INDIAN JOURNAL OF SCIENCE AND TECHNOLOGY

RESEARCH ARTICLE

Big-Five Personality Traits and Risk Perception of Women Retail Investors in the Indian Stock Market: A PLS-SEM and ANN Approach

Arfat Manzoor[1]*, Andleebah Jan[2], Mohammad Shafi[3]

1 Ph.D. Research Scholar, Department of Commerce, University of Kashmir, India
2 Ph.D. Research Scholar, Department of Management studies, IUST, Awantipora, India
3 Ex-Professor, Department of Commerce, University of Kashmir, India

OPEN ACCESS

Received: 10-04-2023
Accepted: 17-06-2023
Published: 04-07-2023

Citation: Manzoor A, Jan A, Shafi M (2023) Big-Five Personality Traits and Risk Perception of Women Retail Investors in the Indian Stock Market: A PLS-SEM and ANN Approach. Indian Journal of Science and Technology 16(26): 1958-1966. https://doi.org/10.17485/IJST/v16i26.835

* **Corresponding author**.

shaducom59@gmail.com

Funding: This research was funded by the UGC (University Grants Commission)

Competing Interests: None

Published By Indian Society for Education and Environment (iSee)

ISSN
Print: 0974-6846
Electronic: 0974-5645

Abstract

Objectives: The purpose of this study is to determine the impact of Big-Five personality traits on the Risk perception of women retail investors in North India. **Methods:** The study adopts a survey approach. The sample comprises 360 active women retail investors investing in the Indian stock exchange. This study adopts a hybrid approach to analysis. Two analysis techniques PLS-SEM and Artificial Neural Network approach are used for data analysis. **Findings:** Results of the study shows the significant impact of Big-Five personality traits on the Risk perception of retail women investors in the Indian Stock Market. PLS-SEM results showed a positive and significant impact of neuroticism (β= 0.215) and conscientiousness (β= 0.234) while a negative significant impact of extraversion (β= -0.129), openness to experience (β= -0.102) and agreeableness (β= -0.156) on risk perception. The ANN results also confirmed these results and ranked neuroticism as the most influential predictor. **Novelty:** Investor participation in Indian Stock Market has increased significantly in recent years. However, being an economic leader, Indian Stock Markets lack the participation of female investors. To improve the ratio of women investors, advisors and government plays an important role. This study is the first of its kind which involves women investors as a study sample and determines their risk perception level. The other novel factor that distinguishes this study from the previously conducted studies is its hybrid analysis approach. This study adopts both linear (PLS-SEM) and non-linear (ANN) approaches for data analysis.

Keywords: BigFive personality traits; Risk perception; Women investors; PLSSEM; ANN

1 Introduction

The large-scale spread of the Covid-19 pandemic forces business establishments across the world to wind up their operations. The financial system of not only one country but

of all affected countries was adversely affected by this fast-spreading pandemic. Many large-scale economies like the USA were severely affected by this unexpected shock[1]. Apart, from its adverse effect on business and economic operation this pandemic also provides an opportunity for individuals to look beyond their normal course of business which results in the large-scale participation of individuals in the stock market. During the Pandemic period, like other parts of the world, India also witnesses a surge in the participation of retail investors in the stock. As per the Securities Exchange Board of India, 26 lakh new demat accounts were opened in India every month in the year ending March 2022. As per the data provided by the National Stock Exchange, about 90 lakh people have hinged the legion of retail investors during the year 2021. Being the 6th largest equity market globally, India ranks in the bottom quartile when it comes to female participation in the stock markets. As per the data provided by the BrokerChooser (a platform that provides online brokerage services), the gender gap in India is about 21 females for every 100 investors, while in the Philippines this gap is very narrow (44 females for every 100 investors).

