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Behavioral Dynamics in Pakistani Markets: Investigating the Roles of Behavioural Biases on Investors Investment Decisions

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ABSTRACT

The main aim of this research is to examine the influence of overconfidence, herding behavior, disposition effect, and risk aversion on investors' investing choices. Moreover, the primary objective of this research is to investigate the moderating impact of financial literacy on the relationship between behavioral biases and investment choices made by investors. The demographic under investigation consists of individual investors who actively participate in investing activities inside the Pakistan Stock Exchange. The sample for this research consists of 365 individual investors. The researcher used a survey questionnaire as a means of collecting data from the participants. The researcher used a structural equation model to examine the findings. The results of this research indicate that there is a statistically significant and positive association between overconfidence, herding behavior, disposition effect, and risk aversion in the context of investors' decision-making pertaining to their investments. Moreover, the results also indicate that financial literacy assumes a moderating function in the relationship between behavioral biases and investment choices executed by investors. The implications of the study's results have considerable importance for individual investors, since they might potentially improve the accuracy of their decision-making processes.

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Introduction

Behavioral finance has attracted considerable attention in recent times, as it concentrates on understanding the psychological and cognitive factors that impact the decision-making of investors. The collective influence of behavioral biases such as overconfidence, disposition effect, risk-aversion bias, and herding behavior on investment decision-making within the Pakistani context has yet to be extensively investigated (Kim et al., 2023; Widyatama & Narsa, 2023). Moreover, the potential moderating effect of financial literacy in alleviating the adverse impacts of these biases has not been thoroughly investigated in the literature. The limitations of literature pertaining to the influence of behavioral biases and financial literacy on investor decision-making within the Pakistani context are substantial. The investigation of these subjects in various nations has provided insight; however, it is imperative to acknowledge the distinct cultural, economic, and social elements that influence investor conduct in Pakistan. The absence of region-specific research limits the applicability of results obtained from other settings, underscoring the necessity for a localized inquiry (Ansari et al., 2023; Bihari et al., 2023; Quang et al., 2023).

An essential area of concern pertains to the prevalence of overconfidence bias among investors in Pakistan. Investors who exhibit overconfidence tend to undervalue risks and overvalue their capacity to generate profits, which can result in suboptimal investment choices and heightened financial susceptibility. Furthermore, it is possible that the disposition effect, a phenomenon characterized by investors' inclination to retain underperforming investments for a longer duration than profitable ones, is widespread in Pakistan. The presence of bias may potentially result in suboptimal portfolio performance and diminished returns for investors (Goyal et al., 2023; Mishra & Mishra, 2023; Sachdeva et al., 2023).

In addition, it is noteworthy that investment decisions in Pakistan may be influenced by risk-aversion bias, which is characterized by a preference for safer options despite the possibility of greater returns, as well as herding behavior, whereby investors tend to emulate the actions of others instead of relying on their own discernment. The presence of biases can potentially result in negative consequences for portfolio diversification and overall market stability, thereby exerting an impact on the growth and development of the financial market in Pakistan (Elvira et al., 2022; Sherani et al., 2023).

The significance of financial literacy in shaping the decision-making process of investors cannot be underestimated. The acquisition of financial literacy empowers individuals with the requisite knowledge and competencies to comprehend investment instruments, evaluate potential hazards, and arrive at well-informed judgments. Research suggests that an individual's ability to comprehend financial matters at a more advanced level may aid in the identification and mitigation of behavioral biases, which could ultimately result in superior investment results (Grable & Rabbani, 2023; Mustafa et al., 2023; Mutereko et al., 2021).

The degree to which financial literacy serves as a moderator for the influence of behavioral biases on investor decision-making in Pakistan is yet to be determined. An investigation is warranted to scrutinize the correlation between financial literacy and diverse biases, with the aim of elucidating how individuals' comprehension and awareness of financial concepts could impact

their vulnerability to such biases. Furthermore, it is imperative to evaluate the efficacy of extant financial literacy programs within the nation and pinpoint prospective avenues for enhancement (Adil et al., 2022; Gupta & Shrivastava, 2022).

