



Influence of Demographic Variables on the Personality Traits of Retail Investors – An Empirical Study

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Abstract

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. The study confirms that males are more active in the financial market but have the tendency to ride the momentum with increase in their portfolio value. Factor analysis by principal component method has been applied to reduce the number of personality traits into ten meaningful factors respectively. The multiple regression analysis is brought to bear on the problem of establishing the collective influence of socio-demographic variables, financial knowledge, investment objectives, appraisal techniques and strategies, portfolio composition pattern on the personality traits. Results reveal that annual rate of return on equity significantly determines the occurrence of self enhancement bias, illusion of control and performance attribution bias. Time spent for investment analysis influences self enhancement bias and illusion of control. Shares held for speculation in the portfolio of retail investors the occurrence of self enhancement bias. Number of shares traded by the investor determines cognitive dissonance and performance attribution bias of the investors. Investment experience influences illusion of control and performance attribution bias.

Keywords: financial Knowledge, personality traits, performance attribution bias, illusion of control, 'wait and watch' strategy.

I. Introduction

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 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)



II. Review of Literature

Research studies amply demonstrate that though there is substantial heterogeneity in individual financial portfolios, many individuals do not hold stocks in their portfolio (Campbell, 2006; Haliassos and Bertaut, 1995) which is aptly described as non-participation puzzle (Mankiw and Zeldes, 1991). Typical Indian investor portfolio constitutes Bank Fixed Deposit, risk-free government securities, tax-favoured assets, low-yielding instruments and non-financial asset (e.g. gold) but do not participate in stock markets (RBI report, 2010). Literature evidences that individuals shy away from markets due to lack of awareness of bundle of assets such as stocks and mutual funds, information barriers (Guiso and Jappelli, 2005), transaction and information costs (Vissing-Jorgensen, 2004)

Economic psychology literature identified that household savings are driven for four reasons, namely: Cash management, Precautionary motive (Saving for unexpected expenditure), Down payment motive and wealth management. Katona (1975) found in 1960 that the US individual investors saved towards buffer (sudden expenditures or emergencies), retirement savings, for children and to buy durable goods, house etc. Interestingly, few respondents replied that they saved to earn additional income or leave inheritance. Kotlikoff (1989) found that household savings in US are driven by precautionary motive especially for old age.

Xiao and Noring (1994) observed that families with little resources save primarily for survival but if resources increase, motivation to save for emergencies also increase. At highest level of income, motivation concerning retirement, children and improvement in standard of living gain importance. Warneryd (1995, 1999) reported similar motives and stated that people save for

different reasons at the same time. According to him, at first level, saving is habitual without specific goal, second level is precautionary (towards future uncertainty), the third motive is bequest motive (accumulating wealth for family and inheritance), the fourth level being profit motive, to get additional income from investment in the future. Likewise Canova, Rattazzi and Webley (2005) analysed the goals that motivated Britons to save and framed a hierarchical structure of 15 goals. Buffer for unexpected expenditure, house/vacation were the concrete goals at the bottom of the hierarchy and psychological goals such as self-gratification and self-esteem at higher levels. They also evidenced that savings motives do not entirely depend on socio-economic variables.

While devising investment decisions, securities are evaluated relative to the goals defined by aspiration levels and probability of success. There are separate mental accounts created by the investors and associated aspiration level corresponding to their different goals (Das et al. 2010). Investment goals considered for investment decision making are capital growth, retirement saving, hobby or speculation (Lewellen, Lease and Schlarbaum, 1980). In several studies investor behaviour had been conceptualised as goal-oriented behaviour. It means that investors carry out investment decisions to attain certain goals. Goals are broadly defined as mental representation of desired states (Austin and Vancouver, 1996). The goals of investment have sequence of priority and an order of preference which dominates the behaviour of the investor.

Lease et al. (1974) investigated the oft pursued investment strategies of individual investors in US household survey and found that 42% of the sample respondents followed fundamental approach in evaluating securities for



investment decisions. Further, 23% of the investors effectively combined fundamental and technical approaches and only 4% adopted technical approach for investment decisions. In the study, the investment portfolio of individual investors consist of 41% primarily income securities and 59% primarily capital appreciation securities. In addition, long term capital appreciation is the paramount investment concern, with dividend income and intermediate term gains claiming secondary importance and short term gains the least.

