

**BEHAVIOURAL BIASES AND DECISION-
MAKING IN PAKISTANI STOCK EXCHANGE
INVESTMENT: THE MODERATING ROLE OF
FINANCIAL LITERACY**

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**ASIA e UNIVERSITY
2025**

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FINANCIAL LITERACY

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A Thesis Submitted to Asia e University in
Fulfilment of the Requirements for the
Master of Science (Management)

August 2025

ABSTRACT

This study examines the influence of behavioral biases on investment decision-making, with particular attention to the moderating role of financial literacy. The research focuses on two groups of investors in Karachi, Pakistan: 230 individual (retail) investors and 150 institutional investors. A quantitative research approach was adopted, using a structured questionnaire for data collection. The data were analyzed through SPSS and Jamovi, employing reliability analysis, independent sample t-tests, and moderation analysis to evaluate the relationships between behavioral biases, financial literacy, and investment decisions. The findings reveal that behavioral biases—such as heuristics, representativeness, availability bias, and regret aversion—significantly affect investment behavior. The results also indicate notable differences between individual and institutional investors in how these biases influence their decisions. Furthermore, financial literacy was found to moderate these effects, suggesting that investors with higher financial knowledge are better equipped to make rational investment choices. Although the study is limited to a specific geographical area and relies on self-reported data, which may involve some bias, its findings offer valuable implications for financial advisors, policymakers, and investor education programs. Enhancing financial literacy through targeted training and awareness initiatives can reduce the impact of cognitive biases and improve investment outcomes.

Keywords: Behavioral biases, heuristic biases, representativeness bias, cognitive biases, financial literacy

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the degree of Master of Science.

The student has been supervised by: **Professor Dato' Dr Sayed Mushtaq Hussain**

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(28 August 2025)

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the requirements for the Master of Science (Management) is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

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Date: 28 August 2025

ACKNOWLEDGEMENTS

I sincerely appreciate my supervisor, Prof. Dato' Dr. Sayed Mushtaq Hussain, for his encouragement and assistance whenever I needed it. His commitment and generosity gave me more self-confidence. I am appreciative of his unending advice and assistance. I want to express how grateful I am to my family for their unwavering love, prayers, and unending support. Their unwavering belief and support help me reach my objective.

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LIST OF ABBREVIATION

BATS	Bonds Automated Trading System
BKTI	Banking Sector Tradable Index
CDC	Central Depository Company Limited
CSDC	Centralized Securities Depository Company
EMH	Efficient Market Hypothesis
FPI	Foreign Portfolio Investment
ISE	Islamabad Stock Exchange
KATS	Karachi Automated Trading System
KITS	Internet Based Order Routing System
KSE	Karachi Stock Exchange (KSE)
LSE	Lahore Stock Exchange
MPT	Modern Portfolio Theory
NCCPL	National Clearing Company of Pakistan Limited
OGTI	Oil and Gas Tradable Sector Index
PSX	Pakistan Stock Exchange

CHAPTER 1

INTRODUCTION

1.0 Background of Study

Investment plays a key role in an economy of a country. It helps to circulate the flow of money and improves living standard. Investment can be broadly categorized into Public and Private Sector: Public Sector investment are generally made by Government from taxes to build and improve country's infrastructure in order to ease its citizen's wellbeing and induce an environment for private sector investment. There are various avenues for Private Sector investment and its performance can be ascertained from country's stock exchange.

Multiple variants of investment have recently become conventional, and investors decide differently on the investment selection. Most of the previous theories of economics depict that a person is rational and makes decisions by knowing all the imperatives of available information. With the passage of time, it turns out to be challenging for investors to make investment decisions by different available factors. Previously, investors had minimal information to decide about the accurate information and its accessibility; with the advent of technological developments, investors must have bulk quantities of information to decide. It is an inevitable need for investors to be conscious of psychological biases through a strong understanding of their personality characteristics and consider their financial literacy when making financial investment decisions. According to Baker et al. (2019), "The investment decision is affected by cognitive and heuristic biases".

The standard paradigm of finance studies the markets using "rationality" models (Baschieri et al., 2017; Statman, 2019). Under the "rationality" concept, an individual continually changes his preferences and ideas on current knowledge

(Bossaerts & Murawski, 2017; Lewis et al., 2014). On the contrary, behavioral financial agents says that their choices do not make them reasonable or consistent since their psychology impacts their decisions (Miłaszewicz, 2019; Statman, 2014).