The main research question of this study is to investigate whether behavioral biases effect on investors investment decision? And also, whether financial literacy mediates the relationship between observed variables? The specific research questions of the study are as follows:

- Does over-confidence effect on investors investment decision?
- Does herding behavior effect on investor’s investment decision?
- Does disposition effect on investor’s investment decisions?
- Whether risk aversion effect on investor’s investment decisions?
- Does financial literacy moderate the role of financial literacy between behavioral biases and investors investment decisions?

2.0 Literature Review

2.1 Theoretical Background of the study

Ajzen (1991) took the idea of rational action and developed it into what we now call the theory of planned behavior (TPB). One of the legitimate notions that may describe human behavior is the TPB. Attitudes and the belief that one can exercise some degree of control over one's actions are two examples of the motivating elements this theory identifies as influencing human behavior. One definition of attitude is "the degree to which an individual is praised or criticized for engaging in a certain behavior." Also, the TPB uses factors like how much control an individual feels they have over their behavior to make predictions about their likely future actions when no choice is involved (Conner & Sparks, 2005). The theory of planned behavior postulates that an individual's behavior intentions and actions are heavily influenced by that person's attitude toward behavior, subjective standards, and theory of planned behavior (TPB) (Conner, 2015).

2.1 Overconfidence and Investment Decision

The study conducted by D'Acunto (2015) revealed that the phenomenon of overconfidence significantly influences the conduct of retail investors, resulting in suboptimal investment outcomes and increased trading activity. Muneeswaran, Babu, Gayathri, and Indhumathi (2020) studied the impact of various behavioral biases upon the financial decision-making of retail investors and found the overconfidence bias has a significant effect on the decision-making of retail investors. Shahid, Aftab, Latif, and Mahmood (2018) found that the S&P 500 faced the problem of inflated because of over-optimistic behavior and overconfidence bias of investors. The irrational behaviors are attached to the retail investors and influence institutional investors' decision-making. According to Waweru, Munyoki, and Uliana (2008), overconfidence bias affected the investment decisions making of institutional investors on the Nairobi stock exchange. The study conducted by (Lakshmi & Minimol, 2016) aimed to examine the influence of overconfidence on investment performance and trading behavior in times of elevated market volatility. The findings of their research indicate that investors who exhibit overconfidence tend to engage in excessive trading, particularly in times of market stress, which ultimately results in diminished overall returns. Based on the above discussion it is hypothesized that:

H1: There is a significant effect of overconfidence on Investors investment decisions

2.2 Herding Behavior and Investment Decision

The herding effect refers to the tendency of individuals to imitate the actions or decisions of others, particularly in the context of financial markets. This phenomenon has gained significant attention in understanding the behavior of retail investors (Quang et al., 2023). Evidence from China illustrates the herding tendency of retail investors, which was studied by Satish and Padmasree (2018) This research investigates the effect that retail investors' tendency to follow the herd has on the volatile nature of China's stock market. According to the findings, herding is a crucial factor in the development of higher market volatility, especially when bear markets are prevalent. Additional rational herding in the field of financial economics. The writers of this paper examine the logic behind herd mentality in the financial world via their research. They provide a model that explains herding on the basis of informational asymmetry and strategic interactions among the animals. The study sheds insight on the possible logical reasons that underlie herding behaviors.

In the domains of finance and economics, the influence of herd mentality on the actions of retail investors has been the topic of a significant amount of study (Raut, 2020). Moreover, herding can result in individual investors deviating from their risk preferences or long-term investment strategies, potentially leading to suboptimal investment outcomes (Saraih et al., 2017). Studying the herding effect on retail investors' behavior provides insights into market dynamics, investor psychology, and the functioning of financial markets (Adil et al., 2022). By understanding the drivers and implications of herding, policymakers, market participants, and regulators can develop measures to mitigate its negative effects and promote informed decision-making among retail investors (Mishra & Mishra, 2023). Based on the above discussion it is hypothesized that:

H2: There is a significant effect of herding behavior on Investors investment decisions

2.3 Disposition Effect and Investment Decision

According to Guenther and Lordan (2023) the phenomenon known as the disposition effect has been extensively researched and observed as a behavioral bias that impacts the decision-making processes of individual investors in financial markets. The disposition effect pertains to the inclination of investors to retain underperforming investments for an extended period while disposing of profitable investments prematurely. The presence of bias holds significant implications for both investment performance and market efficiency. This essay aims to present a succinct overview of the disposition effect, encompassing its conceptualization, theoretical foundations, empirical substantiation, and plausible justifications (Da Costa Jr et al., 2013).

