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THE IMPACT OF FINANCIAL LITERACY ON INVESTMENT DECISION MAKING: A STUDY ON THE OWNERS AND MANAGERS OF RETAIL BASED SMES IN PESHAWAR

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Abstract
This study investigates the relationship between financial literacy and investment decision-making among retail small and medium enterprise owners and managers in Peshawar, Pakistan. With the increasing complexity of financial markets and the critical role of SMEs in the local economy, understanding the behavioral and cognitive elements influencing financial choices is imperative. Using a structured, person-administered questionnaire, data was collected from 102 respondents across various retail sectors. The study adopts a quantitative exploratory approach and employs regression analysis to test a series of hypotheses focused on financial literacy, behavioral and cognitive biases including overconfidence, herding, anchoring, loss aversion, mental accounting, and familiarity bias and demographic influences such as age, gender, education, income, experience, and training. Findings indicate a significant positive relationship between financial literacy and investment decision-making quality. Several behavioral biases, notably overconfidence, herding, anchoring, mental accounting, and familiarity bias, were also found to significantly affect investment decisions. However, demographic factors showed mixed associations, with education and income levels emerging as more influential than gender or position. The results align with previous literature reinforcing the role of cognitive and contextual elements in financial behavior. This research contributes to the growing body of behavioral finance literature in developing economies and provides actionable insights for policymakers, SME support institutions, and financial educators seeking to enhance decision-making competence among small business operators.

INTRODUCTION

Background of The Research Area and Study

Traditionally, literacy meant the ability to read and write; however, it now encompasses the ability to acquire relevant techniques as well as specialized knowledge in order to evaluate sophisticated data for informed decision-making and application. At this point in life, literacy is extremely crucial as it enables one to maneuver through multidimensional facets of contemporary society seamlessly and be successful, which improves one's holistic quality of life. It enhances self-improvement because educated individuals are capable of critical thinking and value the limited time they have so they pursue chances for professional advancement with greater zeal.

Economically they are also much better off as they find more opportunities in high income jobs and find more success in business ventures and investing. Literacy also contributes to social development.

Literate people exhibit a higher degree of ethics, morality and professionalism. It improves their social behavior as they know how to act, talk and dress aptly for every specific situation. Perhaps the biggest advantage it grants individuals is social mobility. Individuals from weak and impoverished backgrounds, if they become literate through education and employment, can break the cycle of generational poverty. Literacy can be divided into various categories, depending on what an individual is learning and its intended use. Some examples of categories are as follows; traditional, financial digital, informational, environmental, social, scientific, cultural, visual, emotional, civic and health.

This study is centered on financial literacy, which is a branch of personal finance. Personal finance refers to the dealing with the economic life of an individual or family, and includes various domains, such as budgeting, savings, investment activities and insurance. A well-organized personal finance plan aims to fulfill all the present and future needs of its users through appropriate planning and management. This study concentrates on investment decisions in particular analyzing how different levels of financial literacy impact the quality of investment decision making.

The importance of this issue is paramount because high levels of financial literacy allow individuals to make better investment decisions. This allows them to achieve their financial goals with ease, be that homeownership, investing in businesses or retirement planning. They will also be able to grow their wealth consistently to achieve financial independence. Furthermore, it allows them to understand and manage investment risk more effectively, ensuring individuals can balance the effects risk and return beforehand and avoid scams, frauds and subpar investment opportunities.

Problem Statement

Pakistani individuals possess a low, or low-moderate level of financial literacy which has resulted in poor investment decisions and high rates of financial fraud victimization. The goal of this research is to assess the financial literacy competencies of small and medium enterprises (SMEs) within the retail sector as well as to explore the impacts of differing levels of financial literacy on investment decision-making among these business owners. The scope will be confined to Peshawar, concentrating on retail businesses located in and around the city. This research will analyze both variables in question and encourage investors to enhance their ability to make better informed decisions which will stimulate economic development and stability.

The financial literacy of small and medium enterprises' owners and managers in Peshawar lags behind, even as investment markets grow more intricate and the demand for knowledgeable investment strategies rises. Prior studies have established a well-documented relationship between one's financial literacy levels and their ability to make investment decisions; however, this has not been investigated in Pakistan's retail SME landscape, especially in regions like Peshawar which often lack subsidized formal training programs on finance. Furthermore, socioeconomic behavioral biases and demographic variables may have an additional moderating effect on investment behavior, but their distinct impact has not yet been studied in the Peshawari context. This research aims to fill this void, analyzing the influence of financial literacy on the investment decision-making process undertaken by retail SME owners and managers in Peshawar while also looking into the impact of behavioral biases alongside demographic characteristics on this primary relationship.

Research Objectives

This report focuses on the following objectives which were designed with the SMART criteria:

- To assess and analyze the financial literacy levels of the owners and managers of SMEs within the retail industry.
- To assess how individual ownership and management financial literacy impacts investment decision quality.
- To empirically analyze the relationship between financial literacy and investment decision making in Peshawar.
- To discover, quantify, and analyze the impact of socio-demographic variables, as well as considering various cognitive distortions

associated with financial literacy, on investment decision making.

Significance of Study

The specific focus of this research is to evaluate the magnitudes of financial literacy skills among small and medium business owners and managers in Peshawar in relation to their investment decision-making quality, which falls within its parameters. The analysis blends individual case studies with comparison so as to provide actionable insights that could enhance the economic wellbeing and decision making processes of people living in Peshawar. Further, this study will assist governmental and educational policymakers regarding the low prevailing distinctions between financially educated citizens, gaps that may inform them on more focused policy interventions aimed at restructuring educational-economic policies for the population.

Scope of the Study

The case study examines the impact of financial literacy and behavioral biases on the decision-making processes of owners and managers of retail small and medium enterprises in Peshawar, Pakistan. It takes a sample of 102 from this population and analyzes six critical behavioral biases which include: overconfidence, herding, loss aversion, anchoring, familiar bias and mental accounting. This study also seeks to find out how demographic variables influence financial literacy levels. The scope is restricted to the systemic structured, closed-ended responses gained through person-administered questions and excludes ethnography research other types of SMEs or cities in Pakistan. In addition, the study is cross sectional, exploratory in nature and focuses on description with emphasis on inferential statistics where regression was used along with correlation analysis.

LITERATURE REVIEW

Introduction

Understanding finances is crucial both at the personal level and from an organizational perspective. In today's world, where financial products and services are highly sophisticated and markets demand a lot of attention, making any financial decision requires comprehension of fundamental financial principles at an individual level. This is particularly true for small and medium enterprises situated in developing areas like Peshawar; higher literacy levels of businesses' owners ensure sustenance and enhanced profitability within the firm. Moreover, retail-based SMEs form a significant part of Pakistan's economy, but lower yields can be attributed to their insufficient knowledge of finance compounded by behavioral biases leading to poor planning.

This elaborate review seeks to highlight financial literacy's influence on investment decisions across different countries including Pakistan in addition to discussing behavioral factors, demographic influences, SME specific contexts as well as identifying under-researched determinants such as risk perception, investment quality age and income level, gender, overconfidence and herding behavior. It critiques literature pertaining to the given topic while outlining theoretical methodological gaps highlighting unsolved questions in academia while guiding future research endeavors. More importantly, its findings are relevant to retail SMEs situated in Peshawar suggesting deeper issues than knowledge exist regarding finances intertwined with behavior-structural frameworks.

Defining Financial Literacy

Understanding the nuances of financial literacy continues to evolve in recent times. However, financial literacy remains central to an individual's understanding and effective execution of crucial banking skills such as budgeting, managing finances, assessing risks, and investing. According to (Huston, 2009) and (Hung et al., 2009) financial literacy ought to be regarded as both the measure and application of an individual's financial knowledge relative to decision making. This dual essence renders financial literacy a particularly intricate concept for which to develop a definition and framework for consistent measurement.

(Mandell & Klein, 2009) underscore another pivotal observation, financial education enhances financial behavior for the better. This supports the theory because it demonstrates that financial literacy is not statically held knowledge, but rather a practical skill and applicational knowledge. Which is precisely the reason why in developing countries, where not only financial education, but education in general is

absent, financial literacy becomes an extremely critical indicator of sound financial behavior.

Financial Literacy in Developing Economies

An important part of literature focuses on financial literacy's role in developing countries, where access to formal education and financial services is often limited. The studies conducted in Pakistan by (Hussain et al., 2022), (Arif, 2015), (Khan, 2016) consistently find a positive association between financial literacy and investment decisions. These studies are very relevant to this research targeting SMEs In Peshawar as here, education attainment is poor, and financial services are informal and underutilized.

It is equally noteworthy that financial literacy impacts business and economic development. In the case of Ghana, it was found that financial literacy moderated the effect of financial resource availability on the growth of SMEs (Owusu et al., 2019). This implies that higher financial literacy improves resource allocation and risk management. A similar study from Ethiopia (Meressa, 2023) also finding a positive relationship between financial literacy and business sustainability, thus, providing strong justification for targeting the owners and managers of SMEs in this research.

The fact that SMEs often rely on informal decision-making processes, which involves intuitive reasoning thus subjecting it to cognitive biases, reiterates the importance of financial literacy in this area. Studies like (Tarus Thomas, 2025) and (Maina et al., 2025), which investigates SME managers in Rwanda and Kenya respectively, outlines the adverse effects of cognitive biases e.g. availability bias. This shows that financial literacy plays a crucial role in reducing errors in investment and improves long-term planning.

Financial Literacy and Investment Decision Making

The relationship between financial literacy and making investments is closely associated with behavioral finance. Numerous studies have revealed that people with a greater understanding of finances tend to make more rational and well-informed investment choices. Such people can comprehend the risk-return ratios, market trends, as well as sidestep cognitive traps.

