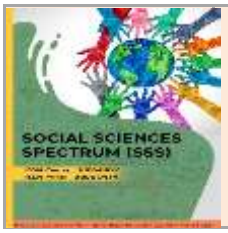


Social Sciences Spectrum

A Double-Blind, Peer-Reviewed, HEC recognized Y-category Research Journal

E-ISSN: 3006-0427 **P-ISSN:** 3006-0419
Volume 04, **Issue** 02, 2025
Web link:https://sss.org.pk/index.php/sss

Check for updates

Cognitive Bias Asymmetry and Heuristic-Driven Market Anomalies: A Neurofinancial Noise Trading Analysis of Prospect Theory Elasticity in the Pakistan Stock Exchange (PSX)

Abdul Malik
MS Scholar, Quaid-i-Azam School of Management Sciences, Quaid-i-Azam University, Islamabad, Pakistan
Correspondence: abdulmalik@ba.qau.edu.pk

Wasim Abbas Shaheen
Assistant Professor, Quaid-i-Azam school of Management Sciences, Quaid-i-Azam University, Islamabad, Pakistan
Email: wasim@qau.edu.pk

Mirza Muhammad Qasim Ali
MS Scholar, Department of Banking and Finance University of the Punjab, Lahore, Punjab, Pakistan
Email: qmirza770@gmail.com

Waqas
M.Phil Scholar, Quaid-i-Azam University, Islamabad, Pakistan
Email: waqas@qasms.qau.edu.pk

Article Information [YY-MM-DD]

Received 2025-01-16 **Revised** 2025-04-02 **Accepted** 2025-04-13

Citation (APA):

Malik, A., Shaheen, W, A., Ali, M, M, Q & Waqas. (2025). Cognitive bias asymmetry and heuristic-driven market anomalies: A neurofinancial noise trading analysis of prospect theory elasticity in the Pakistan Stock Exchange (PSX). *Social Sciences Spectrum*, *4*(2), 108-141. https://doi.org/10.71085/sss.04.02.260

Abstract

This study presents a novel empirical investigation into the impact of psychological biases on investment decision-making within the Pakistan Stock Exchange (PSX), integrating Kahneman and Tversky's Prospect Theory and Heuristics Theory into a unified behavioral finance framework. Departing from conventional analyses, this research employs a dual-method approach, combining meta-theoretical synthesis with primary quantitative data, to dissect how cognitive distortions such as overconfidence, loss aversion, and representativeness skew financial choices under uncertainty. A technically advanced self-descriptive questionnaire was administered to 250 PSX traders, leveraging psychometric scaling to quantify bias intensity, followed by machine learning-assisted regression analysis to isolate dominant behavioral predictors. The findings reveal a nonlinear relationship between heuristic-driven biases and market anomalies, challenging traditional rational-agent assumptions. Notably, the study introduces a bias susceptibility index (BSI), a pioneering metric for assessing individual vulnerability to cognitive errors. By contextualizing these distortions within emerging markets, a previously underexplored domain, this work advances behavioral finance theory while offering pragmatic tools for investors, advisors, and regulators to mitigate irrational decision-making.

Keywords: Cognitive Bias Asymmetry, Heuristic-Driven Market Anomalies, Prospect Theory Elasticity, Behavioral Portfolio Distortion, Neurofinancial Noise Trading.

1. Introduction

Various investment theories may explain market structures and investor preferences (Barber & Odean, 2021). Regarding investing philosophy, Wall Street has two major camps. Proponents of the efficient market hypothesis assert that stock prices accurately reflect all available information; however, opponents of this theory argue that stock prices may not accurately reflect all available information and that specific investor behaviors may impact stock prices. Both theories investigate market influence and customer behavior. Opponents of the EMH used behavioral finance to justify irrational stock market pricing, which they said was backed by the EMH. Sharpe, Treynor, and Jensen created a framework for evaluating investment performance in terms of risk and return in 1964, 1965, and 1968. Unfortunately, the frameworks built by these experts do not go far enough to assist investors in achieving their projected investment returns. Behavioral finance explores the numerous factors and market anomalies that might facilitate or impede an investor's capacity to make educated investment decisions (Malkiel, Mullainathan & Stangle, 2018). It is crucial to comprehend how behavioral finance influences investment performance and decision-making. The application of psychological ideas to financial concerns is referred to as behavioral finance (Pompian, 2021). The study of micro behavioral finance helps us comprehend how people and investors think and the associated cognitive biases. We may utilize macro-behavioral finance to investigate any market behavior anomalies. Literature has provided several definitions of the term "behavioral finance." According to De Bondt and Thaler, one should be objective while making financial decisions (2018). Barberis and Thaler suggested behavioral finance in 2019 as a response to the problems that conventional finance was facing. Behavioral finance adds a brand-new dimension to financial management. According to Ritter, behavioral finance includes research that defy the conventional theory that predicts utility maximization with a rational investor in an efficient market. Behavioral finance is the application of psychological and sociological insights to financial decision-making while rejecting the notion that rigorous adherence to rationality is necessary. According to Sewell (2017), behavioral finance gives an explanation for the inefficiencies of the market. To comprehend behavioral finance, it is required to examine it within the framework of other related topics behavioral sciences, cognitive psychology, investor psychology, behavioral economics) that are also researched within the context of the environment. Pompian (2021) separated the behavioral finance issue into two subtopics to prevent this kind of confusion: There are several techniques to investigate stock market oddities and get insight into the mental processes of individual investors. The research problem of this study is that every minute, millions of choices are made in the business sector. This is not the case with investment choices. In the process of making financial decisions, behavioral factors play an important role. As an example, the psychological makeup of investors influences how they behave in financial problems. This will be the first research to examine how Pakistan Stock Exchange investors make investing decisions based on a number of behavioral factors. In neither Pakistan nor the Gaza Strip have behavioral impacts on investment decisions ever been studied. Individual investors in Pakistan face a unique set of obstacles while investing in the stock market. The purpose of this research is to uncover the main behavioral factors that influence the investment decisions taken in Pakistan Stock Exchange. The primary objective of this study is to examine the influence of behavioral elements within the scope of the Prospect and Heuristics theories on the investing decisions of individual investors on the Pakistan Stock Exchange. The study of Khan, S., Bangash, R., & Ullah, U. (2023) evaluates various models using the business risk metric Value at Risk (VaR) to identify the most suitable framework for the KMI-30 stock market. Pakistan Stock Exchange

individual investors recognize the significance of this publication as a watershed moment in the substantial body of work carried out by a variety of scholars in this field and industry. Because it will have an impact on the investors' long-term financial goals, making a careful selection of the most important aspects that go into an investor's choice is of the utmost importance. Given that this is the first time that the researcher has ventured into the realm of behavioral finance, which is a relatively new field in Pakistan, both academics and students with an interest in the topic will find the study to be of great value.

2. Literature Review

The definition of behavioral finance is according to Sewell, the behavior of individuals working in the financial industry is influenced by their psychology, and this in turn has an effect on the markets (2017). To comprehend what occurs when investors make judgments based on their emotions or gut instincts, scientific concepts and research have been looking into the matter. According to Shefin (2020), the fast-developing field of behavioral finance centers on the study of how the influence of psychology may be seen in the ways that financial professionals think and act. Behaviorists investigate the situations that arise during the process of decision-making and are made worse by a variety of variables including, but not limited to, ambiguity and emotional upheaval. As a direct result of this, they discuss peculiarities and bubbles in the financial market. It looks at the ways in which people employ mental shortcuts and psychological biases when it comes to making judgments about their finances. The research conducted by Abu-Rub and Sharba (2020) is just one example out of many that have investigated these anomalies around the world and in the Arab region. In their study, they documented the calendar impacts on investment decision making in (PEX) as well as the anomalies that took place in stock prices before and after vacations. This research is just one example among many that have been conducted.

2.1. Heuristic Theory

Heuristics theory, often known as a rule of thumb or a short cut, makes it easier to make difficult judgments by reducing the number of variables involved and assigning probabilities to the remaining possibilities (Ritter, 2019). There are times when heuristics may be useful, but there are also times when they can cause people to make poor choices (Waweru et al., 2018). The heuristics of representativeness, availability, and anchoring developed by Kahneman and Tversky were used by investors in the decision-making process (Kahneman & Tversky, 2019). Waweru et al. have contributed to the development of heuristic theory by introducing the Gambler's fallacy and Overconfidence (Waweru et al., 2018).

