DEMOGRAPHIC AND SOCIOECONOMIC IMPACT ON RISK ATTITUDES OF THE INDIAN INVESTORS – AN EMPIRICAL STUDY

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ABSTRACT

Investor behavior and investment activities are strongly influenced by the risk tolerance level of individual investors. International evidence suggests that lower risk tolerant investors are generally risk averse. However, their demographic characteristics and socioeconomic factors drive their risk attitudes. This study aims at investigating the critical role that age, gender, marital/social status, number of dependents, educational qualifications, employment and income status, savings pattern, future monetary planning, investments amount and returns from investments play in influencing risk tolerance and thereby finding whether the individual investors are risk averse or risk prone. To fulfill these objective 12 questions representing hypotheses were asked to 200 individual investors investing regularly in the Indian stock markets. A risk tolerance points scale is prepared to analyze the risk attitudes overall and each factor wise, and a Binary Logit Model is applied to validate these results. On an overall basis, this study finds that the responded investors have a lower risk tolerance level which makes them highly risk averse. In line with the hypotheses drawn, this study proves that aged investors are more risk averse than their younger, inexperienced counterparts; married investors with children and other dependents are more risk averse than their unmarried and with less dependents counterparts; higher education brings risk tolerance attitude and thereby makes investors risk prone; higher income and savings also decrease risk aversion whereas future planning approach increases risk aversion. It is also found under this study that higher investments amount and returns from such investments increase the risk tolerance level and thus reduces risk aversion of these investors. However, contradictorily with the undertaken hypotheses, this study finds that women investors are more risk prone than their male counterparts, and employment status of the respondents is immaterial in regard to their risk attitude. Binary Logit Model results also mostly validate the above results except that it finds no impact of number

of dependents, educational qualifications, employment status, FMP and investments amount on the risk tolerance levels of the respondent Indian investors.

Contribution/ Originality

This study is one of very few studies which have investigated investors' prominent demographic characteristics like gender, age, marital/social status, employment status, income status and educational qualifications to find out their respective role in influencing Indian investors' risk tolerance levels and thereby their risk attitudes.

1. INTRODUCTION

Investment in stock markets is a risky proposition for the retail investors. So, their investment horizons, patterns and amounts are dependent on their respective financial risk tolerance (FRT) levels which determine their risk-attitudes. Braşoveanu *et al.* (2008) also suggest that in Asian countries, the risk aversion is higher than in the European countries, which in turn are having a higher risk aversion than the US market. Thus, understanding of the FRT behavior within the context of developing countries like India is vital for policy making and implementation towards the development of financial markets. Understanding of their risk aversion offers another perspective for constructing and optimizing risky financial portfolios for the investors. Also, it is imperative for the financial planners/investment consultants, researchers and most importantly the investors to know about their risk tolerance levels before investing in an uncertain asset like stocks. The demographics and socioeconomic factors associated with the investors also play a critical role in molding their risk approach. This study specifically aims at investigating how the above factors impact on the FRT of Indian retail investors and thereby risk-attitudes of them.

The last few decades have seen an increase in this kind of research which is focused on the use of various demographic and socioeconomic characteristics to predict investors' risk tolerance. But, the results of these researches have not been uniform with respect to the identification of relevant demographic factors or the strength and direction of the identified relationships. International studies have also employed both subjective and objective measures of risk tolerance to investigate the relationship between various demographic factors such as age, race, gender, marital status, religion and income/wealth that potentially affect an individual's desire or appetite for risk. The literature reviewed often shows conflicting results with some studies finding positive relationships between the level of risk tolerance and a variable, whilst others find a negative or insignificant relationship for that specific variable.

As a concept, risk-taking can be defined as – "any action having at least one uncertain outcome" (Fischhoff, 1992). So, due to this uncertainty element, a key consideration in such a risk-

taking attitude is the FRT level. Here risk means – "the possibility of incurring misfortune or loss" while tolerance implies – "the capacity to endure something" (Collins Concise Dictionary, 1989). Thus, FRT can be defined as the amount of risk the investors are willing to accept when they confront with investment decisions with uncertain outcomes. Thereby, investors' risk tolerance refers to how well an investor is able - "to weather the ups and particularly the downs in the securities markets ... with an emphasis on an investor's attitudes and emotional tolerance for risk" (Hallman and Rosenbloom, 1987). In general, one can expect individuals with a low risk tolerance to act differently with regard to risk than others with a high risk tolerance. Someone with a high level of FRT would be expected to - "accept a higher exposure to risk in the sense of taking sole responsibility, acting with less information, and requiring less control than would" someone with a low level of risk tolerance (MacCrimmon and Wehrung, 1986). However, this risk perception or attitude of individual investors can be positive (risk prone), neutral (risk neutral) and negative (risk averse).

Anbar and Eker (2010) suggest that there are four main methods as found in the literature for measuring financial risk tolerance, which include - "(a) assessing actual behavior (for example, portfolio allocations may be used to infer attitudes to risk), (b) asking about investment choices, (c) asking a combination of investment and subjective questions and (d) asking hypothetical questions with carefully specified scenarios." Pratt (1964) and Arrow (1965) have measured risk preferences of individuals by the proportion of individuals' wealth invested in risky assets using the asset allocation approach. Lewellen et al. (1977) have also studied the proportion of individual investments in risky assets as a measure of investors' risk aversion. These studies have measured risk preferences by the investments behavior of individuals. But, this may not be a rational way as there could be factors other than risk preference like time period of investment, knowledge levels, psychological biases and social norms (Kahneman and Tversky, 1979) that may influence such investment behavior. Grable and Lytton (1999) have also studied individuals' self reported responses to a questionnaire on his risk tolerance level to measure risk tolerance. Gilliam et al. (2010) study two tools - the Survey of Consumer Finance (SCF) - single item measure; and the Grable and Lyton Risk Tolerance Measure (G/L-RTM) which is a 13 item multidimensional measure. The study concludes that the SCF suitable measure for evaluating investment risk behavior, the G/L-RTM is a wider measure of financial risk tolerance of an individual. Hallahan et al. (2004) strongly favor the use of questionnaires as the primary subjective risk tolerance assessment method as employed all over the world.

