Self -Esteem as Determinant of Investors'Risk Tolerance: Mediating Role of Loss Aversion and Regret

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Abstract: The present study investigated how self-esteem affects risk tolerance of the investors in their investment decision making through psychological biases such as loss aversion and regret. A total of 360 males (graduate and above) of the age group 25-40 years from northern part of India participated in the study. Loss aversion was measured by lottery choice task experiment and the level of regret was measured by giving regret inducing situation followed by decision regret scale. The extent of risk tolerance of the individuals was studied by eliciting information regarding their investments using a questionnaire. Conceptual framework was formulated and tested using AMOS 20. The results supported our proposed hypotheses. It was found that low self-esteem individuals showed more loss aversion and regret as compared to the higher self-esteem individuals. In addition to this, low self-esteem individuals prefer less risk as compared to the higher self-esteem individuals. It was also found that loss aversion and regret act as mediating variables between the effect of self-esteem on the risk tolerance of the investors in their investment decisions. These results have several important implications for investors, researchers, financial planners, advisors and others.

Keywords : Self-Etseem, Loss Aversion, Regret and Risk Tolerance

1.0 Introduction

People make a variety of decisions such as political, personal, medical, career, investment, so on and so forth. Investment decision making is referred to as specification of where, when, how, and how much capital has to be spent and invested to earn profits. Risk Tolerance is one of the most important aspects of investment decision making. Stock market crash in 2008 in India leads to increased volatility and fluctuations in the stock market, which shattered the confidence of the investors and makes them more risk averse. Therefore, it becomes very important both on collective and individual level to find out the factors that influence investors' risk tolerance. An enormous array of studies suggested that various behavioral biases influence risk tolerance of the investors. Dimmock (2005) reported that the individuals who show more loss-aversion participate and allocate less in risky assets. Bell (1982) and Sugden (1985) suggested that investors base their decision not only on expected value of payoffs but also on expected

regret. Thus, they will try to make choices in the future that minimize the amount of regret. Dupont and Lee (2002) found that endowment effect, status quo bias and loss aversion are one of alternative explanations for willingness to pay for a good (WTP) and the minimum compensation demanded to part from the good (WTA).

Though all individuals experience different behavioral biases such as loss aversion regret and others, yet the extent of psychological discomfort associated with these biases varies from person to person It is because psychological characteristics such as cognitive ability, emotional intelligence, self-esteem and self-efficacy can indirectly affect the amount of loss aversion and regret the individual experiences at the time of financial decision making. There are a few studies which support a relationship between psychological characteristics and behavioral biases. Albaity, Rahman and Shahidul (2014) reported that individuals with low cognitive ability are more impatient and are more conserved means underestimate the correct probability as compared to individuals with high cognitive ability. Hopfensitz and Wranik (2008) found that individuals with low self-efficacy show more myopic loss aversion as compared to individuals with high self-efficacy. Joseph, Larrick, Stelle and Nisbett (1992) reported that individuals with low self- esteem, make more regret minimizing choices as compared to high self-esteem individuals.

Various researchers have found that various personality factors influence investors' risk tolerance. Carducci and Wong (1998) investigated the influence of personality factors on financial risk taking in everyday money matters. They suggested that Type A individuals prefer more financial risks as compared to Type B individuals. Individuals with higher self-esteem invest in higher-yielding assets such as stocks, bonds, IPO's etc. and accumulate more wealth than those with lower self-esteem (Chatterjee & Finke, 2009). Brockner, Wiesenfeld, and Raskas (1993) suggested that low self-esteem individuals take less risk in order to protect themselves from bad thing happenings while high self-esteem individuals enhance themselves by taking more risk. Corter and Chen (2006) found that investors who scored high on risk-tolerance questionnaire tend to have higher-risk portfolios. In addition to this, they reported that most experienced investment prefers higher-risk portfolios as compared to less experienced investors.

It is evident from the above studies that the investors' risk tolerance is affected by various psychological characteristics such as self-efficacy, self-esteem and behavioral biases such as loss aversion and regret. However, no attempts have been made to unravel the linkage between self- esteem, behavioral biases and risk tolerance of the individuals.

