Chapter 2

REVIEW OF LITERATURE AND FORMULATION OF HYPOTHESES

This chapter describes the findings of prior research related to the impact of various psychological (cognitive abilities, emotion intelligence and self esteem) and demographic variables (age and gender) on behavioural biases and stock market participation. It also discusses the studies related to the link between behavioural biases and stock market participation, and the relationship between risk preferences and stock market participation. In addition, it also outlines the formation of models linking these variables to their hypotheses.

Stock markets have shown increasing volatility and fluctuations over the past few years which further increases the uncertainty and predictability in the market. Moreover, anomalies and irrational behaviour of the investors has also been observed frequently. This has led to the emergence of the new field of finance known as behavioural finance. Kahneman and Tversky, the pioneers of behavioural finance found a number of psychological biases such as loss aversion, disposition effect, and representative bias which cause irrational investment behavior in investors. The foundations of behavioural finance can be traced back over 150 years. Selden (1912) was the first person to relate psychology directly to stock market. In recent years, studies have shown that investments in stocks are affected by various factors such as cognitive abilities emotional intelligence, self-esteem and psychological biases. Although the literature related to the relationship of stock markets and risk aversion with emotional intelligence, self-esteem and psychological biases will be highlighted in the chapter, yet more research is needed in this area.

2.1 Role of psychological factors (cognitive abilities, emotional intelligence and self esteem) on behavioural biases, on stock market participation and risk preferences

Human decision-making is restricted by bounded rationality and does not always follow normative prescriptions. Spearman (1904) reported that a person who is good in one type of mental task also does well in many other tasks. Some people are good at unravelling problems verbally and some are good at elucidating problems visually while some are better at solving both of these problems but are not
good at tasks related to memory (Carroll, 1993). Individuals with high cognitive abilities perform their jobs and work tasks more effectively as compared to the individuals with low cognitive abilities (Binet, 1905).

2.1.1 Cognitive Abilities

Recent research has shown that cognitive abilities have a significant influence on financial decisions. Christellis, Jappelli and Padula (2010) found that cognitive impairments attenuate the penchant to hold stocks. High cognitively skilled individuals are more aware of their pension plan, accumulate more assets and are more likely to have tax deferred savings. This suggests that they have a greater interest in financial markets and invest more in stocks both directly and indirectly. Dohmen, Falk, Huffman and Sunde (2010) reported that individuals with low cognitive ability are associated with greater risk aversion and more impatience. Cognitive skills do not attenuate the bias blind spot (West, Meserve & Stanovich, 2012). According Pronin, Lin and Ross (2002) the bias blind spot refers to the cognitive bias where a person fails to see the influence of biases on one’s own judgment, at the same time recognizing the impact of biases on the judgment of others.

Burks, Carpenter, Goette and Rustichini (2008) investigated the relationship between individual's cognitive abilities and their economic preferences towards risk saving and taking. They found that individuals with high cognitive abilities show more patience and prefer more risk.

Taylor (2013) found that cognitive skills are inversely related to risk aversion, specially when the choices are hypothetical. However they are unrelated when the choices are real. Investors with high IQ choose superior stocks as compared to investors with low IQ. In addition, investors with low IQ inadequately monitor their limit orders and execute poor trade decisions which lead them to pay more because of the increased selection costs while investing (Grinblatt, Keloharju & Linnainmaa 2011).

Oechssler, Roider and Schmitz (2008) investigated whether behavioural biases are related to cognitive abilities. They found that individuals with low cognitive abilities are more prone to biases as compared to individuals with high cognitive abilities. Further such individuals show more risk aversion and
impatience and are more affected by the conjunction fallacy, overconfidence and conservatism.

Booth and Katic (2013) examined the association between cognitive skills, gender and risk preferences. They found that at the age of 20 there was no difference between low cognitive ability and high cognitive ability individuals with respect to risk preferences. Moreover, women prefer to invest less in hypothetical lottery winnings when they have specified investment decision. Similarly, Sousa (2010) found no difference in cognitive abilities with respect to risk aversion. He found equal amount of risk aversion in both low and high cognitive ability investors. Andersson et al. (2013) reported that the correlation between cognitive ability and risk preferences exists only if heterogeneity of noise is not taken into consideration.