Furthermore, the disposition effect provides insight into the impact of taxes on investment behavior. Individual investors may opt to postpone the sale of investments that have yet to be realized in order to defer tax obligations, or alternatively, choose to liquidate investments that have yet to be realized in order to take advantage of tax benefits. Tax implications can have an impact on investment decisions, which may lead to a deviation from the ideal portfolio allocation (Quang et al., 2023). By acknowledging the correlation between taxes and the disposition effect, investors and advisors can devise investment strategies that are tax-efficient and consistent with the

investor's long-term objectives. To summarize, the disposition effect is a crucial factor in comprehending the behavior of retail investors. The impact of cognitive bias on investment performance, emotional biases, portfolio management, and tax considerations highlights the importance of investors and advisors being cognizant of and remedying this bias. Through this approach, investors can enhance their decision-making process, circumvent illogical conduct, and enhance their overall investment results (Shandu & Alagidede, 2022). Based on the above discussion it is hypothesized that:

H3: There is a significant effect of disposition effect on Investors investment decisions

2.4 Risk Aversion and Investment Decision

According to Zalata et al. (2022) the behavior of retail investors is influenced by a psychological phenomenon known as risk aversion bias. The phenomenon being referred to is the propensity of individuals to exhibit a preference for loss aversion as opposed to gain acquisition, even in cases where the potential outcome is identical. The presence of bias holds considerable significance as it has the potential to impact investment choices, the process of portfolio diversification, and the overall state of financial welfare. This essay aims to explore the concept of risk aversion bias, including its definition, underlying factors, observable expressions, and influence on the investment decisions of retail investors (Bauer et al., 2023).

The propensity of risk aversion among retail investors in Pakistan may have wider implications for the efficacy of the capital markets. The stock market's liquidity can be reduced due to excessive risk aversion, as investors may exhibit a decreased willingness to engage in equity buying and selling. Consequently, this can lead to an elevation in bid-ask spreads, obstruct the process of price discovery, and impede the efficiency of the market. The suboptimal functioning of the market may have a dampening effect on the participation of institutional investors and the inflow of foreign capital, thereby constraining the overall advancement and expansion of the capital markets in Pakistan (Adil et al., 2022). The promotion of financial literacy and investor education among retail investors in Pakistan is deemed essential in mitigating the adverse effects of risk-aversion bias. Providing investors with knowledge regarding the fundamental concepts of risk and return, the advantages of diversification, and the enduring possibilities of equities can aid in debunking fallacies and promoting a more equitable investment strategy. Enhancing transparency and trust within the financial system may mitigate the risk aversion of retail investors, thereby promoting a more dynamic and effective capital market (Ahmed et al., 2022).

Based on the above discussion it is hypothesized that:

H4: There is a significant effect of risk aversion on Investors investment decisions

2.5 Moderating Role of Financial Literacy

It has been determined that financial literacy is an essential aspect that may assist investors in making informed investment choices and avoiding irrational behavior in the market. According to a number of studies, having a strong understanding of finances may lessen the influence of cognitive biases on investment choices and boost the efficiency of financial education programs. (Agnew & Harrison, 2015). In addition to this, it has been shown that one's level of financial literacy might limit the connection between important aspects and the process of investment

decision-making. For instance, Rajasekaran (2019)found that one's level of financial literacy moderates the link between one's risk tolerance and investing decision-making. A similar finding was made by Rahayu et al. (2022), who found that a person's level of financial literacy moderates the association between experience in the stock market and investing decision-making.