In this study we have used the third measure as pointed out by Anbar and Eker (2010) to investigate the risk tolerance levels, and based on that the risk attitudes of the Indian investors. The 200 respondents sample has been taken from 20 wards by using the random number generator among 141 wards in Kolkata, West Bengal. We have also constructed a 12 item multidimensional measure based on the hypotheses drawn to investigate whether and which of the Indian individual investors' demographics and socioeconomic factors take a critical role in influencing risk tolerance and thereby risk attitudes of them. Many previous studies (refer literature review) throughout the

world investigate the role of age, gender, marital/social status, number of dependents (children only), education, income status, etc. on the risk tolerance and thereby risk attitude of the investors. But, this is the first study to undertake dependent parents, employment status in the form of Govt., private and self-employed/business, savings pattern, future monetary planning (FMP), and investments amount and returns from such investments in investigating their impact on the risk tolerance levels and thereby risk attitudes of the Indian investors. Also, which of these factors are most significant in influencing their risk averse or prone attitude would be studied in detail. Additionally, in Indian scenario, this kind of study is very rare which incorporates so many demographic and socioeconomic factors and their combined impact on the risk attitudes of the Indian investors. Also, the application of Binary Logit Model is for the first time in investigating Indian investors' risk tolerance levels (helps in judging risk aversion or risk proneness) which makes the study results more reliable and valid.

Thus, overall it contributes to the existing literature in the following ways. First of all, it provides a combination of methodologies including the measurement of risk tolerance levels through a points Scale and then interpreting the values in relation to risk aversion formula. Here, it is assumed that risk aversion has an inverse relationship with the risk tolerance level. These results are then compared with the Binary Logit Model results which make the conclusions of this study more accurate and reliable. The combination of objective and subjective measures also make these results more authentic. Secondly, for the first time in Indian literature many new demographics and socioeconomic factors (as stated above) are included in investigating their influence as catalysts to individual investors' risk attitudes measurement. Along with that investors' prominent demographic characteristics like gender, age, marital/social status, employment status, income status and educational qualifications are also investigated under this study to find out their respective role in influencing Indian investors' risk tolerance levels and thereby their risk attitudes. Last, but not the least, which of the above undertaken factors individually or in combination decide Indian investors' risk tolerance levels and thereby dominate their risk behavior would be found.

The rest of the paper is organized as follows - following introduction in Section 1, Section 2 introduces and reviews relevant empirical literature to understand the diverse perspectives of investors' demographic characteristics and their impact on risk attitudes of them. Section 3 provides hypotheses and research methodology in detail. Section 4 presents the findings of this study and the necessary discussions, followed by conclusion in Section 5.

2. LITERATURE REVIEW

In economic theory and practice, research on FRT is heavily weighted where risk is explained by risk aversion or low tolerance level to accept risk. Thus, FRT can be thought of as the inverse of risk aversion (see e.g., (Barsky *et al.*, 1997; Hanna and Chen, 1997; Hanna *et al.*, 2001; Faff *et al.*, 2008)) (see Equation 1 under this study). It implies that high risk tolerant individual investors generally hold a proportionally higher ratio of risky assets in comparison to their low risk tolerant peers (Riley and Chow, 1992; Grable and Lytton, 1998). While many researchers restrict their

definition of risky assets to include stocks and bonds (see e.g., (Zhong and Xiao, 1995; Jianakoplos and Bernasek, 1998)), some others include individual's wealth and pensions (see e.g., Schooley and Worden (1996)). In this study, we assume risky assets to be stocks, mutual funds (MFs), commodities and real estate, and non-risky assets include banks fixed deposits (FDs) and monthly income schemes (MIS) of post offices.

There is limited literature to guide us in our endeavor to investigate how the selected demographic and socioeconomic factors play critical role in the FRT and thereby influencing the risk attitudes of the Indian individual investors. All the available relevant literature is cited here factor-wise to further develop the hypotheses examined under this study.

2.1. Age

One of the most minutely researched demographic factor influencing FRT and thereby risk attitude of the individual investors is his/her age. In one of the earliest studies on choice dilemmas, Wallach and Kogan (1961) indicate that older individuals are less risk tolerant than their younger peers. This finding creates immense research interests on this topic, leading to two decades of intensive studies using choice-dilemma methods, as well as survey, experimental, subjective and objective measures designs. One group of such researches exploring subjective risk tolerance finds that investors' age is not related to his/her risk attitude (see e.g., (Cutler, 1995; Sung and Hanna, 1996; Grable and Joo, 1997; Grable and Lytton, 1998)) or find statistically insignificant relationships with age (see e.g., (Hanna *et al.*, 2001; Antonites and Wordsworth, 2009; Van De Ventner and Michayluk, 2009; Anbar and Eker, 2010)).

Conversely, many others report a relationship between age and FRT (see e.g., (MacCrimmon and Wehrung, 1986; Schooley and Worden, 1996; Santacruz, 2009)). However, due to different country settings and perceptions, the existing literature defines age (in years) differently. But, mostly they suggest that with increasing age investors' risk tolerance decreases, and so his/her risk averse attitude creeps in.

2.2. Gender

Gender as a determinant of FRT remains a controversial factor (Bajtelsmit and Bernaseck, 1996). Many empirical studies (see e.g., (Riley and Chow, 1992; Roszkowski *et al.*, 1993; Kahn, 1996; Palsson, 1996; Sung and Hanna, 1996; Barsky *et al.*, 1997; Grable and Lytton, 1998; Morse, 1998; Grable *et al.*, 2004; Hallahan *et al.*, 2004; Hanna and Lindamood, 2004; Al-Ajmi, 2008; Olivares *et al.*, 2008; Gilliam *et al.*, 2010a; Faff *et al.*, 2011; 2008)) find that women investors are less risk tolerant and so more risk averse than their men counterparts. However, there are a few studies (see e.g., (Andersen *et al.*, 2008; Gumede, 2009)) that suggest that there is no significant difference in FRT between males and females.

