PERCEPTION OF INDIAN RETAIL INVESTORS IN THE AFTERMATH OF THE GLOBAL FINANCIAL CRISIS – A STUDY WITH REFERENCE TO THEIR PORTFOLIO DECISION MAKING

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ABSTRACT

In January 2008, the Bombay stock exchange having reached the peak level of 21000 points, hit the rock bottom of 8000 points in the aftermath of the Global financial crisis caused by the U.S. Subprime crisis 2007-08. During the years preceding the crash, albeit the stock prices had been rising, it was rather difficult to state whether it was based on economic fundamentals or on pure speculative frenzy. This paper attempts to study the personality traits of the retail investors and examine the psychological biases that influence their portfolio decisions. The methodology of the study is based on primary data collected through well framed and structured questionnaire to elicit the perception of retail investors in the share market. The non-parametric chi-square analysis is applied to find the association between various personality traits and psychological biases. Factor analysis by principal component method has been applied to reduce the number of psychological biases and personality traits into ten meaningful factors and seven meaningful factors respectively. K-means cluster analysis has been applied to classify and group the sample unit on the basis of psychological biases and personality traits of the retail investors. The result of the present study provides a unique contribution to the literature by examining an array of psychological biases and personality traits. Self-consciousness is the most dominating personality trait among the survey respondents and it is influenced by all the proposed variables such as Gender, age, marital status, discipline, occupation, income, time spent for analysis, number of trades per month, percentage of shares held for speculation, investment experience and annual rate of return on equity. Among the ten psychological biases identified in the study, Illusion of control and socio conformity bias are the foremost biases which are influenced by the eight proposed independent variables viz., Gender, Age, Marital status, Occupation, Income, Time spent for analysis, Number of trades performed per month, Percentage of shares held for speculation, Investment experience and annual rate of return on equity.

Keywords : *Global Financial Crisis, Psychological biases, Personality Traits, Portfolio decisions*

INTRODUCTION

In January 2008, the Bombay stock exchange having reached the peak level of 21000 points, hit the rock bottom of 8000 points in the aftermath of the Global financial crisis caused by the U.S. Subprime crisis 2007-08. During the years preceding the crash, albeit the stock prices had been rising, it was rather difficult to state whether it was based on economic fundamentals or on pure speculative frenzy. But the manner in which stock prices behaved during the real estate mortgage crisis period confirmed that the market deemed macroeconomic fundamentals obsolete. No matter what these fundamentals illustrated, the stock market kept rising to unsustainable levels which were mainly due to psychological factors (Karlsson & Olson, 2007).Psychological biases cloud rational thinking of the investors which negatively affect investment decisions.

Although India remained unscathed from the global financial crisis, Indian stock markets have not been attractive since then. The knee-jerk reaction left investors with huge losses and setbacks in their portfolio. Especially, individual investors, who constitute a minor segment suffered severe losses, due to their impulsive streak of winning trades and

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their untiring efforts, not realizing the inherent danger of peak level exit. Currently, stock markets are undergoing bearish phase and investors are not enthusiastic about their current expectation and merely adopting 'wait and watch' strategy. So, the individual investors ought to ponder and re-examine their investment blunders. Further, they need to articulate the reasons for their underperformance relative to the market return (Barber et al. 2009)

REVIEW OF LITERATURE

Psychologists have found several judgment biases but it remains unclear which biases affect economic decisions of investors or whether these biases affect economic behaviour at all. Psychological biases are pervasive, but there are issues that have not yet been addressed in the existing literature especially in the emerging market economies such as India.

In the vast existing literature no attempt has been made to link financial literacy with financial behaviour and actual financial outcomes. Financial literacy is more or less significant in an economic sense in determining good or bad financial behaviour and consequently the good or bad outcomes. Most studies employ educational attainment as a standard measure to test financial knowledge whereas financial literacy is gained from very many other sources such as internet, financial magazines and news paper, investor associations and also information packages provided by financial regulators and institutions. Further, rather than focussing on financial literacy and financial markets as a whole, research attempt towards particular products and services, investor segments are uncommon. Thus the current research focusses on retail investor segment and their behaviour towards equity class only.

A study conducted in Taiwan stock market explored the relationship between psychological traits, demographic and behavioural biases of individual investors. It focussed only on three behavioural biases viz. over confidence, herding and disposition effect which were found significantly related to four personality traits viz., neuroticism, extraversion, openness to experience and conscientiousness. Using primary survey, the author performed cross sectional analysis via structural equation modelling (SEM) that constructs a comprehensive path to link the personality traits with the three proposed behavioural biases (Huei-Wen Lin, 2011).

Another study was conducted in Australia which examined the relationship between various demographics, cognitive, personality variables and financial literacy. The study was undertaken on homogeneous sample of 94 students of University of Southern Queensland and observed that the only relationship among demographic variables and financial literacy was for 'Years of work'. All cognitive abilities were positively related to financial literacy but numeracy was the most important among the cognitive predictors. Neuroticism and agreeableness emerged as the most influential of big five personality factors to predict financial literacy (Kathryn L. Noon &Gerard J. Fogarty, 2007)

McElroy and Dowd (2007) examined and found that individuals high in openness to experience were significantly influenced by susceptibility to anchoring cues in judgement and decision making. Therefore individual differences in other personality traits that are likely to be influenced due to other heuristics and biases are an area unexplored. Most of the experiments check on the validity of behavioural concepts that is tested on students as participants. Thus behavioural conclusions derived from these experiments do not reflect their applicability in actual securities markets where investors, traders and professional are continuously making decisions. Thus the current study focuses on the retail investors cum traders who handle trading and investment decisions in actual securities market.

On a thorough scrutiny of the substantive literature, and to my knowledge there is paucity of research studies towards retail investors focussing on broader perspective of psychological biases.

RESEARCH QUESTION FOR THE STUDY

Can individual differences of retail investor in variables socio-demographic factors, financial knowledge and awareness, objectives and strategy, portfolio composition and personality traits be used to differentiate the nature of psychological biases and to classify the retail investors into stylized biased investor categories?

NEED FOR THE STUDY

The sample of the study is limited to individual investors because individual investors constitute an important group in the financial market place and their decision making behaviour is likely

to have an impact on the stock market as a whole (De Bondt, 1998). It becomes even more pronounced taking into consideration that even an emerging economy like India already accommodates 2.02 million individual retail investors being largest in the world (PTI, Mumbai, Dec 2012) Further this research demonstrates that primary survey can contribute several important ways to increase one's understanding of investor behaviour.

Psychological research has made giant strides in the past several decades to understand biases that compromise human judgment. These biases tend to crop up precisely in situations where the information environment becomes complex, where decisions involve risk and uncertainty, when people are motivated to see things positively and when they undergo conflict between short term and long term desires. Biases are common investment mistakes that individuals commit due to their cognitive and emotional weaknesses leading to distorted financial decisions. Further, social factors also hamper financial decisions (Baker & Nofsinger, 2002).

SCOPE OF THE STUDY

The main theoretical contribution of this research study is that retail investors are segmented based on the revealed psychological biases and personality traits together with the self-reported trading and investment-related behavioural pattern. The segments, both of the personality dimensions and the psychological biases provide an opportunity for independent financial advisors and brokers to devise well-crafted investment plans for the retail clients. The retail clients can be urged to take up a personality type test to help brokers evaluate and identify their personality, risk tolerance, life-cycle stage and other qualitative information. Thereupon, the financial advisors can create asset allocation and execute investment programmes designed to mitigate a number of behavioural biases of retail investors.

STATEMENT OF THE PROBLEM

Investment decisions are seen as an iterative process of interaction between the investor and the investment environment. This investment process is influenced by a number of interdependent variables and dual mental processes viz. cognitive and affective system. The interplay between these systems contributes to bounded rational behaviour in which investors use various heuristics and exhibit biases.

OBJECTIVES OF THE STUDY

1. To study the demographic profile of retail investors
2. To study the personality traits of the retail investors and examine the psychological biases that influences their portfolio decisions

RESEARCH METHODOLOGY

The methodology of the study is based on primary data collected through well framed and structured questionnaire to elicit the perception of retail investors in the share market. Simple random sampling has been used to collect responses from the retail investors. The study has been conducted in a two stage format with preliminary pre-testing followed by the main study.