The significance of financial literacy cannot be overstated in the context of retirement planning for individual investors. Retirement savings accounts, such as 401(k) plans or individual retirement accounts (IRAs), are commonly utilized by individuals as a means of ensuring their financial stability post-employment. Insufficient financial literacy could impede investors from optimizing their utilization of retirement accounts. Individuals may lack comprehension regarding the tax ramifications, constraints on contributions, and range of investment alternatives at their disposal (Tang et al., 2015). Through the acquisition of financial literacy, retail investors are empowered to make informed decisions regarding their retirement savings, optimize tax benefits, and secure a comfortable retirement. In addition, the acquisition of financial literacy assists retail investors in effectively maneuvering the dynamic realm of financial offerings and amenities. The financial sector consistently introduces novel investment vehicles, banking amenities, and financial innovations. The emergence of digital currencies and web-based investment platforms has created novel opportunities for individual investors (Tang et al., 2015). Based on the above discussion it is hypothesized that:

H5: There is a significant moderating effect of financial literacy between overconfidence, herding behavior, disposition effect, risk aversion and Investors investment decisions

3.0 Methodology

The term "research design" pertains to the comprehensive blueprint and framework of the investigation. The present study will employ a cross-sectional survey design. Data was gathered from a subset of investors through the utilization of a survey questionnaire. This particular design facilitates the acquisition of data at a designated moment and facilitates the analysis of interrelationships among variables (Bloomfield & Fisher, 2019). The researcher used positivism philosophy to conduct this research. As the nature of the research is quantitative and deductive approach was used by researcher to conduct this research, therefore this type of research method is consider most reliable (Ryan, 2006).

The utilization of a quantitative approach enables the examination of proposed explanations and the application of statistical techniques to derive significant inferences (Verschuren, 2003). The study was used a cross-sectional survey methodology to gather information from a selected group of investors. The study was employed structured questionnaires to gather quantitative data on the variables of interest. In order to promote impartiality and reduce partiality, the investigator was adhered to rigorous protocols throughout the entirety of the research endeavor. The survey instruments will be meticulously crafted to guarantee precision and impartiality. The queries was undergo scrutiny and authentication by specialists in the respective domain to ascertain their dependability and accuracy (Halbesleben et al., 2009). The investigator was furnishing unambiguous directives to the subjects to ensure uniformity in their answers.

Additionally, the survey was conducted in an anonymous manner to promote candid and impartial responses from the participants. In order to augment the impartiality of the research, a heterogeneous cohort of investors will be chosen to mitigate any probable predispositions. The study will employ a cross-sectional methodology, gathering information at a singular instance. This methodology facilitates the analysis of the interrelationships among variables at a particular point in time, thereby yielding valuable insights into the extant associations (Dyckhoff & Kasah, 2014). The process of data collection was span a duration of three months, wherein the survey will be disseminated to prospective respondents. The designated timeframe facilitates the acquisition of a satisfactory sample size and guarantees a suitable portrayal of the populace.

The retail investors who are actively interested in investing on the Pakistan Stock Exchange in Lahore make up the research population for this study. The study was conducted in Lahore. Individuals who invest their own money in the stock market are known as retail investors. Compared to institutional investors, retail investors often trade in lower quantities. The selection of an adequate number of participants is required in order to provide a sample that is representative of the whole (Hill & Williams, 2012). As the population of the study is un-known therefore researcher employed item to response theory to select the sample size of the study. According to this hypothesis total number of items in questioner is multiply with formula 10 (Wauters et al., 2010). Therefore, a sample size of N equaling 365 was aimed for in this particular investigation. In this study there were 450 questionnaires distributed to respondents through random sampling method, 390 responses received from respondents but 25 questionnaires were incomplete and unable to use for analysis which were discard from sample. Finally, 365 responses were used for purpose of analysis through smart PLS. The response rate was 81.11%. This sample size, which was determined based on previous research in the same subject, is considered to be adequate for quantitative investigations. It is anticipated that the findings offer a realistic representation of the population if the sample size is big enough. This may be accomplished by having a sufficient number of participants.

The method of sampling that was decided to use for this investigation was convenience sampling, more precisely purposive sampling (Sharma, 2017). This method is appropriate for investigations when accessibility and convenience are important factors to take into account. In this particular scenario, retail investors in the city of Lahore would be chosen for the research based on their availability as well as their desire to take part in it. Convenience sampling was carried out via a variety of channels including investor communities' online, investment seminars, and investor forums. The data acquisition procedure was comprised of two primary phases: the adoption of the questionnaire and its dissemination (Zaza et al., 2000). The process of formulating the questionnaire was entail a meticulous curation of items aimed at gauging overconfidence, herding behavior, disposition effect, risk aversion, financial literacy, and investment decisions. The present study employed adapted scales that were validated in previous research endeavors.

