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# BEHAVIORAL BIASES IN INVESTMENT DECISIONS: THE ROLE OF RISK PERCEPTION AND FINANCIAL AWARENESS AMONG PAKISTANI INVESTORS

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**Abstract**
*Examining the psychological biases influencing investing preferences is the aim of this study. This study's main goal is to examine the psychological biases that influence investing decision. Additionally, this study investigates how risk perception & financial literacy affect investing decision-making. The results of the current research will help financial advisors choose which psychological aspects to concentrate on to improve client care. Additionally, it will help individual investors determine which psychological variables significantly influence their investment decisions along with how to avoid them so they may make better choices. Convenience sampling was used to collect the responses from the survey, which collects the data. Regression analysis and correlation are used to assess the ideologies and conceptual framework. The results demonstrated the influence of all three psychological biases on investment decisions. Additionally, examined and verified are the roles of financial literacy and risk perception. One of the study's limitations is that it solely focuses on three biases, despite the fact that many more could influence an investor's choice.*
***Keywords:*** *Behavioral finance, Investment decision-making, Risk perception, Investor psychology*

## INTRODUCTION

Investors aim to maximize profits, according to conventional investing ideas. Investors are not always logical, according to a number of research by Altaf, H., & Jan, A. (2023). When faced with financial decision-making uncertainty, people become perplexed. People's reasoning and arguments are usually absent because of the erratic nature of market operations. Behavioral finance examines the causes of irrational human behavior as well as possible remedies. Behavioral finance is a subfield of finance that examines how participants in financial markets operate and how psychological aspects influence their choices to buy or sell on the market, which has an impact on pricing (Adjasi & Yu, 2021; Brockman et al. 2023). The purpose of science is to provide light on the rationale behind the widespread belief that markets are inefficient. By taking behavioral aspects into account while making decisions, behavioral finance, a relatively recent paradigm in finance, aims to integrate basic concepts in finance. Behavioral bias, often referred to as irrational behavior, is the way an individual assesses a situation, which can result in illogical interpretations, mistakes in analyzing the facts, and changes in perception. Investors may respond impulsively due to behavioral bias, which could hurt their investments and result in losses rather than gains (Sabilla, B. V., & Pertiwi, T. K. 2021). Investment behavior has changed as a result of quick changes in securities prices as well as the impact of behavioral and psychological manifestations on investor decisions. Studying financial behavior is the primary goal in order to comprehend how behavioral biases affect the decision-making of market players. When trading equities on capital markets, investors frequently make irrational choices due to underlying psychological effects. Investors that are overconfident are particularly vulnerable to significant losses as a result of aggressive trading without sufficient financial understanding, which commonly results in investors experiencing significant losses. Investors may buy overvalued equities as a result of herding effects (Shukla et al. 2020). The influence of behavioral biases on investors' decision-making processes has become a crucial field of research in the ever-changing world of financial markets (Banyen, 2022; Sihombing, Y. R., & Prameswary, R. S. A. 2023). The complex terrain that investors frequently traverse is influenced by economic fundamentals as well as emotional and cognitive aspects that can have a big impact on their stock trading choices. Due to psychological inclinations, behavioral biases can cause investors to make irrational decisions, which can have an impact on market dynamics and personal financial results (Karhan, 2019; Loppies et al. 2022). In order to understand

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how psychological factors influence investment behavior, this study explores the complex relationship between behavioral biases and stock trading decisions.

It is a fact that several behavioral factors that impact an investor's decision-making impact their investment success and financial returns. Because individual investors can improve their investment performance by purposefully ignoring these behavioral factors when making investment decisions, the current study is important to them. As there aren't many studies in the subject of behavioral finance, the current research is also a useful addition to the body of literature in the Pakistani context. It determining if highly experienced investors are the only ones capable of making wise financial judgments or if less experienced investors can also benefit from financial literacy in order to make sane investment selections might also be helpful. Additionally, all business, finance, and commerce students will profit from this research by being able to do additional research in this field. The research findings hold significance for traders and regulators as well, since they ought to comprehend that stock market fluctuations can also be attributed to behavioral issues.

## LITERATURE REVIEW

### Investment Decision

The process of forming decisions is intricate and subject to several inner and peripheral influences. In the Indian securities market, multi-bagger selection is influenced by behavioral characteristics (Chauhan et al., 2022; Sadashiv, 2023). Indian investors prioritize environmental, social, and governance (ESG) reasons while making investment decisions (Nasir, 2022; Sood et al., 2023). One important element impacting the stock market and financial performance of the Palestinian food industry is the implementation of the halal standard (Maurya, 2018; Amer, 2023). Review study on the corpus of recent literature has uncovered various viewpoints on the connection between financial decision-making and overconfidence, confirmation, proximity, and chronology bias. Behavioral biases like recency bias have a momentous impact on Indian investors' financial decision-making process (Bashir & Rashid, 2019; Jain & Kesari, 2022). When making financial decisions, experience and complexity are subordinated to recency bias. It has been demonstrated that recency bias significantly affects investment decision-making (Sulistiawan & Wijaya, 2015; Shahabuddin & Ali, 2024). When selecting companies for investment, South African investors exhibit a notable familiarity bias (Vries, Erasmus, & Gerber, 2017; Zahid, 2018). Investors' decisions to diversify their portfolios are severely impacted negatively by familiarity bias (Perveez, 2019; Nurcahya & Dewi, 2021).