Agarwal and Mazumder, (2013) found that high cognitive ability individuals make less financial errors such as balance transfer mistake which implies that “consumers who transfer their entire credit card balance from an existing account to a new card but decide to use the new card for “convenience” transactions—transactions that are fully paid for within the grace period which leads to finance charges” (p193). They also make rate changing mistake where “individuals who proceed to take out the loan at the higher APR, rather than simply decline the loan and reapply for a loan elsewhere” (p194).

Paluch (2011) explored whether cognitive ability explains the relationship between overconfidence and levels of management. He found that differences in the levels of overconfidence at different levels of management. It implies that managers across the board are less overconfident when they have to rate their performance than when they are actually performing a task. Moreover, he also found that high cognitive ability individuals are less overconfident. However, cognitive scores did not significantly define the relationship between overconfidence and level of management. Individuals with high cognitive abilities prefer more risk as they can easily process information (Boyle et al., 2011).
Gyllenram, Hanes and Hellstrom (2013) explored the impact of cognitive and non-cognitive ability, individuals’ personality traits, on stock market participation decision. They also studied the channels through which these abilities work. They found that both cognitive and non-cognitive ability of the investors are positively related to stock market participation. In addition, they also reported that risk preference (direct channel) and non-preference (indirect channels such as wealth, income and others) are the channels through which cognitive and non-cognitive abilities influence stock market participation respectively. Further investors with high-IQ held larger numbers of stocks and mutual funds, and they also prefer lower risk (Grinblatt, Keloharju & Linnainmaa, 2011).

Grinblatt, Ikaheim, Keloharju and Knupfer, (2014) analyzed the relationship between IQ and mutual fund choices. They found that cognitive ability influences mutual fund choice. Individuals with low IQ prefer mutual funds with high management fees than high IQ individuals. Individuals with low cognitive skills are more influenced by behavioural biases. It was found that individuals with low cognitive abilities are more prone to consider the biases such as base rate fallacy and conservatism fallacy. In addition, individuals with higher Cognitive Reflection Test scores assess themselves more precisely (Hoppe & Kusterer, 2011).

Benjamin, Brown and Shapiro (2006) explored the influence of cognitive abilities on preference anomalies. They also showed that more cognitively skilled individuals are less biased. They found that more cognitively skilled individuals are associated with lower levels of measured short-run discounting and small-stakes risk-aversion. It was also reported that one percent increase in cognitive ability leads to a six percent decrease in the loss aversion. Individuals with high CRT scores prefer more risk in the gain domains while avoiding risk in loss domains. They were generally more patient and less impulsive (Fredrick, 2005).

Cole, Paulson, and Shastry (2012) investigated the impact of education on financial management, consumers borrowing and credit behaviour. They found that education increases the investment income. They also found that the individuals with higher levels of education have higher credit scores and are less likely to show bankruptcy or experience a foreclosure. Individual with higher cognitive abilities
hold various financial products such as stocks, bonds, mutual funds, savings accounts, tax-deferred accounts, and commercial deposits. Frisell, Pawitan and Långström (2012) suggested that people with high cognitive ability involve themselves less in risky behaviors such as committing crimes.

Albaity et. al. (2014) found that individuals with lower scores on the CRT are more impatient and conservative. However, there are no differences between individuals with low and high cognitive ability with respect to risk preference and conjunction fallacy. Bashir et. al. (2013) analyzed whether behavioural biases are influenced by cognitive abilities. They found that higher cognitive ability individuals are less prone to behavioural biases however, behavioural biases exist in their financial decisions. They also reported that individuals with high cognitive abilities are less overconfident, show less conjunction fallacy and conservatism biases and on the other hand they show more patience and prefer more risk in gains and less risk in losses.

From the above literature, it can be concluded that cognitive abilities are positively related to stock market participation and risk preferences and are also negatively related to behavioural biases (loss aversion and regret). It means that individuals with low cognitive abilities show more loss aversion and regret, participate less in stocks, and prefer fewer risk preferences in their investments.

