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UNLOCKING THE INVESTMENT PUZZLE: THE INFLUENCE OF BEHAVIORAL BIASES & MODERATING ROLE OF FINANCIAL LITERACY

Shahid Kalim Khan[1], Najam-Ul-Hassan[2] & Javeria Islam[3]

[1]Assistant Professor, Department of Business Administration, Thal University Bhakkar, Pakistan

[2]Lecturer, Department of Economics, Thal University Bhakkar, Punjab, Pakistan

[3]Lecturer, Noon Business School, The University of Sargodha, Sargodha, Pakistan

KEYWORDS	ABSTRACT
Behavioral Biases, Investment Decisions, Pakistan Stock Exchange, Retail Investors	This study aims to investigate the influence of behavioral biases on investors' investment decisions and explore the moderating role of financial literacy in this relationship. Research adopts quantitative approach, utilizing a survey questionnaire distributed among a sample of individual investors actively trading in Pakistan stock exchange. Survey assesses prominent behavioral biases like overconfidence, disposition effect, risk-aversion bias, and herding behavior, while measuring participants' level of financial literacy. Findings of study proves significant impact of behavioral biases on investors' decisions. Respondents validate prevalence of shared biases, including overconfidence, disposition effect, risk-aversion bias, and herding behavior. These biases tend to influence the decision-making process of investors, leading to suboptimal investment choices. Results suggest that financial literacy plays moderating role in linking behavioral biases and investment decisions. The implications of findings suggest importance of promoting financial literacy amid investors over guidance and support of financial professionals, ultimately improving quality of investment decision-making.
Correspondence	Najam-Ul-Hassan
Email:	najamsial@yahoo.com
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INTRODUCTION

The investment decision-making process has undergone a substantial transformation over the time. Historically, the institutional investors, including pension funds, hedge funds, and investment banks, have been the primary players in the field of investing (Bhatia, Chandani, Divekar, Mehta & Vijay, 2022). The proliferation of technology, enhanced availability of information, and democratization of financial markets have enabled retail investors to engage in investment activities with greater agency. Retail investors, also referred to as individual investors or small investors, allocate their personal funds towards the financial instruments such as stocks, bonds, mutual funds, and exchange-traded funds (Quang, Linh, Nguyen & Khoa, 2023; Xu, Yüksel & Dinçer, 2023). Behavioral biases refer to systematic patterns of deviation from rational decision-making that individuals exhibit due to cognitive and emotional factors. An essential area of the concerns pertains to the prevalence of overconfidence bias among investors in Pakistan. The presence of biases can have substantial effect on investment decision-making and exert the notable influence on behavior of investors. Following passage delves into meanings of 4-prevalent behavioral biases, namely overconfidence, disposition effect, risk-aversion bias, and herding behavior, and their impact on the investment decisions of the investors (Bhatia et al., 2022).

The behavioral finance has attracted considerable attention in recent times, as it concentrates on understanding the psychological and cognitive factors that impact decision-making of investors. 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, Thompson & Kim, 2023; Widyatama & Narsa, 2023). Moreover, potential moderating effect of financial literacy in alleviating adverse impacts of these biases has not been thoroughly investigated in literature. Limitations of literature pertaining to the influence of behavioral biases and financial literacy on investor decision-making within Pakistani context is substantial. The investigation in various nations has provided insight, however, it is imperative to acknowledge distinct cultural, economic, and social elements that influence the investor conduct in Pakistan. Absence of region-specific research limits the applicability of results obtained from other settings, underscoring necessity for localized inquiry (Ansari, Albarrak, Sherfudeen & Aman, 2023; Bihari et al., 2023; Quang, 2023). Investors who show overconfidence tend to undervalue risks and overvalue capacity to generate profits, can result in suboptimal investment choices and heightened financial susceptibility.

