done by Hirshleifer, informed us that decision makers usually make errors by getting themselves into certain habits and depend on them , devoid of thinking enough about them . Then he went on saying that amplified awareness with particular type of stocks results in increased interest of investors towards them because they believe knowledge about a certain stock reduces risk related to it. An experiment performed by Mikhailova and Schmidt in 2016, showed that overconfident investors increase the frequency of market bubbles. During the same year, Merkles investigated links between risk and overconfidence in form of over precision and over placement of trades for sample of UK base where overconfidence is related to some kind of risk receptive behavior. Emotions can conceal the risk of the circumstances or instinct and irrational thoughts may Prevail (Slovic &King, 2014).

In contrast other studies done by the researches in Pakistan context argues that risk perception positively effects investments decisions rather than negatively effecting because if they perceive high level of risk related to an investment they then make better investment and tend to avoid risks. (Maqsood Ahmad and Syed Zulfiqar Ali Shah; 2020). Overconfidence also leads investors to assume the best circumstances (Lovallo & Kahnemnan, 2003) and risk appetite of the investors increases collectively with the perception / sense of control over risk. (Gilovich & Doughlas, 1986; Wilson, Asad and Mccanon, 2016). Michailova and Schmidt in 2016 found in their experimental research that overconfident investors are less risk averse and they value holding more risky assets more. They further found that mostly over confident investors over estimate prices and they are more optimistic about their future gains than the one with low overconfidence. Also pointing out that overconfidence is the cause behind over estimation. Further in the article discussing the past studies the researchers mentioned that professional investors are usually more overconfident and make wrong moves regardless their experience

and knowledge and this overconfidence leads them to over trading which means they are willing to take more risk.

Acker and Duck in 2007, as discussed earlier found that in other cross cultural studies that Asian were more overconfident than Britishers and self-attribution bias was not the reason behind but it was actually due to under estimation of risk because of over optimism.(Kahneman & Lovallo 1986) They found the Asian men and women were equally confident. Also they found strong and positive relation between strong overconfidence and skill attribution. Though there was no difference between levels of self-attribution bias and overconfidence found in both Britishers and Asians, so the reason for change between their overconfidence was not evaluating risk properly and that is why they showed more price instability and trading activity in markets. (Pikulina, Renneboog, Tobler; 2017).

2.6 Hypothesis Formulation

From the collected works we have come to conclusions that the theory of bounded rationality provides overview of the limits of decision-making. These restrictions are either misuse of information, research or dodging risks based on the options assessed, personal profit anticipations, own characteristics and emotional and exterior or conditional factors. It gives the impression that when investors make decisions based on the past can lead to overconfidence, knowledge of the past hurdles and possibility of risk behaviors. Additionally when they attribute success to themselves and failures to external factors because of blind faith in their abilities, it boosts their confidence resulting in increased trading activities and taking risk for granted. As self-attribution enhances overconfidence, so the subject who suffers from bias will be overconfident in their decision and judgments. From past literature it was also found that individuals having self-attribution bias become more overconfident after a success. This affect's conception about own capabilities as it hinder evolution of past performance and this lead to overconfidence (Seppala, 2009). This was also confirmed by Lovallo and Kahneman in 2003, that there is a connection between risk perception and self-rated performance. The perceptions of control & situational factors also add to the confidence of investors leading to risk

taking behaviors which ultimately has a negative impact on Investment decisions. Overconfidence is expected to be obvious in a condition which allows a person to have stronger perception of control. In simpler form higher the confidence when there is more sense of control.

On the basis of above arguments we hypothesize that

H1: There is significant and direct relationship between overconfidence bias and investment decision.

H2: There is significant and direct relationship between risk perception and investment decisions.

H3: There is significant and direct relationship between risk perception and overconfidence bias.

H4: Risk perception mediates the relation between overconfidence bias and investment decisions.

H5: Illusion of control strengthens the relationship between overconfidence bias and risk perception.

H6: Self-attribution bias strengthens the relation between overconfidence bias and risk perception.

Chapter 3

Research Methodology

3.1 Research Design

3.1.1 Research Philosophy

For the purpose Interpretivist approach will be adopted to conduct the research which is subjective and regulatory change. The reason of adopting these approaches is that in behavior biases researchers deal with irrationalities because biases itself are subjective. Here studies depend on social actors who play or experience those biases and show them in their behaviors. Because of the nature of the subject it can't be value free so as a researcher to reduce the biasness we researcher need to be independent of the data so that it is not biased. Otherwise it will not be easy in a "feelings research" where researchers have to gauge the feelings and behaviors of investors as compare to "resource research" where they deal with solid facts and figures but in this study we will try to minimize the effect.

3.1.2 Research Approach

Usually a theory is developed and verified on the basis of induction and deduction approach. In case of deduction approach an existing theory is adopted and reaches to inferences on the basis of already existing facts (Sekara, 2006). The purpose of the research is to find out the impact of overconfidence bias on investment decisions

with mediating effect of risk perception and moderating role of self-attribution bias and illusion of control.

There is a lot work done on these behavior biases and this research is conducted using the existing behavior theory to find out mechanism of relation among these variables. That's why deductive approach is adopted to carry out this research.

3.1.3 Inquiry Mode and Data Collection

To achieve the objective of the study and test the hypothesis primary data. The primary data was collected using survey method via highly structured questioner. About 216 questioners were directly distributed among both individual and institutional investors. Of these 200 questioners are used for analysis, which were filled properly by the respondents. The preferable method of data collection is to use highly structured questioner from large samples and a quantitative mode of inquiry which will lend them to statistical analysis. Although it is difficult to analyse the data easily but this method will maximize the objectivity of the research and minimize the biasness. As compare to subjective form of research where researchers have to deal with social actors e.g. investors in this case.

3.1.4 Instrument for Data Collection

In the survey close ended questioners are used so that target audience can fill easily and they are easy to interpret and time saving. The questioner is based on different scale including likert scale adapted from well-known researcher and provided with a range of options to select from. The questioner is consisted of six sections.

Section A: This section is about respondents back ground consisting of seven questions. This portion is about the demographics of investors and consists of seven questions.