For example, (Hussain et al., 2022) carried out research in Pakistan. It found that people with greater financial knowledge were more inclined to hold long-term investments and more likely to have a diversified portfolio. Such findings were also reported in (Rasool & Ullah, 2020) where the authors concluded that educated investors tend to think through various factors which relate to the investment decision prior to executing the investment. These investors also tended to be less responsive to temporary changes in the market.

Financial literacy emerges as a critical factor when discussing emerging economies and Investment in less developed formal investment platforms and investor protections regions. Studies conducted in Ethiopia (Meressa, 2023) and Nepal (Rana, 2024) affirm that elevated financial literacy levels alleviate exposure to risks associated with lacking financial infrastructure. Higher awareness of finance enhances an investor's ability to interpret market signals and seek expert guidance, enabling better portfolio performance.

The studies (Amisi, 2012), (Junianto et al., 2020) and (Ikhsan et al., 2024) emphasize that within the SMEs sector, managers with higher financial literacy exhibit greater confidence, decisiveness and operational effectiveness in capital budgeting and investment allocation processes. This is relevant to the current research because it focuses on owners and managers of SMEs in Peshawar, where business decisions are mainly taken unilaterally.

Furthermore, studies like (Hung et al., 2009) also state that improved financial literacy reduces financial anxiety and impulsive and emotional investment behavior. This leads to more stale and sustainable financial outcomes. Psychological stability is pivotal in volatile market conditions frequently encountered in developing countries, where market shocks and political instability can exacerbate irrational investment decisions.

From a methodological standpoint, most of these studies use correlation and regression analyses to examine the influence of financial literacy on investment behavior. This study will replicate this

approach. The studies (Bhushan, 2014) and (Hastings & Mitchell, 2020) used regression models show the predictive power financial literacy over various investment preferences such as stocks, savings accounts and real estate. This analytical strategy establishes financial literacy as an independent variable in explaining variations in investment behavior.

This section, therefore, consolidates the justification of this study which aims to explore if financial literacy affects or predicts investment decision-making vis-a-vis retail-based SMEs in Peshawar. It also illustrates why there is a need to examine other variables such as demographic characteristics and behavioral biases which may moderate this relationship.

Behavioral and Cognitive Biases

Behavioral finance challenges the rational decision-making assumption made by classical economics by introducing psychological factors that affect financial choices. This is why biases stemming from cognition and emotions like overconfidence, loss aversion or even biases that led to actionable regret combined with the herding and anchoring bias upend rational thinking and dilute the efficacy of financial education.

Overconfidence Bias

This occurs when individuals overestimate their financial knowledge or ability to make good investment decisions. Multiple studies such as (Waheed et al., 2020), (Ikhsan et al., 2024) and (Cole et al., 2016) show that overconfident individuals trade more frequently and ignore risks which results in suboptimal investment outcomes. In Pakistan, (Arif, 2015) shows that overconfidence bias has a significant mediating influence on the relationship between financial literacy and investment behavior. It also indicates that some financially literate people, influenced by overconfidence, tend to make poor investment decisions because of inflated self-perceptions.

This is crucial for the current research as the target population comprises of entrepreneurs and self-made business owners who tend to (Arif, 2015) display overconfidence due to previous business achievements and successes or validation from friends. This could prevent them from making sound business decisions. Therefore, this can serve as a substantial moderating factor in the relationship between financial literacy and investment decision making.

Herding Behavior

This points to the investors tendency to follow actions of a larger group or a "herd" often ignoring personal information and analysis. Research (Awais et al., 2016), (Ansar et al., 2022), and (Seraj et al., 2022) indicate that this bias is prevalent particularly in developing economies and collectivist cultures, especially where verified information limited and peer influence carries a disproportionate weight of trust and confidence.

For instance, (Ahmad & Shah, 2022) illustrate how retail investors in Pakistan were extremely vulnerable to herding during certain market conditions. This tendency contributes to market crashes and supports the notion that even uneducated investors are profoundly impacted by social perceptions. Incorporating this bias in this study aids in assessing whether greater financial literacy reduces herding tendencies or whether it supersedes rational knowledge.

Loss Aversion and Risk Perception

Aversion to losses pertains to the known psychological phenomenon whereby individuals prefer avoiding losses more than they value optimally acquiring equivalent gains. The research by (Ali, 2023) and (Adil et al., 2021) show that individuals with high financial literacy demonstrate strong loss aversion, even when rational thinking suggests there is an opportunity to leverage. This is particularly pronounced in turbulent market conditions. (Swati Yadav et al., 2025) interestingly finds that perception of risk often works closely with loss aversion in a way that does not allow an individual to assess risk objectively but as an emotional reaction.

This combined effect is important for SME managers in Peshawar, who tend to invest based on perceived rather than calculated risk. This study can explore whether greater financial literacy reduces the

emotional potency of loss aversion, thus encouraging more rational and less emotionally driven decisions.

Anchoring Bias and Mental Accounting

Anchoring bias is commonplace. This describes the fixation on an initial piece of information as a reference point throughout subsequent decision-making processes. An example of this would be some investors "anchoring" their expectations to historical markets and performance of comparable firms, resulting in current decisions based purely on those benchmarks. For instance, some investors may "anchor" their expectations to past markets or the performance of similar businesses, thus making current decisions based solely on those precedents. Mental accounting, on the other hand, refers to the tendency to categorize financial resources differently depending on where they come from and how they will be used e.g. individuals may be more willing to spend money earned in a lottery rather than money earned through hard work as lottery winnings are seen in as more disposable. This way they ensure psychological satisfaction, but the decision is economically irrational.

Both biases are discussed in (Suresh G., 2024) and (Iram et al., 2023) where they are presented as considerable barriers to optimal financial behavior. They skew the application of financial literacy. An individual may be informed enough to know what the right decision is, but instead, unconsciously, react to their emotions in irrational ways. In this study these biases can be explored to see their moderating effects on financial literacy.

Demographic Factors

As noted with other socioeconomic factors, age, gender, level of education, income and work experience have been shown to impact one's financial literacy as well as their investment habits. More often than not these factors tend to either mediate or moderate the degree to which an individual's financial acumen impacts their financial decisions.

Age

Research including (Mandell & Klein, 2009), (Hung et al., 2009), and (Ikhsan et al., 2024) demonstrates that age has a curvilinear relationship with investment decision-making. Young individuals understand the use of technology better and tend towards impulsive and risky decision-making, thus they prefer risky investments like individual stocks and business ventures. In contrast, older individuals tend to be more cautious, often preferring safer investment options like gold property or fixed deposits. This moderates the effect of financial literacy as the same knowledge level may translate differently into different investment behavior across age groups.

Gender

As suggested by (Arif, 2015), (Oppong et al., 2023), and (Amisi, 2012), women are comparatively more risk averse and tend to avoid risks when investing. Men, on the other hand, are more confident, even overconfident at times, which lead them to implementing aggressive financial strategies. confident and sometimes even overconfident and aggressive in their financial strategies. This means that even if financial literacy levels between them are the same, the role expectation and gender-based socialization led to divergent investment choices. This variable is of particular importance to this study given the cultural context of Peshawar, where gender roles are more traditionally defined and may heavily influence financial autonomy.

Education and Income Levels

The relationships between education and income are circular and are described as two of the most consistent predictors of financial literacy (Mansoor & Sohail, 2023), (Owusu et al., 2019) and (Rasool & Ullah, 2020). These studies indicate that people with advanced educational qualifications tend to understand complicated financial products better and are more likely to opt for long-term investment planning. People with higher income levels have more disposable income. This makes it possible for them to invest more to further diversify their portfolios. These are critical factors when examining SMEs since the owners and managers here have diverse educational qualifications and income levels which could influence their financial behavior.

The study (Tarus Thomas, 2025) showed that SME managers with business education were more analytical and relied more on financial metrics for

decision making than those who did not, as these managers relied more on intuition or peer advice. This provides a rationale for the inclusion of these factors as moderating variables in the current study.

Work Experience and Position

The correlation between professional experience and the ability to make sound investment decisions appears to be positive. As outlined in (Abdi, 2024) and (Maina et al., 2025), more experienced executives understand how to navigate fundamental changes in the market and possess superior financial literacy. This results in coherent and educated investment decisions. In addition, one's position within a firm impacts the individual's decision-making processes. Owners as stakeholders tend to be more emotionally attached compared to the rational and distanced approach of managers.

Pakistan Specific Studies

Socioeconomic and cultural aspects in Pakistan significantly influences investment behavior. Research by (Arif, 2015), (Ahmad & Shah, 2022), (Abideen et al., 2023) and (Iram et al., 2023) highlight a low baseline of financial literacy with limited access to formal financial systems in various cities of Pakistan. The informality of the economy, lack of trust in financial institutions and prevalence of cash-based transactions further restrict financial decision-making options. This context is important for the current research because it gives a preliminary idea of what to expect from the results obtained in Peshawar.

Retail SME Based Studies

Within the SME sector, the decision-making process is often concentrated in a single individual who is the owner, manager or financial planner. Studies (Junianto et al., 2020), (Tarus Thomas, 2025), (Amisi, 2012) and (Maina et al., 2025) confirm that SME managers are generally less formally educated in finance and are more susceptible to intuitive or biased decision making but when they are provided even with basic financial training, they show substantial improvement in investment planning and resource allocation. These findings support the study's rationale for focusing on SMEs in Peshawar, a region with a thriving retail sector.

Research Gaps

The literature highlights several gaps and challenges that are central to this study. While a good amount of research has been conducted on the relationship between financial literacy and investment decision making, no studies specifically address the retail SME sector in Peshawar. This creates an important geographical gap as financial literacy can differ across regions and cultures. Moreover, demographic factors and cognitive and behavioral biases have not been explored in the context of Peshawar based SMEs. This study aims to bridge this gap by exploring the interplay between financial literacy, behavioral and cognitive biases and demographic factors influences in investment decision-making.