2.1.1.1 Impact of behavioural biases on risk preferences and impact of risk preferences on stock market participation

According to Zeelenberg “regret is a negative, cognitively determined emotion that we experience when realizing or imagining that our present situation would have been better, had we acted differently” (1996, p. 6). Pompian (2015) suggested that persons who are more prone to regret aversion bias hesitate from aggressive behaviour. It was also reported that it can cause investors to shy away from the markets that have recently gone down and it leads the investors to prefer stocks of subjectively designated good companies, even when an alternative stock has an equal or a higher expected return.
Regret enforces the bidders or investors to take high risks and regret itself is affected by the types of feedback outcome. When feedback for foregone alternative is provided along with feedback on chosen alternative, people regret more than when the feedback is provided only for chosen alternative. Therefore, one should consider both outcome feedback and regret to understand the decision behaviour better (Kotak & Wiggans, 2009; Creyer & Ross, 1999). Ratner and Herbst (2005) examined whether negative emotional responses such as regret from negative outcome induces the individuals to move away from their decision. The results indicated that if the outcome is wrong, individuals feel regret which further decrease their desire to take the same decision again.

Myopic loss aversion has different effects on risk preferences. Myopic loss aversion is the combination of a greater sensitivity to losses than to gains and a tendency to evaluate outcomes frequently. It induces investors to take more risk, when they more often assess their investments. (Thaler, Tversky, Kahneman & Schwartz, 1997). The term myopic loss aversion is coined by Benartzi and Thaler (1995) to explain equity premium puzzle. “It consists of two behavioural concepts. First is “loss aversion which refers to the tendency in individuals to be more sensitive to decrease than to increase in theirs levels of well-being” (p.73). Second, mental accounting refers to “the implicit methods that individuals use to code and evaluate financial outcomes such as transactions, investments and gambles” (p.74). Hopfensitz and Wranik (2008) found that myopic loss aversion is influenced by outcomes and feedback frequency. The investors are risk averse, when there are negative investment outcomes and when they frequently observe the feedback. It was also found that myopic loss aversion is mostly observed in individuals with low self-efficacy.

The buying strategy of the bidders is influenced by anticipated satisfaction of choice and anticipated regret of outcome. They prefer the buyout strategy when their option is permanent buyout because they exhibit loss aversion. On the contrary, they prefer the bidding strategy when the temporary buyout option is present (Tan, Yang, Teo & Ling, 2005).
Zeelenberg and Pieter's (2004) explored how regret affects decision making in real life lottery participation. They found that when feedback was provided to the participants that their neighbours had won a prize in the Postcode Lottery, people started regretting not participating in the lottery. These feelings of regret can lead the individuals to participate in the lottery and take more risks. However, when the feedback was not provided to the participants, then equal amount of regret was found among them.

Chinese investors make bad trading decisions because they are prone to disposition effect, overconfidence and representative biases. It was also found that individual investors suffer more from biases than institutional investors (Chen, Kim, Nofsinger & Rui, 2007). Gollier and Salanie (2012) showed that investors who are more susceptible to regret and tend to have more bias in their portfolio. They prefer assets which perform more in low-probability states.

Massa and Simonov (2002) investigated the relationship between behavioural biases (loss aversion, house money effect and mental accounting) and investments. They found that investors react to previous gains/losses. Previous gain escalates risk taking of investors, while preceding losses minimize their risk-taking. It was also found that short-term behavior is better predicted by loss aversion though, long term behavior is better anticipated by house-money effect.

Arkes, Herren and Isen (1988) suggested that positive feelings induce both risk seeking and risk aversive behavior. However, if the loss is emphasized within a positive-affect, the person shows risk aversion and as potential loss is minimized, individual becomes risk seeker. Chin (2012) reported that behavioural biases hinder investors from making rational decisions. They found that biases such as overconfidence, conservatism bias and regret influence investors' decision making. However, they did not find any relationship between herding behavior and investor decision making.
Bailey and Kinerson (2005) investigated the impact of "experienced regret" and "anticipatory regret" on risk tolerance on the individuals financial decisions. They found that anticipatory regret does not affect the investment decision behaviour. However, the experience of regret attenuates the willingness of the person to make the same investment decision.

Dimmock (2005) investigated whether loss aversion explains the differences among households’ behavior in participating in equity market and in the allocation of their wealth to equity markets. He found that higher loss-aversion causes lower probability of participating and a lower allocation to risky assets.

Feng and Seasholes (2005) found that neither sophistication nor trading experience alone eliminates biases in the investors. However, sophistication and trading experience together eliminates the biases. Kezdi and Willis (2003) investigated the role of expectations and beliefs on stock market participation. They developed a model of portfolio selection which indicates that both stock ownership and the probability of becoming a stockholder are positively related to the clarity of their expectations and indices level.