Many times interviewees also claim that most family financial decisions are made jointly (Barsky *et al.*, 1997). Although these sorts of researches provide significant insights into the investment decisions across gender types, one critical shortcoming in the existing literature is that

large-scale survey studies offer poor control over potential gender differences in knowledge sets. So, further investigation about gender's role in FRT and thereby risk attitudes of both men and women individual investors in different country settings with a manageable sample size can only clarify this controversial yet very critical issue.

2.3. Marital/ Social Status

Marital/Social status of individual investors is also considered to be an effective factor that affects FRT (Arano *et al.*, 2010). Some empirical studies show that married individuals are probably being less risk tolerant and more risk averse than single ones (Roszkowski *et al.*, 1993; Sundén and Surette, 1998; Grable and Joo, 2004; Grable and Roszkowski, 2007). Lazzarone (1996) argues that in comparison to married investors, single individuals have less to lose by accepting greater risk who often has responsibilities for themselves and dependents (see e.g., (Lee and Hanna, 1991; Roszkowski *et al.*, 1993; Grable, 2000)). They also face less social risk (i.e., potential loss of esteem) when undertaking risky investments. However, some other studies suggest that married individuals rather than singles possess greater risk-taking propensities, although many others have failed to find any statistically significant relationship between marital status and FRT (see e.g., (Masters, 1989; Haliassos and Bertaut, 1995; Antonites and Wordsworth, 2009; Anbar and Eker, 2010)). However, on an overall basis, it can be concluded that unmarried investors are found to have a slightly higher risk tolerance level and thereby risk prone attitude than all other demographics.

2.4. Number of Dependents

There is lack of scholarly works investigating the relationship of marital/social status of individual investors with FRT and their risk attitudes including children or number of dependents in the family structure or households. In one of the rare studies, Xiao (1996) find that most households with young children don't hold risky assets. Conversely, households with children in their middle (6-11) years and young adolescent (12-17) years tend to be less risk averse (Xiao, 1996). Jianakoplos and Bernasek (1998) also report that as the number of young dependents increases in a married household, the proportion of risky assets to wealth also increases. However, in single female households, holdings of risky assets decrease as the number of children increases. So, empirical research finds it very difficult (except from the savings motive as dependent variable) to accurately predict the role of the dependents and/or children on the risk attitudes of their parents and these households.

Also, the general perception of number of dependents' impact on the FRT is that individual investors with more dependents are less risk tolerant than the persons with less dependent. Chaulk *et al.* (2003) reveals that FRT decreases as the number of children or dependents in their household increases. Conversely, Faff *et al.* (2008) argues that FRT increases with the number of dependents. But, Hallahan *et al.* (2003) and Bellante and Green (2004) find that the relationship between number of children or dependents and risk tolerance is insignificant. Schooley and Worden (1996)

also suggest that family responsibilities don't influence FRT of investors when other demographic factors such as income, race, gender and employment status are held constant.

However, this study for the first time has also taken into consideration the old parents, unmarried sisters, etc. as dependents along with dependent children by looking at the Indian joint family culture and ethos. So, the findings would definitely fill the research gap till date in this regard.

2.5. Educational Qualifications

The level of education of individual investors is another critical factor in determining their FRT and thereby risks attitudes. It is observed that higher educational qualifications help investors become capable of assessing the probable risks and benefits more carefully than those who have lower educational degrees (less than Graduate here). There is also sufficient evidence to suggest that higher education encourages people to take more financial risks and an investor who is more educated is more risk tolerant and thereby more risk prone than others with lower levels of education (Baker and Haslem, 1974; Riley and Chow, 1992; Roszkowski *et al.*, 1993; Haliassos and Bertaut, 1995; Schooley and Worden, 1996; Sung and Hanna, 1996; Grable and Lytton, 1999; Grable, 2000; Bellante and Green, 2004; Grable and Joo, 2004; Christiansen *et al.*, 2006; Al-Ajmi, 2008; Gilliam and Chatterjee, 2011). In contrast, Hallahan *et al.* (2003) find that education is not a significant determinant of an individual's risk tolerance behavior. All these findings have created an increased interest in including 'educational qualifications' as a variable that explain FRT in Indian context and thereby Indian individual investors' risk attitudes under this study.

2.6. Employment Status

It is a given fact that employed individuals have a higher FRT than the unemployed since they are likely to have a higher disposable income and can afford to take on more risks (Anbar and Eker, 2010). Grable and Lytton (1998) also suggest that characteristics corresponding to occupational status and self-employment have been significant in differentiating among risk tolerance levels. Empirical researchers have also found that professionally occupied investors tend to be more risk tolerant than those engage in non-professional occupations (Roszkowski *et al.*, 1993; Grable and Lytton, 1998). However, Sung and Hanna (1996) find that there is no significant effect of occupation on FRT. Antonites and Wordsworth (2009) find a clear distinction between the self-employed and those who work for pay outside the home as well as the unemployed, and consider that business sector individuals and other entrepreneurs typically lead to higher levels of risk-taking than employees who are on a straight salary or wage. This confirms the Stewart and Roth (2001) finding that entrepreneurs have a higher risk tolerance than all other employment categories. So, under this study we have assumed that the Govt. employees are more risk averse than their private and self-employed/businessmen counterparts.

2.7. Income Status

In case of income status also, the empirical literature is divided in their findings and suggestions. One body of empirical literature (see e.g., (Friedman, 1974; Cohn *et al.*, 1975; Riley and Chow, 1992; Roszkowski *et al.*, 1993; Grable and Lytton, 1998; 1999; Hallahan *et al.*, 2004; Watson and McNaughton, 2007)) finds that as income increases FRT increases. It indicates that low income individual investors have lower risk tolerance which implies that they are risk averse as because they have little flexibility with their regular budgets (Riley and Chow, 1992). However, some studies (see e.g., (Hartog *et al.*, 2002; Faff *et al.*, 2008)) also suggest a negative impact of income on such risk tolerance levels. However, some others (see e.g., (Gumede, 2009; Strydom *et al.*, 2009)) find no significant relationship between income and risk tolerance. Discrepancies in results of many such studies arise from the so called income-wealth interrelationships. So, under this study we have also taken into consideration the savings pattern and returns from investments to minimize such discrepancies.