When making investing decisions, investor familiarity bias significantly influences choices (Rosyidah and Pratikto, 2022; Ahmad & Rura, 2024). Weixiang, Qamruzzaman, Rui, and Kler (2022) claim that confirmation bias has a negative but statistically significant influence on behavioral biases during financial decision-making. It is the bias that professionals encounter most often when making investing decisions (Berthet, 2022). Investors' financial decisions are slightly yet significantly impacted by confirmation bias (Diaz & Weber, 2020; Sharma & Kumar, 2022).

### Overconfidence Bias

Overconfidence bias has a major impact on PSX investors, with financial literacy having a moderating effect and risk perception having a mediating effect (Ahmad & Shah, 2020). In the US capital markets, investor behavior and financial decisions are influenced by overtrading and overconfidence (Bates, 2020). In Abu Dhabi, investors' financial decision-making is positively impacted only by overconfidence bias (Shah, Alshurideh, Dmour, & Al-Dmour, 2021). Panic selling, which resulted in the largest market fall in Indian capital markets history, is the result of an overconfidence bias (Luna & Luna, 2018; Kwatra, 2020, Bhoj, 2019). Luu (2014) asserts that its influence on investment behavior is moderate. This has a big influence on investors' financial decisions (Bansal, 2020). Overconfidence significantly facilitates investors' decision-making processes (Qadri & Shabbir, 2004; Willy, 2018; Dungarwal & Tollawala, 2022; Salehi et al., 2023). Pakistani investors' investment decisions are significantly positively impacted by overconfidence bias (Riyaz & Iqbal, 2015). Overconfidence bias and risk tolerance, which is related to financial decision-making, have a positive link (Mallik, Hanif, & Azhar, 2019) potential investors' financial choices. The authors discuss the body of research on familiarity, confirmation, recency, and overconfidence bias in an effort to examine the literature as a whole (Mohammadi, 2022; Trehan & Sinha, 2021; Adejumobi, 2019; Trehan, 2016). The overconfidence bias significantly impacts financial decisions made by investors in Egyptian economy, but the influence varies depending on factors including experience, education level, gender, and age (Metawa et al., 2019). In retrospect, perception bias limits its impact, but it still has a considerable impact on investors' financial decision-making in Tehran's financial markets (Sadi, Asl, Rostami, Gholipour, & Gholipour, 2011). It has a foremost adverse influence on Pakistani investors' financial conclusions on the Islamabad Stock Exchange and is aggravated by an unduly optimistic attitude (Kafayat, 2014). Pakistani investors in Karachi City are significantly impacted by the overconfidence bias (Qasim, Hussain, Mehboob, & Arshad, 2019).

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**Mental Accounting Bias**

Santi et al. conducted a study in 2019 to examine how mental accounting affects equity investment choices. The study's conclusions showed that because of the phenomena of mental accounting, Monthly private funds are more important than bonus funds, and stakeholders devote a larger portion of their income to investments. In the event of a loss, they also show more dissatisfaction with the losses experienced from their monthly funds than from investing bonus funds, and they show a greater dread of the risk involved in investing in monthly private funds than in bonus funds. The results of a study by Ogunlusi and Obademi (2019) that looked at the effect of behavioral investment on venture policymaking revealed a strong correlation between individual investment decisions and potential clients, as well as a positive relationship between financing decisions and behavioral investments. The study also found that there is a strong and detrimental connection between investment decisions and probability and inference theories, and that investors should be made aware of this relationship. Behavioral factors, such as inference and probability theory, can have a noteworthy effect on an investor's policymaking process. The practices of individual investors were examined by Raut et al. (2018) in Stock Advertise Exchanging in India. This structural equation modeling study assesses the data using fundamental information collected from 396 investors located across India. The result demonstrates that optimism, representativeness, data cascades, classification, and anchoring all have an impact on the speculators, while sickness seems to have no bearing at all. Mascarene and Yan's (2017) study discussed the idea of mental accounting, which blends psychology and finance. Since not all investors want to take on risk in order to make money, and not all investors will give away their profits out of fear of risk, it was proposed that the investment portfolio be based on the 280 investors' purpose to take risks and preference for profitability. Contrary to the widely held belief that investment portfolios with different levels of risk and return are in line with investors' mental risk and profit calculations to meet their investment expectations, investors will only engage in investment activities when their psychological and mental needs are met.

**Loss Aversion Bias**

According to research by Kumar et al. (2018), investors' judgments about which investments to make are influenced by loss aversion biased due to the strong impact that investors' gender has on the prevalence of loss averse in investors. Mahina et al. (2017) found that loss aversion bias has a major influence on stock market investments in Rwanda. The notion that stock market investors generally feel worse about keeping losing commodities for a long time than they do about trading winning ones too soon was also examined in this study. One of the peculiarities that prospect theory has identified and addressed is loss aversion, which occurs when people would rather take chances than uncertainty and safety, even in cases where the risk and return profiles are consistent. Given that investors are more cognizant of losing money than to seeing a return from their portfolio, this bias has the potential to have a significant impact on investment decisions. However, persons from various demographic backgrounds may potentially see different implications from this prejudice. When making financial decisions, for instance, female investors typically have a larger sensitivity to loss than do male characters; seniors and those in vulnerable situations, such as jobless or unemployed individuals, may also exhibit more extreme loss aversion than others. The Mahina & Muturi experiment demonstrated that investors are loss averse and will gradually phase out any potential loss because they place a far higher value on a loss than a gain in the stock market. More specifically, the experiment revealed that investors are more likely to sell rising shares even though they may continue to outperform falling ones, and they may not be willing to sell their stocks even when they are declining and may not expect the opposite outcome in the short term.

