

IMPACT OF SELECTED BEHAVIOURAL BIAS FACTORS ON INVESTMENT DECISIONS OF EQUITY INVESTORS

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Abstract

Behavioural finance is a new discipline in finance, which studies the cognitive psychology of an individual's money-related decisions. It has evolved as a response to standard economic theory, which presumes that people are rational, risk-averse and profit maximisers. This concept of the rational individual formed the base for numerous theories about the capital markets. But the reality is that all individuals are far less rational in their decision making than the economic theory takes over. Individual's investment decisions is a complex procedure which controls logic, abstract thought and planning qualities. Based on the influence of these attributes, individual's investment decisions are emotional, fast and automatic. This study is intended to find out the impact of behavioural bias factors on investment decision of equity investors. Retail investors who access the Indian equity market from the Tamil Nadu state are taken as respondents for this survey. By utilizing the broad critique of literature, six behavioural bias factors are identified to find out its impact on investors' investment decisions. They are mood, emotions, heuristics, frames, personality and gambling. This study also examines the relationship among these behavioural bias factors. Descriptive research is utilized to identify the factors that influence investors' investment decisions. This research involves the use of both secondary and primary data. The secondary data includes the selection of broking firm and primary source of data is collected by using well-structured and non-disguised questionnaire. The multistage random sampling technique is applied to select respondents. The data are collected from the retail investors who access Indian equity market from the chosen area of Tamil Nadu. Cronbach's alpha is used to find out the reliability of the constructs. The findings of the Cronbach's alpha test reveal that the reliability of the study variables is greater than the threshold value of 0.6. Besides, Composite Reliability of all the variables is larger than the reference value of 0.6. The gathered data are analyzed quantitatively by using several statistical tools. Conceptual Model is developed by using Structural Equation Modeling (SEM). The findings of this study reveal that all the selected behavioural bias factors have shown significant influence of investors' investment decisions. The result of the impact of interdependence among the behavioural bias factors reveals that, except mood factor, all the factors have shown a strong relationship with other factors.

Keywords:

Bias Factors, Equity Market, Investors, Investment Behaviour, Investment Decisions

1. INTRODUCTION

The financial market is a market for securities, where companies and governments can raise long term funds. It is a market designed for the selling and buying of stocks and bonds. In a market economy like India, financial market institutions provide the avenue by which long-term savings are mobilized and channeled into investments. The confidence of the retail investors in the market is imperative for economic growth of the country.

In India, hardly around 2 percent of retail investors are accessing the capital market. According to financial dictionary, retail investor is an individual who purchases securities for his or her own personal account rather than for an organization. Retail investors typically trade in much smaller amounts than institutional investors. In India, the retail investor participation in the stock market has declined from 20 million in the 1990s to 12 million in 1999, and just around 8 million in 2009, according to official data, this despite the fact that the capital market has grown by 20 times during this period. Retail investors have diverted their funds to real estate and risk-free investments such as bank deposits and national savings scheme, as the equity market has been more or less static in the last five years. The decline in investor participation is mainly due to crises in the market, less awareness level and investor's errors and biased investment decisions. Errors and biases provoke the investors to make on irrational decisions. The standard finance is comprised of modern portfolio and efficient market hypothesis theory. Harry Markowitz [59] is the pioneer of framing the modern portfolio theory, which explains the portfolio's return of investments, standard deviation, and its relationship with the supplementary stocks or mutual funds held within the portfolio. This theory explores the efficient portfolio of an investment. Efficient market hypothesis theory (EMH) assumes that "the prices are right", in that they are set by the agents who understands the market and the Baye's law. Both these theories argued that investors are rational and the market prices are determined by the investors.

People who are against rationality argue that investors are irrationally making decisions on investments. The acknowledgement that individual behavioural factor influences market outcomes which has started a new research stream in financial economics called behavioural finance. Behavioural finance research is about using lessons from psychology to financial decision making. Even with the domination and triumph of standard finance theories, behavioural finance has begun to come out as an option to the theories of standard finance. Behavioural finance is not fully discounted the theories of traditional finance. Instead, it explains that the marketplace is not effective and the investors are not always rational on approaching the market. Behavioural finance is the study of finance, which inculcates psychological concepts into financial discipline to understand the behaviour of investors. Further, it explains why and how the markets become inefficient. How investors' psychological bias affects the market behaviour and change the price movements are explored by Selden [72] in his book entitled "Psychology of the Stock Market". Festinger, Riecken and Schachter [75] brought out a fresh concept in social psychology called "hypothesis of cognitive dissonance". According to this theory, individual's belief is altered in their cognitive process. If

the end product of the cognitive process is unpleasant, then it will lead to cognitive dissonance. Kahneman and Tversky [45] explain investors' decision making choices in their prospect theory. They argued that risk and uncertainty affect the investors' choices. Further, they added that decisions making involves two processes, namely editing the prospects and assess the chances. Ackert, Church and Deaves [1] explain how affects influence individual's decision making process. They opine that first affect push individuals make decisions. Second, it serves to reach optimal decisions. From these, it concludes that cognition and affect play a crucial role in the individual's decision making process. These two factors are influenced by many behavioural bias factors.

Despite the increasing attention devoted to behavioural bias factors and investors' investment decisions, most studies ignore affect related issues on investment decisions. Therefore, it is difficult to resolve the exact behavioural factors which influence the decisions making process of the investors. This is an initial motivation to bear out this work, which looks at six major behavioural bias factors and its impact on equity investors investment decisions. These variables are chosen based on the discernment of the review of literature (discussed detail in the review of literature). In particular, emphasis is placed on to find out the impact of interdependence among the behavioural bias factors and investors' behaviour.

2. AN OVERVIEW OF INVESTORS PARTICIPATION IN INDIAN CAPITAL MARKET

India has the highest saving rate of households than the rest of nations in the world. Around 50 percent of all savings locked in real estate and gold and the remaining 50 percent in financial assets, which includes only 4 percent of the total household savings in the equity market. According to the survey of SEBI sponsored household report (2011), only 11 percent of Indian households invest in equity, mutual funds, debt, derivatives and the other financial instruments in the market. Remaining 89 percent of household savings diversified into non-risky investments of banks, insurance, post office deposits, etc. Out of 11 percent of total household investors, 20 percent of investors belong to urban and 6 percent belong to rural India. The distributions of the investors across different portfolios are shown below.

Table.1. Distribution of investors with different portfolios

	All India	Urban	Rural
Bond	3.64	2.29	1.35
Debenture	1.7	1.3	0.39
IPO	2.46	1.29	1.17
Secondary Market	5.28	3.24	2.04
Mutual Fund	10.5	6.21	4.29
Derivatives	0.89	0.89	0
Total	24.48	15.23	9.25

In rural India, only 2 percent of investors are accessing the secondary market. Most of the investors perceive the equity investing as risky and similar to gambling. The preference of investors towards mutual funds is 43 per cent and secondary market is 22 per cent. In urban areas, 41 per cent of investors invest in mutual funds and 21 percent in secondary markets, whereas, 46 percent of rural population chooses mutual funds and 22 percent prefer secondary markets. Equity market plays a major role for companies to leverage and raise the debts for their projects. Hence, an efficient equity market forms a foundation of economic growth of the nation. Investors can get a maximum tax free return of 15-18 percent from the equity market. Investors of around 41 percent felt that they are getting inadequate information about the financial market and lacked investment skills, (SEBI survey report, 2011).

3. RETAIL INVESTORS' PARTICIPATION IN THE EQUITY MARKET

Retail investors' participation in the equity cash market is very low, with more and more savings finding their way to properties, gold, risk-free avenues like bank deposits and high-yield debt instruments. The daily average volume of retail turnover is down to ₹6,690 crore in 2011-the lowest since 2005 and a 51% drop from the peak of ₹13,709 crore in 2009. The daily average volume generated by retail investors was ₹10,882 crore in 2010 and ₹6,690 crore in 2011. As a percentage of the total population, the retail investor participation is just 1.3%, whereas in the US and China, it is 27.7% and 10.5% respectively, (SEBI report 2011). SEBI has targeted an optimistic figure of 8% for retail participation in India.

4. NEED TO SELECT THE RETAIL INVESTORS FOR THIS STUDY

Retail investors have different backgrounds, experience and also varied motives. Some retail investors invest in the long-run, whereas others wish for short term investments. India has a very low percent of retail investor participation in the capital market. It needs to be increased. In order to achieve this, more awareness of capital market should be inculcated. The recent evidence suggests that investors should learn to control their behavioural biases in order to explore the rational market behaviour. Lo et al. [56] suggest that any investor, who have given proper instruction and training, can achieve in the stock market. Institutional investors have superior market awareness and experience. Therefore, this study focuses on retail investors' participation in the equity market and their behavioural biases.

5. THEORETICAL BACK GROUND OF BEHAVIOURAL FINANCE

5.1 TRADITIONAL FINANCE PARADIGM

“Standard finance is the body of knowledge built on the four pillars of principles which are arbitrage principles of Miller and Modigliani, the portfolio principles of Markowitz, the capital asset pricing theory of Sharpe, Lintner and Black and the option-pricing theory of Black, Scholes, and Merton”, (Statman, 1999).

These four principles conclude that the market is systematic and efficient. Proponents of traditional finance advocate that “individual behavior” often reflect the economic cost of the stock. Modern financial literacy calls this reflection as homo-economicus. Simon [83] explains homo-economicus as, “It is an unlimited cognitive and computational capability and is a super mind who takes all likely choices and their consequences into consideration”. Homo-economicus give importance to the value of money or consumption to capitalize on self-interest and the value so consigned is not discriminated by factors as temper, familiarity with a particular state of affairs, unpredicted increases in fear or regret and rectifies his beliefs in the approved manner with the reception of new information. Moreover the “homo-economicus” is either risk neutral or has an aversion to risk.