2.1.1. Overconfidence Heuristic

Overconfidence is the most domineering and influential heuristics of the individual investor, and it has the broadest scope in the marketplace (Johnson & Fowler, 2021). Overconfidence is marked as a person considering himself to be above average on a number of positive traits. A person tends to overestimate his knowledge, control over the activities, and is far greater than appropriate (Langer, 2019). Overconfident individuals are more likely to believe that things, events and activities happen in much more favorable for him than for others (Weinstein, 2020). Overconfident individuals have undue trust in the intuition, judgement and information (Pompian, 2021). Also, when judgment intervals are set higher than the relative frequencies of correct responses, the answer is overconfidence (Gigerenzer, Hoffrage & Kleinbölting, 2021). The definitions above allow this study to sum up overconfidence in the following way. Overconfident individuals are

excessively confident of their judgment, information, personal capabilities, and everything is perceived to smile at them until they experience something, and consider themselves smart players in the market. (Keasey & Watson, 2019) Identify four major factors that are said to lead to confident people being overconfident. These are (1) the complexity of the task, (2) amount of feedback provided, (3) the motivation level of the subjects, and (4) the skill of the subjects. It can be argued that most people lie in an overconfidence zone because of these four factors, which are situational, event, or some controllable variables (gender, age, income). It was found that men tend to be more overconfident than women (Barber & Odean, 2021). Many authors and researchers give various reasons as to why someone would be overconfident. Self-attribution is a characteristic that blames the unsuccessful outcome of an event to external factors by nature, while favoring winning outcomes to one's skills (Miller & Ross, 2019; Kunda, 2017). For instance, students who excel in examinations tend to attribute their success to personal attributes like intelligence or hard work, and perceive failure as the result of external factors like poor teaching or bad luck. Overconfidence can be caused by an overestimation of self-abilities which is called Illusion of control (Langer, 2019). Pompian (2021) describes illusion of control as defined, the tendency for people to assume that they can, at least to some degree, manage or influence the course of actions or results, when actually, they cannot. Some people view themselves as better guessers than they actually are, particularly during a series of coin tosses where there is no causal influence to the outcome.

A further symptom that justifies an individual's overconfidence is the method in which they analyse data that confirms their arguments, beliefs, or views. This is known as confirmation (Russo & Schoemaker, 2022). People have a tendency to notice the higher use of red vehicles during the summer months since it has been verified that this assumption is correct; nevertheless, people do not pay attention to the increased usage of red automobiles during other months. Overconfidence People thought that because of their knowledge, experience, and expertise, they were in a better position to make better judgments about their investments, which would result in a larger possibility of a favorable return. The vast majority of these authors are of the opinion that individuals who are overconfident in their capacity to make sound judgments about their investments ultimately wind up putting themselves in a position where they may sustain financial losses (Russo & Schoemaker, 2022; Griffin & Tversky, 2022; Kahneman & Riepe, 2018). Overconfidence has its effects on the financial market, as discovered by Barber and Odean in 2021. Hindsight bias constitutes one of the reasons for overconfidence stemming from the belief that people know the outcome or tells the entire story when they actually do not (Pompian 2021). Essentially, they believe that something which has not yet occurred was indeed bound to occur (Fischhoff, Slovic, & Lichtenstein, 2017). Hence, they tend to make over-optimistic assumptions and predictions, together with outcome estimation in relation to the self-assigned task. Proposition of overreaction is one of the more results which stem from overconfidence and is something that will never be avoided. In this paper, it will be argued that people who are overconfident or overestimate their capabilities tend to react strongly to private information concerning a certain subject, while public information is met with a lack of reaction (Chuang & Lee, 2016). Financial disturbance from overconfidence make reasons such as excessive trading (Barber & Odean 2021), over volatility of the equity market (Shiller 2022), the efficient market and expected utility are affected.

2.1.2. Representativeness Heuristic

Making a decision is one of the most challenging things to do in life, particularly when there are a great number of different options from which to choose. How can we determine which option is the best one? When it comes to deciding the most effective way to proceed, psychology is often considered as the most essential component. Take, for instance, the psychological notions that are important to the life of humans, such as attention and recollection, as well as conceptualization and representation. Due to the better underlying judgement and decision-making ability that they possess, psychologists are able to make the most accurate assessments (Einhorn & Hogarth, 2021). It's possible for psychologists to deduce specific heuristics from the way people assess different situations. Heuristics are ways to solve problems quickly and easily, and the majority of us use them to save as much time and effort as we possibly can in our day-to-day lives. The effectiveness of these short cuts is highly dependent on the degree to which you are illogical. Different people have used various techniques, which have been successful in achieving their goals. In their key work from 2022, Kahneman and Tversky identified this as one of the most significant heuristic shortcuts to use when making judgments. Those who are more concerned with the facts pay greater attention to the findings that are more characteristic of the overall data. The vast majority of belief-driven judgments are made in conditions of uncertainty on the basis of numerical evidence such as odd or subjective probabilities in simple representativeness (Kahneman & Tversky, 2022). Consider the following: what is the likelihood that event A will take place as opposed to event B? In what proportion of occurrences is it plausible that event B was precipitated by the previous one, incident A? If occurrence A is a good indicator of another event B, then there is a good chance that both occurrences will take place (Kahneman, Slovic & Tversky, 2022). People give various degrees of probability to the happenings in their lives based on some common beliefs. For instance, Mr. A is a reclusive person who shies away from interacting with other people. How do individuals evaluate the likelihood that Mr.? A is employed in a certain industry? If I were to offer you a list of alternative jobs, what percentage chance do you think you have of becoming a "driver," "farmer," "salesman," "pilot," or a "librarian"? When people observe Mr. A's representative traits, which are more typical in the driving sector, they assume he is the driver since these features are indicative of the profession. People have a tendency to make decisions based on what they already know and what they have lately experienced (Pompian, 2021). This heuristic bases its interpretation of representativeness on long-term averages and the rule of small numbers, notwithstanding the possibility that these factors may not adequately cover the decisive component of the choice (Tversky & Kahneman, 2019). Investors just look at the sample size because they believe it has comparable features to the population. This is due to the fact that investors believe the sample size to be sufficiently modest to be compared to a bigger population.They cause people to make errors that are financially detrimental or suffer significant losses, both of which have an impact on the market (Carolis & Saparito, 2016). Because they depend on a limited number of consultants and other sources, those who use this heuristic have a predisposition to concentrate on the positive elements of the market. These heuristics are used by people to justify their biased assessments, which are based on their preconceived assumptions. An example of representativeness in terms of money may be seen in the market oddity known as the loose winner effect. According to the results of De Bundt and Thaler (2019), investors have a greater propensity to invest in successful companies than unsuccessful ones. People, even at their most fundamental level, have the capacity to cope with both positive and negative input. The representativeness heuristics hypothesis developed by Kahneman and Tversky provides support for the assumptions made by analysts, financial investors, or individuals who believe that a small sample accurately

reflects the whole population (2022). For instance, investors and analysts may be taken aback when the stock price of a firm increases in spite of the absence of significant growth or a large current dividend in the company's financial statements. The consideration of probability or base rate neglect is the only factor that may influence representativeness and similarity; no other factors are taken into account (Tversky & Kahneman, 2019). According to the report, investors mainly depend on generalizations and prejudices when making decisions about their finances. One other significant interpretation of representativeness is the base rate neglect, in which the investor categories the occurrence as the most common and straightforward categorization and then utilizes it as the basis for drawing conclusions without taking into account any other significant factors. When information is not expressed in causal terms (Ajzen, 2017), when information based on individuality (Koehler, 2016), or when information based on distinct categorization is utilized, the base rate is disregarded for whatever reason (Zukier & Pepitone, 1984). Even though people get used to and significantly depend on the organization and portrayal of the activities that they do, it is essential that they do not lose sight of the baseline (Koehler, 2016). When investors are looking for ways to improve their bottom lines, they often seek advice from heuristics and the advice of investment professionals. According to Marsden, Veeraraghavan, and Ye (2018), the representativeness heuristic has an influence on earnings forecaster analysts' responses when a prediction modification is either favorable or unfavorable (negative). In the end, the analyst's assessment is impacted by the degree to which the actual earnings were exaggerated due to these revisions or understated due to the original projections. Because it takes into account the most accurate model for characterizing an irrational investor, representativeness is a very significant factor to take into account. According to psychologists, people are irrational when they do not have enough experience or motivation, but the Bayes principles may be used as a descriptive model when they do have enough (Grether, 2020). According to research conducted by Chang, Jiang, and Kim (2019), high stock prices are related with businesses that have the perception that a Super Bowl advertisement adequately portrays their industry. The ease of calculation and the amount of time saved both contribute to the prevalence of representativeness in investment choices.

2.2. Prospect Theory

Prospect theory is an alternative to expected utility theory which is a decision model under uncertainty (Kahneman & Tversky, 2019). According to prospect theory, a choice among risky prospects EUT is inconsistent. If several arguably axioms – completeness, transitivity, continuity, and independence are satisfied, then we can represent expect of a utility function or otherwise (Barberis, 2021). According to PT, an investor focuses on the change in wealth rather than the total wealth because preference is S shaped which represent risk preference of investor (Levy & Levy, 2019). The change in value of wealth causes an investor to lose, be risk averse and become de-risk dependent on previous outcome (Barberis, Huang, & Santos, 2021). S Diagram of PT depicts the stance where investors are loss aversion and risk seeking or risk averse. In the mentioned diagram, value function is usually concave for gain and convex for loss (Kahneman & Tversky, 2019). Prospect theory elucidates the multitude of factors and effects deemed crucial in making a decision or judge stock market. These four elements will be identified in my research as the primary components of prospect theory.

