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Role of Psychological Factors and Market Volatility on Investors Investment Behaviour: Moderated Mediation Model

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The present study focuses on the complex relationships among financial literacy, financial risk perception, and market value, as well as psychological factors and investment behavior. The current study population includes individual investors investing in Pakistan stock exchange. The sample size of the study consisted of 500 individual investors investing in Pakistan stock exchange. The results show that whereas financial literacy significantly improves investment behavior, financial risk perception has negative connotations with it. Market value and psychological factors positively influence financial risk perception and investment behavior. The mediation analysis reveals that the component of financial risk perception partially mediates the association between market value, psychological factors, and investment behavior. Moderation analysis revealed that market value and psychological factors strengthen financial literacy's impact on investment behavior. These findings identify a need for emphasis on financial education, risk management, and psychological support in making better investment decisions. Limitations of the study were in terms of its cross-sectional design, sample size, and reliance on self-reported data; therefore, indicating avenues of future research.

1. Introduction

The financial market has a direct influence on society by acting as a central platform where several buyers and sellers come together to meet and jointly fulfill their requirements. Investors of all types strive to optimize their profits while minimizing investment risks. Individual investors usually make reasonable decisions by assessing the balance between risk and return in order to establish the most advantageous distribution of assets in their portfolio (Dixit, 2024). Investment choices are impacted by a range of elements, including both internal aspects associated with human behavior, as well as external influences tied to market performance or information.

Market volatility, on the other hand, is defined as price fluctuations caused primarily by macroeconomic events, geopolitical tensions, and other exogenous factors (Nadeem et al., 2020). Because of this aspect of market volatility, the interaction of psychological factors will cause investors to perceive financial risk differently (Pandurugan & Al Shammakhi, 2024). Financial risk perception refers to a subjective judgmental assessment of an investment's potential loss. Individual psychology and external market conditions are undoubtedly influential (Tlili et al., 2023).

Financial literacy has proven to be an effective moderator in this context. As a result, financial literacy, knowledge, and comprehension of financial concepts and products encourage positive investment behavioral changes in investors, allowing them to make better decisions and mitigate the negative effects of psychological biases brought on by market volatility (Baloch et al., 2024). Given the importance of financial literacy in moderating the relationship between psychological factors, market volatility, and investment behavior, this paper argues that it encourages beneficial investment practices (Othman et al., 2024).

However, there are still many unanswered questions and research gaps in the field of investment behavior. First, the previous researches were based on the psychological factors on the investor or market fluctuations in isolation of the two factors in relation to the investment decisions (Pašiušienė et al., 2023). Second, studies have not examined the gap between the two constructs as to how they affect the relationship. Thus, this paper aims to fill the gap in the literature to understand how financial literacy influences these processes in various economic contexts (Jagirdar & Gupta, 2024). Researchers need to provide more information about the investment behavior in order to contribute to the field (Loang & Ahmad, 2024).

This study enhances our comprehension of the mechanisms of the Pakistan derivative market and offers valuable insights that may guide the development of well-informed and logical investing strategies. This information is especially beneficial for investors as it enables them to enhance their expertise and understand the impact of psychological aspects on decision-making. This awareness enables investors to mitigate these effects and make prudent decisions. Furthermore, the results of the research might aid stock market authorities in understanding the influence of psychological elements on investor decision-making. Moreover, this study will

function as a useful repository for future academics who are interested in exploring this particular topic. Overall, this study is significant in terms of financial decision-making (Abideen et al., 2023). It adds to general knowledge by explaining psychological factors, market volatility, financial risk perception, and financial understanding as they relate to investment behavior.

2. Literature Review

There is a vast body of literature on investment decision-making behavior that has paid considerable attention to psychological factors and market volatility and their interactions, which are rather intertwined and can influence the investors' decision making to a large extent (Parihar & Gupta). This paper gives an insight on how emotions, cognitive biases and individual risk taking propensity affect investment decisions. For example,) pointed out that psychological factors such as overconfidence and loss aversion affect investments, which results in systematic deviation from the rational model (Dammak et al., 2024). Likewise, the work of in Prospect Theory highlighted the concept of loss aversion whereby it was evident that investors are more sensitive to loss than equal gain which in return influence the investor's risk taking propensity (Padmavathy, 2024).

