SELF-ESTEEM AS DETERMINANT OF INVESTORS' STOCK MARKET PARTICIPATION: MEDIATING ROLE OF RISK PREFERENCES AND BEHAVIORAL BIASES

Muskaan ARORA and Santha KUMARI

Thapar University, India

The present study investigated how self-esteem affects stock market participation through risk preferences and behavioral 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. Conceptual framework was formulated and tested using AMOS 20.0. Loss aversion was measured by lottery choice task experiment and the level of regret was measured by a regret inducing situation followed by decision regret scale. The extent of stocks preference and risk preferences of the individuals was studied by eliciting information regarding their investments using a questionnaire. The results supported our proposed hypotheses. Mediation analysis proved that the impact of self-esteem on stock market participation not only operates through risk preferences of the investors but also through loss aversion and regret.

Key words: self-esteem, loss aversion, regret, risk preferences and stock market participation

INTRODUCTION

Investment decision making is referred to as specification of where, when, how and how much income have to be spent and invested to earn profits. The most important aspect of investment decision making is stock market participation. Stock market crash in 2008 in India leads to increased volatility and fluctuations in the stock market, which shattered the confidence of the investors. Therefore, it becomes very important both on a collective and on an individual level to find out the reasons why people shy away from stock market participation. Recently, various theories have begun to examine the psychological and personality determinants of investment decision making. Previous studies have suggested that there are various psychological factors such as cognitive abilities, emotional intelligence, and personality factors such as self-efficacy, self-esteem that influence the stock market participation of the investors. Chatterjee, Finke, and Harness (2009) found that 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.

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Correspondence concerning this article should be addressed to Muskaan Arora, School of Humanities and Social Sciences, Thapar University, P.O. Box 32, Bhadson Road, Patiala 147004, India (e-mail: muskaan.arora0606@gmail.com).

Individuals with poor cognitive abilities have difficulty in gathering and processing information and problem in learning different financial products due to which they participate less in stocks as compared to individuals with high cognitive abilities (Cole & Shastry, 2009).

In studying the influence of self-esteem on stock market participation, the second matter of concern is that through what channels this work. It could be risk preferences or non-preference channels (behavioral biases) through which self-esteem influences stock market participation. Various researchers have found that self-esteem and risk preference is positively related. 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. In addition to the above, few of the studies indicated that low self-esteem individuals are more prone to loss aversion and regret. Josephs, Larrick, Steele, and Nisbett (1992) reported that individuals with low self-esteem make more regret minimizing choices as compared to high self-esteem individuals. Hopfensitz and Wranik (2008) found that individuals with low self-efficacy show more myopic loss aversion as compared to individuals with high self-efficacy. Therefore, we assume that self-esteem is an important determinant of both risk preference and behavioral biases which further drive the interest of investors in stock market participation.

The Present Study

Previous studies robustly supported the linkage between self-esteem and stock market participation of the investors. Self-esteem was found to have a strong and important relationship with stock market participation, where lower self-esteem is, in general, related to lower stock market participation and vice versa (Chatterjee et al., 2009). While studying the influence of self-esteem on stock market participation, the second matter of concern is about the channels how this works. To take a step further, this is the first study to summarize the mechanisms that how self-esteem influences on individual stock market participation. It has been previously discussed that factors, such as risk preferences and behavioral biases could intervene in the relationship between self-esteem and stock market participation. Therefore, a mediational analysis was considered in order to understand the complexities of the relationship between self-esteem, loss aversion, regret, risk preferences and stock market participation of the investors. Mediation occurs when a given variable function as a mediator between the predictor variable and the outcome variable (Baron & Kenny, 1986). In this case, the predictor variable is self-esteem, the possible mediating variables are risk preferences and behavioral biases such as loss aversion and regret and the outcome variable is stock market participation. The reason for this mediation hypothesis is that previous studies have generally been unable to shed much light on the mechanisms through which personality factor such as self-esteem influence stock market participation the investors. The importance of explicating, the mechanisms through self-esteem influences stock market participation is that by understanding these mechanisms leads to the advancement of knowledge and will help in all appropriate portfolios to the investors.

The aim of the study is to formulate a mediational model in order to explain a

differential impact of self-esteem on stock market participation of the investors through risk preferences of the investors and also through behavioral biases such as loss aversion and regret. Therefore, an attempt was made to test the mediation models shown in the following figures which made the ensuing predictions. First, the present study hypothesized that individuals with low self-esteem show more loss aversion and regret as compared to individuals with high self-esteem. Second, we hypothesized that low self-esteem individuals prefer less risk in their investments as compared to high self-esteem individuals. Third, we predicted that low self-esteem individuals participate less in stocks as compared to high self-esteem individuals. Fourth, the present study predicted that risk preference is the mediating variable between self-esteem and stock market participation. Lastly, we hypothesized that the behavioral biases such as loss aversion and regret act as an underlying pathway between the effects of self-esteem on stock market participation.

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 investment decisions of the investors.