2.2.1. Loss Aversion

In an important piece by Kahneman & Tversky (2019), they analyzed the psychology behind people’s perception towards loss. They discovered that individuals were more likely to experience

negative emotions associated with loss than with positive emotions linked to gain—over two and a half more times, in fact. This is known as Loss Aversion (Prospect Theory). Investors focus primarily on the losses, which is the greatest negative outcome in their decision- making process. In other words, loss averse investors have a low tolerance to risk. Camere (2017) suggested that investors aim at maximizing their wealth and achieving a given optimal level of utility, whereas most individuals tend to contravene the expected utility hypothesis. Abdellaoui, Bleichrodt, and Paraschiv (2017) argued the contravention stems from loss aversion. To explain loss aversion, the most pertinent topic is prospect theory, which measures the utility of losses and gains simultaneously; in terms of loss aversion is prospect theory. One of the most fundamental issues concerning the loss aversion is the absence of universally accepted definition. Various authors offer conflicting explanations for loss aversion, these authors are working well in the block of loss aversion (Kahneman & Tversky, 2019; Tversky & Kahneman, 2022; Neilson & Stowe, 2022; Köbberling & Wakker, 2015). These all definitions, in the realm risk, intention can alter the bona fide notion of loss aversion. Intentions, or more precisely premeditated actions, may reduce the effect of loss aversion. A combination of the emotional attachment and the cognitive dissonance during appraisal is what Novemsky and Kahneman (2015) call the effects of mediation voltage of intentions on loss aversion. A reference-dependent model by Kőszegi and Rabin (2016) is also available which accounts for much of the effect because of some passive curve impairment around the reference point: Tversky and Kahneman (2021). Most of the people make a mistake thinking that the endowment and status quo and loss aversion blend. It is a difference since both loss aversion and endowment depend on how the investors framing the alternatives (Pompian, 2021).

2.2.2. Regret Aversion

In an important piece by Kahneman & Tversky (2019), they analyzed the psychology behind people's perception towards loss. They discovered that individuals were more likely to experience negative emotions associated with loss than with positive emotions linked to gain over two and a half more times, in fact. This is known as Loss Aversion (Prospect Theory). Investors focus primarily on the losses, which is the greatest negative outcome in their decision- making process. In other words, loss averse investors have a low tolerance to risk. Camere (2017) suggested that investors aim at maximizing their wealth and achieving a given optimal level of utility, whereas most individuals tend to contravene the expected utility hypothesis. Abdellaoui, Bleichrodt, and Paraschiv (2017) argued the contravention stems from loss aversion. To explain loss aversion, the most pertinent topic is prospect theory, which measures the utility of losses and gains simultaneously; in terms of loss aversion is prospect theory. One of the most fundamental issues concerning the loss aversion is the absence of universally accepted definition. Various authors offer conflicting explanations for loss aversion, these authors are working well in the block of loss aversion (Kahneman & Tversky, 2019; Tversky & Kahneman, 2022; Neilson & Stowe, 2022; Köbberling & Wakker, 2015). These all definitions, in the realm risk, intention can alter the bona fide notion of loss aversion. Intentions, or more precisely premeditated actions, may reduce the effect of loss aversion. A combination of the emotional attachment and the cognitive dissonance during appraisal is what Novemsky and Kahneman (2015) call the effects of mediation voltage of intentions on loss aversion. A reference-dependent model by Kőszegi and Rabin (2016) is also available which accounts for much of the effect because of some passive curve impairment around the reference point: Tversky and Kahneman (2021). Most of the people make a mistake thinking that the endowment and status quo and loss aversion blend. It is a difference since both loss aversion and endowment depend on how the investors framing the alternatives (Pompian, 2021).

Thus, it does not justify how people express negative emotion over alternative possible outcomes. Economics has done a most commendable job in the literature of regret aversion, but because of the multitude of shortfalls in the economic model attempting to capture regret aversion, some work is needed on the aversion to regret, and these shortcomings are addressed by the science of psychology. The most important work on this is Kahneman & Tversky (2022); this research was sparked by an economist's leading question which critiques the consideration of events in isolation. They proposed comparison should be made with the alternative that could have or should have happened (Gilovich & Medvec, 2015). Most of the existing robust evidential concepts empirically demonstrate the expected utility theory fails as is the case when an investor is presumed to have maximized his single-outcome wealth but in reality, he has only to his available monetary resources, which are, in most scenarios, insufficient, (Bell, 2021). This manner of behavior introduces more concepts such as, loss aversion and regret. Bell (2022) and Tversky and Kahneman (2022) noted that the extensive body of literature concerning psychological decision-making tells of regret aversion influencing choices made under uncertainty. According to Kahneman and Riepe (2018), people feel regret for what they did rather than for what they could have done. This applies when a person reaches an identical outcome through differing processes marked by either action or inaction (Gilovich & Medvec, 2015).

2.2.3. Mental Accounting

Mental accounting is a common heavily recognized in the individuals in one way or another way. What does Mental Accounting mean? Mental refers to as an intellectual process and Accounting is a system of recording (transaction), classifying (ledger), summarizing (balance sheet /profit and loss account) and interpreting the financial transactions (Khemani & Diamond, 2015). Every person in our daily life performs an accounting function (recording, classifying and summarizing and interpretation) intentionally or intentionally. Individual dealt to manage the financial decision or events and organization used to manage its accounting function for a financial decision. General accounting has some rule (GAAP) and procedure that we have studied in textbook. Mental accounting; does not have any text to define rule its only follow the behavior and find inferring the rules. The process of an intellectual deal to the financial decision according to own mental account is called mental accounting (Barberis, Huang & Santos 2021). In another word, mental accounting describes the human being inclination to codification, classification, and analyzes the economic results and outcomes by grouping their asset into any non-fungible mental accounts (Pompian, 2021).

In simpler words, mental accounting relates to the splitting of areas of finance that is typically done at the household level. This is described as the processes of recording, summarizing and analyzing financial transactions (Thaler, 2019). In prospect theory, mental accounting provides an individual with the ability to set a reference point to determine the value of gain and loss with regards to different accounts (Grinblatt & Han, 2015). If we analyze a particular person, we see that he treats his financial decision making in unique silos. For instance, he views his income stemming from salary servic in a distinct lens relative to what he considers the return on an asset or capital appreciation. Same goes for expenses where he does not treat his retirement pay as an ordinary expense but rather an appreciation drawn upon a house. This implies that the individual has made up his mind to set for himself a different account for different income and expense (Thaler, 2019). While analyzing mental accounting, the two most important concepts that come to mind are: framing where individual’s perspective towards money and investments changes on the situation they encounter (Pompian, 2021). More so, how have individuals framed their decision

problem is a critical aspect in behavioral finance (Del Águila, 2019). The second is the behavioral life cycle hypotheses which suggests that people attempt to maintain wealth and create the smoothest path for consumption throughout their lifetime. Consider that an individual reallocating his funds has increased their savings for future consumption purposes (Thaler, 2019). The world ‘s behavior of money depends on how they think about life, For Instance, some people want to live in high standard with consuming the current income without saving. Some of the people live in moderate life they save something from his current income for future. Choice influences mental accounting and it is alternative of rational theories or utility theory (Thaler, 2019). Mental accounting is based on prospect theory and it based on behavior and state question how do people do choose? While in rationality question state that how do people should choose? Under the behavioral theory of consumer choice mental accounting use three major concepts. Thaler (2019) describes the mental accounting, and it is an important component in (2019) in it his famous article Mental Accounting Matters. It describes the three main components of mental accounting first is Value function (Thaler, 2019; Thaler, 2019). It is based on prospect theory, so in the head of value function consumer consider the gain and loss and describe event how does it coding, and make a decision in the value function. In value function consumer perceived about the event for instances what do want to buy. The second concept is Reference outcome (Tversky & Kahneman, 1973), in this phrase, people infer the outcome of a valued event or choose an event and find the difference between expected and actual outcome. The outcome is in the form of gain and loss or some in the mixer, so mental accounting is categorized gain and loss into four head. The results indicate that although past banking experiences may not directly influence customers, several mediating factors play a significant role in shaping their willingness to adopt RAAST Ullah, U., Khan, J., Shah, J. A., & Baloch, R. (2023). These four categorize are popular with the name of four principles of mental accounting in the concepts of prospect theory that having the aim of maximizing the value and positive outcomes especially facing the two events. These four principles of value function are: (1) segregate multiple gains (two gains), (2) integrate mixed gains (gain with a smaller loss), (3) integrate multiple losses (two losses), and (4) segregate mixed losses (a loss with a smaller gain) (Heath, Chatterjee & France, 2015). The third and most important concept used in the behavioral theory of consumer choice is transactions utility theory in which people find a result of the chosen event. In the transactions utility theory, two important phrases are considering evaluating and making a decision. In the evaluating individuals are potentially evaluating their transaction and in the second phrase accept or reject each transaction and make a decision (Thaler, 2019; Thaler, 2019). Summarize these concepts-value function is the question it describes the outcome and its experienced and reference outcome are a possibility to answer. Its assessment and impact of the specific event and transaction utility theory is the evaluating the possible outcome and select a most appropriate event with their behavior or risk preferences or in simple, how the event is framed narrowly or broadly. In the mental accounting people ‘s selects their preferences by reason rather than on opinion (Kivet, 2019). Reason describes the process by which people are thinking about event or outcomes this process is called reason explicitly because it defines the facts and matters that affect the decision by making decision maker (Kivet, 2019).

Mental accounting mostly describes the pattern of buying and selling of precious things (Kivet, 2019). Prospect theory is the influential theory in behavioral finance; Mental accounting heavily relies on this because it uses to make a mental account such as loss aversion, the value function and different risk preferences on the different situation or events (Langer & Weber, 2021; Grinblatt & Han, 2015).

