Do investors exhibit behavioral biases in investment decision making? A systematic review

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Abstract
Purpose – The purpose of this paper is to study and describe several biases in investment decision-making through the review of research articles in the area of behavioral finance. It also includes some of the analytical and foundational work and how this has progressed over the years to make behavioral finance an established and specific area of study. The study includes behavioral patterns of individual investors, institutional investors and financial advisors.

Design/methodology/approach – The research papers are analyzed on the basis of searching the keywords related to behavioral finance on various published journals, conference proceedings, working papers and some other published books. These papers are collected over a period of year’s right from the time when the most introductory paper was published (1979) that contributed this area a basic foundation till the most recent papers (2016). These articles are segregated into biases wise, year-wise, country-wise and author wise. All research tools that have been used by authors related to primary and secondary data have also been included into our table.

Findings – A new era of understanding of human emotions, behavior and sentiments has been started which was earlier dominated by the study of financial markets. Moreover, this area is not only attracting the attention of academicians but also of the various corporates, financial intermediaries and entrepreneurs thus adding to its importance. The study is more inclined toward the study of individual and institutional investors and financial advisors’ investors but the behavior of intermediaries through which some of them invest should be focused upon, narrowing down population into various variables, targeting the expanding economies to reap some unexplained theories. This study has identified 17 different types of biases and also summarized in the form of tables.

Research limitations/implications – The study is based on some of the most recent findings to have a quick overview of the latest work carried out in this area. So far very few extensive review papers have been published to highlight the research work in the area of behavioral finance. This study will be helpful for new researches in this field and to identify the areas where possible work can be done.

Practical implications – Practical implication of the research is that companies, policymakers and issuers of securities can watch out of investors’ interest before issuing securities into the market.

Social implications – Under the Social Implication, investors can recognize several behavioral biases, take sound investment decisions and can also minimize their risk.

Originality/value – The essence of this paper is the identification of 17 types of biases and the literature related to them. The study is based on both, the literature on investment decisions and the biases in investment decision-making. Such study is less prevalent in the developing country like India. This paper does not only focus on the basic principles of behavioral finance but also explain some emerging concepts and theories of behavioral finance. Thus, the paper generates interest in the readers to find the solutions to minimize the effect of biases in decision-making.

Keywords Overconfidence, Financial markets, Disposition effect, Behavioural finance, Behavioural biases, Investment decisions

Paper type Literature review
1. Introduction

Financial management popularly known as the art of wealth management has been the lifeline of the economic system for decades. Several theories and assumptions have been put forward by known scholars to explain the functioning of the finance models. The individuals, companies and organizations in view of the associated risks and returns consider finance with procurement and allocation of financial resources. Ironically, trading and investing are considered as the interchangeable terms[1]. While trading is meant for short term and quick returns, investing is for the long term that gives the investors an opportunity to reap the optimum returns in the form of both cash flows and capital gains. While investing is a complex procedure, these complexities are increased by the behavior of the stock market. The primary reason for complexities in the investment decisions is the presence of a large number of participants who exhibit varied emotions and behavioral patterns while taking investment decisions. Efficient market hypothesis explains that stock markets are efficient. It states that the share price incorporates all the available information. In fact, the classical finance theory is built on the efficient market hypothesis.

Modern portfolio theory states that because there are uncertainties in the security market, the investor preference cannot be quantified in terms of choices but with the help of mean and variance of the returns, the tradeoff of modern finance is shown as follows:

- Expected utility theory (Bernoulli, Daniel; originally published in 1738; translated by Dr Louise Sommer, 1954) is concerned with the choice among the alternatives that have uncertain outcomes. The aim is to attain a tradeoff between risk and return.
- Markowitz (1952) approach helps an investor to achieve his optimal portfolio position and explains how the diversification reduces the risk.
- Capital asset pricing model (Treynor, 1961; William, 1964; Lintner, 1965; Mossin, 1966) model helps to ascertain the relationship between the systematic risk and expected return of an asset. It can be used either to price a single security or an entire portfolio of securities.

These theories considered the market to be efficient and investors to be rational. The efficiency of the stock markets is questionable, as the various stock market anomalies remain unanswered. These anomalies that are to be answered are as follows:

- Why there are bubbles in the market?
- Why does the market get crashed?
- How to prevent these bubbles and crashes?
- When do these bubbles and crashes actually arise in the market?
- What factors can be held responsible for these uncertainties?

The answers to these questions can be found if the psychology of the participants is studied and understood properly. The perfect market conditions as those discussed in the economics and finance books do not always prevail in the real stock markets. It was by the year 1980s that the solution to this problem was searched. The result was in the form of behavioral finance which is an emerging area in the field of finance. It has answered and explained some of the reasons for the behavioral changes in the investors that deviate them from the rational decision-making. The various reasons for the sudden and untimely changes in the stock market and pricing of securities have been explained. It contradicts both the theory of rational investors and efficiency of the markets. Kahneman and Tversky (1979) wrote a
paper titled “Prospect theory: An analysis of decision under risk”. This paper became a well-known paper in the field of behavioral finance as the concept of prospect theory was introduced. This theory explains how the investors make decisions based on the probabilistic alternatives involving risk when the probable outcome of investment decision is known.

Then another important contribution came from Thaler (1980) which explained the prospect theory based on an alternative descriptive theory. Instead of considering investors acting in a cold, irrational way, he argues that investors act under the influence of behavioral biases often leading to less than optimal decisions. The theory and assumptions of traditional finance and modern finance have been challenged by several scholars from time to time. But the theories of behavioral finance have also been subject to various doubts and challenges. Thaler (1999) explained in his paper, “The End of Behavioral Finance”, several instances where the theories of modern finance give no answer and here the assumptions of behavioral finance start working. He has selected five areas where the behavior of the investors in the stock market differs from what have been proposed by the finance theories. These are volume, volatility, dividends, predictability and equity premium puzzle.

Shiller (2003) has proposed substantial literature with the aim of clearing doubts about efficient market hypothesis. The answers to the various irregularities in the investing patterns of the investors have been found with the help of behavioral finance. Caginalp and DeSantis (2011) have extended the theories that further contradict the efficiency of the stock market. According to him, the nature of the investments and the participants that trade or invest in the market are the driving factors of the efficiency of the markets. In his paper, Marchand (2012) identifies the irrationality in the human behavior in the form of biases and compares the traditional and modern finance theories with the behavioral finance theories. Nair and Antony (2015) view behavioral finance as not a replacement to classical finance theories but as means to understand the irrational investor behavior and reasons for sudden rise and fall in the market.

If the investors have complete information about the asset pricing, pricing of securities in the market, the prospect of the company in the future, government guidelines for investment in the securities, then also they are prone to make irrational decisions. This is because while making any investment decision, they are influenced by both the potential outcomes and emotional outcomes. Thy can get influenced by the perceptions of their peers, friends, family or even their competitors. Such a behavior of the investors to act differently in different situations makes it essential to combine the concepts of psychology with finance. This can explain the reasons for varying investor behavior under different circumstances that they face in the market. The strategies of the investment made keeping in view the principles of behavioral finance can increase the profits of the investors. It can also guide investors to invest in profitable securities and to withdraw from the loss-making securities. The rational investors are able to attain the benefits by investing in those profitable securities and beneficial opportunities that are not recognized by the irrational investors.

1.1 Behavioral biases
1.1.1 Overconfidence. It is the situation when people are highly optimistic about the trading outcomes and they suppose that the information they have is adequate for them to take sound investment decisions. Investors also relate the high performance of the market to their own performance and ignore the fact that paying too much attention to their own capabilities and ignoring other factors can make them incur huge losses in the future.
1.1.2 Disposition effect. It was initially given by Shefrin and Statman (1985). Investors tend to sell superior selling stocks early to realize the gains and they tend to hold the losing stocks for long to delay the losses. The tendency to avoid losses is much more than the willingness to realize gains. The final decisions of the investors are based not on the perceived losses but on the perceived gains.

1.1.3 Herding effect. It was identified by Shiller (2000) and Kahneman and Tversky (1979). Herding in the stock market is the tendency of the investors to follow the decisions of the other investors. This aspect of the investors is a subject of extensive research because the investors rely on the collective information that they possess more than the private information. This can result in price deviations from the fundamental values and the risk of reduced returns.

1.1.4 Mental accounting. It was initially proposed by Thaler (1985). This theory implies that investors divide their investments in various portfolios on the basis of a number of mental categories they have. Then they separate investment policies for each mental account in a way that each of them has a specific purpose to be attained and the aim is the maximization of returns with the minimization of risk. This could result in the selection of those portfolios that are not profitable yet they satisfy the emotions of the investors.

1.1.5 Confirmation bias. It was described by Dickens (1978). People generally have a preconceived impression of something and they rely on this information. This makes them adjust the future information to suit their opinion. This results in irrational decisions on the part of the investors as they get skewed toward the information that they already have and avoid the other information.

1.1.6 Hindsight bias. This bias (Fischhoff and Beyth, 1975) occurs when an investor believes that the happening of some event can be predicted reasonably. But this belief can be dangerous as the investor can form cause and effect relationship between the two events even when the relationship is not associated at all and thus results in irrational decisions.

1.1.7 House money effect. It was given by Thaler and Johnson (1990). It means that when gamblers are making profits then they become less loss-averse and more willing to take the risk. So the investors who are making huge profits are willing to take more risk and vice versa.

1.1.8 Endowment effect. It was originated by the paper of Kahneman et al. (1990). People pay too much emphasis on what they currently hold and do not want to change their position. This makes them forego even the most profitable investment opportunities. This attitude makes the prices of some of the very profitable securities to remain at a very low level; thus, the money lies in the market but suffers from the ignorance of the people.

1.1.9 Loss aversion. This bias was given by Benartzi and Thaler (1995); it occurs because people react differently to assured losses and assured profits. When they are faced with sure profits then they do not want to take any risk, while if there are any chances of losses, then they are ready to take more risks. This means they value the certainty of losses more than the uncertainty of losses.

1.1.10 Framing. This bias was given by Tversky and Kahneman (1981). When the information is provided in the positive frame, investors avoid risk to make sure profits and when the same information is provided in the negative frame, they are ready to take the risk to avoid losses. Thus, the same information can be presented to the investors in either of the ways to change their opinions.

1.1.11 Home bias. This was first introduced by French and Poterba (1991) and Tesar and Werner (1995). The feeling of belongingness of the investors toward their domestic companies makes them invest in the domestic companies even if their returns are lower than those of the international companies. Thus, the investors become inclined toward home bias.
1.1.12 Self-attribution bias. This was developed by Bem (1967, 1972). People attribute their success to their own hard work and intelligence, while they blame their failure to the action of others or to some outside factors.

1.1.13 Conservatism bias. It was originated by Edwards (1982). In this case, people stick to their own beliefs and forecasts and are not willing to accept the information which might be useful for their decision-making.