The study was conducted among the retail investors of different broking and sub broking firms having several branches in Chennai City. The pilot study was conducted during the period from 1st May 2011 to 15th June 2011 while the main study was conducted during the period from 15th July 2011 to 30th November 2011.

The questionnaire contained one page covering letter signed by the researcher and pre-printed reply envelop. It outlined the intent of the research with an assurance that the information provided by the respondents would be used for academic research only and kept confidential. Studies indicate that factors such as estimation of the time needed to complete the questionnaire and signature of the most senior researcher were found to significantly increase response rates (Hornik, 1981; Brown and Coverly, 1999).

A heterogeneous sample was adopted to cover a wide variety of demographic group. The prime respondents are the retail investors of share broking firms and sub-broking firms. Since they have numerous branches in Chennai city, care was taken to ensure the selection of retail investors of share market in a fairly proportionate manner. To begin with, the attitude and behaviour of respondents was gauged in the actual trading environment i.e. walk-in retail clients who perform trading operations in the broking firms. But personal visit by the traders to the broking firms for trading had significantly declined in the post global crisis period. Moreover, provision of online trading terminal at convenient locations for the retail clients saw a huge reduction in their personal visit to the broking offices.

Questionnaire was also administered to the retail investor participants in the meetings conducted by the Madras Stock Exchange, Bombay Stock exchange, National Stock exchange and Securities exchange board of India. Further, questionnaire was circulated and collected during the regular meetings conducted by the Tamil Nadu Investors Association. The student traders of B-School the Institute for Financial Management and Research (IFMR), Nungambakkam also responded to the primary survey questionnaire.

The retail investor participation in Chennai city is about 1.4 percentage of its population [CDSL Update]. The total sample size of the study is cross verified for representation of the population parameters. Since the researcher focused on personality traits and psychological biases of retail investors, a factor analysis was run separately for personality traits and psychological bias. The results of the analysis revealed twenty five variables of personality traits which are perfectly grouped into six predominant groups. Similarly, in the case of psychological bias thirty two variables except two are perfectly grouped into ten biases. It clearly shows that the variance of the respondents possess less than five per cent admissible errors to represent the population parameters. Therefore, the researcher profoundly concludes that the sample size of 606 is adequate to conduct the research.

DATA COLLECTION

Data for this study was primarily collected through a survey in the form of a questionnaire as well as through research based published data concerning retail investor participation. Primary data refers to data, which is collected for specific purpose and which is required in order to complement secondary data (Wiedersheim- Paul & Eriksson,1997).Secondary data refers to the existing collected and summarized material of the research papers and publications. This data originates from sources such as databases, literature, journals and the internet (Wiedersheim- Paul & Eriksson, 1997).

The primary data was collected from the retail clients of share broking firms in person by the researcher through survey method. For a few respondents who were busy during trading hours and those who experienced difficulty in language, responses were collected orally by the researcher in a one-to-one interview manner. A mail survey instrument was also chosen as the method of collecting the self-reported data. Despite potential problems with non-response, mail questionnaires are commonly held as the most efficient means of collecting empirical data (Wu and Vosika, 1983). The researcher developed a web page that contained the survey questionnaire and allowed respondents to mail their response to an email account specifically created for this purpose.

Based on the pilot study results, 1200 questionnaires were distributed for the main survey to the respondents in Chennai City. The number of questionnaire collected after sustained follow up was 859. Out of the 859 responses only 606 were complete and suitable for statistical analysis. Out of the total 1200, 341 questionnaires were not returned and 253 were eliminated for inconsistent replies and incomplete answers. Therefore, the exact sample size for this study is 606.

DATA ANALYSIS

The primary data collected through the questionnaire is analysed using the SPSS-V 15 (Statistical Package for Social Sciences) computer packages. The statistical tools used for data analysis based on the data enumerated from the questionnaire are as follows.

1. Simple percentage analysis is used to describe the sample unit considered for the research
2. The non-parametric chi-square analysis is applied to find the association between various personality traits and psychological biases
3. Factor analysis by principal component method has been applied to reduce the number of psychological biases and personality traits into ten meaningful factors and seven meaningful factors respectively
4. K-means cluster analysis has been applied to classify and group the sample unit on the basis of psychological biases and personality traits of the retail investors.

DESCRIPTIVE STATISTICS

Demographic factors such as gender, age, education, occupation and income are indispensable for investment pattern and preferences of investors. They exercise significant influence in determining the psychological biases which investors succumb to while making financial decisions. Table 1(Appendix) presents the descriptive statistics of the demographic

profile of the sample unit. From Table 1(Appendix) it can be deduced that males constitute 80 % of the sample unit while the remaining 20 % represent females. This is consistent with the previous studies undertaken on individual investors in various countries. Feng and Seasholes (2008) reported that in their study in U.S, men represented approximately 80 % of the sampled investors while women represented 20 %. In People's Republic of China, male and female investors were equally represented. Similarly, survey investors in Malaysian stock exchange revealed that 70 % respondents were male and 30 % of the respondents were females (Audrey Lim Li Chin, 2012). Thus it shows that males are more likely to invest and trade in the stock market compared to females. Maximum number of sample respondents 35.48 % are found in the age group of 21-30 years followed by 21.29 % in the age group 31-40 years, 16.67 % in the age group of 41-50 years, 13.7 % in the group of 51-60, 9.57 % in the age group above 60 years. Respondents in the age group up to 20 years constitute the least, 3.3 % of the sample unit. Post graduates constitute 38.78 % of the sample unit followed by under graduates who constitute 34.98 %, professionally qualified who constitute 17 %, technically qualified who constitute 5.94 %. Respondents who have school education constitute the least, 3.14 % of the sample unit.

Sample respondents who have specialised in business or management constitute the highest, 23.6 % followed by investors who have specialised in finance constitute 20.46 %, investors who have specialised in engineering discipline constitute 18.81 %, investors who specialise in other disciplines constitute 13.04 %, investors who specialised in economics constitute 11.88 %, investors who specialised in pure science constitute 8.09 %, investors who specialised in literature constitute2.81 %.Respondents who specialised in law constitute the least, 1.32 % of the sample unit.

Married investors restrain themselves from venturing into stock market through direct equity investment since it is viewed as a risky proposition. 33.17 % of the sample unit is married while 66.83 % represents the unmarried. Sample respondents who constitute a maximum of 52.48 % of the sample unit belong to salaried class, followed by non-employed (viz. House wives, students and retired personnel) who constitute 22.77 %. Sample respondents in business constitute 15.68 % and employed in professional occupations represent the least 9.07 % of the sample unit.

Sample respondents with an annual income more than one lakhs upto three lakhs constitute the maximum of 37.29 % followed by investors with an annual income more than three lakhs up to five lakhs who constitute 24.26 %. Respondents earning an annual income more than five lakhs constitute 17.17 % of the sample unit; investors earning annual income up to one lakh constitute 17 %. Sample respondents without any income (viz. students) constitute the least 4.29 % of the sample unit.

FACTOR ANALYSIS OF PERSONALITY TRAITS OF RETAIL INVESTORS

The factor analysis of the psychological biases and personality traits is conducted by means of exploratory factor analysis. Factor analysis is used to summarize a set of variables into a smaller set of factors by means of the inter correlation between variables (Pallant, 2007). Within the broad spectrum of factor analysis, this study made use of principal axis factor analysis which rotates the data such that maximum variabilities are projected onto the axes (Pallant, 2007; Tabachnick and Fidell, 2001). In determining the number of factors to be extracted, the Kaiser eigenvalues greater than one criterion is considered (Pallant, 2007).

As a first step towards an exploratory factor analysis, a principal component analysis was conducted in order to determine the underlying dimensions of psychological biases and personality traits of retail investors of share market in Chennai City. Seven principal components were constructed out of the personality traits using the Kaiser's varimax rotation technique which explains 54.926 % of the total variance which shown in Table 2(Appendix). The eighth factor in Table 2 (Appendix) which consists of third variable viz. "I analyze market action to respond aptly" and eleventh variable "I do not follow diet or exercise program" which has the peculiarity of negative correlation value. This implies that the variable composition is not mixed up with the factors coined by the researcher. Therefore, the researcher appropriately moved third variable to the fifth component factor to give value addition and variances for the fifth factor and deleted the eleventh variable. The seven components resulting from factor analysis of personality traits are described as follows:

The variables in Table 3 (Appendix) relate to

individuals who are assertive, energetic, stimulated and excited with people around. They possess positive emotions and are venturesome to accomplish their ambitions (Watson and Clark, 1997). Conversely, individuals scoring low on the above traits are reserved and independent. They perform things at even pace and prefer to remain in their own company (Taylor and de Bruin, 2006). They correspond to the personality trait extroversion in the big five personality inventory (Costa& McCrae, 2006). Hence, factor I is labeled as gregariousness.