2.8. Investment and Savings Patterns, Amount and Returns and FMP

According to Arrow (1965) and Pratt (1964), the main factor of investors' risk aversion is the wealth of them. Morin and Suarez (1983) find that households in the upper wealth group show a trend of decreasing relative risk aversion. Additionally, in their study wealth is found to be the most important variable in determining investors' risk aversion levels. Schooley and Worden (1996) also find that as a households' level of wealth increases so does their holdings of risky assets, while Hallahan *et al.* (2004) provide evidence that wealth and risk tolerance exhibits a positive relationship. But, many studies (see e.g., Hartog *et al.* (2002)) observe a negative association between investors' wealth and FRT. Savings and investment patterns are also critical in investigating risk tolerance and thereby risk preferences and attitudes of individual investors. In one of the earliest studies, Lewellen *et al.* (1977) find that age, gender, income and education affect investors' preferences. Kumar Singh (2006) analyzes the investment patterns of people in two Indian cities namely Bangalore and Bhubaneswar. He observes that in Bangalore investors are more aware about various investment avenues and the risks attached with them, while in Bhubaneswar, investors are more conservative in nature and they prefer to invest in less risky avenues like bank deposits, small savings, post office savings, etc. Alinvi and Babri (2007) suggest that investors change their preferences according to their life circumstances, and while certain preferences are well-defined others can be inconsistent.

This study has used different investment avenues starting from the less risky ones like bank FDs and post office MIS to the most risky ones like stocks and commodities. The savings pattern, investments amount and returns from such investments, and FMP of the Indian investors as driving factors of FRT and thereby their risk attitudes, are also considered for the first time under this study. If these are high and positive (except FMP), it is hypothesized that the investors are more risk tolerant (similar to wealth status) and prefer to take higher risks in their investment decision

making. This review of the existing and relevant literature has helped us to develop our hypotheses (see Section 3) to be examined under this study.

3. RESEARCH METHODOLOGY

The accurate assessment of individual investors' risk tolerance needs to consider the attitudinal component of risk as well as measurement of relative risk aversion. The attitudinal component of FRT under this research study refers to subjective risk tolerance. However, this type of risk tolerance is somewhat difficult to measure and is often based on heuristics that use demographics to classify individuals into risk tolerance categories (Cutler, 1995; Grable and Lytton, 1998). Barsky *et al.* (1997) point out that using questionnaire surveys overcome these issues as one can construct a survey instrument "...that is designed precisely to elicit the parameter of interest while asking the respondent to control for differences in economic circumstances that confound estimation". In simple terms, it allows for a comparison to be made on fairer terms between all respondent investors regardless of differences in their respective individual responses and demographics.

In order to ensure that the respondent investors are allowed to be examined for various research questions under all factors and that pre-selected sub groups of the population are represented, a random stratified sampling technique is employed here (in line with Hair *et al.* (2008)). In our study, each option in the question statement receives a point (see below in brackets). Then, each questionnaire is evaluated and each respondent investor receives a total number of points on all the statements answered. The minimum and maximum total points that a respondent investor can accumulate is 11 and 40. These total points reflect his/her risk-tolerance. For the purpose of interpretation of total points, we have used the following scale (see Table 1):

Table-1. Interpretation of Risk Tolerance Scores

Total Points (i.e., Risk Tolerance Scores) Between	Interpretation (i.e., Risk Tolerance Levels)
0-17	Low
18-23	Below Average
24-28	Average
29-34	Above Average/High
35-40	Very High

Barsky *et al.* (1997) for the first time carried out an estimation of the minimum and maximum limits of the investors' risk aversion and defined the concept of risk tolerance as being the inverse of risk aversion. He applied his Model over returns, and other demographic and socioeconomic factors and discovered that risk aversion varies between 0.7 and 15.8 with significant differences related to age, gender, race, religion or nationality. On similar lines, we compute risk aversion by the following formula (refer (Barsky *et al.*, 1997; Hanna and Chen, 1997; Hanna *et al.*, 2001; Braşoveanu *et al.*, 2008; Faff *et al.*, 2008)):

$$Aversion = \frac{1}{Tolerance} \times 100 \qquad\qquad Equation\ (1)$$

We give the interpretation for this indicator. This is provided in Table 2 as follows:

Table-2. Interpretation of Investors' Risk Aversion Levels

Risk Aversion Levels	Interpretation
Higher than 5.9	Very High
Between 5.8-4.4	High
Between 4.3-3.6	Average
Between 3.5-3.0	Low
Below than 2.9	Very Low

For the risk aversion factorial analysis we choose age, gender, marital/social status, number of dependents, educational qualifications, employment status, income status, savings pattern, FMP, investments amount, returns from investments and investment patterns which overall represent the demographic and socio-economic and professional profile of all 200 respondent investors within the study region.

For the age factor we choose five representative levels - less than 25 yrs. (5 points), 25-35 yrs. (4 points), 35-45 yrs. (3 points), 45-60 yrs. (2 points) and more than 60 yrs (1 point). We have taken the following hypothesis:

Hypothesis 1 - "Risk aversion of individual investors increases with age. In other words, young investors are more risk-prone than their old counterparts".

Gender is considered under male (2 points) and female (1 point) representative category. We have taken the following hypothesis:

Hypothesis 2 – "Female investors are more risk averse than their male counterparts".