Women investors play a crucial role in economic development through their participation in the stock market. Their capital allocation, diverse investment strategies, emphasis on sustainability and responsible practices, promotion of gender diversity, role modelling and closing of the gender wealth gap collectively contribute to a more inclusive and prosperous economy. There is positive association between household savings and investments in any economy and women in India are primarily responsible for the significant percentage of savings in the country. So, contribution of women in India to investment decision-making cannot be overlooked. Women investors contribute to economic development by channelling their financial resources into the stock market. By investing in stock market, women provide capital to companies, enabling them to grow, expand their operations and create job opportunities. Increased capital allocation helps stimulate economic activity and contributes to overall economic development. The success of retail investors in the stock markets is very much based on proper investment planning and taking the appropriate investment decisions at right time. To assess investment behavior, researchers tried to explore human psychology to assess the potential linkage between their psychology and investment behavior[2]. Investment decisions of investors are determined by numerous factors and risk perception is one among them. Risk perception is a belief of an investor about the possibility of loss. It is a personal evaluation of the nature and potential consequences of a risk, which varies according to individuals and their subjective interpretation of the situation. Risk perception refers to an individual's subjective assessment and interpretation of potential risks and hazards. Risk perception plays a crucial role in decision-making, as it determines how individuals approach and manage uncertain situations and make choices to mitigate or accept risks. Risk perception itself predicted by the number of psychological factors and personality traits is argued as the most important among them[3]. A large number of studies conducted in the field of psychology have proved a strong association between the personality traits and risk behavior of investors[4].

Personality traits refer to enduring patterns of thoughts, feelings, and behaviors that shape an individual's unique character. They encompass traits such as extraversion, openness to experience, conscientiousness, agreeableness and neuroticism, influencing how individuals interact with others, approach tasks and respond to challenges in their daily lives.

The big-five personality traits; openness to experience, conscientiousness, extraversion, agreeableness and neuroticism are widely accepted and extensively researched constructs in the field of personality psychology[5]. However, their impact on the risk perception of female investors in emerging markets like India is still largely unexplored. This paper aims to examine the relationship between the big-five personality traits and the risk perception of women retail investors in India.

1.1 Literature Review

Personality traits have been found to play a significant role in influencing an individual's risk-taking behavior. From time to time several studies were conducted, that viewed personality traits as a significant determinant of an individual's risk-taking behavior. Some studies found a positive association of personality traits with risk-taking behavior and some studies found opposite results. Openness to experience and extraversion has a positive association with risk tolerance. While neuroticism, agreeableness and conscientiousness are negatively associated with risk tolerance[6]. Investors having an openness to experience as a trait of personality are more probable to have high-risk tolerance while neurotic trait discloses that negative risk-taking behavior means they tend to have low-risk tolerance[7]. The study by[8] indicated the significant linkage between neuroticism, conscientiousness and openness to experience risk aversion and found contradictory results for extraversion and agreeableness. The personality trait of extraversion has an insignificant influence on risk aversion which means these are willing to take risks while conscientiousness and openness to experience showed a positive significant impact on risk aversion which implies that these are reluctant to take a risk. Agreeableness has a negative influence on risk aversion means a tendency to take a risk[9]. Personality traits of extraversion, neuroticism and openness to experience have a significant impact on risk aversion while agreeableness and conscientiousness have insignificant linkage with risk-taking behavior. Neuroticism is positively associated with risk aversion however extraversion and openness to experience are negatively related to risk aversion. These results are consistent with the above study. Also, the study found an influence of gender on risk aversion which indicated

men as less risk averse than women[10]. The parallel study showed the negative influence of conscientiousness, agreeableness and openness to experience on the risk which implies the person who possesses more of these traits tends to lower risk tolerance and the absence of influence was found between extraversion, neuroticism and risk. Furthermore, gender also has a remarkable influence on the risk that indicates the mean of risk for males is more than the same mean for females[11]. In a similar study extraversion and openness to experience are positively linked to financial risk tolerance. However neuroticism, conscientiousness and agreeableness are negatively linked to financial risk tolerance means these are not willing to take a risk[12]. Agreeableness, extraversion and openness to experience are linked to risk tolerance while no linkage between neuroticism and conscientiousness was found with risk tolerance[13]. These results are consistent with those[14] which showed a positive relation between extraversion and risk behavior while agreeableness and conscientiousness were found negatively associated with risk behavior. In a similar study, conscientiousness and neuroticism were found consistent with risk-averse behavior[15]. However,[16] in their study observed that extraversion and openness to experience are risk-takers.