The variables in Table 4 (Appendix) relate to individuals who are prone to anxiety; feel unsure and worried about their investments and trading decisions. Such individuals respond emotionally to market events and become easily tensed leading to erratic decisions. Due to their subjective feeling and insecurity, they experience negative emotions and thus enter and exit trade on whims of emotions (Brett.N. Steenbarger, 2003).Additionally, unstable emotions make them less dependable. They correspond to the personality factor high neuroticism of the big five personality inventory (Costa& McCrae, 2006). Hence, factor II is described as Self-consciousness.

The variables in Table 5 (Appendix) indicate that the sample respondents perceive them as risk-averse and risk-avoiders. It shows that investors neither prefer nor have willingness to bear risk to achieve desired outcome in the stock market. They are found to be risk averters as they want to avoid risk and choose the safer option in making the decision. Majority of the investors take risk in order to reap some psychological or material benefit not for the sake of risk itself. This is supported by Olsen (1998) in his studies, in which most people consider themselves to be risk-avoiders rather than risk-takers. Similar results were reported by Audrey Lim Li Chin (2012) in his study where investors tend to be cautious in exercising choice towards investment while judging risk-return relationship. It is expected that their tendency to be risk-averse has exacerbated due to the major losses they had experienced before. Therefore, factor III is labeled as Risk-aversion.

The variables Table 6 (Appendix) deal with individuals who are thoroughly organized, achievement-striving, efficient and adhere to moral precepts (McCrae and John, 1992). They are self-disciplined and persevering. Conversely, individuals who are low on these variables tend to be hedonistic, distractible in their efforts (Taylor and de Bruin, 2006), careless towards responsibilities and disorganized (Haslam, 2007). They correspond to the personality trait conscientiousness in the big five personality inventory (Costa& McCrae, 2006). Hence, factor IV is named as Diligence.

The variables in Table 7 (Appendix) represent individuals who are emotionally stable. They have good emotional control during stressful conditions of trading and are less prone to irrational ideas. They are generally calm and collective under pressure (Hans Eysenck, 1958), remain even-tempered and composed (Taylor and de Bruin, 2006). They are predisposed to adopt practical approach towards market and not capitulated to temptations and desires.(McCrae and Costa, 2006). They correspond to the personality factor low neuroticism of the big five personality inventory (Costa& McCrae, 2006). Hence, factor V is labeled as Pragmatism.

The variables in Table 8 (Appendix) represent individuals who possess inquiring intellect, vivid imagination resulting in creative ideas. They have broad interest domains and appreciate aesthetics. (Trapnell, 1994). Alternately, individuals low on these traits is conventional and conservative. They have narrow interest and remain comfortable with familiar experience and are unwilling to explore new experience (Taylor and de Bruin, 2006). They relate to the personality trait openness to experience in the big five personality inventory (Costa& McCrae, 2006). Hence, factor VI is labeled as Aesthetic.

The variables in Table 9 (Appendix) stated measure individuals who are empathetic, helpful and considerate (Taylor and de Bruin, 2006).They are concerned with individual's interpersonal orientation. (Pervin and John, 2001). Conversely, individuals who are low on them are indifferent, hostile (Haslam, 2007: Pervin and John, 2001), manipulative and self centered (Taylor and de Bruin, 2006). They correspond to the personality trait agreeableness in the big five personality inventory (Costa& McCrae, 2006). Hence, factor VII is named as Altruism.

CLUSTER ANALYSIS FOR PERSONALITY TRAITS

Cluster analysis is applied to classify the 606 respondents based on seven factors that emerged from the principal component analysis for the personality dimensions. It has resulted in formation

of three clusters on the basis of similar characteristics which is exhibited in Table 10.

Table 10 (Appendix) shows the number of respondents classified into three clusters with cluster sizes ranging from 168 to 235. From Tables 10 and 11, the three clusters are described as follows

Cluster I Enthusiastic investors

First cluster constitutes 27 % of the sample with 168 respondents who are labeled as Enthusiastic investors. These investors are gregarious who tend to enjoy human interaction and are driven by positive emotions. This cluster has complex conditions that the individuals who are gregarious are also risk averse and self conscious. Recent research has investigated the role of anxiety in extraverts and found that they are negatively related to anxiousness but the relationship did not remain when statistically controlling for gender, age and education (Jylha and Isometsa, 2006). It is likely that these individuals are not hard core traders and are not anxious about their trading results. Probably trading may be undertaken for accomplishing hedonistic goals. Since they like stimulation and excitement and are venturesome they seem to be high risk takers. Therefore, they are highly correlated with risk taking domains.

Cluster II Impulsive traders

Second cluster constitutes 34% of the sample with 203 respondents and is labeled as impulsive traders. These individuals are day traders who are self conscious and who react emotionally to events in the stock market. They interpret ordinary situation as threatening and minor frustrations as hopelessly difficult. These individuals frequently enter and exit trades and are prone to anger and depression (Brett N.Steenbarger, 2003). Their negative reaction tends to persist for unusually long periods which often results in prolonged bad mood. This inhibits their ability to think properly and execute their trading decisions. Further these traders generally are not able to curtail their urge and desire to trade or to delay gratification.

Cluster III Apathetic investors

Third cluster represents 39 % of the sample with 235 investors. This cluster has a complex combination of investors who are neither aesthetic nor altruistic hence named as Apathetic investors. These investors are characterized with indifference, callousness and hostile nature (Digman, 1990; Graziano & Eisenberg, 1997; Haslam, 2007). It is evident that in the modern world, investors tend to become competitive, manipulative and self centered (Howard &Howard, 1995; Taylor & de Bruin, 2006) to serve one's own interest. Further, they are impassive, narrow minded and conservative. They do not exhibit any interest or emotion in what others find exciting and lack sensitivity to others.

FACTOR ANALYSIS FOR PSYCHOLOGICAL BIAS

The variables covered in the survey capture ten psychological biases exhibited by the retail investors in Chennai city. Table 11(Appendix) shows the ten principal components which are constructed out of psychological biases using the varimax rotation technique that explain 54.481 % of the total variance.

The variables in Table 12 (Appendix) relate to the investor who is motivated to promote positive self views rather than negative self views of themselves (Taylor and Brown, 1988). He strives systematically to promote the perception that others think well of him (Shrauger, 1975). It stems from over confidence (Martin Glaser and Martin Weber, 2003) of the investors which is manifested in the form of illusion of knowledge (H.K Baker and J.R.Nofsinger, 2002), illusion of control (Langer, 1975, Presson and Benassi, 1996), better than average effect (Svenson, 1981).

Retail investors in Chennai City overestimate the accuracy of their own judgment towards stock market which is amplified because others seek information from them regarding investment. Further they are overly confident about their stock picking skill and claim to be self disciplined to fix stop loss limits while trading. It is evident that familiarity towards trading, access to information increases their confidence and induces them to enhance their self image. Therefore, factor I is labeled as Self-enhancement bias.

The variables in Table 13 (Appendix) indicate that the sample respondents in Chennai prefer to be exposed to information that is supportive of their current beliefs rather than to non supportive information which presumably could arouse dissonance (Adam kowol, 2008). The investors are prone to inconsistent thoughts and action leading to disharmony which has to be balanced (Leon Festinger, 1975). Further they are anchored to their preconceived

ideas and they ignore any information which is incompatible with their preconceived notion. They interpret new information as confirmation to their prior held beliefs. It reveals that these investors are prone to intrapersonal conflict between their objective self and subjective self. While objective self encourages rational thoughts and decisions subjective self induces instinctive and myopic action to protect self image (Junichiro Ishida, 2010). They try to change their original thought or accept the new thought or rationalize their action to resolve the conflict.