According to classic financial theories, investors are entirely rational and behave as investment choice maximizers. It has been noticed that investors act irrationally by focusing on investors' decisions in real life. Investors' moods, feelings, and instincts influence their perceptions and choices and contribute to illogical conduct. The investor's psychology is also strongly influenced by investment decisions, which is why they are irrational (Zaidi & Tauni, 2012). According to Sharpe (1964) investment is the practice or method of investing capital in the expectation of future reward. Every investor needs their investment to get the maximum return. Some research has demonstrated that the decision on financial information is irrational and reasonable; the more financially aware a person is, the more rational the decision will be. To make optimal and logical decisions, the investor needs to measure ideally and captivate all the information restricted to the market. Yet many investors have different opinions on receiving the data and, because of the existence of biases, they are irrational in the investment decision.

We need to be aware of the mental processes that give rise to people's ideas, emotions, and animal spirits in order to comprehend how economies function and how we may manage and thrive in them. If we don't acknowledge that a big portion of the causes of significant economic events are psychological, we can never truly comprehend them. It is regrettable that the majority of economists and business writers don't seem to understand this and frequently rely on the craziest and most fabricated explanations of economic occurrences. They believe that fluctuations in people's emotions, perceptions, and passions are irrelevant in the grand scheme of things and

that unpredictable technological elements or unpredictable government actions are the main forces behind economic developments (Akerlof & Shiller, 2009).

As, the study entails both types of investors i.e., retail and institutional, it is necessary to discuss the stock market. The selling and buying of stocks takes place on the stock market. The stock market serves as a source of financing for business organisations' investments in any economy (Samuel, 1999). Additionally, stock markets are regarded as a barometer of a nation's economic health and expansion. Therefore, stock market movements or market trends represent the economic growth of the country. It is said that an increase in share prices are the good indication for the economy (Jaswani, 2008).

According to Bloomberg, Pakistan is a developing economy and in 2016, Pakistan's stock market was the highest performing market in Asia and the world's 5th best performing market. "Pakistan's stock exchange recently announced that it will regain its emerging economies status from the MSCI All Country World Index" (Mangi, 2016).

Investors worldwide are looking for financial markets that are not as affected by both the U.S. interest rate cycle and China's economic slump. According to Mangi (2016), Pakistan is seen as an amazing investment destination by many, prompting investors worldwide to consider potential ventures there. Understanding the behavior of investors in Pakistan's stock market and the factors influencing their investment decisions is crucial.

In our everyday lives, decision making is a critical task. It is considered that decision is one of the human intellectual processes. In his everyday life, a person has to take lots of decisions. A more detailed and logical decision would result in reliable and research-based knowledge relevant to decision to be made. The hardest aspect of

investment decision is to decide a particular zone and field for investment. While investing capital, we need to understand the state of the market, risk-bearing potential, and various other factors.

Saleem et al. (2018) outline three methods of decision analysis that provide an accurate representation of an individual's mental processes. These three methods are prescriptive, normative, and descriptive assessments. A rational decision model is a normative approach in which the decision maker is well-informed, able to calculate accurately, and seeks to enhance real-world decisions beyond existing practices. Rational decision-making can be described as a decision that is based on the logical analysis of potential outcomes (March, 1994). A logical sequence in a rational model begins with defining a goal, then considering different options and their outcomes, and finally choosing the most suitable option. The majority of economic models indicate that people make rational decisions. Conversely, behavioral finance explained that market anomalies are caused by overreaction, under reaction, and herding behavior. According to Malkiel (2003), markets behave irrationally as investors are driven by their emotions rather than logic when making financial decisions. Investors believe they are rational in their decision-making process while trading, but many still exhibit behavioral biases, raising the question of how rational their decisions truly are.

Researchers who focus on firsthand experiences have discovered that investment decisions do not always adhere to rational practices, even when efforts are made to ensure rationality. However, in actual situations, individuals encounter the challenge of limited rationality, where they have constrained time, resources, and mental capabilities. Decision makers lack complete information on the consequences of their decisions, making it difficult for them to choose the best option, resulting in rational decisions sometimes leading to negative outcomes.