**Risk Perception and its Mediating Role**

A crucial element in the investment decision-making process is risk perception, which refers to how persons assess and interpret the handy of risk tied to an investment. Research by Bazley et al. (2021), Gonzalez-Iguala et al. (2021), and Venter et al. (2023) has delved into risk perception. Their findings highlight the intricate and multifaceted character of risk perception. Influencing factors include personal attributes, market dynamics, and cognitive distortions. By examining how investor biases shape their risk perception, behavioral finance elucidates the complexities of their decision-making. It emphasizes that, beyond objective elements, people’s perceptions of threats are swayed by biases. Heuristics that could cause one to deviate from rational decision-making heuristics that could deviate from logical judgment. Therefore, studying risk perception in the framework of behavioral finance provides valuable new insights into the emotional and cognitive mechanisms that underlie financial judgments. Areiqat et al. (2019) claim that the mediating role of risk perception suggests that the relationship between financial decision-making and behavior investment can be explained by investors' perceptions and assessments of risk. For example, an investor who is overconfident may underestimate the risk of a dangerous investment, which increases the likelihood that they would make a decision that is not in line with their risk tolerance. However, a loss-averse investor may overlook possible returns because they wrongly think a low-risk investment is riskier than it actually is. The behavioral finance literature

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can be divided into five main strands, each of which focuses on a different aspect of risk perception and investment decision-making. The first strand investigates how herding behavior influences perceptions of risk and investing decisions. Mundi et al. (2022), Lim et al. (2018), and Zhang et al. (2022) have conducted research in this field. The impact of the disposition implication on risk perception and investment decisions has been studied by researchers such as Richards et al. (2017), Ullah et al. (2020), and S. U. Ahmed et al. (2022) in the second line of inquiry. The third strand looks at how blue-chip (biggest) corporations affect investors' risk perceptions and investment decisions. Scholars who have examined this association include S. U. Ahmed et al. (2022) and Shiva and Singh (2020). The fourth strand focuses on how overconfidence affects how risk is perceived and how investments are made. Parveen et al. (2020), Areiqat et al. (2019), and others have all added to our understanding of this phenomenon. Lastly, the fifth strand focuses on the connection between risk perception and investing choices. Researchers Chen et al. (2018) and Wattana et al. (2020) have investigated this association.

**Financial Literacy and its Moderating Role**

In the modern economy, financial understanding and consciousness is essential for selecting the best project, particularly in developing nations. To increase their capacity to make wise investment decisions, people need to gain financial literacy and expertise (Audi et al., 2021; Alshebami and Aldhyani, 2022; Ahmad et al., 2024). Because of its importance, financial literacy has recently attracted the attention of governments, banks, employers, and financial markets. The importance of improving financial literacy has been highlighted by a number of factors, such as changing demographic and economic environments, complex financial markets, and the creation of new financial markets. Financial literacy is the capacity to assess and handle one's own finances (Fatima & Zaman, 2020; Yashita et al., 2022). Numerous studies have been carried out to analyze investors' financial literacy, and numerous academics have looked into financial literacy from a variety of angles. The government and firms in industrialized nations have polled people on their financial literacy. Previous research has demonstrated a direct link between choices concerning investments and financial literacy. Investing involves uncertainty, therefore being financially literate aids in making secure financial decisions. In extremely volatile and uncertain markets, financial literacy can prevent people from suffering significant losses and provide solutions to a variety of issues. A person is more likely to use their money wisely when they possess greater financial knowledge. Accordingly, having a solid understanding of concepts and knowing how to use them to one's advantage when making investment decisions is financial literacy (Absegami and Aldhyani, 2022; Kar & Dasgupta, 2024). Improved financial literacy enables individuals to make better financial decisions and investments, such as saving for retirement and retirement planning, whereas poorer financial literacy leads to poor investment choices that have a detrimental impact on finances (Gilenko and Chernova, 2021; Audi & Yu, 2024). The relationship between saving behavior and financial literacy, which affects investment decisions in developing countries like Saudi Arabia, has not received much attention in research (Supanantaroek et al., 2017; Musa, 2024). The impact of financial literacy on investing choices has been the subject of much research. According to Alshebami and Aldhyani (2022), having a high level of financial literacy helps consumers make wise investment decisions. The goal of the study by Baker et al. (2019) is to demonstrate how financial literacy affects investors' behavioral tendencies. The results show a negative association between the impact of herding bias and tendency and financial literacy, suggesting that greater investment literacy may be associated with a decrease in herding bias and the influence of heuristics among investors. Furthermore, the association between herding behavior and overconfidence may have a moderating effect on financial literacy, according to Sabir et al. (2019).

**Research Gap**

By taking into account the previously provided facts, Behavioral finance does not necessary presume that every investor will make the same error, we can conclude. Many factors probably influence an investor's exposure to a particular delusion. For case, there is convincing evidence that an investor's experience contributes to his belief that experienced traders engage in gambler presumption while fewer experienced investors are more susceptible to observation. Similarly, behavioral factors are important when it comes to investors' decision-making. It is imperative for investors to undertake the necessary actions to address or eradicate any biases that may influence their decision-making process. Upon reviewing the existing literature on behavioral finance and behavioral biases, we are able to defend the research's focus on risk perception as a mediating variable, which has not been thoroughly examined before. At one point, the role of financial literacy as a moderating variable was not investigated. Furthermore, there aren't many studies conducted in developing nations.