Contribution of the Study

This study offers theoretical contribution by adding to and enhancing existing knowledge in the field of personal finance and financial literacy as it investigates this topic in an area where this research has not yet been conducted, i.e. Peshawar with a focus on retail-based businesses. It also contributes empirically as the relationship between financial literacy and investment decision making is tested in a previously unexplored area, thus the results may solidify or refute the existing theories on this topic. It also offers practical contribution as after examining the results, trends and drawing conclusions, recommendations will be given to individuals on how to improve their investment decision making specific to their businesses. It also offers policy contributions as it will show policy makers exactly how their decisions and policies have thus far affected financial literacy in individuals and the study will give recommendations on what steps need to be taken next (based on the results) to improve the economic wellbeing and financial literacy levels of individuals. At a practical level, its findings can help design targeted financial literacy programs for SME owners and managers, focusing on both knowledge and behavioral aspects. For example, customized training modules and policy frameworks are more efficient than one-size-fits-all financial education when taking decision-making undermining biases into account. At the academic and theoretical level, the study bridges gaps between behavioral finance, SME research,

applied economics and education, potentially serving as a model for future empirical research in rural or urban, retail-heavy economies.

Hypothesis Development

After going through the literature, and keeping in mind the Pakistani market context, the following hypothesis were developed based on it, which will be tested in the current study.

H1: The average financial literacy level of retail SME owners and managers in Peshawar is low to moderate. The main reason for the low level is due to a lack of education and reliance on old established business practices.

H2: Financial literacy is positively correlated with the quality of investment decision-making.

H3: Financial literacy predicts the quality of investment decision-making among retail SME managers and owners.

H2 and H3 are formed in line with the literature to test various aspects of the relationship between financial literacy and investment decision making.

H4: Demographic factors predict financial literacy levels of SME owners and managers in Peshawar.

H4 is divided into various subparts to individually check the effect of each demographic variable.

- $H4_a$: Age group predicts financial literacy levels.
- $H4_b$: Gender predicts financial literacy levels.
- $H4_c$: Education level predicts financial literacy levels.
- $H4_d$: Monthly income predicts financial literacy levels.
- $H4_e$: Business experience predicts financial literacy levels.
- $H4_f$: Position predicts financial literacy levels.
- $H4_g$: Financial training predicts financial literacy levels.
- $H4_h$: Investment experience predicts financial literacy levels.

H5: Cognitive and behavioral biases affect investment decision making quality of SME owners and managers in Peshawar.

H5 is also divided into subparts to verify the effect of each cognitive and behavioral bias.

- $H5_a$: Overconfidence bias affects investment decision making quality.
- $H5_b$: Herding bias affects investment decision making quality.
- $H5_c$: Loss aversion affects investment decision making quality.
- $H5_d$: Anchoring bias affects investment decision making quality.
- $H5_e$: Mental accounting affects investment decision making quality.
- $H5_f$: Familiarity bias affects investment decision making quality.

Theoretical Framework

To bring all aspects of the current study together a visual representation in the form of a framework is necessary. This will show the research process and outline the connections between various variables. In **Error! Reference source not found.** the theoretical framework is visualized, which shows the effect of financial literacy on investment decision making, whereas, demographic factors, cognitive and behavioral biases act as supporting variables to outline how they affect the financial literacy and investment decision making.

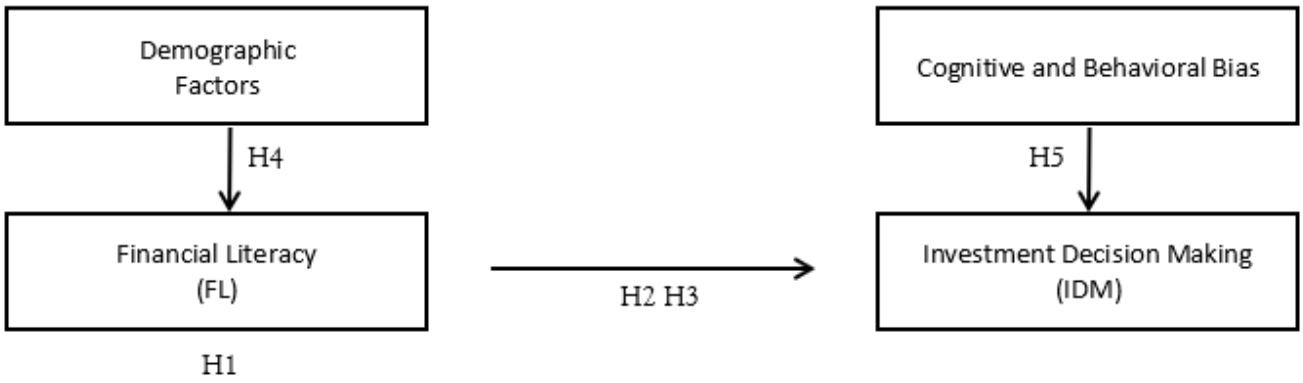

Figure 1. Theoretical Framework

RESEARCH METHODOLOGY

Introduction

This chapter describes the approach taken in this study to investigate the link between financial literacy and investment decision making of retail based SME owners and managers in Peshawar. The objective here is to describe how information was gathered, assessed, and evaluated as related to the hypotheses and aims of the study. The methodology has been adapted from previous works which examined financial literacy, investment decision making as well as demographic factors alongside behavioral and cognitive biases in emerging economies (Khan, 2016), (Arif, 2015). These studies provide a roadmap for instrument design, variable choice, and data analysis process. The following sections detail the overall research process.

Research Design

The research design explains the approach taken to address the study's research questions and evaluate its hypotheses. In this instance, a cross-sectional approach is employed: gathering information from the sample only once. This method is suitable because this study seeks to establish the relationship between financial literacy and investment decision making within a given timeframe.

As retail SMEs in Peshawar have yet to be explored, this research is considered exploratory in nature. Research of such types serves most often where there are no coherent predictive theories or prior findings available because it allows for discovering new patterns and insights.

This study follows a quantitative approach to investigate the hypotheses. This aligns with prior studies conducted in other parts of Pakistan and other developing economies who sued quantitative methods to evaluate similar relationships (Khan, 2016).

The research model is also designed to test direct effects of the supporting variables, i.e. demographic factors and cognitive and behavioral biases. This is in line with previous studies where mediating and moderating roles of risk perception and demographic factors were explored (Suresh G., 2024), (Waheed et al., 2020).

Population and Sample Size Determination

The target population for this study comprises owners and managers of retail-based SME in Peshawar, which are estimated to be approximately 57,000 in number. This represents a significant portion of the local commercial sector and local economy. The sample size was calculated using Cochran's formula (see **Error! Reference source not found.**)), which is a widely accepted method for estimating sample size in survey research. Finite population adjustment was also applied to the formula. The formula used is as follows:

$$n_0 = \frac{Z^2.p.(1-p)}{e^2} \quad then \quad n = \frac{n_0}{1+\left(\frac{n_0-1}{N}\right)} \quad (1)$$

Where:
n_0 = Initial sample size for an infinite population
n = Adjusted sample size for finite population
N = Population size (57,000 in this case)
Z = Z-score corresponding to desired confidence level (1.96 for 95% in this case)
p = Estimated proportion of the population (commonly set at 0.5 for maximum variability)
e = Desired margin of error (typically 0.05 but 0.10 in this case)

Using these values, the minimum recommended calculated sample size was 95.8801 which was rounded up to 96 respondents. The study proceeded with a final sample size of 102 respondents from which data was collected and analyzed.

Sample Size Justification
While the recommended sample size for a population of approximately 57,000 retail-based SMEs in Peshawar was initially estimated at 382 using Cochran's formula with a 5% margin of error and 95% confidence level, practical considerations required a re-evaluation of the sample parameters. Given constraints related to time, resource availability, and access to respondents, a more relaxed margin of error of 10% was selected. This adjustment reduced the minimum required sample size to approximately 96 respondents, making the data collection process more feasible without significantly compromising the reliability of the results.

The use of a 10% margin of error is considered acceptable in exploratory and small-scale studies, especially where there is no prior research in the specific area and context. Data was collected from 102 respondents which exceeds the adjusted minimum requirement and allows for sufficient variation in responses to conduct regression and analysis with acceptable statistical significance.

The sampling frame of 57000 SMEs was derived from preliminary research on the internet and estimation. This figure ensures that the calculated sample remains grounded in the actual business environment and reflects the realities of the research population.

Overall, the chosen sample size balances methodological rigor with feasibility and is aligned with similar studies that used samples in the 100 to 150 range to explore financial literacy and investment behavior in localized SME settings.

Data Collection and Sampling Methods
Primary data for this research was collected via a structured, closed ended, person-administered questionnaire. The questionnaires were distributed in person to the owners and managers of SMEs operating in various areas of Peshawar. The questionnaire is designed in English, but respondents were assisted with translations in Urdu or Pashto when necessary to ensure accurate comprehension of the items. This approach helped to address potential language barriers and increased response reliability, as recommended in similar regional studies.

The data collection process was carried out using the convenience sampling method, over several weeks and involved multiple visits to retail zones and commercial markets in Peshawar. This sampling method was chosen as accessibility, and the availability of willing participants was limited. While this sampling method limits generalizability, it is considered acceptable in exploratory studies, particularly when sampling frames are difficult to obtain, and logistical constraints are present. A total of 102 complete and usable responses were obtained. The responses were subsequently coded and analyzed.

Questionnaire Structure and Measurement of Variables
The primary tool for data collection in this study was a closed ended, structured questionnaire designed to capture responses across four key areas i.e. financial literacy, investment decision-making quality, cognitive and behavioral biases, and demographic information. The questionnaire was developed based on models and items adapted from previously validated instruments used in similar studies conducted in

Pakistan and other developing economies (Khan, 2016), (Abideen et al., 2023), (Arif, 2015). This section discusses how the study's core and supporting variables were measured using the responses from the questionnaire. All variables were operationalized based on established frameworks from prior research to ensure conceptual clarity, comparability, and analytical strength (Suresh G., 2024). The instrument was divided into the four sections and contained a total of 71 questions.