1.1 Research Gap

Because behavioral financing is comparatively new discipline compared to other financial theories, conducting research is crucial for advancing the understanding of behavioral finance. Behavioral finance is utilized to uncover the influences affecting investment choices. There is limited application of behavioral finance in emerging markets. This study aims to enhance the application of behavioral finance in various markets like emerging and established markets. This study is special because, as previously stated, behavioral finance is an emerging research field. Research done in Western nations may not apply to Asian settings and may not be as relevant to the Pakistani context due to variations in contextual frameworks. The majority of research is being carried out in advanced economies, while only a few studies have been done in emerging markets.

The primary aim of this study is to analyze how cognitive and heuristic biases, specifically herding behavior, regret aversion, representativeness, and availability bias impact decision making. Additionally, assessing how financial literacy moderates the connection between these biases and investment choices.

The present study will add to available literatures by including new evidence from an emerging economy of Pakistan. This research investigates the effects of behavioral biases and investment decision with the moderating role of financial literacy. There is a lot of work done all over the world in this context. In Pakistan, however, there are no or minimal studies in this context, and it is also important because each individual's behavior is different. In this study, we examine how the decisions of Pakistani investors are influenced by these biases. This study additionally assessed the consequence of financial literacy in investment decision in Pakistan Scenario which was not adequately addressed.

1.2 Problem Statement

Subject Matter (Importance & Relevance): The significance of understanding the factors that impact investor behavior in assessing an individual investor's decision-making process has been highlighted by the recent worldwide financial crisis. In investment process many things are included like obtaining information, picking stock, holding stocks and selling investments, which is followed by investors while making a new selection, this process of investment is full of psychological biases, however investors can reach impartial decisions by becoming aware of behavioral biases and avoiding actively behavioral biases. This research is related to behavioral biases and aims to shelter light on right financial behavior. Cohen and Kudryavtsev (2012) demonstrated that the decisions of investors are affected by their perception, historical performance, past experiences, and aspirations. Individual investors appear to exhibit behavioral biases when trading and they make trading errors because of these biases. But according to Chen et al. (2007) the market can overreact or underreact due to these trading errors and incorrect investment decisions. Many investors blame big investors for manipulation. Many investors have inadequate expertise and no technological skills needed to make investments. And they are totally dependent for investment decisions on professional investors and brokers. For advice on better investment decisions, a complete profile analysis of an investor is needed. Hence, studying the behavior of both individual and institutional investors is crucial for improving financial advisory services and creating policies for resilient financial systems.

Although the relationship between behavioral biases and investment decisions has been widely studied, the moderating role of financial literacy in this context has received comparatively less attention. Financial literacy, while often overlooked, plays a crucial role in helping investors recognize and manage the impact of such biases.

The core issue lies not only in the presence of behavioral biases, but in the extent to which limited financial knowledge can amplify their negative influence on investment decision-making.

Study Focus: This research addresses the issue by exploring how cognitive and heuristic biases influence investment choices, with financial literacy acting as a moderator. Market conditions in Pakistan differ from those in developed countries, leading to differing investment philosophies among Pakistani investors, who will be the focus of this research. In order to provide appropriate clarification to investors regarding their investment decisions, it is crucial to examine the behavioral factors that impact investors' choices.

1.3 Introduction

People make varying choices in their lives; certain decisions carry more weight, while others are less significant. Certain choices are straightforward while others are intricate and necessitate a decision-making procedure with numerous stages. Instead of relying on external information, people rely on their own experiences and perceptions when making investment decisions, leading them to make sound choices (Shah et al., 2018).

Psychologists found that humans do not act as rationally as economists believed, with stock market anomalies and empirical research conducted by Babajide and Adetiloye (2012) and Bashir et al. (2013) showing that investors do not behave as expected by economists. A recently developing area of finance known as behavioral finance could help to explain these anomalies. Behavioral finance looks at the actions of individuals or entities in roles such as investors, analysts, and asset managers, taking into account their various psychological characteristics. "It aims to explore how emotional responses and cognitive mistakes influence the decisions of individual investors" (Kengatharan & Kengatharan, 2014). Behavioral Finance explains how

investors rationally make errors in decision-making and lead to different irregularities (Gupta & Ahmed, 2016).