Brown et al. (2004) investigated the link between geography and stock market participation. They found two distinct local area effects. They found that investment decision of a person is affected by their community members. It was also found that this influence is more in the individuals who are less financially sophisticated. Bonaparte and Alok Kumar (2011) investigated how political activism is related to stock market participation. They reported that individuals who are more politically active prefer more stocks in their investments. Stock market participation and political orientation were found to be highly correlated when various factors such as income, wealth and education were controlled (Kaustia & Torstila, 2010).

Ali (2011) reported that perceived risk, returns and trust directly influence the trading decisions of the investors. They also found that attitude plays a mediating role while taking a decision to invest in stocks after finalising their perceptions about the financial performance of a particular company. Financial advice was found to be the major factor that influences individuals' willingness to invest in risky assets. It was found that for low financial capability individuals, trust is crucial determinant to increase their investment in stocks (Georgarakos & Inderst, 2011).

Bailey, Kumar and Ng (2011) examined the influence of behavioural biases on
mutual fund choices. They found that investors who are behaviourally biased are more likely to take poor investment decisions, specifically decisions related to their fund style, expenses, trading frequency. Harreveld, Pligt and Nordgren (2008) examined the influence of base rate information on the performance of others who experienced regret. It was found that experienced regret attenuates while base rate information showed that most of other individuals made even worse decision than they themselves.

Ngoc (2014) reported that investors should be cautious from herding, regret aversion, overconfidence, gambler's fallacy, loss aversion, anchoring bias, mental accounting and also from price changes, market information. Babajide and Adetiloye (2012) reported that though the biases such overconfidence, loss aversion, framing, status quo biases and myopic loss averse exists in the security market of Nigeria, but they do not influence the market.

Seppala (2009) investigated whether behavioural biases like hindsight, overconfidence and self-attribution possessed by investment advisors have any impact on client's decision making who take the advices of these advisors. The results revealed that investment advisors exhibit all these three biases though hind sight bias is the least shown. Tochkov (2009) found that poor anticipation of regret increases the risk preferences which further leads to excessive gambling.

Riaz, Hunjra and Azam (2012) showed that risk propensity is the most critical factor influencing the investor's decision making. The finding also suggested that the effect of problem framing on investor decisions is partially mediated by risk perceptions. It was also found that knowledge of investment, investors' biases and risk in the investment are required for rational decision making and an accurate assessment of the stock market. They also found that risk perception mediates the effects of other factors on investment decision making.

Laakso (2010) found that all factors such as risk aversion sociability, trust, political orientation, cognitive skills, life satisfaction and religion are major drivers of stock ownership. Merton, (1969) reported that individual differences in portfolio composition are due to the difference in risk preferences of the individuals Risk aversion not only influences portfolio composition of the investors, but also the decision to become a stockholder. Risk aversion reduces the willingness to invest in risky instruments. With increase in wealth, risk aversion decreases. Further, women
were found to be more risk averse than men (Jianakoplos & Bernasek, 1998).

The same propositions related to the impact of behavioural biases on risk preferences and impact of risk preferences on stock market participation are applicable in all the models (Model 2-6).

2.1.1.2 Hypotheses of Cognitive Abilities Model

It can be seen from review of literature (section 2.1.1) that cognitive abilities affect behavioural biases such as loss aversion and regret and also influence financial decision making such as stock market participation and risk preferences of the investors. In addition to the above, from section 2.1.1.1 it is also clear that behavioural biases influence financial decision making of the investors.

For example, Cole and Shastry (2009) found that individuals with high cognitive abilities hold more risky financial assets such as stocks, bonds, mutual funds, and savings accounts. Further, cognitive abilities not only have direct effects on stock market participation; but also have a negative influence on behavioural biases (loss aversion and regret) (Benjamin, Brown & Shapiro, 2006); and a positive effect on risk preferences (Angrisani & Casanova, 2010); behavioural biases are negatively related to risk preferences (Hopfensitz & Wranik, 2008) and risk preferences positively influence stock market participation. By extending this line of thinking, this study proposed and tested the model presented in Figure 2.
Figure 2. Proposed Path Model between Cognitive Abilities and Stock Market Participation.
Based on the model in Figure 2, the following hypotheses were formulated:

H₂a: Cognitive ability has direct and positive effect on stock market participation.
H₂b: Cognitive ability is negatively related to loss aversion.
H₂c: Cognitive ability is negatively related to regret.
H₂d: Cognitive ability is positively related to risk preferences of the investors.
H₂e: Loss aversion is negatively related to risk preferences.
H₂f: Regret is negatively related to risk preferences.
H₂g: Risk preferences are positively related to stock market participation.
H₂h: Cognitive ability has an indirect effect on stock market participation through loss aversion, regret and risk preferences of the investors.