1.2 Research Gap

Although the above-cited literature clarified the link between personality traits and risk perception. However, the impact of personality traits on the risk perception of female investors in India is yet to be explored. Women investors make relatively good numbers in the Indian stock market but there is a dearth of empirical research regarding the impact of personality traits and risk perception of women investors in India. The major portion of the above cited literature clearly provides the evidence that developed countries have taken the lead in determining the women investors' investment behavior and developing countries like India are lagging far behind. So, the need is to determine the impact of two main influencing predictors (Big-Five personality traits and Risk perception) on retail women investors' investment behavior in Indian Stock Market.

Based on the above-cited literature following hypotheses have been developed which will be tested in this study.

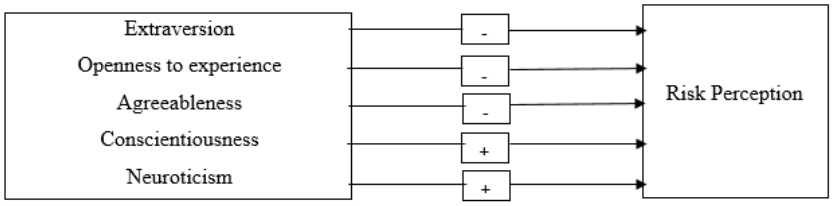

Fig 1. Hypotheses for the big-five personality traits and risk perception

2 Methodology

The current study utilizes a two-staged research methodology. PLS-SEM is used in the initial stage to test the hypothesized routes in the proposed research model. The PLS-SEM is only capable of assessing linear associations between decision variables, and it may overgeneralize the intricacies engaged in the process of decision-making in some circumstances. This flaw is resolved by the sturdiness of Neural Network (NN) modelling, which can assess both linear and non-linear associations between decision factors. As a result, Neural Network (NN) modelling was used in the second step to rank the main variables and validate the PLS-SEM results.

2.1 Methods and procedure

The respondents initially filled up the demographic information (age, marital status, education and investment experience). Then they put answers in questionnaires evaluating personality traits (independent variables) and risk perception (dependent variable). 38 items: Neuroticism (5 items), Conscientiousness (9 items), Extraversion (5 items), Agreeableness (7 items), Openness to experience (8 items) and Risk perception (4 items) were measured through standard scales adopted from existing studies. The BFI scale of[17] was used to measure Big-Five personality traits while the Risk perception scale of[18] was adopted for risk perception. All questions in the questionnaire were demarcated utilizing a Five- point Likert scale with a 1 representing "strongly disagree" and 5 "strongly agree" with exception to demographic variables.

3 Results and Discussion

3.1 Demographic profile

The focus of this study is to determine the impact of big-five personality traits on the Risk perception of Retail women investors in North India. To achieve this purpose the data was collected through multi stage cluster sampling procedure from the women retail investors in North India. In first stage of cluster sampling two states (Punjab and Haryana) and two Union Territories (Jammu and Kashmir and Delhi) were selected. In second stage, two states were further segregated into (Punjab: Amritsar, Jalandhar and Haryana: Faridabad, Gurgaon) and two UTs' were clustered into (Jammu & Kashmir: Jammu, Srinagar and Delhi: New-Delhi, Central Delhi). In total 475 survey instruments were distributed and 360 were returned which entails a 75.7% response rate. Both offline and online modes were used for the data collection. Table 1 inferred that among 360 respondents 110 belong to the age group of below 20 years, 70 belong to the age group of 20 – 30 years, 160 belong to the age group of 30-40 years and 20 respondents are above the age of 40 years. 145 respondents work in a private organization, 29 respondents work in government organizations and 186 respondents are not working. 205 respondents are married whereas the remaining 155 are unmarried. 111 respondents are undergraduates, 160 respondents are postgraduates, 44 respondents are professional degree holders and the remaining 55 are high school grads. 117 respondents have less than 1 year of investment experience, 105 respondents have 1 to 3 years of investment experience, 115 respondents have 3 to 5 years of investment experience and the remaining 23 respondents have above 5 years of investment experience.