2.3. Market Efficiency

Fama formulated a notion of market efficiency in 1970. According to this basic finance theory, nobody can outperform the market given that stock markets are efficient (Sewell, 2021). Consequently, stocks trade at their intrinsic value (Aguila, 2019). According to the idea of market efficiency, stock prices always represent all immediately available information (Fuentes, 2021; Malkiel, 2019). A financial market is deemed "efficient" when the stock price accurately represents all of the information accessible to investors (Fama, 2017; Lo, 2017). Investors are rational, logical, and heartless, according to Hayat, Bukhari, and Ghufran (2016). Ritter (2019) asserts that market efficiency is predicated on the hypotheses that institutional and individual investors are rational-agents who attempt to outperform the market in order to earn abnormal returns, and that the stock price maintains its intrinsic value as a result of competition among return-focused individuals. According to Shiller (2018), prices have stayed steady because investors take into account all relevant information when making investment decisions. Investors are not always reasonable since their expectations and views impact their decisions. This research refutes the EMH on the grounds that people do not always act rationally (Shah, Raza & Khurshid, 2022).

Numerous studies have shown that the stock market is ineffective in practice due to behavioral traits. In the actual world, the stock market is never completely efficient or completely abnormal (Pompian, 2021). According to Fama (2017), anomalies dissipate rapidly after being recognised; nevertheless, over time, anomalies diminish due to changes in proficiency. Market inefficiency may be ascribed to the formation of "noise traders" and the "limit to arbitrage" (Baker & Nofsinger, 2020). According to Pompian, anomalies in the market test the EMH (2021).

Several studies indicate that the stock market is inefficient in practice owing to behavioral reasons. In the actual world, the stock market is never completely efficient or completely abnormal (Pompian, 2021). According to Fama (2017), anomalies dissipate rapidly after being recognized; nevertheless, over time, anomalies disappear due to changes in proficiency. The growth of "noise traders" and the "limit to arbitrage" may be responsible for market inefficiencies (Baker & Nofsinger, 2020). According to Pompian, market irregularities constitute a danger to the EMH market (2021). In classical finance, anomalies are characterized as occurrences, movements, or conditions that cannot be explained by the efficient market theory (Silver, 2021). Anomaly is defined as a deviation from the usual or typical pattern or patterning in the dictionary. The word "anomaly" refers to anything or anybody that is out of the ordinary.

Tversky and Kahneman's (2016) three components of the anomalous meaning are as follows: (1). It is much too prevalent to ignore. (2). Unemployment is too systematized to be the result of chance. It is too important for the normative framework to be flexible. "Anomalies in the stock market" refers to any inconsistencies or variations in stock price, as well as an inefficient market. Before investing in the stock market, consider these peculiarities while making investment decisions. When there are anomalies caused by behavioral factors, it is difficult for an investor to get a decent return on his investment (heuristic and prospect). According to Schwert (2019), some anomalies are diminishing or disappearing, implying that traders who speculate no longer have the possibility to profit. These anomalies are relevant beyond the risk-return connection since everyone wants higher and better returns. Investors have used these anomalies to earn higher returns regardless of the risk-to-return ratio.

For the author's convenience, it is vital to classify these abnormalities. Author refers to these anomalies as fundamental analysis anomalies, calendar anomalies, and technical analysis

anomalies (Technical anomalies). The author attempts to identify these anomalies using pertinent reasons. In Pakistan's stock market, these anomalies are crucial for establishing an investor's track record of profitable transactions.

2.4. Investment Performance

A variety of investing theories may explain market and investor behavior (Barber & Odean, 2021). According to Wall Street, there are two primary investment schools of thinking. According to the efficient market hypothesis, all available information about the stock is accurately reflected in the stock price. However, according to the inefficient market theory, some investor behaviors may impact the stock price. Both theories investigate market influence and customer behaviour.

Behavioral finance research may rationalize the stock market's illogical pricing, according to one investor. Sharpe, Treynor, and Jensen created a framework for evaluating investment performance in terms of risk and return in 1964, 1965, and 1968. As a consequence of multiple academic frameworks, the expected rate of return of an investment is not entirely justified. Behavioral finance examines the numerous market and behavioral peculiarities that may hinder or aid investors in making better investing decisions (Malkiel, Mullainathan & Stangle, 2015). Critics of behavioral finance blame investor irrationality, while proponents believe that markets and people operate in ways that enable them to outperform expectations. Critics of behavioral finance are split on this question. Academics are intrigued by the current studies on behavioral finance. It was discovered that investors who conduct more transactions per investment earn more money than those who do fewer transactions each investment (Anderson, Henker, and Owen, 2015). According to Wang (2021), moderate overconfidence may persist for a long period in the stock market and regulate the appropriate amount of activity, but under- and overconfidence cannot. According to Anderson, Henker, and Owen, overconfident investors may see the higher outcome with more clarity (2015). The author discovered that market and individual behavior may assist investors enhance their investment performance or get a better understanding of market circumstances. Maximizing profits, asset returns, and shareholder wealth were the measures utilized to evaluate success. In a bullish market, investors wanted to maximize returns while remaining satisfied with their investment decisions. The authors examine the effect of overconfidence on investment performance, as assessed by investment return and trading experience (2018). According to the research, the long-term success of an investor on the stock market may be determined by examining their investment return rate. According to the conclusions of a new research, overconfidence has little influence on investing performance. Barbosa and Louri (2015) assessed the performance in terms of return on investment, residual income, earnings per share, dividend yield, price-to-earnings ratio, sales growth, and market capitalization. This is merely one of the four fundamental value creation indicators identified by Bălan (2019): financial (NPV), market, hybrid (financial and accounting), and accounting (Net income, EPS, operational profitability, ROA and ROE) (market value added, Total Shareholder return). Lin and Swanson (2019) examined the five-year performance of an investment using a mixture of the three return criteria formulae (raw returns, risk adjusted returns, and momentum adjusted returns).

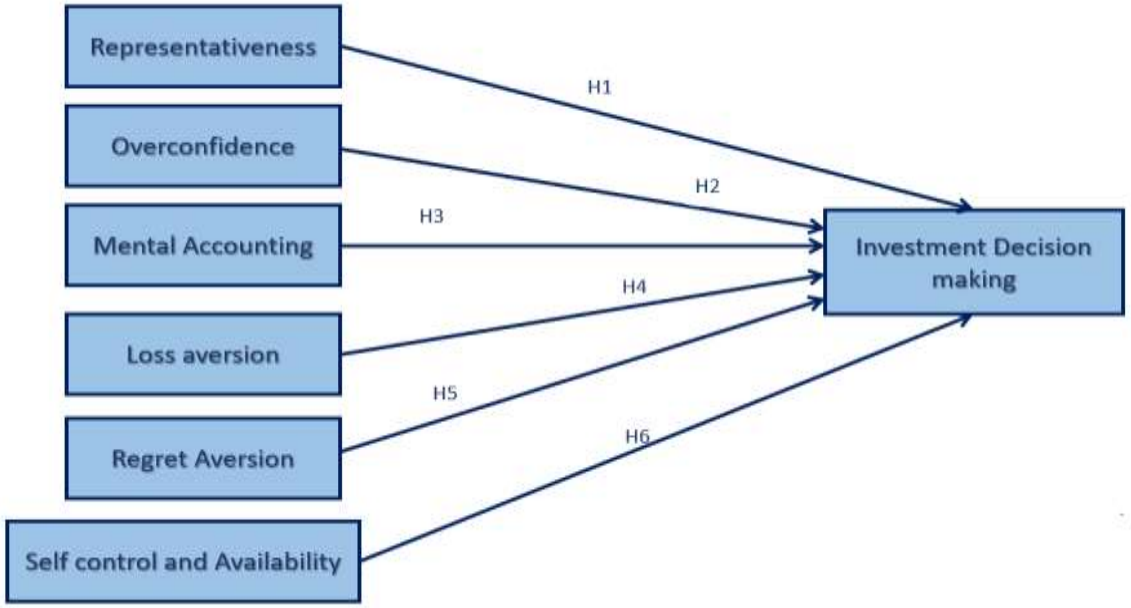
Since behavioral finance research has advanced significantly over the last few years, it has become more evident that psychological elements impact investors' choices (Warneryd, 2021). Retail investors' stock investments, or people who purchase and sell stocks on their own account, are impacted by a variety of variables, including firm- and macroeconomic-related factors (Gunathilaka C, 2018). There is mounting evidence to support the behavioral economics idea that

investors make choices that contradict their rationality due to their desire for financial gain and fear of loss (Meditinos et al, 2017). This study explores key themes including investment behavior, the efficient market hypothesis, and stock price prediction in the context of the anticipated second wave of COVID-19 (Khalil & Ullah). According to Ambrose Jagongo and Vincent S. Mutswenje, tools for determining investment choices (2018). They discovered that market structure and characteristics continue to impact individual investment choices and market results, and that investor market behavior is explained by psychological decision-making principles. We'll examine these elements to have a better understanding of how investors make investing choices. They conclude that investment choices are influenced by a variety of variables, including market conditions, individual risk profiles, and accounting data. According to Taqadus Bashir et al., investment choices are impacted not only by market results, but also by investor traits and information structure (2019). According to Le Phuoc Luong Doan Thi Thu Ha (2021), stock trading provides a range of investing opportunities, including the opportunity to purchase and sell stocks as well as make judgments about which equities to hold and for how long.