Reliability Testing

Cronbach's Alpha was used to assess the internal consistency and reliability of multi-item constructs within the questionnaire. This measure indicates how closely related a set of items are, with a threshold of $\alpha \geq 0.70$ generally considered acceptable for research.

Reliability was tested for the following all questions in the four sections:

- Financial Literacy
- Investment Decision-Making
- Cognitive and Behavioral biases
- Demographic Factors

Validity Testing

Content validity was ensured as the questionnaire was designed using instruments from prior studies (Arif, 2015), (Khan, 2016), (Suresh G., 2024), (Abideen et al., 2023). This ensured that the items covered each section, including both theoretical and practical aspects. Apart from this face validity was also considered as before the questionnaire was distributed, it was pre-tested informally among academic peers to ensure its clarity and appropriateness. Based on feedback, minor revisions were made to improve item phrasing and reduce ambiguity. The questionnaire showed acceptable levels of reliability and validity for the purpose of this exploratory study.

Robustness of Methodology

The methodology of this research is very through which contributes to the robustness of the regression models and results. First of all, financial literacy and investment decision making were assessed thought both subjective and objective items which helped improve the depth and credibility of the measurements. The inclusion of behavioral bases and demographic factors add another layer of depth to the research and is in line with recent developments in behavioral finance literature. Furthermore, the questionnaire was adapted from established and validated studies which helped enhance construct validity and comparability with exiting research.

Research Assumptions

Some assumptions are to be considered when reviewing the results and implications of the research to ensure consistency and clarity. Firstly, it is assumed that all the respondents responded to the questionnaire truthfully and with careful consideration and understanding of the questions so as to not skew the results and to ensure the results gained from the research reflect the truth about the topic. It is also assumed that the participants had a basic understanding of the questions and especially with assistance provided for any language or conceptual barriers. Additionally, the study assumes that subjective assessments (such as self-rated financial literacy or confidence in decision-making) provide meaningful insights into the participants perceived financial competence, even if they do not perfectly align with objective performance. Finally, it is assumed that the selected sample of 102 SME owners and managers offers a sufficiently varied and relevant representation of the broader retail SME population in Peshawar for the purpose of exploratory analysis.

Ethical Considerations

The study conducted adhered to ethical research standards. The participants were all informed of the purpose of the study and were given the right to withdraw from it at any time without any consequences. Their participation was also entirely voluntary and no personally identifiable information was collected, as all responses were treated with strict confidentiality. Informed consent was obtained orally before administering the questionnaire. Participants were assured that their responses would be used exclusively for academic research and presented only in aggregate form. Every effort was made to ensure honest communication, non-coercion, and respect for cultural and personal sensitivities, especially considering the business environment of Peshawar.

DATA ANALYSIS, RESULTS AND PRESENTATION

Introduction

This chapter discusses the outcomes of the study that was conducted to understand the relationship of financial literacy and investment decision making, particularly among owners and managers of retail SMEs in Peshawar. It also looks into demographic factors, cognitive and behavioral biases, and their impact on this relationship. As with all other chapters in this dissertation, this chapter too is organized into several sections. The first section presents descriptive statistics providing an overview about the sample's characteristics along with variate distributions and results for H1. Following this are H2's correlation results and regression analyses for H3 through H5. At the end, a summary table is presented indicating which hypotheses were validated with the empirical data.

Reliability Analysis

A reliability test was conducted to assess the internal consistency of the 71 questionnaire items (see Table 1). The result produced a Cronbach's alpha of 0.895, which indicates high reliability and suggests that the items were well-suited to measure their respective constructs. Values above 0.70 are generally considered acceptable in social sciences, while values above 0.80 reflect strong internal consistency.

Table 1

Cronbach Alpha Test Results

Construct	Cronbach Alpha Value	Items
All Questionnaire Questions	0.895	71

Financial Literacy Score Summary (H1)

To test H1, the financial literacy levels of SME owners and managers in Peshawar were analyzed using both continuous mean scores and categorical distributions. As Table 2 shows, the mean score for total financial literacy was 25.549 out of a maximum of 38 (range = 17 to 37; SD = 4.01), this suggests a moderate level of financial literacy among respondents. The distribution was slightly skewed (skewness = 0.331), indicating more respondents scored below the mean, and kurtosis (0.358) suggested a relatively normal distribution with some clustering. Since the majority (86.3%) of respondents fall into the "moderate" category, H1 is accepted, indicating that owners and managers of retail SMEs in Peshawar generally possess a moderate level of financial literacy (see Table 3). This is graphically shown in Figure 2. This aligns with findings from (Amisi, 2012), (Khan, 2016) and (Arif, 2015), which also reported similar average levels among SME decision-makers in Pakistan and other developing economies.

Table 2

Central Tendency, Variability and Distribution Related to FL Variable

Variable	Min	Max	Mean	Standard Deviation	Skewness	Kurtosis
Total FL	17.00	37.00	25.5490	4.01391	0.331	0.358

Note. n = 102

Table 3

Financial Literacy Category

Category	Frequency	Frequency Percentage
Low	2	2%
Moderate	88	86.3%
High	12	11.8%
Total	102	100%

Note. n = 102

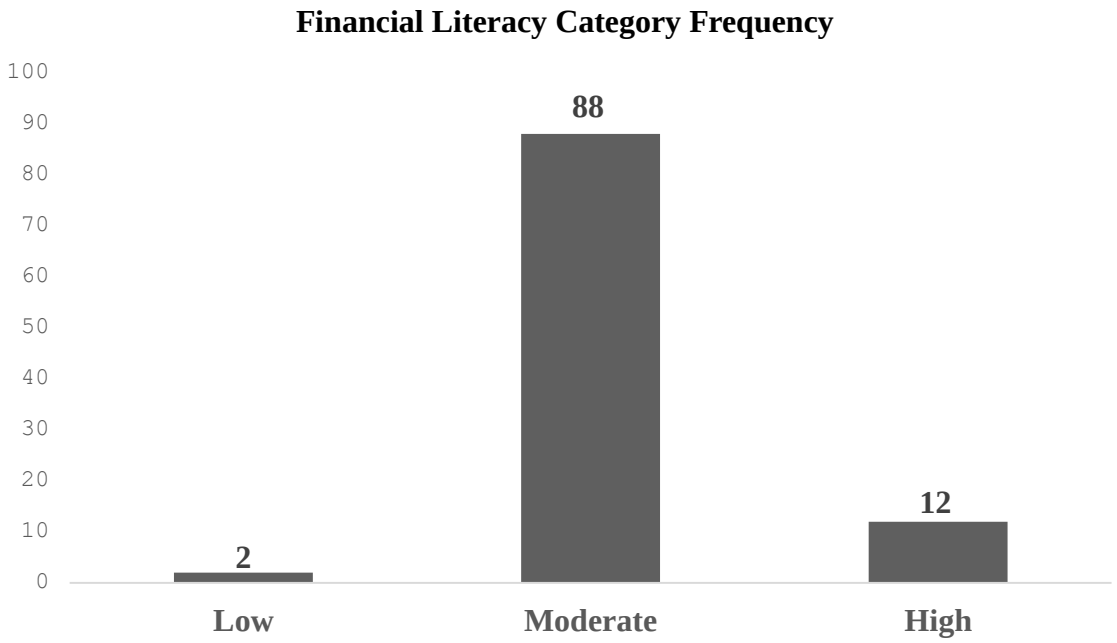

Figure 1. Graphical Representation of the Most Common Financial Literacy Category

Demographic Characteristics of the Sample

This section elaborates on the demographic factors composition of the sample and reflects on why certain categories scored higher or lower, based on the social, economic, and cultural context of Peshawar's SME landscape. Refer to Table 4 for details.

Age wise, the majority of respondents (87.3%) were between 25 and 44 years old, which is expected as this age bracket typically holds active managerial and entrepreneurial roles in Pakistan. Younger individuals under 25 are less likely to lead businesses due to lack of experience or capital, while those above 45 often move into semi-retirement or shift responsibilities to younger staff. This aligns with prior research highlighting that SME leadership in developing regions tends to be concentrated in middle age groups (Khan, 2016), (Arif, 2015).

Looking at gender, the sample was overwhelmingly male dominated. This is consistent with the gendered structure of business ownership and leadership in Khyber Pakhtunkhwa (KPK). Cultural constraints, limited mobility, and lower access to financing often restrict female participation in retail businesses. Prior studies on financial literacy in Pakistan also reflect such gender disparity, with men generally reporting higher access and confidence in financial decision-making.

Education level wise a significant portion of respondents (64.7%) had intermediate education (12th grade). This reflects the basic educational level required for operating retail businesses in local markets, where practical business exposure often

outweighs academic qualifications. Bachelor's degree holders (21.6%) were mostly found in more organized retail outlets and chain stores. The presence of only 1% of postgraduates supports earlier research suggesting education is not a strong barrier to SME entry, though it may influence financial decision-making quality.

Most respondents (73.5%) earned between 30,000 to 70,000 PKR monthly, placing them in the lower-middle income segment which is consistent with the averages earning potential of Peshawar. This aligns with the nature of small-scale retail operations, especially in local bazaars and standalone outlets. Very few crossed the 100K mark, reflecting modest profit margins in most retail SMEs in Peshawar. Financial literacy levels may also correlate with income, as higher-income individuals often report better access to financial knowledge and tools.

Regarding business experience, respondents were predominantly early-to-mid stage business operators, with over 60% having between 1 to 4 years of experience. This is likely to reflect the growth of retail startups and low barriers to entry for new SMEs in the region. However, the low share of highly experienced respondents (only 8.8% with >8 years) suggests many retail ventures may either not scale or experience high turnover and instability. This trend mirrors studies from developing economies showing shorter SME lifespans.