The variable in Table 14 (Appendix) reflects that investors face and handle two consistent realities in the market. On the one hand markets cannot be controlled or predicted and on the other virtually any trader or investor has to try to predict market movements. In such a situation to reduce the dissonance investors pay attention to the evidence that confirms favorable propositions and discount evidence against such propositions. Generally investors agonize over whether they have exercised right choice in trading and investment decisions. Often being plagued with regrets and second thought after tough choice, they automatically seek information that vindicate their decision and allays nagging doubts to reduce dissonance. Therefore, a good way to reduce such dissonance is to seek exclusively positive information on the decision and avoid negative information about it (Aronson, 2004). Thus, factor II is named as Cognitive dissonance.

The variables in Table 15 (Appendix) reflect the investor's tendency to choose familiar stocks rather than unfamiliar ones. It indicates that the sample respondents have distaste for ambiguity as uncertainty accompanies risk. Individuals are averse to ambiguity, as they cause irrational choices (Ellsberg, 1961), emotional tendency such as fear towards risky choices (Peter and Slovic, 1996). Individual investors are likely to express ambiguity aversion because of obvious absence of identifiable parameters of the decision problem which often associated with higher risk and possibly lead to hostile manipulation. Further, retail investors prefer gamble that give them a sense of understanding or competence (Heath and Tversky, 1991). Hence factor III is described as Ambiguity aversion.

The variables in Table 16 (Appendix) imply that sample respondents exhibit unrealistic perception of their control in trading and investment decisions. This bias basically emerges in investors due to their over confidence. So they underestimate the size of the risk they are undertaking and assume large risks (Terrance Odean, 1999). These investors own responsibility for the outcome both for profits and losses. It is evident few investors do not conform to the group behaviour yet, overconfident in their ability and skills to outperform the market. The traders and investors's familiarity with the trading process, the competition they face, the choice they could exercise, the information they possess and their personal involvement causes illusion of control (Presson and Benassi, 1996). They behave as if the stock market situation is determined by their skill and they could exert control over price movements.

Further sample respondents have a preference for control so they adopt online trading terminal to trade than someone else doing it for them (Fleming and Darely 1986, Langer 1975) or they watch live updates and order transactions to the broker through phone. These investors substantially overestimate their degree of control though it is chance determined event (Crocker, 1982) and caught under the illusion that they were instrumental if the outcome turns out successfully (Miller and Ross, 1975). Hence factor IV is named as Illusion of control.

The variables in Table 17 (Appendix) capture the retail investor's tendency to extrapolate the recent trends in stock prices while forming expectations about future stock returns. They expect stock prices to continue the recent trend, predicting higher returns following price rallies and lower returns after price decline (De Bondt, 1993; Vissing-Jorgensen, 2003). It indicates that certain investors in Chennai are trend chasers thereby reflecting their over optimism towards past winners and pessimism about past losers. They strongly believe that by extrapolating historical price pattern they can suggest future movements of the corresponding shares (Sheen and Kendall, 2005). The need to spend resources on tracking price trends, volume and numerous other gauges of demand for equities is emphasized because it is the investor's sentiment which moves prices rather than economic fundamentals (Shleifer and Summers, 1990). Further, investors think that good companies represent good investment and expect the good companies to continue their superior performance in the future (Shefrin and Statman, 1995; Solt and Statman, 1989).Therefore, factor V is labeled as Extrapolation bias.

The variables in Table 18 (Appendix)

measure investors tendency to attribute internal factors viz. their own ability, effort and skill for successful outcomes, conversely ascribe external uncontrollable factors such as market events and circumstances for unfavourable outcomes (Ash Kanasy and Callois, 1987).Although, investors perceive that all information about financial market is readily available, the preponderance lies in the direction of self serving biases. They contend that they have adequate training, experience and skills to interpret information in an unbiased manner (Baker and Nofsinger, 2002). They tend to give themselves too much credit when trades go their way as it promotes ego enhancement but rationalize situations that lose money since it is ego threatening . They are likely to become over confident after a string of winning trades, raise their trading frequency or size and place themselves at risk, jeopardising their performance (Brett N Steenberger, 2003). It shows that investors do not own losses and gain with equal fervor. So, factor VI is labeled as Performance attribution bias

The variables Table 19 (Appendix) imply that the sample respondents are more willing to bet on their own judgment because they are skillful and knowledgeable in trading and investment field. It is likely that educational background and other demographic characteristics make some investors feel more competent than others in understanding an array of financial instruments, information and opportunities available in the stock market (Graham, Harvey and Huang, 2009). The competency effect posits that individuals' willingness to act on their own judgment is affected by their subjective competence (Heath and Tversky, 1991), which induces them, to turndown alternate methods. Further they claim that critical analysis is not necessary for efficient investment decisions. Thus, factor VII is named as Competency bias.

The variables in Table 20 (Appendix) measure the perceived potentiality of investors towards information collection, segregation and compilation in terms of its utility towards trading decisions. The respondents perceive although more information leads to better decision, the time frame is too short to consider all information. They possess positive illusion that more information increases their knowledge but the fact is that they lack the necessary training, experience and skill to interpret the information (Baker and Nofsinger, 2002). Moreover, the time and cognitive resources often are limited to analyse the data optimally (David Hirshleifer, 2001).

Investors lay more emphasis on the quantum of information rather than the factors such as relevance, reliability, speed, anticipated market surprise, and expected market impact which is rated foremost in judging the efficacy of information (Oberlechner and Hocking, 2004). In addition retail investors are unaware of the latent effect that increased amount of information leads to illusion of control and overconfidence (Nofsinger, 2005; Peterson and Pitz, 1988).Therefore, factor VIII is labeled as Information Overload bias.

The variables in Table 21 (Appendix) indicate that the sample respondents are motivated to conform to social norms in their trading and investment decisions. They use evidence of other's behaviour to decide most effective course of action when the situation is novel, ambiguous and uncertain (Sherif, 1936; Tessor, Campbell and Mickler, 1983). They seem to follow other's leads to avoid loss or to grab profitable opportunities as this 'social proof' saves time and cognitive effort (Cialdini, 1993). Investors in Chennai associate with social groups because they view group members as trust worthy source of information. It helps them to resolve conflict between one's own senses and perception of others i.e. to seek social approval (Asch, 1956; Deusch and Gerard, 1955). Socio-conformity decreases search costs and helps to circumvent their lack of expertise in trading decisions (Margarida Abreu and Victor Mendis, 2011). Groups consensus provide simple heuristics to act effectively (Tversky and Kahneman, 1974), in situations which evoke ambiguity and uncertainty (Sherif, 1936), for goal attainment (Festinger, 1950) and vicarious reinforcement from others provide reward power (Opp, 1932; Berger and Luckmann, 1966; Summer, 1906). Hence, factor IX is named as Socio-Conformity bias

The variables Table 22 (Appendix) relate to the perception of investors to erroneously believe in mean reversion of prices i.e. they believe today's losers will outperform today's winner likewise today's winners would be losers of tomorrow. So they sell winners and buy losers. As far as valuation is concerned they exercise their choices in terms of potential gains or losses relative to the purchase

price. So they are risk averse in the domain of gain and risk seeking in the domain of loss (Shefrin and Statman, 1985). These investors stick to previous unsuccessful actions because they feel the need to justify or rationalize their decisions. They are reluctant to admit that the prior decisions were incorrect (Zuchel, 2001). They sell winning stocks to realize gains, implying that they have made a good initial decision. Further, realizing profits early allows them to maintain self-esteem while realizing losses causes them to admit an implicit erroneous investment decision. Thus they hold on to losers (Martin Vlcek, 2007). Hence, factor X is named as Disposition Effect.

CLUSTER ANALYSIS FOR PSYCHOLOGICAL BIASES

Cluster analysis is applied to classify the 606 respondents based on ten factors that emerged from the principal component analysis for the psychological biases. It has resulted in formation of three clusters on the basis of similar characteristics which is exhibited in Table 23 (Appendix)

Table 24 (Appendix) shows the number of respondents classified into three clusters with cluster sizes ranging from 168 to 258. From Tables 23 and 24 (Appendix), the three clusters are described as follows

Cluster I Grandiose Investors

First cluster constitutes 30 percentage of the sample with 180 respondents. These investors are characterised with fundamental strong motivation to feel good about them and to maintain positive self esteem) In self evaluation processes, they often reflect biases favouring positive rather than negative self relevant information (Baumeister, 1999; Kunda, 1990; Taylor and Brown, 1988). They systematically strive to promote the perception that others think well of them. So they adopt mechanisms such as better than average effect to maintain positive views of themselves (Beauregard and Dunning, 2001; Brown, Dutton and Cook, 2001). They are overconfident and also exhibit its varied facets termed as illusion of control (Langer, 1975), referred to as illusion of knowledge,(Nofsinger,2002) and termed as unrealistic optimism in their trade and investment dealings. They are overconfident about their abilities, control, knowledge and their future prospects. These investors make tall claims and inflated opinion about themselves in social circles.