Research GAP

Prior research has shown the influence of heuristics and prospective factors on the investing performance of individual and institutional investors (Barber & Odean, 2021; Waweru, Munyoki, & Uliana, 2018). Although heuristics and investment success are closely related, academics prefer to focus on the processes behind these relationships. This research analyses a range of mediation mechanisms that may help explain these associations in an effort to bridge this knowledge gap. Alternative mediation mechanisms may aid researchers in better comprehending processes, addressing the issue of causality, and describing the nature of the relationship between heuristics, prospects, and investment results. Financial advisors and their clients gain from a deeper knowledge of the processes since it expands the breadth of information at their disposal, improves the usability of practical applications, and streamlines the administration of investment efforts (Peloza, 2019). This study examines and contrasts, to the best of the researcher's knowledge, several mediation processes linked to heuristics, expectancies, and investment success. The relationship between heuristics, prospects, and an individual's investing success is explained by behavioral finance. According to Stonham, alternative models to the efficient market hypothesis should be studied (2019). behavioral finance presents a challenge to the efficient market theory by identifying deviations from it (Pompian, 2021). According to behavioral scientists, a range of market abnormalities might impact investor performance (e.g., Barber & Odean, 2018; Allen, Brealey & Myers, 2016; Hirshleifer & Subrahmanyam, 2018). Pompian (2021) identifies three sorts of anomalies: fundamental, technical, and calendar. This research reveals the effect of these anomalies on the relationship between investment performance and heuristics. Three stock market anomalies are the result of heuristics and forecasting components, which influence the investment performance of people.

2.5. Theoretical Model



Source: *(Author derivation)*

2.5.1. Hypothesis

Following are the hypothesis of this study:

H1: Representativeness has a significant impact on investment decision.

H2: Overconfident has a significant impact on investment decision.

H3: regret aversion has a significant impact on investment decision.

H4: mental accounting has a significant impact on investment decisions.

H5: Loss aversion has a significant impact on investment decisions.

H6: Self-control has a significant impact on investment decision.

3. Research Methodology

This section provides an explanation of the research methodologies that were used in this particular study. The purpose of this study is to achieve its goal, which can be accomplished through the utilization of a combination of a descriptive approach and information regarding the research design, research conceptual model, population sample size, research environment, questionnaire, statistical data analysis, content validity, pilot study, and ethical aspects of the research.

3.1. Introduction of Research Methodology

This study employs quantitative methods of analysis. The researchers rely on secondary data, which they get through books, investigations conducted by experts, and publications published in journals. Because this is a new field of research in Pakistan, primary data for this study was collected via a survey of individual investors on the Pakistan Stock Exchange (PSX). Using an approach known as description, the researchers summarize the most important aspects of the data. Because it works with interactions between factors that are not controlled in a natural context as

opposed to an artificial one, this method has been largely recognized by the scientific community. Because the occurrences or circumstances that are of interest to our research have already taken place or been put into practice, the researcher concentrates on and chooses the significant factors for the purpose of analyzing the connections between the hypotheses.

3.2. Sampling Method and Technique

Probability sampling is the approach that has been suggested for use in the sampling process for this project. This is so that the sample will be representative of the whole population. In addition to this, using this type of sampling enables the researcher to keep an eye on the population as a whole and to make judgments based on accurate information. By using this kind of sampling, researchers have the ability to focus on the whole population. The use of probability sampling is something that researchers have suggested should be done in order to investigate the effect of psychological factors on the decisions made by individual investors in the Pakistani stock market. Using this kind of sampling, it is possible to investigate any and all psychological factors that influence the decisions that individual investors make on the Pakistan Stock Exchange.

3.2.1. Sampling Technique

It is suggested that a simple random sample approach be used for this investigation. The basis for selecting random samples is provided by the random selection of the sample region that will be used. Because it concentrates on various subsets of the sample space that has been defined, simple random sampling is an essential component of quantitative research. However, using this approach, it is essential to adhere to the fundamental idea of including the whole of the community. To identify samples that were in conformity with the objectives and questions of the research, a straightforward random selection was used. Throughout the whole process of data collecting, each sample will be selected at random.

3.3. Sample Size

The Krejcie and Morgan table is proposed to be used for the sample size calculation in this study. By using Krejcie and Morgan tables in the determination of the sample size, it is possible to gain increased reliability and validity. In addition, the researcher could look at all of the data in a single table, which is important information for the study to have. The fact that all of the information is in numerical form is the primary advantage. Therefore, a sample size of investors on the Pakistan Stock Exchange will be calculated by using Krejcie and Morgan's table to the data acquired for this study. This will be done so as to ensure that the sample size is representative of the whole investor population.

3.3.1. Questionnaire Design

To carry out a survey or poll. A questionnaire was used to collect the majority of the data required for this investigation. The data collection process may be sped up by the use of closed-ended questions in the form of questions that are included in the questionnaire. For the sake of this investigation, a questionnaire is comprised of nine different parts, each of which is evaluated by a set of questions that do not allow for free-form responses.

3.3.2. Targeted Population

Participants in the Pakistan Stock Exchange, all of whom are either professionals or investors in the Pakistan Stock Exchange, will each get one of the approximately 250 questionnaires that will be sent their way. People working in Pakistan's stock market provided information on the influence

of psychological variables on the choices made by individual investors. The questionnaire for the research project will consist of both open-ended questions and a Likert scale with five points.

3.4. Data Collection Method and Technique

In the course of this investigation, the use of data collection methods such as questionnaire surveys was suggested. Utilizing a survey as a method for data collection is both easy and economical to use. In addition to that, it could make the weight of location a little bit lighter. When a survey is being conducted, this presents a significant advantage for the researcher. For the purpose of this study, one method for acquiring data may be the administration of surveys. This would ensure the collection of a sample population that is sufficiently representative of individual investors whose choices on the Pakistan stock market are influenced by psychological variables.

3.4.1. Technique

When conducting a survey, the technique of choice is to use a questionnaire that does not allow for open-ended responses. It is advantageous to employ a questionnaire with no room for open-ended responses while conducting surveys. Researchers are able to make more efficient use of the available sample space as a result of this. In addition to this, it stops the collection of data that could contain unusual information and prevents such data from being included in the sample.

3.4.2. Pilot Testing

In the course of pilot testing, a system component or the whole system is put through its paces in a real-world environment to verify that it carries out its functions in the manner that was anticipated. A pilot test is often used when determining the practicability, timeliness, cost, degree of risk, and overall effectiveness of a proposed piece of research. Throughout the whole of this part of the project, tests are being run in both the UAT and Production environments. Before a system can be used by a large number of people, it must first be evaluated by a sample size of users to get their feedback.

4. Data Analysis

4.1. Descriptive Statistics

Table 4.1: *Descriptive Statistics*

	N	Minimum	Maximum	Mean
Gender	250	1.0	2.0	1.508
Age	250	1.0	4.0	1.824
Education Level	250	1.0	4.0	2.112
How long have you attended the stock market	250	1.0	5.0	2.076
Have you attended any course of Stock Exchange	250	1.0	2.0	1.560
Please estimate your average monthly income ($)	250	1.0	5.0	1.848
Valid N (listwise)	250			

The above table 4.1, explains the descriptive statistics of gender, age, education level, experience with stock market, course attended of stock exchange and income. The gender has minimum value 1.0, maximum value 2.0, and mean value is evaluated as MEAN= 1.508. The minimum value of age has 1.0 with a maximum value of 4.0 and MEAN= 1.824. The education level has a minimum

and maximum value of 1.0 and 4.0 with a mean of 2.112. Similarly, the minimum and maximum value of how long have you attended the stock market has 1.0 and 5.0 with the mean of 2.076. The mean value of have you attended any course of stock exchange is computed as 1.560. and the mean value of monthly income is calculated as 1.848.

4.2. Demographics Statistics

Table 4.2: *Demographics Statistics*

	Std. Deviation
Gender	.5009
Age	.9362
Education Level	.9957
How long have you attended the stock market	1.1504
Have you attended any course of Stock Exchange	.4974
Please estimate your average monthly income ($)	.9904
Valid N (listwise)	

The above explains the standard deviation of variables which includes gender, age, education level, stock market experience, course of stock exchange attended and monthly average income. Therefore, it is evaluated that standard deviation of gender is computed as 0.5009. Also, the standard deviation of age and education level are 0.9362 and 0.9957 respectively. More to add, standard deviation of how long have you attended the stock market is computed as 1.1504, standard deviation of have you attended any course of stock exchange is evaluated as 0.4974, and monthly income has standard deviation= 0.9904.

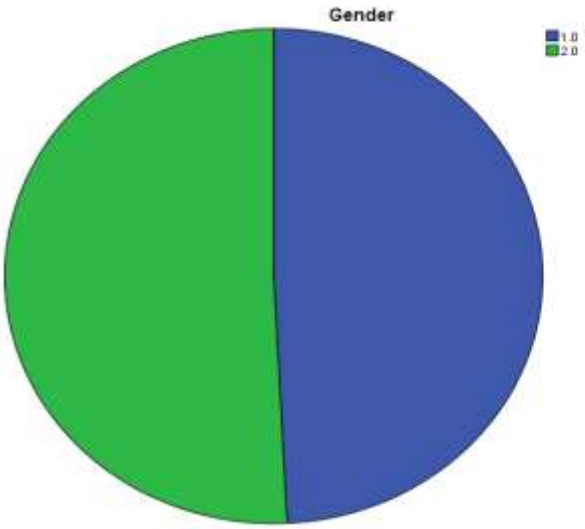
4.3 Frequency Table

4.3.1 Gender

The frequency tables of demographic information have been explained. The below table represented the number of male and female members. Hence, the male participants were N= 123 (49.2%), and female participants were N= 127 (50.8%). Therefore, it is concluded that female participants were more interested in this study than male.