**Research Hypotheses**

H1: Investment decisions are positively related to overconfidence bias.
H2: Investment decisions are positively related to mental accounting.

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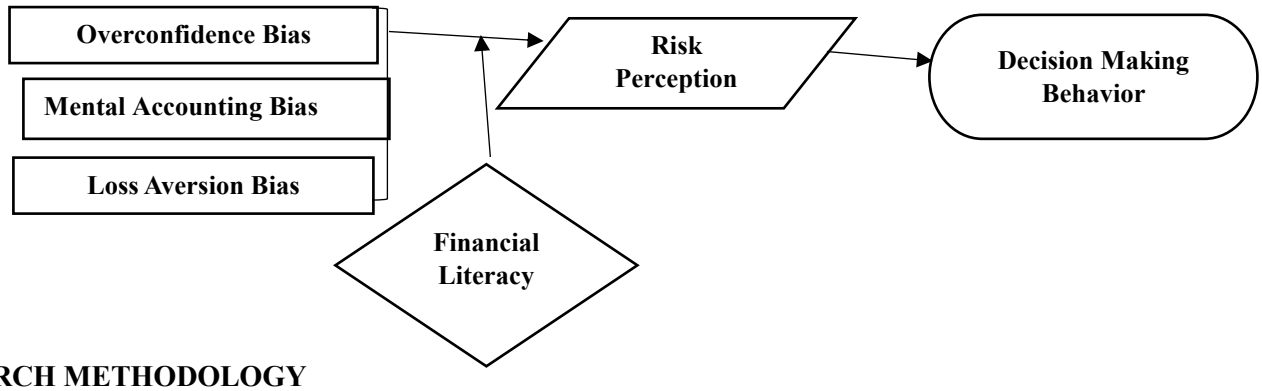
H3: Investment decisions are positively correlated with loss aversion bias.
H4: The association between overconfidence bias & investing decisions is mediated by risk perception.
H5: The association between mental accounting bias & investing decisions is mediated by risk perception.
H6: The association between investment decisions & loss aversion bias is mediated by risk perception.
H7: The association between overconfidence bias & investing decisions is moderated by financial literacy.
H8: The association between mental accounting bias & investing decisions is moderated by financial literacy.
H9: The association between loss aversion bias & investing decisions is moderated by financial literacy.

**CONCEPTUAL MODEL**




**RESEARCH METHODOLOGY**

Research Design is the general strategy we use to logically and cogently combine the several research components. It shows that the research topic is effectively resolved and creates a conceptual framework for obtaining, estimating, and analyzing data. The purpose of this research is to explain how various psychological factors affect investors' decision-making behavior. For data that is based on numerical measurement and has practical ramifications, a quantitative approach to data collecting is employed. A questionnaire is employed in the quantitative technique to gather data from those participating in the study. This study is cross-sectional since data is only collected once at a certain period. Deductive reasoning was employed in this analysis since the study is predicated on earlier research and hypotheses. The primary focus of this study is investor behavior. The study's target population is investors. The term "target population" refers to the entire set of people that the scholar is trying to learn more about (Easton & McColl, 1997). There exist a pair of investor categories. An institutional investor is a person who invests in financial markets through a company or business. Another is the purchase of equities for personal portfolios by individual investors. This study's primary goal is to highlight investor behavior when they are considering making an investment decision. The study's target group includes those who buy stock and make investments on the Pakistan Stock Exchange inside the limits of Lahore, including employees of the government or the private sector, business owners, brokers, and female investors. In the context of statistics and quantitative analytic methods, a sample is a group of people or objects that have been selected or assembled from a statistical population using a particular procedure. The elements of a sample are places used as references, sampling units, or observations. the process of taking a large enough sample of the population to extract the precise statistics that apply to the target population as a whole (Hair et al., 2003).

We can choose the sample by using a variety of sampling approaches. Convenience Sampling Technique was chosen for our study since it makes it simple to choose pertinent respondents. The researcher's engagement determines the analysis's environment. There are two types of study environments that attract the researcher. There are two types: one is referred to be induced, and the other as non-induced. Artificial research, often known as contrived research, is typified by the creation of situations or surroundings by researchers through laboratory trials. This involves symmetrically documenting the data or facts. An investigation that is conducted in a natural setting is the result of non-contrived research settings. It is recognized as a field study as well. The research is being undertaken using a non-contrived approach, as the investors' behavior is quantifiable in an unmanipulated natural setting. Two different kinds of investigations exist. The first is inquisitive, and the subsequent one is explanatory. The aim of an exploratory study is to investigate different perspectives from the preceding one. However, in an explanatory analysis, the causal linkages between the variables are discussed (Blumberg, Copper & Schidler, 2014). This is an example of an explanatory research. This research's primary goal is to elucidate the psychological biases that directly affect investors' decision-making processes. Given that the goal of this research is to examine investor behavior. As a result, the study's unit of analysis is the individual investor, regardless of their age, gender, or company affiliation. The quality of the data determines how research gathers data. Two categories of data exist. There are two: a primary and a secondary. Since the data for this study is gathered from individual PSX

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investors, the primary data collecting approach is employed. The benefit of using this strategy is that it allows for the acquisition of up-to-date and relevant information.

**Preliminary View**

Prior to the commencement of formal data analysis, preliminary view tests pertaining to data preparation are conducted. These tests include reliability view, normality view, frequency distribution, descriptive statistics, and correlation view. Each analysis's specifics are provided in the sections that follow.