2.1.2 Emotional Intelligence

Earlier only the cognitive aspect of intelligence was considered by psychologists. However, later many researchers recognized the importance of the non-cognitive aspects of intelligence. David Wechsler (1940) brought the idea of using both non-intellective as well as intellective elements of intelligence. Wechsler (1958, p.7) defined intelligence as "the aggregate or global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment". Many researchers considers the importance of non-cognitive aspects of intelligence for success like Salovey and Mayer (1990, p. 189) defined "emotional intelligence as, "the subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions". They categorized emotional intelligence into four different factors "the perception of emotion, the ability to reason using emotions, the ability to understand emotion and the ability to manage emotions".

Several theorists have proposed that emotional intelligence (EI) predicts an individual’s decision in various aspects. Carmelli (2003) reported that emotional intelligence amplifies positive work attitudes, altruistic behaviour and work outcomes. The behavioural finance explored various behavioural biases out of which some are caused by memory, some by habits and some more due to emotions.
Emotional intelligence and other psychological factors are strongly related to financial decision making in varied contexts (Ameriks, Wranik & Salovey, 2009).

Each emotion has a distinct effect on risky decisions. Fear makes a person risk-averse while anger makes a person risk-seeker in the risky choices. Similarly, sadness biases the preference towards high risk/high reward option while anxiety biases the preference towards low risk/low reward option (Lerner and Keltner 2000; Raghunathan, 1999). Kugler, Ordonez and Connolly (2009) found that in lottery-risk tasks fearful participants were more risk-averse as compared to angry participants. People predict their feelings about the outcome of their decisions and finally use these predictions to guide their choice in future. It was found that people prefer the risky gamble which maximizes their pleasure (Mellers, Schwartz & Ritov, 1999).

Lin *et al.* (2006) suggested that endowment only occurs when the individuals were induced to feel happy and not when the individuals were induced to feel sad. Lee and Andrade (2011) investigated the impact of investors' fear on their decision to sell a liquid asset. It was found that fearful people sell stock earlier as compared non fearful people.

Shahzad, Sarmad, Abbas and Khan (2010) found that emotional intelligence predicts performance of the employees. They also found that social awareness and relationship management are strong determinant of employee's performance. However, self awareness, self management are weakly correlated with employee's performance.

People with induced positive emotions prefer low-risk, whereas people with induced negative emotions prefer high-risk deck (Zhao, 2006). Risk taking is influenced with changes in fatigue and while concomitant changes in anxiety or depression cause a small change in risk taking behaviour (Hockey, Maule, Clough & Bdzola, 2000). Negative affect induces people to engage in risky decisions because of the depletion caused by active mood regulation attempts (Bruyneel, Dewille, Franses & Dekimpe, 2009).
Ameriks, Wranik and Salovey (2009) investigated the relationship between the psychological variables and investment decisions. The results showed that individuals with high EI were more conservative and less aggressive in risk taking than individuals with low EI. Impulsiveness is strongly related to high transaction activity, actively managing mutual funds and index funds. In addition, individuals who scored high on conscientiousness were less likely to adopt new investment strategies. Boyer (2006) suggested that cognitive capacities and emotional regulation decrease the probability of risk-taking behaviors of the individuals.

Azouzi and Jarboui (2013) found that CEOs emotional intelligence was positively correlated with their overconfidence and optimism, but negatively correlated with loss aversion which makes them to choose more debt investment projects. Hassan, Shahzeb, Shaheen, Abbas and Hameed (2013) suggested that affect heuristic, fear and anger influence the judgments and decision making of Pakistani investors. Huy (2002) showed that the development CEOs' emotional intelligence capabilities reduce their behavioural biases and ensure effectiveness in their decisions.

Ayranci (2011) found that that spiritual and emotional intelligences together do not influence financial performance. However, individually, the components of spiritual and emotional intelligences are weakly correlated with their financial performance. Telle, Senior and Butler (2011) showed that participants with high emotional intelligence make better decisions in a social gambling task than participants with low emotional intelligence.

