Chapter II: Review of Literature and Conceptual Framework
2.1 Introduction

Investment is scrupulous activity that requires conviction starting from selecting a stock or assets to designing a portfolio. The selection is a mindful task and asks for self-discipline. Investors have not always been aware of the happenings around the stock market and sometimes this brings an adverse effect on their return and investment performance.

Financial decision-making is part and parcel of portfolio management. The very basic aim of it is to maximise the portfolio return. There are specific approaches like fundamental analysis and technical analysis of investments. An investor can go by looking at the balance sheet, financial ratios of a company or the price of a stock, charts and volume. Whatever be the approach, the ultimate goal is to ensure gains at the end. It implies that investors are rational in nature and take into consideration assumptions as well as the thumb rule for their investments.

The conventional finance school of thought says that investors are rational decision makers and make their choices as per the assumptions of rationality (Fishburn, 1968). But in later years the scenario has changed and now researchers are trying to figure out how psychology affects the behavior of investors regarding their investment (Baker & Wurgler, 2007). For that concern, both individual and institutional investors are the vital components of investment decision framework. The advancement of information technology has explored many avenues in the realm of finance. There is a plethora of information floating in the stock market by various participants including brokers, advisors, arbitrageurs, hedgers, mutual funds, banks, financial institutions and individual investors. The mechanism using which one assimilates the same into practice is highly psychological in nature. The process put forth the reasoning that the optimal models of finance have to be a conglomerated human approach (Slovic, 1972). The domain of behavioral finance comes in here that states human behavior is affected by diverse disciplines like economics, social science and psychology. Conventional financial theories are not applicable if we deviate from the assumption of rationality (Tseng, 2006).

In one of the most influential contribution by Bon(1897), crowd psychology has been studied. The book has stressed the importance of interpreting crowd behavior that is not imbibed by reasoning and throws light on how a crowd emerges and puts things into action. Understanding and interpreting investor psychology in uncertain and risky market situation involves a behavioral finance approach.
All across the world, researchers are seeking ways to understand human behavior in financial markets. People like Daniel Kahneman, Robert J. Shiller, Eugene F. Fama, Herbert A. Simon, and Gary Becker are among the major contributors towards the field of economics and finance. They have tried to measure unusual and deviant behavior that is far away from the assumption of rationality. If conventional financial theories were based on the normative assumption, the behavioral finance paradigm would not have ever emerged. When fundamental prices are deviated by non-standard investors, anomalies occur in the market. Fundamental analysts are based on the natural stock selection approach and non-fundamentalists are based on deviation in prices due to excess pricing power (Takahashi & Terano, 2003).

Behavioral finance deals with biases that lead to wrong decision-making, sub-optimal result and performance. Behavioral researchers believe that judgment taken with these biases lacks the tenets of conventional finance. Cognitive and emotional biases are the primary drivers of behavioral finance. Biases like confirmation bias, gambler’s fallacy, negativity bias, anchoring bias, etc. come under cognitive bias. Whereas loss-aversion bias, endowment bias and overconfidence bias, etc. come under emotional bias. Investors get trapped into these biases and their emotion overrides presumption based on logical and rational thinking.

In the recent years, an attempt has been undertaken to establish a relationship between drivers of behavioral biases and investment decision. The financial industry has been applying behavioral theories and concepts. As mentioned by Hersh Shefrin (2006) in his highly acclaimed and comprehensive book, psychology is a pertinent concept and has a lasting effect on the investment decisions. It has a diffusing power in the financial market. Investors try to beat the market by carrying biases in their mind which result in poor management of finance. Researchers and practitioners have explored ways in which behavioral biases affect the market sentiment and behavior across the world. Knowing these biases would help in designing the customised portfolio, strategies for client management and loyalty programs. As per various psychological traits based on personality, cognitive skills, knowledge and psychometric skills, it would be easier to do client profiling (Hilton, 2001).

The Indian financial market is one of the oldest and fastest growing markets in the world. Financial market comprises capital market, commodity market, money market, derivatives market and foreign exchange market. The Indian capital market today is way more regularised, streamlined and organised with a lot of reforms in the recent years. SEBI is
a regulatory body that takes care of the conduct and operation of the stock market. However, there are evidences that show the unexpected psychology of investors during the market crash and collapse. Stock market downturn of 2002 and subprime crisis of 2008 has witnessed the erosion of market capitalization, dropping of prices, change in the state of economy and ultimately loss of investors in the capital markets. So, getting into the psychology of the Indian capital market investors would help in investigating the core behavior of investors and preparing strategies based on the result.

For the purpose of study, the entire review of the literature chapter is divided into the following three basic themes:

1. Deviation from rational investment decisions.
2. Drivers of behavioral biases.
3. Establishing relationship between drivers of behavioral biases and investment decision.

2.2 Documentation

This section provides an extensive literature about the body of knowledge on conventional finance and emergence of behavioral finance in the financial domain. The basic objective of the section is to discuss and summarise relevant literature about the topic of study. It contributes to the overall body of literature. An exhaustive volume of literature has been reviewed, synthesized and summarised so as to prepare an outline of research. For the purpose of understanding, the activities involved in preparing for the review of literature section have been divided into six parts as shown in chart 2.1. The first part is the formulation of key search terms and keywords searched were conventional finance, rational behavior, subjective utility, behavioral finance, behavioral bias, investor behavior, individual behavior, and investment decision-making etc.


Third part consists of identification of relevant studies which are pertinent to research endeavour. This was based on the scope and coverage of the journal paper and those that added to the overall body of knowledge were considered for the study.

Fourth part stands for selecting the appropriate studies and discarding the inappropriate ones. In total, out of 200 studies that were reviewed, I have selected 145 studies for the review of literature.

The fifth part is about writing the review of literature section in three broader themes that are: deviation from rational investment decisions, drivers of behavioral biases and establishing relationship between drivers of behavioral biases and investment decision. In the first sub-theme, theories of conventional finance have been examined. It covered rational choice theory, neoclassical economic theory, subjective expected utility theory, bounded rationality theory and contributions of authors in the area of conventional finance. Second sub-theme is about discussing how behavioral finance has emerged and what the drivers of behavioral biases are. The substantiation of the presence of inefficiency in the market, erratic and irrational behavior of investors is made by citing the studies which are disparate and yet have an integral role. Third sub-theme is the explanation of the relationship of drivers and investment behavior. This is further sub-divided as per constructs used in the study. Basically, the study has used three biases as the key variables of study that includes a) overconfidence bias, b) herd behavior bias, and c) risk tolerance bias. This section finally did end with the development of a conceptual framework which is the outline of research. The framework is about the strength and direction of the relation between the three key variables and their influence on the extent of investment decision in the capital market.
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<td>Formulation of key search terms: conventional finance, rational behavior, subjective expected utility, investment decision, market inefficiency, behavioral bias, behavioral finance, behavioral economics, capital market, individual investor, finance industry, stock market, portfolio performance, psychological bias, decision</td>
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<td>Selection of pertinent studies for the thesis and casting off the irrelevant ones. A total of 145 studies were considered relevant for writing review of literature out of 200</td>
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<td>Development of a conceptual framework as an outline for research: It explains the strength and direction of relationship between independent variables (overconfidence bias, herd behavior bias and risk tolerance bias), and dependent variable (extent of investment decision in capital market).</td>
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2.3 Significance of Studying Behavioral Finance in the Context of Study

The job of a fund manager, broker or an advisor is to assist their clients in making sound investment decisions. These decisions include the selection of a stock or portfolio, identifying the best possible course of action, timely review of the portfolio, and management of the overall portfolio. They serve as a solution provider for different kinds of investors. Keeping this factor in mind, let us highlight the importance of behavioral finance in an investment context.

Ben Bernanke, U.S. Federal Reserve Chairman puts forth the importance of studying human behavior. According to him, understanding economic climate is a complex activity because human forms the basic element of an economic climate. Hence, forecasting the human behavior is dependent on the historical relationship of economic indicators (Market Realist, 2016).

As mentioned in the introduction section, the foundation of conventional finance is based on the following assumptions: people are rational and independent, markets are efficient, mean variance theory is the crux of investment and expected return is a function of risk. Later on, behavioral finance challenged these assumptions and emerged as an alternative to the conventional financial paradigm. It is assumed that people are not rational and markets are not efficient. Cognitive and emotional biases persuade faulty emotional decisions and discomforting losses (Statman, 2008).

In the financial industry, awareness of this irrational behavior is required as they have an adverse impact on decision-making. After the awareness, the next task is tantamount to control these biases and reduce their influence. This task is sometimes difficult and requires careful execution. In the realms of investments, such biases can have precarious effect and hence, understanding them is of significant importance (Byrne & Utkus, 2013).

Behavioral finance is a study of the systematic errors of judgments made by investors in the investment decisions. Heuristics, illusions, regret, etc. create inconsistent judgment in decisions (Fuller, 1998). Behavioral finance aims at improving the understanding of the financial market by integrating psychology and sociology. This field is a deviation from ‘homo economicus’ theory that people do not take decisions based on probabilities (Baltussen, 2009).
Behavioral finance includes the decision of all classes of participants, public or private enterprise, individual or institutional investor, capital market or money market investor. Academicians have been trying to incorporate behavioral finance into their study books as it has now become a fully developed discipline. Insights from debt market and pension industry reveals the application of behavioral finance (DeBondt, Forbes, Hamalainen, & Muradoglu, 2010).

Although bountiful research is being carried out about behavioral finance across the world, research in the Indian context is still thin in nature. Focussing on the untapped potential of Indian investors would help enhance the overall body of behavioral finance literature. Hence, the next section begins with the first theme and discusses about the ways conventional financial theories have taken a departure from the rational investment decision framework. It also highlights some important contributions in the pertinent field.

2.4 Theories of Conventional Finance

2.4.1 Rational Choice Theory

Being the rational decision makers, human beings take careful and logical decisions. Social science researchers have studied human behavior to prove the rational part of decision-making. The pioneering work for this theory was done by Homans (1961) through an exchange theory. All rational choice theories are based on the fact that human is a basic element that has preference over goods and services. Application of the threat of punishment or promise is a motivating factor in the conditioning of human behavior. An individual takes a calculative approach and interacts through a social exchange based on economic behavior (Scott, 2000).

The application of rational choice theory is widespread in various disciplines like economics, biology, history, political science, law, etc. The basic reason is that it involves humans in decision-making. This theory is used in two different meanings. First is having a very considerate approach and the second includes transitive preferences in economic term. This theory conceives the idea that a human takes decisions based on the expected utility framework.

The theory gives an overview of risk and possible outcomes of an economic decision. It also estimates the probability of an outcome’s occurrence (Ulen, 2000). Given a scenario where a person has to engage in a buy or sell transaction of any kind, they do the one
which suits the best of their choices. They prefer one over the other if the choice of alternatives is presented to them. This complies the rule of completeness. These preferences are expressed through a utility function which is a mathematical representation of the value of the possible alternative (Green, 2002).

An example of a utility function could be seen from an economic perspective. Take coke and pepsi for an example. Both fall under the colddrinks category and have said to be the closest substitutes available in the market. Now let’s say that ‘c’ denotes coke, ‘p’ denotes pepsi and ‘u’ denotes utility. Here, the utility function would be \( u(c+p) \). A person who consumes only 100ml coke and no pepsi would enjoy the full utility of 100ml (Blokhin, 2016).

2.4.2 Neoclassical Economics

Neoclassical economics is a branch of economics that deals with the idea of supply and demand for goods or other economic variables. Let’s go into the detail through one of the papers by Arnsperger & Varoufakis (2006). The author has introduced methodological instrumentalism which is sought at the individual level. It follows ‘methodological individualism’ i.e. working on an individual and study of socially intricate problems. The other maxim states that people’s behavior is motivated by preferences and that is the way through which they derive satisfaction. This term has found its base from the work of David Hume (2012) who has segregated the human decision process in three stages: a) passion, b) belief, and c) reason. Here, passion provides the goal, beliefs are converted into preference with reasoning and people maximise the utility in relation to goods and services.

Thorstein Veblen has initiated the term called “neoclassical economics”. He has advocated the idea of a group from an outsider outlook. The concept basically focuses on the proper distribution of capital and income or any kind of resources. Based on a utilitarian approach, the central point is demand and not supply. Rationality is also at the heart of the assumption with optimization. The concept of utility maximization was then converted to a social phenomenon (Leibenstein, 1950).

Further, these assumptions were challenged by modern economists and behavioral economists and slowly the rational framework faded in its own flame.
2.4.3 Subjective Expected Utility Theory

It is an approach towards decision-making under risk, value and probability. The subjective assessment of variable is done using this theory. All decision makers try to make the best possible decision out of the existing alternatives. Each variable is assigned with discrete probability and making an optimal outcome is not possible. When the outcome of a decision is expressed in mathematical expression, it becomes easy for the decision maker to measure that variable. Nevertheless, where gambling is involved, it is difficult to calculate. People value different products and services differently based on changed circumstances and reasons. One can also make a trade off, when non-monetary decisions are involved. As people tend to maximize the utility, they assign probability to the riskier gambles (Shanteau & Pingenot, 2009).

2.4.4 Bounded Rationality

The efficient market provides ‘no free lunch’ and the asset prices are always right in nature. But the deviation from the asset prices due to the presence of noise traders in the market brings into account the inefficiency of the market. By incorporating risk and demand function, cost function or both, the assumptions of the theory could be modified. When there is only incomplete information about the alternatives available to the agents in the market, rationality can be bounded. By bringing complexity and constraints into the decision function, one could limit the rationality and restrict the best course of action. The rational behavior theory did not take into account the limits to rationality in this perspective. When the nature of the market is imperfect and it is vulnerable to exploit the opportunities due to the presence of several biases, it puts a boundary into the rationality and limits the cognition.

Rationality is a matter which aims at achieving the desired outcome within the given constraints. Maximising profits comes under the “Theory of Firm” which is based on the difference between sales and the cost of production. By modifying the assumptions, it could be easy or tough to evaluate and find the optimum solution (Simon, 1972a). It is a non-optimizing behavior of a rational person. However, ‘bounded rationality’ cannot be correctly put in the form of a definition. Here, the importance of ‘Aspiration Adaption Theory’ is brought into the picture. This theory caters to the multifaceted goals of decision-making where the goals are arranged in a complete preference order over each other. There is an aspiration grid that caters to the goal variables. The adjustment step moves over one goal, one level to another level (Selten, 1999).
The approaches discussed here put forth the foundation of rational thinking in decision-making that had stemmed from the branch of economics and social science. Theories of conventional finance, which are the pioneers in the field of portfolio and asset management are- efficient market theory, markowitz portfolio theory and capital Asset pricing theory. Now, let us proceed to discuss the contributions of different authors and researchers on the deviation from the rational thinking framework.