1.2 Conceptual Framework

Previous studies have shown that self-esteem affects behavioral biases and risk tolerance of the investors. Individuals with low self-esteem show more loss aversion and regret as compared to individuals with high self-esteem. Similarly, Individuals with low self-esteem prefer fewer risks as compared to individuals with high self-esteem (Brockner, Derr, & Laing, 1987; Brockner, Wiesenfeld & Raskas, 1993; Chatterjee & Finke, 2009). We argue that self-esteem affects psychological biases such as loss aversion and regret

and these psychological biases subsequently affect risk tolerance of the individuals in investment decisions. The aim of the present study is to construct conceptual framework where loss aversion and regret act as mediating variables between self-esteem and risk tolerance of the investors in their investment decision making.

Therefore, the present study formulated the following conceptual models to investigate the path regarding how self-esteem affects investors' risk tolerance of the investors through psychological biases such as loss aversion and regret. It is clear from Fig. I that self-esteem act as an antecedent of psychological biases such as loss aversion and regret and these psychological biases further influence the risk tolerance of the investors.

Insert Figure I about here

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The dimensions of the conceptual model in an investment context can possibly help to improve the accuracy of the investment decisions by building the knowledge of how self-esteem determines psychological biases such as loss aversion and regret which further influence risk tolerance of the investors

1.3 Hypotheses

Based on the above model the following hypotheses have been formulated

Model I: Self Esteem and Risk Tolerance

H_1: Individuals with low self-esteem show more loss aversion as compared to individuals with high self-esteem.

H_2: Individuals with low self-esteem regret more as compared to individuals with high self- esteem.

H_3: Individuals who show more loss aversion prefer fewer risks in their investments than individuals who show less loss aversion

H_4: Individuals who regret more prefer fewer risks in their investments than individuals who regret less.

H_5: Individuals with low self-esteem take less risk as compared to individuals with high self- esteem.

2.0 Method

The study was designed to investigate whether investors' loss aversion, regret, and risk tolerance varied as a function of the amount of esteem-protective resources they possessed, as measured by the Rosenberg Self-Esteem Scale. The present study used a survey approach to collect data from individual investors and used AMOS 20 to test the hypotheses of the above conceptual models. This software is used for structural equation modeling (SEM). It provides various methods for estimating structural equation models such as Maximum likelihood estimates, Unweighted least squares, Generalized least squares, Browne's asymptotically distribution-free criterion, Scale- free least squares and Bayesian estimation. It also provides various model fit indices such as Goodness of fit, comparative fit indices and others evaluate how well the model fits the data.

2.1 Participants

A total of 360 males (graduate and above) of 25-40 years age group from northern part of India volunteered to participate in the study. The researcher tried to get the information regarding annual income of investors, but they were averse to provide their income. Therefore, the present study could not control income variable. The target group was professionals from various financial organizations, businessmen, and teachers.

2.3 Design

Self-esteem was the exogenous variable, whereas loss aversion, regret and risk tolerance were the endogenous variables. Mediational analysis was conducted using AMOS 20.0 to find the path coefficients for all variables. The conceptual model provides quantification of the relationship between each of the exogenous as well the endogenous variables according to the following equations:

1) LAi= β 0+ β1 Di,SE + e; 2) REGi = β 0+ β1 Di,SE + e; 3) RPi=β 0+ β1 Di,SE + e; 4) RPi= β 0+ β1 Di, LA + e; 5) RPi= β 0+ β1 Di, REG + e

Where SEi, the self-esteem score for respondent i calculated based on the answers to Rosenberg self-esteem scale. LAi is the loss aversion score for the respondent icalculated in lottery choice task experiment based on their switching point from the sure outcome to lottery. REGi is the regret score for respondent icalculated by decision regret scale. RPi is the risk preference score for respondent icalculated based on the answers to questionnaire (Appendix C).