Table Error! No text of specified style in document**..1:** *Gender*

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Male	123	49.2	49.2	49.2
	Female	127	50.8	50.8	100.0
	Total	250	100.0	100.0	

***Figure** Error! 1* 

der

Figure** Error! No text of specified style in document.**..2 Pie Chart of Gender

4.3.2: AGE of Respondents

The below table explains about the age of participants. It is recorded that participants having age group of 18-25 were N= 115 (46%), 26-35 were N= 84 (33.6%), 36-45 were N= 31 (12.4%), and 46 and above were N= 20 (8%). Hence, it is concluded that majority of participants were from age group 18-25 years.

Table Error! No text of specified style in document.**.2:** *Age of Respondents*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**18-25**	115	46.0	46.0	46.0
	26-35	84	33.6	33.6	79.6
	36-45	31	12.4	12.4	92.0
	46 and above	20	8.0	8.0	100.0
	Total	250	100.0	100.0	

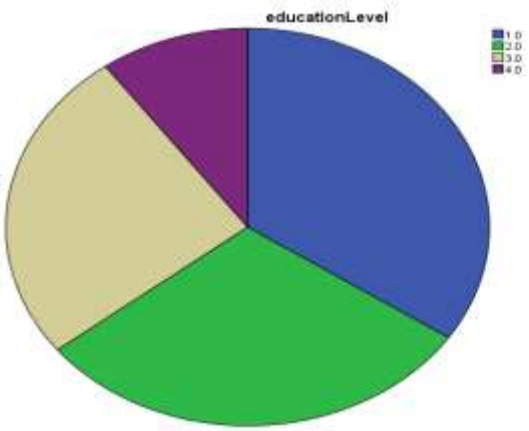


Figure** Error! No text of specified style in document.**..3: Pie Chart of Age

4.3.3: Education Level

When talking about the education level of participants, then below table is presented. It is noticed that participants who have done high school and lower were N=86 (34.4%), respondents who have done diploma were N=75 (30%), participants whose education level was bachelor N= 64 (25.6%), and respondents who have done higher studies were N= 25 (10%).

Table 4.3: *Education Level*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School and lower	86	34.4	34.4	34.4
	Diploma	75	30.0	30.0	64.4
	Bachelor	64	25.6	25.6	90.0
	Higher Studies	25	10.0	10.0	100.0
	Total	250	100.0	100.0	

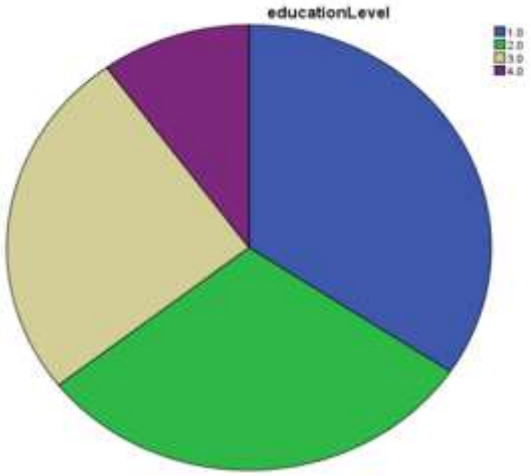


Figure Error! No text of specified style in document.**.4: Pie Chart of Education Level**

4.3.4: How Long have you attended the stock market

Table 4.6: *How long have you attended the stock market*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.0	97	38.8	38.8	38.8
	2.0	83	33.2	33.2	72.0
	3.0	37	14.8	14.8	86.8
	4.0	20	8.0	8.0	94.8
	5.0	13	5.2	5.2	100.0
	Total	250	100.0	100.0	

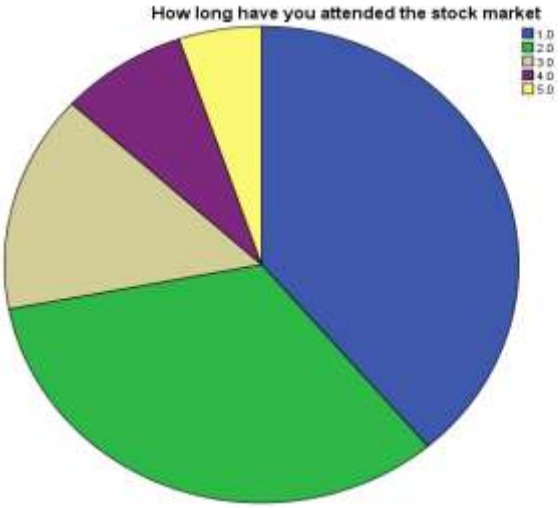


Figure Error! No text of specified style in document.**.5:** *Pie Chart of How long have you attended the stock market*

4.3.5. Have you attended any course of Stock Exchange?

The below tabulated figures showed the results of participants who have attended any course of stock exchange. Thereby, it is reported that respondents who have attended course of stock exchange were N= 110 (44%), and on the other hand, participants who have not yet attended any course of stock exchange were N= 140 (56%).

Table Error! No text of specified style in document.**-4:** *Have you attended any course of Stock Exchange*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	110	44.0	44.0	44.0
	Not yet	140	56.0	56.0	100.0
	Total	250	100.0	100.0	

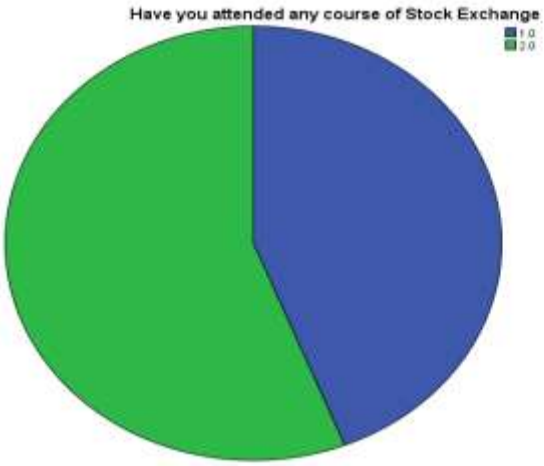


Figure Error! No text of specified style in document.**..6:** *Pie Chart of Have you attended any course of Stock Exchange*

This study also focuses on the average monthly income ($) were tabulated as below. It can be seen that respondents who earned $1000 were found N= 111 (44.4%). Similarly, participants who have average monthly income between $1001-$2020 were counted as N= 93 (37.2%). In a same way, respondents who earned between $2021-$3000 were evaluated as N= 25 (10%). Moreover, the people who have income between $3001-$4000 were counted as N= 15 (6%). Lastly, the participants who have earned between $4001-$5000 were noted as N= 6 (2.4%).

4.3.6. Please estimate your average monthly income ($)

Table Error! No text of specified style in document.**..5:** *Please estimate your average monthly income ($)*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1000	111	44.4	44.4	44.4
	1001-2020	93	37.2	37.2	81.6
	2021-3000	25	10.0	10.0	91.6
	3001-4000	15	6.0	6.0	97.6
	4001-5000	6	2.4	2.4	100.0
	Total	250	100.0	100.0	

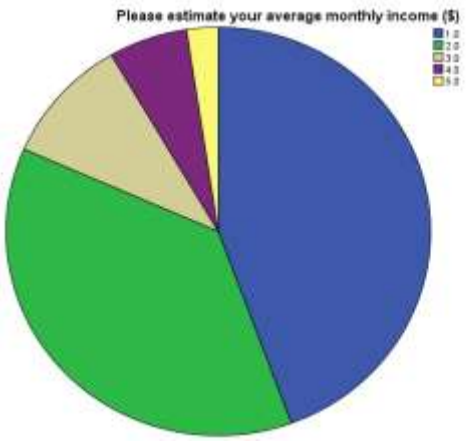


Figure *Error! No text of specified style in document.**..7*****:*** *Pie Chart of Please estimate your average monthly income ($)*

4.4. Reliability Analysis

Table 4.9: *Reliability Statistics*

Cronbach's Alpha	N of Items
.794	6
.844	6
.865	4
.794	7

.855	6
.834	3
.792	5
.853	5
.773	4

The values of all the variables are more than the threshold value of 0.70, which shows the reliability of data used in this study. The above table explains the Cronbach alpha score of investment decision which is 0.773 that consist of four number of items. This indicates a good variability among variables.

4.5: Regression

4.5.1: Hypothesis 1

Table 4.10: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756[a]	.571	.570	.46544

The above table is predicted the value of correlation of between representativeness and investment decision R= 0.756. The value of R2= 0.571 and this indicates that there is 57.1% variability in the data.

Table Error! No text of specified style in document.**.11:** *ANOVA Test for Hypothesis 1*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71.610	1	71.610	330.555	.000[b]
	Residual	53.726	248	.217		
	Total	125.336	249			

a. **Dependent Variable: investment decision**

The above ANOVA table is computed to check the positive and significant relationship between representativeness and investment decision. It is evident that p-value is less than alpha and is explained as [F= 330.555, p-value=0.000]. Hence, it is concluded that there is statistically significant relationship among representativeness.

Table 4.12: *Coefficients Hypothesis 1*

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.776	.101		7.678	.000
	Representativeness	.713	.039	.756	18.181	.000

a. Dependent Variable: investment decision

The above table explains the value of the coefficient which is calculated as [b= 0.776, t= 7.678, p-value= 0.000] for investment decision. Similarly, value of coefficient of representativeness is computed as [b= 0.713, t= 18.181, p-value= 0.000].