Section B: This second section is to measure investment decision the dependent variable (Y). This is adopted form Hoffmman , Sheffrin and Pennings (2010) &

Hiren and loibl, (2008). It comprises of twelve questions which includes investment objectives, Investment strategies, and ambition level and investor sophistication.

Section C: This consist of independent variable (X) the overconfident bias, it has ten questions. This scale was adopted from Seppala, (2009). This is about thinking styles, ranking yourself compare to others.

Section D: Self attribution bias the moderators with four questions which includes questions like how do you rate your skills and reason your success or failures This was adapted from K.c (Mishra and Mary Metlida 2015).

Section E: This section is about second moderator the illusion of control (Z) and five have questions. Here questions were asked whether investors feel in control while making investment choice and whether they are more optimistic about results when they have control over their choices.

Section F: The very last portion includes risk perception with seven questions in it. The scale was adapted from Aquino, Houghton & Simon, (2000) the question were to determine risk tolerance and whether perceive successful investments of past to be less risk.

Respondents were individual and institutional investors. These included both investors who participates in investing activities either for themselves or on others behalf. These were identified by selecting investors from brokerage firms which are listed in pakistan stock exchange Data was collected by personally visiting these investors and also by online survey questioner. The questioner is attached in the **Appendix A.**

3.2 Instrument Reliability Test

To check the reliability of the instrument Cronbach's Alpha test is used in SPSS Software. All the questions except the demographics were selected for the reliability test and these were 38 questions and the values for Cronbach's Alpha in table 3.1 shows that instrument is highly reliable and research can be carried out.

Table 3.1: Reliability Analysis

Reliability Statistics	
Cronbach's Alpha	No of Items
0.899	38

3.2.1 Sampling and Population

The sampling of the study consists of Probability sampling and due to time constrains simple random sampling methods are used. The population consists of all kind of investors participating in investment decisions which includes both institutional and individual investors. The sample size is 200. Probability sampling other methods are not used because they are much time consuming and costly methods which is difficult to perform in current restricted situations of pandemic and limited resources . It is very difficult to reach out investors on larger scale.

3.2.2 Time Horizon

The data for the study is collected during the whole research period and no of contacts made with respondents is one time. This means cross sectional method is adopted to conduct the study which can be changed in future according to requirements of the research.

3.3 Data Analysis Method

The data collected through surveys was analysed using SPSS. Statistical technique use to perform the analysis was regression analysis and descriptive statistics which is most appropriate technique for carrying out this type of research. Further Hayes process model made it easier to study the mediation and moderation effect together. He has proposed 92 process model and out of these process model 9 is compatible with this research objectives which shows partial moderation mediation relation with two moderators in it that operates independent of each other (Hayes, 2018).

3.4 Regression Equation

Model 9 has been selected for this study form Haye's process Model. Where two moderators self attribution bias and illusion of control are moderating path between Independent variable overconfidence bias and mediator risk perception indicating an indirect effect. Both moderators are although following common path between X & M but they both are independent of each other. That means in the absence of illusion of control we still assume that self-attribution bias will act as moderator between overconfidence bias and risk perception.

This phenomenon was explained by Hayes's in 2018 and named it as partial moderation mediation. So model is defined as when investors decides about their Investment decision (Y) they face overconfidence Bias (X) and there exist a direct cause and affect relation between these two. While risk perception act as tool via which this effect is activated. However both self-attribution bias and illusion of control moderate this relationship because in the presence of self-attribution bias and overconfidence bias risk perception of the investors is more pronounced due to boosted overconfidence bias. So overconfidence bias results in more risk perception especially among those who score higher in self-attribution bias and illusion of control. On the basis of these facts this study derives these regression equations to test our Hypothesis.

Regression Equation 1:

$$\hat{Y} = i_y + \acute{C}X + bM \tag{3.1}$$

Regression Equation 2:

$$M = i_m + (\alpha_1 X + \alpha_2 W + \alpha_3 Z + \alpha_4 XW + XZ) \tag{3.2}$$

Regression Equation 3:

$$RP_i = i_m + \alpha_1 OCB_i + \alpha_2 SAB + \alpha_3 IOC + \alpha_4 OCB * SAB + \alpha_5 OCB * IOC \tag{3.3}$$

The equation 1 shows unconditional effect of risk perception (M) on Investment decisions (Y) while equation 2 shows indirect effect of overconfidence bias on Investment decisions (Y) which we assumed is mediated by risk perception (M) while m is the product of conditional effect of overconfidence (X) on the risk perception(M). Here α_4 XW shows the interaction of overconfidence bias with self-attribution bias (W) and α_5 XZ shows interaction of illusion of control with overconfidence bias. These explains indirect effect of overconfidence bias(X) on investment decisions (Y) through risk perception (M) by self-attribution bias (W) and this is known as index of partial moderation mediation. Z is the same effect with moderator illusion of control.

Third equation is same as the second equation it represents equation with variables of this study. where RP is the mediator, risk perception, OCB is independent variable overconfidence bias, IOC is the moderator illusion of control, SAB is 2^{nd} moderator self-attribution bias and ID is the dependent variable investment decision. Whereas OCB*SAB shows the first interaction between overconfidence bias and self-attribution bias while OCB*IOC represents second interaction between illusion of control and overconfidence bias.

Table 3.2: Hayes Process Model

Name	**Symbol**	**Variable**
Overconfidence Bias	AvgforOC	Independent Variable
Investment Decisions	AvgforID	Dependent Variable
Risk Perception	AvgforRP	Mediator (M)
Self-Attribution bias	AvgforSA	Moderator (W)
Illusion of Control	AvgforIC	Moderator (Z)
(AvgforOC x AvgforSA)	Int_1	Interaction 1
(AvgforOC x AvgforIC)	Int_2	Interaction 2

Chapter 4

Results and Discussions

4.1 Descriptive Statistics

Table 4.1 it shows frequency and descriptive of the variables. The frequency shows that there is no missing value for any of the variable. There were 200 respondents and all the responses are valid.