Behavioral finance combines finance and psychology theories to explain deviations from traditional finance theories. Investors' goal is to maximize benefits by analyzing the state of the capital market and monitoring market indicators and factors.

Psyche and emotions are significant factors that trigger investment judgement biases. Biases are defined as “error predispositions (H. Shefrin, 2007) and investors are vulnerable to a number of biases, mistakes and illusions when making decisions because of a lack of ability to process the complete information” (H. M. Shefrin, 2011). Typically, investors often find themselves becoming the focus of their own choices and frequently falling victim to other errors as a result of emotional influences in their investment decisions.

In order to make informed investment decisions, understanding the impact of Cognitive and heuristic biases on investment decisions is essential. Previous research has looked at either the behavioral biases or studied how they affect individual investors. However, there has been no effort to examine the link between cognitive or heuristics biases and decision-making, especially in the Pakistani setting.

1.3.1 About Pakistan Stock Exchange

According to information found on the PSX website, the Pakistan Stock Exchange was founded on September 18, 1947 and officially registered on March 10, 1949 as the 'Karachi Stock Exchange', operating as a limited liability company. In October 1970, another stock market was founded in Lahore to cater to the stock trading requirements of the provincial city. In October 1989, the Islamabad Stock Exchange was founded to serve northern region investors. As a result of each exchange having its own management, trading interfaces, and indices without a shared structure, the Stock

Exchanges (Corporatization, Demutualization and Integration) Act, 2012 was passed by the Government of Pakistan. This led to the integration of the three exchanges on January 11, 2016, operating under the new name 'Pakistan Stock Exchange Limited' (PSX).

By December 31, 2018, PSX achieved major progress in its development, starting with only 5 listed companies and a total paid-up capital of Rs 37 Mn. In 1960, there were 81 companies valued at Rs 1.8 billion, but now there are 546 companies in the market valued at Rs 7.692 trillion. The listed companies are divided among 35 sectors/ groups of industries on the PSX website. More on the PSX is discussed in 'Appendix 1' of this Chapter.

1.4 Research Objectives

The main objective of the study is to determine the effect of behavioral biases on investment decisions.

1. To identify the relationship between behavioral biases and investment decisions.
2. To identify the relationship between heuristic behavioral biases and investors' decisions.
3. To identify the relationship between cognitive behavioral biases and investors' decisions.
4. To investigate the moderating impact of financial literacy on relationship between heuristic biases and investment decision.
5. To investigate the moderating impact of financial literacy on relationship between cognitive biases and investment decision.