1.1.14 Regret aversion. It was invented in three different following papers, Loomes and Sugden (1982), Bell (1982) and Fishburn (2013). When the people regret about some decision, then it has a greater impact on their future decisions. They either become motivated to take more risk or resist to take any risk at all. This is done to avoid any feeling of regret in the future.

1.1.15 Recency. The decisions of the investors are based on some recent events that are in news and they neglect the information that might be useful but have taken place quite a while ago.

1.1.16 Anchoring. The investors make their judgments on the basis of the initial information they receive and then base their subsequent decisions on the basis of the past information. The successive decisions are anchored around some previous information. This bias was introduced by Tversky and Kahneman (1981).

1.1.17 Representativeness. It means assessing the characteristics of an event/object and considering them similar to other events/objects. This makes them to consider the event/object more likely to happen which may or may not happen. It was given by Kahneman and Tversky in the early 70s.

In the following paper, Section 2 shows the basic concepts, and discoveries in the field of behavioral finance shall be explained through a systematic review of the literature. The various biases, its impact on investment decisions and reasons for behavioral biases and investment biases in behavioral finance shall be highlighted. Section 3 shows the existing gaps in the literature. Section 4 will also present the methodology that has been adopted both for the primary and secondary data. Section 5 present results and findings. Section 6 gives the conclusions and suggestions. Section 7 shows contribution of this paper to the field of behavioral finance. Section 8 gives the future implications for research in behavioral finance.

1.2 Research motivation

- The introduction of behavioral finance eases to study the investors in the stock market as distinct from the expected utility theory. It marks a start of a new area that meets an ideal way of assimilating the financial theories with that of the psychological theory to find a new way exploring the dimensions of investor behavior.

- Behavioral finance has been created as a full-fledged field that has its own principles and theories backed up with strong experiments that have been conducted with the actual investors. It is not arbitrarily supposed to be only a part of the certain assumptions of perfect market conditions, complete financial information and rationality of the investors.

- It has a separate code of conduct that provides an array of opportunities to find various factors that could have a probable impact on the differing behavior of a variety of investors.
• The issues and questions that were once a part of inappropriate evidence have now been backed up by strong proofs and the doubts are treated with extreme theoretical support.
• It provides an easy answer to the ambiguity why only a small segment of the investors are able to track the exact deviation of the prices from their fundamental value.
• An inquiry into this area makes it possible to understand an entirely new subject which was not studied before. It creates an interest in the readers to get to know something about finance to which they were not familiar with.
• The fundamentals of behavioral finance work at the individual and corporate level. The behavior of individual investors, professionals, brokers and institutional investors can all be studied simultaneously as well as separately.

1.3 Research problems
• We desired to point out the biases that the investors should willingly or unwillingly consider while they make any investment choices.
• There was a need to collect various types of biases which can ease the readers to get acquainted with these biases.
• The paper has aimed to highlights the key factors which are creating a base for the improvement to these biases.
• This research will review those papers which have studied one, two or even multiple biases in their research.
• To find significant differences in the area of behavioral finance between the developing and developed countries.
• To sort out the ways that may discard the discrepancies in the pricing of securities in the stock market.
• To aid the future research to bring Indian stock exchange at par with the stock exchanges of the other countries.

2. Literature review
One of the most significant and parental works done in the field of behavioral finance is by the two psychologists Kahneman and Tversky (1979) who laid the foundation of the prospect theory. Prospect theory was introduced as an alternative to the expected utility theory, rational expectations theory and the efficient market hypothesis. Thaler (1980) has given theories to apply the prospect theory to the financial markets. Being a finance theorist, he argues that individuals don’t always behave rationally, but they often make mistakes while taking investment decisions. Therefore, these three, Kahneman and Tversky (1979) and Thaler (1980), are considered as the father of the behavioral finance (Hammond, 2015).

2.1 Literature on factors influencing investment decisions
Jagongo and Mutswenje (2014) explain that the investment decisions are rather sophisticated and so it requires considerable brainstorming. Most of the investors are bound to make mistakes in their investment decisions, as they desire to minimize their losses. There are several factors that have an impact on the investment decisions. These include the goodwill of the firm, benefits of diversification by investing in various securities, the
position and performance of the firm, return on investment (ROI), perceptions of investors toward the firm. The investors should be able to study deeply and understand all the variables that could affect the investments in the securities.

Adair et al. (1994) clarify that investment in property has recently been recognized as an important decision for a multi-asset portfolio and investors are using it as a tool for hedging against inflation as well as for diversification. Investors are focusing on the past performance and the future prospects of the investments for decision-making. The investors are risk averse and so they want to invest in those securities that promise a high return and a low risk. They are suspicious about investing in those portfolios which offer both high return and high risk. The high level of entry cost and differences in the culture acts as an impediment to the investment for some investors. Property taxation, currency fluctuations and exchange rate risk are some other constraints to an effective investment decision. Investors invest in the markets they are familiar with and the markets which provide sufficient information to its investors. The psychological biases were explained to describe the reasons for the irrational behavior of the investors. Guler (2007) finds the reasons for the firms continuing the investments in the venture capital despite the losses from the expected returns. This happens both in the case of individual and organizational investors. If the investors manage the sequential investment process properly, then they can terminate the investment on the chances of failures and vice versa.

Feldman and Lepori (2016) used the agent-based modeling to examine whether psychology has an impact on the asset pricing. The author has combined the regimes of rational, irrational investors and a combination of the two. Behaviorists think that the existence of the irrational investors along with the rational ones has a significant impact on the asset prices. Efficient market hypothesis assumes that in the long run only rational investors are left in the market because the irrational investors become insolvent and so they withdraw from the market. The irrational investors are further segregated into introspective and aggregating investors. The former are the ones those who associate the reason of their irrationality to their own performance, while the later ones are influenced by the performance of the other investors. The findings suggest that aggregating investors affect asset prices but not the introspective investors. Therefore, only irrationally aggregating investors should be modeled in the agent-based models. D’Acunto (2016) studies the effect of anti-market ideology on a group of investors. The results show that the investors who are exposed to anti-market ideology are more risk averse. The effects of anti-market ideology give different results to different demographic variables. Women, educated and the people who are not young reacted more to anti-market ideologies. Behavioral biases drive less sophisticated individuals and anti-market ideology drives sophisticated investors away from classical decision-making. Every investor is guided by different sentiments and so the purpose of the paper by Hoffmann et al. (2015) is to study the different sentiments of the investors which make them invest in certain portfolios. The final outcome of the investment decisions is an important indicator of the position that an investor wants to take in a security or investment.

The relatively higher temperature on Monday causes the irrational behavior of the investors. This way, the weather forecast can predict the sensitivity of the market (Brahmana et al., 2014). Abreu and Brunnermeier (2003) find the causes of manifestations and timing of occurrence of bubbles in the stock market. It drafts the validity of efficient market perspective. A bubble can burst when all the investors in the market begin selling the stock. Arbitrageurs have an important role to play in the determination of the time of bursting of the bubbles. Chaudhary (2013) has moved a step forward by clarifying certain trading approaches to the investors to invest in the stocks and bonds, also explaining the
importance and application of behavioral finance in investment decisions. Chavali and Mohanraj (2016) found the relationship between demographic characteristics of investors and their investment pattern. The findings suggest that gender is the most important variable impacting the investment decisions of individual investors. The stronger managerial incentives are a result of proper governance and it reduces the herding effect. Thus, it is a good monitoring device to control the actions of the fund managers to minimize the poor performance (Casavecchia, 2016). Chhabra and De (2012) find that there is a significant impact of the result of the recent past failures on the current potential to invest. The sign of the securities traded is stronger than the size of the trades. A positive sign is an indicator of profitable trade and vice versa. There exists a natural tendency in the investors that the past investment outcomes have a considerable impact on their future resource allocation in the portfolio of assets. Papadovasilaki et al. (2015) tested the relationship between early gains and losses of an investment and its effect on the subsequent investment decisions. The relationship between early investment experiences and subsequent portfolio investment decisions are positive and both the factors are strongly correlated.

Maung and Chowdhury (2014) suggest the right timing of equity issuances and other investments in real fixed assets for the corporate investors. The thrust is to choose the value enhancing equity backed projects for the investment. The market is divided into hot and cold issue markets. The hot issue market is the one where the information asymmetry is considerably low and so the information exchange between corporate managers and outside investors is reasonably high, the cold issue market is where the information is highly asymmetrical and, therefore, in high issue market, the firms have greater opportunities to select the best investment. The equity issuances are less costly, so the firms can raise an adequate amount of fund from the market for these projects. Therefore, investors should choose equity-financed investment in hot issue markets to maximize their wealth. The investors and participants inform other investors on the various issues for their investment decision-making.

2.2 Literature on behavioral biases

The expected utility theory and efficient market hypothesis as explained by the traditional finance theory is not able to clear the picture regarding the investing patterns and preferences of the investors under certain circumstances. This has led to a further research into the field of finance to pursue the reasons of varying individual behavior under different circumstances.

The expected utility theory was challenged by a new theory: prospect theory by Kahneman and Tversky (1979). The expected utility theory assumes that the investor decides between risky assets by comparing the utility values weighted by probabilities of their occurring and that utility is dependent on the current state of the wealth. On the contrary, prospect theory describes that people decide between alternatives that involve risk and return in terms of expected utility of returns. The utility of returns is based on the potential value of losses and gains rather than the final outcomes and investors apply certain heuristics while making decisions. Investors are willing to gamble less with profits than with losses. They are risk averse toward gains and risk taking toward losses. An alternative to efficient market hypothesis has been explained by Soufian et al. (2014), the adaptive market hypothesis. The advantage is that this theory explains loss aversion, overreaction and behavioral biases. It doesn’t assume the scenario of purely rational investors who make the optimal capital allocation. It supposes that finance theory and its various theories have the power to drive the entire economy and so any change in the financial theory has an impact on the entire economy. The economy is ever changing and so
the same theories in all the scenarios can result in the wrong estimation of the operation of the economy. Ultimately the market is able to adapt itself to its inefficiencies and then quickly recover to function according to the functioning to its participants.

Benartzi and Thaler (1995) has propounded the concept of the “myopic loss aversion” and has explained the equity premium puzzle through a series of behaviors. The term “myopic” added to the loss aversion refers to those investors who have investments in the longer horizon but prefer short-term gains and losses. Loss aversion is the tendency of the decision-makers to weigh their losses heavily, i.e. double than their gains. The feeling of loss aversion in the investors is studied by Godoi et al. (2005) through the deep qualitative interview. The interview is conducted because loss aversion is an aspect of human subjectivity and so shouldn’t be quantified. The results reveal that familiar influence, investment objectives, risk dimension, the feeling of guilt, rationalization, fear and anguish are the factors associated with the feeling of loss aversion. A qualitative approach has been used by Kleinübing et al. (2005) to understand loss aversion its influence and meaning to the investors. The loss aversion as a feeling involves the human emotions and desires. This bias could not be studied extensively through quantitative methods. The interpretative paradigm is used for the study, as it provides an epistemological base for the study of a given phenomenon. It shows the ideal investor behavior apart from their actual behavior. It also captures the hidden feelings of the interviewees that cannot be studied through other methods. The feelings associated with the loss aversion are organized into various categories like familiar influence on decision-making, financial investment and driving investment, loss and risk, guilt, defense mechanism and rationalization, fear anguish and aversion.