A large empirical literature in finance documents the lack of portfolio diversification by investors. Particularly, literature on household asset allocation decisions, retirement saving decisions of individuals, establish that they tend to under-diversify, under diversify their portfolios or do not hold stocks in their portfolios. It is rather difficult to find whether they conform to rational models of investor behaviour. The substantive literature in finance which document the portfolio choices of individual investors suggest that they hold under-diversified equity portfolios (Lease, Lewellen and Schlarbaum (1974); Blume and Friend (1975); Kelly (1995), Barber and Odean (2000); Goetzman and Kumar (2005); Polkovnichenko (2005)); under-diversified household portfolios in various countries (Guiso, Halioussos and Japelli (2002)), under-diversified retirement and pension accounts (Benartzi (2001), Bernatzi and Thaler (2001), Agnew, Balduzzi and Sunden (2003), Huberman and Sengmueller (2004))

Blume and friend (1975) utilised the tax-filing and survey data to find that household portfolios are grossly under-diversified. Similarly, Kelly (1995) used the data (1993) from survey of consumer Finances to document poor diversification in the U.S households. He found that number median stocks in an investors' portfolio is two and that less than one-third of the

households hold more than ten stocks. Benartzi and Thaler (2001, 2007) studied the defined-contribution saving plans of individuals and found naive diversification strategy of 1/n heuristics in which an individual spreads his contribution evenly among the various assets. Though such strategies seem reasonably good for some investors they lack suitability for all investors due to the difference in age and risk preferences (Brennen and Tourois, 1999). Naive diversification strategy serves as an excellent benchmark for investment portfolio but investors perform poorly due to the errors in estimating mean and co-variances between stocks (De Miguel et al. 2007). Further investors build separate mental compartments for the employer stocks, local stocks, and reputed stocks but perceive risks separately rather than the portfolio risk in totality.

III. 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.

IV. 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?

V. Need for the Study and Scope of 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.

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

VI. Objectives of the Study

To measure the collective influence of demographic variables, financial Knowledge, investment objectives, appraisal techniques and strategies, portfolio composition pattern on the personality traits

VII. Limitations of the Study

The study design comes with a number of limitations. Firstly, the study is not able to gain access to individual investor's actual trading records as such information is considered

commercially sensitive. Moreover, the broking firms are not allowed by the regulatory authorities to divulge these records. As a consequence the researchers were not able to reaffirm the accuracy of information provided by the respondents regarding their investment portfolio, preferences and behaviour by scrutinising their actual share trading decisions.

The study's overall sample size is constrained by limited resource in terms of time and associated cost to carry our elaborate empirical research. The various findings in the study will be more credible and better reflect the retail investor population in India if only the researchers are able to obtain access and subsequently to draw the main investor sample from entire nation through network of branches of various brokerage firms.

The study has been conducted based on the responses of retail investors of share market in Chennai City. Since investor operate in a dynamic and multi period setting, the inferences and findings of the analysis may differ substantially depending upon the time sequence, place, the nature and group of investors. Although the researchers detected the behaviour of retail investors during the bull phase of the stock market viz., 2006-2007, elaborate attempts were made to investigate their behaviour in the post financial crisis period. The stock market was and is undergoing a bear phase with low enthusiasm of investors since then.

VIII. 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.



VIII (A). Study Area and Period

The study has been 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.

VIII (B). Questionnaire Design

The questionnaire contained one page covering letter signed by the researchers 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 researchers were found to significantly increase response rates (Hornik, 1981; Brown and Coverly, 1999). Unlike earlier studies, ample time was given to the respondents in our data collection, but with a gentle reminder and frequent follow-up. The questionnaire consisted of 49 questions split into the following parts:

- Part I Elicits the demographic profile of the respondents
- Part II Deals with their financial knowledge and awareness
- Part III Seeks details on their investment objectives, appraisal techniques and strategy
- Part IV Consists questions regarding the portfolio composition and trading performance
- Part V Contains statements relating to psychological biases
- Part VI Contains statements which reflect the personality traits

On gaining a deep insight from different strands of literature in behavioural finance, the researchers drafted the questionnaire for the main study. The questionnaire comprised three different kinds of questions in the form of bipolar type (Yes or No), Multiple choice and Likert’s five-point scale type, in order to sustain the interest of the respondents and avert monotony. The questionnaire is divided into six parts, each containing a mix of these questions and a summary of measurement parameters for the study is shown in the table 1 (Appendix)

VIII (C). Selection of Respondents

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 Institute for Financial Management and Research, Nungambakkam also responded to the primary survey questionnaire.