2.5. Contributions of Authors and Researchers on the Deviation from Rational Thinking Framework

There are many illustrations that reflect deviation from rational investment decisions. They enumerate the occurrence of the events that add up to the role of human conduct. Given below is a list of 22 publications reviewed in this section, which provides a view of deviation from the traditional economic presumptions.

Mitroi & Oproiu (2014) examined the psychology of financially driven investors and concluded that the stock market does not follow random behavior. Data from stock market confidence index and U.S. stock market data were used for the study. A regression analysis was performed using Generalized Autoregressive Conditional Heteroskedasticity (GARCH) and Autoregressive Conditional Heteroskedasticity (ARCH) models for Bucharest Stock Exchange of Romania (BET) index during April 1998 to January 2012. It was found that there exists no dependence on daily returns of stock prices on a specific index. The mean value does not revert in a long run. However, what could be other possible reasons for this kind of behavior is not discussed in detail in the study.

Baker & Wurgler (2011) studied corporate finance context and found that managers did not show any rational behavior. ‘Behavioral signalling’ theory under this concept indicates some alteration in the conviction and the predilection of managers. Managers have used behavioral signalling with respect to dividend policy. They perceived dividend as a signal of financial strength of the company that acted as a reference point. Decisions related to research and development involved the use of option based proxy for converting their research into patents. The asymmetric information has deviated the decision when dealt with non-standard preferences.

Armistead (2014a) examined from a quasi-experimental study, whether the portfolio strategy based on behavioral finance offered a higher return than that of the efficient market
portfolio. DOW30 index fund portfolio was taken as a proxy for the efficient market theory. The behavioral finance strategy was based on anchoring, confirmation bias and moving average. Results revealed a substantial difference between the two strategies. It was suggested that pricing strategy based on heuristics could be of great importance to investors.

Sonje, Alajbeg & Bubas (2011) examined the daily and monthly data for Croatian and U.S. markets for 2002 to 2010 and found inefficiency in the stock market. The study revealed that crisis of 2008-09 accounted for this anomaly. Test of autocorrelation was used to check the anomaly. Both the indices were tested using 50 days moving average as shorter moving average and 200 days moving average as longer moving average. Low average correlation was found in Croatian stock market during that period. After the Lehman Brothers crash in 2008, both markets were considered to be inefficient as there existed a high serial correlation of price changes. Nonetheless, the findings have not disclosed the strong effect of market inefficiency during this period.

Swartz (2006) found that the unstructured private incentive of Chief Operating Officer or any other high designated person affects the personal efficiency in terms of investment. Traditional financial theories claimed that a proper and effective incentive structure modified the self-centered behavior, but behavioral finance challenged the same. The study used discounted cash flows (DCF) to measure investors’ overreaction and underreaction.

The presence of long term anomalies, such as underreaction and overreaction was studied by Fama(1998). Two behavioral models namely: Barberis, Shleifer, and Vishny (BSV) and Daniel, Hirshleifer, and Subhramanyakam (DHS) have been examined here. The BSV model assumed judgment biases like representative bias and conservatism bias. A short term momentum brought underreaction to the earnings information and a trending belief about the earnings brought overreaction to the news. Events like- stock issue and repurchase of stocks carried information by mispricing of information. Olsen (1998)unveiled that stock price volatility was not explained thoroughly by standard financial models as claimed by the researchers. Decisions involving complexity bring about non-linear behavior. Many a time, investors tend to have relied on a reference point for a complex decision.

Ezzeddine, Hachicha & Bouri (2011) examined mean-variance approach of behavioral investors. Prospect Theory assumes that investors behave differently as risk-seekers and gainers. Behavioral Portfolio Theory (BPT) includes a pyramid shaped layer of
the goals of an investor in totality. The paper has used survey method on Tunisian investors. The findings claimed that the overall demographic variables such as: experience, wealth and education affected portfolio choice. Brabazon (2000) mentioned that behavioral finance is the blend of economics and cognitive psychology which helps in making a model based on human behavior. The paper argued that utility maximizers and rational man lay at the core of traditional finance. However, behavioral finance focused on cognitive psychology that leads to systematic errors. A heuristic decision process contains many illusions as: gamblers fallacy, anchoring, and representativeness etc. which causes deviation from the rationality. Gamblers’ fallacy occurs in case of failure in predicting the trend of the market and leads to inadequate returns. People try to regress towards the mean in order to come closer to the market trend, but inability to do so creates a fallacy. Anchoring occurs when people rely on a limited set of information and any deviation from this makes errors in judgment. Representativeness happens when people have faith in the law of small numbers. Which means that on the basis of small observation, a trend would be monitored. These phenomena are found more in hot stocks, stocks announcing earnings, and multibagger stocks which are the trend setters in the market. Evidences suggest that updating beliefs based on fundamentals get overshadowed by overreaction or underreaction to certain information, extrapolation of past trends in the future, concentration on selected stocks, and changes in prices on a cyclical basis. These factors necessitate investors to search for abnormal returns due to the anomalies in the market. The paper also argued that if the individual level analysis is to be expandable to aggregate market level, it has yet to be proven.

Benartzi & Thaler (1995) perceived a distinction between the performance of stocks and bonds. The fact argued that stocks have outperformed bonds over a number of years. This phenomenon is called ‘equity premium’ which comes under the standard expected utility maximizing framework. But when the concept of prospect theory and mental accounting comes with an asset allocation model, sensitivity towards loss aversion makes the returns unpredictable.

Albar & Jetter (2009) disclosed that due to the heuristics in the decision-making, the behavior of investor is directed by systematic errors. While taking decisions, our brain prepares a cognitive map which is based on experience and knowledge of the person. These heuristics include gut feeling, intuition and hindsight. They deny the law of probability and cause divergence from rational theory. Bounded rationality brings impracticality of rational decisions into practice. Tseng (2006) examined the U.S. stock exchange data such as: DJIA,
S&P 500 and NASDAQ from 1971 to 2005. To prove the presence of the efficient market hypothesis in those exchanges, serial autocorrelation was used. From 1971 to 1990 and 1991-2004, the coefficients were found positive.

Kahneman, Slovic & Tversky (1974) found that biases are uncovered through heuristics and that add to the complexity in decisions. Representative bias, availability bias, adjustment and anchoring are the heuristics that makes a decision erratic. People have a tendency to believe on some events based on the representation of that event such as judging someone that he is into a particular profession on the basis of little information given. Having affected by these biases, people update their beliefs with confidence based on the information presented.

Frankfurter & McGoun (2002) drew a comparison between modern finance and behavioral finance. The efficient market hypothesis is covered by the tenets of various forms of market efficiency such as- a) strong form, b) semi strong form, and c) weak form market. Strong form infers that all public and private related information is absorbed by market price; semi-strong form infers that all public information is updated by market; and weak form market implies that out of the historical price of the market, it is impossible to make any abnormal return. But on the contrary, due to overreaction to the series of news flows, winning stocks underperform and losing stocks outperform the market. Positive and negative reactions of market occur due to some trigger (event based) in the market. For example, listing of a stock on an exchange followed by Initial Public Offer (IPO) could be the premium or discount. Moreover, on a long run, its performance might be completely different from the initial performance.

David Dreman, the founder of Dreman Value Management has been working on the contrarian market strategy by investing in low price-to-earnings (PE) stock. The strategy does not follow the principles of EMH. People are judicious in modern finance and normal in behavioral finance. Which means that rational people are not affected by any cognitive illusions rather normal people fall prey to cognitive illusions. The behavioral finance area is the fabrication of numerous dimensions of biases and it might have its own limitations. Overall, behavioral finance has attributed to many researchers in the field of finance, sociology and psychology, but conventional finance is still believed to be the oldest form of finance. On a positive note, assimilation of both conventional finance and behavioral finance would probably bring a new paradigm for the finance industry.
Kahneman (2003) perceived that psychology is connected to several disciplines. There is a strong interplay of intuition and reasoning in regards to cognitive thinking. It disconnects the rational theory of conventional finance. Two systems of our brain, specifically, System 1 and System 2 directs our behavior. System 1 is fast and intuitive, System 2 is slow and involves reasoning. Framing affects the judgment unconsciously and System 2 supervises the thinking process. A series of experiments were made to comprehend the cognitive thinking that involved letter crunching and billboards for different mental activities. It sufficed the expressive needs of a person. By looking at a billboard, one could easily connect to the emotions displayed and can be intuitive to the message. Here, perception is assumed to be ‘reference dependent’ which means the outcome is dependent on reference point and contrast between an existing and prior stimulus.

Statman (2014) sighted the difference between conventional finance and behavioral finance. Conventional finance is built on the assumptions that people are rational, markets are efficient, application of mean-variance theory for portfolio building, and return being the only function of risk. Whereas, behavioral finance is built on the assumptions that people are normal, markets are inefficient, application of behavioral portfolio theory for portfolio designing etc. A rational investor goes through utilitarian, expressive and emotional needs while taking a decision. But a normal investor does not differentiate between his role as consumer or investor at the same time. This brings the prevalence of other factors such as: culture, emotional bias and social responsibility under cognitive and systematic errors.

Armistead (2014b) investigated the fall down of the U.S. market after the 1987 crisis that led the researchers to explore how and why such reactions come from the market. Does markets rely on fundamental assumptions or they are driven by investors sentiments? Supporters of fundamental thinking suggested that there is nothing called undervalued stock because all the information is factored into the stock price. A quasi experimental study was performed based on price momentum theory and the efficient market theory. DOW30 index of U.S. stock market was taken as a proxy of an efficient market. ANCOVA was used to evaluate and observe the control and experimental group portfolio. Time series were also used with a non-equivalent and no-treatment control group. Results revealed that in terms of return on investment, both strategies produced dissimilar results. The DOW 30 portfolio reflected the return of 16.55%, while behavioral portfolio reflected the return of 51.63% and 40.81% respectively.
Avila et al., (2016) ascertained that behavioral finance deals with the intrusion of psychology into decision-making. Many studies have corroborated the non-rational preference of investors and violation of the rational choice. The study was carried out in Brazilian perspective and integrated the developments in the field of behavioral finance from 2006-2015. Factors like gender, optimism, pessimism, demographics, emotions, risk aversion, etc. caused irrationality in decision-making. This was also related to management of the financial market and other financial activities. Evidence suggested the application of behavioral finance in the real estate market, construction industry and the stock market in the context of Brazil.

Qawi (2010) observed that if the formulas of conventional finance could be twisted into behavioral finance, the gap between conventional and behavioral finance would be minimised. The study has highlighted the presence of herding effect, contagion effect, affect bias, demographics and socially responsive behavior in the context of investment. People followed group information and their decision is driven by group behavior. The need for consensus was the major attribute of this kind of emotional behavior. The study claimed that risk taking ability increases when a person is a fellow member of a group. Investor sentiment also accounted for considerable variations in share price and investment approaches of investors. Socially responsible investment changed the preference of investors and created a bias toward the companies accounting for the same.

A study by Yu (2007) reviewed the basic themes of behavioral economics, namely heuristics, biases, prospect theory, reference dependence and loss aversion. The application of behavioral economics is also tested in marketing. Behavioral economics studies the decision-making of individuals and firms. For making a product or service reachable to its customers, a marketer does all kinds of promotional activities. Advertising plays an important part over here. Behavioral dynamics direct a customer behavior through motivation, perception, prior learning and experience. Heuristics theories direct the individual to assess the chance of events which are uncertain in nature. Anchoring and adjustment bias is applicable in marketing. The tendency to overweigh the product which a person wants to own has a direct influence in retail and direct marketing.

Pawar (2013) identified that factors like education, age, income, and perception of investors affect the decision-making of people in the city of Hyderabad, India. The buy, hold and sell decision of investors varied as per the information flow. In terms of dividend
announcement, people disposed to buy and hold the stock (46%), for bonus announcement they inclined more to hold (50%) and wanted to book profits in bullish market (66%).

Finke (2011) highlighted the significance of variables such as cognitive ability in numeracy, risk tolerance, credit decisions, wealth and retirement savings and asset allocation on financial decisions. There was an evidence of the influence of intertemporal behavior on asset accumulation and allocation. On the financial literacy aspect, knowledge of people over the age of 60 was an important point to ponder. For cognitive ability, IQ was taken as a proxy and that affected the basic numeracy skills. A multivariate analysis showed a strong influence of IQ on credit and investment behavior and least influence on investors with less education. Investors with high cognitive ability had a high expected lifetime wealth and efficient portfolio.

2.6 Contributions of Authors and Researchers on Drivers of Behavioral Biases

Studies in economics and psychology have demonstrated that humans are affected by numerous biases in the process of decision-making. These biases act as drivers and influence our cognitive thinking and make an individual predisposed to behave in an irrational manner. The following 36 publications reviewed in this research cover the importance of studying behavioral biases.

The human brain is a complex system and so is the investment decision-making. No matter how much we try to explore it and for how long, it remains perplex and confound. Our mind looks for creating a balance between conflicting thoughts and actual outcome. How about reducing the complexity and using heuristics to reduce it? If an event is characterized by the occurrence of one outcome, it leads to a misconception about the event as a whole. A simple clue is also a representative of the whole event. Overestimating the probability of occurrence of some events even lead to erroneous results (Razek, 2011). Anchoring bias has an effect on the investment decision. It can be a numerical value, opinion or attitude and act as a point of consideration. To be dependent on past prices and analysts view about a particular stock for a quick judgment, or friend’s view for estimating some data in financial market involves behavioral biases. People prefer to bet on familiar things rather than unfamiliar ones. One example could be betting about the price of a share based on quarterly earnings estimates. Narrow framing occurs when people take narrow routes for their decisions. Most often, the narrow frames are evaluated separately from other risks. If a
particular stock does not perform well and that contributes to the major portion of a portfolio, the overall portfolio performance might get affected (Lawrence, 2012).

International investors have behavioral biases while investing overseas. They feel comfortable in investing with familiar countries or stocks. And the end, result leads to poor diversification and concentration on a particular stock or group of stocks. This is due to the cultural difference which evolves from trust, optimism, ethics and satisfaction arising out of the behavior. And hence, investing in unknown and unknowable stocks is not done on a larger scale by local investors (Speidell, 2009).

When we talk about the aspects of one’s own behavior, personality acts as a driver for it. Krishnan & Beena (2009) have studied experience and personality dimension under “Big Five” personality measurement. Questionnaires were floated to 80 investors and results indicated that Kaiser Meyer Olkin (KMO) test measured the accurate sampling adequacy. Extraversion scores have indicated a positive relationship and openness indicated a negative relationship with behavioral finance concepts.