The herding behavior of investors on the Chinese stock markets has been studied by Demirer and Kutan (2006). The Shanghai and Shenzhen Stock Exchanges are studied and the results have shown the non-existence of herd behavior in these markets. It suggests that when the market is extremely down, then the return dispersions are low and the stock value also decreases during downside markets. The herd behavior and the investor behavior are different in both the stock exchanges because of the size of market and types of firms working there. Furthermore, a non-financial sector with lower rates of capitalization and a small number of traders are more exposed to the herding bias. The results are based on the assumptions that in the period of market stress, the investors are likely to follow the market than to follow their private information. Both non-firm- and sector-level data provide support for these results. The absence of herding behavior in the markets provides evidence of a stabilized market and indicates that the investors in both the exchanges have complete information about the market. Thus, it proves that if the market is efficient and investors are well informed, then the same market information is communicated globally within a short span of time. According to Messis and Zapranis (2014), the existence of herding is an additional risk factor for the investors. So, the volatility measure is positively affected by the presence of herding behavior.

Barber et al. (1999) study the presence of disposition effect in the individuals with reference to the proportion of gains realized (PGR) and proportion of losses realized (PLR). A large difference in PLR and PGR indicates a greater tendency in investors to acquire either losses or gains. Linnainmaa (2010) finds the impact of the limit order on the trading frequency of investors. He states that even if the limit orders of buy-sell are equal, a positive news of the market behavior results in the execution of the limit order. So it gives an impression of the disposition effect. Richards et al. (2011) investigate the impact of stop losses on the disposition effect. The results indicate that the use of stop losses results in a lower disposition effect. Jhandir and Elahi (2014) find the possible impact of investor type on
the investment decisions. He concludes that the investor type has a negative impact on the disposition effect and herding, while it has a positive effect on overconfidence. Aspara and Hoffmann (2015) represent that the disposition effect can be minimized by generating an inclination toward the overall saving goal in the investor.

The format in which the information is presented to the investors has a significant impact on their choice of investments, which has been explained by Glenzer et al. (2014). They further explain that the risk seeking abilities of the investors is effected when the information is presented in absolute numbers rather than in terms of rate of return. This is due to the framing effects in investor behavior. Nwogugu (2010) points out the inefficiency in the net present value (NPV) and internal rate of return (IRR) models, as there is a difference in the market values and present values. This is due to the presence of framing and cognitive biases in the investors. The weighted average cost of capital doesn’t measure the operational risk in the capital structure which further adds to the framing problems. Regret theory finds a solution to the problems that are faced in the project selection in NPV-IRR model. Mittal (2010), with the study of 330 investors, concludes that the salaried class is more prone to framing effects than the business class investors. The results are drawn with the help of a self-structured questionnaire.

The paper by Daniel et al. (1998) seeks to highlight the effect of the biases, i.e. investor overconfidence and biased self-attrition on the security market under and overreactions. The effects of these biases have been identified by its impact on autocorrelations, volatility returns and pattern based on past and future returns. The economists are of the viewpoint that there are various possibilities about the presence of several irrational behavioral patterns that cannot be studied through a single theory. This paper shows that investors overestimate their abilities in various ways under various circumstances. It defines that an overconfident investor relies on the information that he gathers rather than the information that is generated in the market. This paper thus explains that market has a tendency to under-react to public information but overreact to private information. The investor psychology has a direct impact on the functioning of the stock market. Fisher and Statman (2003) find the possible association between the overconfidence in the investors and returns on the company’s stock. The overconfidence in the investors is reduced on a negative stock return. The low stock price doesn’t result in low stock returns, but surprisingly, it results in high stock returns.

Glaser and Weber (2007) study the overconfidence in online stock broker and concludes that overconfidence is not related to the trading volume when measured by calibrated questions. The heterogeneous agent model is used by Fischer (2012) to study the impact of overreaction and under-reaction of investors in the financial markets. The efficiency of the financial markets can be increased if the investors have a high degree of rationality and critical thinking. Glaser et al. (2013) measures overconfidence through interval estimates. This method measures overconfidence at an individual investor’s level. The results show that expertise in professionals doesn’t mitigate the losses. The investors can be both overconfident and under confident, depending on the task they have to perform. They can be confident toward some decisions, while they remain uninformed and under confident toward other decisions. Duxbury (2015) presented a systematic synthesis of the experimental studies is conducted to clarify the effect of heuristics and biases (under-overreaction and overconfidence), the influence of moods and the emotions of the investors. The experimental studies have been used because it increases the originality of the study by isolating the impact of the previous studies and setting the result targets that has to be achieved. The correlation between equity market returns and the moods of the investors has emerged as a subject of great interest in psychology-based proxies. This relates to those
investor moods that have to be studied by experimenting on the relations among them and to study its impacts on another. It is always assumed that biased managers can make decisions having an adverse impact on the firm’s position.

Omondi (2016) explores the possible effects of optimism/pessimism bias on the reaction of investors toward information collection, processing and decision-making. The ignorance, peer influence, media information and broker’s recommendation has a significant impact on the decision to invest. Mohlmann (2013) explains how the difference in behavior of investors with regard to the different the tax collectors is associated with home bias. The investors prefer to invest in domestic companies, as the tax collection is comparatively easier with respect to the foreign country and the investors have a trust on the tax collection of their own government. Additionally, Daly and Vo (2013) finds that capital control policies, transaction costs, trade governance and market size determine the preference of investors toward their domestic investment compared to the international diversification. The presence of home bias is studied by Fellner and Maciejovský (2003) using an experimental study on 144 students in various disciplines. The social factors, group affiliation and optimism toward domestic portfolio drive the investor behavior toward domestic securities.

Zhou and Pham (1984) investigate the possible reasons of investors’ different orientation toward different investment opportunities. The investor makes separate investment decisions keeping separate mental accounts for both profit and loss. The promotion and prevention decisions act as separate stimuli in choosing the two options. This was tested across four sets of experiments.

2.3 Literature on multiple biases
The investor psychology has a direct impact on the functioning of the stock market. The paper by Daniel et al. (1998) seeks to highlight the effect of the biases, i.e. investor overconfidence and biased self-attribution on the security market under and overreactions. The effects of these biases have been identified by its impact on autocorrelations, volatility returns and pattern based on past and future returns. The economists are of the viewpoint that there are various possibilities about the presence of several irrational behavioral patterns that cannot be studied through a single theory. This paper shows that investors overestimate their abilities in various ways under various circumstances. It defines that an overconfident investor relies on the information that is he gathers rather than the information that is generated in the market. This paper thus explains that market has a tendency to under-react to public information but overreact to private information. The perceptual errors have an important effect on the investors’ financial decisions, while they buy and sell the stocks.

Chen (2008) studied the pattern of poor trading decisions of investors in China and finds them to be affected by disposition effect, representativeness bias and overconfidence. The study also makes a contrast between the individual and institutional investors. Additionally, the paper investigates whether one bias leads to another bias, but any conclusive remarks cannot be given. Chandra (2008) has pointed that the behavioral factors that affect the investment decision-making should be considered as risk factors. These consists of heuristics, cognitive dissonance, greed and fear, anchoring and mental accounting. The research is helpful for the investment advisors and other finance professionals to know the investors’ sentiments in a better way that would enable them for better decision-making strategies. He explains behavioral finance as the point of study where psychology meets up with finance. The findings show that investors are risk seeing when they are exposed to the loss. The greed is the prime feeling that overpowers an investor’s risk-seeking behavior. They separate their investments into separate mental
accounts and the investment decisions are made to satisfy different mental accounts. Proper care has to be taken to involve these emotional factors when designing the portfolio of investment for the investors.

Sadi et al. (2011) recognize the important perceptual errors and its effect on their personality. It is essential to know the deviations of investors from the rational decisions because of their personality factors. So the paper tries to bridge the gap between the personality and the perceptual bias of the investors and guide them to take the best decisions for their long-term financial goals. The investors can get affected by their emotions and cognitions and so their financial decisions and investment strategies get affected by these behavioral factors. The perception is the ability of the investors to organize and explain the environmental stimuli to get the desired results. The perceptual errors are described as overconfidence bias, availability bias and escalation of commitment, hindsight bias, and randomness bias. The personality of investors has been explained through the Big Five model. These include extroversion, agreeableness, conscientiousness, neuroticism and openness to experience. Four hypotheses are developed to study the relationships between the perception bias and personality factors. The results show that there is a strong relationship between the perception bias and personality factors. The relationship between extroversion and hindsight bias is positive which means that the stock market should provide all the necessary information to reduce the errors and to help investors to take timely decisions. Second, there is no relationship between investors’ agreeableness and perceptional errors. Third, there exists a reverse relationship between dutifulness and randomness bias, so the output of the investors can be improved by holding workshops and improving their knowledge and skills. Fourth, a strong relationship exists between neuroticism and randomness bias and between hindsight bias and availability. Finally, there is a direct relation between openness and hindsight and overconfidence bias, and there is an inverse relation between openness and availability bias.