The descriptive of the variables are represented by mean, median, std.deviation and maximum and minimum. The choices that were given to the respondents are based on likert scale and other options combined ranged from 0-6 these choies varies according to nature of questions and so the scale. Mean values represents average value for each of the responses and median are the middle values while standard deviation shows deviation from sample mean with respect to each of variable. The maximum and minimum shows the available choices provided to the respondents to choose from. Now mean value 1.66 for oc, the overconfidence bias informs us that it is closer to zero which is the minimum value and scale for overconfidence inform us that people are less overconfident as we move to from 0 to 4. This means the respondents are overconfident.

The next variable is investment decisions and scale shows us that as we move from the minimum value zero to maximum three, the respondents will perceive themselves to be less experienced and the belief in capabilities will be lower and lesser will be the value of investment for them they will less optimistic and less biased.

The mean value for avgforid is 1.81, which is again close to zero which means people believe in investment activities and consider themselves as experienced individuals who have enough of knowledge and experience in what they are doing simply these individuals are optimistic about their capabilities and are biased in their investment decisions. . In the scale used for self-attribution bias as we move from 0 to 4 the self attribution bias decreases in the respondents. The mean value for avgsa is 2.12, which is closer to 0 the minimum value which means most of respondents are prone self attribution bias but thsi value is very close to median which means selfattributed respondents are just slightly higher then those who are not self attributed. The mean value for illusion of control is .85 and median is .80 which is closer to maximun value 2 that means that most of respondents dont have significant perception of control when making investment decisions because as we move towards maximum value 2 respondents illussion of control decreases.

TABLE 4.1: Descriptive Statistics

Statistics					
	AvgforRP	**AvgforSA**	**AvgforOC**	**AvgforID**	**AvgforIC**
Mean	1.8	2.12	1.66	1.81	0.85
Median	1.86	2.25	1.8	1.92	0.8
Std. Deviation	0.623	0.892	0.6	0.574	0.379
Variance	0.388	0.796	0.361	0.33	0.144
Minimum	0	0	0	0	0
Maximum	3	4	4	3	2

4.2 Regression Analysis

Table 4.2 shows collective effect of overconfidence bias, risk perception, bias on investment decisions. This regression analysis reports that there is a direct effect of overconfidence bias and risk perception on the dependent variable investment decisions. This study found and statistically significant impact of both risk perception and overconfidence bias on investment decisions ($P<.01$)

The next **Table 4.3**, to comprehend how both variable OC (X) and RP (M) individually affect dependent variable ID (Y). This also reports the direction of impact

whether it is positive or negative. The output shows that impact of overconfidence bias (X) is statistically significant and positive (P<.01, β=.3380). Which means overconfidence bias brings 33.8% positive change in investment decisions. Risk perception has also statistically significant and positive impact on investment decisions (P<.01, β=.3665). It brings 36.5% change dependent variable.

Table 4.2: Collective Effect of OC & RP on Investment Decisions

R	**R_SQ**	**MSE**	**F**	**DF1**	**DF2**	**P**
0.6968	0.4856	0.1712	92.9796	2	197	0.0000

Table 4.3: Effect of OC, IOC, SAB on Investment Decisions

	Coeff	**Se**	**T**	**P**	**LLCI**	**ULCI**
Constant	1.153	0.1256	9.1827	0.0000	0.9054	1.4006
AvgforOC	0.338	0.0703	4.8089	0.0000	0.1994	0.4766
AvgforRP	0.3665	0.0677	5.412	0.0000	0.233	0.5001

4.2.1 Mediator Analysis

Table 4.4 reports the relationship of the all the independent variables with mediator (M) variable, the risk perception. It shows that the relationship of all these variables collectively is statistically significant with risk perception (P<.01, R=.7837). This means they bring 78% change in risk perception.

Table 4.5 explains how individually these relationships work with risk perception (M). It includes all the independent variable along with their interactions. The symbol in table - AvgforOC represent the impact of overconfidence on risk perception which shows a significant and positive relation. That means overconfidence brings 51% positive change in risk perception. Symbol AvgforSA explains relation of self-attribution bias on risk perception which is positive and significant. It

brings 12% change in risk perception. Symbol AvgforIC explains relation of risk perception with illusion of control which is again statistically significant and positive. It brings 29% change in in risk perception. These statistics prove that risk perception act as mediator between overconfidence bias and investment decisions.

TABLE 4.4: Collective Effect of OC, IOC, SAB & ID on Risk Perception

R	**R-SQ**	**MSE**	**F**	**DFI**	**DF2**	**P**
0.7873	0.6143	0.1536	61.7835	5	194	0.0000

TABLE 4.5: Individual Effect of OC, IOC, SAB,ID on Risk Perception

	Coeff	**Se**	**T**	**P**	**LLCI**	**ULCI**
Constant	1.18416	0.0308	59.7075	0.0000	1.7808	1.9025
AvgforOC	0.5109	0.0594	8.597	0.0000	0.3973	0.6281
AvgforSA	0.1262	0.0411	3.0698	0.0024	..0451	0.2037
INT_1	-0.1527	0.0578	-2.6433	0.0089	-0.2666	-0.0388
AvgforIC	0.2913	0.0873	33,379	0.001	0.1192	0.4635
INT_2	0.0896	0.138	0.6494	0.5169	-0.1825	0.3617

4.2.2 Moderator Analysis

The very important part of the **Table 4.5** is the interactions of SA & OC, OC & IC which explains the moderation effect of illusion of control and self-attribution bias This portion INT-1 reports regression analysis of variable M onto self-attribution bias and interaction between self-attribution bias and overconfidence bias. This output informs that this interaction is statistically significant (b=-.1527, p<.001) suggesting that self-attribution bias (w) moderates the effect of overconfidence bias (x) on risk perception (M) while the sign of the co-efficient portrays that in the presence of self-attribution bias overconfidence causes a negative impact on risk perception.

The second Interaction symbolized by INt-2 Regression of the variable risk perception (M) onto variable Z along with interaction of illusion of control (z) and overconfidence Bias (x). The result here shows that this interaction is statistically not significant (b=.0896, P<.01 and =.5196). There also lies zero between the confidence interval 95 upper and lower limit showing that the relationship in insignificant in context of this study.