Another challenge that is a result of globalization and technological advancements is market volatility, which is defined by the regular and unpredictable changes in asset prices (Vuković & Pivac, 2024). The study conducted by shows that with increase in market volatility, the perceived risk of the investors goes up, thereby making the investors to opt for more conservative strategies (Vinutha & Hebbar, 2024). This is in consonance with where they established that investor sentiment which is a factor of market timing may result to market anomalies and excessive variability of prices (Dixit, 2024). Hence, the psychological factors are of utmost importance in the context of market volatility as the market conditions can either enhance or suppress the impact of psychological factors on investment decisions (Che Hassan et al., 2023).

Financial risk perception which is an investor's psychological assessment of the likelihood of incurring a loss is a key moderator that links psychological factors, market volatility and investment decisions (Almansour et al., 2023). In the light of the above, risk perception can therefore be defined as a phenomenon that is influenced by the personality of the investor and the environment of the market in which investment decisions are made by the investors as proposed by (Padmavathy, 2024).Research conducted has established that risk perception is not the same across the investors, and this affects the way they allocate their assets and trade. This underlines the fact that financial risk perception should equally be included into the analysis of the impact of psychological factors and the market volatility on investors' decision-making (Kishor, 2023).

Even though the relationships between the above-mentioned variables have been confirmed, the moderating effect of financial literacy has not been thoroughly examined. The knowledge and awareness of financial ideas and products are vital for the right decision making concerning the investment. According to (Othman et al., 2024), more financial literacy in investors makes them in a better position to understand risk-reward trade-off, make better decisions that are less susceptible to psychological effects, and as such, achieve better investment results. Moreover,

the studies of (Intarawanich et al., 2024) revealed that investors with higher levels of financial literacy use appropriate strategies of investment and have minimal anxiety during market fluctuations, which can be interpreted that financial literacy acts as a moderator on the negative effects of market fluctuations (Lamichhane & Simkhada, 2024).

Even though the literature on investment behavior has progressed tremendously, there are still some areas that need to be filled (Noch & Rumasukun, 2024). The previous research has predominantly examined the psychological factors or market volatility without considering their interaction on investors' decisions (Sathya & Prabhavathi, 2024). Also, the moderating effect of financial risk perception has received limited empirical assessment especially in relation to heterogeneity in economic conditions and investors. Also, there is little research that explores how financial literacy acts as a moderator in the relationship between psychological factors and market volatility and investment behaviour (TS & Mayya). This analysis is critical to reducing the current gaps in the literature regarding the multifaceted factors that influence investment choices. Following are the hypotheses.

H1: Financial Literacy positively relates with Investment Behaviour

H2: Financial Literacy positively relates with Investment Behaviour

H3: Financial Risk Perception negatively relates with Investment Behaviour

H4: Market Value positively relates with Financial Risk Perception

H5: Market Value positively relates with Investment Behaviour

H6: Psychological Factors positively relates with Financial Risk Perception

H7: Psychological Factors positively relates with Investment Behaviour

H8: Financial Risk Perception negatively mediates the relation of Market Value and Investment Behaviour

H9: Financial Risk Perception negatively mediates the relation of Psychological Factors and Investment Behaviour

H10: Financial literacy positively moderates the relationship of Market Value and Investment Behaviour

H11: Financial literacy positively moderates the relationship of Psychological Factors and Investment Behaviour

3. Methodology

This study involved a number of individual Pakistani investors, which may include people having different income and investment attitudes. The sample size included 550 Pakistani investors to enhance the validity and generalizability of the findings. With this sample size, analysis of the research questions using advanced statistical methods like SEM was considered sufficient, which requires a large number of cases to derive reliable results. The stratified random sampling

technique was adopted for sample selection, representative of the target population on the considerations of age, gender, level of education, and previous investment experience. By doing this, the research controlled for possible demographic characteristics among investors and ensured that the results obtained were transferable. The data was collected based on a questionnaire, and the questions were developed from other previous research studies that had employed similar scales and measures. The questionnaire was divided into several parts, with each part targeting a specific area of the study.