The development of behavioral finance has evolved from the branch of psychology, sociology and finance. A human being’s physical and mental shape, social behavior in groups, attitudes, etc. conforms to behavioral finance. An individual, group and organization are the decision makers and take judgment regarding financial decisions. Sometimes people have a predisposition to overestimate their own ability; fail to learn from the past mistakes; try to validate contrary behavior; go with the crowd behavior instead of basic principles of investing; regret the choice of investment; make biased behavior accordingly and use decision weights to measure gain and loss. Whether to buy a stock or mutual fund, our emotional rhythm compels us to make mental mistakes (Ricciardi & Simon, 2000). Investor does not always take a decision based on standard preferences or quantitative models, rather their cognitive and emotional aspects encourage taking a decision in an irrational manner. Both macro and micro aspects of behavioral finance are essential and have their own importance.

Macro aspects cover limits to arbitrage and the micro cover cognitive bias of investors. Evidences suggest the use of behavioral finance concepts in fund houses like JP Morgan and LVS Asset Management. JP Morgan had incorporated the influence of overconfidence bias and loss aversion on stock prices and made a portfolio strategy keeping in mind the value and momentum of stocks (Park & Sohn, 2013). Industrial conduit creating
instability is one of the drivers of applying psychological dimensions in taking financial decisions. Investment with rational calculation seems to be uneasy and irrational psychology leads to deviation from conventional rules. The illogical presence of optimism and pessimism constructs asset bubbles and affects long term yields. The Post Keynesian theory has been analysed in real market context. Evidences of the crash of 1987, dot-com bubble and the crisis led by psychological factors have validated the drivers of behavioral finance (Raines & Leathers, 2011).

Behavioral finance has taken the roots of psychology for taking cognitive decision and judgment. It directs the issues such as: stock market volatility, stock bubbles, underreaction, overreaction and mispricing of securities. In relation to market condition and investment behavior, it addresses areas such as: volume, volatility, dividend, equity premium puzzle and predictability. Through all these aspects, it couples up with investors and market movements and offers a means for interpreting information for investment decision that leads to irrational and emotional actions (Flynn, 2014). The ways in which the decision of a household, organisation and individual are affected by cognitive errors is being explained by behavioral finance. It collects facts about the behavior through survey, experiments and various studies. Factors such as mood, affect, social psychology and judgmental bias create a departure from systematic thinking. In stock market investments, noise traders leave room for expert investors to earn profit. The foundation of behavioral finance is built on sentiment, behavioral preferences, and limits to arbitrage. The error stemmed from individual takes a larger shape for institutions. There is a limit to the arbitrage and that is the reason for inefficiency in the market price. Behavioral preferences like- self control, myopic loss aversion, regret aversion, narrow framing, and mental accounting drive the decision-making (Bondt et al., 2008).

Another probable vindication of individual investors’ bias could be the familiarity bias which has a tendency to bring the local preference aspect of the investor. Using data from a large brokerage firm in the United States, it was found that people are inclined towards local companies and information available in the market. The study was done on 27,189 investors who had a local bias affinity towards their investment and preferred domestic investment over the foreign ones. End of month portfolio position data was taken for January 1991 to November 1996. The categories of securities which they deal included domestic securities, fixed income securities, mutual funds and foreign assets. The study also suggested that local bias might vary from country to country. The familiarity could be
brought by reading the annual or quarterly results of the stock, by getting information based on valuation of a company from the earnings report, and the marketing promotions of products. Whether investors’ sophistication is related to the familiarity bias is something to be thought of. For this argument, income and profession of an investor were taken as proxies. It was also found that information based on advertisement created an advantageous situation for people having a preference for local companies (Zhu, 2002). In the similar line, in today’s complex investment scenario, the subjective probability distributions of investors are indistinct in nature too. Factors accounting for the ambiguity are also varied in nature. However, applications of these factors are of paramount importance to the financial industry as a whole. The ambiguity aversion effect is a manifestation of subjective know-how of the investors, which could be due to different educational background and other demographic variables. Trading frequency and home bias were covered in the study. This paper brought into account the hypotheses which were: investors with more competencies did tend to trade more frequently than the ones who are less competent; and investors with high competencies have a high degree of inclination towards their belief. The findings were in the same line with the hypothesis. However, no evidence was found that high competence led to a high portfolio return. Male respondents were found to be more competent than female counterparts in relation to investment. The study could have argued on other aspects of investors like trading experience and past return to measure investors’ competence (Graham, Harvey & Huang, 2009).

The basic caveat for any investment is the fact that it must earn the market return before costs that include commissions, bid-ask spread, market impact and transaction cost. But due to the perverse stock picking ability of individuals, they earn sub-par returns. Investors sometimes manage their portfolio on a self basis or sometimes invest in an index fund managed by fund managers. Probable behavioral rationalization involves overconfidence, sensation seeking, and familiarity and disposition effect. People churn their portfolio more often owing to overconfidence that causes poor performance. Those who seek gambling show sensation seeking behavior while choosing investment and similar tendency towards trading as well. When people have information about the company prospects, they have a bigger advantage of having a higher rate of return with respect to their investment. Nonetheless, they do excessive trading and undiversified their portfolio and earn sub-par returns. Having a tendency to sell winner stock and hold the loser stock makes a bad
investment decision and brings in a feeling of regret. In short, it can be stated that people are diverse and have varied characteristics (Barber & Odean, 2013).

A financial market is built of individuals and hence in order to evaluate the market, the aggregate behavior of individuals through the practice of behavioral science has to be studied. With this notion, Farrelly (1980) has taken a behavioral science approach to explain financial research. The paper started with its discussion of the mathematical modelling used in finance for the valuation of the market. For validating the assumptions of efficient market theory, researchers were earlier used to those models. Statistical sampling and computer science technology helped in aggregating the psychological data for generalization. Some investigations that could assist this include knowing about the past behavior of individuals, how the economic system of a country which is a representative of individuals’ reaction could be made competitive and how far application of an average person could aid in decision-making? Here, the attitude of investors, values, needs and ideology are important for assessing the market behavior. Researchers have explored in the area of risk and subjective probability. Instruments were designed to make the job of a researcher easy to assess risk perception. The paper did end with bringing the importance of amalgamation of theory and practice by using human behavior in the field of finance.

One aspect of knowing market behavior could be about the way people take a decision which helps in processing market data and interpreting the market behavior. Choice of individual portfolio and security, investment style and horizon of investment supports in making a judgment about human behavior. Heuristics are used to explain why an individual behaves in a certain way, how they find a solution to a problem and arrive at a decision based on certain rule of thumb. As resources are inadequate in nature, so is the capacity of an individual to analyse data. This limit of perception and attention creates unconscious thoughts and decisions. Propensity to rely on existing information influences our cognitive skills. The likelihood of relying on most remembered incidence or instance captures mind space and precedes overreaction to a series of good or bad news. Individuals’ prioritize the information from different sources and retain the one that has more impact on the mind. When there is a lesser known fact about the total trait of an individual, this turns into halo effect and interrupts in taking a sound investment decision. The other factor is the limited framework within which the situation is presented before a person. This effect is termed as framing and it deviates from rational choice. People also rely greatly on one piece of data that act as an anchor for some decision. This anchoring allows a person to narrow down its approach and
creates a bias in selection. When making some negotiations for a new financial venture, for somehow, if we don’t like the concerned person, the deal may be scrapped. This happens due to the impression that we get of that person at a first glance (Abreu, 2014).

Olsen (2001) described the work of Dr. Paul Slovic, a famous psychological experimenter who laid the foundation of psychological based investment research. Olsen tried to know whether behavioral finance that stems from a diverse field of finance could be presented in the form of science. In order to prove something as a science, there should be some hypothesis which can be tested, should have some scientific method to call it a science. But there are few arguments that advocate this thought. It says that preference of decision makers is many sided and formed during the process of decision-making. Firstly, they have the tendency to satisfy and not to optimize and secondly, the environment aligns with the technique involved in the process so that researchers integrate emotions to decision-making framework. But opponents of this idea argue that in order to be called a science, behavioral finance should fit into the scope of physics, chemistry, biology, and integrated science. Here, Olsen also mentioned that Paul Slovic’s research was based on interpreting risk from both behavioral and scientific perspectives. Risk is subjective in nature and multifaceted, cultural and social factors affect risk perception and there is an essence of emotional and affective dimension to risk. In order to assess risk, Slovic had developed a psychometric paradigm scaling technique. Slovic pointed out that risk arises out of a particular situation and has greater importance than beta and standard deviation of return to behavioral science researchers. Hence, it was concluded that behavioral science could be studied from a different dimension of science.

In the widespread financial market, communication has taken a major role in terms of dissemination of information. The market movement in the short term is driven by investors’ sentiment and behavior. The paper argues that behavioral finance is more related to the behavior of non professional investors. By this, it means that people are driven by intuition and other criteria that disagree with a rational belief. The aspects such as: why and how investors trade, the way investors’ confidence affect trading activities, the ways in which investors’ experience and gender has an effect on financial decisions, and how does information is interpreted based on the availability, pre-conceived notion and situational factors have not been covered under the purview of conventional finance. That is the reason researchers in the new era of finance called as behavioral finance try to explore those factors both at a) micro and b) macro level. When talking about the investment decisions of small
and non professional investors, it was observed that they believe in having an ample knowledge about investment and their experience makes them more competent than the professional ones. However, the inquiries that were investigated through the research could have been even more elaborative to create a synthesis of the concepts of behavioral finance and their effects on overall market behavior (Bikas, Jurevičienė, Dubinskas, & Novickytė, 2013).

De Bondt & Thaler (1990) examined the stock market volatility and overreaction of security analysts. The volatility is subject to the performance of a stock and the intuitive nature of the investors about forecasts of future stock prices. The idea of bringing professionals as subject matter was that despite being experts in their field, they were subject to behavioral biases. Security analysts are the ones who forecast their company’s earnings. Reporting the earnings is essential for the market and has implication on stock prices. If an analyst is right in his reporting, he can perform better than time series forecasts. The paper highlighted overreaction in forecasts which were extreme in nature based out of predictive value of information available with the analysts. The objective of the study was to analyse forecasted change in earnings per share (EPS) for one year and a two year period and to check whether forecasted errors in EPS were related to changes in the forecasts. The forecasts were studied for the period 1976 to 1984 and obtained from the Institutional Brokers Estimate System Tapes (IBES) which was founded by Lynch, Jones & Ryan and Technimetrics. Forecasted earnings were compared to stock returns and accounting figures. Regression was performed to forecast change in EPS, actual change in EPS and forecasted revisions. When regressing actual change in earnings on forecasted change for a particular month, intercepts were found to be negative which implied that forecasts were highly optimistic. Six regressions were performed to test the hypothesis and the results revealed the consistency of results. It was concluded that similar overreaction amongst security analysts were found as that of forecasts of economic variables and undergraduates.

In the parallel line to check whether demographic, environmental and bio-psychosocial factors affect risk tolerance behavior, a regression analysis was performed. Risk tolerance is a multidimensional attribute. The paper applied Irwin’s (1993) risk taking model into account which presumes that environmental and bio-psychosocial factors affect risk tolerance. The environmental factors were income, financial status, family status, social status and conversion of social status. Age, gender, personality traits, birth order, attitude, belief, personality, self-esteem and ethnicity were included in the bio-psychosocial factors. In
total, 460 respondents from university faculties and staff members were taken into consideration. Predominantly there were more female respondents (55%), married (63%) having the average age of 43.2 years, 55% were employed in professional and technical employment. The dependent variable, financial risk tolerance was measured using a 5 point Likert scale. Independent variables included age, education, gender, financial status, ethnic background, home ownership and occupation. Regression analysis indicated that there lies a positive relationship between education, net worth, household income, financial knowledge, self-esteem and risk tolerance. Results suggested that these factors played a significant role in determining risk tolerance. Most risk a person can take is a manifestation of environmental and bio-psychosocial factors. However, this paper partially proved the Irwins’ model of risk tolerance. Further implications could be seen on the aspects such as financial counselling and planning for ascertaining risk tolerance in greater extent. And measures should be taken in designing a customised program for educating investors towards financial investment (Je Grable & Joo, 2004).

Hirshleifer (2014) reviewed individual and aggregate level bias and brought into importance its influence on trading and market activities. People use shortcuts when they are confronted with limited cognitive ability. Feelings have a role in making people persuaded for taking an insensitive decision out of the forced innate feeling. For example, doing an intraday trading in a stock based on momentum without analysing much about the stock is the influence of feelings and enthusiasm. If one feels that s/he has more merit and accuracy than others, it makes them more overconfident in nature. This causes excessive trading, poor returns and under diversification. The underlying cause of this could be overestimating fundamental information about stocks. Managers are also biased in taking their firm’s decision due to overconfidence and optimism. Paying limited attention to the earnings’ reports causes both overreaction and underreaction. If the general attitude of a person is inclined towards a particular stock or company or investment option, this could cause bias in the choice of investment and performance. Global sentiments also have implications on the world stock market and the economy. Every stock market takes cues from the global market in terms of the policy rate, growth and momentum. In case of dividend decisions, a manager may or may not prefer dividend decisions. This brings about the proposition for whether to declare a dividend for general investors or not. Analysts, brokers and fund managers often provide information which manipulates the investors and makes them susceptible. The paper concluded that plausible actions could be taken to match the decision taking environment
from both laboratory and field work studies. There is a need for more theoretical and empirical studies to get the influence of biases on real market behavior.

Purohit, Satija & Saxena (2014) highlighted the effect of demographics on investment decision-making process. Whether the profile of the respondent affects decision-making and the source of information which affects decision-making were the objectives of the study. The study was conducted in Delhi and NCR region. Out of 300 questionnaires, 228 were found valid. All respondents were the investors in the stock market with the majority of respondents being male at 69.7%, primarily graduates from the age group of 25-40. Investors preferred to buy stocks and hold the mover immediately buy and sell of stocks. Results revealed that a majority of investors considered their past experience for present investment decisions and took the others view. It was claimed that incorrect recommendations from brokers/analysts/bankers resulted in lesser successful investment. This confirmed that investors did not follow rational models like Capital asset pricing model or Asset pricing model rather they were affected by behavioral biases. Therefore, having known the effect of these bias, financial experts could design a program for guiding investors and increase their awareness level.