3.2 Measurement model assessment

Measurement model assessment, also known as the outer model involves the measurement of three things as depicted in Figure 2

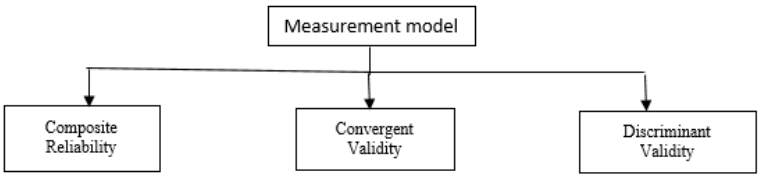

Fig 2. Measurement model

Composite Reliability: Table 1 shows that all the study constructs have achieved the suggested composite reliability threshold limit of 0.7 [19].

Table 1. Composite reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
AGR	0.856	0.861	0.892
CON	0.894	0.896	0.914
EXT	0.826	0.831	0.878
NER	0.794	0.806	0.858
OPN	0.890	0.883	0.904
RP	0.851	0.861	0.900

AGR: agreeableness, CON: conscientiousness, EXT: extraversion, NER: neuroticism, OPN: openness to experience, RP: risk perception

Convergent validity: Average Variance Extracted (AVE) was used to assess the convergent validity and here the rule is that the value above 0.5 [19] overcomes the convergent validity issue. The AVE value of all the constructs (Table 2) in this study was found above 0.5.

Discriminant validity: Heterotrait – Monotrait ratio (HTMT) proposed by [20] is an advanced method used to determine discriminant validity. HTMT considered the disattenuated correlation, a value close to 1 signals the discriminant validity issue. Table 3 shows that all the values are way below 0.9 suggested by [21].

Table 2. Average Variance Extracted

Constructs	Average variance extracted (AVE)
AGR	0.535
CON	0.541
EXT	0.589
NER	0.549
OPN	0.544
RP	0.692

AGR: agreeableness, CON: conscientiousness, EXT: extraversion, NER: neuroticism, OPN: openness to experience, RP: risk perception

Table 3. Heterotrait-Monotrait ratio

	AGR	CON	EXT	NER	OPN	RP
AGR						
CON	0.178					
EXT	0.67	0.146				
NER	0.106	0.259	0.083			
OPN	0.111	0.076	0.062	0.149		
RP	0.299	0.354	0.282	0.323	0.128	

AGR: agreeableness, CON: conscientiousness, EXT: extraversion, NER: neuroticism, OPN: openness to experience, RP: risk perception

3.3 Hypotheses Testing

To test the hypothesis of the study, structural model evaluation was conducted by applying the bootstrapping method with 360 cases, 5000 samples, a 5% significance level, and two-tailed with no sign changes. According to[19], "Bootstrapping can be said as a re-sampling approach which draws random samples with replacement from the data and uses these samples to estimate the path model multiple times under slightly changed data constellations".