In the proceeding **Table 4.6** there are simple slope of relationship between overconfidence and moderator variables self-attribution bias (W) and illusion of control (z) at several points .At -1SD the effect of self-attribution bias and illusion of control on overconfidence bias are positive and significant similarly at mean effect of self-attribution bias and illusion of control on overconfidence bias is again significant and positive. At +1SD of the effect is again positive and significant predictor. However if we carefully observe the effect both moderators W & Z, they are showing different patterns the effects of self-attribution is becoming more positive as investors move from low self-attribution bias to high levels of self-attribution bias , but illusion control is becoming less positive as investors move from low illusion control to higher level of illusion of control.

TABLE 4.6: Conditional Effects of the Overconfidence Bias on Self Attribution Bias and Illusion of Control (s)

AvgforSA	**AvgforIC**	**Effect**	**SE**	**T**	**P**	**LLCI**	**ULCI**
-0.8924	-0.3793	0.6132	0.0707	8.6745	0.0000	0.4738	0.7526
-0.8924	0.0000	0.6472	0.0774	8.3572	0.0000	0.4944	0.7999
-0.8924	0.3793	0.6811	0.1117	6.0988	0.0000	0.4069	0.9014
0.0000	-0.3793	0.4769	0.0786	6.0669	0.0000	0.3219	0.632
0.0000	0.0000	0.5109	0.0594	8.597	0.0000	0.3937	0.6281
0.0000	0.3793	0.5449	0.0798	6.8321	0.0000	0.3876	0.7022
0.8924	-0.3793	0.3407	0.1126	3.026	0.0028	0.1186	0.5628
0.8924	0.0000	0.3747	0.0799	4.6908	0.0000	0.2171	0.5322
0.8924	0.3793	0.4087	0.0774	5.48	0.0000	0.2616	0.5557

TABLE 4.7: Indirect Effects of Overconfidence Bias on Investment Decisions

AvgforSA	**AvgforIC**	**Effect**	**BootSE**	**LLCI**	**ULCI**
-0.8924	-0.3793	0.2248	0.05	0.1346	0.3288
-0.8924	0.0000	0.2372	0.0557	0.1282	0.347
-0.8924	0.3793	0.2497	0.0686	0.1073	0.3802
0.0000	-0.3793	0.1748	0.0428	0.1016	0.2713
0.0000	0.0000	0.1873	0.0409	0.11	0.2709
0.0000	0.3793	0.1997	0.0502	0.0979	0.2954
0.8924	-0.3793	0.1249	0.0497	0.0483	0.0483
0.8924	0.0000	0.1373	0.0394	0.0676	0.2221
0.8924	0.3793	0.1498	0.404	0.0641	0.2248

Table 4.7 demonstrates indirect effects of x on y. These tables explain conditional indirect effect of overconfidence bias on investment decisions for statistical significance using confidence interval 95.

The output reports that the conditional indirect impact of overconfidence bias on risk perception on self-attribution bias and illusion of control. These relationships are also statistically significant as it does not fall in zero between upper and lower limit of 95% confidence interval. In that case this study identifies that there lies a significant and positive impact of overconfidence bias on investment decisions at all levels. Also we can see in the second table as we move from low self-attribution bias to higher levels of self-attribution bias the effect become more positive while in case of illusion of control the effect become less positive as we move lower level of illusion of control to higher level of illusion of control.

The **Figure 4.1** shows how self-attribution (W) the moderator acts between relationship of Independent variable (X) which is overconfidence bias in this case and Mediator variable Risk perception (M). On Horizontal line the X-axis we have Overconfidence bias while on Y axis along the vertical line we have Risk perception. Line orange explains effect of self-attribution on the relation between the overconfidence and risk perception above mean +1sd. Blue line is the relationship

between the two at -1sd below means and the green line shows the relationship at mean. Here all slopes are positive but slope below the mean is strongly related.

The graph explains that at high self-attribution bias the relationship between overconfidence bias and Risk perception is more positive as compare to those individuals who have lower levels of self-attribution bias.

The **Figure 4.2** shows how illusion of control (z) the moderator acts between relationship of Independent variable overconfidence bias (X) and Mediator variable Risk perception (M).In the graph on X-axis we have Overconfidence bias while on Y axis along the vertical line we have Risk perception. Line orange explains effect of self-attribution on the relation between the overconfidence and risk perception above mean +1sd. Blue line is the relationship between the two at -1sd below means and the green line shows the relationship at mean. Here all slopes are positive but slope below the mean is strongly related.

This graphical presentation shows us that at high levels of illusion of control the relationship between overconfidence bias and risk perception is less positive as compare to those individuals who have lower perceived control. But if we compare both the graphs, self-attribution bias has a stronger positive relation as compare to illusion of control and it increase with increase in self-attribution bias where the illusion of control shows the opposite effect.