Daniel, Hirshleifer & Teoh (2002) argued that limited attention and overconfidence happened to be the motive for credulous investors’ in the case of strategic incentives. The study highlighted that the role of Government should be in the direction of improvement of efficiency in the system, reporting standards and advertising. Whether the outgoing debate over market efficiency is a political gimmick or a mere expression of thought was the central point of the paper. The existence of market efficiency as a mere school of thought was advocated by the University of Chicago and Rochester whereas; deviation from rationality was advocated by East Coast Schools which believed in the importance of the role of Government in investors’ psychology. Political or government groups have their own interest in changing rules. Therefore a stable policy should be there to encourage the interest of investors. Limited attention and mental processing drive investors to keep their money in different avenues and pockets. Those who do more transactions incur huge transaction costs and lower returns. An analyst forecast is important from an investment point of view. But the misinterpretation of the information by them provides a complex investment scenario. The information is sometimes discounted by stock prices on rare events. The rise of the stock option as an employee benefit or incentive makes the improper disclosure of accounting information. When investors come across this fact, they mostly overrate the company
fundamentals and overvalue the stock. Hence, measures like proper disclosure of information by firms and their intermediaries, robust financial reporting norms, proper disclosure of mutual fund advertising and educational awareness to investors should be intact in order to curb the irrational behavior of investors. Policy measures should also be taken to control inflation and restrain money illusion problems.

Sewell (2010) reviewed the literature chronologically as per the developments in behavioral finance from 1896 to 2009. The paper highlighted behavioral finance as a study on psychology. The stock price is dependent on the attitude of the investors and the social framework. An insightful idea of people keeping different mental accounts for their investment activities provides another dimension of investors’ behavior in general. A glimpse of value based investment strategies exploits the sub-optimal behavior of investors. By investing in low book value, low earnings or a low fundamental based stock, people get trapped into the fallacy of being irrational. This means that they update their belief far away from rationality and make erratic decisions. When the information is diffused in the stock market at a higher rate, it creates either a rising or falling trend in the share price. An investor’s way of taking decisions based on dissemination of information from diverse sources affects his behavior. The process through which an investor takes cue from events of uncertainty on his decisions has always been the interest of behavioral researchers.

If each and every investor were able to achieve the basic rule of investment as wealth maximization, perhaps the term ‘irrationality’ would have never existed. People thought process and the efficiency of the markets is the two goals that researchers have been pondering since the past few years. Keeping that in mind, Muneer (2012) mentioned cognitive biases and limit to arbitrage as the source of incompetent behavior of the market. The paper highlighted heuristics, conservatism, overconfidence, framing, mental accounting and representativeness as cognitive biases. Heuristics is the basic rule that one follows for making some judgments. One example of this is dividing the money evenly into different options of investment and hence arresting a naive diversification. Conservatism applies being defensive about own notion and not willing to accept change as desired. Overconfidence is being overdone as one’s own assessment and thinking oneself ‘better than the average’. Framing is about how a person, group, or organization confers to the reality based on facts being presented. The information is available through different sources, but whether people analyse it correctly or not, that is a point of worry for researchers. Behavioral portfolio theory is used as a tool for allocating money into different mental layers as per the goals of
investment. Planning about the education of children, savings for the future, planning for leisure and retirement planning depending upon the person’s need at various stages of life comes under the theory. Researchers have claimed that people buy both lottery tickets and insurance at the same time, which reflects both their risk seeking and risk averse nature. These factors drive the investment decision.

Fischhoff, Slovic & Lichenstein (1977) explained that people project a sense of being too confident if provided by an unreasonable situation. For example, let us assume that while asking about the chances of formation of government, people gave answers such as: “I am 80% confident that the Bhartiya Janta Party will form the government.” This statement showed how confidently they thought the outcome of a particular event. But this confident statement is often backed by the ex-ante results given by various polls in nationwide news channels. Does it mean that they calibrate to an extent that they feel is accurate and right? This paper tested the validation of extreme certainty of a range of experiments. For experiment 1, the stimuli were history, geography, nature and literature. Questions were asked in an open ended format and different alternative formats. Subjects were volunteers based on the ad shown at the University of Oregon. First experimental results showed the correctness of extreme probabilities given by the subjects. But the answer given for a probability of 1.00 being correct was in the range of 20% -30%. Experiment 2 carried questions for general knowledge where subjects had to answer in scales such as 1:1 (being equally right or wrong), or 10:1 (10 times more likely to be right than wrong) or 100:1 (100 times likely to be right than wrong) and 1000:1 (1000 times likely to be right than wrong); etc. Results showed that in small odds scale as 1:1 or 2:1, calibration was reasonably correct and in case of increasing odds as 100:1 and so on accuracy was rather modest and stable. A surprising result was found for odds 100000:1 with the highest accuracy being 90% which indicated high level of overconfidence. In experiment 3, subjects were explained about the scale and to use calibration. Results revealed that a limited overconfidence was found after providing education regarding the experiment. Experiment 4 added the willingness to join a gambling game in addition to the repetition of experiments from experiment 3. And the last experiment was designed to check the reasoning of accepting bets out of the hypothetical situation. Overall conclusion came that for most of the statements that were presented, the subjects had no exact clue in their mind prior to the experiments. For certain questions which had some existence in the mind of subjects were also splintered in various small parts in their
memory. Hence, overconfidence was found with varying degree of calibration and was affected by knowledge and memory processing.

Baker & Nofsinger (2002) mentioned that investors are affected by behavioral biases that leads to poor judgments. How well they feel and think in terms of decision or they take a departure from the rational process of decisions was studied by proponents of behavioral finance. Influence of behavioral biases makes people do wrong investment and therefore understanding these biases could improve the decision-making and overall performance of a portfolio. An interesting factor that was mentioned in this paper was an effect of daylight on investors (Kamstra, Kramer, & Levi, 2003). Generally daylight falls in winter, which creates a sense of gloominess in investors’ mind and reduces their ability to take risks. This effect is termed as Seasoning Affective Disorder (SAD). Overall stock returns fall during the December month due to this effect and this has been seen in countries like; Britain, Canada, Germany, Sweden and United States. On the other side, optimism of investors increases overconfidence and encourages investors to do more transactions and take more risks. It even leads to improper evaluation of information and overlooks negative information about any stock or company. Endowment effect which is the tendency of an investor to hold what they have inherited induces them to hold on to investments irrespective of the nature of the investment. The investor doesn’t want to take the pain of giving up the investment even if it is unprofitable or risky in nature. Status quo bias that does not allow investors to change their status of investment creates a bias too. It happens generally when the stock prices have fallen and people don’t want to take the pain of loss after selling off the poor investment. Another aspect that deals with giving weightage to the short term information on stock momentum creates faulty predictions in future. People believe in the law of small numbers and infer to recent patterns of stock movement while predicting the future pattern. Even media reports which are kind of storytelling for any analysis or future prediction by an expert doesn’t always indicate a clear picture of what has been presented. That finally creates an inappropriate choice of investment.

Giglio & Shue (2014) identified an interesting idea of researching on the nonexistence of a news report and termed it as “no news is news”. When a person who hasn't ever felt the pressure of an economic disaster of the country is interrogated about it, then he would always have a positive reply to it. Again, if a company does not change its corporate policies as per the change in the state of economy, people are likely to form mis-belief about the company. Media has become one of the prime transferring agents for moving information from one
source to the other. However, what if there is no news after an event, would somebody call it an ‘agenda’ or a plain ‘system failure’? With the above questions in mind, this paper puts forward quantification of the information on mergers in the financial industry. Mergers have a profound impact on the growth of a company and its overall corporate structure. Each and every stage of the merger is discussed by the media starting from the announcement date to the closure date. Thus, follows great uncertainty at every stage. Any merger without any closure date would invite uncertainty. In this paper, 5000 merger samples were taken to measure the hazard rate of the merger completion from 1970 to 2005. In any rational market, all market information should be completely incorporated. But if agents underreact to the information during the period of merger, they will tend to overestimate the hazard rates when it is high and vice versa. Results revealed that the hazard rates followed the volatility after the announcement of the merger and if, agents have not accepted this variation; it implied agents’ overreaction or underreaction to this. Hence, underreaction to no news might create intensified asymmetrical problems in future.

Utkus (2008) drew attention to the rationale behind subprime crisis, stock market movement and oil prices. How an advisor should make their investment planning having known that psychology affects decision-making is of paramount importance. The paper mentioned two biases, namely- overconfidence and loss aversion that has affected the major markets in recent years. Professionals such as: doctors, lawyers, drivers, corporate managers, etc. consider themselves better than the others and overestimate their skills. The same was found among underwriters and credit agencies of Wall Street leading to faulty estimation and misinterpretation of rates. But how far this trait is generating value in terms of the creation of wealth for different categories of shareholders? In commodities and oil market too, people are broadly investing as it is a good source of diversification. But often these countless numbers give a rosy picture of profits and investments. Loss aversion leads to overestimating losses against gains. In a falling market, people generally take a sell off mode and don’t retain the approach of long term investment. The psychological impact of these biases is mostly seen in the stock market, real estate and commodities market. Hence, the job of a fund advisor becomes very tricky in preparing winning strategies for the impatient investors. In both the rising and declining trends of the market, if advisors remained firm in their approach and acted prudently, several mistakes could have been avoided.
Chandra (2008) investigated the presence of behavioral factors such as: greed and fear, cognitive dissonance, heuristics, mental accounting and anchoring. Investment decision is a function of personal and technical factors. Personal factors such as age, income, education, marital status and technical factors such as: CAPM aid in decision-making. A successful decision-making necessitates better understanding and knowledge of human behavior. Different individuals have different risk perception and it may be defined in terms of volatility, capital loss, regret, performance risk and shortfall of goals. Let’s take an example; if Rakesh Jhunjhunwala (who is a big investor and trader) invests in a particular stock, soon after the announcement by media, people start investing in that stock. This is known as “representative heuristics”. Similarly, people are prone to such events which are familiar to them or were recently stored in their memory. An example of the same would be investing in the stock which has announced quarterly earnings better than the forecasts. This is known as “availability heuristics”. Having a feeling of fear and greed directs excessive trading, excessive risk and lesser number of profits. People do segregate their investment in separate mental accounts. Hence, a suggestive measure should be taken in order to keep the investment strategies intact along with incorporating behavioral dimensions.

Ricciardi (2004) gave an overview of risk perception in the financial market context. Paul Slovic and other researchers have worked in this area and contributed to the body of literature in this field. Risk is not defined in real terms in any discipline, and is a multidimensional term. Lopes (1987) defined risk as -“situations in which a decision is made whose consequences depend on the outcomes of future events having known probabilities”. Whether risk is a danger, an uncertain event or an opportunity, it is important to know the phenomenon. Standard finance has viewed risk as standard deviation and variance to return, high risk, moderate risk and low risk, risk seeker, risk averse, interest rate risk, credit risk, and risk attached to derivatives etc. Behavioral finance views risk being subjective in nature. This subjective risk perception of investors or group of investors is useful in ascertaining the behavior of investors. It includes affect, emotion, feeling, trust, thinking and other elements of decision-making of individuals. Perceived risk is always present in the mind of the investors/customers in the case of a buying decision when an actual risk is not even present. These risks could be the function of intuitions, situational, personal, social, and physical factors. From a social science perspective: familiarity, controllability, media attention, frequency, dread, personal and societal, trust, voluntariness, catastrophic, potential, benefit and knowledge are the factors that affect the perceived risk. For quantification of perceived
risk- psychological scales, laboratory experiments, and multivariate analysis are used. The risk taking example is best seen in gambling, where people become a risk seeker while betting on gains and vice versa. Non probability sampling technique was mostly used in previous studies. With the different time horizons for investment, risk perception varies as per the change in the stock price, market variation, personal status and economic variation in the country. Hence, knowing about this bias would help in designing a portfolio strategy based on the varied risk perception of individuals. This will prevent them from getting trapped into the wrong investment decisions. The basic crux is that human being is bound to behave differently in different situations, so as is in the case of investment decisions. Therefore, any study should cover the untapped factors which are more subjective in the context of financial decision.

The study by Stewart (2006) underlined the role of behavioral patterns that influences the movement of security prices. Patterns are presented by cognitive factors that persuade people towards an endeavour. It is a dilemma between emotion and logic. The evidence of tulip mania that happened in Europe in early 1600’s suggested how emotion could bring terrible implications. The price rise in tulip led by emotions of people made an exceptional rise in the price up to 4000 florins and exceeded the average earnings of a skilled worker. This has shown how emotions could deviate from the rational ability to predict that led to cascading effects. The prospect theory deals with the emotional aspect of human beings. Staying aware regarding affect of heuristics in the mental process is the job of a behavioral researcher. This paper brought about the application of behavioral finance in various fields such as- accounting, mutual fund, stock investing, real estate, and entrepreneurship, etc. A comprehensive strategy could be made to prepare a risk-return based portfolio for investment. But as it is difficult to buy time, which is the only concern of behavioral researchers, any portfolio strategy has to be tested over the years to see its effectiveness and thus requires patience and endurance.

Baker & Ricciardi (2014) discussed behavioral biases and suggested measures to curb its effect on investors’ sentiment. One can always be away from logic, if he/she is driven by cognitive errors, wrong mental calculations and personal factors in their decisions. It can happen at a micro level or macro level through a subjective or objective way. Behavioral finance deals with making judgments based on personal beliefs, predilection towards past performance and heuristics. The subprime crisis has led to strengthening this field of finance as that has taken a toll on the whole world economy. Any disciplined investment has timely
estimation of returns and losses. If one cannot have a strict rule of maintaining stop losses, it will definitely have a negative impact on the earnings. This bias is termed as regret aversion. Human is bound to make mistakes if they get worried. Being worried is inevitable and people who are afraid of risky investments often enter into wrong calculations and a myriad of other errors. The other aspect of attributing one’s success to own judgment and failure to others augments self confidence resulting in faulty decisions. An example of such bias would be investing in stock after the announcement of a big deal from the company. If a stock fares well after the news announcement, a person thinks that he is accurate in his approach. But, in case the opposite happens, the failure can be attributed to the news channel exaggerating about the deal information. Overcoming this bias would control errors being made and a feedback approach could enhance the self awareness. Moreover, it would help in objectively making asset allocation strategy and reining back the emotions. Once the successful investors become aware of the biases, they avoid being emotional and follow a disciplined approach of investing.

The study by Hilton (2001) described the role of experimentation and organizational psychology in a financial context, basically dealing with currency and investment decisions. Optimism bias means having the idea that someone has ‘better than the average’ skills and has control over his self estimation. It is normally found in students and participants of financial market. Men are more prone to security analysis and rely less on brokers and trade more than women. This results in lesser portfolio returns than their female counterparts. In the intraday trading activity, many people bet on a stock if it goes down at 3.00 p.m. just before half an hour of the stock market closing. This risk seeking tendency does not match with the rational model of thinking. In some cases, where the analysts bet on the underperforming stock, despite the negative news, stock investors continue to bet on that. This tendency shows that people take a contrarian approach towards undervalued stock. The strategies that are presented before the clients could be adjusted as per their requirement and the objective. Further, linking clients’ personality to their investments would help in identifying the characteristic of the client which leads to sub-optimal performance. Therefore, the study puts forward the importance of policy capturing techniques as an aid for decision-making in the investment.