In regard to marital/social status factor, we use five categories – married with children (1 point), married without children (2 points), divorced (3 points), widow/widower (4 points) and unmarried (5 points). Also, we have looked into the number of dependents (includes children, home maker women and parents) – less than or equal to 2 (3 points), 3-5 (2 points), more than 5 (1 point). This is due to the fact that in most Indian households parents live with their sons which imply added responsibilities in all regards. We have taken the following hypotheses:

Hypothesis 3 – "Married investors are more risk averse than their unmarried counterparts. Also, married women are more risk averse than their men counterparts".

Hypothesis 4 – "Social responsibilities make the individual investors risk averse".

In consideration of the educational levels, we use - less than Graduate (1 point), Graduate (2 points), post-Graduate and more (3 points), and professional qualifications (4 points). We have taken the following hypothesis:

Hypothesis 5 – "Higher educational qualifications of individual investors make them more risk-prone, i.e., risk aversion decreases".

In regard to employment status factor, we use three categories - Central/State Govt./Govt. undertaking (1 point), private (2 points) and self-employed/business (3 points). We have taken the following hypothesis:

Hypothesis 6 – "Individual Investors who are Govt. employees are more risk averse than their other counterparts".

Income status factor is represented by four categories under this study - up to Rs.15,000 p.m. (1 point), Rs.15,000-30,000 p.m. (2 points), Rs.30,000-50,000 p.m. (3 points) and more than Rs.50,000 p.m. (4 points). We have taken the following hypothesis:

Hypothesis 7 – "Risk aversion of individual investors decreases with higher income. In other words, rich investors are more risk-prone than their poor counterparts".

The savings pattern is also represented by four categories - up to Rs.10,000 p.m. (1 point), Rs.10,000-20,000 p.m. (2 points), Rs.20,000-40,000 p.m. (3 points) and more than Rs.40,000 p.m. (4 points). We have taken the following hypothesis:

Hypothesis 8 – "Risk aversion of individual investors decreases with higher savings".

Monetary planning for post-retirement is answered by yes (1 point) or no (2 points) by all respondents under this study. We have taken the following hypothesis:

Hypothesis 9 – "Planned behavior by the individual investors make them risk averse".

Higher amount of investments (represents wealth status also) is categorized under four following categories - up to Rs.5,00,000 (1 point), Rs.5,00,000-10,00,000 (2 points), Rs.10,00,000-25,00,000 (3 points) and More than Rs.25,00,000 (4 points). We have taken the following hypothesis:

Hypothesis 10 – "Risk aversion of individual investors decreases with higher amount of investments. In other words, wealthy investors are more risk-prone than their less wealthy counterparts".

Returns from investments is also taken into consideration under this study under four categories - Up to Rs.10,000 p.m. (1 point), Rs.10,000-25,000 p.m. (2 points), Rs.25,000-50,000 p.m. (3 points) and more than Rs.50,000 p.m. (4 points).

We have taken the following hypothesis:

Hypothesis 11 – "Risk aversion of individual investors decreases with higher returns from investments".

For each of the above factor category we analyze the percentage analysis data of the respondent investors and also compute the risk tolerance and aversion levels.

Last, but not the least, the investment patterns of individual investors are represented by - 100% in FDs and MIS, more in FDs and MIS and a portion in equity and mutual funds and/or commodities, more in equity and mutual funds and/or commodities and a portion in FDs and MIS, 100% in real estate and 100% in equity and mutual funds and/or commodities. It would be obvious that risk averse individual investors invest in more of FDs and MIS and less in other risky assets and vice versa.

This study has also employed a Binary Logit Model in analyzing the data in line with the studies by Anbar and Eker (2010), Hanna and Lindamood (2005) and Sung and Hanna (1996). This

model is preferred to other techniques (e.g. regression analysis and discriminant analysis) as because it does not assume a linear relationship between the dependent and independent variables, nor does it require the assumptions that the variables are normally distributed and homoscedastic (Anbar and Eker, 2010).

In this research study, Indian individual investors' risk tolerance (i.e., the dependent variable) is referred to the maximum amount of investment risk someone is comfortable taking (Schaefer, 1978). The mean score for the sample is 21.285. Following Grable and Lytton (1999a) and Anbar and Eker (2010), respondent investors who scored below 21.285 are categorized as being below average risk tolerant and others who scored above 21.285 are categorized as being above average risk tolerant. In total, there are 122 respondents who are below average risk tolerant (61%% of the total respondents) and 78 (i.e., 39%) who are above average risk tolerant. The classification above average risk tolerant (coded 1) or below average risk tolerant (coded 0) is being used as the dependent variable in the Binary Logit Model. The complete Model estimated under this study is shown below:

$$RT_i = \alpha + \beta_i Age_i + \beta_i Gender_i + \beta_i MaritalStatus_i + \beta_i NumberofDependents_i + \beta_i EducationalQual._i + \beta_i EmploymentStatus_i + \beta_i IncomeStatus_i + \beta_i SavingsPattern_i + \beta_i FMP_i + \beta_i InvestmentsAmount_i + \beta_i ReturnsfromInvestments_i + \varepsilon_i \qquad \text{Equation (2)}$$

4. RESULTS AND DISCUSSIONS

The demographic data of the surveyed respondent investors are given in Table 3.