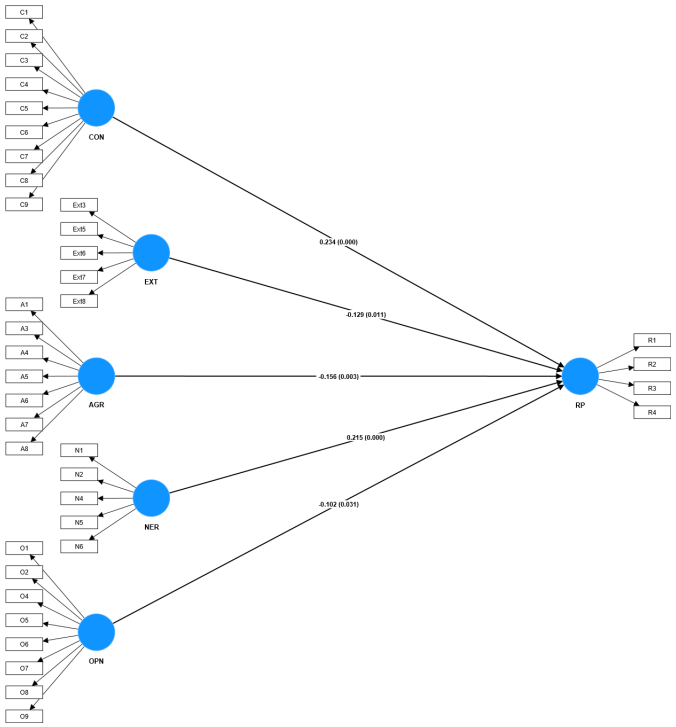

Fig 3. PLS-SEM model

Table 4. Path coefficients

Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AGR -> RP	-0.156	-0.158	0.053	2.966	0.003
CON -> RP	0.234	0.237	0.041	5.649	0.000
EXT -> RP	-0.129	-0.131	0.051	2.537	0.011
NER -> RP	0.215	0.217	0.044	4.902	0.000
OPN -> RP	-0.102	-0.115	0.047	2.157	0.031

*5% significance level

AGR: agreeableness, CON: conscientiousness, EXT: extraversion, NER: neuroticism, OPN: openness to experience, RP: risk perception

From Table 4 it is found that extraversion is having a significant and negative impact on risk perception (path coefficient= -0.129, t=2.537, $p < 0.05$). Agreeableness is having a significant and negative impact on risk perception (path coefficient= -0.156, t= 2.966, $p < 0.05$). Hence both the H1 and H2 are supported and accepted. Openness to experience is having a significant and negative impact on risk perception (path coefficient= -0.102, t= 2.157, $p < 0.05$). Neuroticism is having a significant and positive impact on risk perception (path coefficient= 0.215, t= 4.902, $p < 0.05$). Conscientiousness is having a significant and positive impact on risk perception (path coefficient= 0.234, t= 5.649, $p < 0.05$). Hence hypothesis H3 hypothesis H5 and hypothesis H4 are supported and accepted. The coefficient of determination (R^2) of the model is 0.514, which demonstrates that 51.4% of the dependent variable is determined by the independent variables in the study model.

3.4 Artificial Neural Network (ANN)

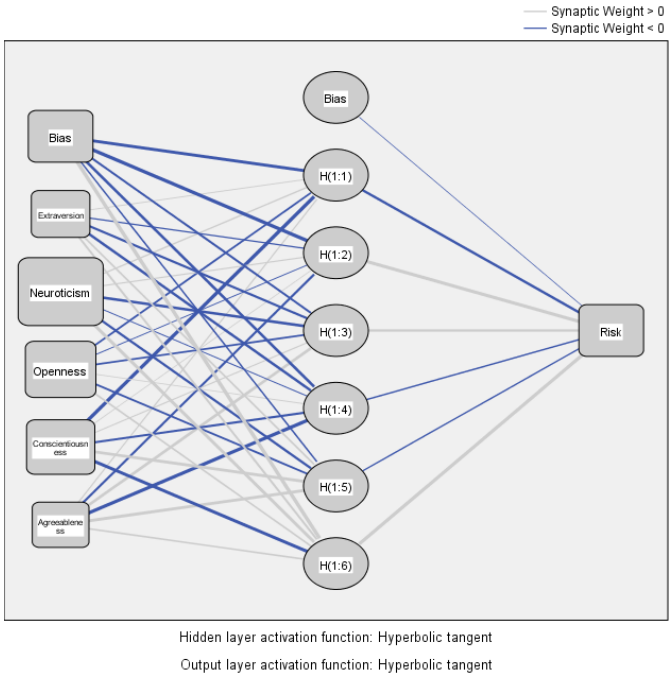

Fig 4. ANN model

ANN was carried out with the help of IBM SPSS software. As suggested by[22], 90 % of the study sample was allocated for the training procedure and the remaining 10% for the testing procedure. Root Mean Square Error (RMSE) was calculated with the 10-fold cross-validation approach to dodging the possibility of over-fitting.