Veld & Veld-Merkoulova (2008) underlined the importance of risk perception and how risk should be measured. Understanding the risk profile of clients’ has become a crucial task of advisors. Risk questionnaire has been used across the world and financial domain, and
includes time horizon and risk perception of clients. The paper included experimental questions that were asked to Dutch investor panel members and utilized three asymmetric measures of risk such as: semi-variance, probability of a loss, and an expected value of loss. The fourth measure was symmetric in nature and included the variance of returns. Questions were asked with regards to investment pertaining to information related to time horizon, instrument held, benchmark used for the investment. The experimental questions were used to judge the risk level by asking pair wise questions. A semi-variance risk measure was the most preferred measure followed by the probability of loss, variance and the expected value of loss. The actual risk measure showed the real life risk taking behavior of clients and hence, portfolio managers should look at various aspects of risk while offering portfolio strategies to their clients.

2.7 Contributions of Authors, Researchers on Establishing Relationship between Drivers of Behavioral Biases and Investment Decision

The preceding sections have shown strands of literature in the context of deviation from rational investment decisions and drivers of behavioral biases. This section reflects those strands of literature that establishes the relationship between drivers of behavioral biases and investment decision. In finance domain, establishing the relationship between the variables is of great importance. For some hypotheses to be proved, it has to go through certain assumptions. Behavioral biases have multiple effects on investment decisions. Therefore, it is important to understand how these biases influence the decision and the magnitude of the influence. Given below are 44 publications reviewed in this section, to gain insights into the relationship between behavioral biases on investment decisions. Bearing this in mind, some pieces of literature in investment decision context have been discussed further.

Dungore (2011) proposed psychological theories to determine the investor behavior. The study was conducted in the city of Nagpur to check its investment climate. Convenience sampling was used to select the broking firm and then cluster sampling was used to divide the sample as per the clusters. Demographic factors such as: gender, age, education, earning level and employment were tested in the study. To check whether the endowment effect, disposition effect, fears of regret and framing affect the investment decision, a structured interview was conducted. It was intended to know the response and motive of the investors. Results revealed that men have an average risk aversion while women have less risk aversion. Risk taking decreases with age and risk aversion decreases as education level increases. It
also gave an idea about as income increases, risk aversion decreases; risk seeker is affected by the endowment effect and risk aversion by fear of regret. The framing effect was not found in any of the groups. Hence, it is important to know which biases affect the investors’ decision and how can it be reduced so that error based judgment doesn’t happen in cases of uncertainty.

Pal & Gill (2008) explained household investment behavior in Indian market context. Indian households comprised nearly 80% of total aggregate savings as per RBI report, 2008³. But participation by households in the capital market is not that encouraging. To explain the underlying factors accounting for household investment decisions, the study was conducted to assess whether familiarity in terms of knowledge and awareness about investment, satisfaction level and overall idea about safety and return affects the household investment behavior. Results have demonstrated that in the case of equity and mutual fund, familiarity is high in terms of knowledge. For returns and overall suitability, mutual fund was the preferred investment option. Hence, unraveling the why and how aspects of household investment could lead to an increased participation in the capital market. Further work could be done in the case of options and other derivatives to assess the financial climate in that particular field.

Lin (2011) explored three behavioral biases namely: disposition effect, herding and overconfidence in Taiwan. During the past several years, cognitive illusions are deemed to be prevalent in the financial market. The paper identified the causal relationship among the three variables and aimed at knowing the effect of demographic factors in decision-making. A cross sectional analysis was conducted by using Structure Equation Modeling to link the path of relationship between the observed and latent variables. A questionnaire consisted of three parts, where part one aimed at verifying the rational decision process as proposed by (Mintzberg, Raisinghani, & Theoret, 1976). Part two involved measuring the relationship between the three variables and part three contained demographic information of respondents. Data was collected for Dec, 2009 to Jan, 2010 and convenience sampling method was used to get the response from 430 respondents. Demographic profile revealed that respondents were predominantly male, primarily from finance occupation with a maximum age group of 25-35. Results of part one revealed that investors first go from identifying the demand of a product and then secondly, they evaluate the alternatives. These two stages were associated to overconfidence in judgments. Herding bias was not subject to any stages of the decision

model, but was affected by the market environment. Detailed comprehensive search for information and evaluation of alternatives lowered the disposition effect. On the other side, female investors were found to be prone to herding and disposition effect. Further work could explore the relationship of a number of different biases in relation to investments. Simultaneously, the addition of more participants or extending the time period or geography could also be a good idea for generalizability of the results.

Luong & Ha (2011) studied the effect of behavioral factors on Ho Chi Minh Exchange (HOSE). This indicated that the behavior of individual investors affects the economy and the financial market of a country. To understand this phenomenon, the study aimed at understanding the impact of behavioral factors in the investment decision and investment performance in Vietnam at HOSE. The idea behind conducting the study in the Asian market context is that Asian people have a socially collective pattern and culture. Thus, they can have varying degree of differences in terms of individual decision-making. People can differ as per cultural and societal norms. As very little work has been done in the Asian market context, the present study justifies the context. Hence, conducting this study would add up to the existing body of literature. For the study; heuristic factors, prospect theory, market and herding effect were taken into account to know their impact on investment performance. The questionnaire had three parts intending to extract information regarding personal and behavioral factors affecting the investment decision and performance. The methods of analysis used were factor analysis and structural equation modeling. In total, 172 responses were received and the analysis showed that there was no gender biasness of the total sample. Maximum respondents belonged to the 18-25 age groups. Under heuristic factors, ability bias had the highest impact on investment decisions and the gamblers’ fallacy had the lowest impact. Loss aversion, regret aversion and mental accounting that come under prospect factors had moderate impact on investment decisions. Market factors such as market information and past trend of stocks had a high impact on decision-making. Herding factors also showed a moderate impact on investment decisions. The result of structural equation modeling showed that heuristics and herding had a positive impact on the investment performance, whereas prospect had a negative impact on the same. Further research could explore the impact of behavioral factors on institutional investors’ decision-making and a wide array of dimensions could untangle the factors responsible for different kind of behavior.
Glaser (2003) presented the internet behavior of online traders of Germany. Evidences indicated that stock bubbles attributed to the internet behavior. From a sample of 3000, descriptive statistics regarding demographic information, investment strategy, portfolio positions and trading activity of German online investors were mentioned. Results revealed that maximum transactions indicated towards stock purchase. The sale and trading in warrants were also noted on the higher side. Respondents were predominantly male; income and age were negatively related to the number of transactions; online investors who had kept their account for retirement savings had lesser number of transactions; online investors traded at a higher level of transactions and had churned their portfolios. They were prone to invest in tech based stocks. In cases, where stock value was higher, the transaction per volume of stock was also higher. This positive and negative affect had a strong effect on investment performance of online clients. Hence, more work is needed to explore the facts in the perusal of finding the internet based behavior. Further, an investigation into the role of brokers would really be an interesting facet of investors’ behavior.

Charles & Kasilingam (2014) brought up the role of sentiments in investment decisions. People seem to have varied sentiments towards market activities and therefore knowing its effect would make a contribution across the financial industry. The study was conducted on retail investors in Tamilnadu from November 2011 to January 2012. Likert scale was used to capture the responses. Multistage random sampling was utilized to get the response from 1000 respondents. Analysis was done using chi square analysis, factor analysis, cluster analysis and discriminant analysis. The factor analysis revealed three factors, namely- a) informational sentiments b) speculative sentiments and c) trend sentiments. Under informational sentiments, cognition directed the investors’ sentiments in an indirect manner. Market liquidity and volatility affected speculative sentiments. In particular, bullishness and bearishness industry index affected the trend of a stock or a market. Investors were categorized on the basis of their sentiments (moderate, low and high sentiment investors). Moderate sentiment group was less affected by speculative sentiments and moderately by information and trend sentiments. These categories of investors were experienced with cognitive skills, were stable in their approach and had a positive attitude towards the market. The second categories of investors were basically the long term investors and those were found to be less affected by the sentiments. There was evidence of risk aversion in their approach for moderate sentiment investors. The third categories of investors were the high sentiment investors, who were highly intuitive in nature, and had the investment horizon from
short to medium. Their risk seeking ability increased as they were highly influenced by intuition. Age, marital status, education, occupation, financial dependents, proportion of investment in the stock market, time horizon and investment portfolio have been ascribed to the development of various categories of sentiments. Further work could be done with various other sentimental factors to check the different aspects of investment.

Gholizadeh, Shakerinia & Saber (2013) made an endeavour to assess the knowledge of behavioral finance on the investors in the Tehran Stock Exchange. Biases such as compatibility, familiarity, belief, event orientation, fresh point and irreversibility were studied through a structural equation modelling. In order to understand the subject of behavioral finance, it is very important to comprehend the investment behavior. Sometimes, they themselves stay unaware about the rationale behind their irrational exuberance. For the basic understanding, the two approaches to behavioral finance were discussed: a) Behavioral Finance Micro (BFMI) and b) Behavioral Finance Macro (BFMA). BFMI deals at a personal level and BFMA, at market level. Questionnaires were distributed to 400 respondents, out of which 384 were found valid. Results disclosed that out of the six variables, only the event oriented factor (which indicated investors’ predictability towards the normal market) did not significantly affect investment decisions. Suggestive evidence has shown that people were affected by familiarity of the market situation or the stock and happening of a fresh event in the market. In total, all factors such as compatibility, familiar concept, realistic belief, fresh point, irreversibility and event oriented accounted for about 83% variation in the investors’ decision. Further study might be conducted with more number of biases to extract their influence in greater detail. The same study could be replicated for the other stock markets in order to assess commonality in investors’ behavior all across the globe.

Subash (2012) explored the influence of overconfidence, representativeness, herding, anchoring, cognitive dissonance, regret aversion, gambler’s fallacy, mental accounting, and hindsight bias on investment decisions. As the volatility of the stock market is seen across the world, factors accounting for it have been in the mind of researchers for years. With the increasing pace of market movement and uncertainty, maintaining the rationality in investment decision becomes difficult. To prove this, respondents were bifurcated into young (age being less than or equal to 30 and having experience of 7 years) and experienced (age being more than 30 and having experience of at least 7 years). Equal numbers of responses were gathered from both the category and in total 92 responses were gathered. Results have shown that gambler’s fallacy and anchoring were found to be high in both young and
experienced investors. Overall, both the groups were found to be affected by behavioral biases at the similar level. But in terms of loss incurred during 2007-2009 crises, 50% of respondents mentioned that they had a loss of 30%. Hence, a better understanding of the factors affecting decision-making would help increase the self awareness of investors. Whether being aware of these biases decrease the sub-optimal results or increase the rationality has to be thought of. The limitation of the study was that it was conducted only in Tamilnadu. Replication of the same in other states would bring in a new dimension to it.

A study done by Kamran, Karl & Thom (2008) investigated the decision-making behavior of the students from the perspective of behavioral finance. Classical investment thinking rules out the possibility of irrational behavior. But evidences of the dot com bubble and the tulip mania suggests that psychology affects human behavior. This also suggests that a human’s mental state affects his thinking more than any other compelling factors affecting his decisions. The students of Jonkoping International Business School (JIBS), Sweden were taken as the sample for the study. Also, students were not that aware of their decision-making style, attitude towards risk and their choice of behavior towards stocks. Therefore, bringing the naive aspect of individual behavior through this paper would open up a new direction of research in the financial settings. The paper has discussed about the two forms of analysis, namely fundamental and technical analysis. Through fundamental analysis, investors rely on the company’s fundamentals and performance. Through technical analysis investors rely on stock price and volume. The paper approaches three basic themes as introduced by Shefrin (2000) which are heuristics, frame dependence, and inefficient markets. Heuristics applies a rule of thumb based on experience; frame dependence depends on the situation in which they were represented; and inefficient markets happen due to a series of psychological biases and unpredictable movement of markets. The primary data for the study was collected through a self administered questionnaire using the online link through survey monkey. Secondary data was used to check the theories and literatures in the field of behavioral finance with respect to investors’ behavior. Results have shown that people traded by applying technical analysis in a high frequency and displayed irrationality. Another finding suggested that between the price and preference of a stock, there existed a positive relationship and vice-versa. Experience and frequency of trading were also significantly related which might have been due to heuristics and previous experience. However, this behavior cannot be formally defined, but can be taken as a reference for further studies. More studies could be taken on other sub-groups or
different kind of investors and their attitude towards investment could be useful in the realm of investment.

Chen et al. (2007) examined investment decision-making in Chinese stock market. Previous studies have claimed the existence of behavioral biases for U.S. investors but in the context of emerging market, the studies are very thin. Trading behavior is related to personal characteristics like- wealth, location, age and trading frequency of the individual. People make choices that bring sub-optimal results. Overconfidence is one such trait that makes people overtly precise in their approach. Disposition effect makes people selling the winning stock and holding the losing stock. Mental shortcut makes people rely on stereotyping and through this; investors misjudge a company’s prospect and take false decisions. Culture also has an effect on investment behavior. Emerging market culture could differ from western market culture and it brings the role of psychology into limelight. In this context, a line of difference is mentioned that individual investors are less sophisticated than the institutional ones and they’re more prone to behavioral biases. Therefore, studying this varied behavior would make new insights into the overall body of literature. For the study, respondents were classified on the basis of experience, age, activity, wealth, and the size of cities they hailed from. Data was collected for 1998 to 2002. Respondents were divided into two panels as individual and institutional investors. From the results, it was revealed that the annual turnover of the Chinese individual investors was 327%. Institutional investors held more stocks and traded more aggressively than the individual investors; were diversified than their counterparts. They suffered from disposition effect as they seemed reluctant to realize losses, and overconfident as they traded more aggressively. Also, they relied on short term representation of stock movement. Around 43% of the respondents had shown that they exhibit more than one bias at a time. Hence, intriguing into the matter from further studies would throw light on the issues related to emerging markets and the gap between countries would see a closure.