Overconfidence induces them to trade actively since they are too certain about their own opinion and do not consider sufficiently opinion of others. Moreover, they perceive their actions to be less risky and hence overtrade which lower their expected utilities and causes detriment of their own welfare. Generally they demonstrate unwillingness to close a position at a loss. So they trade excessively but incur trading losses beyond transaction cost. They are high disposition investors who sell winners early (i.e. those with recent strong performance) while refrain from selling losers. Realising profits early allows them to maintain self esteem while realizing losses causes them to implicitly admit an erroneous investment decision and hence they hold on to losers.(Nofsinger, 2007). Thus, these investors with high self enhancement bias and high disposition effect have been labeled as grandiose investors.

Cluster II Sophisticated investors

Second cluster represents 42 percentage of the sample with 258 respondents. Contrary to the previous cluster, investors who are neither ambiguity averse nor prone to disposition effect belong to this cluster. They are non-disposition investors who are unbiased in their selling decisions. They are willing to bet on the uncertainty in the stock because they consider themselves knowledgeable and competent to understand the dynamics of stock market. The major reason for competency is the underlying motivation drive rather than the cognitive appeal. Investors learn from their life ling experience which helps them to perform better in situations they understand than in situations where they have less knowledge.

A combination of sophistication and trading experience of investors eliminates their reluctance to realize losses, but at the same time only reduces (does not fully eliminate) their propensity to realize gains (List, 2003)(Feng and Seasholes, 2005, Dhar and Zhu, 2006). Experience helps investors to reduce certain behavioural biases and their behavior improves over time (Hovis and Shultz, 1987; Dhar and Zhu, 2006; Erev and Roth, 1998; List, 2003; Shor, 2004). Sophistication weakens disposition effect (Brown et al. 2006), Dhar and Zhu (2006), Grinblatt and Keloharju, 2001, Shapira and Venezia, 2001; Shumwayand Wu, 2006). Experience helps the

investors to resist the urge that leads to money-losing trades. Resistance towards such a urge is important while considering disposition effect because individual investors tend to be poor in deciding when to sell and when to hold a stock. They do not yield themselves to capitulation decisions during the booms and bust cycles of the stock market. Further individual investors with high incomes are more likely to sell their losers rather than their winners. Hence they are labeled as sophisticated investors.

Cluster III Sagacious Investors

Third cluster represents 28 percent of the sample respondents with 168 investors. This cluster has a complex combination of investors who do not exhibit cognitive dissonance since they are consistent in their attitudes and behavior and also unified in their thought and actions (Leon Festinger, 1957; Elisa M. Jean, 1999).They are not prone to competency bias or socio conformity bias but are ambiguity averse and vulnerable to illusion of control. Further they are competent and confident to exercise self control and view all information objectively, mentally well prepared and highly resourceful towards stock market decisions. They are capable of mental discernment and decipher relevant information to make sound and wise judgment. Uncertainty is ubiquitous and inevitable aspect in stock market decisions. Although they are ambiguity averse they are not risk averse probably because familiar choices cause less regret if they fail (Warner F.M. De Bondt, 1998).

Investors who possess less knowledge and experience in stock market necessarily rely on social groups for both information related needs and social needs (Hoffman, A.O.I, Von Eije, J.H and Jager.W (2006 b). Contrary to the above finding, investors belonging to this cluster are not likely to be influenced by conformity considerations. They are not susceptible to social influences while searching for information or trying to reduce the uncertainty that surrounds decision making. Moreover, previous research demonstrated that lack of cognitive ability on the part of investors is supplemented by social learning process (Dimitris, Christelis, Jullio Japelli, Mario Padulo, 2007). Contrarily, investors in this cluster do not conform to social groups or seek consensus. Therefore, they are termed as Sagacious investors.

CHI-SQUARE ANALYSIS BETWEEN CLUSTERS OF PSYCHOLOGICAL BIAS AND PERSONALITY TRAITS

One of the prime focus of the study is to determine whether there is an association between clusters of psychological bias and personality traits which is shown in Table 24. It can be observed from Table 25 (Appendix), that out of 180 grandiose investors maximum 109 (60.6 %) are apathetic personalities and minimum 31 (17.2 %) are impulsive traders. Similarly, out of 258 sophisticated investors, maximum 127 (49.2 %) are gregarious personalities and minimum 61 (23.6 %) are impulsive traders. Likewise, out of 168 sagacious investors, maximum 98 (58.3 %) are impulsive traders and minimum 24 (14.3 %) are apathetic investors. The non-parametric Pearson's chi square test indicates that Pearson's chi square value is 142.317 and p value= 0.000. This implies that Pearson's chi square value is statistically significant at 5 % level. It is therefore concluded that there is association between psychological bias and personality traits of retail investors.

Grandiose investors are apathetic personalities because literature documents that they are known for self-grandeur and exaggeration about their abilities. They possess overconfidence which makes them less inclined to seek other's support. Further, being ego-centric and sceptical of other's intentions, (Costa and McCrae, 1991), they exhibit lack of concern for things which others find exciting and are insensible to suffering. They are also impulsive personalities since overconfidence leads to high risk taking propensity (Tommy Garling et al. 2009). In stressful situations, they are less likely to control their impulses and experience difficulty to handle taxing pressures (Hills and Norwell, 1991).

Contrary to the general notion, our respondents who are sophisticated due to age, knowledge and experience, demonstrate capacity to endure and enjoy noise. They have numerous friends and acquaintances and are very active (Jung, 1936). It is evident that they are energetic, matured with active disposition, exhibit positive emotions and assertiveness in decisions (McCrae and Costa, 2006). But they are also impulsive personalities though they are not likely to take large risks. Further, studies in cognitive ageing demonstrate that physical and cognitive abilities, especially memory decline with age (Salthouse, 2000; Schroeder and Salthouse, 2004). Therefore, older and experienced investors hold less

risky portfolios (George M. Korniotis and Alok Kumar, 2007).

Sagacious investors are best system traders, meticulous about their research in investment, trading and execution. They become impulsive traders due to dysfunctional impulsivity proposed by Dickman (1990). He proposed two dimensional impulsivity based on information processing approach to personality viz. functional impulsivity and dysfunctional impulsivity. Sagacious investors are prone to dysfunctional impulsivity which is associated with disorderliness and a tendency to act with less forethought than most investors of equal ability. They tend to ignore hard facts, engage in rapid, error-prone information processing because of the inability to use slower and more methodical approach under certain compelling circumstances of the stock market. Sagacious investors are apathetic personalities in our analysis because though they are acute, sharp and wise in judgment; they are self-centered, competitive, and clever and focused on their own interest, rather than others.

This study corroborates the findings of Hue-Wen Lin (2011) who showed positive relationship between Big Five personality traits and three proposed psychological biases in their study viz. Overconfidence, disposition effect and herding. Similarly, McElroy and Dowd (2007) reported that individuals high in openness to experience (Big Five personality trait) are significantly influenced by the heuristic anchoring cues related to those who were low on this trait.

CHI-SQUARE ANALYSIS BETWEEN CLUSTERS OF PSYCHOLOGICAL BIAS AND PERSONALITY TRAITS WITH DEMOGRAPHIC VARIABLES

The researcher identified three clusters of psychological biases viz. grandiose investors, sophisticated investors and sagacious investors and three clusters of personality traits viz., gregarious investors, impulsive traders and apathetic investors. At this juncture, the researcher appropriately exploited non-parametric Chi-square approach to verify the association.

Table 26 (Appendix) shows that association between clusters of psychological bias and personality trait with demographic variables of the respondents is significant at 5% level. Further, association between demographic variables such as gender, education, discipline, marital status, occupation and psychological bias clusters are not statistically significant at 5 % level. Similarly, association between discipline occupation and personality traits cluster are not statistically significant at 5 % level.