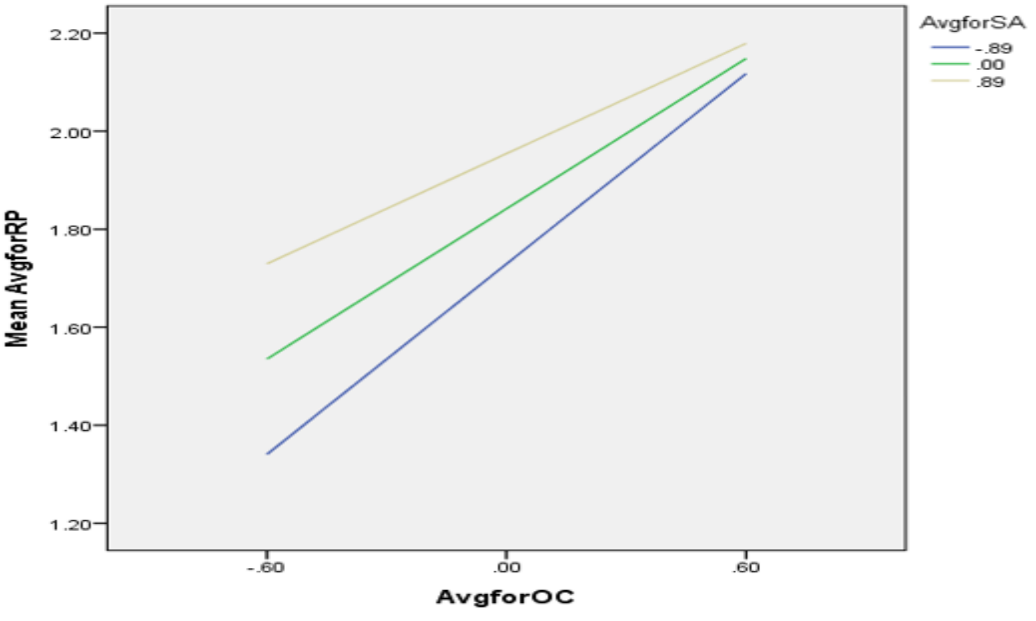

FIGURE 4.1: Impact of SAB on Risk Perception and Overconfidence Bias

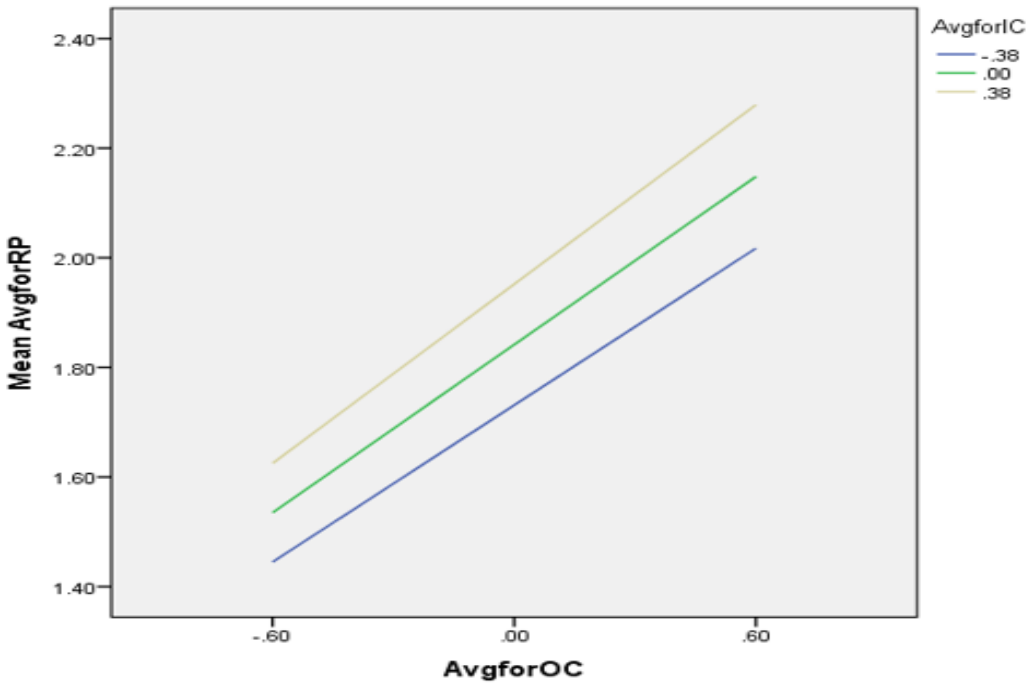

FIGURE 4.2: Impact of IOC on Risk Perception and Overconfidence Bias

4.3 Discussions

This study tries to find out answers for how overconfidence is related to investment decisions and the contribution of risk perception, self-attribution bias and illusion of control between these two. For the purpose we carried out a regression analysis to find out significance of these relations The **Table 4.3**, provide answer for the first research question: Is overconfidence bias directly associated with investment decision?

The statistic shows that there is a direct significant and positive relationship between investment decisions and overconfidence bias (P<.01, Se =.0703, β=.3380). Which means our hypothesis 1 is accepted that "There is significant and direct relationship between overconfidence bias and investment decision?" These findings are align with those of Pikulina, Runneboog and Toble, (2017) who found in their experimental research that overconfidence positively effects investment decisions of both individual and institutional investors.

They argued that investors who are confident about their capabilities are motivated and inspired and thus take more part in investing activities and this influences theirs investing activities positively. On the contrary under confident

investor don't participate much in investing activities due to fear of losing and thus loses the chance to win and causes the problem of under investment. Higher the investor is confident more will they trade (Statman, 2003). All of these findings shows a positive relationship on investment due to overconfidence These finds are also align with (Lovallo & kahneman, 2003; Khalid Javed & shehzad ,2018; Pradikasari & Isbinah ,2018).

These findings are contradicting to Gheeber, Wheeler and Sur, (2018) social comparative theory, Chaung and Lee (2006), who believed that overconfident investors don't evaluate all the available information and use their mental filter to avoid the information that they are not able to analyze and keep themselves above all. These factors lead them to biased decisions which negatively affect their investments decisions. Here we have achieved our research objective "To identify relationship ship between overconfidence bias and investment decision". And also found the direct effect that confidence bias positively effects our investments decisions.

Table 4.3 also provides details for research question no 2 "Is there a relationship between iisk perception and investment decisions"? The statistical analysis shows that there exist a direct significant and positive relationship between risk perception and investment decisions (P<.01, Se =.0677, β=.3665). It brings 36.5% change in our dependent variable. This means that in the presence of overconfidence investors perceives that there is low risk associated to assets that they are investing in. That actually is higher that they expect to be. This way they unconsciously agree to take a higher risk. According to the laws of risk and return those who are willing to take more risk will get a higher return so they make decisions that are actually in favor to them. These findings are aligning with Markowitz theory of risk and return (1952) and were also confirmed by (Zenghanin and Aren, 2016; Lorsi and Jayanto, 2021). So our hypothesis that there exist a relationship between risk perception and investment decisions is accepted .We have also found that this affect is in a positive direction which leads to reject the findings of Slovic and King,(2014); Mikhailova and Schmidt (2016); (Penning, Post, Hoffman(2013) that sentiments can cover the risk of the situations or instinct and illogical judgments take over. They overestimate their abilities and also the abilities to analyze risk and thus fail to take necessary measures and thus poor performance.