## RESULTS

A single figure's overall reliability guarantees the instrument's overall reliability. The instrument utilized in this study, which has 31 items, has a reliability of.945 or around 94%. This demonstrates how much more reliable the research tool is.

**Table 1: Variable wise Reliability**

| Variables | Cronbach's alpha (α) | Item's Number |
|---|---|---|
| DMB | 84% | 5 |
| OB | 82% | 7 |
| MAB | 75% | 4 |
| LAB | 80% | 5 |
| RP | 76% | 5 |
| FL | 84% | 5 |

**Normality Test of Skewness and Kurtosis**

| | DMB | OCB | MAB | LAB | RP | FL |
|---|---|---|---|---|---|---|
| Skewness | -.562 | -.662 | -1.090 | -1.341 | -.922 | -1.440 |
| Kurtosis | -.484 | -.575 | .565 | 3.562 | 1.620 | 1.961 |

The normalcy assumption is met when the values of Skewness and Kurtosis tumble between -1 and +1 and -3 and +3, correspondingly.

**Table 2: Descriptive Statistics and Analysis**

| Variables | Mean | Median | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| DMB | 4.50 | 4.63 | .592 | 1 | 4 |
| OB | 3.52 | 4.75 | .882 | 2 | 5 |
| MAB | 4.65 | 3.01 | .792 | 1 | 4 |
| LAB | 4.03 | 3.22 | .504 | 2 | 5 |
| RP | 4.36 | 4.43 | .725 | 1 | 4 |
| FL | 3.44 | 4.65 | .754 | 2 | 4 |

**Correlation Matrix**

| Variables | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. RP | __ | | | | | |
| 2. FL | .122* | __ | | | | |
| 3. OB | .258** | .357** | __ | | | |
| 4. MAB | .202** | .341** | .703** | __ | | |
| 5. LAB | .119* | .239** | .370** | .375** | __ | |
| 6. DMB | .360** | .501** | .733** | .651** | .437** | __ |

This table displays the high correlation between each variable. The data clearly shows that, at the significant level of.01, RP is substantially connected with FL, OB, MAB, LAB, and DMB. The corresponding significant values are.122*,.2568**,.202**,.119*, and.360**. At the significant level of .01, there is a substantial correlation between financial literacy and decision-making behavior, mental accounting bias, loss aversion bias, and overconfidence bias. The corresponding significant values are.357**,.341**,.239**, and.507**. At the significant level of .01, there is a significant correlation between OB and MAB, LAB and DMB. The notable values are.703**,.370**, and.733**, respectively. At the substantial level, there is a significant correlation between MAB, LAB, and DMB. 1.375**

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and.651** are the noteworthy values. Likewise, there is a considerable level of correlation between LAB and DMB .437** is the remarkable value.

**Mediated Moderation effects of OB**

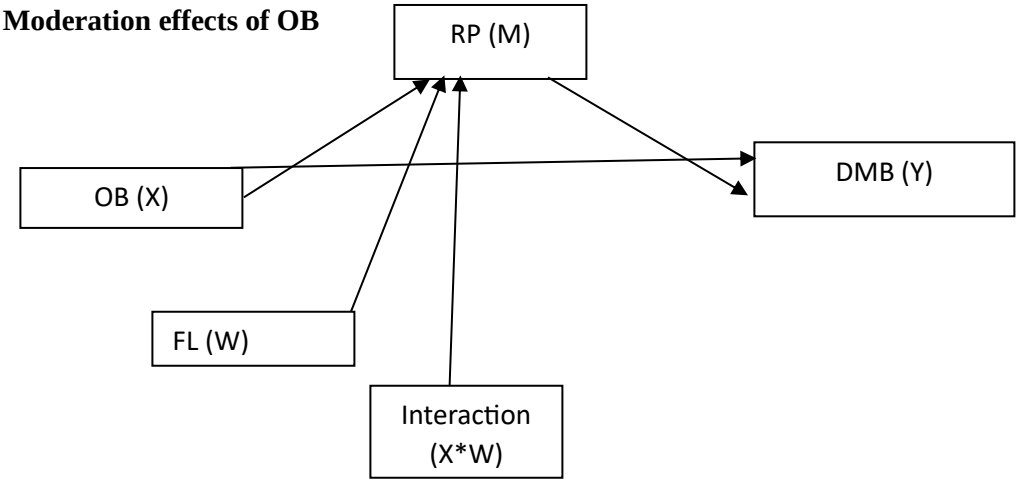


**Table 3: Outcome Variable: Model Overview**

| R | R-sq. | MSE | p |
|---|---|---|---|
| .2628 | .0822 | .4680 | 0.000 |

At the 1% level of significance, the total model is significant, as indicated by the table value of p being less than 0.01. The degree to which the I.V explains the D.V is shown by the R2 value. In this instance, financial knowledge and overconfidence bias account for 8.22% of risk perception. The mean standard error comes out to be.4680.

**Table 4: Moderation outcome of FL allying OB and DMB with Indirect effects**

| | Coeff | SE | t | p | LLCI | ULCI |
|---|---|---|---|---|---|---|
| OCB | .6370 | .2118 | 3.0070 | .0029 | .2201 | 1.0538 |
| FL | .4420 | .2099 | 2.1059 | .0360 | .0290 | .8551 |
| Int_1 | -.1263 | .0624 | -2.0223 | .0440 | -.2491 | -.0034 |

According to the schedule, the overconfidence bias degree is .6370 which is innocently correlated with individual investors' RP of the PSX at the 5% level of significance. The t-statistic value is 3.0070, indicating that risk perception of investments has increased as a result of overconfidence. LLCI and ULCI have respective values of .2201 and 1.0538. Similarly, as the value of p is less than 0.05, the coefficient value of FL is.4420, which is substantial with the RP. The t-statistic value is 2.1059. The lower and higher bounds are.0290 and.8551, respectively. At the 5% level of implication, the coefficient's interaction (fl*ocb) value is -.1263, representing that FL moderates the affiliation between overoptimism bias and policymaking conduct.