It can be observed from Table 27 (Appendix) that out of 180 grandiose investors maximum 73 (40.6 %) belong to the age group 21 to 30 and minimum 2 (1.1 %) belong to the age group up to 20 years. Likewise, out of 258 sophisticated investors maximum 97 (37.6%) belong to the age group 21 - 30 years and a meagre 13 (5%) belong to the age group above 60 years. Similarly, out of 168 sagacious investors maximum 45 (26.8%) belong to the age group 21-30 years and a meagre 2 (1.2%) belong to the age group up to 20 years. Non-parametric Chi square value indicates the Pearson's Chi square value as 37.104, p= .000. This implies that the Pearson's Chi square value is statistically significant at 5% level. It is concluded that there is association between age of the investors and psychological biases.

It is further added that investors belonging to all the age groups are susceptible to various psychological biases. It is consistent with the findings of George M. Korniotis and Alok Kumar, (2007) who observed that older and experienced investor exhibit weak behavioural biases such as disposition effect and familiarity bias. Further, studies indicate that investors are less prone to behavioural bias as they grow older and become more experienced (List, 2003; Feng and Seasholes (2005); Dhar and Zhu (2006); Goetzmann and Kumar (2008).This study also confirms the previous findings of Hue-Wen Lin (2011) who found positive associations between age and disposition effect, as well as age and over-confidence. Likewise, Chen et al., (2005) observed that middle aged investors suffer more from disposition effect in a study on Chinese investors.

It can be observed from Table 28 (Appendix), that out of 180 grandiose investors, maximum 85 (47.2%) have earnings more than one lakh upto 3 lakhs and minimum 1 (0.6%) do not have any source of income. Likewise out of 258 sophisticated investors, maximum 95 (36.8%) earn more than 1 lakh up to 3 lakhs and a meagre 17 (6.6%) earn up to one lakh. Similarly, out of 168 sagacious investor, 47 (28%) have earning more than five lakhs and minimum 8 (4.8%) earn up to one lakh. The non parametric Chi square test indicates the Pearson's Chi square value as 35.042 and p=0.000. This implies that Pearson's

Chi square value as statistically significant at 5% level. Therefore it is concluded that there is an association between annual income and the psychological biases of the investors. Nguyen and Schubler (2012) analysed German individual investors and found that income influences the anchoring effects. Higher income leads to lower probability of an investor susceptibility to anchoring cues. Dhar and Zhu (2002) found that higher investor sophistication by means of higher income attenuates the magnitude of disposition effect of investors.

It can be observed from Table 29 (Appendix) that out of 213 gregarious investors 165 (77.5%) are males and 48 (22.5%) are females. Likewise out of 190 impulsive traders, 166 (87.4%) are males and 24 (12.6%) are females. Similarly out of 203 apathetic investors, 152 (74.9%) are males and 51 (25.1%) are females. The non- parametric Chi square test indicates the Pearson's Chi square value as 10.483 and p=0.005. This implies that Pearson's Chi square value as statistically significant at 5% level. Therefore it is concluded that there is an association between gender and personality traits of the investors. The common findings in literature indicate that women are stronger in neuroticism and agreeableness while men are open to experience (Costa et. al, 2001) and extroversion (Feingold, 1994).Neuroticism is a personality variable in which women have been found to score significantly higher than men. (Costa, Terraciano and McCrae, 2001; Noftle and Shaver, 2006).

It can be observed from Table 30 (Appendix), that out of 213 gregarious investors, maximum 78 (36.6%) belong to the age group 21-30 years and minimum 9 (4.2%) belong to the age group up to 20 years. Likewise, out of 190 impulsive traders maximum 54 (28.4%) fall in the age group 21-30 years and a minimum 3 (1.6%) fall in the age category up to 20 years. Similarly out of 203 apathetic investors maximum 83 (40.9%) belong to the age group 21-30 year and minimum 8 (3.9%) belong to the age category upto 20 years. The non-parametric Chi-square test indicates the Pearson's Chi square value as 30.751 and p=0.001. This implies that Pearson's Chi-square value as statistically significant at 5% level. Therefore it is concluded that there is an association between age and personality traits of the investors. Srivatsava, Gosling and Potter (2003) found a decrease in openness to experience with age in both men and women while extraversion declining only for women as they age. Literature shows that expressions of personality are dependent on age and maturity. Neuroticism and openness to experience decreases while self esteem, conscientiousness and agreeableness tend to increase as age increases (Neyer, 2000). Sensation-seeking (which is a construct of extroversion and openness to experience) is one example of characteristic which diminishes over time from adolescence to middle age in all cultures (McCrae and Costa, 1980).

It can be observed from Table 31 (Appendix) that out of 213 gregarious investors maximum 84 (39.4%) are post graduates and minimum 11 (5.2%) are school educated. Out of 190 impulsive traders maximum 72 (37.9%) are post graduates and minimum 2 (1.1%) are school educated. Out of 203 apathetic investors maximum 80 (39.4%) are graduates and minimum 6 (30%) are school educated. The non-parametric Chi-square test indicates the Pearson's Chi square value as 19.021 and p=0.040. This implies that Pearson's Chi-square value as statistically significant at 5% level. Therefore, it is concluded that there is an association between education and personality traits of the investors. Our result is similar to the findings of Li Fang Zhang,(2006) who in his study reported that participants with higher educational level were less impulsive than did participants with lower educational levels (neuroticism in Big Five personality inventory).

It can be observed from Table 32 (Appendix) that out of 213 gregarious investors 139 (65.3%) are married and 74 (34.7%) are unmarried. Likewise out of 190 impulsive traders, 340 (73.7%) are married and 50 (26.3%) are unmarried. Similarly out of 203 apathetic investors 126 (62.1%) are married and 77 (37.9%) are unmarried. The non-parametric Chi-square test indicates the Pearson s Chi square value as 6.340 and p=0.042. This implies that Pearson's Chi-square value as statistically significant at 5% level. Therefore it is concluded that there is an association between marital status and personality traits of the investors.

It can be observed from Table 33 (Appendix) that out of 213 enthusiastic investors, maximum 77 (36.2%) earn more than 1 lakh upto 3 lakhs and minimum 15 (7.0%) have no income. Further out of 190 impulsive traders maximum 58 (30.5%) earn more than 5 lakhs and minimum 7 (3.7%) earn no income. Furthermore out of 203 apathetic investors maximum 94 (46.3%) earn more than 1 lakh upto 3

lakhs and minimum 4 (2.0%) have no income. The non-parametric Chi-square test indicates the Pearson's Chi square value as 51.415 and p=0.000. This implies that Pearson's Chi-square value as statistically significant at 5% level. Therefore, it is concluded that there is an association between annual income and personality traits of the investors.

FINDINGS

Objective 1

The sample exhibits high proportion of male respondents compared to female participants which is typical of the financial market. The overall age distribution indicates that respondents falling in the age group up to 20 years are meager three percent, above 20 years constitute 87% and nearly 10% of the sampled investors who are above 60 years divert their retirement benefit towards investment in equities. Majority of the sampled investors (90%) represent those who have pursued or pursuing college degree. Above 1/3 of the sampled respondents are under graduates. Likewise, more than 1/3 of them post graduates and 1/6th of the sample are professionals. 1/3 of this study sample indicates married investors while 2/3 represents unmarried investors.

Further, maximum 24% of the sample respondents are found in the discipline of business management followed by finance with 20% and economics with 12%. Those who specialise in science discipline constitute less than 30%. Furthermore, the study reflects that more than 50% of the sample respondents belong to the salaried class, non employed (viz. housewife, retired persons and students) constitute 23% followed by business persons 16% and ultimately professionals who are 9% of the sample. Less than 40% of the sample earns income above Rs.1 lakh up to 3 lakhs, followed by 24% who fall in the income group Rs.3 lakhs to 5 lakhs and respondents having an annual income up to Rs.1 lakh and above Rs.5 lakhs represent 17% each in the sample.