The data analysis procedure consisted of several steps. First, frequency and percentage were used to present basic demographic information about the participants and other variables in the study. Second, the reliability and validity of the measurement scales were evaluated using pilot testing to ensure that the measures used were valid and reliable. Third, correlation and regression analyses were carried out to test the hypothesis regarding the relationships between psychological factors, market volatility, financial risk perception, financial literacy, and investment behavior. Finally, Baron and Kenny's (1986) procedure were used to investigate mediation and moderation effects using Structural Equation Modeling (SEM), providing a comprehensive view of the relationships between the variables.

4. Data Analysis

4.1 Measurement Model

Table No 1: Reliability Analysis

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Financial Literacy	0.8034	0.8156	0.8502	0.569
Financial Risk Perception	0.7738	0.8224	0.8343	0.569
Investment Behaviour	0.7766	0.7773	0.831	0.515
Market Value	0.7093	0.7365	0.7967	0.587
Psychological Factors	0.7768	0.7873	0.8399	0.633

Table 1 reliability analysis using Cronbach's Alpha, rho_A, Composite Reliability and Average Variance Extracted for different constructs—Financial Literacy, Financial Risk Perception, Investment Behaviour, Market Value, and Psychological Factors. All constructs exhibit reliabilities above the threshold; the Cronbach's Alpha ranged from 0.7093 to 0.8034; thus, the constructs were internally consistent. rho_A was a bit higher, thereby showing that these constructs were reliable. Also, the values of composite reliability, all above 0.8, confirm the constructs' reliability. From 0.515 to 0.633, the AVE values are indicative of adequate convergent validity, where each construct explains a sufficient amount of variance in its items.

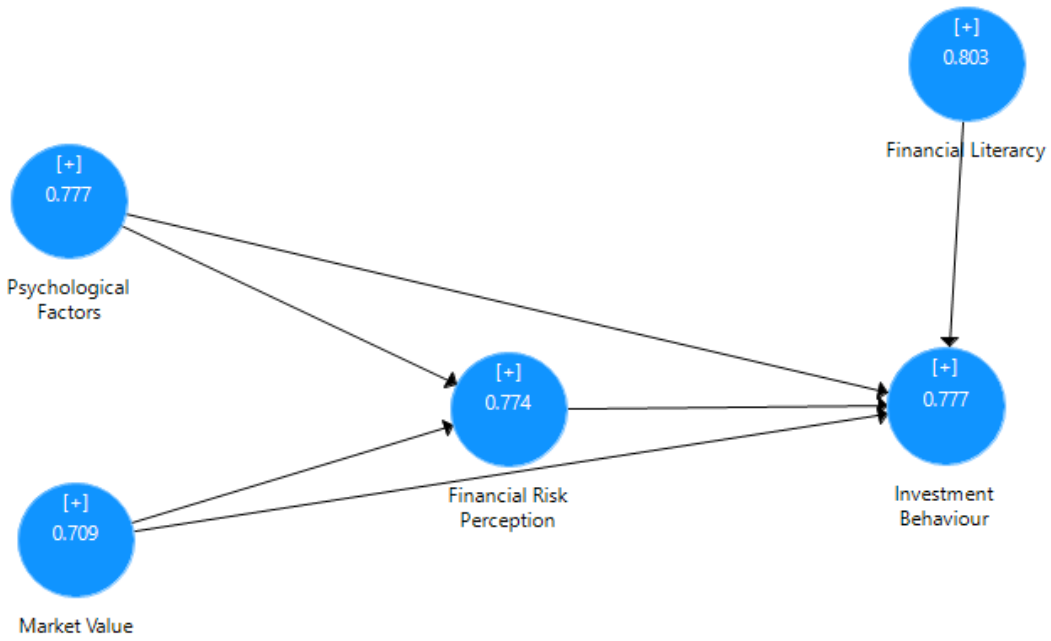
4.2 Validity Analysis (HTMT)

Table 2 shows the results of Heterotrait-Monotrait Ratio Validity Analysis for the Constructs of Financial Literacy, Financial Risk Perception, Investment Behaviour, Market Value, and Psychological Factors. The diagonal elements are zero because every construct was compared with itself. Accordingly, the HTMT values amount to a range from 0.3869 to 0.8826, thus staying below the generally accepted threshold of 0.90. Therefore, constructs can be said to have good discriminant validity in the sense that they are sufficiently differentiated from one another.