5.2 EFFICIENT MARKET HYPOTHESIS

Samuelson, [72] is the pioneer of framing the efficient market hypothesis. At one step further, Ritter [7] explains EMH as “the building block of modern finance, is based on the assumption that investors compete for seeking abnormal profits”. This indicates that the investors impel the stock prices to its fundamental values. “Efficient market hypothesis states that stock prices reflect all the available information relevant to the stocks and also prices can be treated as an optimal estimate of real investment value at all times. It also explains that people behave rationally, maximize their expected utility and process all available information”, Shiller, [80]. Proponents of standard finance states that the market and investors who access the market are rational. But in reality, lament investors cannot act as rationally all the time. They are often influenced by psychological factors like mood, emotion and belief, which mislead them to act as irrational investors. Kahneman and Tversky, [82] are the pioneer in modern finance point out that, “people fail to update beliefs correctly and have preferences that differ from rational agents”. Previously, Simon [85] had the same notation that investors have limited capacity of processing information for solving the complex problems. Simultaneously, individuals have some restrictions or limitations of attention capabilities and they give some importance to social considerations also on making investment decisions, Kahneman, [92]. Barberis and Thaler, [9] have a different opinion of the rationality of investors. They opined that “rational traders are bounded in their possibilities such that, markets will not always correct non-rational behavior. From the above findings, it concludes that the traditional theories are incomplete and misleading description of financial behavior. Most of the theories of standard finance give less importance to investor decision processes and the quality of judgment. Therefore, it is advocated that the standard finance is against the rationality of the markets and investors. Hence, there is a need to evolve modern finance to study these anomalies. “The Structure of Scientific Revolutions”, portrays the modern finance as; “the old paradigm of an efficient market is crumbling. But the outlines of a new paradigm, the Behavioral Finance, are visible in the resulting cloud of intellectual dust”.

5.3 DRAW BACKS OF STANDARD FINANCE

The first drawback of standard finance was the application of sophisticated econometric techniques for constructing the theories. Roll [68] advocated that, “the foundation stone of

standard finance, the CAPM was almost certainly unverifiable”. Between the period of 1980s and 1990s, more research works and theories suggest that the traditional theory is incomplete, if not faulty. In 1992, Eugene Fama, one of the proponents of CAPM, withdraws his support from the CAPM model. Hence, there is a need to change the paradigm shift from the traditional, neo classical mathematical modeling approach based on a representative, fully rational agent and perfectly efficient markets to a behavioral based model. As markets get more complex and the investors use some rule of thumb to shift the market into another face. (e.g. Anderson et. al., [5]). Therefore, it is unavoidable to study the behavioural based approach for replacing the EMH theory.

5.4 EVOLUTION OF BEHAVIOURAL FINANCE

Behavioural finance is useful to predict the market perfectly, identify the flexible prices of the stocks, and understand the behaviour of other players who access the market. Behavioral finance is a new paradigm of finance theory, which seeks to understand and predict systematic financial market implications of psychological decision-making. The new paradigm of behavioural finance is not fully avoiding the standard finance. Rather, it supplements the standard theory of finance. Further, it specifies that the existing paradigm can be true within certain limitations. With the help of behavioural finance, standard finance model is improved to explain the current realities of today’s evolving markets. Behavioral finance adopts the psychological and economic principles to improve the individual’s financial decision-making process. Shefrin [78] wrote a book of behavioral finance and EMH titled “Beyond Greed and Fear”. This book explores the various behavioural biases of investors. The key concept conveyed in his findings that the people are “imperfect processors” of information and are usually biased, commit mistakes and have perceptual problems. At present, there is no unified theory of behavioral finance exists. Shefrin and Statman [77] identify how individual decision making affects the financial market behaviour. Proponents of standard finance argued that “Behavioral finance” give more importance to decision making process of individuals, instead of giving importance to fundamental factors. But now, it has acknowledged that the individual decision making process significantly influence the market price movements.

5.5 UNDERSTANDING INVESTMENT BEHAVIOUR

The human decision making process is a complex phenomenon which was determined by many physical, environmental, and behavioural factor. Psychology is the familiar discipline often used in the medical field to understand or to study the behaviour of people. Behavioural finance incorporates psychology context into finance to understand the behaviour of investors in making decisions in the context of equity markets. Individual investors tend to be inconsistent in making investment decisions. In particular, they are under diversified, loss averse [8], and overconfident [8]. Barber and Odean [8] explain how investors are inconsistent in making decisions. They advocate that individuals trade too much and tend to hold on to losing stocks too long and selling the winners too early. According to Grinblatt and Keloharju [40], traders often trade for non-rational reasons.

Hence, they are reluctant to accept the losses. Interesting evidence suggests that investor moods, which were influenced by cloud or the number of hours of daylight, affect financial markets and stock price movements (Hirshleifer and Shumway, [42]). Kahneman [73] states that people are lacking the ability to perform multiple tasks. Due to the limited working memory, people often struggle to process the available information quickly. Previously, Miller [60] found that people have limited memory of grasping things. Therefore, their cognitive load required for complex decisions often exceeds their cognitive capabilities. People try to overcome the cognitive problems by using a rules-of-thumb, or simple heuristics, which may result in faster decisions. But their decisions are not fully rational (Simon, [83-85],[93]).

Influence of cognitive biases on investors' decisions making process has given more importance in recent literature of finance. Proponents of standard finance opined that few agents in the economy can turn the market into fundamental perspectives. Now, the trend has changed. More retail investors access the market and they turn the market into different perspectives. Evidence from the field of psychology and financial research suggest that people expect more, when the market becomes uncertain. Further, it is noted that most of the individual's financial decisions are taken in the situations of high degree of uncertainty and complexity (Kahneman and Tversky, [45]). This reveals that the situations play a significant role in influencing individual's investment decisions. Standard finance explored that individuals examine all the relevant information and alternatives before reaching any conclusions. Finally, they may select the best choice or solutions. Conversely, findings from psychological work suggest that people are not able to behave in such a way in many situations. People are limited in their abilities and capabilities to solve, especially complex problems (Simon, [83-85], [45]). In order to overcome these issues, people may adopt simple rules-of-thumb, or heuristics, that may result in behaviour that is not fully rational (Simon, [83-84],[93]).

6. REVIEW OF LITERATURE

Behavioural finance attempts to explain the irrational behaviour of investors' which can affect investment decisions and market prices. It also explains how emotions and cognitive biases influence investors' decision-making process. The contribution of behavioural finance is not to eliminate the underlying work that has been made out by the proponents of efficient market hypothesis. Instead, it is to examine the importance of relaxing unrealistic behavioural assumptions and make it more realistic.

Mood: Traditional theory of finance assumes that 'investors are fully rational and the stock prices are not reflecting the investors' psychological biases like affect and cognition. But a recent study of behavioural finance suggests that investors are not fully rational. Moreover, investors' investment decisions are more influenced by their psychological biases than the fundamental factors. Amongst the psychological biases, contributions of affect (mood and emotion) are inevitable. Practically, both of them are used interchangeably. But in theory, there is a slight difference between them. One of the main differences can be seen in the form of 'expression'. The mood is something a person cannot be expressed, whereas emotions are expressed. Another important difference is existence of mood is longer than emotion. The

influence of mood on investment decision has long been ignored by the traditional finance practitioners, because its influence is considered as temporary and unimportant. Now sufficient evidence suggests that mood does significantly influence decision-making, especially when the decisions involve risk and uncertainty. Researchers suggest that mood is not only affects judgment and decision-making, but also altering the behaviour of investors. A mood could affect the choices, risk taking, rational cognition, and the investment decisions. Therefore, investors' decisions are fluctuating with their mood. The mood is debatable an important focusing mechanism in economic decision-making (Etzioni, [4]) and good mood is associated with fast and effective decision-making (Forgas, [28]). From these, it is clear that mood is an inevitable one for an individual's investment decisions. Moods have different forms. Some of them are happiness, sadness, calmness, carefulness, tiredness, Energeticness, angeriness and fearfulness. Amongst these, happiness and sadness influences are high on investor investment decisions. According to Bless et al [12], happy mood state increases reliance on general knowledge such as scripts and stereotypes. Investors who are in happy mood may rely on heuristic approach (Ruder & Bless, [69]). On the other side, negative mood state results in analysis of information very carefully before making decisions, (Bless, Bohner, Schwarz & Strack, [12]). According to Devries, Holland & Wittman [19], positive mood matched with intuitive decisions and negative mood matched with deliberate decisions. These findings suggest that mood plays a significant part of acting upon the decisions making process of investors.