Objective 2

The factor analysis on personality traits segmented the retail investors into seven personality traits of viz., Self consciousness, pragmatism, Diligence, Risk aversion, Altruism and gregariousness. Similarly, the factor analysis revealed ten component factors for psychological biases which the sampled investors succumb to while making investment decisions viz. Self-enhancement bias, cognitive dissonance, ambiguity aversion, illusion of control, extrapolation bias, performance attribution bias, information over load bias, competency bias, socio conformity bias and disposition effect.

Cluster analysis based on the result of factor analysis indicated that retail investors can be grouped into 3 distinct clusters with specific personality traits and the behavioural biases they are susceptible to, during financial decision making. The clusters of psychological biases reveals maximum 42% of the sample respondents are sophisticated investors, 30% of them are Grandiose investors and 28% of them are Sagacious investors. Likewise, the clusters of personality traits revealed that maximum 39% of the sample respondents are found in the cluster named as apathetic investors, 34% of them labeled as impulsive traders and 27% of them termed as enthusiastic investors.

Association between personality traits cluster and demographic variables

Chi-square analysis revealed that demographic variables including gender, age, education, marital status and annual income show significant difference in their distribution over the three clusters of personality traits.

In each cluster of personality trait, the distribution of males and females differ significantly with nearly 78% of the enthusiastic investors cluster are males whereas only 22% are females. Similarly, in the impulsive traders cluster males constitute 87% while 13% are females. Likewise, 75% of the apathetic investors' clusters are males while 25% are females. Enthusiastic investors, impulsive traders and apathetic are represented more by investors in the age group 21-30. Enthusiastic and impulsive personalities are found more among investors who are post graduates while apathetic personality is found among investors who are under graduates. Investors who are unmarried are found more in enthusiastic personality, impulsive traders as well as apathetic personality clusters compared to married investors. 2/3 of the sampled investors who are

unmarried are significantly different from married investors in their personality traits. Enthusiastic investors are found more among investors who earn income of more than Rs.1,00,000- 3,00,000 while impulsive traders are prevalent more among investors earning above Rs.5,00,000 and apathetic personalities are spread more among investors earning income above Rs.1 lakh up to 3 lakhs.

Association between psychological bias cluster and demographic variables

Chi-square analysis revealed that demographic variables viz. age and annual income show significant differences in their distribution over the three clusters of psychological biases. Investors belonging to the age group 21-30 are found to display all the three psychological bias clusters viz., Grandiose, sophisticated and Sagacious. Grandiose investors and sophisticated investors are highly prevalent among the investors with annual income of Rs.1 lakh to 3 lakhs whereas sagacious investors are more represented by the investors whose annual income is above 5 lakhs.

CONCLUSION

The result of the present study provides a unique contribution to the literature by examining an array of psychological biases and personality traits. Self consciousness is the most dominating personality trait among the survey respondents and it is influenced by all the proposed variables such as Gender, age, marital status, discipline, occupation, income, time spent for analysis, number of trades per month, percentage of shares held for speculation, investment experience and annual rate of return on equity. Consistently, Chennai respondents have exhibited risk aversion which is the second important personality influenced by gender, income, time spent for analysis and annual rate of return on equity. Diligence is the third important personality trait displayed by the respondents which is influenced by time spent for analysis, number of trades performed per month and annual rate of return on equity.

Among the ten psychological biases identified in the study, Illusion of control and socio conformity bias are the foremost biases which are influenced by the eight proposed independent variables viz., Gender, Age, Marital status, Occupation, Income, Time spent for analysis, Number of trades performed per month, Percentage of shares held for speculation, Investment experience and annual rate of return on equity. Self enhancement bias is influenced by occupation, income, time spent for analysis, number of trades performed per month, investment experience and annual rate of return. Performance attribution bias is influenced by income, time spent for analysis, number of trades performed per month, investment experience and annual rate of return on equity.

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APPENDIX

Table 1 : Percentage analysis of demographic variables

Variables	Category	Frequency	Percentage
Gender	Male	483	79.70
	Female	123	22.30
	Total	**606**	**100.00**
Age (years)	Upto 20	20	3.30
	21-30	215	35.48
	31-40	129	21.29
	41-50	101	16.67
	51-60	83	13.70
	Above 60	58	9.57
	Total	**606**	**100.00**
Educational status	School education	19	3.14
	Undergraduate	212	34.98
	Postgraduate	235	38.78
	Professional	103	17.00
	Technical	36	5.95
	Others	1	.17
	Total	**606**	**100.00**
Area/Discipline	Economics	72	11.88
	Business/management	143	23.60
	Pure science	49	8.09
	Law	8	1.32
	Finance	124	20.46
	Engineering	114	18.81
	Literature	17	2.81
	Others	79	13.04
	Total	**606**	**100.00**
Marital status	Married	201	33.17
	Unmarried	405	66.83
	Total	606	100
Occupation	Salaried class	318	52.48
	Professional	55	9.07
	Business	95	15.68
	Non employed	138	22.77
	Total	**606**	**100.00**
Annual income	No income	26	4.29
	Upto 1 lakh	103	17.00
	<l lakh upto 3 lakhs	226	37.29
	<3lakhs upto 5 lakhs	147	24.26
	<5 lakhs	104	17.17
	Total	**606**	**100.00**

Source: Computed data

Table 2 : Rotated component matrix for personality traits

Components	Eigen value	% of variance explained	Cumulative variance
I	3.376	13.503	13.503
II	2.895	11.581	25.084
III	1.603	6.411	31.495
IV	1.473	5.894	37.389
V	1.268	5.071	42.460
VI	1.075	4.299	46.759
VII	1.023	4.093	50.852
VIII	1.019	4.074	54.926

Source: Computed data

Table 3 : Factor I Gregariousness

Variables	Factor loading
I really enjoy talking to people	.804
I am cheerful and high spirited	.804
I am very active	.715
I avoid social gathering	.411

Source: Computed data

Table 4 : Factor II Self- consciousness

Variables	Factor loading
I am often tensed	.737
When I fail, I consider giving up	.715
Sometimes I am not dependable	.601

Source: Computed data

Table 5 : Factor III Risk aversion

Variables	Factor loading
I do not prefer to take risk	.805
I avoid risk totally	.687
I choose low risk-steady return over high risk high returns	.583

Source: Computed data

Table 6 : Factor IV Diligence

Variables	Factor loading
I approach my task meticulously	.732
I perform each aspect of a job in the best manner	.684
I apologise on failure to do my work	.638

Source: Computed data

Table 7 : Factor V Pragmatism

Variables	Factor loading
I analyse market action to respond aptly	.653
I do not trade by gut feeling	.626
I take market setbacks as cost	.588
Sometimes I feel worthless in trading	.437

Source: Computed data

Table 8 : Factor VI Aesthetic

Variables	Factor loading
I often try new and strange food	.667
I am inquisitive	.612
I seek thrill	.535

Source: Computed data

Table 9 : Factor VII Altruism

Variables	Factor loading
I often argue	.644
People think that I am cold and calculative	.628
I am thoughtful and considerate	.434

Source: Computed data

Table 10 : Cluster centers for Personality traits

Personality Traits	Cluster		
	1	2	3
Self-consciousness	2.20	4.15	2.92
Pragmatism	3.57	3.50	3.21
Diligence	3.84	3.53	3.07
Aesthetics	3.73	3.51	2.95
Risk aversion	1.88	3.11	3.55
Altruism	2.63	3.83	2.41
Gregariousness	4.21	3.93	3.47

Source: Computed data

Table 11 : Frequency distribution of clusters of personality traits

Cluster	No. of respondents	Percentage
1	168	27
2	203	34
3	235	39
Total	606	100

Source: Computed data

Table 12 : Rotated component matrix for psychological biases

Components	Eigen value	% of variance explained	Cumulative variance
I	4.351	13.597	13.597
II	2.326	7.270	20.867
III	2.077	6.490	27.356
IV	1.450	4.531	31.887
V	1.353	4.229	36.116
VI	1.293	4.039	40.156
VII	1.259	3.934	44.090
VIII	1.147	3.585	47.676
IX	1.128	3.526	51.202
X	1.050	3.280	54.481

Source: Computed data

Table 13 : Factor I Self enhancement bias

Variables	Factor loading
I have the ability to cut losses	.752
I am more knowledgeable than average investor	.679
Often, I am able to pick winning stocks	.661
I am familiar with trading process	.553
I have access to vast amount of information	.543
Others seek information on stock from me	.517