Moving on the **Table 4.4** provides details about all variables and how they are related to Risk perception. To start with, it answers our third research question; is there a relationship between overconfidence bias and Risk perception?

The effect of overconfidence on risk perception is a significant and positive (P< .01, β=5109, Se=.0594) which means overconfidence brings 51% change in risk perception. Hence our third hypothesis is also accepted which says that "There is significant and direct relationship between risk perception and overconfidence bias". In the presence of overconfidence investors believes that they have knowledge and skills to take better decisions about their investments. On the basis of this belief they underestimate the risk associated to particular assets which means if an assets is risky, a overconfident investor will perceive it to be less riskier and vice versa.

This leads investors into biased risk perception and as a result participates in excessive trading activities and riskier assets .These findings are consistent with Yaowen (2016), Ainaia and lutfi (2019) and inconsistent with findings of Pommpian (2006) & Lovallo and Kahneman ,(2003). When we study relationship between overconfidence bias and risk perception, overconfidence investors move toward risky investment choices and ultimately face losses. Gave and Grin, 2018 also confirm to this hypothesis.

Here we have achieved third research objective of the study, "To identify effect of Risk perception on investment decisions"

Table 4.5 further explains research question, Is there mediating effect of risk perception between overconfidence bias and investment decisions? Results for this relationship were found significant (P< .01) because it is related to both, investment decisions and overconfidence bias. In this table it shows that overconfidence bias rings 51% change in investment decisions and risk perception investments explains 36% change in investment decision. Hence our fourth hypothesis also has been proved and this leads us to achieve our third investments objectives. In this we found that that this mediating effect is in a positive direction which means that overconfident investors both institutional and individual believe that they are skillful and they can make better decisions for their investments .This believe

inspires them to make investments and take part in trading activities more than under confident investors and they create investing opportunities for themselves and also removes the problem of under-investment these findings are consistent with (Elena Pikulina, Renneboog and Tobler; 2017 & Lorsi and Jayanto; 2021).

This also approves work of Acker and Ducker, 2007 where they found that Asians are more overconfident due unweighting of risk and they show more volatility in prices and aggressive trading. Thus our research objective "To identify mediation effect of risk perception between overconfidence bias and investment decision" has been achieved.

Table 4.6 explains 5th research question, "Is there a moderation effect of self-attribution bias between overconfidence bias and risk perception?" via Interaction 1 which is product of overconfidence bias and self-attribution bias. This is done by combining the both to see how it affects risk perception to explain the moderating role of self-attribution bias between overconfidence bias and risk perception. We can see that this interaction is statistically significant (β=-.1527, p<.001) suggesting that self-attribution bias moderates the effect of overconfidence bias on risk perception which means in the presence of self-attribution bias the risk perception of the investors and this leads them towards biased investment decisions.

Which means that in the presence of self-attribution the overconfidence further increases and this increases the biasness in risk perception.Too much overconfidence results in cost and worst outcomes Elena Pikulina, Renneboog and tobler; (2017) Chuang and Li (2006). Research also shows that there is a strong correlation among the both biases, attribution bias & overconfidence bias.

This relationship is further explained in detail next **Table 4.6 and 4.7**. The **Table 4.6** shows the relationship of self-attribution bias at different levels with overconfidence bias at + SD, Mean and – SD. Similarly the figure 4.6 explains conditional indirect effects of overconfidence bias on risk perception on self-attribution bias again at + SD, mean and – SD. Values from the both table explains that relationship is significant at each level as it does not fall in zero between upper and lower limit of 95% confidence interval. These values depict that as we move from

lower level of self-attribution bias to higher level the relationship between the two becomes more positive.

Here our hypothesis "Self-attribution bias strengthens the relation between overconfidence bias and Risk perception" has been proven. Gervais & Odean also found evidence in their study that self-attribution bias feeds overconfidence through a circular process. They will generally blame it on circumstances on which they had no control. Such as, general condition of market or economy as it was. People will learn to be overconfident (Codean & Gervais, 2001) Overconfident investors overvalue the precision of their own knowledge and the ability to predict the upcoming events better than others (Graves and Ringues , 2018).

All of these studies confirm hypothesis that was also proved by Daniel in 1998, in their model "outcome dependent confidence" for presence of self-attribution bias and fifth research objective "To identify moderation effect of self-attribution bias between overconfidence bias and Risk perception" has been achieved.

Table 4.6 further comprehends second interaction that is between overconfidence bias and illusion of control bias. This is done by combining the both variables to see how it affects risk perception to explain its moderating role, between overconfidence bias and investment decision. The results for this interaction are not significant (P>.01). Here this study fails to achieve its last objective. To identify moderation effect of illusion of control between overconfidence bias and Risk perception. And thus it rejects hypothesis that illusion of control moderates relationship b/w overconfidence bias and risk perception.

This **Table 4.4** demonstrates that illusion of control has no significant relationship between risk perception and over confidence bias. But **Table 4.5 and 4.6** helps to it further explain the behavior of illusion of control. Table 4.6 shows the relationship of illusion of control at different levels with overconfidence bias at +SD, Mean and –SD. Similarly the **Figure 4.2** explains conditional indirect effects of overconfidence bias on risk perception on illusion of control bias again at +SD, mean and –SD.

It says that illusion of control affects the relationship as it doesn't fall in zero between upper and lower limit in 95% confidence interval. But it doesn't work

like self-attribution bias. The output shows that effect of illusion of control become less positive as we move from lower level of illusion of control to higher level of illusion of control. This behavior is also explained via graphical presentation in **Figure 4.2**.

Results of this study are different from past studies as; these findings are not align with the studies Stotz & Nietzsch, (2010) who argues that a stronger perception of control also has an evident negative impact on individual investment decision because they result in higher level of confidence because of close connection between overconfidence and contextual control, this study informs that feeling of control is stronger when there is overconfidence. And because of excessive trust one can make a bad or aggressive decision about one's investments. It also deviates from findings of Kahneman where he argues in his are famous book Think, Fast and Slow that in the presence of illusion of control there is a negative and significant impact on investment decisions due to inflated overconfidence.