The average RMSE values of both training (1.569) and testing (1.470) were found small. This shows that the model has a good fit and the error size is comparatively small.

Table 5. RMSE value

Network	Sample Size Training	Sample size Testing	Total Sample Size	RMSE Training	RMSE Testing
1	252	108	360	0.176	0.172
2	260	100	360	0.174	0.186
3	247	113	360	0.176	0.173
4	246	114	360	0.167	0.150
5	246	114	360	0.159	0.133
6	**262**	**98**	**360**	**0.127**	**0.119**
7	254	115	369	0.139	0.121
8	251	109	360	0.144	0.135
9	257	103	360	0.150	0.140
10	253	107	360	0.154	0.141
Mean				**1.569**	**1.470**
Std. Deviation				**0.015**	**0.022**
• RMSE: Root Mean Square Error					

Sensitivity analysis: To determine the predictive strength of the exogenous variables, sensitivity analysis was carried out. The normalised importance was used to determine the predictive relevance of predictors.

Table 6. Sensitivity analysis

Network	Extraversion	Neuroticism	Openness	Conscientiousness	Agreeableness
1	0.03	0.48	0.17	0.27	0.05
2	0.05	0.29	0.19	0.13	0.33
3	0.12	0.33	0.29	0.16	0.11
4	0.26	0.31	0.21	0.18	0.05
5	0.09	0.35	0.18	0.19	0.19
6	0.33	0.11	0.18	0.20	0.19
7	0.17	0.35	0.14	0.33	0.02
8	0.19	0.25	0.22	0.14	0.19
9	0.14	0.44	0.12	0.22	0.09
10	0.12	0.37	0.29	0.15	0.07
Average importance	**0.15**	**0.33**	**0.20**	**0.20**	**0.13**
Normalised Importance	**45.40**	**100.00**	**60.90**	**59.40**	**38.71**

Table 6 confirms that neuroticism is the most significant predictor of risk perception which is followed by openness to experience, conscientiousness, extraversion and agreeableness respectively.

The findings shown in the preceding section provide evidence that the research model adopted in this study is quite successful in fulfilling the objective of the study. In the first stage of the analysis, the research hypotheses were tested by the PLS-SEM approach. The findings show the Negative impact of extraversion, openness to experience and agreeableness on the risk perception of women retail investors. This shows that the women retail investors who are outspoken, cooperative and love to do new things perceive low risks or these types of women investors love the thrill and thus take high risks. These findings are in line with the findings of[7] who in their study held the same view. Hypotheses 4 and 5 were also accepted in the study which proposes the positive impact of neuroticism and conscientiousness on the risk perception of women retail investors in North India. The findings show that women investors who are high on anxious, tense and more organised and dependable perceive high risk in their investment behavior. These findings are consistent with the results of[13,14] who in their study hold the same view that neurotic and conscious investors are highly risk averse.

ANN approach was used in the 2nd stage of analysis to validate the PLS-SEM results and to label the most significant predictor. The results of sensitivity analysis confirm that neuroticism is the most significant determinant of risk perception which is

followed by openness to experience, conscientiousness and extraversion. Agreeableness is considered the least significant predictor of risk perception of women retail investors in North India. Deviance was found between the results of PLS-SEM and ANN. PLS-SEM gives more weightage to conscientiousness (β= 0.234) in determining risk perception, while ANN labels neuroticism (normalised importance= 100) as the most significant predictor of risk perception. The second significant influencing predictor as per PLS-SEM is neuroticism (β= 0.215) followed by agreeableness (β= -0.156), extraversion (β= -0.129) and openness to experience (β= -0.102). But ANN analysis shows different results, it gives second rank to openness to experience (normalised importance = 60.90) followed by conscientiousness (normalised importance = 59.40), extraversion (normalised importance = 45.40) and agreeableness (normalised importance = 38.71). The deviance between the results of these two analysis techniques is because of the robust and non-linear approach of ANN. ANN technique is free from many errors which influences the traditional linear models like sample size and normality which becomes the main reason for the results deviation.