Source: Computed data

Table 14 : Factor II Cognitive dissonance

Variables	Factor loading
I ignore information contradicting my belief	.694
I look for information supporting my belief	.692
I brush aside negative information about stock	.663

Source: Computed data

Table 15 : Factor III Ambiguity aversion

Variables	Factor loading
I prefer familiar stock to the unfamiliar	.753
I prefer certain over uncertain	.746

Source: Computed data

Table 16 : Factor IV Illusion of control

Variables	Factor loading
I own responsibility for my decisions	.752
Following the crowd is not always correct	.512
I have experienced both positive and negative outcomes	.466
Good results are due to my investment skills	.416

Source: Computed data

Table 17 : Factor V Extrapolation bias

Variables	Factor loading
Past performance of stocks indicate future price trend	.798
Good companies sustain high growth levels achieved in the past	.723
Good companies do not always make good investment	.604

Source: Computed data

Table 18 : Factor VI Performance attribution bias

Variables	Factor loading
All information on financial market is readily available	.669
My investment losses are due to unpredictable factors	.540
I have the training, experience and skills required to interpret information	.442

Source: Computed data

Table 19 : Factor VII Competency bias

Variables	Factor loading
Critical analysis is not required for investment decisions	.699
I do not consider alternative methods	.635

Source: Computed data

Table 20 : Factor VIII Information Overload bias

Variables	Factor loading
More the information better the forecast	.718
Time constraints prevent considering all information	.526

Source: Computed data

Table 21 : Factor IX Socio conformity bias

Variables	Factor loading
I discuss about stocks often with my friends	.648
I act on others' behavior to grab profit opportunities	.535
I follow the herd to avoid loss	.461

Source: Computed data

Table 22 : Factor X Disposition effect

Variables	Factor loading
I tend to sell stocks that go up in value	.637
Often I hold stocks that have lost value	.502

Source: Computed data

Table 23 : Cluster centers of psychological biases

Psychological biases	Cluster		
	1	2	3
Self Enhancement bias	4.19	3.37	4.12
Cognitive Dissonance	3.93	3.15	2.39
Ambiguity aversion	4.01	2.68	4.25
Illusion of control	4.14	3.11	4.24
Extrapolation bias	3.62	3.07	3.16
Performance attribution bias	3.66	3.14	3.29
Competency bias	3.33	2.83	2.80
Information overload bias	3.84	3.35	3.71
Socio-conformity bias	3.59	3.11	1.94
Disposition effect	4.04	2.93	3.43

Source: Computed data

Table 24 : Frequency distribution of clusters of psychological biases

Cluster	No. of respondents	Percentage
1	180	30
2	258	42
3	168	28
Total	606	100

Source: Computed data

Table 25 : Association between psychological bias and personality traits

Psychological Bias Cluster	Personality cluster						Total		Chi. Sq. Value	P value
	Enthusiastic		Impulsive		Apathetic					
	Freq	%	Freq	%	Freq	%	Freq	%		
Grandiose	40	22.2	31	17.2	(109)	60.6	180	100	142.317	0.000
Sophisticated	(127)	49.2	61	23.6	70	27.1	258	100		
Sagacious	46	27.4	(98)	58.3	24	14.3	168	100		
Total	**213**	**100**	**190**	**100**	**203**	**100**	**606**	**100**		

Source: Computed data

Table 26 : Summarised Chi-Square test and its significance

Dependent variable	Independent variable	Chi square value	P value	5% level of significance
Psychological bias cluster	Age	37.104	.000	Significant
	Annual income	35.042	.000	Significant
Personality trait cluster	Gender	10.483	.005	Significant
	Age	30.751	.001	Significant
	Education	19.021	.040	Significant
	Marital status	6.340	.042	Significant
	Annual income	51.415	.000	Significant

Source: Computed data

Table 27 : Association between psychological bias clusters and age

Psychological bias	Age group (years)												Total		Chi Square Value	P Value
	Up to 20		21-30		31-40		41-50		51-60		Above 60					
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%		
Grandiose	2	1.1	73	40.6	41	22.8	24	13.3	21	11.7	19	10.6	180	100	37.104	0.000
Sophisticated	16	6.2	97	37.6	59	22.9	42	16.3	31	12.0	13	13	258	100		
Sagacious	2	1.2	45	26.8	29	17.3	35	20.8	31	18.5	26	15.5	168	100		
Total	**29**	**3.3**	**215**	**35.5**	**129**	**21.3**	**101**	**16.7**	**83**	**13.7**	**58**	**9.6**	**606**	**100**		

Source: Computed data

Table 28 : Association between psychological bias clusters and annual income

Psychological bias	Annual Income										Total		Chi Sq. value	P Value
	No income		Upto 1 lakh		100001 - 300000		300001-500000		500001 and above					
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%		
Grandiose	13	0.6	28	15.6	85	47.2	42	23.3	24	13.3	180	100		
Sophisticated	17	6.6	48	18.6	95	36.8	65	25.2	33	12.8	258	100		
Sagacious	8	4.8	27	16.1	46	27.4	40	23.8	47	28.0	168	100		
Total	26	4.3	103	17.0	226	37.3	147	24.3	104	17.2	606	100	35.042	0.000

Source: Computed data

Table 29 : Association between personality traits clusters and gender

Personality Clusters	Male		Female		Total		Chi-Square value	P value
	Freq	%	Freq	%	Freq	%		
Enthusiastic	165	77.5	48	22.5	213	100		
Impulsive	166	87.4	24	12.6	190	100		
Apathetic	152	74.9	51	25.1	203	100		
Total	483	79.7	123	20.3	606	100	10.483	0.005

Source: Computed data

Table 30 : Association between personality traits clusters and age

Personality Cluster	Age group (years)												Total		Chi-Square value	P value
	Up to 20		21-30		31-40		41-50		51-60		Above 60					
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%		
Enthusiastic	9	4.2	78	36.6	4.4	20.7	36	16.9	32	15	14	6.6	213	100		
Impulsive	3	1.6	54	28.4	34	17.9	33	17.4	36	18.9	30	15.8	190	100		
Apathetic	8	3.9	83	40.9	51	25.1	32	15.8	15	7.4	14	6.9	203	100		
Total	**20**	**3.3**	**215**	**35.5**	**129**	**21.3**	**101**	**16.7**	**83**	**13.7**	**58**	**9.6**	**606**	**100**	**30.751**	**0.001**

Source: Computed data

Table 31 : Association between personality traits clusters and education

Personality cluster	Education										Total		Chi Sq. Value	P Value
	School		U.G		P.G		Professional		Technical					
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%		
Enthusiastic	11	5.2	76	35.7	84	39.4	32	15.0	10	4.7	213	100		
Impulsive	2	1.1	56	29.5	72	37.9	43	22.6	17	8.9	190	100		
Apathetic	6	3.0	80	39.4	79	38.9	29	14.3	9	4.4	203	100		
Total	**19**	**3.1**	**212**	**35.0**	**235**	**38.8**	**104**	**17.2**	**36**	**5.9**	**606**	**100**	**19.021**	**0.040**

Source: Computed data

Table 32 : Association between personality traits clusters and marital status

Personality cluster	Marital status				Total		Chi Square Value	P value
	Married		Unmarried					
	Freq	%	Freq	%	Freq	%		
Enthusiastic	139	65.3	74	34.7	213	100	6.340	0.042
Impulsive	140	73.7	50	26.3	190	100		
Apathetic	126	62.1	77	37.9	203	100		
Total	**405**	**66.8**	**201**	**33.2**	**606**	**100**		

Source: Computed data

Table 33 : Association between personality trait clusters and annual income

Personality cluster	Annual Income										Total		Chi Sq. value	P Value
	No income		Upto 1 lakh		100001-300000		300001-500000		500001 and above					
	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%	Fre	%		
Enthusiastic	15	7.0	46	27.6	77	36.2	46	21.6	29	13.6	213	100	51.415	0.000
Impulsive	7	3.7	23	12.1	55	28.1	47	24.7	58	30.5	190	100		
Apathetic	4	2.0	34	16.7	94	46.3	54	26.6	17	8.4	203	100		
Total	**26**	**43**	**103**	**17.0**	**226**	**37.3**	**147**	**24.3**	**104**	**17.2**	**606**	**100**		

Source: Computed data