A study by Chakraborty (2011) investigated the investment pattern, savings objective and individual investors’ preference towards different investment options in Odisha. The basic reasoning argued that human beings are different in a variety of ways; they have varied approach towards investment and savings in their different stages of life. At the young age, preference towards equity products are high and in later stages of life debt oriented products majorly captures investors’ portfolio. Parametric and non parametric tests were used for the analysis. Questionnaires were collected from 200 samples from December 2011 to August
2012. Demographic profile revealed that the majority of respondents were male (70%), salaried, having income in the range of 3-5 lakh per annum. Age, income and occupation were found to be related to savings habit. Self employed males were found to invest in real estate followed by term deposits and endowment insurance plans, whereas self employed females preferred term deposits followed by real estate investment and gold. Salaried and self employed categories were more inclined towards saving for retirement than the category of entrepreneurs. The other categories such as: National Savings Certificate and Public Provident Funds were the other preferred avenues of investment for both male and female investors. Hence, to encourage more savings, financial awareness programs could be conducted by various advisory services so that investors save their money through the right channel and right direction.

2.8 Operational Definition of the Constructs Used in the Study:

For the thesis, three constructs have been taken into consideration which are- overconfidence bias, herd behavior bias and risk tolerance bias. These variables have been defined in operational terms with reference to various reviewed literatures. The tabular presentation of the constructs is as follows:

Table 2.1

*Operation Definition of Overconfidence Bias*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Conceptual definition</th>
<th>Operational Definition</th>
<th>Authors (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overconfidence Bias</td>
<td>Defined as person’s subjective confidence in his / her judgement is reliably greater than the objective accuracy of those judgements (“Overconfidence Effect”)</td>
<td>LOT-R^4 dispositional measure</td>
<td>(Scheier &amp; Carver, 1985)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Miscalibration quiz^5^</td>
<td>(Nofsinger, 2005)</td>
</tr>
</tbody>
</table>

^4^Life orientation test is an eight item self report measure plus four filler items for assessing the expectancy of positive and negative item

^5^Measures individual calibration as per 90% confidence interval estimation.
<table>
<thead>
<tr>
<th>Factors influencing</th>
<th>Authors (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispositional optimism or self attribution</td>
<td>(Libby &amp; Rennekamp, 2012); (Daniel, Hirshleifer, &amp; Subrahmanyam, 1998)</td>
</tr>
<tr>
<td>Global financial crisis</td>
<td>(Utkus, 2008)</td>
</tr>
<tr>
<td>High self-esteem</td>
<td>(Shrauger &amp; Rosenberg, 1970)</td>
</tr>
<tr>
<td>Complexity of task, amount of feedback, level of motivation and skills</td>
<td>(Keasey &amp; Watson, 1989)</td>
</tr>
<tr>
<td>Personality factors (negative emotion, extraversion, openness to experience, conscientiousness, preference to innovation)</td>
<td>(Durand, Newby, Tant, &amp; Trepongkaruna, 2013)</td>
</tr>
<tr>
<td>Disposition effect (Pride &amp; shame)</td>
<td>(Chu, Im, &amp; Jang, 2012)</td>
</tr>
<tr>
<td>Miscalibration of information</td>
<td>(Odean, 1999)</td>
</tr>
<tr>
<td>Gender</td>
<td>(Barber &amp; Odean, 1999)</td>
</tr>
</tbody>
</table>

**Source:** Authors’ Own
Table 2.3

**Operational Measure of Herd Behavior Bias**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Conceptual Definition</th>
<th>Operational Definition</th>
<th>Authors (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herd Behavior</td>
<td>A tendency of individual to mimic the action of a larger group</td>
<td>LSV measure&lt;sup&gt;6&lt;/sup&gt;</td>
<td>(Lakonishok, Shleifer, &amp; Vishny, 1992)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IHM measure&lt;sup&gt;7&lt;/sup&gt;</td>
<td>(Merli &amp; Roger, 2013)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CH model&lt;sup&gt;8&lt;/sup&gt;</td>
<td>(Christie &amp; Huang, 1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CCK model&lt;sup&gt;9&lt;/sup&gt;</td>
<td>(E. C. Chang, Cheng, &amp; Khorana, 2000)</td>
</tr>
</tbody>
</table>

Source: Authors’ Own

Table 2.4

**Factors Influencing Herd Behavior**

<table>
<thead>
<tr>
<th>Factors influencing</th>
<th>Authors (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information asymmetry</td>
<td>(Dasgupta, Prat, &amp; Verardo, 2011)</td>
</tr>
<tr>
<td>Reputational concern for institutions</td>
<td>(Ionescu, 2012)</td>
</tr>
<tr>
<td>Contrarian strategy for individual investors</td>
<td></td>
</tr>
<tr>
<td>Regret aversion</td>
<td>(Scharfstein &amp; Stein, 1990)</td>
</tr>
<tr>
<td>Market stress / sentiments</td>
<td>(Christie &amp; Huang, 1995; Lakonishok et al., 1992)</td>
</tr>
<tr>
<td>Conformity, congruity, cognitive dissonance, home bias and rumour</td>
<td>(Kallinterakis, V&amp; Kaur, 2010)</td>
</tr>
<tr>
<td>Feedback trading / past return</td>
<td>(Nofsinger &amp; Sias, 1999)</td>
</tr>
</tbody>
</table>

Source: Authors’ Own

<sup>6</sup>Lakonishok, Shleifer and Vishny measure to test the accuracy of herding among UK mutual fund manager.

<sup>7</sup>An investor’s specific measure of herding.

<sup>8</sup>A measure of herding by using cross sectional standard deviation of returns.

<sup>9</sup>A measure to capture nonlinearity in relationship between variation in the asset return and market return.
### Table 2.5

**Operational Definition of Risk Tolerance Bias**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Conceptual Definition</th>
<th>Operational Definition</th>
<th>Authors (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Tolerance Bias</td>
<td>An extent to which an investor is willing to take more risk in expectation of a higher return</td>
<td>Ratio of risky asset to total wealth</td>
<td>(Wang &amp; Hanna, 1997)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCF measure(^{10})</td>
<td>(Grable &amp; Lytton, 2001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GL-RTS measure(^{11})</td>
<td>(Grable &amp; Lytton, 1999)</td>
</tr>
</tbody>
</table>

**Source:** Authors’ Own

### Table 2.6

**Factors Influencing Risk Tolerance Bias**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Factors influencing</th>
<th>Authors (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Tolerance</td>
<td>Non investment income, liquid &amp; non liquid financial assets, no. of years to retirement, race/ethnic group, education, marital status, gender, self employment</td>
<td>(Sung &amp; Hanna, 1996)</td>
</tr>
<tr>
<td></td>
<td>Gender, age, no. of dependents, marital status, income, wealth</td>
<td>(Hallahan, Faff, &amp; McKenzie, 2004)</td>
</tr>
<tr>
<td></td>
<td>Habit formation, loss aversion &amp; investor sentiment</td>
<td>(M. Guillemette &amp; Nanigian, 2014)</td>
</tr>
<tr>
<td></td>
<td>Personality dimensions (extraversion, conscientiousness, agreeableness, emotional stability &amp; openness)</td>
<td>(Wong &amp; Carducci, 2013)</td>
</tr>
</tbody>
</table>

**Source:** Authors’ Own

\(^{10}\)Survey of Consumer Finance measure is a single question measure to assess risk tolerance.

\(^{11}\)Grable & Lytton Risk Tolerance Score is a 13-item, multidimensional measure to assess risk tolerance.
2.9 Literatures on the Three Constructs

2.9.1 Overconfidence Bias

A study by Stonz & Nitzsch (2005) highlighted the prevalence of overconfidence bias in financial analysts’ earnings forecasts and prices. The psychological twist that an analyst faces is a function of various reactions to news, personal judgments and decision-making skills. Overconfidence in one’s own knowledge and abilities are basically used in its actual meaning. But the question arises how far a person holds control over the illusion towards a particular event. Here, perception of control plays a significant role in determining the quantum of control over the events. If the perception of control is stronger, more overconfidence could be seen in a person. The paper argued that if an analyst knows about the company, sector in specific and has earnings guidance from the company in detail, he is found to be overconfident in predicting numbers. The methodology that was used for the forecast was the direct approach, where analysts were asked questions about their accuracy of forecasts than that of their colleagues. Nine analysts were inquired about their skills and asked to compare themselves with their known counterparts. It was also tested whether overconfidence was related to the quality of work of the analysts produced. Results have indicated that analysts believed that luck affects successful earnings forecasts and irrational factors accounts for events occurred by chance. Those who found themselves more hardworking and experienced seemed to be more overconfident and had more perceived control. And as analysts had pronounced control whilst predicting earnings over prices, they had better and increased perceived control. Around 60% to 70% of them had rated themselves as above average. Hence, on a solution mode a psychological training could be effective in handling these issues of the analysts. Keeping in mind the importance of analysts in giving recommendations, a general awareness of overconfidence would enhance self-control while forecasting earnings and prices.

A different perspective was studied by Grimes (2002) to understand the presence of overconfidence in connection to macroeconomics students’ behavior during their mid-term examination. How applicable is metacognition for the educational psychologists in the pursuit of learning has been discussed in the paper. The paper argued about how predictive calibration is displayed by economics students and what factors affect it. To know about it, about 253 Mississippi State University economics students were taken as respondents. The self evaluation of learning was done on the basis of self expressed expectations of students
with respect to actual performance during the mid-term examination. Students were asked whether they will get better marks than the previous exam and their perception about the exam score out of 100. Results revealed that students were overconfident in rating themselves better than their previous exam. There was a substantial deviation between the expected results and actual performance which indicated towards overconfidence. Out of the demographic factors, age was found to be a significant factor affecting the predictive calibration. An interesting finding indicated that overconfidence was negatively related to measures of economic ability and produced less accurate predictive calibration. Students who overly predicted their exam scores were poor in their predictions. This paper has highlighted the interest of educators and the role of metacognition in classroom teaching.

Glaser & Weber (2007) spotted the relationship between overconfidence and trading volume. It was revealed that the trading volume of different transactions was found to be high in financial markets. The strands of literature on overconfidence presumed that people had the tendency to overestimate the exactness of the information. On the basis of the above backdrop, the paper raised questions on whether trading volume is a function of overconfidence, whether it was employed as an important determinant in the overconfidence models, and whether both of them were positively correlated. The dimensions of overconfidence from literature were: mis-calibration, volatility estimates and “better than the average” effect. For the study, data was collected from the online buy and sell transactions carried out by various German broking houses in the period of January 1997 to April 2001. The used proxies of trading volume were- number of transactions in the stock market, number of purchases done and mean monthly stock portfolio turnover for the data period. The mean and median scores out of mis-calibration indicated that around 75% to 80% of the responses fell into 90% confidence limit confirming overconfidence of the respondents. With regard to ‘better than the average’ effect, almost 50% of the respondents were found to have the effect. Past returns of the stock are not an illustrative variable of overconfidence. Gender and types of assets traded did not explain variation in overconfidence. Hence, knowing about the overconfidence traits which prevail in an individual and his/her financial settings would contribute to the basic understanding of overconfidence.

A study by Scott, Stumpp & Xu (2003) explored overconfidence in relation to the valuation of a company. Overconfidence can create a variation in the stock prices through a variety of ways. Measures like price-to-earnings ratio, price-to-book value ratio, earnings forecasts and recommendations affect the movement of stock prices. These ratios vary from
company to company and sector to sector. Valuation of a company by an analyst drives overconfidence. The information that is presented by the fundamental source of a company has to be ranked in the order of priorities. The assumptions used in the paper were: a) overconfidence creates a delayed response to news for quickly growing companies than that of slowly growing companies, and b) P/E effect is bigger for slow growing companies than the faster ones. Data was used for France, Germany, Japan, U.K. and U.S. for 1987 to 2000. Stocks were divided into slow, average and fast growing companies and variables such as the average growth rate and the expected growth rate were taken as proxies. Japanese stocks have shown the slowest sales growth; and mostly average sales growth was exhibited in the rest of the country. The results were consistent with the valuation theories and explained that the fastest growing stocks have a lower E/P (Earnings-to-price) ratio and slowing moving stocks have a higher E/P ratio. Hence, uncovering cheap valuation based stocks would be a different strategy for investment in stocks.

Daniel et al., (1998) presented a theory based on overconfidence, which is derived from self attribution bias. Overconfidence bias has largely been discussed by various researchers which states that one actually overestimates its own ability’ in the case of decision-making. Those investors overvalue the information privately received than that of public related information. This causes an overreaction in the price of securities and underreaction in its price subsequently. The self attribution theory is well talked about in psychology literature. It states that the events which create a favourable framework for investors are well attributed. The theory states that ‘investors strongly favour those events which validate their opinions and actions and deny the role of external factors that contradict with past experience’. This meant that unfavourable outcomes of an event were unwelcome by them. This trait is found in different professionals such as: psychologists, medical professionals (doctors, nurses and physician), lawyers, investment managers, security analysts and investors. Continuing overreaction causes a kind of momentum in security prices. And due to the pervasive behavior of market, the public related information gradually regresses the stock prices towards its mean. The study assumes that investors are quasi-rational, bayesian optimizers and perceives themselves best in valuing stocks. The presumed model is based on overconfidence about private information and gives an idea of the presence of information asymmetry. Two categories of investors- informed (risk seeker) and uninformed (risk averse) were taken. It was found that positive autocorrelation is a result of continuing overreaction. The limitation of the study was the tendency of quasi rational traders
to impose restrictions on trade distributions. Hence, considering them for the model brings error in judgment. Due to self attribution bias, the model brings about the dominance of price inefficiency and information asymmetry in the case of small companies.

An experiment by Ifcher & Zarghamee (2014) was done to investigate whether overconfidence was impacted by the incidental mild positive or negative affect. Here, overconfidence is defined as ‘systematic deviation from standard rational theory’. And there are several factors driving the overconfidence. The paper probed into the role of affect or mood in driving overconfidence bias. Two experiments were performed in this regard. The experiment 1 was conducted to know how mild affect influenced overconfidence. The subjects were asked to assess their performance in absolute and relative term with respect to other subjects with and without incentives. Affects like fear and sadness did not necessarily bring negative effect. The second experiment was conducted with one control group related to neutral effects and three treatment groups related to anger, fear and sadness. Different literatures have identified the significance of overconfidence in decision-making. 157 subjects were taken from Santa Clara University. Both treatment and control groups were shown a film clip to induce or neutralize the effect. PANAS (Positive Affect Negative Affect Schedule) was used to test the score of subjects. Results have shown that the sums of seven positive scores were higher for the treatment group than the control group. Other factors like level of amusement, happiness, and interest scores were also higher for the treatment group. Both treatment and control groups had no difference in terms of arousal, contentment, relief and surprise during the experiment. The negative affect’s factors like anger, disgust and embarrassment were higher in the treatment group with scores: 1.64, 1.88 and 1.48. The findings suggested that positive factors led to overconfidence which was guided by high self estimation and poor earnings.