Table No 2: Validity Analysis (HTMT)

	Financial Literacy	Financial Risk Perception	Investment Behaviour	Market Value	Psychological Factors
Financial Literacy	0	0	0	0	0
Financial Risk Perception	0.5114	0	0	0	0
Investment Behaviour	0.5563	0.7824	0	0	0
Market Value	0.4542	0.5035	0.4953	0	0
Psychological Factors	0.3869	0.5436	0.5133	0.8826	0

Figure No 1: Hypothesized Research Model & Reliability Analysis



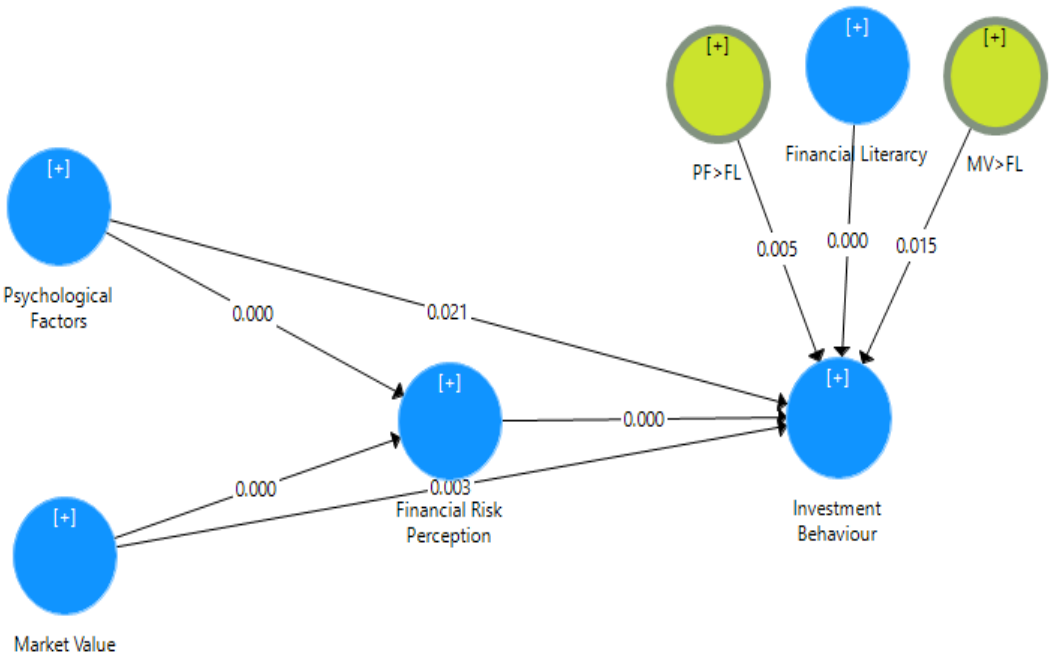
4.3 Structural Equational Model

Table 3 displays the Structural Equation Model results containing the relationships between different constructs, their original sample values (O), sample means (M), standard deviations (STDEV), T statistics, and P values. The paths from Financial Literacy to Investment Behaviour (O=1. 0208, T=177. 0568, P=0) and from Financial Risk Perception to Investment Behaviour (O=-0. 0576, T=6. 3714, P=0) show the significant effects. The effect of Market Value on the two variables is also statistically significant for Financial Risk Perception (O=0. 1756, T=4. 179, P=0) and Investment Behaviour (O=0. 0134, T=3. 0048, P=0. 0029). The psychological factors have been found to have significant impact on the Financial Risk Perception (O=0. 1567, T=3. 883, P=0. 0001) and Investment behaviour (O=0. 0089, T=2. 3228, P=0. 0209). The results further show that the relationships between Financial Risk Perception and Market Value and Psychological Factors and Investment Behaviour are significant at (P<0. 05). The results also revealed that Market Value and Psychological Factors have significant moderating effects on the relationship between Financial Literacy and Investment Behaviour at a significance level of 0.05, thus, these variables enhance the effect of Financial Literacy on Investment Behaviour.