In view of the above findings, it can be concluded that emotional intelligence is positively related to stock market participation and risk preferences and also negatively related to behavioural biases (loss aversion and regret). It means that individuals with low emotional intelligence are more prone to behavioural biases such as loss aversion and regret and show less stock market participation and risk preferences in their investments.

With respect to connectivity of Impact of Behavioural Biases on risk preferences and impact of risk preferences on stock market participation please refer to section 2.1.1.1 on p 15-20.
Based on the above review of literature (2.1.2) it can be concluded that emotional intelligence affects behavioural biases such as loss aversion and regret and also influences financial decision making such as stock market participation and risk preferences of the investors. In addition to the above, from section 2.1.1.1 it is also clear that behavioural biases influence financial decision making of the investors.

For example, Ameriks, Wranik & Salovey, (2009) found that psychological factors associated with different aspects of financial decision making, such as frequency of such as transactional activity, the decision to invest in stocks and the use of actively managed mutual fund. This shows that emotional intelligence also has positive, significant effect on stock market participation. Moreover, (i) it also has negative influence on behavioural biases (Azouzi & Jarboui, 2013), and (ii) positive effect on risk preferences (Yaghoubi and Poori, 2011). Behavioural biases are negatively related to risk preferences (Hopfensitz and Wranik, 2008) and risk preferences in turn positively influence stock market participation (Laakso, 2010). In view of above premises, the model for emotional intelligence was formulated as presented in Figure 3.
Figure 3. Proposed Path Model between Emotional Intelligence and Stock Market Participation
Based on the model in Figure 3 following hypotheses were formulated:

H₃ᵃ: Emotional Intelligence has direct and positive effect on stock market participation.

H₃ᵇ: Emotional Intelligence is negatively related to loss aversion.

H₃ᶜ: Emotional Intelligence is negatively related to regret.

H₃ᵈ: Emotional Intelligence is positively related to risk preferences of the investors.

H₃ᵉ: Loss aversion is negatively related to risk preferences.

H₃ᶠ: Regret is negatively related to risk preferences.

H₃ᵍ: Risk preferences are positively related to stock market participation.

H₃ʰ: Emotional Intelligence has indirect effect on stock market participation through loss aversion, regret and risk preferences of the investors.

2.1.3 Self-Esteem

Self-esteem makes the person capable to subsist in the primary provocations of life. Increase or decrease in the self-esteem leads to major successes and failures in life. It rises if someone wins a contest, and falls if someone fails. Several theorists proposed that self-esteem affects individual decisions in variety of contexts. People construct their choices not only considering objective attributes of choice alternatives, but also take into consideration the damage to self-esteem which results from a poor decision outcome (Joseph, Larrick, Stelle & Nisbett, 1992. Individuals with low self-esteem show more rigorous emotional reactions to failure than high self esteem individuals. The difference in the emotional reactions between high and low self esteem individuals is present only for emotions such as pride and humiliations which have direct implications to self and not for the emotions such as happiness and unhappiness which do not have direct implications to self (Brown & Dutton, 1995).
Brockner, Wiesenfeld, and Raskas (1993) suggested that individuals with low self-esteem protect themselves more in order to minimize bad things while individuals with high self-esteem people make more risky choices. Josephs, Larrick, Steele, and Nisbett (1992) reported that individuals with low self-esteem lack the self-protective resources therefore take less risk as compared to individuals with high self-esteem.

Individuals with low self esteem and higher anxiety were more risk averse due to over generalizing the implications of negative feedback. (Wray & Stone, 2005). Chatterjee and Finke (2010) found that high self-esteem individuals invest in assets with high yield and earn more wealth than low self-esteem individuals. Petit, Tcherkassof and Gassmann, (2011) found that low self-esteem people will choose more frequently the safe option than high self-esteem people.

Yang, Dedovic and Zhang (2010) showed that with respect to the behavioural assessment of the risk-taking decision-making, no difference was found between the high self esteem and the low self esteem individuals. They suggested that the individuals with high self-esteem experience more emotional signals during decision-making as compared to individuals with low self-esteem.

Hagan (2008) showed that financial self-efficacy (FSE) was found to be a significant predictor of stock market participation and financial information seeking. It was also found that general self-efficacy (GSE) is directly related to financial information seeking. However, GSE and stock market participation were not related with each other.