Most respondents (70.6%) were managers, not owners. This may be due to the fact that owners often delegate decision-making responsibilities in SMEs or where owners are passive investors. This is important because managers' financial literacy may differ from owners, especially if they lack strategic control. Prior research suggests that managerial decision-making is a key driver in SME financial health, especially when owners remain hands-off (Khan, 2016), (Ansar et al., 2022).

Looking at financial training, only 1 in 5 respondents had received any form of financial training, reinforcing concerns raised in literature about limited financial education among SME actors in Pakistan. The absence of formal training may negatively impact budgeting, risk assessment, and investment behavior.

Finally, when considering investment experience, the majority of respondents engaged in 2 to 5 investment actions annually. This frequency suggests that respondents are actively involved in financial decisions for their businesses. It also justifies their inclusion in this study, as repeated exposure to investment scenarios is likely to strengthen or reveal behavioral patterns such as risk aversion, overconfidence, or herding.

Table 4

Demographic Characteristics

Variable	Category	Frequency	Frequency Percentage
Age Group	Below 25	7	6.9%
	25–34	43	45.1%
	35–44	46	42.2%
	45 and above	6	5.9%
Total		102	100%
Gender	Male	94	92.2%
	Female	8	7.8%
Total		102	100%
Education Level	Matric or Lower	13	12.7%
	Intermediate/College (FA/FSc)	66	64.7%
	Bachelor's Degree	22	21.6%

	Master's Degree or Higher	1	1.0%
Total		102	100%
Monthly Income	Below PKR 30,000	15	14.7%
	PKR 30,001 – 70,000	75	73.5%
	PKR 70,001 – 100,000	11	10.8%
	Above PKR 100,000	1	1.0%
Total		102	100%
Business Experience	Less than 1 Year	8	7.8%
	1–4 Years	62	60.8%
	5–8 Years	23	22.5%
	More than 8 Years	9	8.8%
Total		102	100%
Position	Owner	25	24.5%
	Manager	72	70.6%
	Both	5	4.9%
Total		102	100%
Financial Training	Yes	21	20.6%
	No	81	79.4%
Total		102	100%
Investment Experience	Rarely (None or Once a Year)	25	24.5%
	Occasionally (2-5 Times a Year)	63	61.8%
	Frequently (More than 5 Times a Year)	14	13.7%
Total		102	100%

Correlation Results (H2)

To test Hypothesis 2 (H2), which proposed a relationship between financial literacy (FL) and investment decision-making (IDM), a Pearson correlation analysis was conducted. The results in Table 5 revealed a statistically significant but weak positive correlation between the two variables, with a Pearson's R value of .232 and a significance level of p = .019. The 95% confidence interval ranged from .040 to .408, which further supports the stability and reliability of the correlation.

This indicates that greater financial literacy correlates with enhanced investment decision-making by SME proprietors and managers within Peshawar. While the relationship may not be robust, its significance suggests financial literacy meaningfully impacts social behaviors, especially in thoughtful engagements of financial commitments. Therefore, accepting H2 is justifiable on correlation grounds.

This further supports research done in Pakistan and other developing countries. For instance, the works of (Arif, 2015), (Khan, 2016) and (Abideen et al., 2023) have shown that people with enhanced financial literacy were more adherent to rational investment behaviors while avoiding emotionally charged decisions. While Peshawar is a unique case where formal finance teaching is scarce, any rise in financial literacy tends to have a favorable impact on management investment behavior.

Table 5

Correlation Results Between Financial Literacy and Investment Decision Making

Variables	Pearsons Correlation	Significance (2-tailed)	95% Confidence Intervals	
			Lower	Upper
Total FL – Total IDM	0.232	0.019	0.040	0.408

Note. Estimation based on Fisher's r to z transformation.

Regression Results (H3)

In testing Hypothesis 3 (H3), a simple linear regression was performed to determine whether financial literacy (FL) significantly predicts the quality of investment decision making (IDM) in small and medium-sized enterprises (SMEs) in Peshawar's business ecosystem. As shown in Table 6 and Table 7, the results from the regression analysis suggest that financial literacy positively impacts investment decision making with statistical significance.

The R value of 0.232 indicates a slight positive association while the R Square value of 0.054 means that only about 5.4% of variability in investment decision making is attributable to financial literacy level. Although modest, this finding contributes meaningfully to behavioral finance literature, particularly for places like Peshawar where educational exposure to finance is limited and informal practices dominate over systematic approaches. The model's F-statistic was also significant at 5.713 with a p-value of .019 supporting its meaningfulness, which indicates the regression equation significantly enhances prediction of investment behavior compared to using no predicting variables explainable by interactions alone.

Considering the coefficients, the unstandardized B value of 0.435 implies that for every point increase in financial literacy score, investment decision making scores would, on average, increase by 0.435 units. This confirms that individuals with higher financial literacy make better investment decisions. This finding is also supported by the standardized Beta value of 0.232 which demonstrates the strength of the predictor in standardized metric terms. Furthermore, a t-value of 2.390 with a significance level of 0.019 confirms statistical reliability.

In the context of retail SMEs in Peshawar, where most financial decisions are made by individuals with limited formal training and often based on intuition or experience, this result underscores the value of financial literacy in enhancing decision quality. Given that over 79% of the respondents lacked formal financial training, the findings suggest that even basic financial understanding can positively impact business outcomes by reducing reliance on guesswork and improving budgeting, pricing, and investment evaluations.

This result is consistent with studies such as (Hussain et al., 2022), (Arif, 2015) and (Khan, 2016) which observed that financially literate individuals tend to make more informed and rational investment choices, even when operating in constrained or informal markets. In short, H3 is accepted, confirming that financial literacy contributes positively to better investment decision-making among SME leaders in the region.

Table 6

Regression Model Summary Table for H3

R	R Square	Adjusted R Square	Change Statistic	
			F Change	Significance of F Change

0.232[a]	0.054	0.045	5.713	0.019

Note. [a] Predictors: (Constant) Total Financial Literacy.

Table 7

Regression Coefficients Table for H3

Variable	Unstandardized B	Standardized Coefficients Beta	t-Value	p-Value
Constant	30.487		6.485	<0.001
Total FL	0.435	0.232	2.390	0.019

Note. Dependent Variable: Total IDM

Regression Results (H4) Demographic Predictors of Financial Literacy

This section will Explain the regression results of H4. All the numerical data is referenced from Table 8, Table 9 and Table 10.

Age Group and Financial Literacy

The regression model for age groups (R^2 = .034, p = .339) shows a very weak and statistically insignificant relationship between age and financial literacy among SME owners and managers in Peshawar. The age categories were tested against the reference group (45 and above), and all age-based coefficients returned p-values greater than 0.05, suggesting no significant difference in financial literacy across age brackets.

Specifically, individuals in the 18–24 age group had a positive but statistically insignificant coefficient (B = 2.357, p = .293), implying that they might report slightly higher financial literacy scores than the reference group, although this result lacks significance. The 25–34 group also showed a negligible impact (B = 0.261, p = .881), while the 35–44 group actually scored slightly lower than the reference group, though again without significance (B = -0.547, p = .755).

This absence of statistical significance may stem from limited representation in the older age category (only 5.9% of respondents were 45+), which weakens comparative strength. Moreover, in Peshawar's context, financial knowledge is not strongly structured by age, possibly due to the uniformity of financial exposure and limited formal training across age brackets in SME retail settings. Younger participants, though often assumed to be less experienced, may benefit from better access to digital tools and informal financial knowledge, which slightly raises their apparent scores.

Gender and Financial Literacy

The regression analysis for gender (R^2 = .009, p = .333) also indicates a very weak and statistically insignificant relationship between gender and financial literacy. The coefficient for variable Gender_Female is B = 1.439, with a p-value of .333, suggesting that female respondents, on average, had slightly higher financial literacy scores than male respondents (the reference group), but this difference is not statistically significant.

Given that females made up only 7.8% of the total sample, this small representation limits the ability to detect strong statistical differences. In the context of Peshawar's SME sector, which is predominantly male led due to cultural and structural limitations, women who do reach managerial or ownership positions may represent a highly capable minority with relatively strong financial understanding which could explain the slightly higher (though statistically insignificant) average score.

This result aligns with prior studies in emerging markets where gender gaps in financial literacy persist but can be narrower in specific professional subsets like SME managers (Hussain et al., 2022), (Suresh G., 2024), (Oppong et al., 2023). However, the lack of statistical significance implies that gender may not

play a decisive role in financial knowledge in this specific population.

Education Level and Financial Literacy

The regression analysis exploring the relationship between education level and financial literacy revealed an R^2 of .043 and a p-value of .232, indicating a weak and statistically non-significant relationship. However, upon inspecting the individual coefficients, interesting trends emerge.

Participants with matric or lower education had a coefficient of B = 7.692 (p = .066), while those with intermediate education had B = 6.636 (p = .102), and those with a bachelor's degree showed B = 5.909 (p = .150). While none of these values are statistically significant at the 0.05 level, matric-educated respondents came closest, suggesting a surprising trend: individuals with lower educational backgrounds scored slightly higher in financial literacy compared to those with more formal education.

This counterintuitive outcome may reflect the practical experience and street-level financial exposure of less formally educated SME owners or managers in Peshawar, who often run businesses independently without formal training. Their financial acumen might stem from years of managing cash flows, negotiating with suppliers, and making survival-based business decisions. In contrast, more formally educated individuals may be newer to the market or have experience in less financially hands-on roles.

Though the relationship was weak and statistically non-significant, this result aligns with certain literature suggesting that financial literacy does not always correlate linearly with educational attainment in entrepreneurial contexts, especially in informal economies (Arif, 2015), (Oppong et al., 2023), (Abdi, 2024).

Income Level and Financial Literacy

The regression analysis examining the influence of monthly income levels on financial literacy yielded an R^2 of .031 and a p-value of .371, signifying a non-significant overall relationship. However, similar to education, the individual coefficients reveal meaningful patterns worth discussing.