2.4 Tools used

Loss aversion: To measure loss aversion we used a modified version of lottery choice task developed by Gachter, Johnson and Hermann (2010) which was originally developed by Fehr and Goette (2007). Individuals have to decide whether they want to accept sure outcome or the lottery (Appendix A). Loss aversion was measured by investors' switching point from sure outcome to choose the lottery. Higher the switching point, the higher is the subject's loss aversion.

Regret: Regret was measured by giving a regret inducing situation to the investors, which was modified, and derived from Ratner & Herbst (2005). It is a situational anticipated regret. They were asked to read the situation in which they had to invest Rs. 50000 with one of the two brokers (Broker A and Broker B) for the period of one year. After taking the decision, investor were asked to judge whether their decision was right or wrong if the broker chosen by you get failed after one year. After this decision regret scale (Connor, 1996) was administered to gauge the extent of regret experienced by the investors (Appendix B).

Risk Tolerance: A questionnaire was used to measure the extent of risk tolerance of the investors. Investors have to choose one of the best options out of the given options for each of the seven questions (Appendix C). The above questions asked to elicit the information about the preference are derived from questions generally asked by financial planners, advisors from the sites such as humfauji .com and duswealth.com to measure the risk tolerance of their clients or customers.

3.0 Results

3.1 Correlation and Regression

There is a significant correlation of self-esteem with loss aversion (r = -.133, 360) and regret (r = -.224, 360). We also found that self-esteem is significantly correlated with risk tolerance (r= .190, 360) of the investors. For further confirmation, we computed a linear regression and found that self-esteem is a predictor of loss aversion (B= -.032), (F (1,360) = 6.445, p<.05), regret (B= -.284), (F (1,360) = 18.89, p<.001), and risk tolerance (B= .223), (F (1,360) =13.38, p<.001).

3.2 T-Test

Individuals having very high and very low scores on self-esteem were identified. Two extreme categories, low and high self-esteem were chosen on the basis of mean (20.30) and half standard deviation (SD= 1.90) values of 360 investors who were surveyed to study their financial behavior. Those who scored half standard deviation below mean, i.e. <18were considered as low scorers and those who scored half standard deviation above mean i.e. >22 were considered as high scorers. The extent of loss aversion, regret, and risk tolerance of all these participants was measured and compared between high and low scorers of self-esteem.

Insert Table I about here

It is clear from the Table I that the difference in loss aversion and regret between low self-esteem (M = 2.03) (M = 16.39) and high self-esteem (M = 1.74) (M = 13.15) is significant (t (210) = 2.28, p < .05), (t (210) = 4.66, p < .001) respectively. The difference between low self-esteem (M = 18.66) and high self-esteem (M = 20.74) is also significant (t (210) = -3.23, p < .01) for risk tolerance. It indicates the individuals with low self-esteem show more loss aversion and regret as compared to individuals with high self-esteem. In addition to this, they prefer fewer risks in their investments.

3.3 Path Analysis

The present study used a maximum likelihood method to measure the estimates of different variables.

Insert Table II about here

Insert Table III about here

Table II shows mean and standard deviation scores of exogenous variable that is self-esteem and endogenous variables which are loss aversion, regret, and risk tolerance. Estimates and standard errors of the parameters are shown in Table III.

Insert Figure II about here

Figure II shows that loss aversion and regret act as mediator variable between the effects of self- esteem on the risk tolerance of the investors. The data confirm all hypotheses H_1-H_5 in the model. The default model II fits the data (X2/df = .151, GFI=1.000 CFI= 1.000, NFI=0.998, TLI= 1.085, RMSEA=0.000.

The present study confirmed that self-esteem not only has direct effects on risk tolerance (H_5: β = .146, $p<0.05$) but also has indirect effects on risk tolerance through loss aversion and regret. Self-esteem is found to be significantly predictor of loss aversion (H_1: β =-0.032, $p<0.05$) and regret (H_2: β = -.28, $p<0.001$) respectively. In addition to this, loss aversion and regret significantly influence risk tolerance of the investors (H_3: β = -1.062, $p<0.001$; H_4: β = - .151, $p<0.01$). The indirect effect of self-esteem on risk tolerance through both loss aversion and regret was further verified by 95% confidence intervals which was [.036, .126].