4.0 Results

4.1 Demographic Analysis

Table 1: Frequency Analysis

Variable	Frequency	Percent
Gender		
Male	201	55.1
Female	164	44.9
Age of Respondents		
20-30	172	47.1
31-40	132	36.2
41-50	53	14.5
51-above	8	2.2
Education		
Bachelor Degree	19	5.2
Master	257	70.4
MS	55	15.1
Doctorate	20	5.5
Diploma	14	3.8
Investment Experience		
< 10 years	163	44.7
11 – 15 years	92	25.2
> 16 -25 years	93	25.5
> 25 years	17	4.7

Table 4.1 presents the demographic characteristics of the respondents. Based on the statistical data, it can be shown that 55.1% of the participants in the study identify as male. The masculine gender constitutes the bulk of the responders. Furthermore, the tabulated data reveals that a significant proportion of the participants fell within the age range of 20 to 30 years (47.1%). Additionally, a substantial majority of respondents had a master's degree (70.4%). The results of the study also indicated that a majority of the participants (about 50.3%) had less than a decade of experience in the field of investment.

4.2 Measurement Model for Lower Order Construct

Cronbach's alpha and composite reliability were employed by the researcher to evaluate the construct validity of the lower-order concept. The generally accepted cutoff for each of these metrics is 0.7 (Boyd & Reuning-Elliott, 1998). All model constructs are trustworthy, as shown in Table 4.1 of the study findings. Each construct has a Cronbach's alpha and composite reliability over 0.7, showing that they are internally consistent.

Table 4.2: Construct reliability

	Cronbach's Alpha	Composite Reliability
Herd Behavior	0.794	0.857
Over Confidence	0.871	0.907
Disposition Effect	0.908	0.936
Risk Aversion	0.858	0.904
Investment Decisions	0.954	0.959
Financial Literacy	0.873	0899

The average variance extracted (AVE) uses for the purpose of analyzing construct validity. According to Alarcón et al. (2015), it should be more than 0.5. Table 4.3 represents the AVE of the lower-order construct that is almost more than 0.5. VIF is normally used by the researcher for the purpose of analyzing the multicollinearity of items. VIF should be less than five that shows no multicollinearity between the indicators. Annexure 02 shows the VIF table of the measurement model.

Table 4.3: Average Variance Extracted (AVE)

	Average Variance Extracted (AVE)
Herd Behavior	0.597
Over Confidence	0.55
Disposition Effect	0.628
Risk Aversion	0.784
Investment Decisions	0.695
Financial Literacy	0.661

Table 4.4 shows the results of HTMT for the purpose of checking the discriminant validity between constructs. The figures of HTMT should be less than 0.9 (Yusoff et al., 2020), and if it is more than 0.9, it means the data do not have discriminant validity.

Table 4.4 Construct Validity (HTMT)

	HB	OC	DE	RA	ID	FL
Herd Behavior	0.812					
Over Confidence	0.674	0.675				
Disposition Effect	0.639	0.545	0.699			
Risk Aversion	0.66	0.735	0.772	0.878		
Investment Decisions	0.759	0.69	0.696	0.691	0.761	
Financial Literacy	0.562	0.638	0.55	0.351	0.506	0.53

4.4 Assessment of Structural Model:

In order to assess the structural model, path analysis was conducted using Smart PLS software. Additionally, the SRMR (Standardized Root Mean Square) was calculated through PLS-Bootstrapping to check the model fitness. According to Sarstedt and Cheah (2019), an SRMR value of less than 0.08 indicates a good fit. The calculated value of SRMR for our model was 0.052, indicating that the model is a good fit. This assessment follows the measurement model assessment conducted earlier, which analyzed the validity and reliability of the model.

Table 4.5 Results of R Square

	R Square	R Square Adjusted
Investment Decision	0.699	0.697
Financial Literacy	0.686	0.684

Table 4.5 represents the results of the r square from the PLS bootstrapping. R square shows how much percent change in the dependent variable is explained by the independent variables. These results show that approximately 70% of the change in investment decisions is captured through the available independent variables. While the r square of risk perception is 0.686, which shows a 68% change in risk perception because of change in independent variables (Behavioral biases, social and cultural factors, and institutional factors).