Besides, it is possible that disposition effect, a phenomenon characterized by investors' inclination to retain underperforming investments for a longer duration than the profitable ones, is widespread in Pakistan. The presence of bias may potentially result in the suboptimal portfolio performance and diminished returns for investors (Goyal et al., 2023; Mishra & Mishra, 2023; Sachdeva et al., 2023). In addition, it is notable that investment decisions in Pakistan may be influenced by risk-aversion bias, which is characterized by preference for safer options despite the possibility of greater returns, as well as herding behavior, whereby investors tend to emulate 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 the financial literacy in shaping the decision-making process of investors cannot be underestimated. Acquisition of financial literacy empowers individuals with 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 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 influence of behavioral biases on investor decision-making in Pakistan is yet to be determined. 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 the existing financial literacy programs within the nation and pinpoint prospective avenues for enhancement (Adil et al., 2022; Gupta & Shrivastava, 2022). This study aims to investigate the impact of behavioral biases on investors' investment decisions, considering the moderating role of financial literacy. The specific objectives include examining the effects of the overconfidence, herding behavior, disposition effect, and risk aversion on investors' investment decisions. Additionally, the study aims to explore the moderating role of financial literacy in the relationship between behavioral biases and investors' investment decisions.

LITERATURE REVIEW

Theoretical Background

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 TPB. Attitudes and belief that one 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 " degree to which an individual is praised or criticized for engaging in a certain behavior." 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 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).

Overconfidence & Investment Decision

The study conducted by Riaz and Iqbal (2015) aimed to investigate the influence of overconfidence on the conduct of individual investors and the performance of their portfolios. The findings of their research indicated that investors who showed overconfidence tended to engage in greater trading activity and attained lower risk-adjusted returns in comparison to those were less overconfident. Study conducted by Combrink and Lew (2020) aimed to examine contribution of overconfidence in elucidating the disposition effect, a phenomenon characterized by investors' inclination to retain underperforming investments and dispose of outperforming ones prematurely. Research findings indicate that disposition effect was notably influenced by overconfidence, resulting in suboptimal investment choices and reduced overall returns. The study conducted by Zacharakis and Shepherd (2001) investigated relationship between overconfidence and the involvement of retail investors in the stock market.

The study revealed that individuals with high levels of overconfidence exhibited the greater propensity to participate in the stock market and engage in further frequent trading, resulting in elevated transaction costs and diminished returns. 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

Herding Behavior & Investment Decision

The herding effect refers to the tendency of individuals to imitate the actions or decisions of others, particularly in context of financial markets. This phenomenon has gained significant attention in understanding the behavior of retail investors (Quang et al., 2023). Several studies have explored the impact of herding on retail investors, shedding light on its causes, consequences, and potential mitigating factors. Dewan and Dharni (2019) common stock investment performance of individual investors. In this study, the authors examine the trading patterns of a large sample of retail investors. They find evidence of herding behavior among retail investors, that leads to suboptimal investment performance. Kumar and Goyal (2015) using theory of fads, fashion, custom, and cultural change as informational cascades. This seminal paper presents a theoretical framework for understanding the herding behavior.

The authors argue that individuals follow actions of others due to belief that those actions convey valuable information. Consequences of herding behavior can be significant. It can lead to increased market volatility, exacerbate price bubbles or crashes, and distort asset prices. Besides, herding can result in individual investors deviating from the 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 offers insights in market dynamics, investor psychology, and the functioning of financial markets. By considerate drivers and implications of herding, policymakers, market participants, and regulators can develop actions to ease its negative effects and promote informed decision-making among the retail investors (Mishra & Mishra, 2023). Based on the above discussion it is hypothesized that:
H2: There is a significant effect of herding behaviour on Investors investment decisions