Chandra (2008) has also studied certain behavioral factors such as financial heuristics, self-regulation, prudence and precautious attitude, financial addiction and informational asymmetry and the extent of their impact on the investor decision-making. He finds that heuristics have a greater impact on investor decisions than the biases. Lakshmi et al. (2013) gave an interesting addition to the existence of biases on the basis of the time period of holding investment by the investors. The result shows that the long-term investors tend to exhibit the lower tendency of overconfidence and are less prone to herding bias. They search for those decisions that can benefit them in the long run. The short-term investors can easily follow the herd behavior and the gains of short-term investors are generally low because of a majority of investors following the same investment decisions. Brundin and Gustafsson (2013) stated that the decisions of the entrepreneurs are highly influenced by the emotional feelings of the investors. The emotional reactions of investors to various conditions are the basis of deciding to continue the investment or not. He conducted an experiment with 101 entrepreneurs by giving them a chance to take 3232 investment decisions. The dependent variable was the propensity to allocate their investments into various decisions, while independent variable was the experienced emotions of the entrepreneurs. The uncertainty was used as a moderating variable for making the investment decisions. The test was conducted on the entrepreneurs of the small and medium-sized enterprises to test the impact of emotions like challenge, hope, strain and embarrassment on their investment decisions. The main thrust is to study the emotions of the entrepreneurs to decide about investing in an underperforming asset. Thus, entrepreneurs are more willing to continue their investments if they experience the positive emotions. The negative emotions reduce the inclination of entrepreneurs to invest.
By their study, Kengatharan and Kengatharan (2014) have highlighted the individual investor’s behavior on the Colombia Stock Exchange. Anchoring and herding bias, respectively, have the most and the least impact on the investment behavior. The results are summarized and tested on the basis of three hypotheses. The first hypothesis explains that heuristics, market, prospect and herding have an impact on the investment decisions of individuals; the second hypothesis explains that behavioral factors have an influence on investor decisions; and third that behavioral factors have a positive influence on investor performance. The results of the findings support the first hypothesis but reject the second hypothesis. The third hypothesis is again tested through four factors. The result shows that herding, heuristics, market and prospect do not have a positive influence on investor performance and so the third hypothesis is rejected. Kafayat (2014) finds out whether the investors on the Islamabad Stock Exchange are exposed to certain dilemmas such as self-attribution bias, overconfidence bias and over-optimism bias. The main purpose is to show if these biases have an impact on the rational decision-making of the investors. It also discovers the interrelationship of all biases with one another. The sample was collected from 220 respondents by means of a questionnaire and structured equation modeling (SEM) was applied to analyze the hypothesis. The results show that the investors who suffer from these biases are not able to take rational decisions and ultimately their return is less than what they expect it to be. So, the investors who are not affected by these biases are able to enjoy favorable outcomes. The attribution bias results into overconfidence and overconfidence results into over-optimism. As a result, the different biases can be studied in isolation as well as in relation to each other.

Bakar and Yi (2015) have explained the impact of various biases and their effect on the investor decision-making. The results are in the context of the Malaysian Stock Market, and it has proved that overconfidence, conservatism and availability bias have a significant impact on the investor decision-making, while herding bias doesn’t have any significant impact. Furthermore, it also revealed that gender differences have a significant impact on decision-making. Such that, 1 per cent increase in overconfidence increases decision-making by 0.466 and when conservatism increases by one unit decision-making increases by 0.247. When herding increases by one unit, investor decision-making changes by 0.07 and when availability bias changes by one unit, then investor risk taking increases by 0.0568. The study focuses on the behavioral factors of Malaysian investors and the impact of these factors on their decision outcomes. The studies tried to integrate the results of Malaysian investors with the other investors in The Association of Southeast Asian Nations, Middle East and other Western countries. Hayat and Anwar (2016) find the impact of financial literacy on the biased behavior of investor. The results show that financial literacy reduces the herding behavior but increase the overconfidence in the investors. Aren et al. (2016) have evaluated published institutional investors research in recognized journals. It studies herding, disposition effect and home bias. They also suggested that the home bias is associated with information and culture, disposition effect arises because of overconfidence and experience and herding effect is affected by published information and protection of reputation and career.

Several papers have reviewed the different types of biases that exist in individual and institutional investors, these include Wolf (2005) who explained herding, house money effect, confirmation bias and its impact on investor’s decision. Suresh (2013) explained that hindsight bias, loss aversion, endowment effect, mental accounting, disposition effect and anchoring indeed help to take sound investment decisions. Mokhtar (2014) explained conservatism bias, confirmation bias, representativeness bias, hindsight bias, anchoring and adjustment bias, mental accounting bias, framing bias, availability bias, loss-aversion bias,
overconfidence bias, regret-aversion bias and endowment effect. Paul (2014) found representation, overconfidence, herding, anchoring and framing as irregularities in financial markets. Joo and Durri (2015) explained biases such as herding, loss aversion, disposition effect, overconfidence, framing, hindsight bias and representativeness. Sukheja (2016) reviewed mental accounting bias, representativeness, overconfidence, anchoring, availability bias, confirmation bias, disposition effect and framing. Mallick (2015) reviewed anchoring bias, mental accounting bias, confirmation bias, hindsight bias, gambler’s fallacy, herd behavior, overconfidence, prospect theory, etc.

2.4 Literature on academics understanding of behavioral finance
Some interesting papers have been found that have a focus on some new strategies, refined from the old ones and that are in use by the academicians to get a better understanding of emerging concepts in behavioral finance. These papers give a better understanding of the important papers that can be referred by the researchers and scholars in behavioral finance. These are as follows: Ricciardi and Simon (2000) targeted at new and young researchers by explaining the prospect theory, the theory of regret, financial cognitive dissonance and a checklist of numerous important terms in behavioral finance. Subrahmanyam (2008) also provided some basic synthesis of related literature on the existing theories in behavioral finance.

Ricciardi (2006) provided useful insights for the scholars and academicians who are new in the area of behavioral finance as it gives an introductory definition of the areas in which the work has been done, some useful books to be studied, PhD thesis and dissertations that have been completed in this area in the past. Kumar and Goyal (2015) provided a systematic literature review on the four types of biases focusing on the individual investors and providing information about the papers with most citations, active researchers and journals, type of data and tools studied and countries where behavioral finance is frequently studied. Huang et al. (2016) gave a summary of the papers that have been published in the past 20 years to give a detailed view of some active authors, publications and the universities doing substantial work in this area. This is aimed at new researchers, industry professionals and other professionals who are interested in this field.

2.5 Reasons affecting differences in investment patterns
There are several factors that have an impact on the investment behavior patterns in various countries. The literature review provides some interesting insights into these factors. These are as follows:

2.5.1 Relationship between experience and investment. Gupta and Ahmed (2016) find the existence of loss aversion, regret aversion and anchoring has been found to be more prevalent in the experienced investors and less in the inexperienced investors. The result is derived by gathering the first-hand information of the retail investors with the use of questionnaires. Financial experts do not perform better than others; private investment of fund managers performs at par with individual investors. Managers show disposition effect, but mutual funds don’t exhibit disposition effect. Bodnaruk and Simonov (2015) found that wealthy and experienced investors prefer to invest on their own rather than seeking the help of advisors. Chen et al. (2007) conclude that inexperienced investors are less prone to the biases. Hackbarth (2008) suggested that the managers with high-risk perception bias issue more debt instruments compared to the unbiased managers. They take more risk and use their experience to select the debt instrument. Feng and Seasholes (2005) said that sophisticated investors are less prone to risk and experience can reduce the risk in investors to 72 per cent. While the reluctance of investors to realize losses can be eliminated, there is
no amount of investor sophistication/experience that eliminates an investor’s propensity to realize gains. Cronqvist and Siegel (2014) have conducted an experiment on the twins in Sweden. It presents a different aspect of investment behavior on the basis of genetic similarities among investors. Genetic predisposition to genetic biases is reduced by the experiences of the investors.

2.5.2 Profession and education. Mirji and Prasantha (2016) tested the trend of investment patterns based on the respective occupation and level of education of the investors. The investments were divided into large, mid-caps and small caps. It was found that those who are employed in the business and occupation have preferably inclination toward the large-cap securities. Homemakers and people related to agriculture have less inclination toward large-cap securities because of an inconsistent source of income. Also, the education level of the investors has a strong influence on the investing patterns. Such that graduates and postgraduates have great interest toward large and medium-sized securities, while undergraduates and doctorates have a lesser inclination toward these securities. Mittal (2010) explained that the investors that are of business class are more susceptible to cognitive biases, while salaried class is more prone to biases explained in the prospect theory.

2.5.3 Gender differences. Matsumoto et al. (2013) found that the group with both the male and female investors gives more rational performance than when they acted separately. Women are prone to more overconfidence than men and so group behavior (both men and women working together) may help to reduce overconfidence in the investors. When both the men and women work as a team to take investment decisions, then the decisions are rational. Bogan et al. (2013) explained the portfolio choice decisions on the basis of the gender composition of the team for decision-making. Thus, proving that a team consisting of only men is prone to increase both the risk aversion and loss aversion. The team consisting of both men and women is neither risk seeking and nor loss averse. Glenzer et al. (2014) stated that the female participants make decisions that are less consistent compared to the male participants and they choose alternatives that are less risky. Graham et al. (2002) searched for the possible reasons for the differences in the investment behavior of male and female investors. The information processing styles of both the genders are different from each other. The risk-taking capabilities and confidence levels in female investors are lower than the male investors.

2.5.4 Culture and performance of investors. The studies of Li et al. (2016) indicated that a sense of responsibility toward the society and its culture increases the performance sensitivity. It reduces the disposition effect when the decisions are taken with respect to the societal trust on the investors. Howard (2014) found that the behavioral directed investors or rational investors have a tendency to outperform the overall stock market. But the rational investors resist outperforming the market as forming such a portfolio will make their decisions against the emotional crowd or irrational investors. This action of going against other irrational investors is not desired from the societal point of view.

2.5.5 Emotions of investors. The stock market volatility and stock market returns are largely determined by the emotional sentiments of the investors (Howard, 2014). Agyemang and Ansong (2016) have studied the impact of the personal values on the behavioral decision-making and choices of the investors. A total of 137 values have been teamed up into three guiding values and seven motivational values. The results have shown that honesty, comfortable life and family security have a great impact on the investment decisions of individual investors. Interestingly, Bellotti et al. (2010) have explained the reason for the Chinese stock market bubbles by a new area in behavioral finance, i.e. emotional finance. The depressive state of mind (D) as well as paranoid-schizoid (PS) state of mind are the
forms of mental states. Guler (2007) describe that the decisions to invest in the venture capital is to be taken by a group of managers, and this can result in some behavioral and political influences in those decisions. Hughes et al. (2010) studies the reasons why the market underreacts when the investment accounts’ details of Warren Buffet is revealed by the Berkshire Hathaway. He explains that the overconfidence and emotional factors of the market participants, financial analysts and institutional investors are the reasons for downgrading the value of stocks after the disclosures of the transactions of Warren Buffet.

3. Research gaps in the existing literature

Kirchler and Maciejovsky (2002) studied the impact of overconfidence biases on the investors with the experiment performed in Vienna. Results with a sample of 72 investors show that people are not prone to overconfidence. There is a scope of study of overconfidence bias with a sufficient number of investors in the context of several counties. Fellner and Maciejovsky’s (2003) findings show that individuals are spuriously more optimistic toward the performance of domestic firms. Social factors motivate home bias. The company-specific and market-specific factors for home bias can also be studied in the context of other countries. This will increase the scope of study. Demirer and Kutan (2006) found the absence of herding in Chinese stock exchange by taking the individual and sector specific stock return data. The cross-sectional standard deviation can be used to find the existence of herding behavior in the context of other investors on different stock markets. Kothari et al. (2006) contradict behavioral finance theories that the post earnings announcement drift of companies is not capable of explaining the aggregate price returns. This model explains the relation between the discount rate and earnings surprises. The model need to be further studied to know the relations between market factors which affect earnings apart from discount rates. Then only some concrete argument can be drawn to support the theory.