Table 4.6: Path Coefficients

	Original Sample (O)	T Statistics	P Values
Direct Effect			
Herding Behavior_ -> Investment Decision	0.087	1.76	0.083

Over Confidence_ ->Investment Decision	0.613	15.339	0.000
Disposition effect -> Investment Decision	0.292	6.681	0.020
Risk Aversion->Investment Decision	0.145	3.614	0.002
Financial Literacy -> Investment Decision	0.389	7.565	0.000

Table 4.6 shows the results extracted from PLS-SEM for the purpose of showing the significance regarding the impact of exogenous variables on endogenous variables. The table shows that all exogenous variables have a significant impact on endogenous variables. The researcher accepts direct hypothesis because all the independent variables and moderating variable has significant direct effect with the investment decisions making of retail investors at 0.01 and 0.05 levels of significance.

Table 4.7: Moderation analysis (Financial Literacy)

	Beta Value	**T-value**	**Moderation**
Herding Behavior>Financial Literacy> Investment Decisions	0.921	0.087**	Supported
Over- Confidence >Financial Literacy> Investment Decisions	0.521	0.292**	Supported
Disposition effect >Financial Literacy> Investment Decisions	0.392	0.201***	Supported
Risk Aversion >Financial Literacy> Investment Decisions	0.201	0.221***	Supported

**** Highly significance at 0.01 level of significance*
*** Significance at 0.05 level of significance*

Table 4.7 shows the moderation analysis through the path coefficients. The results show that financial literacy plays its role as the moderator variable between all exogenous variables and endogenous variables that are investment decisions. Based upon these results, the researcher accepted the research hypothesis H5.

5.0 Conclusion

The current research has shed light on the ways in which numerous variables, including overconfidence, herding behavior, the disposition effect, and risk aversion, impact investing behavior. Within the scope of this research, the moderating influence of financial literacy on these parameters was carefully investigated. The findings highlight the significant influence that these cognitive predispositions have on investment decisions and the necessity of financial education as a protective factor in the market. According to the results, an individual's overconfidence may cause them to assume unnecessary risks, which may result in investment outcomes that are less than ideal. The concept of herding behavior, which comprises the replication of investment choices made by others, has the potential to amplify collective biases and contribute to market inefficiencies. Herding behavior may be defined as the practice of following the actions and decisions of other people. The phenomena that is known as the disposition effect is defined by the propensity of people to hold on to assets that are not doing well while fast divesting from investments that are lucrative. This tendency has the potential to result in unrealized profits as well as heightened sensitivity to losses. In addition, those who have a propensity to avoid risk may be dissuaded from participating in potentially profitable investment opportunities due to anxiety around the possibility of incurring losses.

The findings of the research highlight the relevance of financial literacy in controlling the association between these biases and investing behavior. This is emphasized by the fact that the results of the study are presented. The development of a person's financial literacy helps that person to acquire the necessary information and skills to recognize the detrimental consequences of such biases and develop strategies to mitigate those effects. People who have a higher level of financial literacy are more likely to be able to make reasonable and well-informed choices about their investments because they have a better understanding of the fundamentals of risk management, diversification, and pricing. In conclusion, the findings of this study emphasize how important it is to promote financial literacy as a method of minimizing the negative effects of overconfidence, herding behavior, the disposition effect, and risk aversion on investing behavior. It is possible for policymakers and educators to equip people with the capacity to make better-informed investment choices by increasing the financial literacy of individuals via educational programs and targeted interventions. This will result in improved financial outcomes and greater economic stability. It is necessary to do more research in order to investigate the additional components and processes that may have an effect on the association between cognitive biases and investing behavior. This is essential in order to develop comprehensive strategies for boosting financial literacy and improving investment decision-making.

Muhammad Ali Mufti: Problem Identification and Model Devolpement
Muhammad Arshad: Data Collection, Results and Analysis
Waqas Patras: Research Model and Hypothesis testing

Conflict of Interests/Disclosures

The authors declared no potential conflicts of interest in this article's research,authorship, and/or publication.

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