4 Conclusion

With the rapid growth of the Indian economy, the number of women participating in the stock market has increased significantly over the years. However, women investors still face various socio-cultural barriers that affect their investment decisions and risk perception [23] . Therefore, understanding the impact of personality traits on their investment behavior and risk perception can be beneficial for financial service providers and policymakers to develop more tailored and effective investment strategies for women. This study is the first of its kind which is conducted on women retail investors in North India.

This study also adopts a unique methodology as it adopts the two-stage analysis procedure PLS-SEM approach and ANN approach. The PLS-SEM approach is a new technique based on linear principles. Linear technique suffered from the limitation of normality [24] because of which ANN technique is used to overcome this flaw of linear techniques.

4.1 Theoretical Implications

This research has significant theoretical implications, particularly in the field of behavioral finance in emerging countries like India. Many existing studies had used different models to examine the determinants of women retail investors' behavior, but the model used in this study is quite unique. It explores the impact of personality traits and risk perception on the investment decisions of the women retail investors' in Indian Stock Market. The study utilizes a unique combination of PLS SEM and neural network technique to examine the effects of different factors and rank their predictive strength.

4.2 Practical Implications

Besides having theoretical implications this study have also many practical implications. This study highlights the importance of understanding the non-rational aspects of financial decision-making, including risk perception and personality traits. It suggests that financial advisors should incorporate behavioral finance knowledge to better serve their clients and enhance the advisory process. Policymakers can use these findings to promote investor awareness and develop policies that consider both psychological factors and financial literacy to mitigate inappropriate risk perception and protect women investor interests.

4.3 Limitations and future research

Like other research studies, this study also suffers from many limitations. Firstly, this study was conducted in North India only. The future study should draw a sample from a whole country or even cross country analysis should be conducted to know the risk perception level of investors across many countries. The second limitation of this study is that it doesn't use any moderator or mediator in the relationship between personality traits and risk perception. The future study should consider the role of mediators and moderators also.

Acknowledgement

This research was funded by the UGC (University Grants Commission)

References

1) Ramelli S, Wagner AF. Feverish stock price reactions to COVID-19. 2020. Available from: https://doi.org/10.1093/rcfs/cfaa012.
2) Rao AS, Lakkol SG. A review on personality models and investment decisions. *Journal of Behavioral and Experimental Finance*. 2022;35:100691. Available from: https://doi.org/10.1016/j.jbef.2022.100691.