Table-3. Demographic Data of the Surveyed Respondent Investors (200 [100%]in Total)

Classification Category	Number of Respondents (%)
Age	
Less than 25 yrs.	02 (1%)
25-35 yrs.	49 (24.50%)
35-45 yrs.	42 (21%)
45-60 yrs.	90 (45%)
More than 60 yrs.	17 (8.50%)
Gender	
Male	185 (92.50%)
Female	15 (7.50%)
Marital/Social Status	
Married with Children	147 (73.50%)
Married without Children	28 (14%)
Divorced	00 (0%)
Widow/Widower	00 (0%)
Unmarried	25 (12.50%)
Number of Dependents	
≤ 2	59 (29.50%)
3-5	100 (50%)
> 5	41 (20.50%)
Educational Qualifications	
Less than Graduate	26 (13%)
	Continue

Graduate	158 (79%)
Post-Graduate and More	12 (6%)
Professional Qualifications	04 (2%)
Employment Status	
Central/State Govt./Govt. undertaking	21 (10.50%)
Private	71 (35.50%)
Self-employed/business	108 (54%)
Income Status	
Up to Rs.15,000 p.m.	11 (5.50%)
Rs.15,000-30,000 p.m.	59 (29.50%)
Rs.30,000-50,000 p.m.	110 (55%)
More than Rs.50,000 p.m.	20 (10%)
Savings Pattern	
Up to Rs.10,000 p.m.	85 (42.50%)
Rs.10,000-20,000 p.m.	76 (38%)
Rs.20,000-40,000 p.m.	35 (17.50%)
More than Rs.40,000 p.m.	04 (2%)
Future Monetary Planning (FMP)	
Yes	180 (90%)
No	20 (10%)
Investments Amount	
Up to Rs.5,00,000	119 (59.50%)
Rs.5,00,000-10,00,000	46 (23%)
Rs.10,00,000-25,00,000	27 (13.50%)
More than Rs.25,00,000	08 (4%)
Returns from Investments	
Up to Rs.10,000 p.m.	127 (63.50%)
Rs.10,000-25,000 p.m.	68 (34%)
Rs.25,000-50,000 p.m.	04 (2%)
More than Rs.50,000 p.m.	01 (0.50%)

Table 3 shows that 185 (92.50%) of the respondent investors are men. This is due to the fact that generally Indian women don't invest in the stock markets. So, it is very difficult to find more women investors within this region. The age profile also confirms that middle-aged (45-60 yrs.) Indian individuals are more prone to stock market investments than their students, entry-level service persons or professionals and retired peers. There is also only 25 (12.50%) unmarried persons who take part in this questionnaire survey. There are 147 (73.50%) respondent investors who have children and 50% of the total respondents, i.e., 100 such investors have in between 3-5 dependents in their households. This points out the responsibilities-burden on them which generally make them more cautious in regard to risky investments. The employment status data however are quite balanced which includes 92 (46%) respondent investors from the salaried class working in Govt., public and private sectors and others are engaged in self-employed occupations or businesses. 110 (55%) of the total 200 respondent investors are in the middle income bracket (taken as Rs.30,000-50,000 p.m.). Only 20 (10%) of the individuals are falling into high income category. The educational qualifications data also show that the major (158 respondent investors [79%]) portion of surveyed investors is having a Graduate degree, i.e., average/higher skill sets, to invest knowledgably in the Indian stock markets. The savings pattern, investments amount and returns on

investments data also point out that 161 (80.50%), 165 (82.50%) and 195 (97.50%) out of 200 respondent investors are in the low to mid category. Thus, it shows lack of wealthy people within this region to be surveyed here. The FMP data also shows that most (180 in total [i.e., 90%]) respondent investors are worried about their retirement planning. Some classification category (e.g., in regard to age, number of dependents, income status, savings pattern, etc.) are assumed for this study based on Indian contexts.

Table 4 provides the investment preferences of the surveyed investors.

Table-4. Investment Patterns of the Surveyed Respondent Investors (200 [100%] in Total)

Classification Category	Number of Respondents (%)
100% in FDs and MIS	00 (0%)
More in FDs and MIS and a portion in equity and mutual funds and/or commodities	44 (22%)
More in equity and mutual funds and/or commodities and a portion in FDs and MIS	29 (14.50%)
100% in real estate	08 (4%)
100% in equity and mutual funds and/or commodities	119 (59.50%)

The results show that 119 (59.50%) respondent investors prefer only to invest in the Indian stock markets directly or indirectly through stocks and MFs or in risky commodities. Another 29 (14.50%) such individuals prefer more such risky options in their portfolio. Only 44 (22%) respondent investors want more of less risky FDs and MIS in their investments combinations. This implies that most of the surveyed Indian investors are more risk prone in nature and attitudes.

Table 5 presents the analysis and interpretation of risk aversion attitudes based on risk tolerance levels of the respondent investors.

Table-5. Risk Aversion Analysis

Particulars	Risk Tolerance	Risk Aversion	Comment
Total (200 Respondents)	21.285	4.698	High Risk Aversion
Age			
Less than 25 yrs.	25.000	4.000	Average Risk Aversion
25-35 yrs.	23.673	4.224	Average Risk Aversion
35-45 yrs.	21.810	4.585	High Risk Aversion
45-60 yrs.	19.567	5.111	High Risk Aversion
More than 60 yrs.	22.176	4.509	High Risk Aversion
Gender			
Male	21.195	4.718	High Risk Aversion
Female	22.867	4.373	Average Risk Aversion
Marital/Social Status			
Unmarried	25.320	3.949	Average Risk Aversion
Married without Children	22.500	4.444	High Risk Aversion
Married with Children	20.415	4.898	High Risk Aversion
Divorced			
Widow/Widower	None		
Married (175 Respondent Investors)			
			Continue