Chen et al. (2007) identified the investors who suffered from disposition effect, overconfidence and representativeness bias and if the investors who suffer from any one kind of bias are prone to other biases subsequently. This is a unique study in itself and can be explored to study the impact of more biases like disposition effect, home bias and loss aversion and their effect on the investor’s behavior. Sayim et al. (2007) state that the company fundamentals can have a significant impact on the investor sentiment in the US auto, finance, food, oil and utility industries. Further, this study can be conducted to test the impact of investors’ sentiments of different stock exchanges around the world with several top-performing sectors. The inclusion of a variety of sectors will help to get a broader outlook of several sectors altogether. Pak and Mahmood (2015) studied the financial behavior of the students with regards to their personality characteristics and found that investors with varied personality types show diverse risk tolerance behavior. The study was conducted with regard to post-Soviet transition economies and the applicability of the study seems questionable. The study can be further extended to include the cross-country transitions of financial information targeting comparatively a wide range of investors. The market performance of some of the major economies can have a significant impact on the investment choices of a particular country.

Sadi et al. (2011) studied the impact of overconfidence, availability and hindsight bias on a sample of 200 investors. Further, the study can be performed to find the additional biases and their impact on investment preferences of the investors. The effect of financial education on the level of risk aversion among male and female investors is studied by Marie et al. (2013). The results conclude that the investors of both the genders, having the same level of financial education, are equally liable to invest in the certain portfolio. The study can be
further extended to find the impact of family size, investment objectives, years of experience in the financial market, peer influence, etc., as they may have a significant effect on the level of risk aversion among male and female investors.

Karatasova (2013) identified the irrational behavior of the investors with the help of certain biases like anchoring, mental accounting, confirmation and hindsight bias, herd behavior, overconfidence, overreaction and availability bias. Besides this, emotions and intuition like investor mood, financial crisis, weather conditions, sports events and information availability also affect investor behaviors significantly. The prospective reasons of these biases can be studied. The expected reasons can be found to quantify the effect of these biases and to know the exact degree to which they are impacting the investor behavior. Mohlmann (2013) results suggest that investors prefer domestic equity and invest in riskier portfolios in case of a foreign tax rather than a domestic tax on foreign dividend income. The willingness to pay taxes depends on the attributes of the tax collecting country.

The study can be conducted in other countries to find the difference in cultures and attitudes of subjects, level of patriotism of investors and economic conditions of various countries on the tax evasion behavior of investors.

Kafayat’s (2014) finding shows that self-attribution motivates overconfidence and overconfidence causes optimism in investor behavior which ultimately hinders the rational decision-making of the investors. The significant effect of biases on decision-making can be found, with the help of asset pricing, momentum in markets and corporate finance. Oprean (2014) studies the rational and irrational behavior of the investors in the financial markets. The study identifies the existence of optimism, pessimism, confidence and rationale of the Brazilian and Romanian investors. The study confirms the irrational investor’s behavior exist in stock exchanges. The study can be further used to find more factors that can lead to identify irrational investor behavior and how these irrational investors behavior exist in different economic conditions in different countries. Toma (2015) studied the presence of overconfidence, representativeness bias and disposition effect, and they tested how frequent trading and investor’s age affect these biases in Bucharest Stock Exchange. The studies further tested to find the impact of market-related factors like foreign exchange rate, the performance of various sectors, interest rates, gross domestic product, etc., on the trading patterns of the investors. Tekçe et al. (2016) studied demographic factors like gender and age affecting overconfidence, familiarity bias, representativeness heuristic and status quo bias. The results found different levels of biases among Turkish investors on the basis of gender and age. The further extension can be made by including additional biases like disposition effect, home bias, financial education, current income levels and the status of the business cycle of the country in the study.

Fochmann et al. (2016) conducted an experiment to test the effect of tax perception biases of the investors. The participants were asked to choose regimes when they were given an option of investment with the tax imposed on capital gains and the other with no tax imposed on capital gains. The findings show that the investors are prone to invest in securities with lower tax inclination. The study can be used to inform and educate investors to minimize the impact of tax perception bias on the investors. The further extension may be to study to find the factors, which are causing higher tax inclination on the investors. This will help to study the effect of the tax burden on biases from the perspective of a variety of factors like amount of investment, a portfolio of securities, company specific securities, the amount of capital gain realized, etc. Ahsan and Malik (2016) found that the conservatism bias has not played a moderating role in relationship between personality traits and the investment management. The sample size was quite low and comprises graduate students doing major in finance and some other professional investors. A research can be conducted
which would focus only on professional investors to make the study more relevant. Shusha and Touny (2016) found the presence of herding bias in Egyptian Stock Exchange. They have found how the effect of attitudinal determinants differs with the different demographics characteristics and how they have an impact on the investors’ herding behavior. These factors can be studied to find the overall impact of these characteristics on the investor’s in the different countries.

4. Research methodology

4.1 Research objectives

We constructed several research objectives based on the gaps in the existing literature. These are as follows:

- to understand why and how the behavioral finance theories are significantly different from the traditional finance theories;
- to explore the authors who have given their significant contributions to the field of behavioral finance;
- to categorize prevalent biases that can affect the investors and also identify the factors causing an increase in these biases;
- to study the impact of these biases in association with demographic factors like age, experience, gender and education;
- to identify solutions to deal with the adverse effect of the biases on the investment decisions and suggestions given by various authors to mitigate the effect of these biases to the different investors like minimizing the effect of biases, to avoid problems in investment decisions, application of analytical techniques in finance, solution of cognitive biases, etc.; and
- to provide useful insights about the applicability of behavioral finance and to find the appropriate area that could focus some prospect research to be conducted in the field of behavioral finance.

4.2 Methodology

Review of the literature has been used as the basis of the research. Although the extensive literature review could not be carried out because of the limit of various constraints, a considerable number of literature has been reviewed. The literature has been provided prominently by the Emerald Insight, Elsevier, JStor, EBSCOhost, Google Scholar and SSRN. The keywords used for searching the papers were behavioral biases and investment decisions, as the purpose was to correlate the effect of the biases on investment. The search results included papers incorporating several biases and then those papers were further divided on the basis of different biases. The result included not only the individual investors but also institutional investors and mutual funds. The timeframe of the study consists of the year 1979 (First proposed by Kahneman and Tversky, 1979) onward, as this was the year of the phenomenal work in behavioral finance and continues till 2016. The results were then summarized and analyzed using Excel. Several methodologies are used by the researchers to review the existing literature, to collect some primary data for the study, or to conduct empirical and restricted surveys to get the desired results.

The research is generally carried out for some specific study, for some specific country or for a particular time period. The sampling usually consists of the choice from among the convenience, simple random sampling, cluster sampling, quota sampling, etc.
(Kothari, 2009, pp. 60-65) as per the requirements of the study. Questionnaire and interview methods have been used for the collection of primary data. Secondary data are provided by databases of various companies, brokerage house data and data of companies collected from the stock exchanges. The most prevalent tool used is the Likert (1932) scale that categorizes questions into a scale, ranging from the least favorable to the most favorable. This is used to help the respondents to choose their answers on some specific range with respect to a series of statements. It also explains the psychological emotions and reactions of the respondents through a single questionnaire. The most prevalent tool to find the primary information from the investors is by the use of a questionnaire. This is a flexible tool to modify the questions to find the hidden feelings of the human behavior. Moreover, it works as a convenient source to reach to a variety of target investors at the same time. Regression analysis (Mendenhall and Sincich, 1996), Cronbach’s alpha (Glaser and Weber, 2007), multivariate analysis (Kothari, 2009, pp. 60-65, pp. 315-340), factor analysis (Kothari, 2009, pp. 321-337), ANOVA (Kothari, 2009, pp. 256-275), ANCOVA (Kothari, 2009, pp. 275-279), t-test (Kothari, 2009, pp. 160-196), F-test (Kothari, 2009, p. 196, pp. 225-228), Z-test (Kothari, 2009, p. 196), Varimax (Kothari, 2009, p. 336) and chi-square test (Levin and Rubin, 2001, pp. 567-609) are used for analysis of primary data. Besides this, cross-sectional standard deviation (Demirer and Kutan, 2006), multivariate regression (Kothari, 2009, p. 130, pp. 318-319) augmented dickey-fuller (ADF) test (Stock and Watson, 2004), Mann–Whitney test (Levin and Rubin, 2001, p. 793, p. 801, p. 802, p. 839), Kolmogorov–Smirnov test (Levin and Rubin, 2001, p. 793, p. 832, p. 839) and survival analysis (Chen et al., 2007) are some of the tools for analyzing secondary data.

Different sampling methods have been used by different authors based on their research objectives. Such as convenience sampling is integrated by numerous researchers like Chandra and Kumar (2012), Sachse et al. (2012), Linh (2015), Kannadhasan (2015), Chavali and Mohanraj (2016) and Asgarnezhad Nouri et al. (2017), as it seemed appropriate to reach the target investors. Random sampling is used by Sadi et al. (2011), Jagongo and Mutswenje (2014), Njuguna et al. (2016), Ishfaq and Anjum (2015) as the collection of data through. This method ensures that the sample represents the entire population to be studied without basing the selection on any single factor. However, Gustafsson and Omark (2015) had used cluster sampling to form clusters of students with different academic backgrounds to find the level of financial literacy in the young educated individuals. On the other hand, quota sampling is used by Bakar and Yi (2015), as it enables to use control characteristics based on gender, race and age as the basis of selection. Standard deviation is used by Barberis and Huang (2001), Vissing-Jorgensen (2003), Demirer and Kutan (2006), Glaser and Weber (2007) and Cronqvist and Siegel (2014) to measure the variability of scores within a set of factors to be studied.

Kolmogorov-Smirnov test is applied by Fernandes and Luiz (2007), Hibbert et al. (2013), D’Acunto (2016) and Asgarnezhad Nouri (2017). Asgarnezhad Nouri et al. (2017) used this test to measure the distribution of the data, to check whether the data are normally distributed or not. Survival analysis methods are used by Guler (2007), Chen et al. (2007), Richards et al. (2011) and Chhabra and De (2012). Chen et al. (2007) used survival analysis to test the duration of holding stocks by the investors to check the disposition effect. Survival analysis is easy to interpret and the data on those days when the investor does not buy or sell is also found out by this method.