Emotions: Behavioural finance attempts to explain the irrational behaviour of investors and the market movements. It also explains how emotions and cognitive biases influence investor's decision-making process. The contribution of behavioural finance is not to eliminate the underlying work that has been done by the proponents of efficient market hypothesis. Rather, it has examined the importance of relaxing unrealistic behavioural assumptions and makes it more realistic. Mood and emotion are contributing more on investment decisions. The term 'mood' and 'emotion' are often used interchangeably, when in fact they are closely related but distinct phenomena (Beedie, Terry, and Lane [10]). Both emotions and moods fall within the theoretical realm of 'affect', which can be defined as 'the specific quality of goodness or badness (1) It is experienced as a feeling state (with or without consciousness) and (2)It is demarcating a positive or negative quality of a stimulus' (Slovic et al. [87]). In general, affective states of both sorts can be categorized into positive (pleasant) and negative (unpleasant) feelings. However, emotions are feelings about a particular circumstance or event (someone or something) that arise from cognitive appraisals of circumstances, whereas moods are more generalized non-specific states that are not aimed at any particular target (Bagozzi, Gopinath, and Nyer [6]; [81]; [86]). In other words, emotions are in reaction to specific stimuli, whereas moods are free-floating feelings that need not be linked to anything specific. Emotional states include specific feelings like anger, jealousy, fear and envy, while moods are general states of mind such as happy and sad. The dispositional theory of mood suggests that a person's mood is temporary (Siemer [82]), but the duration of mood is longer than that of emotion. Moreover, moods tend to be unaffected by personal beliefs and unlike emotions; moods are 'not the intentional mental states' (Sizer [81]). A lot of research work has

been conducted about these issues. According to Kahneman and Tversky ([45],[93]), most investors do not respond equally to gains and losses. Investor feels positive emotions from a realized gain, but relatively stronger negative emotions from a realized loss of the same size. As a result, some investors sell their winners prematurely while some of them hanging on to their losers (Shefrin and Statman [79]; Barber and Odean [7]). Some trade too much, others, too little (Barber and Odean [7]). In the past, behavioural finance research attributed these kinds of mistakes primarily to cognitive, heuristic biases (Gilovich, Griffin, and Kahneman [36]). Recently, psychologists and economists have shown increased interest in the role of emotions in economic behaviour and decision making (e.g., Hopfensitz and Wranik [43]; Loewenstein [56]). Indeed, ample evidence now exists that feelings significantly influence decision making, especially when the decision involves risk and uncertainty (Schwarz [74]; Forgas [26]; Isen [44]; Loewenstein, Weber, Hsee, and Welch [56]). Loewenstein and Lerner divide emotions during decision-making into two types: one is anticipated and other one is immediate emotion. Anticipated (or expected) emotions are not experienced directly, but are expectations of how the person will feel once gains or losses associated with that decision are experienced. Statman [88] observed that people trade for both cognitive and emotional reasons. They trade because they think they have information, when in reality they do nothing but only noise. They trade continuously because trading brings them joy and pride. Damasio [17] indicates that a lack of emotion has striking effects on individual decision making. Damasio uses behavioural and physiological evidence in support of the hypothesis that decision making is intertwined with emotion. He studied brain-damaged patients who had impaired emotional responses even though they retained their cognitive abilities. Neurobiological studies (Damasio [17]; LeDoux [55]) indicate that emotion improves decision making in two respects. First, emotion pushes individuals to make some decision when making a decision is paramount. Second, emotion can assist in making optimal decisions. A vast psychological literature shows that emotional state can significantly affect decision making (Elster [22]; Hermalin and Isen [41]). While strong emotional responses are often associated with poor decisions (particularly those of a financial nature), recent research in psychology indicates that the absence of emotions can also lead to suboptimal decisions. It can also help to optimize over the cost of optimization. According to Isen [44], even mild emotional states can affect behaviour. Little attention has been paid to the direct role of emotion in the choices of a financial nature. Loewenstein et al. [56] says that emotions may influence decision making through (1) the anticipation of future emotional states, and (2) the actual experience of emotions. The above findings motivate the researchers to find out the impact of emotions on decisions making process of retail investors. In this study, investors' different emotional swing variables are taken to find out its impact on their investment decisions.

Heuristics: Kahneman, Slovic, & Tversky, [94] have provided more studies related to human judgments, specifically, they explain the individual's intuitive behaviour and their investment decisions. The main plot of heuristic is individuals often rely on non-algorithmic methods to make quick and fast decisions rather follow on algorithmic method. "A heuristic is a strategy that ignores part of the information, with the goal of making decisions

more quickly, frugally, and/or accurately than more complex methods", Gerd Gigerenzer and Wolfgang Gaissmaier [33].

Representativeness is one of the primary heuristics explain the individuals' judgments based on stereotypes. This was first proposed by Kahneman & Tversky, [93] and later edited by Kahneman, Slovic, & Tversky, [94]. Furthermore, research evidence about representativeness suggest that individuals often ignore base rates, neglect sample size, overlook regression toward the mean, and misestimate conjunctive probabilities ([93-94], Kahneman & Tversky). Individuals are fixed narrow bands, when they are overconfident. They fix high guess into too low and low guess into too high. Therefore, they may often get surprised than they anticipated, Roger Clarke and Meir Statman [70]. This shows that over confidence affect individual's decisions. Availability is one such heuristics estimate "frequency or probability, by the ease with which instances or associations comes to mind" (Kahneman, [93]). It is slightly different from representativeness that availability explains the evaluations of associative distance (Kahneman, [93]). Individual's thoughts, experience and brilliance influence their stereotypes and scenario thinking (Kahneman & Tversky, [45]). Anchoring is a heuristic which explain the assessment of subjective probability distribution. Experts' opinions are often adopted by investors in making decisions. Such opinions may create biases amongst the investors. Adjustment refers to modifying the portfolios based on the advices from the anchoress, (Tversky & Kahneman, [93]. Hersh Shefrin [78] advocates that conservatism heuristic is a tendency of not updating or struggle to update the knowledge, based on the ever changing market environment. He found that around 45 percent of individuals are updating their knowledge very often and subsequent findings suggest that anchoring is the prime factor which influences their non-conservatory behaviour. Aversion to ambiguity is one of the heuristics which explains the emotional instability of an individual. Investors who have this bias may adopt familiarity to non-familiarity approach towards the market. In other words, it is called as a fear of the unknown. Herbert Allison, the former president of Merrill's Lynch, says that "it wasn't worth a jump into the abyss to find out how deep it was".

Frame Dependence: Investors often face the problem of making biased decisions. Cognition and emotion play a key role behind these biases and errors. This was first coined by Psychologists Kahneman, Paul Slovic and Amos Tversky [94]. Later, this was consolidated by Hersh Shefrin [78] in his book titled "Beyond greed and fear". He explained behavioural finance into three themes, namely heuristics, frame dependence and market inefficiency. Framing is nothing but how individuals perceive the particular thing. Traditional finance proponents argued that investors are always rational, so their frames should be a transparent one. This was opposed by behavioural finance practitioners. They opined that many frames are opaque in nature. Opaueness frames affect the rational decisions of investors. Previously, Tversky and Kahneman [93] opined that frames are associated with their choices. Further, they added that investor choices are influenced by their personal attributes, habits and the situations encountered by them. This may differ from persons to persons. Benartzi and Thaler [11], Gneezy et al. [37] indicates that investor's frames are influenced by two things, namely gain and loss. This was supported by Barberis et al [9]. He argued that most of the people use narrow framing, because they are highly influenced by the feeling of regret. Most of the findings support

this argument that investors' emotions and cognition influence their frames. Shefrin [78] consolidating the frame dependence as loss aversion, concurrent decisions, hedonic editing, regret, self-control and money illusion.

Individual's tolerance for risk and value of return has been tested not to be consequential. The results differed depending on the opacity of the frame, how shrouded the information was compared to a decision baseline. The values exhibited in one question could be followed by the opposite depending on the phrasing of the question. Many times, the presentation and not the underlying information decided the answer (Shefrin, [78]). This also differs from traditional financial theory, in which all rational decisions are made with a transparent view of risk and return. A good example for illustrating *hedonic editing* are investors selling the assets at current loss in order to avoid risk and reinvest that amount into other stocks. Simply saying that "Relocate the assets". Investors who have adopted this frame are called as hedonic editing. Simultaneously, individual's emotions play a significant impact on their profit and loss. The loss of an investment affects two and a half times than that of an equal profit. This is called as *loss aversion*. Loss aversion drives the individuals to emotionally make decisions. Individuals may try to avoid the emotion, and by association a loss. Depending on how something is edited, the loss aversion can be manipulated. Traditional finance proponents opined that all these frames are assumed to be transparent, allowing all decisions to be made on the identical grounds. Frame dependency explores the tendency of an individual to enhance the opaqueness of a frame. This tendency arises as a result of both emotional and cognitive (Shefrin, [78]). Hedonic editing is a type of frame explores how investors wish to oblige rules on themselves, the focus of *self-control*. Self-control is essential for investors, which were decided by their investment portfolio. In the same way, if the investments in market yield very poor results, then it will produce hind sight frame. It explains the pain of a loss and also explores the attitude of being guilty of losing the investments. This guilty on losses increase the emotional influence of the decision. *Aversion to regret*, trying to minimize the future regrets on all investment decisions. Due to fear of losing the investments, some individuals may sell all the negative return stock and put-off indefinitely on future buying. They enjoy the dividends on their already invested portfolio, (Shefrin, [78]). At last, how the people think of money will decide their final frame called money illusions. People often calculate their return on its nominal form. They forget the time value of money. Investors who exhibit this type of frame are called as *money illusions*. Simply saying "People often ignore inflation, while calculating their return". This study has taken the above frames to study deeply on how these frames influence the decisions of retail investors on making equity investments in the Indian capital market. Further, the impact of frames on other behavioural bias factors is also explored in this study.