The reasons that impact of illusion of control are insignificant among overconfident investors lies behind the fact we have discussed previously in this research where (Acker and Duck 2008), explained in their study that as expertise increases and investors have more knowledge their feelings of illusion of control gets stronger. For example, when analysts were asked to estimate earnings of a firm because of the fact that these experts have a lot of information about company and close contacts with a managing board of members and other representatives. These factors lead them to feel stronger perception of control because they considered themselves to have better estimates of firm and they believe they know the firm. Along with these factors they also have knowledge of d/f sectors because of their expertise in the field which further inflated their sense of control. This usually happens when we talk about developed and efficient markets where investors have all information available to them and they use that information to evaluate among the different choices which makes the sense of control inflated. But in countries like Pakistan neither the market is efficient nor is the capital market is well developed, here the information is asymmetrical.

Information is not easily available to everyone so unlike those investors who believe that they have enough information about their investment and it is fairly

distributed among everyone and they own the expertise to analyze and evaluate these information properly. Investors in Pakistan don't have that confidence that they have all the available information in their access neither do they own sufficient expertise to evaluate and analyze the available information thus the perception of control is not stronger in these investors. The other reason of non-significant evidence of illusion of control is that, this study is carried out in worlds one of the most volatile and uncertain market. According to a report publish by state bank in May 2020, economic policy uncertainty of Pakistan has reached from 54.43 to its peak to 2006 and 2007 in April 20 during Covid and is increasing till now. Thus in such uncertain markets it is not realistic for people to perceive control because market changes constantly.

Evidences from cultural perspective were also found to explain this deviating behavior. According Hofstede cultural dimensions countries with high score in uncertainty avoidance is less tolerant to uncertain situations as future is not predictable so they rather believe in short-term outcomes and rewards. (Wang reiger and Heings, 2015) Pakistan is part of culture with high score for uncertainty avoidance. They believe they have more chances of losses rather than gains and this form brings anxiety with in them. This suggests that they believe we can't control the outcomes in long term and so to deal with it ,cultures with high uncertainty avoidance invest for short terms rather than trying to achieve control for future outcomes that's. That's why they don't have stronger perception of control.

Chapter 5

Conclusion

This research was carried out to find how overconfidence bias effects investments decisions with the mediating role of overconfidence bias and moderating role of self-attribution bias and illusion of control. The results show that there is a significant and positive relationship between overconfidence bias and investment decisions. Investors who believe in their capacities and knowledge allow themselves to contribute in investing activities and thus perform well.

We also found out the risk perception completely mediates the relationship between overconfidence bias and investment decisions. We found evidence that, as risk perception of overconfident increases they under value the risk associated to their investments and make riskier choices. Not only they make riskier choices and trade but they also perform well by getting higher returns.

These findings are also consistent with prospect theory which states that people make riskier investments to escape losses. They become risk averse and risk taker according to their perceptions of risk in a situation. This also proves the point of Oslen, (2007) "To be bias is not necessarily bad as long as it leads to result that the decision maker wishes".

We also found evidence for moderating role of self-attribution bias. It has significant and negative effect on overconfidence bias which means in presence of self-attribution bias overconfidence increases and they become too overconfident and negatively affect our risk perception. They either overvalue or under value

the amount of risk that is associated with those assets as result they make biased decisions.

These effects of overconfidence are more pronounced in the presence of self-attribution bias where investors believe they are better than others. So being excessively overconfident and risk behind certain levels is never too good for investors. In this study there was no significant evidence found for the moderating role of illusion of control so we have to reject our hypothesis.

5.1 Recommendations

It is recommended that individual investors conduct a post-mortem analysis of any investment to understand their historical behavioral miscalculations and try to identify reason behind them and avoid them in future and they must acknowledge themselves that market constantly changes and the past is not a good predictor of future. Achievements time and again come from suppressing emotional sentiments and overpowering behavioral prejudices. Based on representative heuristics, there is a tendency for excessive behavior and contributes to the elimination effect.

They need to invest for the long term, determine their risk tolerance, determine the appropriate asset allocation strategy and often rebalance their investment portfolios. It is also recommended that fund managers try to identify client behavioral biases before designing a portfolio.

You need to relax with proper knowledge and rational investment decisions to avoid the "loss of wealth" of investors on both sides and adapt to market conditions. Success often comes from suppressing emotions and overcoming behavioral prejudices.

These investors has the propensity to trade aggressively due to overconfidence bias and contribute to biased investment decisions They need to evaluate how much risk is associated with particular assets and determine their tolerance in advance. Also they need to rethink what are the biases they have faced in past their before

investing and determine their basic investment strategies. They can also diversify their investment portfolio to minimize the risk.

It is also recommended that institutional investors need to try to isolate their client behavior biases in advance before making an investment for them. You must use appropriate knowledge and reasonable investment choices to relieve yourself, in order to avoid the "loss of assets" of investors.

The regulatory bodies must come forward and make important progress to realize the existence of biases in investment and make standard scientific rules and educate investors about effect of these biases on their investment decisions and to avoid those biases or minimize their effects.

In a research done Ricciardi and Baker and in 2015, they found that knowing clien-tal factors, such as behavior characteristics, demographics, socioeconomic impacts, religion, risk tolerance, and mental and sentimental prejudices, can influence their (the investors) thinking in investment choices.

This means if the institutional and professional investors are well known of the biases faced by their clients they can avoid them and educate them by making them aware of possible biases they are facing. Not only they can remove the effects of biases that are not good for our investment decisions but this way investors will be able to determine how these biases can be used in better ways to get advantage of them.

They will be able to control the limits to which a bias is not bad for their returns. For example just like healthy levels of overconfidence bias in this research which motivates them to perform better. Also that overconfidence behind a certain level is no more beneficial so investors will be able to identify limits of these biases and make wise decisions.

5.2 Limitations and Future Indications

In the present pandemic situation we were unable to collect data from large sample especially from the institutional investors and that might have affected our findings

and we can't generalize it. This also leads to future need for research where researcher can use a larger sample of both kind of individual and institutional investors to check the effect of these biases.

Also researches need to work on finding tools that can help investors to measure the possible behavioral biases that they might be facing. The most important recommendation during this is to dig out in to the new field of behavioral finance that is cultural finance how these biases can be studied in different cultural context and what is the role of culture in these biases.