Table 3: Structural Equational Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Financial Literacy -> Investment Behaviour	1.0208	1.0205	0.0058	177.0568	0
Financial Risk Perception -> Investment Behaviour	-0.0576	-0.0568	0.009	6.3714	0
Market Value -> Financial Risk Perception	0.1756	0.1797	0.042	4.179	0
Market Value -> Investment Behaviour	0.0134	0.0131	0.0045	3.0048	0.0029
Psychological Factors -> Financial Risk Perception	0.1567	0.1582	0.0404	3.883	0.0001
Psychological Factors -> Investment Behaviour	0.0089	0.0088	0.0038	2.3228	0.0209
Mediating Variable					
Market Value -> Financial Risk Perception -> Investment Behaviour	-0.0101	-0.0102	0.0029	3.4863	0.0006
Psychological Factors -> Financial Risk Perception -> Investment Behaviour	-0.009	-0.0091	0.0032	2.855	0.0046
Moderating Variable					
MV>FL -> Investment Behaviour	0.0063	0.0058	0.0026	2.4551	0.0147
PF>FL -> Investment Behaviour	0.0068	0.0062	0.0024	2.8492	0.0047

Figure No 2: Structural Equational Model



5.0 Discussion and Conclusion

The results of the reliability and validity analyses reveal that all the constructs that were employed in this study, namely; Financial Literacy, Financial Risk Perception, Investment Behaviour, Market Value and Psychological Factors are reliable and valid. The reliability analysis displayed that all the applied measures had Cronbach's Alpha coefficients greater than 0. All the constructs had a Cronbach's alpha of 7, which is considered high and shows internal reliability for all the constructs. Moreover, the composite reliability coefficients were above the recommended level of 0. 8, which can be considered a high level, thus supporting the validity of these constructs. The Average Variance Extracted (AVE) values for all the constructs were higher than the recommended minimum of 0. 5 indicating a high degree of convergent validity, thus supporting the scale's construct. The HTMT ratios also supported discriminant validity with all the ratios coming in below 0. Thus, the two constructs are moderately different from each other as the value is 90.

SEM helped to establish how the constructs are related to each other and analyzed the relationships between the variables. The empirical results show that Financial Literacy has a significant positive relationship with Investment Behaviour thus underlining the need to promote financial literacy among investors. On the contrary, Financial Risk Perception has a negative bearing on Investment Behaviour meaning that high levels of risk perception are likely to limit investment activities. Market Value has a positive relationship with both the variables; Financial Risk Perception and Investment Behaviour that means that higher market value is good for risk

perception as well as investment behaviour. This study supports Psychological Factors as having a positive effect on Financial Risk Perception and Investment Behaviour, thus stressing that psychological aspects are not to be neglected when it comes to financial decisions. Besides, it also established that Financial Risk Perception moderates the link between Market Value and Investment Behaviour and between Psychological Factors and Investment Behaviour as revealed by the mediation analysis. The results of the moderation analysis supported Market Value and Psychological Factors as moderators that enhance the relationship between Financial Literacy and Investment Behaviour through the interaction effects in financial decision-making process.

The analysis of the results of this study reveals the interdependence between the financial literacy, risk perception, market value, psychological factors and investment behavior. The level of financial literacy is seen to have a positive influence on the investment decision while on the other hand, financial risk perception is seen as a negative influence. Market value and psychological factors are not only the factors that directly affect investment behavior but also the factors that moderate the effect of financial literacy. The mediation and moderation effects show that the decisions made regarding the financial aspect are not straightforward and are influenced by several factors.

The following are the recommendations that can be made from the above findings. First, to enhance the investment behaviour the financial literacy levels must be raised through awareness campaigns and education. Financial institutions and policy makers should emphasis on the reduction of financial risk perception by giving adequate and accurate information about investment opportunities and risks. Furthermore, it is also important to note that having a psychologist and or a counselor can assist an individual in dealing with the anxiety that comes with finances and at the same time assist in decision making when it comes to investing. Stabilization of the economic policies and market conditions will also help in boosting the positive investment behavior. Last but not least, incorporating psychological aspects into the financial literacy initiatives would enrich the programs and lead to better financial choices.

The following are the limitations of this study. The number of participants in the study and their characteristics may restrict the applicability of the results to other people. Further research should incorporate a bigger and perhaps more diverse population to increase the generalizability of the findings. Some of the limitations of the study include; the cross-sectional design hence, cannot establish cause-effect relationship. It is suggested that longitudinal research should be conducted in order to establish the cause-effect link between the constructs in question**.**

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