Disposition Effect & Investment Decision

According to Guenther and Lordan (2023) the phenomenon known as disposition effect has been extensively researched and observed as behavioral bias that impacts decision-making processes of individual investors in financial markets. Disposition effect, pertains to inclination of investors to retain underperforming investments for 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 succinct outline of disposition effect, encompassing its conceptualization, theoretical foundations, empirical substantiation, and plausible justifications (Costa et al., 2013). The disposition effect is a crucial factor in understanding the behavior of retail investors. Impact of cognitive bias on investment performance, emotive biases, portfolio managing, 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). The hypothesis is as;

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

Risk Aversion & Investment Decision

According to Zalata et al. (2022) the behavior of retail investors is influenced by a psychological phenomenon known as risk aversion bias. Phenomenon being referred to is propensity of individuals to exhibit a preference for loss aversion as opposed to gain acquisition, even in cases where 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 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). Providing investors with knowledge regarding the fundamental concepts of risk and return, the advantages of diversification, and 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

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 the 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 the financial literacy moderates the association between experience in the stock market and investing decision-making. Thus, 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

RESEARCH METHODOLOGY

The retail investors who are actively interested in investing on 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 stock market are known retail investors. Compared to institutional investors, retail investors often trade in the lower quantities. The selection of an adequate number of participants is required in order to provide the 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 320 was aimed for in this particular investigation. 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 vital factors to take into account.

In this particular scenario, retail investors in the city of Lahore would be chosen for the research based on 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 the items aimed at gauging overconfidence, herding behavior, disposition effect, risk aversion, financial literacy and investment decisions. Present study employed adapted scales that was validated in the previous research endeavors. Contemporary scholars use diverse data analysis methodologies to extract insights and derive significant inferences from their data. Descriptive analysis utilizing SPSS (Statistical Package for the Social Sciences) and inferential analysis employing SMART PLS (Partial Least Squares) Structural Equation Modeling (SEM) are two frequently utilized methodologies which was used by researcher for data analysis (Carlson & Donavan, 2008).

RESULTS OF STUDY

Demographic Analysis

The study's findings indicate that the significant proportion of the respondents were male (55.1%). Additionally, the data presented in table reveals that the majority of the participants fell within age range of 20 to 30 years old (47.1%) and held a master's degree as their highest qualification (70.4%). Besides, the results show that a significant portion of respondents had less than 10 years of investment experience (44.7%).

Measurement model

To evaluate the reliability of the lower-order construct, the researcher employed two widely utilized methods: Cronbach's alpha and composite reliability. It is customary to consider a minimum threshold of 0.7 for both measures (Boyd & Reuning-Elliott, 1998). Table 4.1 displays the results of the analysis, which indicate that all constructs in the model are reliable. The Cronbach's alpha and composite reliability for each construct exceed the minimum threshold of 0.7, providing evidence of their internal consistency.

Table 1 Construct Reliability

	Cronbach's Alpha	Composite Reliability
Herd Behavior (HB)	0.732	0.792
Over Confidence (OC)	0.821	0.890
Disposition Effect (DE)	0.748	0.786
Risk Aversion (RA)	0.718	0.804

Investment Decisions (ID)	0.724	0.789
Financial Literacy (FL)	0.743	0799

Assessment of Structural Model

Table 2 Path Coefficients

	Original Sample (O)	T Statistics	P Values
	Direct Effect		
HB -> ID	0.287	1.706**	0.043
OC -> ID	0.513	7.339***	0.000
DE -> ID	0.392	5.981**	0.020
RA-> ID	0.245	2.514**	0.012
FL -> ID	0.489	6.465***	0.000

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

The results from partial least squares structural equation modeling, presented in Table 2, indicate the significance of the impact of exogenous variables on endogenous variables. The table reveals that all exogenous variables exhibit a significant influence on the endogenous variables. Therefore, the researcher accepts direct hypothesis, as all independent variables and the moderating variable demonstrate a significant direct effect on the investment decision-making of retail investors at the 0.01 and 0.05 levels of significance.