VIII (D). Sample Size

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 researchers 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 researchers profoundly concludes that the sample size of 606 is adequate to conduct the research.

VIII (E). 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 researchers 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 researchers

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 researchers 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.

The pilot study was conducted by distributing 150 questionnaires to retail investors of various broking firms in Chennai city but only 100 responses were suitable to be taken up for testing the internal consistency and reliability of the constructs. Cronbach alpha test was used to determine the degree of consistency among the multiple measurements of each factor. It measures the inter-item reliability of a scale generated from a number of items.

Ideally, the reliability coefficient above 0.5 is considered acceptable as a good indicator of construct reliability (Nunnally, 1976), above 0.6 is treated satisfactory (Robinson et.al., 1991), but alpha above 0.7 is considered sufficient (George and Mallery, 2001; Pallant, 2005). The questionnaire responses exhibited Cronbach-Alpha value of 0.806 for items relating to psychological biases and 0.703 for items relating to personality



traits. These alpha values are statistically significant to ensure a smooth normal distribution and to justify the sample statistics for the representation of population parameters. Further, during the pilot study, the respondents expressed difficulty to comprehend certain questions and give responses. Such issues were redressed to make the questionnaire fully refined for the main study.

VIII (F). 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. Factor analysis by principal component method has been applied to reduce the number of personality traits into ten meaningful factors respectively
2. The multiple regression analysis is brought to bear on the problem of establishing the collective influence of socio-demographic variables, financial knowledge, investment objectives, appraisal techniques and strategies, portfolio composition pattern on the personality traits

IX. 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 researchers. Therefore, the researchers 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.

X. Multiple Regression Analysis

Multiple regression analysis is used to predict the variance between the dependent variable and independent variables (Coolican, 2004; Pallant, 2007). Multiple regression permits for multiple predictions in which the influence of each predictor variable is directly proportional to the correlation that exists between the variable and the criterion, and inversely proportional to other predictors (Urbina, 2004). Thus multiple regression analysis explores the interrelationship among variables and the contribution of each predictor to explain the variance in the dependent variable (Pallant, 2007; Urbina, 2004). This method is used to determine how much variance in psychological biases can be explained by personality.

The application of Multiple Regression Analysis is to determine the independent variables influencing the personality traits of an investor. After reviewing national and international literature, the researchers deduced the following independent variables profoundly in the research. These independent variables are segmented into four domains viz. demographic profile, financial knowledge and awareness, investor objectives, appraisal techniques and strategy, portfolio composition and trading performance. Each of these domains possess the following categorical variables such as gender, age, education, discipline, marital status, sources of information, number of trades, investment experience, stock holding period, annual rate of return etc. The dependent variables of personality traits viz. self

consciousness, pragmatism, diligence, risk aversion, aesthetic, altruism and gregariousness are considered to perform multiple regression analysis.

In this analysis, the researchers observed collective impact of independent variables as well as individual influence. While estimating the influence of independent variables on dependent factors, sequential changes are observed for the status of independent variables. In terms of parametric approach, the researchers obtained the factors of personality traits and psychological biases. As far as time t is concerned, the personality traits are acquired first by the investors and then the psychological biases emerge out of set of influencing variables such as demographic profile financial knowledge and awareness, investor objectives, appraisal techniques and strategy, portfolio composition and trading performance and personality traits. Sequence of time plays an important role to test the status of independency and dependency of the variables. A careful examination with respect to time t indicates the existence of domain of regression analysis.

✓ Regression analysis is based on demographic variables, financial knowledge and awareness, investor objectives, appraisal techniques and strategy, portfolio composition and trading performance and personality traits. In this case personality traits are considered as dependent factors.

Influence of Demographic Variables, Financial Knowledge and Awareness, Investor Objectives, Appraisal Techniques and Strategy, Portfolio Composition and Trading Performance on Personality Traits

The regression output consists of three tables viz. model summary to express the amount of variation created by the independent variables followed by analysis of variance to verify the



regression fit and coefficient table to determine the individual influence of independent variables. The results of these two time-wise regression analysis and their results are discussed below.