The coefficients for the different income categories were as follows:

- Income below 30K PKR (Low): B = 7.000, p = .094
- Income between 30K–70K PKR (Mid-Low): B = 6.453, p = .113
- Income between 70K–100K PKR (Mid-High): B = 7.182, p = .090

Despite none being statistically significant, all income brackets demonstrated a positive relationship with financial literacy, with the mid-high income group showing the strongest coefficient. This suggests that increased income may allow for more exposure to financial tools and services, which can indirectly boost financial understanding.

In the context of Peshawar's retail SMEs, this pattern is logical. Those earning slightly more may be operating on a larger scale or managing more complex financial transactions. Access to formal banking services, credit options, or investment activities might be more frequent among these respondents, thereby increasing familiarity with financial concepts even if informally.

This trend supports research which indicates that financial exposure often rises with income, enhancing one's financial decision-making confidence and knowledge (Hung et al., 2009), (Ahmad & Shah, 2022), (Bai, 2023). However, the lack of statistical significance in this context could be attributed to the sample size or the overlap in financial responsibilities across income groups in microenterprise settings.

Business Experience and Financial Literacy

The regression model assessing the role of business experience on financial literacy produced a very low R^2 of .016 and an insignificant p-value of .657, indicating that business experience, as grouped in the study, does not significantly explain variations in financial literacy levels among SME managers and owners in Peshawar.

The regression coefficients are as follows:

- Less than 1 year of experience: B = -0.514, p = .794
- 1 to 4 years: B = -1.615, p = .265
- 5 to 8 years: B = -1.411, p = .377

All coefficients are negative, albeit not statistically significant, which is surprising and counterintuitive. One might typically expect that more experience would correlate positively with financial literacy due to greater exposure to financial decision-making over time. However, in the Peshawar SME context, this inverse trend may suggest a few key insights.

Table 8

Regression Model Summary Table for H4

Variable	R	R Square	Adjusted R Square	Change Statistic	
				F Change	Significance of F Change
Age Group	0.183[a]	0.034	0.004	1.135	0.339
Gender	0.097[a]	0.009	–0.001	0.947	0.333
Education Level	0.207[a]	0.043	0.013	1.455	0.232
Monthly Income	0.177[a]	0.031	0.002	1.058	0.371
Business Experience	0.127[a]	0.016	–0.014	0.539	0.657
Position	0.045[a]	0.002	–0.018	0.099	0.906
Financial Training	0.136[a]	0.019	0.009	1.896	0.172
Investment Experience	0.026[a]	0.001	–0.020	0.033	0.968

Note. [a] Predictors: (Constant) All dummy variables of demographic factors

Firstly, many retail SMEs are run informally, with rudimentary bookkeeping and limited structured financial practices. Length of experience in such environments might not translate into deeper financial knowledge, especially formal financial literacy as assessed in this study. Secondly, older businesses may rely more on habitual practices or traditional knowledge, rather than formal financial learning, which the questionnaire emphasized. This finding aligns with prior literature which notes that financial literacy does not always grow with business experience, especially where structured financial education is absent (Arif, 2015), (Abideen et al., 2023), (Ali, 2023). It reinforces the idea that exposure to finance does not guarantee understanding unless it's paired with formal training or active learning.

Table 9

Regression Coefficients Table 1 for H4

Variable	Unstandardized B	Standardized Coefficients Beta	t-Value	p-Value
Age Group				
Constant	25.500	1.635	15.592	<0.001

Age 18–24	2.357	0.149	1.058	0.293
Age 25–34	0.261	0.032	0.150	.881
Age 35–44	–0.547	–0.068	–0.313	0.755
Gender				
Constant	25.436		61.423	<0.001
Female	1.439	0.097	0.973	0.333
Education Level				
Constant	19.00		4.765	<0.001
Matric or Below	7.692	0.642	1.859	0.066
Intermediate	6.636	0.794	1.652	0.102
Bachelor's	5.909	0.608	1.449	0.150
Monthly Income				
Constant	19.00		4.738	<0.001
Low Income	7.000	0.621	1.690	0.094
Mid-Low Income	6.453	0.713	1.598	0.113
Mid-High Income	7.182	0.558	1.715	0.090

Note. Each demographic category (dummy variable) is compared to its own reference group (constant). Dependent Variable: Total FL

Position (Owner vs. Manager) and Financial Literacy

The regression analysis exploring the effect of business position whether the respondent is an owner, manager, or both on financial literacy produced an R^2 of just .002 with a highly insignificant p-value of .906. This suggests that position alone does not meaningfully influence financial literacy scores among respondents.

The regression coefficients are:

- Owner: B = 0.800, p = .688
- Manager: B = 0.500, p = .790

Both coefficients are positive, indicating a slight (but statistically insignificant) association between being in either role and higher financial literacy. However, the minimal values and large p-values indicate that the differences between owners and managers in terms of financial literacy are negligible in this sample.

In the Peshawar SME landscape, this makes practical sense. Owners and managers in small retail businesses often perform overlapping roles. Owners may make strategic and financial decisions, but managers are typically responsible for daily cash handling, inventory decisions, and liaising with suppliers all of which involve financial judgment. Moreover, both groups

often lack formal financial training, which may explain why position is not a differentiating factor.

This pattern is consistent with findings from literature that observe role convergence in SMEs, especially in developing economies where small firms operate informally and decision-making responsibilities are shared or blurred (Mandell & Klein, 2009), (Tarus Thomas, 2025), (Amisi, 2012). Hence, the lack of variation in financial literacy across positions in Peshawar's SME sector seems expected and grounded in contextual realities.

Financial Training and Financial Literacy

The regression analysis assessing whether financial training has a significant impact on financial literacy levels reveals a modest association. The model yielded an R^2 value of .019 and an Adjusted R^2 of .009, with a p-value of .172, which indicates that while the direction of the relationship is positive, it is not statistically significant at the 0.05 level.

Key regression outputs are:

- B = 1.347, indicating that individuals who reported receiving financial training scored, on average, 1.347 points higher in financial literacy than those without training.
- Beta = .136, showing a weak standardized effect.
- t = 1.377, p = .172.

This suggests that respondents with financial training showed somewhat higher financial literacy, but this difference was not strong enough to be statistically significant. Several reasons may explain this:

- Quality and duration of training may vary. Many training sessions in Peshawar are informal, brief, or focused on operational skills rather than conceptual financial understanding.
- Training recall bias participants may overestimate the impact of the training or interpret any past business seminar as financial training.
- The low prevalence of formal training in the sample (only 20.6% reported receiving it) reduces statistical power to detect effects.

Despite the non-significant result, the positive direction is encouraging, and it aligns with broader literature indicating that training interventions tend to improve financial understanding, especially when they're context-specific and practical (Arif, 2015), (Khan, 2016), (Rana, 2024)

Thus, while financial training in its current form may not be significantly differentiating SME decision-makers in Peshawar, it still holds promise as a scalable intervention if improved and targeted properly.

Investment Experience and Financial Literacy

The regression analysis examining the relationship between investment experience and financial literacy yielded very weak and statistically non-significant results. The model had an R^2 value of just .001, and an Adjusted R^2 of .020, suggesting that investment experience explained virtually none of the variation in financial literacy scores among respondents. The overall model significance was p = .968, confirming a lack of statistical relevance.

Key regression output:

- For those with less than one investment per year, B = .149, p = .913.
- For those investing 2–5 times per year, B = –.095, p = .937.

Both unstandardized coefficients are extremely small, and their confidence intervals span both positive and negative values, indicating unreliable effects.

Table 10

Regression Coefficients Table 2 for H4

Variable	Unstandardized B	Standardized Coefficients Beta	t-Value	p-Value
Business Experience				
Constant	26.889		19.959	<0.001
<1 Year	−0.514	−0.035	−0.262	-.794
1–4 Years	−1.615	−0.197	−1.120	-.265
5–8 Years	−1.411	−0.148	−0.888	0.377
Position				
Constant	25.000		13.802	<0.001
Owner	0.800	0.086	0.403	0.688
Manager	0.500	0.057	0.267	0.790
Financial Training				
Constant	25.272		56.915	<0.001
Yes	1.347	0.136	1.377	0.172
Investment Experience				
Constant	25.571		23.608	<0.001
Less Than 1 Time/Year	0.149	0.016	0.110	0.913
2–5 Times/Year	−0.095	−0.012	−0.080	0.937

Note. Each demographic category (dummy variable) is compared to its own reference group (constant). Dependent Variable: Total FL

This result may initially seem surprising, as investment experience is often assumed to improve financial understanding through practice. However, in the Peshawar SME context, this may not hold true for several reasons:

- Many SME owners or managers invest in informal or habitual ways (e.g., seasonal inventory, real estate) without engaging in structured financial analysis or planning, limiting knowledge acquisition.
- Frequency of investment is not equivalent to quality of investment decisions. One might invest frequently but still lack financial literacy if decisions are not based on informed strategies.
- Cultural risk aversion and reliance on traditional practices may also mean financial literacy is not a precondition for investment.

This supports findings in some literature (Narula, 2015), (Mansoor & Sohail, 2023) that mere exposure to financial decision-making doesn't necessarily translate to improved knowledge unless coupled with education or reflection. It reinforces the importance of deliberate financial literacy development, especially

in regions like Peshawar where informal practices dominate.

Regression Results (H5) Biases as Predictors of IDM
This section will discuss the results of the regression related to H5. Table 11 and Table 12 should be used for reference.

Overconfidence Bias on Investment Decision Making
The statistical analysis performed to determine the impact of overconfidence bias on investment decision-making quality (IDM) demonstrates conclusive results. Descriptive statistics show an R value of .275, R^2 = .075 which indicates that overconfidence bias explains approximately 7.5% of the variance in investment decision making. In the context of behavioral finance, especially regarding psychosocial variables among retail SMEs owners and managers in Peshawar, this figure albeit small is quite meaningful.