Table 3 Moderation analysis (Financial Literacy)

	Beta Value	T-value	Moderation
HB>FL> ID	0.811	0.102**	Supported
OC >FL> ID	0.434	0.289**	Supported
DE >FL> ID	0.389	0.216***	Supported
RA >FL> ID	0.219	0.234***	Supported

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

In Table 3, moderation analysis is presented, indicating path coefficients. The findings demonstrate that financial literacy serves as moderator variable amid all exogenous variables and endogenous variable of investment decisions. These results lead the researcher to accept research hypothesis H5, which suggests that financial literacy plays a significant role in moderating relationship between the exogenous variables and investment decisions.

DISCUSSION

The findings of the research demonstrated a significant impact of overconfidence on the decision-making procedures of investors. The aforementioned findings augment current corpus of literature on behavioral finance and furnish significant perspectives on the function of overconfidence in the process of investment decision-making (Pikulina et al., 2017). Further, the findings of the current investigation have furnished convincing proof to substantiate the concept that herd behaviour has a significant impact on the investment choices made by investors. The present study's results are consistent with prior investigations conducted in this domain, thereby enhancing the pre-existing knowledge base pertaining to this topic (Iram et al., 2023). The study's findings indicate that the disposition effect has a noteworthy impact on the decision-making process of investors. The results obtained are in line with prior investigations conducted in the domain, thereby reinforcing the idea that the disposition effect has a pivotal impact on the formation of investment choices (Costa Jr et al., 2023; Danbolt et al., 2022).

Further, the findings of the current investigation offer substantiation for the significant impact of risk aversion on decision-making process of investors. Results indicate that individuals exhibiting higher levels of the risk aversion tend to adopt distinct investment decision-making strategies in comparison to their less risk-averse counterparts. The aforementioned result is consistent with prior studies carried out in domain, thereby strengthening the comprehension of the correlation between risk aversion and investment decisions (Bauer et al., 2023; Garcia et al., 2022; Ji et al., 2022). Lastly, the findings of the current investigation offer compelling support for notion that financial literacy exerts a noteworthy impact on decision-making processes of investors. The present study's results are consistent with and corroborate prior investigations in this domain, thereby augmenting the expanding corpus of scholarship on comprehending the correlation between financial literacy and investment decision (Adil et al., 2022; Alaaraj & Bakri, 2020; Fernandes et al., 2014; Istanti & Lestari, 2023).

CONCLUSION

This study has provided valuable insights into the impact of various factors, such as overconfidence, herding behavior, disposition effect, and risk aversion on investment behavior. Research specifically examined the moderating role of financial literacy in relation to these variables. The findings highlight the significant influence of cognitive biases on investment decisions and emphasize the importance of financial education as a protective measure. The results suggest that excessive self-assurance can lead individuals to take the unwarranted risks, potentially resulting in suboptimal investment outcomes. Herding behavior, which involves imitating others' investment decisions, can amplify collective biases and create market inefficiencies. The disposition effect, observed when individuals hold onto underperforming investments while quickly selling profitable ones, can lead to missed opportunities and increased vulnerability to losses. Moreover, risk aversion may hinder individuals from participating in profitable investment chances due to concerns about potential losses. The study underscores significance of financial literacy in managing relationship between these biases and investment behavior.

Acquiring financial literacy enables individuals to gain the necessary knowledge and skills to recognize and mitigate negative impacts of such biases. Individuals with higher financial literacy are better equipped to make rational and informed investment decisions by understanding risk management, diversification, and valuation concepts. In instant, this study emphasizes importance of promoting financial literacy as a strategy to mitigate adverse effects of overconfidence, herding behavior, disposition effect, and risk aversion on investment behavior. Implementing educational programs and targeted interventions to enhance financial literacy can empower policymakers and educators to enable individuals to make more informed investment decisions, leading to improved financial outcomes and greater economic stability. Further research is needed to explore additional factors and mechanisms that may influence relationship between cognitive biases and investment behavior. Developing inclusive strategies to enhance financial literacy and improve investment decision-making is crucial.

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