From Table 10 (Appendix), it is found that R^2 value is 0.250, adjusted R^2 value is 0.184. This shows that the variance ranges from 18.4% to 25%. That is these independent variables are able to create variances on the personality trait self-consciousness. This leads to the subsequent verification of regression model fit in the following ANOVA table.

From Table 11 (Appendix), it is found that the regression fit coefficient $F=3.776$, $p=.000$ are statistically significant at 5% level. Therefore, it can be concluded that the independent variables considered for the regression model are more appropriate to demonstrate the regression model. The following correlation table clearly explains the individual influence of significant variables from the domain of independent variables.

From Table 12 (Appendix), it is found that most of the investors belonging to different age groups ($t= -2.909$, $p= .004$) who rely on financial newspapers ($t= -2.968$, $p= .003$), seek advice from friends ($t= -2.576$, $p= .010$) and spent time to analyse investment decisions ($t= -2.347$, $p= .019$) possess low self-consciousness while a few investors belonging to different age groups who rely on financial newspapers, seek advice from friends and spent time to analyse investment decisions possess high self-consciousness. The mean-wise comparison indicates that most of the investors falling in the three age groups 41-50 years (Mean=3.0033), 51-60 years (Mean= 2.6827), above 60 years (Mean=2.6437) and those who spend 6-10 hours per month (mean=2.9274), 11-20 hours per month (mean=2.9952), 21-30 hours per month (mean=2.8542) for investment analysis possess low self-consciousness while investors

belonging to the age groups up to 20 years (mean=3.4667), 21-30 years (mean=3.2109) and 31-40 years (mean=3.2067) and those who spend less than 3 hours per month for investment analysis (mean=3.1888), 3-5 hours per month (mean=3.1741) exhibit moderate self-consciousness. Notably, investors who possess moderate financial knowledge ($t=2.428$, $p=.015$) and awareness ($t=2.349$, $p=.019$) about the financial websites, those who purchase low-priced scrips ($t=2.659$, $p=.008$) and hold stock from 1 day to week ($t= 2.465$, $p=.014$) appear to be self-conscious investor.

From Table 13 (Appendix), it is found that R^2 value is 0.109, adjusted R^2 value is 0.030. This shows that the variance ranges from 3% to 10.9%. That is these independent variables are able to create variances on pragmatism. This leads to the subsequent verification of regression model fit in the following ANOVA table.

From Table 14 (Appendix), it is found that the regression fit coefficient $F=1.383$, $p=.048$ are statistically significant at 5% level. Therefore, it can be concluded that the independent variables considered for the regression model are more appropriate to demonstrate the regression model. The following correlation table clearly explains the individual influence of significant variables from the domain of independent variables.

From Table 15 (Appendix), it can be concluded that investors of either marital status ($t=2.061$, $p=.040$), financially knowledgeable ($t=2.778$, $p=.006$) and those who gather information through tips and rumours ($t=2.030$, $p=.043$) are pragmatic. The mean-wise comparison indicates that married investors (mean=3.3574) and unmarried investors (mean=3.2861) are moderately pragmatic. In addition, most investors who do not follow any specific technique for financial decision making but listen to advices from



friends and family ($t = -3.239$, $p = .001$) are less pragmatic while only a few investors who do so are more pragmatic.

From Table 16 (Appendix), it is found that R^2 value is 0.099, adjusted R^2 value is 0.020. This shows that the variance ranges from 2% to 9.9%. But these independent variables are able to create variances on Diligence. This leads to the subsequent verification of regression model fit in the following ANOVA table.

From Table 17 (Appendix), it is found that the regression fit coefficient $F = 1.249$, $p = .126$ is not statistically significant at 5% level. The regression model fit is not significant but individual influence of independent variables can be ascertained from the coefficient table. The following correlation table clearly explains the individual influence of significant variables from the domain of independent variables

From Table 18 (Appendix), it can be concluded that most investors belonging to either of the gender ($t = -2.137$, $p = .033$) and who hold stock on average for less than a day ($t = -2.259$, $p = .024$) exhibit low diligence while only a few investors either male or female holding stock for less than a day exhibit high diligence. Further investors who specialize in any academic discipline ($t = 2.108$, $p = .035$) and those who earn an annual rate of return above 10% are moderately diligent. The mean-wise comparison indicates that male investors (mean=3.444) or female investors (mean=3.4309) and those who are school educated (mean=3.1404), undergraduate (mean=3.3648), post graduate (mean=3.3657) and technically qualified (mean = 3.3611) are all moderately diligent.