Male (166)	20.717	4.827	High Risk Aversion
Female (09)	21.333	4.688	High Risk Aversion
Number of Dependents			
≤ 2	23.915	4.181	Average Risk Aversion
3-5	20.82	4.803	High Risk Aversion
> 5	18.927	5.284	High Risk Aversion
Educational Qualifications			
Less than Graduate	20.577	4.860	High Risk Aversion
Graduate	21.158	4.726	High Risk Aversion
Post-Graduate and More	22.833	4.380	Average Risk Aversion
Professional Qualifications	27.000	3.704	Average Risk Aversion
Employment Status			
Central/State Govt./Govt. undertaking	21.857	4.575	High Risk Aversion
Private	21.606	4.628	High Risk Aversion
Self-employed/business	20.963	4.770	High Risk Aversion
Income Status			
Up to Rs.15,000 p.m.	20.364	4.911	High Risk Aversion
Rs.15,000-30,000 p.m.	20.051	4.987	High Risk Aversion
Rs.30,000-50,000 p.m.	21.264	4.703	High Risk Aversion
More than Rs.50,000 p.m.	25.550	3.914	Average Risk Aversion
Savings Pattern			
Up to Rs.10,000 p.m.	19.235	5.199	High Risk Aversion
Rs.10,000-20,000 p.m.	21.868	4.573	High Risk Aversion
Rs.20,000-40,000 p.m.	24.029	4.162	Average Risk Aversion
More than Rs.40,000 p.m.	30.250	3.306	Low Risk Aversion
Future Monetary Planning			
Yes	20.933	4.777	High Risk Aversion
No	24.45	4.090	Average Risk Aversion
Investments Amount			
Up to Rs.5,00,000	20.101	4.975	High Risk Aversion
Rs.5,00,000-10,00,000	21.478	4.656	High Risk Aversion
Rs.10,00,000-25,00,000	24.074	4.154	Average Risk Aversion
More than Rs.25,00,000	28.375	3.524	Low Risk Aversion
Returns from Investments			
Up to Rs.10,000 p.m.	20.024	4.994	High Risk Aversion
Rs.10,000-25,000 p.m.	23.294	4.293	Average Risk Aversion
Rs.25,000-50,000 p.m.	25.500	3.922	Average Risk Aversion
More than Rs.50,000 p.m.	28.000	3.571	Low Risk Aversion

It is found that on an overall basis the respondent investors have a below average risk tolerance score. So, it implies that they are highly risk averse (4.698 in the interpretation Scale). However, this result contradicts with the investment patterns results. The results in Table 5 also show that younger investors (up to 35 yrs. of age) have slightly higher risk tolerance level (scores of 25.000 and 23.673) than their more experienced and aged peers. It indicates a better risk attitude for them, as they have average risk averse nature. An interesting fact here is that results show that old (i.e., more than 60 yrs.) investors have higher risk tolerance score than their middle-aged (35-60 yrs.) counterparts. However, all these investors are highly risk averse than their younger peers. Thus, hypothesis 1 is accepted on this evidence. Table 5 presents that both men/male and women/female

investors under this study have a below average risk tolerance score (21.195 and 22.867 respectively). But, in contrast to the previous empirical results women investors have higher risk prone attitude than their men counterparts. Thus, this rejects our hypothesis 2.

Marital/social status points out that married Indian investors without children (22.500) and with children (20.415) have below average risk tolerance scores in comparison to unmarried individuals who have average (25.320) such score. These scores automatically convert into high risk aversion attitude for the married respondent investors whereas unmarried ones have average risk aversion. It also implies the acceptance of hypothesis 3. However, results in Table 5 prove that both male and female married investors have below average risk tolerance scores which make them highly risk averse. This rejects the second part of hypothesis 3. It is also shown in the results that the higher the number of dependents in Indian households, the lower is the risk tolerance scores and thereby respondent investors become more risk averse. This evidence accepts hypothesis 4 under this study.

It is also found from the results that in regard to 'educational qualifications' demographic factor, respondent investors with professional qualifications have average risk tolerance scores (i.e., 27.000) which make them moderately risk averse. Investors with post-Graduate and more degrees are also showing average risk aversion attitude. However, less than Graduate and Graduate investors with a risk tolerance scores of 20.577 and 21.158 are highly risk averse than their higher educated counterparts. Thus, it can be said that we should accept hypothesis 5 under this study.

The study results also show that both the salaried investors and the self-employed/business persons are highly risk averse in nature. But, the interesting fact to note here is that the self-employed investors have below average risk tolerance level just like their Govt. and private salaried counterparts. This is in contradiction with the previous results. However, on the basis of results evidence, we reject hypothesis 6. In regard to income status this study finds that respondent investors in the higher income category (i.e., more than Rs.50,000 p.m.) have a high risk tolerance score (i.e., 25.550) which makes them less risk averse and thereby more risk prone. The middle and low income category investors however have a high risk aversion attitude with lower risk tolerance scores. Thus, in regard to hypothesis 7, we accept the proposition that higher income increases risk tolerance level of the Indian investors and thereby they are less risk averse in comparison to their low income peers. However, risk aversion attitude doesn't increase with lower income as evident in the previous literature.

Table 5 results show that respondent investors with higher savings (i.e., More than Rs.40,000 p.m.) have a higher risk tolerance score (30.250) which reduces their risk aversion attitude and make them more risk prone than all others. It is also observed that people in the lower savings bracket (up to Rs.20,000 p.m.) are highly risk averse. Indian investors who save in between Rs.20,000-40,000 p.m. having average risk tolerance score (24.029) are of average risk averse nature. Thus, it is proved that hypothesis 8 is acceptable under this study. The factor 'investments amount' has shown quite similar results with the 'savings pattern'. Investors with higher investments amount in the Indian stock markets are also showing high average (28.375) risk

tolerance scores which translate into their risk prone attitude. Conversely, investors with Rs.10-25 lakhs are showing low average (24.074) and respondent investors below that have shown below average risk tolerance scores. Thus, the lower the investments amount, the higher is the risk averse attitude of the Indian investors. This automatically implies the acceptance of hypothesis 10. It can also be suggested here in line with the previous literature that wealthy investors are more risk prone than their poor peers.

Returns from Investments results under this study also show that investors with higher such returns p.m. (more than Rs.50,000) have a higher risk tolerance level (28.000) and thereby low level of risk aversion. Conversely, Indian investors with a lower returns (up to Rs.10,000 p.m.) from their investments are showing a high risk averse attitude as they have below average risk tolerance scores. Thus, hypothesis 11 is also accepted under this study. It is also proved from the study results that respondent investors who are very keen about their retirement planning have a below average risk tolerance score (20.933) which indicates their risk aversion towards more risky assets. Thus, hypothesis 9 is also accepted here.

Table 6 provides the Binary Logit Model results under this study.