Kahneman (2011) mentioned his experience while serving as a psychological trainer in an Israeli army. The author has described the type of nature exhibited by the soldiers during their exercise of being officers. He had encountered with the term “illusion of validity” while judging the performance of an aspiring officer during the training. A general rule that could be made out of the situation was christened as “what you see is all there is”. It means that despite knowing the fact that the situation presented before the trainer is not real, the confidence displayed while judging the soldiers remained intact. The news article has amalgamated different researches, views and works from the field of finance. In the article, the work of Odean is being mentioned who tested overconfidence of 10,000 brokerage
accounts of individual investors in a span of seven years. Further, disposition effect creates overconfidence causing selling the winning stocks and holding the losing ones. While carrying out the portfolio management for their clients, mutual fund managers more often underperform despite having the best track records. If overconfidence is stemmed from strong intuition and experience, would it be able to drive the judgment of people given the uncertainty of the situation? If overconfident people think themselves as experts in the field, do they really mean so, have they been not trapped into the grip of illusion of being just confident or overconfident? Hence, it is always advisable to know one's own behavior before getting into investments.

Hardies, Breesch & Branson (2012) found the prevalence of overconfidence in professional auditors and role of gender in ascribing overconfidence within the auditor's fraternity. In finance domain across different population, overconfidence is treated as the most highlighted bias. However, there is no conclusive evidence that gender creates variation in overconfidence among men and women, but it has already brought attention from researchers and academicians. Auditing is an important function of finance and demands accuracy and exactness from the auditors. Any deviation from the standard rule can act as a hazard to the entire financial function. In this paper, calibration tests involved two experiments where auditors were asked to provide 90% confidence interval for the questions. This interval estimate was referred to as HIT Rate which meant that 10% of the calibrated value will fall outside the 90% estimated interval. For the experiment I, 122 Belgian auditors were taken. When questioned about the exchange rate of Euro, no significant difference in terms of gender was found among the auditors. For the experiment II, 597 Dutch auditors were taken as sample. The second experiment revealed the same (that gender is not the significant factor affecting overconfidence). The study has limitations in terms of asking questions not directly related to auditing and using only one facet of overconfidence. Further study might use other aspects of overconfidence to know the impact of gender on auditing decisions in particular and financing decisions in general.

But the study of Barber & Odean (1999) brought some contrasting results as an argument to the above mentioned work. The study was done in a complete financial setting by brokerage firms where investors made huge transaction volumes while doing stock investments. Samples were collected from 37,664 households for 1991 to 1997. Investment in common stock accounted for 60% of the total portfolio volume. The demographic information was taken from the brokerage house. Results have revealed that men trade more
than women and this trait is found more in single men than single women. Both have different attitude towards risk and women were found to be more risk averse than their men counterparts. While taking demographic effect into consideration, young and single men held more volatile stocks than women. Wealthier investors were prone to take risky and volatile investments. Taking gender as a proxy of overconfidence, difference in portfolio turnover and net return performance was found to be larger in single men and women than that of their married counterparts. The reason could be the role of a spouse taking a decision in a married couple for investments. The study is a departure from the standard portfolio theory which affirms that people trade for gains. More the people trade, more are the chances of getting losses.

Chu et al., (2012) advocated the relationship between overconfidence and disposition effect. It discussed the way in which pride and shame ascribed to an investment outcome and how the success rate of an outcome entailed the feelings of pride and shame. Overconfidence is a pervasive phenomenon and has been found in various decision-making scenarios. This paper takes an experimental approach through a computer based mock investment game. In total, 68 students and 93 office workers were taken as respondents from the South Korean University. The 2*2 experimental design was used to check the association between overconfidence and investment outcome. The survey measured investment experience, the illusion of control and attitude towards overconfidence. The subjects were asked to invest US$ 10000 in the buy and sell transactions in KOSPI (Korea Stock Exchange) index fund. They were asked not to expect that their high profits would lead to higher rewards. The investment performances of the previous rounds were given so that the concerned subjects could depict their feeling after the realized gain or loss. Subjects were asked to assign a probability of 50% to 100% of their answers being correct. Overconfidence was calculated as the positive difference between the average confidence interval and accuracy rate. To measure emotional experience, four dimensions such as pleasure, happiness, sadness and disappointment were used as proxies. Results revealed that overconfidence leads to more buying and holding which further led to repeating loss situations; and more selling in a repeated gain condition which entailed disposition effect. Due to overconfidence trait, people were unable to handle the magnitude of losses and resulted in panic behavior during the profitable situations. Overconfidence leads to pride which leads to excessive selling, whereas under confidence leads to shame and more buying behavior. Further research could explore
the strategies related to the handling of these emotions or self appraisal so that people do not make bad investment decisions due to emotional feelings.

Although the extant literature shows diverse instances of overconfidence bias, it does not give emphasis on the facets of overconfidence bias which affects the individual investors in the capital market. These literatures belong to various domains such as- students, auditing, stock investments, real estate, experimental setting and financial markets. But, the manifestation of overconfidence in the real terms in the context of capital market especially for individual investors hasn’t been mentioned as yet. Therefore, my study takes into account overconfidence bias as the first construct.

2.9.2 Herd Bias

The second dimension which is considered for the purpose of study is Herd Bias. Let us go through some of the works in relation to this and examine what has been talked about it in the realm of research and academics.

A study by Yang & Chen (2015) investigated herd behavior in China, Hong Kong and Taiwan in response to the events from the U.S. and domestic market factors. The aim of the paper was to find out herding relationship between Greater China stock markets and the U.S. stock market. The rationale behind taking the Chinese market into account is its rapid growth, technological advancement and strong political and geographical links to the U.S. and other stock markets. The sample period consists of 2005-2006 pre-crisis, 2007-2008 crisis and post crisis period of 2009. Kalman’s filter based model was used to measure herd behavior. Vector auto regression model was used to explore herding with respect to the change in domestic and international factors. Results showed that during the pre-crisis period when investors exhibited overconfidence, the intensity of herding in China and U.S. markets declined. During the crisis and post crisis period, herding in the China market was negatively related to the U.S. market. In the post crisis period, A-category share of the Shanghai stock exchange was more receptive to the happenings in the U.S. market. There was a high tendency of China and Taiwan market investors to herd in response to the increasing domestic market return. Overconfidence did not articulate herd tendency in general.

Wylie (2005) investigated herding in equity mutual fund managers using U.K. data sets. The purpose of the study was to find whether the LSV measure presents an accurate level of herding among the fund managers. Whether they took decisions on their own or were
affected by other members in their decision-making. A total of 268 equity mutual fund professionals were taken into consideration who were sponsored by 99 separate management firms. The data was taken for the period of 1986 to 1993. First, assumptions of LSV measure were checked for adequacy; and then the relationship between herding and stock returns for before and after the period of herding were tested. U.K. fund managers were supposed to give reports to their investors on a half yearly basis. When they were incentivized, the level of herding increased and fund managers gave their recommendations in the same direction. Moreover, for large and small capitalization stocks herding were found more. Fund wise analysis suggested that the income fund involved more herding than general or growth funds. But the limitation of the paper is that the LSV measure had shown biased results when very few numbers of managers traded. Further study could consider other professional managers while checking the presence of herding in the financial segment.

Another study by Merli & Roger (2013) investigated individual investors herding behavior of French investors for the period of 1999 to 2006. Herding refers to the most an individual imitates others’ actions and decisions. Top leading European broking houses were targeted and a total sample of 87,373 was taken for the study. A different approach of individual herding measure was taken to measure herding. It was aimed at measuring herding only for the traded assets by individual traders. Whether individuals exhibited an extraordinary trait with respect to herd behavior was also studied. Institutional traders habitually maintained their performances with relation to the benchmark index and accordingly adjusted the same. The portfolios were considered at the beginning of every quarter. General level analysis revealed that on an average basis, around 13% of the investors remained in the same side of the market indicating herding prevailed among the individual investors only. Buy side transactions were found to be highly correlated among investor groups. Investors who took less risk are prone to herding. Instances where investors have faced bad experience in terms of portfolio performance in the past induced herding at the individual level too.

Cakan & Balagyozyan (2014) addressed herd behavior in the Turkish banking sector. The study was conducted on sixteen Turkish banks which were listed on the Istanbul stock exchange. The period of study was taken from 2007 to 2012. The goal behind this extensive study was due to the high levels of FII activity in Turkey and the large transactions carried out by institutional investors on the stock exchange as compared to the individual investors. Due to the lack of information, individual investors were prone to herd behavior. Different
sectors catered to different news and their impact was different as well. It is concerned with the performance of money managers or fund managers for the recommendations. The study used Chang et al. (2000) model for measuring herd behavior which followed the assumption that the extremely volatile market condition encouraged herding and people moved towards the collective behavior of the market. Results revealed that the banking industry is affected by herd behavior; and there is an increasing tendency of herd behavior in rising markets. By controlling the market and firm level factors in the model, herding level was found which indicated that the findings are robust in changing market conditions.

A study by Brahmana, Hooy & Ahmad (2012) investigated if herding is impulsive in nature and caused day-of-the-week effect. The study was performed on 846 Bursa Malaysian stocks from 1990 to 2010. The study put forth Monday irrationality effect which suggested that stock returns on a particular day significantly varied from the other day returns that were not tested before. The data was used from Thomson Reuters data stream. During the period of abnormal market swings, investors left their own beliefs and followed the crowd which caused events such as Monday’s irrationality. The results revealed that the coefficients of Monday returns were not positive during the entire data period and were found significant at 1% significance level. This upheld the evidence of the weekend effect in the Malaysian stock exchange. The results were more in favour of hotel, mining and technology industry, which further asserted the presence of herding in small cap stocks in Malaysia. The interesting finding that herd behavior is found only on Mondays triggered the fact that irrationality existed in the Malaysian stock market. The study could be extended further on large cap and mid cap stocks to check whether herding existed in those category stocks. Whether the day-of-the-week-effect is found on days other than Monday could also be studied using different stock exchange data. A deeper exploration into these aspects could bring more clarity on overall cognitive dissonance and deviation from rational thinking.

A testing of herd behavior in an experimental setting was done by Cipriani & Guarino (2014). In actual market, fund managers tend to cluster their investment decisions which can be evaluated statistically. This could be explained by information cascade or any public information available to fund managers. Therefore, in order to examine the question of whether private information causes herding, the study approaches an experimental methodology. In the lab setting, private information about a stock was given in terms of price and history. The way subjects used information and took decisions as per the decision of previous traders gave rooms for the incidence of herding. The paper highlighted that a market
trader exchanged transactions with a market maker. These traders can be an informed traders or noise traders. The experiment was performed on 32 finance professionals in London. Both the treatment rounds were bestowed with paid incentives. In the Treatment I, the subjects acted as informed traders and exchanged the asset with a computerised market maker. Each round consisted of eight trading sessions and at the end, the realization of the asset value was disclosed and subjects could see their payoff on their screens. The conditional market order was made similar to the exact market so that subjects did the exact transactions. Treatment II suggested that due to the trade imbalance and informational uncertainty, herding occurred. Under demographic factors, only gender was found to be a significant factor affecting the trading behavior. Thus, further work is needed in the actual market setting to compare and contrast it with the result of the experiment.

A study by Chang (2014) investigated the herd behavior in the context of social interaction among individual investors. The way asset bubbles resulted in price dynamics and asset behavior; the manner it helped in determining social interaction among individuals brought the subject matter into account. Those bubbles were the deviation from fundamental values and the mean return on the market. As a trader, whether one acted as a noise trader or a rational arbitrageur determined the social utility associated with the trading. By this, it means that herding occurred when a noise trader continued to believe in the present trend and also exploited opportunities by following deviation. It was found that traders followed the herd only when their conviction about the trade is similar to that of 50% of the average traders in the market. An utmost asset bubble created more herding in the market when the social interaction during the unstable market condition is very strong.

A contrasting result was noted in the context of the Indian market by Prosad, Kapoor & Sengupta (2012). Previous studies have reported that herd behavior in developed market context. But a sparse strand of literature is available for the Asian countries context in general and India in particular. In fund manager context, herding occurred out of reputations concern and sharing-the-blame effect. However, while taking real market data, cross sectional standard deviation was used as a tool to measure the dispersion of asset return from the market return. For the study, information was obtained from the Centre for Monitoring Indian Economy for Nifty 50 stocks catering to 22 sectors of Indian economy. Stock returns were derived from April, 2006 to March, 2011 on a regular basis. The paper is aimed at finding out the presence of herd behavior in extreme market condition basically in bull and bear market. But the results revealed that herd behavior was non-existent in India for the period of 2006 to
2011 which seemed different from that of the previous studies. A major part of the findings revealed that herding was found to a greater extent in a bullish market. Nonetheless, the findings of a bear market suggested that people did not panic and therefore did not follow the crowd behavior.

Caporale, Economou & Philippas (2009) investigated herd behavior in Athens stock exchange for the period of 1998 to 2007, especially after the crisis of 1999. The data (stock returns) was taken on a daily, weekly and monthly basis. The study’s objective was to find out whether herd behavior existed during market stress in the stock market. No chances of dispersion from mean were observed when the individual stock returns moved around the average stock market returns. In case, the relationship between cross sectional average deviation and the average market return was non-linear, then the herd behavior existed. The results approved that herding persisted in the case of daily time intervals. Whereas, in the weekly and monthly data, herding seemed to be persistent only during a rising market. A negative correlation indicated the presence of herding during the 1999 crisis. Since 2002, it has been found that investors are more rational due to changes in the regulatory framework and reforms related to working with the capital market.

Wang (2008) measured herd behavior for developed and developing emerging markets by studying the cross sectional variance of data. Under market wide herding, for buying and selling the average crowd did herd around the collective market behavior. The mean and variance of the betas were calculated using the Capital asset pricing model and the Fama-French model. The results disclosed that more herding was found in emerging markets as compared to the developed markets. The herding variable followed the cycle as of other macroeconomic variables. The same group of market displayed a higher degree of correlation for herding than that of different groups. Further studies could throw light on the policy implications of herd behavior and check the presence of herding in other financial domains.

A careful investigation of herd behavior has been done by reviewing the work carried out by various prominent researchers. Most certainly, the work has been put forth to acknowledge the investment behavior of institutional investors. More work is needed to explore the behavior of individual investors who tend to get driven by the crowd. In order to get better clarification, I chose to take up herd behavior as my second construct.
2.9.3 Risk Tolerance Bias

Risk is multidisciplinary in nature. This section describes literatures related to risk tolerance bias. So, let’s discuss about few works in this area and try to inculcate their meaning in the context of present research.