From Table 19 (Appendix), it is found that R^2 value is 0.124, adjusted R^2 value is 0.047. This shows that the variance ranges from 4.7% to 12.4%. That is these independent variables are

able to create variances on the personality trait aesthetic. This leads to the subsequent verification of regression model fit in the following ANOVA table.

From Table 20 (Appendix), it is found that the regression fit coefficient $F = 1.611$, $p = .007$ are statistically significant at 5% level. Therefore, it can be concluded that the independent variables considered for the regression model are more appropriate to demonstrate the regression model. The following correlation table clearly explains the individual influence of significant variables from the domain of independent variables.

From Table 21 (Appendix), it can be concluded that either of the gender ($t = 1.963$, $p = .050$) whereupon the mean-wise comparison indicates that male (mean=2.919), female (mean=3.0730) are moderately aesthetic. Further, most of the investors who hold stock on average for more than 6 months to 1 year ($t = -3.149$, $p = .002$) or more than 2 years ($t = -3.471$, $p = .001$) are low aesthetic. While few investors who hold stock on average for 6 months to 1 year or more than 2 years are high aesthetic.

From Table 22 (Appendix), it is found that R^2 value is 0.204, adjusted R^2 value is 0.134. This shows that the variance ranges from 13.4% to 20.4%. That is these independent variables are able to create variances on risk-aversion. This leads to the subsequent verification of regression model fit in the following ANOVA table.

From Table 23 (Appendix), it is found that the regression fit coefficient $F = 2.913$, $p = .000$ are statistically significant at 5% level. Therefore, it can be concluded that the independent variables considered for the regression model are more appropriate to demonstrate the regression model. The following correlation table clearly explains the individual influence of significant variables from the domain of independent variables.



From Table 24 (Appendix), it can be concluded that most of the investors who are educated ($t=-2.043$, $p=.042$), financially knowledgeable ($t=-2.497$, $p=.013$); with certain income ($t=-2.2774$, $p=.006$), who rely on statistics and other information services ($t=-4.071$, $p=.000$) and financial journals ($t=-1.962$, $p=.050$) and hold stock on average for less than a day ($t=-3.694$, $p=.000$) are less risk-averse. Whereas a few investors who are educated, financially knowledgeable, with income, relying on statistics and information services and financial journals, hold stock on average for less than a day are more risk averse. Additionally, investors whose investment objective is building financial buffer ($t=2.032$, $p=.043$), those who are financially knowledgeable ($t=3.500$, $p=.001$) and are financially aware ($t=2.852$, $p=.005$) exhibit risk-aversion.

The mean-wise comparison indicates that investors who are post graduates (mean=3.0014), professionally qualified (mean=2.9806), technically qualified (mean=2.9259) are less risk averse. While investors who are school educated (mean=3.3158) and undergraduate (mean=3.1242) are moderately risk averse. Investors who do not have income viz. students (mean=2.7051) and investors with income above 5 lakhs (mean=2.6410) are less risk-averse. While investors with income up to 1 lakh (mean=3.2524), 1 lakh-3 lakhs (mean=3.1519) above 3lakhs up to 5 lakhs (mean=3.0726) are all moderately risk averse.

From Table 25 (Appendix), it is found that R^2 value is 0.096, adjusted R^2 value is 0.016. This shows that the variance ranges from 1.6% to 9.6%. But these independent variables are able to create variances on Altruism. This leads to the subsequent verification of regression model fit in the following ANOVA table.

From Table 26 (Appendix), it is found that the regression fit coefficient $F=1.203$, $p=.169$ is not statistically significant at 5% level. The regression model fit is not significant but individual influence of independent variables can be ascertained from the coefficient table. The following correlation table clearly explains the individual influence of significant variables from the domain of independent variables.