4.0 General Discussion

The study was aimed at examining the impact of self-esteem on loss aversion and regret and their subsequent effects on the risk tolerance of the investors. The findings of the study confirmed the hypothesis that the individuals with low self-esteem show more loss aversion and more regret than the individuals with high self-esteem. It could be because of the fact that low self-esteem individuals have a few self-protective resources and cannot cope with the threat (Joseph, Larrick, Stelle and Nisbett, 1992). This makes them to be more loss averse and more regret averse.

As predicted, the present study found that individuals with low self-esteem prefer fewer risks in their investments. Presumably, it is because low self-esteem individuals are more susceptible to the feelings of loss aversion and regret. Mediational analysis in the present study proved the above presumption. It was found that loss aversion and regret act as mediating variables between the effects of self-esteem on the risk tolerance of the investors. Therefore, in order to protect from loss and regret which plummet their self-image, low self-esteem individuals prefer less risk in their investments.

Although it has been demonstrated that risk aversion varies as functions of self-esteem, but the process underlying this behavior was unclear earlier. To the best of our knowledge the present study is the first to confirm that psychological biases such as loss aversion and regret act as mediating factors which influence the linkage between self-esteem and risk tolerance of the investors in their investment decision making.

These results have several important implications for investors, researchers and others. One of the most important implications is that the investment industry should not consider investors as homogenous groups, every individual should be treated as unique and different strategies should be devised according to their characteristics while taking financial decisions. Financial advisors should take into account the impact of loss aversion and regret on financial decisions while formulating investment portfolios of the various individuals. And also practitioners and researchers, family economists and resource management professionals should design financial

products according to the profile and characteristics of every individual. Moreover, investors would not only be cognizant about their own psychological biases but would also be cautious while selecting their investment managers for their investment decisions. Investment companies

and other financial institutions would also be vigilant while recruiting the fund managers whose decisions can influence the profits of their esteemed customers.

The present study will pave the way for researchers and practitioners for future research by taking a different sample frame so as to prove the generalizability of these findings in other populations. Moreover, the researchers can also study the effect of self-esteem on other psychological biases such endowment effect, anchoring, others and their subsequent effect on financial decisions.

4.1 Conclusion

The present study proposed a model to establish the relationship between self-esteem and risk tolerance through loss aversion and regret. It was found to be a perfect fit model. Loss aversion and regret was found to be strong mediating variables between self-esteem and investor' risk tolerance in their investment decision making. The present study will enable financial professionals to learn more about psychological biases to further explore how this dimension of personality affects complex investment decisions that shape financial well-being of the individual.

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APPENDIX (A) For Loss aversion

Instructions: Assume that you are given 12 set of events where you have to choose either option (**A)** or option (**B)** for each event (1-12). Start from Row 1 and proceed further. Tick Mark the option you choose in every event (that is option A or option B)

Event No.	Safe Payment**(A)**	Vs	Lottery (**B)**

1	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 20000
2	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000. , 50% chance of **winning** Rs. Rs. 24000
3	100% chance of winning Rs. 0	Vs	50% chance of **losing**Rs. Rs. 20000, 50% chance of **winning** Rs. Rs. 28000
4	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. Rs. 20000, 50% chance of **winning** Rs. 32000
5	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 36000
6	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 40000
7	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 44000
8	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 48000
9	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 52000
10	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 56000
11	100% chance of winning Rs. 0	Vs	50% chance of **losing** Rs. 20000, 50% chance of **winning** Rs. 60000
12	100% chance of winning Rs. 0	Vs	50% chance of l**osing** Rs. 20000, 50% chance of winning Rs. 64000

APPENDIX (B) For Regret

Assume that you have Rs. 50000 to invest with one of two brokers (Broker A or Broker B). Broker A has a 43% chance of success, that your investment will increase by 15% after one year and Broker B has a 54% chance of success; that your investment will increase by 12% after one year. Which of the two brokers you would like to invest the Rs. 50000? Please circle the option you choose.