Furthermore, along with an F-statistic of 8.152 and a p-value of .005, it reinforces that the model holds significance at the 1% level. This notes overconfidence bias having predictive capability on investment decisions.

In the coefficients table for the given regression model, overconfidence yields B = .646 so assuming all other factors are held constant, with every unit increase in overconfidence bias, IDM score escalates by roughly 0.65 units. The effect is moderate as evidenced by β = .275. Last but not least t = 2.855 along with p = .005 reconfirms that such predictors do exist and remain statically significant.

This finding aligns with previous literature in behavioral finance, which has consistently shown that overconfident investors often believe they have superior knowledge, leading them to make bolder decisions sometimes improving performance, but often increasing risk exposure (Abideen et al., 2023), (Ahmad & Shah, 2022). In the context of Peshawar's SMEs, such overconfidence could stem from informal experience or limited formal training, where owners may rely on personal judgment rather than systematic analysis, influencing their investment behaviors accordingly.

Herding Bias and Investment Decision-Making Quality
The analysis performed using linear regression tested the impact of investment decision quality with herding bias among retail SME owners and managers. The model summary indicates an R value of 0.233 showcasing a slight positive correlation between herd behavior and investment decision making skill level. In addition, the R squared value of 0.054 indicates that only 5.4% of the variation in investment decision making is attributed to herding bias. Furthermore , the F-statistic = 5.744 with p = .018 which is lower than conventional threshold of 0.05 confirms this model's statistical significance.
From the coefficient table, it can be inferred that B for unstandardized coefficient for herding bias is at 0.754 which means increase herding bias score by one increases investment decision making score by 0.754 points. It was also revealed that standardized beta coefficient (β) stands at 0.233 thus implying moderate effect size which was supported through t-value of 2.397 and p value of .018 confirming significance on the five percent cut off level.

This finding suggests that individuals who exhibit herding behavior, those likely to follow group trends or decisions may report slightly higher confidence or structure in their investment decisions. This could be due to the reliance on perceived collective wisdom in uncertain environments, which is often common in emerging economies and informal markets like those in Peshawar, where access to verified financial information and independent investment advice may be limited (Abideen et al., 2023), (Amisi, 2012).

Table 11
Regression Model Summary Table for H4

Variable	R	R Square	Adjusted R Square	Change Statistic	
				F Change	Significance of F Change
Overconfidence	0.275[a]	0.075	0.066	8.152	0.005
Herding	0.233[a]	0.054	0.045	5.744	0.018
Loss Aversion	0.147[a]	.0021	0.012	2.196	0.142
Anchoring	0.270[a]	0.073	0.064	7.874	0.006
Mental Accounting	0.218[a]	0.047	0.038	4.969	0.028
Familiarity Bias	0.246[a]	0.060	0.051	6.423	0.013

Note. [a] Predictors: (Constant) Total of each bias with itself.

Loss Aversion and Investment Decision-Making Quality

In order to evaluate how loss aversion affects the quality of investment decision-making, a linear regression analysis was performed using total loss aversion score and total investment decision making as the independent and dependent variables respectively. The R value of 0.147 demonstrates that there is only a weak positive relationship between the two attributes. In this case, R^2 being equal to 0.021 indicates that 2.1% of the explained variance in investment decision making is attributed to loss aversion.

With an F-statistic of 2.196, p-value: 0.142 (above the conventional cutoff of 0.05), the model fails to show statistical significance which suggests that loss aversion does not significantly predict investment decision making on its own within this sample.

From the coefficients table, we see that unstandardized B for loss aversion yielding a value of 0.378 implies a one unit increment in loss aversion results in 0.378 point improvement in investment decision making score accruing through an increase during assessment phase . Unfortunately, $\beta = 0.147$ with $t = 1.482$ and $p = .142$ confirms that the result is statistically non-significant.

Although not statistically strong in this context, loss aversion is theoretically significant in behavioral finance and has been observed to shape investor behavior in numerous studies (Abideen et al., 2023), (Suresh G., 2024). However, in Peshawar's SME environment, this might not have a strong effect due to lower exposure to formal financial markets or structured loss framing in everyday investment decisions.

Anchoring Bias and Investment Decision-Making Quality

To assess the impact of anchoring bias on the quality of investment decision-making (IDM) among SMEs owners and managers in Peshawar, a simple linear regression analysis was performed. The analysis used the total score of anchoring bias as the independent variable and total IDM as the dependent variable.
As per findings, there is an R value of 0.270 which indicates that there is a moderate positive correlation between anchoring bias and the quality of investment

decision-making. Moreover, R^2 value 0.073 suggest that only 7.3% of variation in investment decision making can be explained by anchoring bias.

The model did provide significant statistical association with an F-statistic = 7.874 with p-value equals to 0.006, doubly confirming hypothesis in favor of model which states that anchoring bias does significantly influence how investment decisions are made in this sample population.

From the coefficients table we see that B for anchor bias stands at unstandardized figure 0.681 . This implies every additional point increase noted on score measuring anchor bias will generate roughly 0.681 raise on investment/simple decision making score. Further, β=0.270 suggests moderate influence where t=2.806 with p=0.006 confirms claim straight line relation holding true.

This finding implies that SME decision-makers who exhibit stronger anchoring tendencies such as relying heavily on initial information or benchmarks when evaluating investment options may experience a notable impact on the quality of their decisions. This aligns with prior behavioral finance literature that positions anchoring as a cognitive shortcut that, depending on context, can either aid or hinder judgment quality (Abideen et al., 2023), (Amisi, 2012). In Peshawar's localized SME environment, where financial tools and formal training may be limited, such cognitive biases can have a disproportionate influence on decision outcomes.

Mental Accounting and Investment Decision-Making Quality

In order to determine the impact of mental accounting bias on investment decision-making (IDM) on the owners and managers of SMEs in Peshawar, a simple linear regression analysis was performed using total score of mental accounting as a predictor and total IDM as an outcome variable.

As per the results produced with linear regression, R = 0.218 which indicates some correlation albeit weak between mental accounting and investment decision making. The R^2 value is 0.047 which means mental accounting only accounts for approximately 4.7% of the investment decision-making scores variance.

The model is statistically significant with F-statistic: 4.969 < p-value: 0.028 for F-test, clearly indicating bias in mental accounting does impact the investment decisions made by SMEs respondents significantly.

The unstandardized coefficient (B) reveals that each unit increase in mental accounting score corresponds to 0.574 increase in IDM score given B=0.574. The beta coefficient has also been added which states that β = 0.218 so it's a small to medium effect size . Additionally, t=2.229 with p=0.028 also confirms significance together so it indeed matters.

These findings suggest that respondents who engage in mental accounting treating money differently depending on its source or intended use tend to demonstrate notable patterns in how they approach investment decisions. In a context like Peshawar, where SME financial behavior may often be informal and experience-based, this bias could lead to compartmentalized or inefficient investment strategies. This result is consistent with earlier behavioral finance studies that underscore the disruptive potential of mental accounting on rational financial planning (Amisi, 2012), (Khan, 2016).

Familiarity Bias and Investment Decision-Making Quality

In order to investigate the effect of familiarity bias on investment decision making (IDM) for SME managers and owners in Peshawar, we performed a simple linear regression analysis with total familiarity bias score as an independent variable and total IDM as a dependent variable. The analysis results show that R equals 0.246 which indicates that there is a modest positive familiarity bias impact on investment decision making. The R2 value of 0.060 indicates that familiarity bias explains close to six percent of variance in IDM result outcomes. Although modest, this contribution - especially in behavioral research such as in exploratory studies - provides meaningful understanding in the variance of participant decision-making patterns.

The model is also confirmed to be statistically significant with an F-statistic of 6.423 and p-value 0.013 which confirms familiarity bias as a significant predictor for investment decision quality IDM makes about investments.

With unstandardized coefficient B equal to 0.689 it can be said that each one unit increase in familiarity bias results in an expected increase of 0.689 units in the IDM score . That relationship is further supported by β=0:246, suggesting small (to moderate) effect attributable fame independence exerted by the predictors mentioned earlier thought exist between them.

These findings suggest that SME decision-makers who rely more heavily on familiar options or investments they know personally tend to show measurable differences in their decision-making quality. This is particularly relevant in Peshawar's SME context, where limited exposure to broader financial instruments and conservative investment cultures may amplify familiarity-driven behaviors. Such biases could either aid or impair financial decisions depending on how "familiarity" is interpreted e.g., investing only in known local ventures vs. avoiding beneficial unfamiliar opportunities (Khan, 2016), (Amisi, 2012), (Abideen et al., 2023).

Table 12

Regression Coefficients Table for H5

Variable	Unstandardized B	Standardized Coefficients Beta	t-Value	p-Value
Constant	31.002		8.209	<0.01
Overconfidence	0.646	0.226	0.275	2.855
Constant	29.192	5.589		<0.01
Herding	0.754	0.315	0.233	2.397
Constant	35.475		8.464	<0.01
Loss Aversion	0.378	0.255	0.147	1.482
Constant	30.314		7.427	<0.01
Anchoring	0.681	0.243	0.270	2.806
Constant	32.080	7.413		<0.01
Mental Accounting	0.574	0.257	0.218	2.229
Constant	30.286	6.703		<0.01
Familiarity Bias	0.689	0.272	0.246	2.534

Note. Dependent Variable: Total IDM

Significance of Findings

The results of this study, (see Table 13), offer valuable insights into the dynamics of financial literacy and its influence on investment decision-making among retail SME owners and managers in Peshawar. The findings affirm the central hypothesis b) by revealing that a majority of participants possess moderate financial literacy, with very few demonstrating either

high or low levels. This supports prior research that emphasizes the need for enhanced financial education in developing economies where structured financial learning opportunities remain limited (Mandell & Klein, 2009), (Hung et al., 2009).