From Table 27 (Appendix), it is found that most investors either gender ($t=-2.050$, $p=.041$) male or female relying on financial newspapers ($t=-2.003$, $p=.046$) and holding stock on an average more than 2 years ($t=-2.571$, and $p=.010$) exhibit low altruism. While few investors either male or female, relying on financial newspapers and holding stock on average for more than 2 years exhibit high altruism. In addition, investors who are financially knowledgeable regarding inflation ($t=2.677$, $p=.008$); and who performed specified number of trades per month ($t=1.984$, $p=.048$) are altruistic. The mean-wise comparison indicates that both females (mean=3.3198) and males (mean=3.1573) are moderately altruistic. Further those who do not perform any trade per month and those who perform minimum number of 1-15 trades per month appear moderately altruistic.

From Table 28 (Appendix), it is found that R^2 value is 0.126, adjusted R^2 value is 0.049. This shows that the variance ranges from 4.9% to 12.6%. That is these independent variables are able to create variances on the gregariousness. This leads to the subsequent verification of regression model fit in the following ANOVA table.

From Table 29 (Appendix), it is found that the regression fit coefficient $F=1.642$, $p=.005$ are statistically significant at 5% level. Therefore, it can be concluded that the independent variables considered for the regression model are more



appropriate to demonstrate the regression model. The following correlation table clearly explains the individual influence of significant variables from the domain of independent variables.

From Table 30 (Appendix) it is observed that most investors who do not follow any specific approach but listen to family and friends ($t=-2.298$, $p=.022$) and hold stock for more than 2 years ($t=-2.032$, $p=.043$) appear less gregarious while few investors who do not follow any specific approach but listen to family and friends and hold stock on average for more than 2 years appear more gregarious. Further, investors who rely on statistics and information services ($t=2.751$, $p=.006$) appear gregarious.

XI. Findings and Suggestions

Annual rate of return on equity significantly determines the occurrence of self enhancement bias, illusion of control and performance attribution bias. Time spent for investment analysis influences self enhancement bias and illusion of control. Shares held for speculation in the portfolio of retail investors the occurrence of self enhancement bias. Number of shares traded by the investor determines cognitive dissonance and performance attribution bias of the investors. Investment experience influences illusion of control and performance attribution bias.

Among the personality traits, diligent investors exhibit maximum seven psychological biases viz. self-enhancement bias, ambiguity aversion, illusion of control, extrapolation bias, performance attribution bias, information overload bias and socio conformity bias.

XII. Conclusion

The result of the present study provides a unique contribution to the literature by examining an array of psychological biases and personality traits. In addition to the existing literature on psychological biases, that causes error in judgement and decision making, various

dimensions of retail investors such as demographic profile, financial knowledge and awareness, investor objective, technique and strategy, portfolio composition and trading performance and personality traits impact their investment decision which is the prime focus of this study.

Another important contribution of this thesis is that it uses an interdisciplinary research approach. More specifically, this thesis combined theoretical insights from the behavioural economics, behavioural finance, social psychology, personality psychology and anthropology literature. Moreover, the methodology used in this thesis is a combination of such literature. Survey approach to conduct a research instead of actual portfolio data contributes better understanding of the financial behaviour of individual investors, the motivation underlying their belief, preferences, attitudes and behaviour in smaller and less developed markets. By using the data from primary survey of retail investors in Chennai city, the researchers contributes towards bridging this gap.

The study confirms that males are more active in the financial market but have the tendency to ride the momentum with increase in their portfolio value. Further the sampled investors are not active, motivated to attend and benefit from financial education programmes conducted by SEBI, NSE, BSE and various broking firms. But surprisingly they make use of the internet technology to become informed investors. Chennai retail investors are heterogeneous investor group and most of the investors hold a small and moderately diversified portfolio. They are inclined towards capital growth with long term perspective. Simultaneously, they are also drawn towards rumour-driven speculative share trading and approach investment with a gambling mind set. Further investors in the past have relied more upon strong economic fundamentals to make investment decision whereas the researchers have



identified from this study that majority of the investors do not rely on a single technique rather they combine fundamental, technical and market sentiments in varying degree of importance for selecting stocks. The level of importance depends their investment objectives, investment horizon, investment level, level of sophistication in terms of education etc. The researchers also found that a sizable proportion of the sample respondents do not follow any specific approach or strategy in the financial market.

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.