1. Broker A 2. Broker B

If the broker chosen by you in above question get failed,

Please show how strongly agree or disagree with these statements by circling number 1 (strongly agree) to 5 (strongly disagree) which best fits your decision in the above question?

1. It was the right decision

a) Strongly agree b) Agree c) Neither agree nor disagree

d) Disagree e) Strongly disagree.

2. I regret the choice that was made

a) Strongly agree b) Agree c) Neither agree nor disagree

d) Disagree e) Strongly disagree.

3. I would go for the same choice if I had to do it for again

a) Strongly agree b) Agree c) Neither agree nor disagree

d) Disagree e) Strongly disagree.

4. The choice did me a lot of harm

a) Strongly agree b) Agree c) Neither agree nor disagree

d) Disagree e) Strongly disagree.

5. The decision made was wise one

a) Strongly agree b) Agree c) Neither agree nor disagree

d) Disagree e) Strongly disagree.

APPENDIX (C) Questionnaire for Risk Tolerance

Instructions: You have to choose one of the options given from each question which suits you the best.

Q1. What proportion of your assets would you wish to invest in instruments other than risk-free deposits?

a) 0% b) Between 1 and 25%

c) Between 25% and 50% d) Between 50% and 75%

e) More than 75%

Q2.You have saved the equivalent of 10% of your gross annual salary and it is proposed that you invest this sum in a risky stock. You have a 50/50 chance that the value of your investment will triple over the next three years or that you will lose the entire amount invested. What will you do?

a) will automatically refuse the proposal.

b) will carefully examine the proposal and then refuse.

c) will have difficulty making a decision.

d) will carefully examine the proposal and then accept.

e) will automatically accept the proposal.

Q3. If you had to invest 2, 00000 which of the following investment choices would you find most appealing?

a) 60% in low-risk investments 30% in medium-risk investments 10% in high-risk investments b) 30% in low-risk investments 40% in medium-risk investments 30% in high-risk investments c) 10% in low-risk investments 40% in medium-risk investments 50% in high-risk investments.

Q4. You are on a TV game show and can choose one of the following. Which would you take?

a) 10,000 in cash b) A 75% chance of winning 25000

c) A 50% chance at winning 50,000 d) A 25% chance at winning 1,00,000

e) A 5% chance at winning 1,000,000

Q5. Suppose the markets go through a difficult period, what decrease in the value of your investments could you tolerate?

a) No decrease b) Less than 5%

c) Between 5% and 10% d) Between 10% and 20%

e) Over 20%

Q6. Investments carrying a higher risk come with a bigger chance of achieving higher returns, but also a bigger chance of incurring substantial losses. Each investor has a different appetite for risk. Suppose you had 1 crore to invest which of following return scenarios would be most attractive?

a. Between a loss of 2% and a gain of 13%

b. Between a loss of 12% and a gain of 28%

c. Between a loss of 26% and a gain of 46%

d. Between a loss of 50% and a gain of 100%

Q7. Please tick which of the following portfolio volatilities would you be most comfortable with? (Assume an inflation rate of say 3% p.a.)

Year	1	2	3	4	5

Portfolio A	5%	5%	5%	5%	5%
Portfolio B	-5%	11%	3%	15%	-2%
Portfolio C	10%	-10%	8%	0%	20%
Portfolio D	38%	-17%	-5%	14%	26%
Portfolio E	15%	18%	-28%	63%	32%

Note: Each question was coded from 1 to 5 or 1 to 4 or 1 to 3 according to number of options having in each question and then they are totaled up to get scores of risk tolerance with higher scores indicating higher risk tolerance.