Chi-square test is applied by Reb (2008), Biais and Weber (2009), Sachse et al. (2012), Kengatharan and Kengatharan (2014), Charles and Kasilingam (2016), Mirji and Prasantha (2016) and Kubilay and Bayrakdaroglu (2016). Reb (2008) used chi-square to compare the frequencies of the risky and riskless options both in regret condition and control condition,
The relationships between psychological biases and personality traits were tested using chi-square by Kubilay and Bayrakdaroglu (2016). On the other hand, ANOVA technique has been used by following authors: Lee et al. (2010), Lakshmi et al. (2013), Jhandir and Elahi (2014) and Kumar and Goyal (2016). Lee et al. (2010) used ANOVA to study the significant difference in the impact of background variables (age, marital status, education, occupation, annual income, average quarterly investment and assets) on investment behavior and decision factors. Jhandir and Elahi (2014) used ANOVA to study the willingness of investors to sell or hold some stocks with an objective to study the disposition effect. ANCOVA is applied by Zeelenberg and Beattie (1997), Nwogugu (2010), Philips (2012) and Guillemette et al. (2015). Varimax is used by Sadi et al. (2011), Sachse et al. (2012), Jagongo and Mutswejne (2014), and Charles and Kasilingam (2015). Charles and Kasilingam (2015) gave information about all the abstracted factors and also the variance that is explained by these factors. Cronbach’s alpha is used by Glaser et al. (2013), Jagongo and Mutswejne (2014), Kafayat (2014) and Pak and Mahmmod (2015). The reliability of the survey measurement is done with Cronbach’s alpha.

The multivariate regression is used by Demirer and Kutan (2006) to find the changes in returns in extreme market conditions in the Chinese stock market; Glaser and Weber (2007) used cross-sectional regression to show relation between trading volume measures and several explanatory variables like gender, age and investment risk; and Cronqvist and Siegel (2014) used linear regression model to regress the Investment Bias Index on various socioeconomic characteristics like education. Zhang (2006), Feng and Hu (2014), Pak and Mahmood (2015), Xu et al. (2016) and Casavecchia (2016) have used multivariate regression. Xu et al. (2016) used it to find whether female chief executive officers (CEOs) have an impact on bank loan contract based on various independent variables like gender and collateral intensity. The following authors had applied “t” test: Cunningham (2002), Fernandes and Luiz (2007), Hoffmann et al. (2010), Rostami and Dehaghani (2015) and Oehler et al. (2017). Hoffmann et al. (2010) used “t” test to find the significant difference between the types of investors on the basis of their investment behavior and return performance. Rostami and Dehaghani (2015) used “t” test with a sample size of 302 to find the behavioral biases and investment level in the stock exchange. The z test is used by Vissing-Jorgensen (2003), Hoffmann et al. (2010) and Feldman and Lepori (2016). Reb (2008) used z test to find a significant difference between the mean value of the regret condition and the control condition. Feldman and Lepori (2016) used z test to find the significant differences in the mean return between rational investors and a combination of rational and irrational investors.


Factor analysis is conducted by Nenkov (2009), Park et al. (2010), Sadi et al. (2011), Jagongo and Mutswejne (2014), Kafayat (2014), Jagongo and Mutswejne (2014), and Sashikala and Girish (2015). Riaz and Hunjra (2015) used factor analysis to convert a set of interrelated variables into another set of unrelated variables and then further into uncorrelated combinations. Sashikala and Girish (2015) used exploratory factor analysis to identify the relationships among factors which influence the trading behavior of equity investors in Indian stock market (Tables I to VI).
<table>
<thead>
<tr>
<th>Author</th>
<th>Data type</th>
<th>Journal</th>
<th>Sample size and tools</th>
<th>Country</th>
</tr>
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<tbody>
<tr>
<td>Kengatharan and Kengatharan (2014)</td>
<td>Primary</td>
<td><em>Asian Journal of Finance &amp; Accounting</em></td>
<td>The sample was consisted of 86 male (67.2%) and 42 female (32.8%) investors. Cross-sectional design for questionnaire, convenience, stratified sampling, Likert scale, SPSS</td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>Mallick (2015)</td>
<td>Secondary</td>
<td><em>Journal of Advances in Business Management</em></td>
<td>Review paper, qualitative data, journals, books and available data</td>
<td>Brazil</td>
</tr>
<tr>
<td>Godoi et al. (2005)</td>
<td>Primary</td>
<td><em>Managerial Finance</em></td>
<td>Five investors belonging to the “Analyst Association of Capital Markets”, deep qualitative interview</td>
<td>India</td>
</tr>
<tr>
<td>Suresh (2013)</td>
<td>Primary and Secondary</td>
<td><em>Journal of Finance, Accounting and Management</em></td>
<td>Source ICICI direct money manager’s records of investors, secondary data from financial reports and primary data from researcher</td>
<td>India</td>
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<tr>
<td>Hassan and Bashir (2014)</td>
<td>Secondary</td>
<td><em>European Journal of Scientific Research</em></td>
<td>Trade records of 120 days relating to 50 stocks, Regression, Descriptive statistics like mean, SD, skewness, kurtosis and ADF test</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Gupta and Ahmed (2016)</td>
<td>Primary</td>
<td><em>EPRA International Journal of Economic and Business Review</em></td>
<td>380 retail investors segregated into two groups on the basis of investment experience, discriminant analysis and chi-square test, SPSS 21.0, Wilks’ lambda and F test</td>
<td>India</td>
</tr>
<tr>
<td>Ofir and Wiener (2009)</td>
<td>Primary</td>
<td><em>SSRN Electronic Journal</em></td>
<td>122 investment advisor candidates, 104 executive MBA students at the Jerusalem School of Business Administration and 42 employees from various industries (other than the financial services industry) for 268 subjects, chi-square statistic</td>
<td>Israel</td>
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<tr>
<td>Chavali and Mohanraj (2016)</td>
<td>Primary</td>
<td><em>International Journal of Economics and Financial Issues</em></td>
<td>101 respondents, descriptive and cross-sectional analysis questionnaire, SPSS and factor analysis, chi-square, Kendall rank correlation test, risk tolerance scale by Grabble and Lytton, Principal component analysis and Varimax rotation method, Factor analysis</td>
<td>India</td>
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<tr>
<td>Fischer (2012)</td>
<td>Primary</td>
<td><em>Algorithmic Finance</em></td>
<td>Heterogeneous agent model of a financial market with chartist and fundamentalist traders those who exhibit bounded rationality, control theory in the frequency domain</td>
<td>Germany</td>
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<tr>
<td>Barberis (2013a, 2013b)</td>
<td>Primary</td>
<td><em>Essay on financial innovation and crisis</em></td>
<td>Two important factors are over-extrapolation of past price changes and belief manipulation</td>
<td>United States</td>
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<tr>
<td>Chira et al. (2008)</td>
<td>Primary</td>
<td><em>Journal of Business &amp; Economics Research</em></td>
<td>68 students of Jacksonville University, Chi-square test, Pearson p-value</td>
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<td>Author</td>
<td>Data type</td>
<td>Journal name</td>
<td>Sample size and tools</td>
<td>Country</td>
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<tr>
<td>Barber et al. (1999)</td>
<td>Secondary</td>
<td><em>Financial Analysts Journal</em></td>
<td>Trading records of 78,000 households, PGR and PLR ratios Data comprised 1,511 investors (accounts), survival analysis, first indicator variable is called the “Trading Loss Indicator” or “TLI”. Our second indicator variable is called the “Trading Gain Indicator” or “TGI”.</td>
<td>California</td>
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<td>Feng and Seaboles (2005)</td>
<td>Secondary</td>
<td><em>Review of Finance</em></td>
<td>Data comprised 1,511 investors (accounts), survival analysis, first indicator variable is called the “Trading Loss Indicator” or “TLI”. Our second indicator variable is called the “Trading Gain Indicator” or “TGI”.</td>
<td>China</td>
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<tr>
<td>Barber and Odean (2008)</td>
<td>Secondary</td>
<td><em>The Review of Financial Studies</em></td>
<td>Data of large discount brokerage - 78,000 households, small discount brokerage - 14,667 accounts of individual investors, large retail brokerage - 665,533 investors with non-discretionary accounts, professional money managers - 43 institutional money managers</td>
<td>California</td>
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<tr>
<td>Chen et al. (2007)</td>
<td>Secondary</td>
<td><em>Journal of Behavioral Decision Making</em></td>
<td>46,969 individual investor accounts and 212 institutional investor accounts, Cross-sectional regression, Survival analysis, Mean monthly portfolio turnover, Regression</td>
<td>China</td>
</tr>
<tr>
<td>Ofir and Wiener (2009)</td>
<td>Primary</td>
<td><em>SSRN Electronic Journal</em></td>
<td>122 investment advisor candidates, 104 executive MBA students at the Jerusalem School of Business Administration and 42 employees from various industries, a total of 288 subjects, Chi-square statistic</td>
<td>Israel</td>
</tr>
<tr>
<td>Richards et al. (2011)</td>
<td>Secondary</td>
<td><em>Behavioural Finance and Economic Psychology: Recent Developments</em></td>
<td>The brokerage company provided the trading data for 7,828 active investors who had made at least two trades per year</td>
<td>UK</td>
</tr>
<tr>
<td>Chhabra and De (2012)</td>
<td>Secondary</td>
<td><em>SSRN electronic Journal</em></td>
<td>Data consists of 2.45 million individual investors trading in 755 stocks during a total period of 18 months (374 trading days) from (January 2005 to June 2006) Review paper</td>
<td>India</td>
</tr>
<tr>
<td>Suresh (2013)</td>
<td>Primary and Secondary</td>
<td><em>Journal of Finance, Accounting and Management</em></td>
<td>318 investors, SEM</td>
<td>India</td>
</tr>
<tr>
<td>Lakshmi et al. (2013)</td>
<td>Primary</td>
<td><em>International Journal of Economics and Management</em></td>
<td>318 investors, SEM</td>
<td>India</td>
</tr>
<tr>
<td>Jhandir and Ehhi (2014)</td>
<td>Primary</td>
<td><em>20th National Research Conference</em></td>
<td>Target population is 37,000 investors. Cronbach's alpha, t-test, Correlation analysis, Ordinary least square (OLS) method</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Aspara and Hoffman (2015)</td>
<td>Primary</td>
<td><em>Journal of Behavioral and Experimental Finance</em></td>
<td>The mutual fund website provides details of all mutual fund investors from march 2006. Sharpe ratios, Multivariate analysis</td>
<td>Finland</td>
</tr>
<tr>
<td>Aren et al. (2016)</td>
<td>Secondary</td>
<td><em>Kybernetes</em></td>
<td>25 articles that focused on home bias, disposition effect and herding behavior (continued)</td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Data type</td>
<td>Journal name</td>
<td>Sample size and tools</td>
<td>Country</td>
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<td>---------------------</td>
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</tr>
<tr>
<td>Hayat and Anwar</td>
<td>Primary</td>
<td>SSRN Electronic Journal</td>
<td>158 investors on Pakistan Stock Exchange, Likert scale, Multiple choice questions,</td>
<td>Pakistan</td>
</tr>
<tr>
<td>(2016)</td>
<td></td>
<td></td>
<td>Regression, ANOVA</td>
<td></td>
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<td></td>
<td></td>
<td>Services &amp; Management Research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Li <em>et al.</em> (2016)</td>
<td>Secondary</td>
<td>C.E.P.R Discussion Papers</td>
<td>2,621,450 investment accounts trading six equity funds from 2002 to 2011, in China</td>
<td>China</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>in the index value from time t-1 to time t</td>
<td></td>
</tr>
</tbody>
</table>
5. Results and findings
Most of the papers on behavioral finance have pointed toward the existence of behavioral biases in different countries and across various types of investors. Very few pieces of literature have given solutions to reduce these biases. This paper has proposed an important solution to this issue. The paper has already discussed some of the literature about the causes of biases of investors when they make investment decisions. This section gives a quick glimpse of few papers that have suggested some solutions for reducing the effects of these biases.