4.5.2: Hypothesis 2

The second hypothesis is this Overconfident has a significant impact on investment decision.

Level of significance = 0.05

Table 4.13: *Summary of hypothesis 2*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.435[a]	.190	.186	.64130

The above table is predicted the value of correlation of between overconfident and investment decision R= 0.435. The value of R2= 0.190 and this indicates that there is 19% variability in the data.

Table Error! No text of specified style in document.**.14:** *ANOVA Test for Hypothesis 2*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.752	1	23.752	57.754	.000[b]
	Residual	101.583	247	.411		
	Total	125.335	248			

a. Dependent Variable: investment decision

The above ANOVA table is computed to check the positive and significant relationship between overconfident and investment decision. It is evident that p-value is less than alpha and is explained as [F= 57.754, p-value=0.000]. Hence, it is concluded that there is statistically significant relationship among overconfident and investment decision.

Table 4.15: *Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.119	.191		5.868	.000
	OVERCONFIDENT	.580	.076	.435	7.600	.000

The above table explains the value of coefficient which is calculated as [b= 1.119, t= 5.868, p-value= 0.000] for investment decision. Similarly, value of coefficient of overconfident is computed as [b= 0.580, t= 7.600, p-value= 0.000].

4.5.3 Hypothesis 3

The third hypothesis is the Regret aversion has a significant impact on investment decision.

Level of significance = 0.05

Table 4.16: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.402[a]	.162	.159	.65079

a. Predictors: (Constant), regret aversion

The above table is predicted the value of correlation of between regret aversion and investment decision R= 0.402. The value of R2= 0.162 and this indicates that there is 16.2% variability in the data.

Table Error! No text of specified style in document.**.17:** *ANOVA Test for Hypothesis 3*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.302	1	20.302	47.935	.000[b]
	Residual	105.034	248	.424		
	Total	125.336	249			

a. Dependent Variable: investment decision

The above ANOVA table is computed to check the positive and significant relationship between regret aversion and investment decision. It is evident that p-value is less than alpha and is explained as [F= 47.935, p-value=0.000]. Hence, it is concluded that there is statistically significant relationship among regret aversion and investment decision.

Table 4.18: *Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.367	.174		7.873	.000
	regret aversion	.431	.062	.402	6.924	.000

a. Dependent Variable: investment decision

The above table explains the value of coefficient which is calculated as [b= 1.367, t= 7.873, p-value= 0.000] for investment decision. Similarly, value of coefficient of overconfident is computed as [b= 0.431, t= 6.924, p-value= 0.000]

4.5.4: Hypothesis 4

The hypothesis four is the Mental accounting has a significant impact on investment decision. Level of significance = 0.05

Table 4.19: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.509[a]	.259	.256	.61210

a. Predictors: (Constant), mental accounting

The above table is predicted the value of correlation of between mental accounting and investment decision R= 0.509. The value of R2= 0.259 and this indicates that there is 25.9% variability in the data.

Table Error! No text of specified style in document**..20:** *ANOVA Test for Hypothesis 4*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.420	1	32.420	86.530	.000[b]
	Residual	92.916	248	.375		
	Total	125.336	249			

a. Dependent Variable: investment decision

The above ANOVA table is computed to check the positive and significant relationship between mental accounting and investment decision. It is evident that p-value is less than alpha and is explained as [F= 86.530, p-value=0.000]. Hence, it is concluded that there is statistically significant relationship among mental accounting and investment decision.

Table 4.21: *Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.178	.151		7.811	.000
	mentalaccounting	.510	.055	.509	9.302	.000

a. Dependent Variable: investment decision

The above table explains the value of coefficient which is calculated as [b= 1.178, t= 7.811, p-value= 0.000] for investment decision. Similarly, value of coefficient of mental accounting is computed as [b= 0.510, t= 9.302, p-value= 0.000]

4.5.5 Hypothesis 5

The fifth hypothesis is the Loss aversion has a significant impact on investment decision. Level of significance is the 0.05.

Table 4.22: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.620[a]	.385	.383	.55751

a. Predictors: (Constant), LOSSAVERSION

The above table is predicted the value of correlation of between loss aversion and investment decision R= 0.620. The value of R2= 0.385 and this indicates that there is 38.5% variability in the data.

Table Error! No text of specified style in document**..23:** *ANOVA Test for Hypothesis 5*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	48.254	1	48.254	155.249	.000[b]
	Residual	77.082	248	.311		
	Total	125.336	249			

a. Dependent Variable: investment decision

The above ANOVA table is computed to check the positive and significant relationship between loss aversion and investment decision. It is evident that p-value is less than alpha and is explained as [F= 155.249, p-value=0.000]. Hence, it is concluded that there is statistically significant relationship among loss aversion and investment decision.

Table 4.24: *Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.669	.154		4.350	.000
	LOSSAVERSION	.683	.055	.620	12.460	.000

a. Dependent Variable: invest decision

The above table explains the value of coefficient which is calculated as [b= 0.669, t= 4.350, p-value= 0.000] for investment decision. Similarly, value of coefficient of loss aversion is computed as [b= 0.683, t= 12.460, p-value= 0.000]

4.5.6 Hypothesis 6

The sixth hypothesis is the Self-control has a significant impact on investment decision. Level of significance is the 0.05.

Table 4.25: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.402[a]	.162	.159	.65079

a. Predictors: (Constant), self-control

The above table is predicted the value of correlation of between self-control and investment decision R= 0.402. The value of R2= 0.162 and this indicates that there is 16.2% variability in the data.

Table Error! No text of specified style in document**..26:** *ANOVA Test for Hypothesis 6*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.302	1	20.302	47.935	.000[b]
	Residual	105.034	248	.424		
	Total	125.336	249			

a. Dependent Variable: investment decision

The above ANOVA table is computed to check the positive and significant relationship between self-control and investment decision. It is evident that p-value is less than alpha and is explained as [F= 47.935, p-value=0.000]. Hence, it is concluded that there is statistically significant relationship among self-control and investment decision.

Table 4.27: *Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.367	.174		7.873	.000
	selfcontrol	.431	.062	.402	6.924	.000

a. Dependent Variable: investment decision

The above table explains the value of coefficient which is calculated as [b= 1.367, t= 7.873, p-value= 0.000] for investment decision. Similarly, value of coefficient of self-control is computed as [b= 0.431, t= 6.924, p-value= 0.000]

4.5.7 Hypothesis 7

The seventh hypothesis is Education level and age have a significant impact on investment decision. The level of significance = 0.05

Table 4.28: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.080[a]	.006	-.002	.71003

The above table is predicted the value of correlation of between education level, age and investment decision R= 0.080.

Table Error! No text of specified style in document**.29:** *ANOVA Test for Hypothesis 7*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.812	2	.406	.805	.448[b]
	Residual	124.524	247	.504		
	Total	125.336	249			

a. Dependent Variable: investment decision

The above ANOVA table 4.15, is computed to assess significant relationship between education level, age and investment decision. It is evident that p-value is less than alpha and is explained as [F= 0.805, p-value=0.448]. Hence, it is concluded that there is a statistically insignificant relationship among education level, age and investment decision.

Conclusion and Recommendation

The section of conclusion and recommendation which provides a summary of all of the study's findings, discusses, in some length, the options available to individual investors trading on the stock market in Pakistan. In addition, this chapter offers some guidance to the individual investors who participate in the PSE.

Conclusion

The responses to the research questions from the introduction section have been summarized, allowing an easier understanding of how each question has been answered. This shows that the study has been successful in fulfilling its objectives and that its underlying assumptions were correct. This section summarizes the results of the research project in a few sentences. It includes the key information necessary to form answers to the research hypotheses. Investors' decisions to trade in the Pakistan Stock Exchange (PSE) may depend on their degree of overconfidence. This research suggests that there is a considerable impact of the overconfidence bias on individual investors. It is easy to argue against this hypothesis since the predominant reason for individual investors' actions at the PSE is the risk of loss. Based on the research, it appears that individual investors in the PSE are neither strongly bound nor totally free of the Loss Aversion bias due to the lack of evidence to prove otherwise.

The amount of impact representative influence affects an individual investor's decision making at the PSE is also analyzed. Based on the findings of the study, the individual investors participating at the PSE has the possibility of being affected in both positive and negative ways due to the representativeness bias. Nevertheless, determining the truth of this hypothesis appears challenging. Anchor effects tend to have an influence on people's investment decisions at the PSE. One of the findings of the study that tried explaining the Anchoring Bias was that it had only a small effect on PSE investors, which implies that the bias cannot be completely dismissed.

Supply and demand market dynamics determines individualized investment decisions at the PSE. From the study's findings, individual investors at the public stock exchange appear to be affected, in some way, adversely or beneficially, by the availability bias and this cannot be disproven. Sixth, during trading in the PSE, the investors' Mental Accounting tends to be a useful tool in guiding them into making logical decisions. The results of the research demonstrate that, because the hypothesis cannot be disproved, individual investors at the PSE might be subject to some degree of Mental Accounting bias. This leads to the conclusion that the hypothesis is indeed valid.