At the 1% level of significance, the total model is significant, as indicated by the table value of p being less than 0.01. In this instance, overconfidence bias accounts for 56.86% of decision-making behavior.

**Table 5: Outcome variable: Decision-Making Behavior: Model Overview**

| R | R-sq | MSE | p |
|---|---|---|---|
| .7540 | .5686 | .1516 | 0.000 |

**Table 6: Outcome of OB on Investor DMB and Mediation impact**

| | Coefficient | Standard Error | t | p | LLCI | ULCI |
|---|---|---|---|---|---|---|
| O.B | .5066 | .0287 | 17.6790 | .0000 | .4502 | .5630 |
| R.P | .1491 | .0317 | 4.7076 | .0000 | .0868 | .2114 |

Given that the coefficient value is.5066 and the p-value is less than 0.01 at the significance threshold of 1%, the table indicates that overconfidence bias significantly improves decision-making behavior. The t-statistic value is 17.6790. The

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highest and lesser perimeter values are.4502 and.5630, respectively. Likewise, as indicated by the coefficient value of.1491 and the t-statistic value of 4.7076, risk perception significantly influences decision-making behavior in a favorable way. LLCI and ULCI have respective values of.0868 and.2114. Given that the p-value is smaller than 0.1, it can be determined that risk perception acts as a mediator between overconfidence bias and decision-making.

**Mediated Moderation effects of MAB**

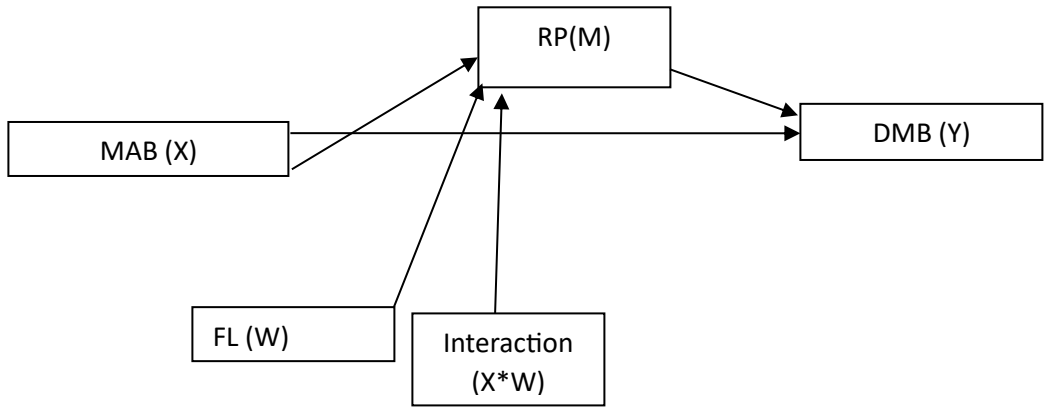


**Table 7: Risk Perception: Model Overview**

| R | R-square | Standard Error | p |
|---|---|---|---|
| .2330 | .0543 | .5005 | 0.0007 |

At the 1% level of significance, the total model is significant, as indicated by the table value of p being less than 0.01. In this instance, financial knowledge and mental accounting bias account for 5.43% of risk perception. The standard error value is.5005.

**Table 8: Moderation impacts of FL allying MAB in addition DMB and Secondary Effects**

| | Coefficient | SE | t | p | Lower limit | Upper limit |
|---|---|---|---|---|---|---|
| MAB | .5071 | .1952 | 2.5976 | .0098 | .1850 | .8293 |
| FL | .4210 | .2073 | 2.0311 | .0431 | .0790 | .7629 |
| Int_1 | -.1086 | .0596 | -1.8210 | .0696 | -.2069 | -.0102 |

Worktable demonstrate that factor rate of m.a.b .5071 which is substantial linked Considering the t-statistic value of 2.5976 and the risk assessment of individual investors at the 1% threshold of significance. The lowest and higher bounds have values of.1850 and.8293, respectively. At the 5% level of significance, financial literacy and risk perception are also significantly correlated, as evidenced by the coefficient's value of.4210 and the t-statistic's value of 2.0311. The ULCI and LLCI are.7629 and.0790 correspondingly. At the 10% level of significance, the factor's collaboration (fl*mab) value of -.1086 is negative. The lowest and upper bounds have values of -.2069 and -.0102. Financial literateness performances as a moderator amongst mental accounting prejudice and decision-making conduct, as indicated by the t-statistic value of -1.8210.

**Table 9: Decision-Making Bias: Model Overview**

| R | R-sq | SE | p |
|---|---|---|---|
| .6912 | .4777 | .1836 | 0.000 |

At the 1% level of significance, the total model is significant, as indicated by the table value of p being less than 0.01. In this instance, mental accounting bias accounts for 47.77% of decision-making behavior. The standard error value is.1836.