A solution to the problem of biases of investors is given by Nenkov et al. (2009), who suggest that a substantial improvement should be made in the type, form and mode of communication of information of financial products given to the investors. This can result in making consumers aware of the pros and cons of investment decisions and subsequent alleviation of these biases in the investment decision-making. This is true even with regards to that information that is same in content but their presentation is quite dissimilar with each other. Cunningham (2002) shows how prices are formed, integrating it into a model and how investor behavior can help to analyze corporate governance. It comes out with the ways to minimize the effect of the cognitive biases. Avgouleas (2008) proposes a framework that could help to remove the biases from the investor decision-making process. It results in the reduction in framing, a check on the herd behavior of fund managers and shifting the focus from the activities that can cause the stock market bubbles.
<table>
<thead>
<tr>
<th>Author</th>
<th>Data type</th>
<th>Journal name</th>
<th>Sample size and tools</th>
<th>Country</th>
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</thead>
<tbody>
<tr>
<td>Messis and Zapranis (2014)</td>
<td>Secondary</td>
<td>The Journal of Risk Finance</td>
<td>41 stocks were selected, the OLS method, Cross sectional means and SD of betas, ADF test, GARCH and TARCH test</td>
<td>Australia</td>
</tr>
<tr>
<td>Ofir and Wiener (2009)</td>
<td>Primary</td>
<td>SSRN Electronic Journal</td>
<td>122 investment advisor candidates, 17,104 executive MBA students at the Jerusalem School of Business Administration, and 42 employees from various industries (other than the financial services industry) for a total of 268 subjects, chi-square statistic</td>
<td>Israel</td>
</tr>
<tr>
<td>Chen et al. (2007)</td>
<td>Secondary</td>
<td>Journal of Behavioral Decision Making</td>
<td>46,969 individual investor accounts and 212 institutional investor accounts, Cross-sectional regression, Survival analysis, Mean monthly portfolio turnover, Regression</td>
<td>China</td>
</tr>
<tr>
<td>Matsumoto et al. (2013)</td>
<td>Primary</td>
<td>Journal of International Finance &amp; Economics</td>
<td>92 students from the University of Brazil, 90% margin of confidence to check range of correct answers from Questionnaire</td>
<td>Brazil</td>
</tr>
<tr>
<td>Lakshmi et al. (2013)</td>
<td>Primary</td>
<td>International Journal of Economics and Management</td>
<td>318 investors, SEM</td>
<td>India</td>
</tr>
<tr>
<td>Kangatharan and Kangatharan (2014)</td>
<td>Primary</td>
<td>Asian Journal of Finance &amp; Accounting</td>
<td>86 male (67.2%) and 42 female (32.8%) investors, Cross Sectional design for questionnaire, Convenience, Stratified sampling, Likert scale, SPSS</td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>Bakar and Yi (2015)</td>
<td>Primary</td>
<td>Procedia Economics and Finance</td>
<td>Sample of 200 respondents including lecturers, students of finance, bank officers, executives and managers, Likert scale, coefficient of multiple determinants (R squared) and using F statistic</td>
<td>Malaysia</td>
</tr>
<tr>
<td>Jhandir and Elahi (2014)</td>
<td>Primary</td>
<td>SZAHST’s 20th National Research Conference</td>
<td>Target population is 37000 investors, Cronbach’s alpha, t-test, Correlation analysis and OLS</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Hayat and Anwar (2016)</td>
<td>Primary</td>
<td>SSRN Electronic Journal</td>
<td>158 investors, Likert scale, Multiple choice questions, Regression and ANOVA</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Aren et al. (2016)</td>
<td>Secondary</td>
<td>Kybernetes</td>
<td>25 articles that focused on home bias, disposition effect and herding behavior, systematic review</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Gupta and Ahmed (2016)</td>
<td>Primary</td>
<td>ISI Impact Factor</td>
<td>380 retail investors who are segregated into two groups based on investment experience, Discriminant analysis and chi-square test. SPSS 21.0 is used, Wilks’ lambda and F test</td>
<td>India</td>
</tr>
<tr>
<td>Omondi (2016)</td>
<td>Primary</td>
<td>Journal of Insurance and Financial Management</td>
<td>104 teaching population, Descriptive statistics such as range, SD and variance</td>
<td>Kenya</td>
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<tr>
<td>Author</td>
<td>Data type</td>
<td>Journal name</td>
<td>Sample size and tools</td>
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<tr>
<td>Kengatharan and Kengatharan (2014)</td>
<td>Primary</td>
<td>Asian Journal of Finance &amp; Accounting</td>
<td>86 male (67.2%) and 42 female (32.8%) investors, Cross-sectional, Convenience,</td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>Mirji and Prasantha (2016)</td>
<td>Primary</td>
<td>IOSR Journal of Economics and Finance (IOSR-JEF)</td>
<td>Stratified sampling, Likert scale, SPSS</td>
<td>India</td>
</tr>
<tr>
<td>Kafayat (2014)</td>
<td>Primary</td>
<td>Theoretical and Applied Economics</td>
<td>30 investors, Mann-Whitney test, Kolmogorov-Smirnov test</td>
<td>Pakistan</td>
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<tr>
<td>Kaustia and Perttula (2012)</td>
<td>Primary</td>
<td>Review of Behavioral Finance</td>
<td>123 Bachelor’s student at Alto University, 23 investors from large Scandinavian Bank, 60 branch managers, 60 advisers from Finnish company, 29 participants in seminar from Finland, multivariate analysis, Regression</td>
<td>Alto</td>
</tr>
<tr>
<td>Hayat and Anwar (2016)</td>
<td>Primary</td>
<td>SSRN Electronic Journal</td>
<td>158 Investors, Likert scale, Multiple choice questions, Regression, ANOVA</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Chen et al. (2007)</td>
<td>Secondary</td>
<td>Journal of Behavioral Decision Making</td>
<td>Sample of 46,969 individual investor accounts and 212 institutional investor accounts, Cross-section regression, Survival analysis, Mean monthly portfolio turnover, Regression</td>
<td>China</td>
</tr>
<tr>
<td>Fisher and Statman (2003)</td>
<td>Primary</td>
<td>The Journal of Portfolio Management</td>
<td>3,500 investors, two measures of investor sentiment, one by Investor’s Intelligence (II) and the other by the American Association of Individual Investors, use of correlation coefficient</td>
<td>California</td>
</tr>
<tr>
<td>Lakshmi et al. (2013)</td>
<td>Primary</td>
<td>International Journal of Economics and Management</td>
<td>318 investors, SEM</td>
<td>India</td>
</tr>
<tr>
<td>Kirchler and Maciejovs (2002)</td>
<td>Primary</td>
<td>Journal of Risk and Uncertainty</td>
<td>72 students of Business Administration, 2*3 factorial design</td>
<td>Vienna</td>
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</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Author</th>
<th>Data type</th>
<th>Journal name</th>
<th>Sample size and tools</th>
<th>Country</th>
</tr>
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<tbody>
<tr>
<td>Matsumoto et al. (2013)</td>
<td>Primary</td>
<td>SSRN Electronic Journal</td>
<td>92 students from the University of Brazil, 90% margin of confidence to check range of correct answers from questionnaire</td>
<td>Brazil</td>
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<tr>
<td>Glaser and Weber (2007)</td>
<td>Primary</td>
<td>The Geneva Risk and Insurance Review</td>
<td>The main data set consists of 563,104 buy and sell transactions of 3,079 individual investors, Data on the securities traded are obtained fromDataStream, Correlation, Regression</td>
<td>Germany</td>
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<tr>
<td>Barberis (2013a, 2013b)</td>
<td>Primary</td>
<td>Journal of Economic Perspectives</td>
<td>Review paper</td>
<td>USA</td>
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<tr>
<td>Hughes et al. (2010)</td>
<td>Secondary</td>
<td>Science And Technology</td>
<td>A sample of 2,252 observations, Regression, T statistics</td>
<td>America</td>
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<tr>
<td>Jhandir and Elahi (2014)</td>
<td>Secondary</td>
<td>National Research Conference</td>
<td>Target population is 37,000 investors, Cronbach's alpha, correlation analysis, Ordinary least square method is used</td>
<td>Pakistan</td>
</tr>
<tr>
<td>Chira et al. (2008)</td>
<td>Primary</td>
<td>Journal of Business &amp; Economics Research</td>
<td>68 students at Jacksonville University in Jacksonville, Chi-square test, Pearson $p$-value</td>
<td>USA</td>
</tr>
<tr>
<td>Glaser et al. (2013)</td>
<td>Primary and Secondary</td>
<td>Journal of Behavioral Decision Making</td>
<td>33 professionals of a large German bank, 75 advanced students, Kruskal-Wallis test</td>
<td>Mannheim</td>
</tr>
<tr>
<td>De et al. (2011)</td>
<td>Secondary</td>
<td>Proceedings of the 2011 Annual Meeting of the Academy of Behavioral Finance and Economics</td>
<td>50 stocks included in S&amp;P CNX Nifty Index, Regression analysis</td>
<td>India</td>
</tr>
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<td>Hassan and Bashir (2014)</td>
<td>Secondary</td>
<td>European Journal of Scientific Research</td>
<td>Trade records of 120 days, Descriptive statistics were computed including mean, SD, skewness, kurtosis, ADF test, e-Views</td>
<td>Pakistan</td>
</tr>
</tbody>
</table>
Chen (2008) has given a model to quantify the value of judgments generalized from the entropy theory of information. While the rate of ROI can be quantified, there was no model to quantify judgments before this model was developed. This mathematical theory can be used to compare the value of human judgments with the investment returns. Lovric et al. (2008) explain the implication of agent-based modeling to understand the behavior of individual investor. Macroscopic simulation technique can be used for a broader application of analytical models in finance. A cognitive model of investor is explained as a dual process system in terms of risk attitude and time preference, personality, goals, strategy and investment.