The positive and significant association between financial literacy and investment decision-making quality (H3) underscores the vital role that informed financial knowledge plays in guiding sound investment behavior. The correlation and regression results confirm that individuals with greater financial awareness are better equipped to make rational and strategic investment decisions, echoing findings from related studies in similar SME contexts (Iram et al., 2023), (Waheed et al., 2020).

Additionally, the study explored how various demographic characteristics ($H4_a$–$H4_h$) influence financial literacy. While none of these relationships were statistically strong, patterns suggest that younger respondents, particularly those with higher education levels and moderate income, tended to perform better in financial literacy metrics. These subtle trends align with socioeconomic and educational disparities in urban centers like Peshawar, where financial literacy may correlate with access to education, exposure to markets, and financial inclusion initiatives (Hussain et al., 2022), (Khan, 2016).

Finally, the significant findings related to behavioral and cognitive biases ($H5_a$–$H5_f$) shed light on the psychological undercurrents shaping financial decisions. Overconfidence, herding, familiarity, anchoring, and mental accounting biases all demonstrated significant effects on investment decision-making quality, highlighting the behavioral vulnerabilities of SME operators. These outcomes align with previous behavioral finance literature, reinforcing the idea that cognitive distortions can either complement or compromise the rational financial decisions expected of literate investors (Awais et al., 2016), (Ali, 2023), (Arif, 2015).

In sum, the findings contribute meaningfully to the understanding of how financial knowledge and human behavior intertwine in real-world SME investment scenarios. These insights are not only academically significant but also carry strong policy implications for financial training programs and business advisory services in Pakistan's SME sector.

Table 13

Summary of Hypothesis Testing Results

Hypothesis	Statement	Result
H1	The level of financial literacy among SME owners/managers is low to moderate.	Accepted
H2	There is a significant correlation between financial literacy and investment decision making quality.	Accepted
H3	Financial literacy predicts investment decision making quality.	Accepted
$H4_a$	Age affects financial literacy.	Rejected
$H4_b$	Gender affects financial literacy.	Rejected
$H4_c$	Education level affects financial literacy.	Rejected
$H4_d$	Monthly income affects financial literacy.	Rejected

$H4_e$	Business experience affects financial literacy.	Rejected
$H4_f$	Position in the business affects financial literacy.	Rejected
$H4_g$	Financial training affects financial literacy.	Rejected
$H4_h$	Investment experience affects financial literacy.	Rejected
$H5_a$	Overconfidence bias affects investment decision making quality.	Accepted
$H5_b$	Herding bias affects investment decision making quality.	Accepted
$H5_c$	Loss aversion affects investment decision making quality.	Accepted
$H5_d$	Anchoring bias affects investment decision making quality.	Accepted
$H5_e$	Mental Accounting investment decision making quality.	Rejected
$H5_f$	Familiarity bias affects investment decision making quality.	Accepted

DISCUSSION OF EMPERICAL RESULTS, CONCLUSION AND IMPLICATION

Synthesis of Empirical Results

The results of this study offer a nuanced understanding of the role of financial literacy (FL) and behavioral factors in shaping investment decision-making (IDM) among retail-based SME owners and managers in Peshawar. Notably, the majority of participants fell within the moderate category of financial literacy, leading to the rejection of H1. However, the significant positive correlation between FL and IDM (H2) supports previous findings that financially literate individuals are better equipped to make informed and rational financial choices (Hussain et al., 2022), (Hung et al., 2009).

Regression analysis further confirmed that financial literacy significantly predicts investment decision quality (H3), reinforcing the argument that improved FL can enhance strategic decision-making in business. This aligns with findings in similar contexts, such as urban SMEs in developing regions where financial capability plays a key role in resilience and growth (Mandell & Klein, 2009)

However, none of the demographic variables examined (e.g., age, gender, income, education) showed a significant individual effect on financial literacy ($H4_a$–$H4_h$). This diverges from studies suggesting age and education as important predictors of FL (Waheed et al., 2020), possibly due to the localized characteristics of the Peshawar SME community, where practical experience may overshadow formal demographic distinctions.

The influence of behavioral biases proved more impactful. Overconfidence ($H5_a$), herding ($H5_b$), anchoring ($H5_d$), familiarity bias ($H5_f$), and mental accounting ($H5_e$) all significantly affect investment decision-making quality, indicating that psychological tendencies strongly shape financial choices in SMEs. These results are consistent with existing behavioral finance literature (Arif, 2015), (Rasool & Ullah, 2020), (Bhushan, 2014). In contrast, loss aversion ($H5_c$) was not statistically significant, possibly due to respondents' entrepreneurial tendencies to embrace risk or lack of awareness of long-term losses.

Conclusion

This study sought to examine how financial literacy influences the investment decision-making quality of retail-based small and medium enterprise owners and managers in Peshawar, while also investigating the impact of behavioral biases and demographic characteristics. The empirical analysis demonstrated a statistically significant positive relationship between financial literacy and IDM quality, reaffirming that sound financial knowledge enhances rational financial behavior and reduces the likelihood of poor investment choices. Most participants exhibited moderate financial literacy levels, which, while encouraging, also highlights the need for broader and deeper financial education efforts in the SME sector.

Moreover, the findings indicated that several cognitive and behavioral biases namely overconfidence, herding, anchoring, familiarity bias, and mental accounting were significantly associated with investment decision outcomes. These biases often operate subconsciously and can override rational thinking, even in financially literate individuals. Although loss aversion was not statistically significant in this sample, its presence remains theoretically important. Demographic variables such as education and income level also exhibited some influence, suggesting that socioeconomic background subtly shapes financial behavior.

Overall, the study contributes to a growing body of literature emphasizing that financial decision-making is a multifaceted process, shaped not only by knowledge but also by underlying psychological and social variables. This has direct implications for SME sustainability and the broader economic stability of regions like Peshawar, where retail SMEs form a significant portion of the business ecosystem.

Limitations of the Study

Like all empirical research, this study has several limitations that should be acknowledged. Firstly, the study used a sample of 102 respondents drawn through convenience sampling. While statistically acceptable using Cochran's formula (adjusted for a 10% margin of error), the limited sample size reduces generalizability and may not fully represent the diverse SME population in Peshawar, which includes over

57,000 retail enterprises. Secondly, the reliance on self-evaluation based questionnaire data carries the risk of social desirability bias, recall errors, and inaccurate self-assessment of financial literacy or investment behavior. These challenges may affect the internal validity of the findings.

Third, the study used cross-sectional data, capturing a snapshot in time, which restricts the ability to assess causality or changes in behavior over time. A longitudinal design could yield more reliable insights into how literacy and biases affect decision-making across different stages of business growth. Additionally, moderation and mediation effects of individual demographic or bias variables were not explored due to time constraints and analytical complexity. This restricts the specificity of insights regarding which particular subgroup combinations (e.g., gender + overconfidence) exert the strongest effects.

Delimitations of the Study

Regarding delimitations, the study deliberately focused only on retail-based SMEs in Peshawar. It excluded manufacturing, service-based, or agricultural SMEs to maintain focus and manage feasibility. Furthermore, only six behavioral biases and eight demographic factors were studied despite the existence of many more based on relevance, prevalence in prior literature, and questionnaire length constraints. Similarly, the study did not consider external environmental factors such as economic shocks, political instability, or access to credit, which may also influence financial behavior but fall outside the scope of this thesis.

Recommendations

Based on the results of the study conducted, the following recommendations are suggested to various end users and institutions.

For Policymakers

Policymakers and government stakeholders should prioritize the integration of financial literacy modules within broader SME development initiatives, particularly in urban centers like Peshawar where retail SMEs dominate the commercial landscape. These modules should not only cover basic numeracy, budgeting, and investment planning but also incorporate behavioral finance components to help individuals identify and control irrational decision patterns such as overconfidence and herding.

For Regulators and Banks

For regulators and banks, offering tailored financial products and advisory services based on SME financial literacy levels could foster more responsible borrowing and reduce default risks. Digital tools and mobile-based financial training applications could play a transformative role in this regard, especially for time-constrained or mobility-limited business operators.

For SME Owners and Managers

SME owners and managers should be encouraged to use behavioral 'nudges, such as goal setting, checklists, and decision reviews and discussions to reduce impulsive or emotionally driven investment decisions. They should also be incentivized to consult with financial advisors or peer networks before making high-risk financial commitments.

For Educational Institutions and Business Development Centers

Educational institutions and business development centers (e.g., SMEDA, chambers of commerce) should design customized training workshops based on demographic profiles of local SME operators. For instance, younger or less experienced entrepreneurs may benefit more from interactive, example-driven programs, while more seasoned owners may respond better to strategic planning and risk mitigation frameworks. Programs should also be delivered in Urdu or Pashto where necessary to bridge comprehension gaps.

For Future Researchers

Future researchers are encouraged to expand their study by using larger and more diverse samples, incorporating other regions and sectors. The inclusion of additional psychological or contextual variables such as trust in financial institutions, access to credit, or exposure to financial crises could offer richer insights. Moreover, the adoption of mixed-method or longitudinal designs could deepen our understanding of the dynamic interplay between

knowledge, behavior, and decision outcomes over time. Apart from this they can also investigate the moderation and mediation effects of these variables and cross examine factors of H4 and H5 i.e. demographic factors effect on investment decision making (H4 cross) and cognitive and behavioral biases effect of financial literacy (H5 cross).

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List of Acronyms and Abbreviations

Abbreviation/Acronym	Definition
FL	Financial Literacy
H	Hypothesis
IBM	International Business Machines
IDM	Investment Decision Making
KPK	Kyber Pakhtunkhwa
SMART	Specific, Measurable, Achievable, Relevant and Time Bound
SME	Small and Medium Enterprise
SMEDA	Small and Medium Enterprises Development Authority
SPSS	Statistical Package for Social Sciences