Personality: During the past several decades, researchers across the world have analyzed the behaviour of investors and their decision making process. Several research works have attempted to enhance the understanding of how people make investment decisions in different ways. After emerging of behavioural finance, these research works have given importance. Today an extensive body of literature exists that seeks to explain how individual characteristics influence their behaviour of making decisions. Simply saying, how personality influences

their investment decisions. According to phares [65], '*Personality is that pattern of characteristic thoughts, feelings, and behaviour that distinguishes one person from another and that persists over time and situation*'. It is the sum of biological based and learnt behaviour which forms the person's unique responses to environmental stimuli (Ryckman, [71]). Investor's investment decisions are influenced by certain factors like environment, mood, emotion and cognition. Personality is the sum of all these variables. The proportion of these variables differentiates one individual from the other. Everyone has their unique pattern of feelings, thoughts and behaviour, which is formed by a fairly stable combination of personality traits (Phares, [65]). The major contribution of individual personality (BIG-FIVE MODEL) given by P.T. Costa and R.R. McCrae, [15]. They are categorizing personality as Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. Many researchers use this theory is the fundamental to analyze individual's personality with respect to decisions making process. Allport and Allport [2], Norman [64], Eysenck [21], Goldberg [35], and McCrae and Costa [14] are the major researchers contribute more studies related to this big five personality. The big five personality traits explain, inter individual variation in behavioral propensities. Extroversion: An extroverted doesn't follow principles and also not tended to control themselves or have self-control. They explore the attributes of low intellect, poor patience and ambitious, carelessness, flexibility, simply deciding, living in present, appreciating his/her social success and properties, (Gholipour, [34]). Agreeableness: Agreeableness explains individual's sincerity, honesty of accepting their mistakes; flexible, uncomplicated, modesty etc. (Gholipour,[34]). These factors influence the investors' perception towards the equity market. Conscientiousness: Conscientious personality trait describes the individual's responsibility, reliability, structured behaviour, and carefulness (Gholipour, [34]). Nicholson, [63] added that Conscientiousness improves individual risk potential. According to Farzanepey, [24] Conscientiousness explains individuals skill, organizing the information ability, dutifulness, self-discipline, neuroticism, and cautious in deciding [24]. Neuroticism: Neuroticisms trait, explains the individual's problem solving skill, self-seeking and selfish attributes. Neuroticism people are anxious, angry, depressive, impulsiveness and vulnerability [24]. Openness to experience: openness to experience elucidates the intellectual ability of an individual. It explains flexibility and wish for new elements (Gholipour, [34]). A flexible individual be inclined to new ideas, steady on their area and activities. They tend to be simple and have a tendency of solving the complexity and vagueness. Flexibility modes are: fantasy, feelings, ideas [24]). In this study, big five personality variables are taken to find out the impact of these variables on retail investors' equity investment decisions. Besides, the impact of other behavioural bias factors on investors' investment decisions is also explored in this study.

Gambling: Risk plays a central component of both the gambling and investment concept. Yale's [97] defined risk as "the outcome of an unguaranteed action; if it is guaranteed then there is chance of no risk". This shows that gambling is related to uncertainty, despite the investment will become appreciate or depreciate in value. Investing and gambling are an interrelated activity hopes for a favorable outcome. Some researchers argued that situations play a vital role in defining the gambling behaviour

of investors. Allport [3] and Funder [29] have examined the relationship of individual personality traits and the gambling behaviour. They found that situations encountered by individuals determine the gambling behaviour. But this concept was lacking the theoretical evidence, Mischel, [61]. He found that “the more unlike the inducing situations, the less likely they show the way to alike or reliable responses from the same individual.” Mischel & Peake, [62] also acknowledge that the characteristics of a situation were more important than the previously acknowledged. Slovic, [87] and Zuckerman, [98] advocates that risk-taking behaviour of individuals has also failed to generate much empirical support. Kuhlman [54] has explained the relationship between individual differences in behaviour across the three different gambling games. Though, there is some dissimilarity between the concept of gambling and investing, it coincides with term of money, risk, and winners/losers (Thorngate & Rajabi, [91]). Steinberg & Harris [89] claimed that those who engage in ‘problem gambling in the financial markets’ comprise part of their clinical caseload of problem gamblers. They found that around 60 percent of the individuals believe that there was a small difference between the investing in the more speculative spots of the stock market and gambling at a casino (Steinberg & Harris, [89]). Loony [57] found that compulsive gamblers wish to prefer riskier investments. Financial market analysts predict the market by using the market patterns and the historical data (Bodie, Kane, Marcus, Perrakis, & Ryan, [13]). Researchers who are opposing the findings of investing and gambling (Bodie, et al., [13]), point out that gambling doesn’t affect the long term investment return. There are many similarities between gambling and investing. Many research approaches have adopted to explain this relation. Yales [97] identified a new research approach to explain this relationship is the *Decision Theory Approach*. According to this theory, the situation is often changed with respect to changing the variables, the behaviour of the participants is examined, and at the same time individual differences are ignored. This approach is emblematic of decision making research. On contrasting this *Approach*, psychologists who trust, personality traits explain the behaviour of individual while crossing different situations. Yates submits this research approach as the *General Trait Approach*. The *Decision Theory Approach* and *General Trait Approach* explain the behaviour of investors while facing dissimilar situations. Wildman, [96]; Walker, [95] consolidates the above findings that personality traits of an individual or the disposition that are used as a tool to predict their gambling behaviour. Studies of deeper understanding of gambling and investment behaviour of investors are ignored so far. This study has taken the attributes of gamblers by incorporating the investments features to explore the retail investors gambling behaviour.

6.1 GAPS IN THE LITERATURE

Investors are influenced by many behavioural biases in making investment decisions. Previous studies of behavioural finance have identified major biases which influence investors’ decision making process is personality, heuristics and framings. Other biases like individual’s affect and gambling have given less importance or not studied deeply so far. This research will fill this gap in the literature by taking the affect and gambling factors to find out its impact on investment decisions of investors. Second, the majority of behavioural finance studies emphasis on the behavioural bias factors and its influence on decisions making

process of investors. Here, all type of investors is taken to find out their biases and investment decisions. There is no specific study which concentrates on the retail investors and their behavioural biases so far. This research will fill this gap by selecting the retail investors, to study their behavioural biases on approaching the equity market. Third, relationship among the behavioural bias factors are not studied or ignored so far. This research fills this gap to study the relationship among the selected behavioural bias factors and its impact on the decision making process of the equity investors.

7. SIGNIFICANCE OF THE STUDY

This study provides valuable information about the investment behaviour of retail investors who access the Indian equity market. The main focus of this study is to analyze the impact of selected behavioural bias factors on the investment decisions of equity investors in Tamil Nadu state. The findings of this study will be helpful for the retail investors to find out their biases, which hinder their rational investment decision. Indians have desired to save and invest more than the other countries in the world. Even the developed countries are struggling during the global crisis of 2008; India is standing alone to face the recession without having much adverse effect. Though, we have sustainable development in different areas, capital market investments are still lagging behind the other developing countries. The main reason for this lagging is less awareness among the investors. After the emergence of behavioural finance, more investors are accessing the market. It helps the investors to detect the biases which influence their investment behaviour.

This study attempts to find out the impact of selected behavioural bias factors on the investment decisions of equity investors. Tversky and Kahneman [92-94] found that heuristics and framings are major biases which affect the individual’s judgment. Later in 1986, they found a theory called “prospect theory” which is a famous revolutionary theory in behavioural finance, accepted by most of the financial practitioners in the world. They argued that a rational theory of decisions does not provide any foundation to the decision making theory. Based on their findings, several researches were carried out for the last four decades. Behavioral finance research has focused primarily on the behavioural biases, by paying very less attention to the part of affect (emotion and mood) on investment decisions, Elster [22]; Hermalin and Isen [41]. Simultaneously, the influence of mood and gambling behaviour on investment decisions is also neglected or deeply studied so far. This study primarily focuses on these behavioural bias factors to find out the influence of these factors on the individual’s investment decisions. Besides influencing of heuristic, framing and personality factors are also studied. This research is useful for the financial advisors, portfolio managers and retail investors to understand the importance of behavioural bias factors and its influence on investment decisions.

8. OBJECTIVES OF THE STUDY

The major focal point of this study is to find out the impact of selected behavioural bias factors on equity investors’ investment decision. The behavioural bias factors included in this research are Mood, Emotions, Heuristics, Frames, Gambling and

Personality. This study also aims to study how each behavioural bias factor influences other behavioural factors on the decisions making process of investors.

9. CRONBACH ALPHA TEST FOR RELIABILITY

Reliability is a test of sound measurement. It is used to find out whether a measuring instrument provides an accurate and consistent result. In this research, behavioural bias factors contain the statements which are measured by using five point Likert scale starting from strongly disagree to strongly agree. Cronbach alpha is one such reliability instrument used in SPSS to find out the reliability of measurement. The instrument is reliable if and only the Cronbach alpha value should be greater than 0.6. The altered questionnaire was tested for reliability by using set of 30 respondents. This procedure was repeated again with another set of 30 respondents to make sure of consistent results. The alpha values of the respective behavioural bias factors are shown in the following Table.2.

Table.2. Cronbach Alpha Test for Reliability

S. No.	Variable	Alpha Value		
		Pilot Study	First 30 respondents	Next 30 respondents
1	Mood	0.600	0.621	0.629
2	Emotions	0.829	0.839	0.845
3	Heuristic	0.817	0.843	0.840
4	Frame dependence	0.661	0.681	0.678
5	Personality	0.709	0.710	0.719
6	Gambling	0.829	0.830	0.836

The Table.2 illustrates that the alpha value is improved after conducting a pilot study. After making some changes the alpha values for the first 30 respondents are improved i.e. greater than 0.6. This shows that the statements used to measure the behavioural bias variables are reliable. The alpha values of the second set of 30 respondents are more or less same as the alpha values for data collected from the first 30 respondents. This implies that there is no further change warranted and there is no early response bias.