Table I Descriptive Statistics

	Low Self esteem	High Self esteem

Loss Aversion	N=92 X=2.03 SD=.900	N=108 X=1.74 SD=.874
Regret	N=92 X=16.39 SD=4.30	N=108 X=13.15 SD=5.33
Risk Tolerance	N=92 X=18.66 SD=4.65	N=108 X=20.74 SD= 4.43

Table II Mean and Standard Deviation Scores

	Self Esteem	Loss-aversion	Regret	Risk-Tolerance
Mean	20.30	1.89	14.79	19.63
SD	1.90	0.45	2.41	2.23

Table III Regression weights

	Estimate	S.E.	C.R.	P
Loss-Aversion <--- Self-Esteem	-.032	.012	-2.542	.011
Regret <--- Self-Esteem	-.284	.065	-4.353	000
Risk-Tolerance <--- Self-Esteem	.146	.060	2.414	.016
Risk- Tolerance <--- Regret	-.151	.047	-3.208	.001
Risk- Tolerance <--- Loss-Aversion	-.1.062	.248	-4.282	.000

Fig. I Path for Self-Esteem and Risk Tolerance

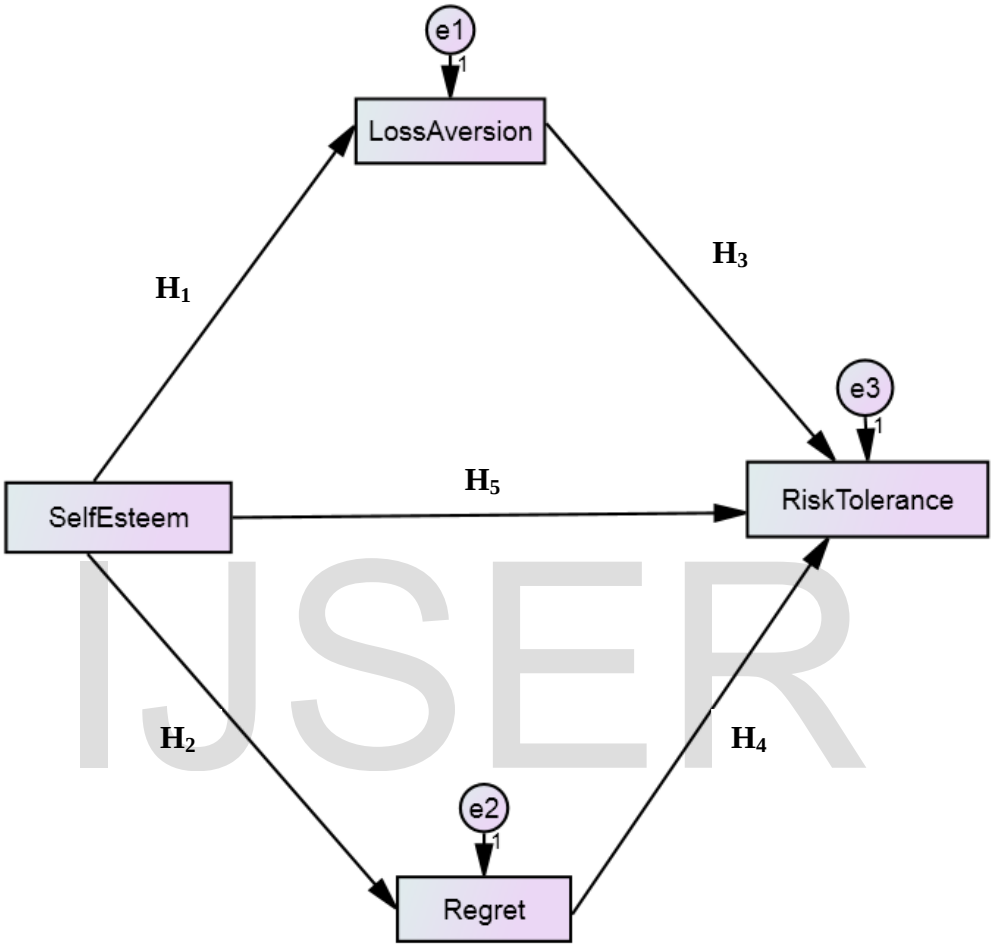

Fig. II Path values for Self-Esteem and Risk Tolerance