Fig. 1. Path for Self Esteem and Stock Market Participation through Risk Preferences

Fig. 2. Path for Self Esteem and Stock Market Participation through Behavioral Biases

METHOD

The study was designed to investigate whether investors' loss aversion, regret, stock market participation and risk preference varied as a function of the amount of esteem-protective resources they possessed, as measured by the Rosenberg self-esteem scale (Rosenberg & Simmons, 1972). The present study used a survey approach to collect data from individual investors and used AMOS 20.0 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 to evaluate how well the model fits the data.

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.

Design

The present study consists of two parts. In the first part self-esteem was the exogenous variable whereas loss aversion regret, stock market participation were the endogenous variables. In part two all the variables are same except risk preference as one of the endogenous variable. Mediation 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:

$$\begin{aligned} 1) LA_i &= \beta_{0+} \beta_1 D_{i,SE} + e; & 2) REG_i &= \beta_{0+} \beta_1 D_{i,SE} + e; & 3) SMP_i &= \beta_{0+} \beta_1 D_{i,SE} + e \\ 4) RP_i &= \beta_{0+} \beta_1 D_{i,SE} + e & 5) SMP_i &= \beta_{0+} \beta_1 D_{i,LA} + e & 6) SMP_i &= \beta_{0+} \beta_1 D_{i,REG} + e; \\ 7) SMP_i &= \beta_{0+} \beta_1 D_{i,RP} + e; \end{aligned}$$

Where SE, the self-esteem score for respondent i calculated based on the answers to Rosenberg self-esteem scale (Rosenberg & Simmons, 1972). LA_i is the loss aversion score for respondent i calculated in lottery choice task experiment based on their switching point from sure outcome to lottery. REG_i is the regret score for respondent i calculated by decision regret scale. SMP_i is the stock market participation score for respondent i calculated based on the answers to questionnaire (Appendix A). RP_i is the risk preference score for respondent i calculated based on the answers to questionnaire (Appendix B).

Tools used

Loss aversion: To measure loss aversion we used modified version of lottery choice task developed by Gachter, Johnson, and Herrmann (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, 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 and 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 (O'Connor, 1996) was administered to gauge the extent of regret experienced by the investors (Appendix B).

Stock market participation: It was measured by a self-designed questionnaire which consisted of 4 questions to elicit how much they invest in stocks, how much is their investments in equities and others (Appendix C). They have to choose one of the five options which suit them the best in each question. The reliability of Stock market participation is .765.

Risk Preference: A questionnaire was used to measure the extent of risk preference of the investors. Investors have to choose one of best options out of the given options for each of the five questions (Appendix

D). 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. The reliability of Risk Preference is .710.

RESULTS

Correlation Analysis

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 stock market participation ($r = .200, 360$) and risk preferences ($r = .192, 360$). The detailed correlations between the independent and dependent variables are shown in Table 1.

Path Analysis

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

Table 2 shows mean and standard deviation scores of exogenous variable that is self-esteem and endogenous variables which are loss aversion, regret, stock market participation and risk preference. Estimates and standard errors of the parameters are shown in Table 3 and 4.

The study depicted the default model and the significance of its relationships is given in Fig. 3 and Fig 4. The results confirmed our expectations that both risk preferences and

Table 1. Correlation Analysis

	Self Esteem	Loss Aversion	Regret	Stock Market Participation	Risk Preferences
Self Esteem	1	-.133*	-.224**	.200**	.192**
Loss Aversion	-.133*	1	.050	-.144**	-.210**
Regret	-.224**	.050	1	-.157**	-.181**
Stock Market Participation	.200**	-.144**	-.157**	1	.262**
Risk Preferences	.192**	-.210**	-.181**	.262**	1

* $p < .05$, ** $p < .01$

Table 2. Mean and Standard Deviation Scores

	Self Esteem	Loss-aversion	Regret	Stock market participation	Risk-Preference
Mean	20.30	1.89	14.79	9.61	15.7
SD	3.80	0.90	4.83	3.34	3.66

Table 3. Regression weights

	<i>Estimate</i>	<i>S.E.</i>	<i>C.R.</i>	<i>P</i>
Loss-Aversion $\leftarrow$ Self-Esteem	-.032	.012	-2.542	.011
Regret $\leftarrow$ Self-Esteem	-.284	.065	-4.353	.001
Stock-Market-Participation $\leftarrow$ Self-Esteem	.140	.046	3.010	.003
Stock-Market-Participation $\leftarrow$ Loss-Aversion	-.432	.190	-2.272	.023
Stock-Market-Participation $\leftarrow$ Regret	-.080	.036	-2.205	.027

Table 4. Regression weights

	<i>Estimate</i>	<i>S.E.</i>	<i>C.R.</i>	<i>P</i>
Stock-Market-Participation $\leftarrow$ Self-Esteem	.137	.045	3.035	.002
Risk-Preference $\leftarrow$ Self-Esteem	.185	.050	3.713	.001
Stock-Market-Participation $\leftarrow$ Risk-Preference	.212	.047	4.533	.001

Fig. 3. Path Values for Self Esteem and Stock Market Participation through Risk Preferences