10. RESEARCH METHODOLOGY

Sample design is a technique or the procedure the researcher would adopt in selecting items for the sample. The sample design to be used must be decided by the researcher taking into consideration the nature of the inquiry and other related factors (Kothari C.R., 2004).

Sample Unit: Retail investors who are accessing the Indian equity market from the Tamil Nadu are taken as the sample unit.

Sample Frame: Details of broking firms are collected through SEBI and BSE/NSE websites. Based on the information collected from these sources, a consolidated list of broking firms is prepared, which is considered to be the sample frame of this study.

Sample Population: As the study calls for analysis and rendering of data without any subjective action, this can be viewed as a descriptive survey. The size of populations of this study is very high. In order to simplify the sample selection process, Multi stage sampling technique is employed. Under multi stage sampling method, the following steps are adopted to select the samples for this study. Initially, 32 districts in Tamil Nadu state are segmented into five zones as North, South, East, West and the Central part of Tamil Nadu. For each zone, one place or city is selected based on the criteria of investors are highly accessing the capital market from that place. Places randomly selected for this study are Chennai, Coimbatore, Trichy, Madurai, and Tirunelveli. After selecting the place, leading broking offices are identified in each place to collect a target data. Five broking offices are randomly selected to collect the target data. They are Aditya Birla money limited, Reliance money, Sharekhan, India info-line and HDFC Securities. Investors who access the equity market from these places are taken as a sample population for this study.

Sampling Technique: The multistage random sampling technique is used to collect the target data from the respondents. Each and every item in the population has an equal probability of inclusion in the sample (Kothari C.R., 2004).

Sample Respondents: Data is gathered from the target audience of retail investors who access the equity market from the selected cities of Tamil Nadu state.

Sample Size: The sample size is calculated by using the formula, $n = (z^2s^2) / e^2$, where 'n' is the sample size, 'z' is confidence limit, 's' is the standard deviation and 'e' is an error (Kothari C.R., 2004). After calculating the sample size, it is found that the sample size should be a lower limit of 720. Hence a total of rounded figure of about 800 questionnaires were targeted to collect the data from the respondents.

Data Collection: Each broking firm was targeted at 32 questionnaires. Questionnaires were given to respondents directly to collect the data, when they visit the broking offices. From the 800 questionnaires, 780 responses were received, out of which 38 were excluded because of incomplete data or response bias of extreme values. The remaining usable questionnaires were 742. This stands for an effective response rate of above 90 percent of the entire sample. Hence the sample size for this study is 742.

11. SELECTION OF BEHAVIOURAL BIAS VARIABLES

After an extensive and careful understanding of existing literature (discussed detail in review of literature) related to behavioural biases and investment behaviour of investors, the following variables are considered for this study. For simplicity, emotional factors are taken as Optimism (E1), Hope (E2), Excitement (E3), Euphoria (E4), Panic (E5), Despondency (E6), Anxiety (E7), Capitulation (E8), Desperation (E9), Denial (E10), Thrill (E11), Relief (E12), Fear (E13) and Depression (E14) respectively. Different personality variables are taken as Agreeableness, Consciousness, Openness, Extraversion and Neuroticisms. For the use of simplicity, these variables are taken as P1, P2, P3, P4 and P5. Around 10 observed gambling attributes of investors are taken as G1, G2...G10 respectively. Heuristic factors are studied by using the six variables. They are aversion to ambiguity (H1), representativeness (H2), overconfidence (H3),

anchoring (H4), adjustments (H5) and conservatisms (H6). Each of these heuristic factors are validated and accepted in Frame dependence factors are studied by using six factors, namely loss aversion (F1), concurrent decisions (F2), regret (F3), hedonic editing (F4), money illusion (F5) and self-control (F6). Mood variables are taken as happiness (M1), carefulness (M2), calmness (M3), Energeticness (M4), Fearfulness (M5), Angriiness (M6), Tiredness (M7), and sadness (M8).

12. BEHAVIOURAL BIAS INTERDEPENDENCE MODEL

Behavioural bias factors and its influence of the investment decisions of investors is shown in the figure 1. Here, mood bias variables have shown no significant associations with the counterpart behavioural bias factors. Hence it has been excluded to construct the following interdependence behavioural bias model. The result of this model is shown in the Table.3 and Table.4.

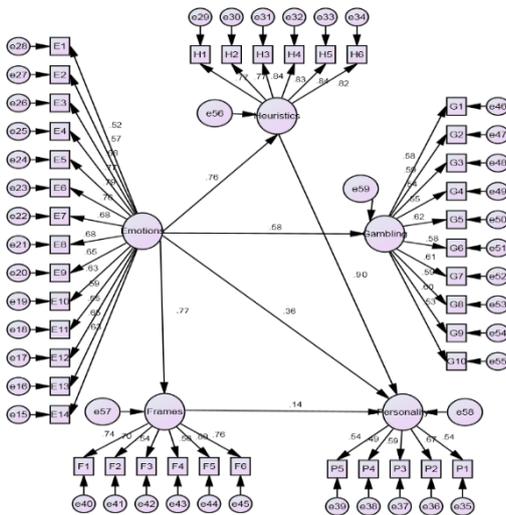


Fig.1. Interdependence Model of Behavioural Bias Factors

The Fig.1 displays the six causal relationships namely, the relationship between emotions and heuristics, emotions and frames, emotions and personality, emotions and gambling, heuristics and personality and frames and personality respectively.

Table.3. Results of Overall Relationship Model

Independent variable	Dependent variable	Path co-efficient	Std error	t-value	p-value
Emotions	Heuristics	0.76	0.053	14.34	0.000
Emotions	Frames	0.77	0.070	10.99	0.000
Emotions	Gambling	0.58	0.054	10.74	0.000
Emotions	Personality	0.36	0.074	4.86	0.004
Heuristics	Personality	0.90	0.155	5.80	0.000
Frames	Personality	0.14	0.042	3.33	0.157

The Table.3 shows the beta value; error value and t-value corresponding to the first causal relationship between Emotions and Heuristics are 0.76, 0.053 and 14.34 respectively. The p - value is 0.00 which reveals that the relationship is significant. It indicates that there is a positive relationship between Emotions and Heuristic of investors.

The beta value, error value and t-value corresponding to the second causal relationship between Emotions and Frames are 0.77, 0.070 and 10.99. The p - value is 0.00 which suggests that the relationship is significant. It indicates that there is a positive relationship between Emotions and Frames of investors.

The beta value, error value and t-value corresponding to the third causal relationship between Emotions and Gambling are 0.58, 0.054 and 10.74. The p - value is 0.00 which indicates that the relationship is significant. It reveals that there is a positive relationship between Emotions and Gambling of investors.

The beta value, error value and t-value corresponding to the fourth relationship between Emotions and Personality are 0.36, 0.074 and 4.86. The p - value is 0.00 which indicates that the relationship is significant. It reveals that there is a positive relationship between Emotions and Personality of investors.

The beta value, error value and t-value corresponding to the fifth causal relationship between Heuristics and Personality are 0.90, 0.155 and 5.80. The p - value is 0.00 which indicates the relationship is significant. It reveals that there is a positive relationship between Heuristics and Personality of investors.

The beta value, error value and t-value corresponding to the sixth causal relationship between Frames and Personality are 0.14, 0.042 and 3.33. The p - value is 0.157 which indicates the relationship is not significant. It reveals that there is no causal relationship between Frames and Personality of investors. It indicates that there exists a complete mediation effect among the Emotions, Personality and Frames paths.

Comparing the path coefficients of behavioural bias factors, the relationship between heuristics and personality path coefficient is shown stronger than other relationship factors. It illustrates that heuristic factor plays a lead role of defining the personality of investors. At the same time, individual's emotion play a major role of determining their heuristic and framing development.

Table.4. Result of Goodness of Fit for Overall Model

Model	Normed Chi-square	P-value	GFI	AGFI	NFI	CFI	RMSEA
Study model	4.869	0.000	.90	.89	.90	.91	.072
Recommended value	≤ 5	≥ 0.05	≥ 0.90	≥ 0.90	≥ 0.90	≥ 0.90	≤ 1

The Table.4 shows the value of various goodness-of-fit indices. The normed chi-square is 4.869, RMESA is 0.072, GFI is .90, AGFI is .89, NFI is .90 and CFI is .91. These fit indices meet its recommended values. This suggests that the available data set is perfectly fits into the model.

13. IMPACT OF BEHAVIOURAL BIAS FACTORS ON INVESTORS' INVESTMENTS IN VARIOUS INVESTMENTS AVENUES

Discriminant analysis is employed to find out the impact of behavioural bias factors on investment decisions of investors. For carrying out this analysis, independents variables are taken as six behavioural bias factors and dependent factors are taken investors' investments in various investment avenues. Investors' investments in various investments avenues are categorized as less than one lakh, one-three lakh, three-five lakh and above five lakh respectively.

Table.5. Eigen value

Function	Eigen value	% of Variance	Cumulative %	Canonical Correlation
1	1.122	96.7	96.7	.727
2	.027	2.4	99.0	.163
3	.011	1.0	100.0	.105

The Eigen value of function one is greater than 1. This explores that function one is contributing high for investors' investment decisions. Further, canonical correlations of function one is around 73 percent. This indicates that there exist a strong correlation between the function one and behavioural bias factors.