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Appendix

Table 1: Summary of Sources of Key Measurement Scale

Measure	Author	No. of items	Scale range	Scale type
Stock knowledge	Lusardi (2008)	1	Nil	Bipolar
SENSEX	Daniel Tobias Dorn (2003)	1	Nil	Bipolar
Inflation	Grable and Joo (2004)	1	Nil	Bipolar
Financial concepts	Ken Yeoh (2010)	4	0-3	Likert type
Investor objectives	Hoffman, Arvid O.I. et. al., (2010)	5	Nil	Multiple choice
Capital growth	Lease et. al., (1974)	4	1-4	Likert type
Reasons to trade	Barber and Odean (1999)	6	1-5	Likert type
Portfolio classification	Lease et. al., (1974)	3	Nil	Unique choice
Investment appraisal technique	Ken Yeoh (2010)	4	Nil	Multiple choice
Frequency of use of appraisal technique	Abdul Quader et. al., (2007)	3	1-5	Likert type
Usefulness of appraisal technique	Abdul Quader et. al., (2007)	3	1-5	Likert type
Investment satisfaction	X. L. Wang et. al., (2006)	4	Nil	Unique choice
Reinvestment intention	X. L. Wang et. al., (2006)	4	Nil	Unique choice
Personality traits	Mayfield Cliff et. al., (2008)	25	1-5	Likert type
Risk attitude	Richard Thaler (1999)	3	Nil	Unique choice
Psychological bias	Kent Baker and Nofsinger (2002)		1-5	Likert type
	Dorn and Huberman (2005)		1-5	Likert type
	Wood and Zaichkowsky (2004)		1-5	Likert type
	Heath and Tversky (1991)		1-5	Likert type
	Langer E.J. (1975)		1-5	Likert type
	Graham et. al., (2009)		1-5	Likert type
	Shefrin and Statman (1985)		1-5	Likert type

Source: Self-Compiled



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



Dependent Variable: Self- Consciousness

Table 10: Model Summary

Model	R	R square	Adjusted R square	Standard error of the estimate
I	.500	.250	.184	.78790

Source: Computed data

Table 11: ANOVA

Model	Sum of squares	df	Mean square	F	Sig.
Regression	114.863	49	2.334	3.776	.000
Residual	345.154	556	.621		
Total	460.017	605			

Source: Computed data

Table 12: Coefficient Table

Model I	Unstandardised Coefficient		Standardised coefficient	T	Sig.
	B	Standard	Beta error	B	Standard error
Constant	3.974	.282		14.106	.000
Age	-.103	.035	-.166	-2.909	.004
Financial Knowledge	.244	.100	.094	2.428	.015
Financial Awareness	.178	.076	.099	2.349	.019
Financial news papers	-.106	.306	-.120	-2.968	.003
Tips & Rumour	.106	.031	.133	3.359	.001
Advice from friends	-.032	.012	-.108	-2.576	.010
Prefer low priced scrip	.067	.025	.129	2.659	.008
Time spent on analysis	-.062	.026	-.103	-2.347	.019
Stock holding period	.121	.049	.099	2.465	.014

Source: Computed data



Dependent Variable: Pragmatism

Table 13: Model summary

Model	R	R square	Adjusted R square	Standard error of the estimate
I	.330	.109	.030	.59498

Source: Computed data

Table 14: ANOVA

Model	Sum of squares	df	Mean square	F	Sig.
Regression	29.085	49	.594	1.249	.126
Residual	264.197	556	.475		
Total	293.282	605			

Source: Computed data

Table 15: Coefficient Table

Model I	Unstandardised Coefficient		Standardised coefficient	T	Sig.
	B	Standard	Beta error	B	Standard error
Constant	3.202	.213		15.502	.000
Marital status	.141	.068	.110	2.061	.040
Financial knowledge	.210	.076	.117	2.778	.006
Tips & Rumours	.048	.024	.088	2.030	.043
Advice-Friends & Family	-.161	.050	-.154	-3.239	.001

Source: Computed data

Dependent Variable: Diligence

Table 16: Model Summary

Model	R	R square	Adjusted R square	Standard error of the estimate
I	.315	.099	.020	.68933

Source: Computed data

Table 17: ANOVA

Model	Sum of squares	df	Mean square	F	Sig.
Regression	29.085	49		1.249	.126
Residual	264.197	556	.594		
Total	293.282	605	.475		