Table-6. Binary Logit Model Results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Age	0.425074	0.210486	2.019488	0.0434
Gender	-4.331778	0.860354	-5.034877	0.0000
Marital Status	1.083419	0.278709	3.887285	0.0001
No. of Dependents	0.271566	0.313282	0.866842	0.3860
Educational Qualifications	0.545642	0.390520	1.397221	0.1623
Employment Status	-0.378038	0.260849	-1.449259	0.1473
Income Status	1.636264	0.360606	4.537541	0.0000
Savings Pattern	1.211438	0.326793	3.707051	0.0002
Future Monetary Planning	0.836989	0.734978	1.138795	0.2548
Investments Amount	0.346129	0.275601	1.255903	0.2092
Returns from Investments	1.683777	0.392927	4.285215	0.0000
C	-6.536594	1.062022	-6.154855	0.0000

Table 6 points out that number of dependents, educational qualifications, employment status, FMP and investments amount has insignificant effect on the risk tolerance levels of the respondent investors. However, except employment status (somewhat) all these results contradict with the earlier study results. In regard to 'employment status', it rejects hypothesis 6 also. The Binary Logit Model results also show that gender has a significant negative relationship with the risk tolerance level of the Indian individual investors. It implies that female investors are more risk prone as suggested by earlier study results also. Thus, this also rejects hypothesis 2. Binary Logit Model results in regard to 'age' factor shows a positive and somewhat significant impact on the risk tolerance level of the Indian investors. The results also show that marital/social status of the

respondent investors is showing a significant positive impact on their risk tolerance levels. It indicates that unmarried investors have higher risk tolerance than their married counterparts. In regard to the income status factor, this study finds significant positive impact on the risk tolerance levels. It indicates that individual investors with high income category are less risk averse than their low income peers. This also confirms the earlier results and validates the acceptance of hypothesis 7. Table 6 results also corroborate with the earlier results in regard to 'savings pattern' and 'returns from investments' both of which show a significant positive effect on the risk tolerance levels of the respondent investors. These imply that hypothesis 8 and 11 are true. Thus, though some of the Binary Logit Model results are contradictory in nature with the earlier results, but in regard to some other factors, they make our study results more valid and authenticated.

5. CONCLUSION

On an overall basis, this study shows that the respondent Indian investors have a lower risk tolerance level which makes them highly risk averse. However, this result contradicts with the investment patterns results of them. In line with the Hypotheses drawn, this study proves that aged investors are more risk averse than their younger inexperienced counterparts with a positive and somewhat significant impact of age on their risk tolerance levels (in line with (MacCrimmon and Wehrung, 1986; Schooley and Worden, 1996; Santacruz, 2009)); married investors with children and other dependents are more risk averse than their unmarried and without much dependents counterparts as they have lower risk tolerance levels (in line with (Roszkowski *et al.*, 1993; Sundén and Surette, 1998; Grable and Joo, 2004; Grable and Roszkowski, 2007)); higher number of dependents (including dependent wife, children, parents, unmarried sister, etc.) also reduce the risk tolerance levels and thereby increase risk aversion (in line with Chaulk *et al.* (2003)); higher education brings higher risk tolerance and thereby makes investors risk-prone (in line (Baker and Haslem, 1974; Grable and Lytton, 1999; Bellante and Green, 2004; Christiansen *et al.*, 2006; Al-Ajmi, 2008; Gilliam and Chatterjee, 2011)); higher income, savings, investments amount, returns from investments and FMP all of them also decrease risk aversion attitude of the respondent Indian investors as their risk tolerance level increases (in line with (Morin and Suarez, 1983; Riley and Chow, 1992; Roszkowski *et al.*, 1993; Hallahan *et al.*, 2004; Watson and McNaughton, 2007)). However, results in Table 5 prove that both male and female married investors have below average risk tolerance scores which make them highly risk averse. This rejects the second part of hypothesis 3. It is also found under this study that in contrast to the previous empirical results (see e.g., (Barsky *et al.*, 1997; Grable and Lytton, 1998; Grable *et al.*, 2004; Hallahan *et al.*, 2004; Al-Ajmi, 2008; Faff *et al.*, 2008; Gilliam *et al.*, 2010; Faff *et al.*, 2011)), Indian women investors have higher risk prone attitude than their male counterparts. The study results also show that both the salaried investors and the self-employed/business persons are highly risk averse in nature. But, we observe that the self-employed investors have below average risk tolerance level just like their Govt. and private salaried counterparts. This is also in contradiction with the previous results (see e.g., (Roszkowski *et al.*, 1993; Grable and Lytton, 1998)).

Binary Logit Model results (see Table 6) points out that number of dependents, educational qualifications, employment status, FMP and investments amount has insignificant effect on the risk tolerance levels of the respondent investors. However, except employment status (somewhat) all these results contradict with the earlier study results. Hypothesis 2 and 6 are rejected here also. Also, according to its results, age, marital status, income status, savings pattern and returns from investments have significant positive impact on the risk tolerance levels of the Indian investors. All these validate the earlier results as shown by risk tolerance scores and Indian investors' risk attitudes through the risk aversion levels.

However, this study is not free from limitations. One obstacle is the dynamic nature of risk – risk, and its tolerance level and attitude varies according to the situation, both from a behavioral and attitudinal science (MacCrimmon and Wehrung, 1985). Further, risk tolerance levels change as individual investors go through life stages such as addition of family responsibilities and wage/salary increases (Leimberg *et al.*, 1989).

In summary, demographic characteristics and socioeconomic factors appear to provide only a starting point in assessing Indian investors' risk tolerance levels and its impact on their risk attitudes. As the results of this study indicate, understanding risk tolerance and attitude is a complicated process that goes beyond the exclusive use of demographics. Risk tolerance also is not a simple one-dimensional or multidimensional attitude rather it may well be sub-dimensional (Cutler, 1995). So, more extensive research is needed to determine which additional individualistic factors including the psychological ones, such as expectations, attitudes, preferences, perceptions, biases, previous experiences, knowledge and skills, family background and culture, religion, nationality and financial stability factors, etc. can be used by future researchers to investigate the explained variances in risk tolerance level differences and risk attitudes.

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