Table.6. Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 3	0.454	581.716	18	0.000
2 through 3	0.963	28.098	10	0.002
3	0.989	8.177	4	0.085

The Table.6 contains Wilk's lambda, chi-square value, degrees of freedom and the significant values. Wilk's lambda values of three functions vary from 0.5 to 1. Function one has shown low Wilks' lambda. This reveals that small wilks' lambda value of function one contributes more of defining the investors' investments decisions. The significant values of first two functions are 0.000. It indicates that the first two functions contribute the investors' investment decisions.

Structure matrix explores the relationship of behavioural bias factors with the two discriminant functions. Personality, Frames and Mood bias factors have shown strong correlations with function one. Emotions and Heuristics factors correlated with function two and Gambling factor correlated with function three matrices. These three functions are explained in equations as,

$$Z1 = (0.681) * \text{Personality} + (0.657) * \text{Frames} + (0.381) * \text{Mood},$$

$$Z2 = (0.806) * \text{Emotions} + (0.649) * \text{Heuristics}, Z3 = (0.356) * \text{Gambling}.$$

An overall finding of this discriminant analysis explores that investors' Personality, Frames and Mood variables determine their general investments decisions.

Table.7. Structure Matrix

Behavioural Bias Factors	Function		
	1	2	3
Personality	.681*	.275	.606
Frames	.657*	.027	-.236
Mood	.381*	.316	.341
Emotions	.158	.806*	.080
Heuristics	.143	.649*	.149
Gambling	.047	-.054	.356*

14. IMPACT OF BEHAVIOURAL BIAS FACTORS ON INVESTORS' INVESTMENTS IN THE EQUITY MARKET

Discriminant analysis is adopted to find out the impact of behavioural bias factors on investors' investment decisions. For carrying out this analysis, independents variables are taken as six behavioural bias factors and dependent factors are taken investors' investments in equity market. Investors' investments in equity market are categorized as less than 25 percent, 25-50 percent, 50-75 percent and 75-100 percent of investments in the equity market.

Table.8. Eigen value

Function	Eigen value	% of Variance	Cumulative %	Canonical Correlation
1	1.070 ^a	55.3	55.3	.719
2	.845 ^a	43.7	99.0	.677
3	.019 ^a	1.0	100.0	.138

The Eigen value of function one is greater than 1. This indicates that function one plays a major role of influencing the investment decisions of investors. Besides, the canonical correlations of function one is around 72 percent. This illustrates that there exist a strong correlation between the function one and behavioural bias factors.

Table.9. Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 3	.257	1000.655	18	.000
2 through 3	.532	465.129	10	.000
3	.981	14.171	4	.007

The Table.9 contains wilk's lambda, chi-square value, degrees of freedom and the significant values. Wilk's lambda values of three functions vary from 0.3 to 1. Function one has explored low

wilks' lambda. This suggests that function one contributes more of defining the investors' equity market investments decisions. The significant values of all the three functions are 0.000. It indicates that all the three functions are statistically significant.

Table.10. Structure Matrix

Behavioural Bias Factors	Function		
	1	2	3
Frames	.814*	.306	-.258
Emotions	.804*	-.481	.337
Heuristics	.756*	-.150	.202
Gambling	.717*	-.359	-.181
Personality	.379	.390*	.179
Mood	.070	.233	.297*

Structure matrix explores the relationship of behavioural bias factors with the two discriminant functions. Investors' Frames, Emotions, Heuristics and Gambling bias factors have shown strong correlations with function one. Personality factors correlated with function two and finally Mood factor correlated with function three matrices. These three functions are explained in equations as,

$$Z1 = (0.814) * \text{Frames} + (0.804) * \text{Emotions} + (0.756) * \text{Heuristics} + (0.717) * \text{Gambling},$$

$$Z2 = (0.390) * \text{Personality} \text{ and } Z3 = (0.297) * \text{Mood}.$$

An overall finding of this discriminant analysis explores that investors' Frames, Emotions, Heuristics and Gambling variables determine their equity investments decisions.

15. CONCLUSION

Role of behavioural bias factors on individual investment decisions is a more discussed topic amongst the financial practitioners all over the world. This study opens the door to another step to study the behavioural bias factors and its' role of defining the investment behaviour of investors. In this study, SEM model is adopted to find out the interdependence among the behavioural bias factors. Findings of this model suggest that relationship between heuristics and personality path coefficient is shown stronger than other relationship factors. Simultaneously, investor's emotion plays a lead role of determining their heuristic and framing development. Discriminant analysis is used to find

out the impact of behavioural bias factors on investment decisions of investors using the categorical investments variables like investments in various avenues and investments in the equity market respectively. Findings of discriminant analysis explore that investors' frames, personality and mood bias factors influence their general investment decisions. Simultaneously, investor's emotions, heuristics, frames and gambling bias factors play a significant role of defining their equity investment decisions.

The major implications of this study will be useful to retail investors to understand the behavioural bias factors and its influence on their investment decisions. This study attempts to find out the causal relationship between the behavioural bias variables with the help of structural equation models. The pictorial relationship model enriches the knowledge of retail investors to rectify the errors and biases in making investment decisions. This research offer several practical implications for the mutual fund industry. The conceptual model provides a systematic framework that fund managers can use to frame suitable niche products (funds) to meet the needs of the customers. The primary aim of Mutual fund industries tries to sell their products to the customers. They don't educate the customers often to retain them till the maturity of the fund. This research opens doors to the mutual fund industry to educate their customers about the behavioural bias factors which hinders their successful investment decisions. They can motivate the retail customers to indirectly approach the capital market through mutual fund schemes to avoid unsuccessful investment decisions.

This research framework covers the major behavioural bias factors and its impact on investment decisions of equity investors. Managers of the broking firm and investment analysts can use this study to understand the investor's market behaviour on stock market investments. They can educate their clients often to make a successful investor. The major outcome of the research is the data used in this study have strongly supported the theorized model and the hypotheses well. This study encourages the academic practitioners for healthy arguments on the theory and proposition, measurement scale, way of approaching the research works and managerial implication.

16. DIRECTIONS OF THE FUTURE RESEARCH

This study has restricted to focus on only selected behavioural bias factors and its impact on equity investors investment decisions. There are many behavioural bias factors which hinder the investors' successful investment decisions. Future researchers can use this study as a base to study other behavioural bias factors and its impact of defining the investment behaviour of investors is the promising area of future research related to this topic.

APPENDIX**BEHAVIOURAL BIAS FACTORS**

Please indicate your preference as a number in the appropriate box as specified below

1-Strongly Disagree 2- Disagree 3- Neither Agree nor Disagree 4- Agree 5- Strongly Agree

MOOD FACTORS	
My happiness mood influences my market activity	
I invest mostly in companies with stable expected returns	
My calmness mindset influences my market activity	
I am always actively participate in market activity	
I usually invest in companies what I am familiar with	
I am actively involved in market activity despite of any angriness situations influences me	
My physical tiredness won't affect my market behaviour	
I am actively involved in market activity despite of any sadness situations influences me	
EMOTIONAL FACTORS	
My positive outlook encourages me to invest in the market	
I am looking forward my next opportunity to invest after a deep fall in the market	
I am very excited to approach the market, if my market strategy works and pass the information to others that the equity market is the best investment options	
If profit on my investment continues, I began to ignore risk to think of every move would give profits.	
I am at a loss for what to do next, after using all my ideas	
If the market moves against me. I tell my selves I am a long-term investor's and that all my ideas will eventually work	
If loss happens in my investment, I'll sell all my stocks to avoid further loss	
If losses continues, I don't want to buy stock ever again	
During bearish market, I'll approach the market with the intention to recover my losses.	
I believe the stocks that I own will never move in favor because of confused market movements.	
If loss continues in my investment, I am confused to make a decision about further investments	
If I bought a stock that becomes profitable, I renew my faith that there is a future in investing.	
I am very much thrilled to invest during booming or recovery stage of the market	
When markets have not rebounded, I begin denying either that I made poor choices or that things will not improve shortly.	
HEURISTIC FACTORS	
I prefer to invest only on familiarity stocks.	
Past winners influence me a lot when compared to past losers	
I frequently overestimate the market	
I stick on random number estimation given by experts	
I modify my portfolio based on the expert's advices.	
I am too slow in updating my beliefs in response to recent evidence	
FRAME DEPENDENCE FACTORS	
Losses are more painful than gains are pleasurable to me. So I hesitate to realize the losses	
I am Focusing more on losses rather than net gains and losses	
I prefer to buy non-riskier stocks	
I prefer to book loss & shift to other stocks during bearish market	
I often calculate nominal return on stocks by avoiding inflations	
I am fully responsible for the results of my investment decisions	
PERSONALITY FACTORS	
I find opportunity to invest despite of bearish market to get good return	

I maintain a self-discipline on my trading	
I always tend to be independent and interested in choosing variety of stocks	
I take losses as like gains	
I always tend to be calm, feel secured and self-satisfied from my returns	
GAMBLING FACTORS	
I have been preoccupied with seeking daily information about the status of my investments or trades	
I have been preoccupied with thoughts of past and future investments or trades	
I have felt uncomfortable when any cash accumulated in my brokerage account and have needed to quickly find a way to keep it in action	
I have been restless or irritable when unable to be active in the markets. Ex when short of money trying to cut back on trades	
My investments or trades have become increasingly speculative or risky over time	
I have not opened brokerage statements to avoid having to think about my losses	
I have borrowed money from family, friends, credit cards or other sources to invest or trade	
When losses have piled up, I continued the same investments and trades or increased the amount in hopes my strategy would work, or my luck would change and I would regain the losses	
I have risked losing or lost important work, family, or other commitments due to the amount of time and money taken up by my trading or investing	
I have committed an illegal act to get money to continue to invest or trade	