A study done by Roxzkowski & Davey (2010) highlighted the importance of risk tolerance pre and post 2008 economic crisis. Risk is an uncertain phenomenon and varies as per the context and situation. Risk tolerance is considered as a very stable individual trait, but it is hard to say whether some unexpected disaster brings it down as a manifestation. In the financial domain, risk tolerance is the individual’s willingness to take risks with their own investments. Perception does play a crucial role in shaping one’s own interpretation. If two persons are given the same condition, their response and attitude towards the risk would be very different. For that matter, it is distinctive in nature and is directed by our emotions, experience, knowledge and personality. Individuals perceive things in different ways and deciding on the alternatives are a function of psychological thinking. One should think about whether s/he judges risk in a rational manner or gets misguided by behavioral biases. Using the Survey of Consumer Finance (SCF), measure of risk tolerance before the crisis between 1983 and 2001 had shown that level of risk tolerance declined between 1983 and 1999, increased in later years and declined back in 2001. The study had documented another report done by Health and Retirement Survey (HRS) for 1992 to 2002. It suggested that risk tolerance declined with age and a great variation in the individual’s response was captured by risk tolerance. On the other side, research by Fina Metrica for the period of 1998 to 2007 in the context of the Australian stock market revealed that risk tolerance did not change with economic conditions. While similar results were obtained even after the crisis period. The final analysis suggested that risk tolerance was relatively stable and stayed unaffected by the 2008 crisis.

Chang, DeVaney & Chiremba (2004) studied both subjective and objective risk tolerance and how they affected each other. The study aimed at describing the effect of age on risk tolerance; analysing various results produced by different measures with respect to age effect. Subjective risk tolerance is an expression of one’s own perception and judgment. Objective risk is calculated as the amount of risky assets in proportion to the total net worth. Many other studies have reported that demographic factors are the basic information to know about someone’s risk tolerance level, so is the importance of age. The above mentioned study
used subjective and objective risk tolerance as dependent variables; and age, education, marital status, employment and net worth as independent variables. Chi square method of analysis and ordinary least square method were used to determine the effect of the independent variables on the dependent variables. From the descriptive analysis, most of the respondents did not want to take any risk. The proportion of risky assets to total net worth was 25%; the young and older mass was less risk tolerant; whereas, risk tolerance seemed to increase with an increase in education and income. Age had a positive effect on objective risk tolerance and not on subjective risk tolerance. It was found at increased levels upto the age of 62.75 and then, a gradual fall was seen. As this study was a cross sectional one, the future studies could aim at carrying out a panel data study to ascertain whether risk tolerance would persist over a longer period of time.

Davies & Brooks (2014) suggested an integrated approach towards measuring risk tolerance through a psychometric scale. Knowing about risk tolerance is the foremost thought of an advisor. Often it is misunderstood as risk perception, but there is a thin line of difference between the two. If the risk profile of customers are not analysed properly, it can lead to some distressing consequences. Self reporting risk tolerance measure is subject to changes as per the changes in risk perception due to changes in the market cycle. Factors such as: fear, greed, and perception towards the changing market scenario leads to a biased self reported response towards risk tolerance questionnaire. If the same information is tweaked to the same audience, their interpretation would be quite different. Therefore, taking a holistic approach for customers’ long term planning and the payoff may bring some adequate measure of risk tolerance. At an individual level, psychometric traits are different; thereby correlating the goal of investment to individual risk tolerance is difficult. By making a stable and integrated framework for risk tolerance to create a risk profile of customers, it becomes easier for advisors to prepare a multilevel approach. Combining the risk and return at various points of the frontier provide a properly planned approach towards risk measurement.

Grable & Lytton (2001) examined the validity of SCF financial risk tolerance measure in contrast to the 13-item-risk-tolerance measure. Knowing about individual risk tolerance is imperative these days in order to design the asset allocation strategy and portfolio construction. Financial planners evaluate the same through their own measures. Although there are several measures available for this, the lack of standardised tools leads to the use of their self developed and in-house assessment tools. SCF measure takes into account
individuals’ willingness of taking financial risks towards their investments. The validity of the SCF measure in actual sense is challenged by the volatility in the market which might create ambiguity in the minds of the concerned individuals. In previous studies where SCF questions have been used as explanatory factors along with some other factors, they’ve suggested that high degree of risk tolerance in the household led to more savings. In case of construct validity, this measure was found to be very consistent over time and it maintained a fair degree of the same. The content validity of the item appeared weaker than face validity. But, at times, the criterion validity of the SCF measure is difficult to establish. The 13-item financial risk tolerance questionnaire gave a cronbach alpha of 0.75 resulting in the adequate measure of risk tolerance. Two surveys were conducted in the study. A first survey revealed that 56% of the respondents willed to take average financial risks in the expectation of earning an average return. Results from the second survey indicated the same line of response. Finally it could be said that the concurrent validity of the SCF measure was relatively weaker as compared to the 13 item measure questionnaire.

A study by Grable & Rabbani (2014) explored risk tolerance for older adults approaching their retirement. The study aimed at knowing risk tolerance as a general attitude; or as an observable fact related to an individual’s personal trait. The domains included: financial, safety, recreational, ethical, social and safety. The first and foremost requirement of a financial planning is to find out one’s own clients and analyse them on the basis of their level of risk tolerance. The study is aimed at presenting a holistic approach for representing risk tolerance of people nearing their retirement level. Samples were taken from the 2010 wave of the National Longitudinal Survey of Youth (NLSY79) panel survey and those who did not belong to this panel were taken from the U.S. Department of Labor’s Bureau of Labor Statistics. The total sample size was 12,686 and samples were asked seven domain dependent items. The principal component analysis was used to group together the domain characteristics. The results revealed that people approaching their retirement were found to be steady while monitoring their risk level. It was also found that despite the fact that people had different behavior towards risk; a risk tolerance portrait could be made on the basis of the behavior displayed. The test was reliable using cronbach alpha measurement and it had shown that the responses were accurately measured. Women were found to underestimate their risk tolerance and men were found to overestimate their risk tolerance. For all the domains, samples were reasonably able to measure their risk tolerance in a consistent manner.
Guillemette, Finke & Gilliam (2012) investigated risk tolerance among investors by examining the questions in the context of economic theory and prospect theory. There are numerous risk tolerance questionnaires, but whether they actually revealed the accurate relation between investors and their behavior is the point of research. While the economic theory of risk tolerance states the willingness to take the deviation in outcomes and prospect theory states that loss has more emotional value than profit, the actual question comes whether these theories resembled risk assessment questionnaires. The Grable & Lytton risk tolerance questionnaire measure used 20 questions stating different variation in risk tolerance levels. The paper used Fina Metrica risk profiling assessment methods that included 25 risk tolerance questions. The total sample size was 2050 and data was collected between November 2009 and October 2010. Based on the relevance of theories, the questionnaire was divided into arrow pratt measure, loss aversion and self assessment measure. For the measurement, three levels of analysis were utilized to capture the portfolio allocation preferences of clients.

Three ordinal regression analyses were also conducted where portfolio allocation score was used as the dependent variable. The regression models were compared using adjusted r-square for different numbers of independent variables. The regression table showed 47% variation in the investment changes by loss aversion model, self assessment model by 38%. Another regression revealed the adjusted r-square statistics of 0.2088 including loss aversion, self assessment and control measures. Hence to conclude, the arrow pratt measure was the best measure of risk tolerance. But whatsoever be the measure is it is very crucial to know clients’ allocation preferences in any kind of market situation.

Grable & Lytton (1999) presented a framework for making a financial risk tolerance assessment tool. These tools are most important for financial experts and advisors while profiling their clients for portfolio allocation. Therefore, the reliability and validity of these tools add value to the overall risk assessment measure. Professionals generally use heuristics based approaches to measure the relationship between risk tolerance and socio-demographic factors. Checking the validity of an instrument is important in case of measuring behavioral attitudes and reliability to know if the measure is adequate and what it intends to know. A sound financial risk tolerance questionnaire must include the central idea of risk, relevance of risk measure for respondents, adequate reliability and validity. For designing the instrument, overall 100 assessment questions were taken. A pilot study was taken for 50 assessment questions using undergraduate and graduate students. Bi-variate item analysis was conducted
for checking the relationship between each other and 30 were finally included for selection. Through a multivariate analysis, 20 items displayed a strong relationship with the final composite index. The 20 item index measured eight dimensions of risk relating to the actual meaning of risk. The next step involved covering of the response for a larger group of people for which 1,075 samples were taken. The factor analysis resulted in three constructs namely: a) investment risk b) risk comfort and experience and c) speculative risk. Hence, to ensure that clients take instrument decision adequately, financial planners should use these measures in an effective manner.

Hallahan et al., (2004) assessed the relationship between financial risk tolerance scores and demographic factors. Risk tolerance is an important concept that describes the general attitude of people towards risk. There is a lack of consensus for the determinants of risk tolerance. Factors such as age, gender, education, income, wealth and marital status come under demographics. The measurement tool used was provided by the ProQuest company. It helped in conducting the psychometric test for measuring risk tolerance scores using eight demographic variables. Demographic results indicated that the respondents were predominantly male (70.75%), belonged to the age group 51-60 (25.49%), were married (77.66%), had an income ($50,000 to $100,000), and had net assets worth ($150,000 to $500,000). The measurement scale was from 0 to 100. Hierarchical regression was used to check the influence of demographic factors on risk tolerance. Age was found to have had a negative effect on the risk tolerance scores. Taking marital status into the picture, single respondents were more risk tolerant. Hence, it was an important determinant. Considering education and income as a factor, level of education for respondents near to retirement was an indicator of their wealth. Women were found to be less risk tolerant than men. Therefore, in the changing demographic scenario, the job of the financial advisor is to profile their client in such a way that would benefit them while making financial investments.

A study by Wang & Hanna (1997) examined the effect of age on risk tolerance. For this, the datasets were used from the Survey of Consumer Finance 1983-89 panel data which are a representative of household’s wealth. The relationship between age and net wealth had been shown for both retired and non-retired households. Here, ratio of risky assets to wealth was used as a proxy for risk tolerance. With the increase in the level of retirement, there was an increase in the ratio of risky assets to wealth. At the age of 30, the proportion was 0%, 14% at 55, 18% at 65, and 24% at 80. Hence, relative risk aversion decreased with age and the proportion of net wealth invested in risky assets increased with age. The financial
educators and planners should keep in mind that a proper allocation of risky assets should be done at different level of age.

Hanna & Chen (1997) studied risk tolerance in two distinct contexts basically in subjective risk tolerance and objective risk tolerance. Subjective risk tolerance is measured using relative risk aversion and objective risk tolerance, based on the horizon of investment and financial assets to total wealth. The investment horizon is different for different people, and for this study, three dimensions of the horizon were considered: short, intermediate and long horizon. For a 5 year investment, horizons with a short investment horizon, one should have a considerable amount of small stocks along with corporate and government bonds. For a stock investment having 20 years horizon, the expected utility was assumed to have a high and small stock portfolio. This dominated the entire portfolio at various levels of risk aversion. The paper did put emphasis on the financial planners’ role in advising clients to allocate their portfolio appropriately in stocks and bonds as per their horizon of investment and risk aversion.

A thorough investigation into the concept of risk tolerance behavior reflects the importance of this phenomenon. Basically, it is examined in the case of demographics variables like age, gender, marital status, education, experience and wealth. I take this bias as the third construct of my study to investigate its impact on the investment decision of individual investors.

2.10 Research Gap

After going through the extensive literature review from different arrays of literature, several gaps which have been identified are relevant to the present study and justify the Indian market. Most past empirical studies have used one psychological bias to explain one type of investor behavior. Although they provide useful insights, they do not provide combined and relative impact of biases on investment decisions. Overconfidence bias is the most documented bias in behavioral finance, whereas herd behavior is a collective phenomenon and Indians have a tendency to follow group norms and societal values. Risk tolerance is an essential factor for any type of investments. Keeping these arguments in mind, the present study covers three biases that influence investors’ behavior, a) Overconfidence bias, b) Herd behavior bias, and c) Risk Tolerance bias. The study put forth measuring the variables in an absolute manner instead of using the proxy variables.
Moreover, in terms of decision making, individual investors are found to be less proficient than institutional investors. Therefore, they are prone to biases due to the lack of awareness and proper knowledge. In Indian context, the application of these biases to determine the impact of behavioral dimensions on investment behavior in the capital market is very thin. The impact of behavioral biases on Eastern Indian investors has not received much attention so far. There is an avenue for these biases within the framework of investment behavior to explain their extent of influence on the Indian market in general and Eastern India in particular. It would be an important field of study at this point of time when there are plentiful developments and reforms across the Indian stock market.

Most of the published work reviewed relate to national level and a few covered small geographic regions and larger cities. In India, studies were mostly found to be conducted in Mumbai, Delhi, Chandigarh, Indore, Bangalore, Ahmedabad, Kolkata and Chennai. Most of these studies reflect new geographic regions as the future scope of research to gain richer insights into the investment decisions. The rationale behind selecting Eastern India is that the proportion of households’ investors’ in Eastern India is 27.54% as compared to households’ savers’ 55.41% (SEBI-NCAER, 2011). This shows the narrowness in the market despite the strengthening of nation-wide network of investment platforms and the channels of investment in Eastern India.

2.11 Conceptual Framework

Conceptual framework is the outline for understanding how the variables of the study are connected to each other. After summarising the literatures from various themes and concepts and isolating the variables from it, a conceptual framework has been prepared. It is a map to establish the relationship between dependent and independent variables. An array of relationships has been drawn between overconfidence and the extent of investment in capital market, herd behavior and the extent of investment in capital market, risk tolerance bias and the extent of investment in capital market. Based on the relationships and flow of the diagram, a statistical analysis would be carried to justify the exactness of the relationship has been established. The following diagram shows the conceptual framework for the present study:
2.12 Conclusion

Human behavior is one of the most important drivers of decision-making. From the different extant of literatures- several concepts, theories and work of academicians, researchers, practitioners and authors has been discussed. Multiple insights have been drawn from studies and are found to be relevant. Behavioral dimensions have found to be an essential determinant of decision-making in various contexts. The journey from conventional finance to behavioral finance has seen a shift in investors’ preference and their tendency to take action for the desired results. Numerous biases have been studied in different countries under different situations. Knowing about the biases and acting on the ways to mitigate their ill effects would be essential for both investors and financial advisors. Evidences suggest that investors’ decision-making is a function of various biases and studying them in greater detail would develop a comprehensive framework of judgment and thinking. What we think and how we deviate from rational thinking in times of uncertainty has a direct influence on our portfolio performance. The present study focuses on knowing the impact of overconfidence bias, herd behavior bias and risk tolerance bias on the extent of investment decision. This section has led to the development of a conceptual framework which ascertains the relationship between the variables defined for the study. Keeping in mind the framework made, let us proceed to discuss the methodology of research in the next section.