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Appendix-A

Survey about Behavioral Biases in Investors

Back Ground of the Respondent

*** Required**

1. Email.....

2. Gender

Mark only one oval.

☐ Male

☐ Female

3. Martial Status

☐ Single

☐ Married

4. Age

Mark only one oval.

☐ Less than 30 years

☐ 31-40

☐ 41-50

☐ Above 50

5. Education Level

☐ Primary Education

☐ Secondary Education

☐ Diploma

☐ Under Graduate

☐ Post Graduate

☐ Other

6. Nature of Employment

Mark only one oval.

☐ Self - Employment

☐ Formal Employment

☐ Both

7. Investor Type

Mark only one oval.

☐ Individual Investor

☐ Institutional Investor

☐

8. Income Level

Mark only one oval.

☐ Less than 5000

☐ 5000-20000

☐ 20000-50000

☐ 50000-100000

☐ 100000-200000

☐ More than 200k

Investment Decisions

9. Money is most important goal Of my life

Mark only one oval.

☐ Strongly Agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

10. It is more satisfying to Save rather than Investing money

Mark only one oval.

☐ Strongly Agree

☐Agree

☐Neither

☐ Disagree

☐ Strongly Disagree

11. What kind of Investor do you consider yourself to be?

Mark only one oval.

☐ Highly advance

☐ Advance investor

☐ Moderate Investor

☐ Intermediate Investor

☐ Beginner

12. How ambitious do you consider self to be.

Mark only one oval.

☐ I am very ambitious

☐ I am quite ambitious

☐ Moderately ambitious

☐ A bit Ambitious

☐ Not ambitious

13. What is most important investment objective with investment portfolio of yours.

Mark only one oval.

☐ Capital growth

☐ Hobby

☐ Saving for retirement

☐ Speculation

☐ Building Financial buffer

14. What strategies do you use for your investment decisions?

Mark only one oval.

☐ Financial News

☐ Intuitions

☐ Technical Analysis

☐ Fundamental Analysis Tips from others

15. My investments in stocks and other commodities is based on my knowledge, Experience, or education.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

16. I can invest a larger sum of Money in stocks.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

17. The uncertainty in market keeps me from doing any kind of investments in stock market.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

18. I prefer saving money because I am never sure when things will collapse and I will need money.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

19. I can manage/budget my money really well.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

20. Others investors has impact on my investment decisions.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

Overconfidence bias

21. Thinking hard for a long time about something gives me a little satisfaction.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

22. I trust my initial feelings about people.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

23. I prefer to do something that challenges my thinking abilities rather than something that requires little thought.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

24. I prefer complex to simple problems.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

25. When it comes to trusting people I can usually rely on my gut feelings.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

26. My initial impression about people are always right

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

27. I don't like to have alot of thinking

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

28. How good are you at your job.

Mark only one oval.

☐ Excellent

☐ Above average

☐ Average

☐ Below Average

☐ Poor

29. How do you rate your personal level of investment.

Mark only one oval.

☐ Excellent

☐ Above average

☐ Average

☐ Below. Average

☐ Poor

30. Relative to other investors how good are you in your Investment decisions.

Mark only one oval.

☐ Excellent

☐ Above average

☐ Average

☐ Below. Average

☐ Poor

Self Attribution Bias

31. How do you rate your ability to predict any market activity (ups & downs) in market?

Mark only one oval.

☐ Excellent

☐ Above average

☐ Average

☐ Below. Average

☐ Poor

32. When returns to your portfolio increase what do you believe to change in performance is due to?

Mark only one oval.

☐ My skills & Experience

☐ My financial advisor Expertise

☐ Overall market is doing well My

☐ luck

☐ Others

33. After a successful transaction how likely are you to put your money into another investment rather than keeping your money until you see another better investment opportunity?

Mark only one oval.

☐ Extremely likely

☐ likely

☐ Not sure

☐ Unlikely

☐ Very unlikely

34. After making an investment, assume that you hear of a news report that has negative implications regarding the potential outcome of the investment you have just executed. How likely are you to seek information that could inform that you made a bad decision?

Mark only one oval.

☐ Extremely likely

☐ Very likely

☐ Not sure

☐ Unlikely

☐ Very unlikely

Illusion of Control

35. When you participate in games of chance that involve dice - such as backgammon, Monopoly or Craps - do you feel in control when you roll the dice your self.

Mark only one oval.

I feel more in control when I roll the dice I

☐ Am Indifferent to who rolls the dice

36. When you are playing cards, are you usually most optimistic with respect to the outcome of a hand that you dealt yourself?

Mark only one oval.

☐ A better outcome will occur when I am controlling the deals of the card It

☐ Makes no difference to me who deals with the cards

37. When returns to you portfolio /investment increases, what do you mainly attribute this turn of events to?

Mark only one oval.

☐ Completely Random chance

☐ Combination of Investment control & random chance

☐ The control that i have exercised on my investment

38. When you purchase a lottery ticket, do you feel encouraged regarding your odds of winning, if you choose the number yourself rather than using a computer generated number.

Mark only one oval.

☐ I'm more likely to Win if I control the numbers picked.

☐ It makes no difference to me how the numbers are chosen.

39. How would you rate your ability to predict market trends?

Mark only one oval.

☐ Excellent

☐ Above Average

☐ Average

☐ Below Average

☐ Poor

Risk Perception

40. I am a risk averse * Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

41. What kind of investment profile do you have?

Mark only one oval.

☐ Highly speculative

☐ Speculative

☐ Moderately defensive

☐ Extremely Defensive

☐ Saving

42. I am hopeful when undertaking investments in stocks that have exhibited a sure loss.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

43. If I have Rs 500000 in excess, I would prefer to invest in risky alternatives.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

44. If I inherited 2000000, I would prefer to choose less risky investment options

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

45. If I Win Rs. 1000 in a game then I will continue doing more.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree

46. It will be easier to invest in options that have shown a past positive performance in Market.

Mark only one oval.

☐ Strongly agree

☐ Agree

☐ Neither

☐ Disagree

☐ Strongly Disagree