REFERENCES

- [1] Lucy F. Ackert, Bryan K. Church and Richard Deaves, "Emotion and Financial Markets", *Economic Review-Federal Reserve Bank of Atlanta*, Vol. 88, No. 2, pp. 33-41, 2004.
- [2] Gordon W. Allport and Henry S. Odbert, "Trait-names: A Psycho-Lexical Study", *Psychological Monographs*, Vol. 47, No. 1, pp. 1-171, 1936.
- [3] Gordon W. Allport, "*Personality: A Psychological Interpretation*", 1st Edition, Holt Later Printing, 1937.
- [4] Amitai Etzioni, "Normative-Affective Factors: Toward a New Decision-Making Model", *Journal of Economic Psychology*, Vol. 9, No. 2, pp. 125-150, 1988.
- [5] George Anderson and R.I.F. Brown, "Real and Laboratory Gambling, Sensation-seeking and Arousal", *British Journal of Psychology*, Vol. 75, No. 3, pp. 401-410, 1984.
- [6] Richard P. Bagozzi, Mahesh Gopinath and Prashanth U. Nyer, "The Role of Emotions in Marketing", *Journal of the Academy of Marketing Science*, Vol. 27, No. 2, pp. 184-206, 1999.
- [7] Brad M. Barber and Terrance Odean, "Trading is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors", *The Journal of Finance*, Vol. 55, No. 2, pp. 773-806, 2000.
- [8] Brad M. Barber, Yi-Tsung Lee, Yu-Jane Liu and Terrance Odean, "Just How Much do Individual Investors Lose by Trading?", *Review of Financial Studies*, Vol. 22, No. 2, pp. 609-632, 2009.
- [9] Nicholas Barberis, Ming Huang and Richard H. Thaler, "Individual Preferences, Monetary Gambles, and Stock Market Participation: A Case for Narrow Framing", *American Economic Review*, Vol. 96, No. 4, pp. 1069-1090, 2006.
- [10] Christopher J. Beedie, Peter C. Terry and Andrew M. Lane, "Distinctions between Emotion and Mood", *Cognition & Emotion*, Vol. 19, No. 6, pp. 847-878, 2005.
- [11] Shlomo Benartzi and Richard H. Thaler, "Myopic Loss Aversion and the Equity Premium Puzzle", *The Quarterly Journal of Economics*, Vol. 110, No. 1, pp 73-92, 1995.
- [12] Herbert Bless, Gerd Bohner, Norbert Schwarz and Fritz Strack, "Mood and Persuasion: A Cognitive Response Analysis", *Personality and Social Psychology Bulletin*, Vol. 16, No. 2, pp. 331-345, 1990.
- [13] Zvi Bodie, Alex Kane, and Alan Marcus, "*Essentials of Investments*", McGraw-Hill/Irwin, 2001.
- [14] Paul T. Costa and Robert R. McCrae, "NEO PI/FFI Manual Supplement for use with the NEO Personality Inventory and the NEO Five-Factor Inventory", *Psychological Assessment Resources*, Vol. 40, pp.45-67, 1989.
- [15] Paul T. Costa and Robert R. McCrae, "Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual", *Psychological Assessment Resources*, pp. 50-72, 1992.
- [16] John R Crawford and Julie D. Henry, "The Positive and Negative Affect Schedule (PANAS): Construct Validity, Measurement Properties and Normative Data in a Large Non-Clinical Sample", *British Journal of Clinical Psychology*, Vol. 43, No. 3, pp. 245-265, 2004.
- [17] Antonio R. Damasio, "*Descartes' Error: Emotion, Rationality and the Human Brain*", Quill, 1994.
- [18] Gert-Jan de Bruijn, Stef P.J. Kremers, Hein de Vries, Willem Van Mechelen, and Johannes Brug, "Associations of Social-Environmental and Individual-Level Factors with Adolescent Soft Drink Consumption: Results from the SMILE Study", *Health Education Research*, Vol. 22, No. 2, pp. 227-237, 2007.
- [19] Marieke De Vries, Rob W. Holland, and Cilia L.M. Witteman, "Fitting Decisions: Mood and Intuitive versus

- Deliberative Decision Strategies”, *Cognition and Emotion*, Vol. 22, No. 5, pp. 931-943, 2008.
- [20] Marieke De Vries, Rob W. Holland and Cilia L.M. Witteman, “In the Winning Mood: Affect in the Iowa Gambling Task”, *Judgment and Decision Making*, Vol. 3, No. 1, pp. 42-50, 2008.
- [21] Hans J. Eysenck, “*The Structure of Personality*”, 3rd Edition, Methuen, 1970.
- [22] Jon Elster, “Emotions and Economic Theory”, *Journal of Economic Literature*, Vol. 36, No. 1, pp. 47-74, 1998.
- [23] Nancy S. Fagley and Paul M. Miller, “Framing Effects and Arenas of Choice: Your Money or Your Life?”, *Organizational Behavior and Human Decision Processes*, Vol. 71, No. 3, pp. 355-373, 1997.
- [24] Eugene F. Fama, “The Behavior of Stock-Market Prices”, *The Journal of Business*, Vol. 38, No. 1, pp. 34-105, 1965.
- [25] Eugene F. Fama, “Efficient Capital Markets: A Review of Theory and Empirical Work”, *The Journal of Finance*, Vol. 25, No. 2, pp. 383-417, 1970.
- [26] Leon Festinger, “An Analysis of Complaint Behavior”, *Group Relations at the Crossroads*, 1953.
- [27] Joseph P. Forgas, “Mood and Judgment: The Affect Infusion Model (AIM)”, *Psychological Bulletin*, Vol. 117, No. 1, pp. 39-66, 1995.
- [28] Charles B Ferster and Burrhus Frederic Skinner, “Schedules of Reinforcement”, *Appleton-Century-Crofts*, pp. 23-47, 1957.
- [29] Leon Festinger, Henry Riecken and Stanley Schanchter, “*When Prophecy Fails*”, Harper Torchbooks, 1956.
- [30] Joseph P. Forgas, “On Feeling Good and Getting Your Way: Mood Effects on Negotiator Cognition and Bargaining Strategies”, *Journal of Personality and Social Psychology*, Vol. 74, No. 3, pp. 565-577, 1998.
- [31] David C. Funder, “Global Traits: A Neo-Allportian Approach to Personality”, *Psychological Science*, Vol. 2, No. 1, pp. 31-39, 1991.
- [32] Gerd Gigerenzer and Wolfgang Gaissmaier, “Heuristic Decision Making”, *Annual Review of Psychology*, Vol. 62, pp. 451-482, 2011.
- [33] Gerd Gigerenzer, “On Narrow Norms and Vague Heuristics: A Reply to Kahneman and Tversky”, *Psychological Review*, Vol. 103, No. 3, pp. 592-596, 1996.
- [34] Gerd Gigerenzer and Daniel G. Goldstein, “Reasoning the Fast and Frugal Way: Models of Bounded Rationality”, *Psychological Review*, Vol. 103, No. 4, pp. 650-659, 1996.
- [35] Gerd Gigerenzer and Peter M. Todd, “*Simple Heuristics that make us Smart*”, Oxford University Press, 1999.
- [36] Aryan Gholipour, “Organizational Behavior”, Tehran: Center for social science, 2007.
- [37] Lewis R. Goldberg, “An Alternative Description of Personality: The Big-Five Factor Structure”, *Journal of Personality and Social Psychology*, Vol. 59, No. 6, pp. 1216-1229, 1990.
- [38] Thomas Gilovich, Dale Griffin and Daniel Kahneman, “*Heuristics and Biases: The Psychology of Intuitive Judgment*”, Cambridge University Press, pp. 16-19, 2002.
- [39] Uri Gneezy, Arie Kapteyn, and Jan Potters, “Evaluation Periods and Asset Prices in a Market Experiment”, *Journal of Finance*, Vol. 58, No. 2, pp. 821-838, 2003.
- [40] Lewis R. Goldberg, “The Development of Markers for the Big-Five Factor Structure”, *Psychological Assessment*, Vol. 4, No. 1, pp. 26-42, 1992.
- [41] Mark Grinblatt and Matti Keloharju, “Sensation Seeking, Overconfidence, and Trading Activity”, *The Journal of Finance*, Vol. 64, No. 2, pp. 549-578, 2009.
- [42] Robert D. Herman, “*Gamblers and Gambling: Motives, Institutions, and Controls*”, Lexington Books, pp. 78-105, 1976.
- [43] David A. Hirshleifer and Tyler G. Shumway, “Good Day Sunshine: Stock Returns and the Weather”, *The Journal of Finance*, Vol. 58, No. 3, pp. 1009-1032, 2003.
- [44] Astrid Hopfensitz and Tanja Wranik, “Psychological and Environmental Determinants of Myopic Loss Aversion”, *Toulouse School of Economics-GREMAQ, CISA-Swiss Center on Affective Sciences, MPRA Paper*, pp. 1-29, 2008.
- [45] A.M. Isen, “*Positive Affect and Decision Making*”, Handbook of Emotions, 2nd Edition, M. Lewis and J. Haviland-Jones, 2000.
- [46] Daniel Kahneman and Amos Tversky, “On the Psychology of Prediction”, *Psychological Review*, Vol. 80, No. 4, pp. 237-251, 1973.
- [47] Daniel Kahneman, “A Psychological Point of View: Violations of Rational Rules as a Diagnostic of Mental Processes”, *Behavioral and Brain Sciences*, Vol. 23, No. 5, pp. 681-683, 2000.
- [48] Daniel Kahneman, “Experienced Utility and Objective Happiness: A Moment-Based Approach”, *Choices, Values and Frames*, D. Kahneman and A. Tversky (Eds), Cambridge University Press and the Russell Sage Foundation, 2000.
- [49] Daniel Kahneman, “Evaluation by Moments: Past and Future”, *Choices, Values and Frames, Choices, Values and Frames*, D. Kahneman and A. Tversky (Eds), pp. 693-708, 2000.
- [50] Daniel Kahneman, “Maps of Bounded Rationality: Psychology for Behavioral Economics”, *The American Economic Review*, Vol. 93, No. 5, pp. 1449-1475, 2003.
- [51] Daniel Kahneman, Jack L. Knetsch and Richard H. Thaler, “Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias”, *The Journal of Economic Perspectives*, Vol. 5, No. 1, pp. 193-206, 1991.
- [52] Daniel Kahneman, Paul Slovic and Amos Tversky, “Judgment under Uncertainty: Heuristics and Biases”, *Cambridge University Press*, pp. 64-89, 1982.
- [53] Daniel Kahneman and Amos Tversky, “Prospect Theory: An Analysis of Decision under Risk”, *Econometrica: Journal of the Econometric Society*, Vol. 47, No. 2, pp. 263-291, 1979.
- [54] D.M. Kuhlman, “*Individual Differences in Casino Gambling*”, W.R. Eadington (Ed.), *Gambling and Society*, Charles C Thomas, pp. 323-335, 1976.
- [55] Joseph Ledoux, “*The Emotional Brain: The Mysterious Underpinnings of Emotional Life*”, Simon and Schuster, 1998.
- [56] Sarah Lichtenstein and Paul Slovic, “Reversals of Preference between Bids and Choices in Gambling Decisions”, *Journal of Experimental Psychology*, Vol. 89, No. 1, pp. 46-55, 1971.