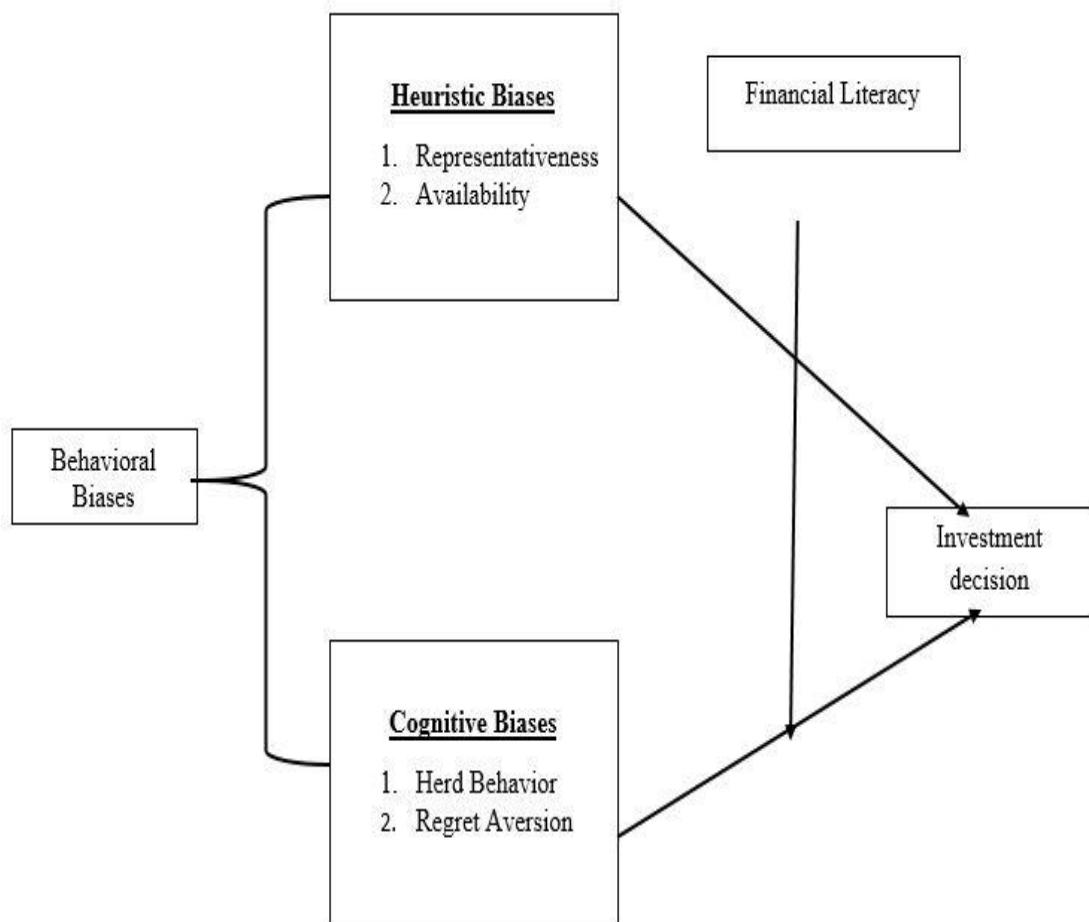
1.5 Research Questions

The present study thus planned to seek answers for questions such as:

1. What is the relationship between behavioral biases and investment decision?
2. What is the relationship between heuristic biases and investment decisions?
3. What is the relationship between cognitive biases and investment decisions?
4. What is the moderating impact of financial literacy on relationship between heuristic biases and investment decision?
5. What is the moderating impact of financial literacy on relationship between cognitive biases and investment decision?

1.6 Research Framework

Figure 1.1: Research Framework



Sources of Conceptual Framework

The study's conceptual framework is grounded in established behavioural finance models and draws on key contributions from Ullah (2015), Khan (2020), and Ishfaq et al. (2020), among others. These sources collectively highlight the impact of cognitive biases on investment behaviour and underscore the moderating role of financial literacy. Their integration supports a framework that examines the influence of behavioural biases on investment decisions and the extent to which financial literacy can mitigate these effects.

1.7 Research Hypotheses

H_{1a} = Representativeness has a significant and positive influence on Investment Decision.

H_{1b} = Availability has a significant and positive influence on Investment Decision.

H_{2a} = Herd Behavior has a significant and positive influence on Investment Decision.

H_{2a} = Regret Aversion has a significant and positive influence on Investment Decision.

H₃ = Heuristic biases and Cognitive biases are highly correlated.

H₄ = Financial Literacy has moderating role in relationship between Heuristic biases and Investment Decision.

H₅ = Financial Literacy has moderating role in relationship between Cognitive biases and Investment Decision.

1.8 Significance of the Study

This research is of crucial importance for investors because it highlights the effects of cognitive and heuristic prejudices on investment decision. By being aware, they can make corrections in their investment decisions, leading to the market performing

efficiently. This research is extremely beneficial for stock market policymakers to comprehend how these biases work and how they influence decision-making.

This study provide significance for the researchers as it can be the impetus for greater studies in this area considering lack of empirical studies on this behavioral finance and stock market in Pakistan.

This study is also useful to academicians to incorporate teaching of technical analysis besides fundamental analysis in Investment subject. This would add valuable inputs to enhance market-based courses and teaching which would contribute to students' and public's greater understanding and knowledge on market reactions and timing to enter and exit from the market.

1.9 Scope of the Research

The main goal of this study is to examine how cognitive and heuristic biases affect the investment choices made by retail and institutional investors. Furthermore, it will assess the significance of financial literacy and how it affects the connection between these biases and investment choices.

1.10 Organization of the Thesis

Chapter # 1 – Introduction

In this part we have discussed the introduction, background, research question, research objective, significance, scope and problem statement of our research.

Chapter # 2 – Literature Review

In this part the past literature is discussed with reference to behavioral biases, investment decision and financial literacy. This chapter contains evaluations of past literature and conversations on the subject with input from experts, academics, and