With respect to the connectivity **Impact of Behavioural Biases on risk preferences and impact of risk preferences on stock market participation please refer to section 2.1.1.1 on p. 15-20.**
2.1.3.1 Hypotheses of Self-Esteem Model

It can be concluded from the above literature (section 2.1.3) that self-esteem is related to investment decision making. Chatterjee and Finke (2010) found that individuals with high self-esteem invest in assets which have high yield and which multiply their wealth as compared to individuals with low self-esteem. According to the researcher's knowledge, the relationship between self-esteem and behavioural biases has not been clearly identified. Past research assumed that similar to cognitive abilities and emotional intelligence, self-esteem also has an indirect effect on stock market participation through loss aversion, regret, and risk preferences of the investors. Model presented in Figure 4. was formulated on the basis of the above observations.
Figure 4. Proposed Path Model between Self-Esteem and Stock Market Participation
Based on the model in Figure 4, following hypotheses were formulated:

H₄a: Self-Esteem has direct and positive effect on stock market participation.
H₄b: Self-Esteem is negatively related to loss aversion.
H₄c: Self-Esteem is negatively related to regret.
H₄d: Self-Esteem is positively related to risk preferences of the investors.
H₄e: Loss aversion is negatively related to risk preferences.
H₄f: Regret is negatively related to risk preferences.
H₄g: Risk preferences are positively related to stock market participation.
H₄h: Self-esteem has an indirect effect on stock market participation through loss aversion, regret and risk preferences of the investors.

2.2 Gender and age differences in behavioural biases, stock market participation and risk preferences of the investors.

Dwyer, Gilkeson and List (2002) investigated gender differences in risk tolerance among mutual fund investors and found that women prefer less risk in their latest, largest and riskiest investments of mutual funds. However, when the investors’ knowledge was controlled, the impact of gender difference on risk taking decreases. Women are more shy, risk averse and less confident than men (Beckmann & Menkhoff, 2008).

Hallahan, Faff and McKenzie (1999) analyzed the effect of demographic variables on risk tolerance of the investors. They reported that risk tolerance has positive relation to gender, income and wealth, and has negative relation to marital status and age. Women prefer risky assets only if they are employed and hold higher inherited wealth. However, men prefer risky assets if they are divorced, educated and old (Embrey & Fox, 1997). Highly educated men who are near to retirement and have experience of investments were found to more overconfident. (Bhandari & Deaves, 2006).

Bajtelsmith and Bernasek (2001) explored health and retirement study of older Americans to examine the determinants of portfolio allocation in risky assets of individual household portfolio. It was found that more wealthier the investor is the more is their portfolio allocation in risky assets. They also found that demographic
factors such as age, gender, income and marital status are major determinants of risky investment behavior.

Wang and Hanna (1997) carried out the survey of consumer finances to find the effect of age on risk tolerance. They reported that if other variables such as income are controlled then risk tolerance increases with age. Age, gender and income have nonlinear relation with risk tolerance. Risk tolerance attenuates as the number of dependents increases and also decrease as age of the individual escalates. (Hallahan, Faff, & McKenzie, 2009).

Beckmann, Lutje and Rebeggiani (2007) investigated Italian mutual fund industry and compared Italian professional with Germans. They reported that Italian females are risk averse and preferred passive portfolio management as compared to Italian males. It was also reported that Germans take more risk than Italians. Xiao (1996) carried out a survey of consumer finance to find effects of income and other life cycle factors on the financial asset ownership. He reported that middle age young group families are more likely to own risky assets such as bonds, and stocks as compared to older age group families.

Kornoitis and Kumar (2007) found that investment skills of old investors at the age of 70 get deteriorated because of the cognitive aging. They also reported that they hold less risky assets, prefer more diversification and trade rarely. People are loss averse in the both riskless and risky choice tasks. Loss aversion increases with age, income, and wealth, and decreases with education in both choice tasks (Gächter, Johnson & Herrmann, 2010).

Risk tolerance is negatively related to age and is positively related to height and parental education in the case of females (Dohmen, Falk, Huffmann, Sunde, Schupp & Wagner, 2005). Age was found to be negatively related with risk taking ability of the investors. However, no difference was found between males and females with respect to risk taking ability of the investors of Rajasthan (Jain & Mandot, 2012).
Borghans, Golsteyn, Heckman and Meijers (2009) reported that women show more risk aversion as compared to men. They found a strong relationship between psychological factors and risk aversion. However, they did not find any significant correlation between psychological factors and ambiguity aversion.