- [57] George F. Loewenstein, Elke U. Weber, Christopher K. Hsee and Ned Welch, "Risk as feelings", *Psychological Bulletin*, Vol. 127, No. 2, pp. 267-286, 2001.
- [58] Donald G. MacGregor, Paul Slovic, David Dreman and Michael Berry, "Imagery, Affect, and Financial Judgment", *Journal of Psychology and Financial Markets*, Vol. 1, No. 2, pp. 104-110, 2000.
- [59] Harry Markowitz, "Portfolio Selection", *The Journal of Finance*, Vol. 7, No. 1, pp. 77-91, 1952.
- [60] Edward M. Miller, "Risk, Uncertainty, and Divergence of Opinion", *The Journal of Finance*, Vol. 32, No. 4, pp. 1151-1168, 1977.
- [61] Walter Mischel, "Personality and Assessment", Wiley, 1968.
- [62] Walter Mischel and Philip K. Peake, "Beyond Déjà vu in the search for Cross-situational Consistency", *Psychological Review*, Vol. 89, No. 6, pp. 730-755, 1982.
- [63] N. Nicholson, E. Soane, M. Fenton and P. Willman, "Personality and Domain Specific Risk Taking", *Journal of Risk Research*, Vol. 8, No. 2, pp. 157-176, 2005
- [64] Warren T. Norman, "Toward an Adequate Taxonomy of Personality Attributes: Replicated Factor Structure in Peer Nomination Personality Ratings", *The Journal of Abnormal and Social Psychology*, Vol. 66, No. 6, pp. 574-583, 1963.
- [65] E. Jerry Phares, "Introduction to Personality", Harper Collins Publisher, pp. 35-42, 1991.
- [66] William B Riley Jr and K. Victor Chow, "Asset Allocation and Individual Risk Aversion", *Financial Analysts Journal*, Vol. 48, No. 6, pp. 32-37, 1992.
- [67] Laura M. Ritter, James H. Meador Woodruff and Gregory W. Dalack, "Neurocognitive Measures of Prefrontal Cortical Dysfunction in Schizophrenia", *Schizophrenia Research*, Vol. 68, No. 1, pp. 65-73, 2004.
- [68] Richard Roll, "A Critique of the Asset Pricing Theory's Tests Part I: On Past and Potential Testability of the Theory", *Journal of Financial Economics*, Vol. 4, No. 2, pp. 129-176, 1977.
- [69] Markus Ruder and Herbert Bless, "Mood and the Reliance on the Ease of Retrieval Heuristic", *Journal of Personality and Social Psychology*, Vol. 85, No. 1, pp. 20-32, 2003.
- [70] Roger G. Clarke and Meir Statman, "The DJIA Crossed 652,230", *The Journal of Portfolio Management*, Vol. 26, No. 2, pp. 89-92, 2000.
- [71] Richard M. Ryckman, "Theories of Personality", 2nd Edition, Brooks/Cole Publishing Company, 1982.
- [72] William Samuelson and Richard Zeckhauser, "Status Quo Bias in Decision Making", *Journal of Risk and Uncertainty*, Vol. 1, No. 1, pp. 7-59, 1988.
- [73] D.M. Saunders and P.E. Wookey, "Behavioural Analyses of Gambling", *Behavioural Psychotherapy*, Vol. 8, No. 1, pp. 1-6, 1980.
- [74] Norbert Schwarz, "Warmer and More Social: Recent Developments in Cognitive Social Psychology", *Annual Review of Sociology*, Vol. 24, pp. 239-264, 1998.
- [75] Norbert Schwarz, "Feelings as Information: Informational and Motivational Functions of Affective States", Guilford Press, 1990.
- [76] George Charles Selden, "Psychology of the Stock Market", Ticker Publishing Company, 1912.
- [77] Hersh Shefrin, and Meir Statman, "The Disposition to Sell Winners too Early and Ride Losers too Long: Theory and Evidence", *The Journal of Finance*, Vol. 11, No. 3, pp. 777-790, 1985.
- [78] Hersh Shefrin, "Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing", 1st Edition, Oxford University Press, pp. 105-132, 2007.
- [79] Hersh Shefrin and Meir Statman, "Behavioral Capital Asset Pricing Theory", *The Journal of Financial and Quantitative Analysis*, Vol. 29, No. 3, pp. 323-349, 1994.
- [80] Robert J. Shiller, "The Subprime Solution: How Today's Global Financial Crisis Happened, and What to do About It", Princeton University Press, 1998.
- [81] Matthias Siemer, "Moods as Multiple-Object directed and as Objectless Affective States: An Examination of the Dispositional Theory of Moods", *Cognition and Emotion*, Vol. 19, No. 6, pp. 815-845, 2000.
- [82] Herbert A. Simon, "A Behavioral Model of Rational Choice", *Quarterly Journal of Economics*, Vol. 69, No. 1, pp. 99-118, 1955.
- [83] Herbert A. Simon, "Rational Choice and the Structure of the Environment", *Psychological Review*, Vol. 63, No. 2, pp. 129-138, 1956.
- [84] Herbert A. Simon, "Models of Man Social and Rational", John Wiley and Sons, 1957.
- [85] Laura Sizer, "Towards a Computational Theory of Mood", *British Journal of Philosophical Science*, Vol. 51, No. 4, pp. 743-770, 2000.
- [86] Paul Slovic, Melissa L. Finucane, Ellen Peters and Donald G. MacGregor, "Risk as Analysis and Risk as Feelings: some thoughts about Affect, Reason, Risk, and Rationality", *Risk Analysis*, Vol. 24, No. 2, pp. 311-322, 2004.
- [87] Meir Statman, "Investor Psychology and Market Inefficiencies", *ICFA Continuing Education Series*, Vol. 1, No. 2, pp. 32-55, 1988.
- [88] M.A. Steinberg and J.J. Harris, "Perceptions of Connecticut Stock Brokers Concerning Problem Gambling in the Stock Market and extent of Brokerage Firm Responsibility for Prevention", *The Journal of Finance*, Vol. 6, pp. 67-105, 1994.
- [89] Richard H. Thaler and Eric J. Johnson. "Gambling with the House Money and trying to Break Even: The Effects of Prior Outcomes on Risky Choice", *Management Science*, Vol. 36, No. 6, pp. 643-660, 1990.
- [90] Warren Thorngate and Alieh Rajabi, "Predictors of Investment Decision Making Behavior", *Gambling Research Centre Publication*, Vol. 1, pp. 25-33, 2002.
- [91] Amos Tversky and Daniel Kahneman, "Judgment under Uncertainty: Heuristics and Biases", *Science*, Vol. 185, No. 4157, pp. 1124-1131, 1974.
- [92] Amos Tversky and Daniel Kahneman, "The Framing of Decisions and the Psychology of Choice", *Science*, Vol. 211, No. 4481, pp. 453-458, 1981.
- [93] Michael B. Walker, "The Psychology of Gambling", Routledge, 1992.
- [94] Robert William Wildman, "Gambling: An Attempt at an Integration", Wynne Resources, 1997.
- [95] Jacques F. Yates, "Risk-Taking Behavior", John Wiley & Sons, 1992.
- [96] Marvin Zuckerman, "Traits, States, Situations, and Uncertainty", *Journal of Behavioral Assessment*, Vol. 1, No. 1, pp. 43-54, 1979.