**Table 10: Result of MAB on Investor DMB besides Mediation impact**

| | Coefficient | Standard Error | t | p | LL | UL |
|---|---|---|---|---|---|---|
| MAB | .4488 | .0314 | 14.3091 | .0000 | .3970 | .5005 |
| RP | .1942 | .0344 | 5.6493 | .0000 | .1375 | .2509 |

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Specified that the t-statistic rate is 14.3091 and the p-value is less than 0.01 and.4482, the table indicates that mental accounting bias has a substantial beneficial influence on decision-making conduct at the inference threshold of 1%. LLCI and ULCI have respective values of.3970 and.5005. Similarly, at the 1% level of significance, risk perception significantly improves mental accounting bias and decision-making behavior. This is demonstrated by the fact that the t-statistic is 5.6493, the coefficient value is.1942, and the p value is less than 0.01; these findings indicate that RP mediates the relationship between MAB and DMB. The minor and higher bounds are.1375 and.2509, respectively.

**Mediated Moderation effects of LAB**

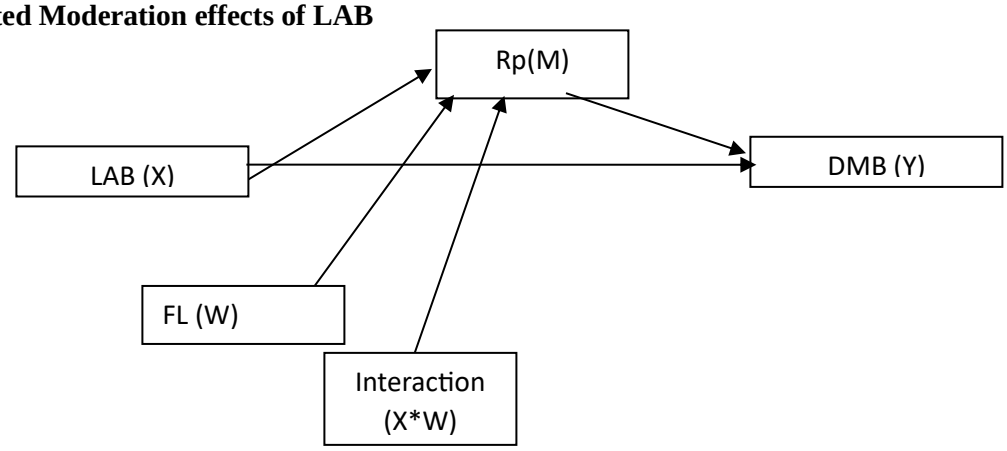


**Table 11: Risk Perception: Model Overview**

| R | R-sq | SE | P |
|---|---|---|---|
| .1767 | .0312 | .5127 | 0.000 |

At the 1% level of significance, the total model is significant, as indicated by the table value of p being less than 0.01. In this instance, financial knowledge and loss aversion bias account for 3.12% of risk perception. The mean standard error comes out to be.5127.

**Table 12: Moderation outcome of FL amongst LAB and DMB with Secondary effects**

| | Coefficient | Standard Error | t | p | LL | UL |
|---|---|---|---|---|---|---|
| L | .7388 | .3959 | 1.8662 | .0630 | -.0402 | 1.5177 |
| FL | .8064 | .4615 | 1.7474 | .0816 | -.1017 | 1.7144 |
| Int_1 | -.1806 | .1163 | -1.5522 | .1216 | -.4095 | .0483 |

The block indicates that, at the 10% level of significance for individual investors, loss aversion bias is positively significant in relation to risk perception, as indicated by the coefficient value of.7388 and the t-statistic of 1.8662. The ULCI is 1.5177 and the LLCI is -.0402. Similarly, the t-statistic rate is 1.7474 and the financial literacy coefficient value is.8064, both of which are positive significant with risk perception at the 10% level of implication. Values of lower and upper limits are -.1017 and 1.7144. Because coefficient rate is.-1806, the t-statistic value is -1.5522, and the bottom and higher limits are -.4095 and.0483, the interaction (fl*lab) value is adverse and irrelevant, indicating that FL does not mitigate the relationship between LAB and DMB.

**Table 13: Decision-Making Behavior: Model Overview**

| R | R-square | Standard Error | p |
|---|---|---|---|
| .5354 | .2866 | .2507 | 0.000 |

At the 1% level of significance, the total model is significant, as indicated by the table value of p being less than 0.01. In this instance, loss aversion bias accounts for 28.66% of decision-making behavior. The SE value is.2507.

**Table 14: Outcome of LAB on Investor DMB and Mediation effect**

| | Coefficient | Standard Error | t | p | LL | UL |
|---|---|---|---|---|---|---|
| LAB | .4707 | .0572 | 8.2276 | .0000 | .3581 | .5832 |
| RP | .2546 | .0396 | 6.4243 | .0000 | .1766 | .3326 |

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Given that p is smaller than 0.01, the table indicates that, at the 1% significance level, loss aversion significantly improves decision-making behavior. The t-statistic value is 8.2276, while the coefficient value of loss aversion bias is.4707. The ULCI and LLCI values are.5832 and.3581, respectively. At the 1% level of significance, risk perception also significantly improves loss aversion bias and decision-making behavior. This is demonstrated by the fact that the coefficient is.2546 and the t-statistic is 6.4243, both of which have values below 0.05, indicating that risk perception acts as a mediator between the two. The lower and upper bounds are.1766 and.3326, respectively.