Fig. 4. Path Values for Self Esteem and Stock Market Participation through Behavioral Biases

non-preferences channels that are loss aversion and regret act as mediating variables between the effects of self-esteem on stock market participation of the investors. The direct effect of self-esteem on stock market participation was significant (H_3 : $B_3 = .137$, $p < 0.01$; H_8 : $B_8 = .140$, $p < 0.01$) respectively as indicated in Fig. 3 and Fig. 4. The indirect effect on stock market participation through risk preferences ($B_1.B_2 = .039$, $p < .001$), was also significant. A bias- corrected bootstrap 95% Confidence Interval (CI) also validates that the indirect effect for stock market participation through risk preferences [.017, .073] for self-esteem. Similarly, the indirect effect from both behavioral biases that are loss aversion and regret ($B_4.B_6 + B_5.B_7 = .036$, $p < .01$), were also significant. It was further proved by 95% CI which were [.009, .068] for non-preference channels that are both loss aversion and regret. In addition, the individual indirect effect of loss aversion ($B_3 = .014$, $p < 0.01$) and regret ($B_3 = .023$, $p < 0.01$) were also significant. It was further proved by 95% CI levels. The lower and upper bounds of the CI level were, for loss aversion [.003, .035] and for regret [.003, .052]. If zero is included in the upper and lower bounds of confidence limits then the indirect effect is not significant and if upper and lower limits did not include zero then the indirect effect is statistically significant.

GENERAL DISCUSSION

The main goal of this study was to propose a mediational model for explaining the path between self-esteem and stock market participation. The results of the present study provide an integration of several important aspects of self-esteem, risk preferences, loss aversion, regret and stock market participation by examining their interrelationships. The variations in loss aversion, regret and risk preferences play a significant mediating role between self-esteem and stock market participation. Main results have confirmed the proposed model of analysis, pointing that the impact of self-esteem on stock market participation not only operates through risk aversion but also through behavioral biases 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 (Josephs et al., 1992). This makes them to be more loss averse and more regret averse. Similarly, the present study found that individuals with low self-esteem prefer less risk preferences in their investments as compared to individuals with high self-esteem. This finding is in line with earlier work done on self-esteem and risk tolerance. Low self-esteem and higher anxiety individuals were more risk averse due to over generalizing the implications of negative feedback. (Wray & Stone, 2005; Kernis, Brockner, & Frankel, 1989).

As predicted, the present study found that individuals with low self-esteem participate less in stocks as compared to individuals with high self-esteem. The plausible explanation for this could be that low self-esteem individuals are more risk averse and are more prone to behavioral biases such as loss aversion and regret. Mediational analysis in the present

study proved that risk preference and behavioral biases such as loss aversion and regret act as mediating variables between the effects of self-esteem on stock market participation of the investors. Therefore, in order to protect from loss and regret which plummet their self-image, low self-esteem individuals participate less in stocks in their investments.

Although it has been demonstrated that the stock market participation, risk aversion and behavioral biases vary as functions of self-esteem, but the process underlying this behavior was unclear earlier. The present study advances the previous findings by demonstrating that variation in risk preferences and behavioral biases play an important role in mediating the association between self-esteem and stock market participation. To the best of our knowledge the present study is the first to confirm that both risk preferences and behavioral biases such as loss aversion and regret act as mediating factors which influence the linkage between self-esteem and stock market participation of the individuals. Therefore, in order to protect from loss and regret which plummet their self-image, low self-esteem individuals participate less in stocks.

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 as endowment effect (Cao, Hirshleifer, & Zhang, 2003), anchoring (Johnson, Schnytzer, & Liu, 2009), others and their subsequent effect on financial decisions.

Conclusion

On a final note, this study has introduced the argument that loss aversion regret and risk preferences mediate the relationship between self-esteem and stock market participation. The results of this investigation were that risk preference and non-preference channels (loss aversion and regret) were found to be mediating variables between self-esteem and stock market participation. 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 losing 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 STOCK MARKET PARTICIPATION

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

1. How many different types of Stocks do you own on the average?
 - a) Less than 2 b) 2–6 c) 7–10
 - d) 10–14 e) More than 15
2. How much is your total investment in stock market annually?
 - a) Less than 25000 b) 26000–50000 c) 50000–75000
 - d) 75000–100000 e) More than 100000
3. What percentage of your income is invested in equity market?
 - a) 0–10% b) 10–20% c) 20–30%
 - d) 30–40% e) More than 40%
4. What are the approximate dividends you have earn from the stocks you recently own from the last 1 year?
 - a) Less than 2000 b) 2000–4000 c) 4000–6000
 - d) 6000–10000 e) More than 10000

Note: Each question was coded from 1 to 5 and then they are summed up to get scores of stock market participation with higher scores indicating higher stock market participation.

APPENDIX (D) QUESTIONNAIRE FOR RISK PREFERENCES

Instructions: You have to choose one of the options given for 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. 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

Q4. 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%

Q5. 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 and then they are summed up to get scores of risk preferences with higher scores indicating higher risk preferences.