Obamuyi (2013) found that the major determinants of Nigerian investors are the stocks past performance, bonus, dividend rules, and expected earnings of the company. In addition, age, gender, marital status and educational qualifications also influence the investment decisions of Nigerian investors. Fisher (2010) reported that women had lower risk tolerance as compared to males.

The above studies clearly indicate that investors' exhibit various psychological biases such as loss aversion, regret, endowment effect, and others which subsequently affect their financial decision making. However, loss aversion and regret are negatively related to cognitive abilities and emotions and self-esteem. Individuals with low cognitive abilities, low emotional intelligence and low self-esteem exhibit more loss aversion and regret. Moreover, females are found to be more prone to risk in financial decision making as compared to males.

With respect to the connectivity **impact of behavioural biases on risk preferences and impact of risk preferences on stock market participation** please refer to section 2.1.1.1 on p 15-20
2.2.1 Hypotheses on Age and Gender Model

The above review of literature (section 2.2) shows that age and gender affect behavioural biases such as loss aversion and regret and also influence financial decision making such as stock market participation and risk preferences of the investors. In addition to the above, from section 2.1.1.1, it is also clear that behavioural biases influence financial decision making of the investors. For example, women prefer fewer stocks as compared to men (van Rooij et al. 2011). Age and gender not only have a direct effect on stock market participation, but also (i) have an indirect effect on stock market participation; (ii) influence on behavioural biases (Gachter, Johnson & Herrmann, 2010); and (iii) positive effect on risk preferences (Yaghoubi and Poori, 2011). These behavioural biases are negatively related to risk preferences (Zeelenberg & Pieter's, 2004) which in turn positively influence stock market participation (Laakso, 2010). Thus, the models presented in Figures 5 and 6 were developed.
Figure 5. Proposed Path Model between Age and Stock Market Participation
Based on the model in Figure 5, following hypotheses were formulated:

Age, is taken as a dummy variable. The value taken is unity if the respondent is in the age group 41-55 years and zero if the respondent is in the age group 25-40 years. Therefore a positive relation of age with the behavioural biases indicates that individuals in the age group 41-55 years are more prone to behavioural biases and a negative relation of gender with the stock market participation and risk preferences indicates that individuals in the age group 41-55 years prefer less stocks and less risk preferences in their investments.

H₅ₐ : Age is negatively related to stock market participation.
H₅₉ : Age is positively related to loss aversion.
H₅ᵄ : Age is positively related to regret.
H₅₆ : Age is negatively related to risk preferences of the investors.
H₅₇ : Loss aversion is negatively related to risk preferences.
H₅₈ : Regret is negatively related to risk preferences.
H₅₉ : Risk preferences are positively related to stock market participation.
H₅₀ : Age has an indirect effect on stock market participation through loss aversion, regret and risk preferences of the investors.
Figure 6. Proposed Path Model between Gender and Stock Market Participation
Based on the model in Figure 6, following hypotheses were formulated:

Gender is taken as a dummy variable. The value taken is unity if the respondent is female and zero for males. Therefore, a positive relation of gender with the behavioural biases indicates that females are more prone to behavioural biases and a negative relation of gender with the stock market participation and risk preferences indicates that females prefer fewer stocks and have less risk preferences in their investments.

H₆ₐ: Gender is negatively related to stock market participation.

H₆₇: Gender is positively related to loss aversion.

H₆₈: Gender is positively related to regret.

H₆₉: Gender is negatively related to risk preferences of the investors.

H₆₁₀: Loss aversion is negatively related to risk preferences.

H₆₁₁: Regret is negatively related to risk preferences.

H₆₁₂: Risk preferences are positively related to stock market participation.

H₆₁₃: Gender has an indirect effect on stock market participation through loss aversion, regret and risk preferences of the investors.

The above studies clearly indicate that various psychological (cognitive abilities, emotional intelligence and self-esteem) and demographical (age and gender) factors directly influence financial decision making of the investors. Moreover, behavioural biases such as loss aversion and regret are negatively related to cognitive abilities, emotional intelligence and self-esteem. In addition to this, there are gender and age differences with respect to loss aversion and regret. The present study attempts to study how the psychological and demographical factors indirectly influence financial decision making of the investors.