## DISCUSSION

This study aims to investigate how psychological factors impact investors' decision-making behavior. Risk perception mediates the link between variables, whereas financial literacy moderates it. The study focuses on investors on the Pakistan Stock Exchange. By utilizing the frequency analysis, I begin with demographic characteristics in the analysis. It is clear from the data that men between the ages of 23 and 49 are more likely than women to invest. Most investors earn at least Rs. 150000 and have 20 years or more of experience. The study's mean, median, and standard deviation analysis show that investors are consistent with the research parameters. The results are analyzed using Hayes's method and extra correlation. To investigate the relationships between the variables, correlation is utilized. The results of the correlation show how significant the factors are. Hayes' technique is used to test the model.

The model is substantial, according to the results. Investor decision-making behavior is directly and significantly impacted by overconfidence. This result aligns with the findings of Ngacha, S. W. (2019), Chhapra (2018), Kashif (2018), and Rehan & Bai (2018). According to the hypothesis, FL is linked to DMB, OB and RP are positively correlated with investment decisions.

According to the well-known financial axiom that states that where there is more danger, there is more reward, investors who are extremely confident have a reduced risk perception when it comes to investing, according to the analysis of model 7's first independent variable, overconfidence bias. In other terms, we may say that investors forget to consider the risk because they are overconfident. Additionally, it goes without saying that those with greater financial literacy will make better investment choices than those with less financial literacy. This result is comparable to those of Calcango & Monticone (2015) and Fernandesetal (2014). Psychologically, this implies that financial knowledge in Pakistan supports the choices made by individual investors. In a similar vein, investor behavior is directly and significantly impacted by overconfidence and risk perception. The study's findings imply that investors lack rationality. Both mediation and moderation between the variables are present, and the hypotheses have been validated.

Regarding mental accounting bias, the second independent variable It is determined that decision-making behavior is significantly improved by mental accounting. This result is still in line with what Valaskova et al. (2019) found. Decision-making is significantly improved by mental accounting and risk perception. The impact of FL as a moderator and RP as a mediator is also noteworthy.

The impact of financial literacy as a moderator and risk perception as a mediator is also noteworthy. The study makes it abundantly evident that investors frequently make biased decisions based on their preferences and interests rather than applying any theory to support their decisions. Investors divide their funds into different groups according to their funding sources. Investors face danger and financial loss as well. They therefore handle their monthly revenue differently. Thus, it is demonstrated that the variables are mediated and moderated, and the hypotheses are validated. These results are comparable to those of Khan (2014) and Simon et al. (2000), Kannadhasan et al. (2014).

Results for last independent variable, LAB, indicate that it provocatively improves decision-making behavior. The findings of Kiran Aziz Malik et al. (2017) are comparable to this one. Decision-making behavior is significantly impacted by risk perception and loss aversion. There is proof of the mediating impact. The results of Iacobucci and Duhachek (2003), Khan (2014), and Simon et al. (2000) are comparable to our findings. Poor decision-making may result from an aversion to personal losses. It is obvious that investors do not like to incur losses. However, investors avoid taking even well-considered risks that could provide positive returns because they are afraid of losing money. However, there is no proof of the moderation effect.

### Implications of the Study

The new study adds to the body of knowledge on financial literacy and risk perception. The majority of Pakistani scholars look at the behavioral factors that affect investment decisions. Few research has examined the function of mediating and moderating variables in investment decision-making. As a result, current research examines the importance of financial literacy as a moderating variable and the impact of risk perception as a mediating variable. This study supports the

moderation between DMB and MAB, OB, and LAB, in addition to confirming the mediation between these psychological biases and decision-making behavior.

The study's conclusions showed that relying solely on the swift and generous principle would not increase investors' returns. Based on these data, various writers would like to claim that investors don't actually rely on prejudices while making investments. However, before making decisions based solely on psychological heuristics and emotions, conduct a thorough evaluation of investment opportunities, develop quantitative investment strategies, and establish investment requirements and objectives. Then, make wise decisions and proceed in the direction of appropriate investment fortunes. This study gave regulators and stock market policymakers insight into the composition and function of psychological factors taken into account when investors make decisions.

They will be able to comprehend investors and develop a system that accounts for these psychological factors thanks to this research, which will guarantee smooth market movement. Therefore, financial professionals will greatly benefit from the awareness and information that the current study provides regarding psychological investment management biases. For the purpose of this study, investors favor sound investment tools in order to avoid making the same costly mistakes that arise from psychological biases. The study also aims to motivate financial advisors to learn more about the psychology of their clients.

**Limitations**

As mentioned above, this study looked at how investors' decisions are impacted by psychological biases in the particular setting of Pakistan. The sample size is small because the data was only gathered from participants on the Pakistan Stock Exchange. There was extremely little time available for gathering information. The data gathered from the Lahore region might not be applicable to other cities. Lack of funding is another factor limiting research.

**Future Recommendations**

The findings indicate that psychological biases have an effect on how investors make decisions, with RP acting as a mediator and FL in the PSE acting as a moderator. Investors carefully consider their options before deciding to make an investment. The findings show that mental accounting bias, loss aversion bias, and overconfidence bias all affect how well investors perceive risk and their level of financial literacy. I discovered that the connections between loss aversion bias, mental accounting bias, and overconfidence bias are mediated by risk perception. The associations between mental accounting bias and overconfidence bias are moderated by financial literacy, but not between loss aversion biases.

Prior studies look at how psychological biases directly affect how people make investments. This study differs from others in that it examines for the first time the mediating function of RP and the moderating role of financial literacy on the relationship amongst these emotional biases. Therefore, the current work helps to close this gap in the literature.

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