Otuteye (2015) finds a solution to the problem of cognitive bias by developing a heuristic model (O S Heuristics) that will aid to avoid the problems in decision-making and to avoid these issues in the future as well. Tipu and Arain (2011) find the six success factors that help to improve the outlook of the entrepreneurs toward the entrepreneurial actions. These findings will help to take steps toward improving the actions that will generate the spirit of entrepreneurship. Jiang and Yan (2016) explain financial innovation in the form of a regular and levered exchange-traded fund (ETF). He suggests that those investors who want the short-term gains should go for levered ETF, while those who are interested in diversification and maintaining liquidity should choose for regular ETF. Zhang (2006) suggests that greater information asymmetry gives rise to more forecast errors. The effect of uncertainty in information is increased on the happening of some bad event. He examines the effect of stock prices on analyst forecast revisions. When the information is complete, then it becomes easy to process the information with certainty to take decisions.

Kaustia and Perttula (2012) showed that the number of years of working experience reduces overconfidence in bank managers but not among financial advisers. The use of these debiasing tests enables the use of written warnings and lecture methods on the different group of investors. The written warning does not show any reduction in the ability to pick mutual funds but reduces the self-assessment ranking on job-related activity. The lecture method reduces the chances of picking inferior mutual funds and an improvement in

### Table VI

<table>
<thead>
<tr>
<th>Serial no.</th>
<th>Biases</th>
<th>No. of time studied</th>
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<tbody>
<tr>
<td>1</td>
<td>Overconfidence</td>
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<tr>
<td>2</td>
<td>Disposition effect</td>
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<td>3</td>
<td>Herding</td>
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<td>4</td>
<td>Loss aversion</td>
<td>14</td>
</tr>
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<td>Mental accounting</td>
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<tr>
<td>6</td>
<td>Representativeness</td>
<td>06</td>
</tr>
<tr>
<td>7</td>
<td>Conformation</td>
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<td>Hindsight</td>
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<td>10</td>
<td>Anchoring</td>
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<td>11</td>
<td>House money effect</td>
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<td>Home bias</td>
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<td>Self-attribution</td>
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<td>14</td>
<td>Conservatism</td>
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<tr>
<td>15</td>
<td>Regret aversion</td>
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<tr>
<td>16</td>
<td>Endowment effect</td>
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<tr>
<td>17</td>
<td>Recency</td>
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</table>

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<tr>
<th>Behavioral biases</th>
<th>Number of times biases studied during the literature review</th>
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<tbody>
<tr>
<td></td>
<td>237</td>
</tr>
</tbody>
</table>
general job-related activity. But the probability estimates aren’t reduced by both the methods.

6. Conclusion and suggestions
The worth of existence of behavioral finance lies in the fact that it makes possible to enrich the understanding of the financial market by including the human elements into it. It shows the investment pattern of the investors specifically those who exhibit under reaction in the short run and overreaction in the long run. It could present a model of integration of principles of psychology and economics.

The finance theories need to be understood and implemented in financial decisions to gain profitable investments. It can increase the wealth of the shareholders and investors and also increase their potential to invest more. The theory of behavioral finance gives a vivid picture of actual investor behavior and the factors of the investor behavior in different circumstances. The knowledge about these theories can restrain companies from issuing those securities that can’t reap the desired benefits. The investors can take the advantage from the profitable securities when others don’t have information about these opportunities. Money has been referred to as idea in the book[2], Stocks to Riches: Insights on Investor Behavior by Parag Parikh (2006), Seventeenth Edition. If properly planning is made then money can grow into great opportunities. The existence of the biases in the financial markets gives a momentum to the market. Investors can make their decisions on self-created principles. This can result in quick decision-making and can even have severe impacts on the future investment decisions.

According to Barberis (2013a, 2013b), financial innovations are one of the measures to reduce the effects of psychological factors of the irrational behavior of investors. But care has to be taken, as it can be a double-edged weapon. If financial innovations fail, then it makes investors feel less competent about the ability to analyze the risk associated with these products which leads to the reduction in the prices of these securities in the market. Through the comprehensive literature review, Joo and Durri (2015) have concluded that, although there is not any specific theory for the behavioral finance, there is a need to understand the various behavioral anomalies that could help to form a portfolio and explain the psychological traits of the investor. The aim of profit maximization and attaining rational behavior is not complete till the time the investor is able to understand the psychological biases inherent in the decision-making. The behavioral finance should supplement traditional finance to help better understand the phenomena of the investor choices.

There is a long list of benefits that behavioral finance can give. This can help not only to the retail investors to justify their investment decisions but also to the issuing companies, financial intermediaries and financial advisors to clear the doubts about understanding why the market doesn’t behave as planned or desired. The entire process of understanding the moods, emotions and motivations of human behavior and to find undervalued and overvalued securities is the new competitive edge. Doesn’t it seem interesting to invest or divest from the securities that are not adequately priced and then to benefit from any subsequent rise or fall in prices?

7. Contributions to the field of behavioral finance
This paper provides an extensive review of the origination of the behavioral finance as a separate field of study (Kahneman and Tversky, 1979; Thaler, 1980; Loomes and Sugden, 1982; Daniel et al., 1998; Thaler, 1999). This paper has explained the behavioral finance in sharp contrast to the traditional finance theories. This paper is a summary into the vast
universe of the literature published in the area of behavioral finance. Up to this point, this is a single study in the literature extensively reviewed and collected seventeen different types of biases into a single paper. These biases are overconfidence, disposition effect, herding, loss aversion, mental accounting, representativeness, confirmation, framing, hindsight, anchoring, house money effect, home bias, self-attribution, conservatism, regret aversion, endowment effect and endowment effect.

Several biases like confirmation bias, hindsight bias, house money effect, endowment effect, self-attribution bias, conservatism bias, recency and anchoring have not been studied adequately in the Indian context. We have found that both the psychological biases (Feng and Hu, 2014, Chira et al., 2008; Tekçe et al., 2016) and investment biases (Stracca, 2004; Glaser and Weber, 2007; Moradi et al., 2011; Nguyen and Schuessler, 2013; Pak and Mahmood, 2015) have a considerable impact on the financial decision-making of individual and institutional investors.

The behavioral biases are an integral part of the investors' behavior, their velocity can be increased or reduced for some decisions, but the complete elimination of these biases (Grable and Lytton, 1999; Fernandes and Luiz, 2007) from the investors' inherent behavior is not possible. The existence of behavioral biases should not be considered always as the risk factors, but some papers prove that few biases give a momentum to the investment activities in the stock market. Linnainmaa (2009) found that the effect of disposition effect can be reduced to half if the sell limit order is excluded from the overall limit order. Charles and Kasilingam's (2015) research shows that the behavioral bias factors like emotions, moods and heuristics can be used as a base to educate the customers of mutual funds about the strategies of investing in capital markets for avoiding unsuccessful investment decisions. Thus, there is an increase in the investors of mutual fund holdings.

The effect of different biases on the different determinants of investor behavior such as risk perception (Wang et al., 2006; Riaz and Hunjra, 2015), risk propensity (Pan and Statman, 2012), portfolio analysis (Hoffmann et al., 2010) risk tolerance (Sulaiman, 2012; Pak and Mahmood, 2015), financial rationality (Soufian et al., 2014), financial literacy (Gustafsson and Omark, 2015), financial planning (Guillemette et al., 2015; Hayat and Anwar, 2016) and financial personality (Kubilay and Bayrakdaroglu, 2016). The following factors have been identified, which implies a significant impact on the investors’ decisions such as investor’s experience (Feng and Seaboles, 2015; Papadovasilaki, 2015), past investment results (Ray, 2009; Olsen, 1998), occupational effects (Dhar and Zhu, 2006; Yee et al., 2010), timing of security issue (Deng et al., 2012; Maung and Chowdhury, 2014), investment intentions (Njuguna et al., 2016; Trang and Tho, 2017), information processing (Graham et al., 2002; Husser and Wirth, 2014), emotional feelings (Hassan and Bashir, 2014; Charles and Kasilingam, 2015).

The investors have a tendency to focus on the fundamental factors like return on equity (Michenaud and Solnik, 2008), profit margin (Otuteye and Siddiquee, 2015), future growth (Moradi et al., 2011) and revenues (Lee et al., 2010) before investing in any security, but behavioral finance digs deeper into finding the hidden emotional and psychological factors with have a concurrent impact while taking investment decisions for both the individual and institutional investors. The risk and return associated with an investment decision is well estimated with the support of behavioral finance.

It gives a quick glimpse of the various dynamic authors who have specified their outstanding contribution in this upcoming area realizing its importance in time (Zeelenberg et al., 1997; Shiller, 2003). The readers can realize their association with home bias, disposition effect, loss aversion, herding, etc., which they might not have recognized before. The paper contributes some significant value addition to the knowledge of various
implications of financial decision-making such as new equity issuances (Daniel et al., 1998), trading volume (Glaser and Weber, 2007), investment risk (Sachse et al., 2012), impact of level of risk undertaken (Linciano and Soccorso, 2012; Ahmed, 2014), stock market volatility (Messis and Zapranis, 2014), portfolio formation (Daly and Vo, 2013), investment performance [Social Trust (Li et al., 2016)] and asset pricing (Dash, 2016; Chandra and Thenmozhi, 2017). It also suggests some probable solutions to minimize the effect of these biases (Zhang, 2006; Lovric et al., 2008; Nenkov et al., 2009; Feng and Hu, 2014).

Some prospective areas can be identified where the research can be conducted in the future such as the impact of central banking policies on behavioral finance, integrating investment decisions of individual and institutional investors, combining demographic factors with psychological factors together, strategies for improving investors’ financial literacy, investor sentiment analysis, role of CEOs in asset pricing and social and ethical investing. It indicates few papers that can be referred by the new researchers who want to understand the behavioral finance as a separate discipline.

8. Future implications
This field seems promising and interesting, as it provides an easy and interesting way to get the benefits from the opportunities present in the market. There are vast possible areas in behavioral finance that can be studied. First, the research should target the participants in the market participating themselves and also those who invest through some financial intermediaries. Second, there is a wide scope to study the differences in investing behavior of investors on the basis of demographic and seasonal factors. The region wise climatic and seasonal conditions that affect the decision-making power of the investors is an important variable to be studied. Third, the target population can be narrowed down into many factors on the basis of experience, occupation, financial needs, etc. of the investors. Fourth, there is a dearth of study of behavioral finance in the developing countries and the developed economies like US, UK and Europe have conducted substantial research and experiments to obtain a strong understanding of investors’ behavior. As the economy of the developing countries like India is still progressing, there is a wide possibility of the study of a variety of investment patterns, investor behaviors and how the behavioral factors impact the asset pricing. These opportunities provide an array of progressive areas that can be studied in the near future. Finally, few pieces of the literature exist on some biases like conservatism, recency, self-attribution bias, house money effect and endowment effect. There is a scope of deeper research in these areas.

Notes

References


Further reading


Society for the Advancement of Behavioral Economics (SABE) Conference, New York University, New York, NY.


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