3) Vaibhav J, Mehak K. Impact of personality on risk tolerance. *International Journal of Indian Psych□logy*. 2020;8(4). Available from: https://doi.org/10.25215/0804.106.
4) Chhabra L. Exploring Relationship between Impulsive Personality Traits and Financial Risk Behavior of Individual Investors. *International Journal for Creative Research Thoughts*. 2018. Available from: https://ssrn.com/abstract=3994358.
5) Sutin AR, Stephan Y, Terracciano A. Psychological well-being and risk of dementia. *International Journal of Geriatric Psychiatry*. 2018;33(5):743–747. Available from: https://doi.org/10.1002/gps.4849.
6) Sadiq M, Amna H. Impact of Personality Traits on Risk Tolerance and Investors' Decision Making. *International Journal of Applied Behavioral Economics*. 2019;8(1):1–20. Available from: https://doi.org/10.4018/IJABE.2019010101.
7) Ferreira SJ. Is financial risk tolerance influenced by personality traits? *Proceedings of the 12th Economics & Finance Conference, Dubrovnik*. 2019. Available from: https://doi.org/10.20472/EFC.2019.012.005.
8) Ahmed MA, Khattak MS, Anwar M. Personality traits and entrepreneurial intention: The mediating role of risk aversion. *Journal of Public Affairs*. 2022;22(1). Available from: https://doi.org/10.1002/pa.2275.
9) Aumeboonsuke V, Caplanova A. An analysis of impact of personality traits and mindfulness on risk aversion of individual investors. *Current Psychology*. 2023;42(8):6800–6817. Available from: https://doi.org/10.1007/s12144-021-02015-9.
10) Pavlíček A, Hintošová AB, Sudzina F. Impact of Personality Traits and Demographic Factors on Risk Attitude. *SAGE Open*. 2021;11(4). Available from: https://doi.org/10.1177/21582440211066917.
11) Marwaha K. Examining the Role of Psychosocial Stressors in Hypertension. *Journal of Preventive Medicine and Public Health*. 2022;55(6):499–505. Available from: https://doi.org/10.3961/jpmph.21.266.
12) Salameh AA, Akhtar H, Gul R, Omar AB, Hanif S. Personality Traits and Entrepreneurial Intentions: Financial Risk-Taking as Mediator. *Frontiers in Psychology*. 2022;13. Available from: https://doi.org/10.3389/fpsyg.2022.927718.
13) Dhiman B, Raheja S. Do Personality Traits and Emotional Intelligence of Investors Determine Their Risk Tolerance? *Management and Labour Studies*. 2018;43(1-2):88–99. Available from: https://doi.org/10.1177/0258042X17745184.
14) Pinjisakikool T. The Influence of Personality Traits on Households' Financial Risk Tolerance and Financial Behaviour. *Journal of Interdisciplinary Economics*. 2018;30(1):32–54. Available from: https://doi.org/10.1177/0260107917731034.
15) Aren S, Hamamci HN. Relationship between risk aversion, risky investment intention, investment choices: Impact of personality traits and emotion. Kybernetes. 2020. Available from: https://doi.org/10.1108/K-07-2019-0455.
16) Joseph E, Zhang D. Personality Profile of Risk-Takers: An Examination of the Big Five Facets. *Journal of Individual Differences*. 2021;42. Available from: https://doi.org/10.1027/1614-0001/a000346.
17) John OP, Srivastava S. The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. 1999. Available from: http://www.personality-project.org/revelle/syllabi/classreadings/john.pdf.
18) Blais ARR, Weber EU. A Domain-Specific Risk-Taking (DOSPERT) scale for adult populations. *Judgment and Decision Making*. 2006;1(1):33–47. Available from: https://doi.org/10.1017/S1930297500000334.
19) Hair JF, Risher JJ, Sarstedt M, Ringle CM. When to use and how to report the results of PLS-SEM. *European Business Review*. 2019;31(1):2–24. Available from: https://doi.org/10.1108/EBR-11-2018-0203.
20) Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*. 2015;43(1):115–135. Available from: https://doi.org/10.1007/s11747-014-0403-8.
21) Jr JFH, Matthews LM, Matthews RL, Sarstedt M. PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*. 2017;1(2):107–107.
22) Leong LY, Hew TS, Ooi KB, Wei J. Predicting mobile wallet resistance: A two-staged structural equation modeling-artificial neural network approach. *International Journal of Information Management*. 2020;51:102047. Available from: https://doi.org/10.1016/j.ijinfomgt.2019.102047.
23) Menon ST. A quarter century of management research in South Asia – II: India and Pakistan. *South Asian Journal of Business Studies*. 2019;8(1):81–104. Available from: https://doi.org/10.1108/SAJBS-06-2018-0071.
24) Talukder S, Chiong R, Dhakal S, Sorwar G, Bao Y. A two-stage structural equation modeling-neural network approach for understanding and predicting the determinants of m-government service adoption. *Journal of Systems and Information Technology*. 2019;21(4):419–438. Available from: https://doi.org/10.1108/JSIT-10-2017-0096.