Source: Computed data



Table 18: Coefficient Table

Model I	Unstandardised Coefficient		Standardised coefficient	T	Sig.
	B	Standard	Beta error	B	Standard error
Constant	3.300	.246		13.389	.000
Gender	-.161	.075	-.093	-2.137	.033
Discipline	.027	.013	.090	2.108	.035
Average stock holding period	-.231	.102	-.104	-2.259	.024
Annual rate of return	.050	.024	.104	2.109	.035

Source: Computed data

Dependent Variable: Aesthetic

Table 19: Model Summary

Model	R	R square	Adjusted R square	Standard error of the estimate
I	.353	.124	.047	.66849

Source: Computed data

Table 20: ANOVA

Model	Sum of squares	df	Mean square	F	Sig
Regression	35.285	49	.720	1.611	.007
Residual	248.467	556	.447		
Total	283.752	605			

Source: Computed data

Table 21: CoefficientTable

Model I	Unstandardised Coefficient		Standardised coefficient	T	Sig.
	B	Standard	Beta error	B	Standard error
Constant	3.099	.239		12.964	.000
Gender	.143	.073	.084	1.963	.050
Average stock holding period(6)	-.039	.012	-.125	-3.149	.002
Average stock holding period(8)	-.038	.011	-.163	-3.471	.001

Source: Computed data



Dependent Variable: Risk-aversion

Table 22: Model Summary

Model	R	R square	Adjusted R square	Standard error of the estimate
I	.452 (a)	204	.134	.82286

Source: Computed data

Table 23: ANOVA

Model	Sum of squares	df	Mean square	F	Sig.
Regression	96.637	49	1.972	2.913	.000(a)
Residual	376.470	556	.677		
Total	473.107	605			

Source: Computed data

Table 24: Coefficient Table

Model I	Unstandardised Coefficient		Standardised coefficient	T	Sig.
	B	Standard	Beta error	B	Standard error
Constant	4.079	.294		13.864	.000
Education	-.077	.038	-.084	-2.043	.042
Income	-.101	.036	-.123	-2.774	.006
Financial knowledge (10)	-.275	.110	-.104	-2.497	.013
Financial knowledge(12)	.358	.102	.143	3.500	.001
Financial awareness	.220	.077	.121	2.852	.005
Building financial buffer	.045	.022	.087	2.032	.043
Stats &Infrmn. Services (4)	-0.88	.022	-.167	-4.071	.000
Financial journals	-.028	.014	-.086	-1.962	.050
Average stock holding pd(1)	-.451	.122	-.160	-3.694	.000

Source: Computed data



Dependent Variable: Altruism

Table 25: Model Summary

Model	R	R square	Adjusted R square	Standard error of the estimate
I	.310	.096	.016	.69593

Source: Computed data

Table 26: ANOVA

Model	Sum of squares	df	Mean square	F	Sig.
Regression	28.544	49	.583	1.203	.169 (a)
Residual	269.284	556	.484		
Total	297.828	605			

Source: Computed data

Table 27: Coefficient Table

Model I	Unstandardised Coefficient		Standardised coefficient	T	Sig.
	B	Standard error	Beta	B	Standard error
Constant	3.059	.249		12.293	.000
Gender	-.155	.706	-.089	-2.050	.041
Financial knowledge	.231	.086	.117	2.677	.008
Financial news papers	-.063	.032	-.089	-2.003	.046
Trades per month	.038	.019	.099	1.984	.048
Avg. stock holding pd (8)	-.030	.012	-.122	-2.571	.010

Source: Computed data



Dependent Variable: Gregariousness

Table 28: Model Summary

Model	R	R square	Adjusted R square	Standard error of the estimate
I	.356 (a)	.126	.049	.77128

Source: Computed data

Table 29: ANOVA

Model	Sum of squares	df	Mean square	F	Sig
Regression	47.859	49	.977	1.642	.005 (a)
Residual	330.748	556	.595		
Total	378.607	605			

Source: Computed data

Table 30: Coefficient Table

Model I	Unstandardised Coefficient		Standardised coefficient	T	Sig.
	B	Standard error	Beta	B	Standard error
Constant	3.670	.276		13.307	13.307
Stats & Information services	.056	.020	.118	2.751	2.751
Advice friends & family	-.148	.064	-.108	-2.298	-2.298
Avg. Stock holding pd (8)	-.026	.013	-.095	-2.032	-2.032

Source: Computed data