Personal investors on the PSE display an inclination influenced by a tendency to avoid regret. Research shows that individual investors at PSE are told that they are suffering from Regret Aversion Bias to an extent that is between moderate and severe, and this is indisputable. In terms of self-control, the PSE places a considerable focus, at least for the private investors, when it concerns decision-making at an advanced level with respect to individual investment opportunities. According to the gathered data, private investors in PSE firms seem to be untouched by the Self-Control bias. There is very little effect from age, culture or level of education on the investment decisions of Pakistani investors in the stock market within the country.

Future Research and Limitations

Some of the matters above could attempt to look into other areas for further study or attempt to better understand why the behavioral theories coming from developed markets are relevant for emerging economies. Since the investors are treated differently, there might also be some attention on the behavior of investors in the Philippine Stock Exchange (PSE). It might be possible that

some will attempt to develop more comprehensive explanations using the psychological aspects and the irrational tendencies that influence the decisions of people in the financial markets. In addition, some new studies will look at the impact of religion on the choice of investment. Also, how the market makers influence price control as well as issues of behavioral finance need some more work. To enhance portfolio management, an investor's self-education on the psychological biases impacting their financial decisions is imperative. Additionally, consultants and investment managers need training in behavioral finance to mitigate these biases in their decisions. These biases may inhibit an investor's decision to participate in the market, so information disseminators at the Pakistani Stock Exchange need to design effective marketing strategies with the information that targets investor behavior. It is not prudent for fund managers and investors to make financial decisions based on personal biases; rather, they should follow the decision of a wider group. While costly, establishing committees can lead to more optimal and equitable results. Behaviorally informed finance practitioners must also possess the skill described by Shefrin: identifying not only their own but also other people's errors, understanding these errors, and taking necessary measures so they are not repeated in the future.

Conflict of Interest

The authors showed no conflict of interest.

Funding

The authors did not mention any funding for this research.

References

AbuRub, N., & Sharba, T. (2020). Calender Effects in the Pakistan Securities Exchang PSE: Analysis and Investigation.

Abushammala, N., & Sami. (2021). Testing the Weak Form Efficiency of Pakistan Exchange. *International Journal of Economics and Finance*, 244-253.

Jahanzeb, A. (2012). Implication of behavioral finance in investment decision-making process. *Information management and business review*, *4*(10), 532-536.

Akintoye, I. a. (2021). Effect of Misinterpretation in an Informational Efficient Marke. Europen *Journal of Finance*.

Avanidhar, S. (2021). Behavioral Finance: A review and Synthesis. European Financial Managment, 14, No. 1, 12–29.

Azeez, B., & Sulaiman, L. (2022). Capital Market Efficiency: A Test of the Strong Form in Nigeria. *Australian Journal of Business and Management Research*.

Baghdadabad, M. R., Tanha, F. H., & Halid, N. (2021). A study on small investors' behavior in choosing stock. *African Journal of Business Management*, 11083-11092.

Baker, H. K. (October 5, 2020). Behavioral Finance: Investors, Corporations, and Markets.

Barber, B. M. (2018). All that glitters: the effect of attention on the buying behavior of individual and institutional investors. *Review of Financial Studies*,785–818.

Barberies, N., & Huang, M. (2021). Metanl Accounting, Loss Aversion and Individual Stock Returns. Natioal Bureau of Economic Research ;Working Paper 8190.

Barberis, N. a. (2021). Mental Accounting, Loss Aversion and Individual Stock Returns. *The Journal of Finance*, 1247-1292.

Baron, R. A., & Byrne, D. (2017). Social Psychology. Boston, MA: Allyn and Bacon.

Behavioural Factors in Investment decision making at Tehran Stock Exchange. International Conference and Economics Research, 234-237.

Belotti, H. S. (2021). Behavioral Finance: Biases, Mean–. *Journal of Finance*.

Benartzi, S., & Thaler, R. (2019). Myopic Loss Aversion and the Equity Premium Puzzle. *Quarterly Journal of Economics*, 73-92.

Bergen, J. V. (2021). Efficient Market Hypothesis: Is The Stock Market Efficient? Retrieved M ay 30, 2019, from Investopedia: http://www.investopedia.com/articles/basics/04/022018. asp

Bernéus, H., Sandberg, C., & Wahlbeck, D. (2019). Behavioral Finance – Investors' Rationality.

Bhandaria, G., Hassaneinb, K., & Deaves, R. (2018). Debiasing investors with decision support systems: An experimental investigation. *Decision Support Systems*, 399–410.

Chandra, A., & Kumar, R. (2021). Determinants of Individual Investor Behaviour: An Orthogon al Linear Transformation Approach. MPRA_paper_29722.pdf.

Chandra, A. (2018). Decision Making in the Stock Market: Incorporating Psychology with Fine. National Conference on Forecasting Financial Markets of India, 2018.

Chandra,iA.i(2018). Decision Making in the Stock Market: Incorporating Psychology with Finance. *Journal of Finance*.

Chen, G. K. (2021). Trading performance, disposition effect, overconfidence representativeness bias, and experience of emerging market investors. *Journal of Behavioral Decision Making*.

Cherry, K. (2019). About Psychology. Retrieved April 20, 2019, from Availability Heuristic: htt p://psychology.about.com/bio/Kendra-Cherry-17268.htm

Chip Heath, S. H. (2019). Psychological factors and stock option exercise. *Quarterly Journal of Economics*, 227-271.

Chira, I., Adams, M., & Thoronton, B. (2018). Behavioral Bias Within The Decision Making Pr ocess. *Journal Of Business & Economics Research*.

Chun, W., & Ming, L. (2021). "Investor behavioure and Decision Making Style: A Malaysian perspective".3-14.

Cooper, M., Dimitrov, O., & Rau, P. R. (2021). *Journal of Finance*, 2371-2388 .

Curtis, G. (2018). Modern Portfolio Theory and Behavioral Finance. *The Journal of Wealth Ma nagement*, 16-22.

Daniel, k., & Titman, s. (2020). Market effeciency in an irrational world. Working paper 7489.*N ational Bureau of Econimic Research* (NBER).

Daniel, K. D. (2018). Investor Psychology and Security Market Under- and Over Reactions. *Journal of Finance*, 1839-1886.

Daniel, K. D. (2021). Covariance Risk, Mispricing, and the Crosssection of Security Returns. *Journal of Finance.*

Dargham, N. A. (2019). The implications of Behavioral Finance. *Journal Of Economics*

DeBondt, W. T. (2019). Does the stock market overreact? *Journal of Finance,* 793-805.

Deuskar, P., Deng, P., Weisbenner, S. J., & Wu, F. (2022). The Effect of Regret. 25th Australasian Finance and Banking Conference .

Dittrich, D., Güth, W., & Maciejovsky, B. (2015). Overconfidence in investment decisions: An experimental approach. *The European Journal of Finance*.

Dominic D. P. Johnson, J. H. (22 Sep 2019). The Evolution of Overconfidence.

Evans, A., Dillon, K., Goldin, G., & Krueger, J. (2021). Trust and self control: The moderating role of the default. *Judgment and Decision Making,* 697-705.

Evans, W. D. (2015). Bidding and overconfidence in experimental financial markets. *The journal of behavioral finance,* 108-120.

Fama, E. F. (1 September 2018). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics.* Volume *49*, Issue 3, Pages 283–306.

Fama, E. F. (2018). Market Efficiency, Long-Term Returns, and Behavioral Finance. *Journal of Financial Economics*, 283-306

Fama, F. (September/October (reprinted January - February 2019). Random Walks in Stock Market Prices. *Financial Analysts Journal*.

Fischer, R., & Gerhardt, R. (2021). Investment Mistakes of Individual Investors and the Impact of Financial Advice. 20th Australasian Finance and Banking Conference .

Fischer, R., & Gerhardt, R. (2021). Investment Mistakes of Individual Investors and the Impact of Financial Advice. 20th Australasian Finance and Banking Conference .

Frieder, L. (2018). Evidence on Behavioral Biases in Trading Activity. 2-58.

G. Sevil, M. S. (2021). Small Investor Behaviour in Istanbul Stock Exchange (ISE). Middle Eastern Finance and Economics, 74-79.

Gervais, S. (2019). Behavioral Finance:Capital Budgeting and Other Investment Decisions. Review of financial Studies.

Gokul Bhandari, K. H. (2021). Debiasing Investors with Decision Support Systems: Debiasing Investors with Decision Support Systems:. 1-33.

Goldberg, J. a. (2021). Behavioral Finance. Chichester: FinanzBuch Verlag GmbH.

Gongmeng Chen, K. A. (2021). Trading Performance, Disposition Effect, Overconfidence, Representativeness Bias and Experience of Emerging Market Investors. *Journal of Behavioral Decision Making*, 425–451

Gunay, S. G., & Demirel, E. (2021). Interaction between Demographic and Financial Behavior Factors in Terms of Investment Decision Making. *International Research Journal of Finance & Economics*.

Herschberg, M. (2022). Limits to Arbitrage: An introduction to Behavioral Finance and a *Literature Review*. Palermo Business Review.\

Hoguet, G. (2015). How the World Works. Behavioral Finance and Investing in Emerging Markets.

Baily, W., Alok, K., & Ng, D. (2021). Behavioral biases of mutual fund investors. *Journal of Financial Economics*.

James Felton, B. G. (2019). Preference for Risk in Investing as a Function of Trait Optimism and Gender. *The journal of behavioral finance*, 33

Jensen, M. C. (1987). Some Anomalous Evidence Regarding Market Efficiency. *Journal of Financial Economics*, 95-101.

John Ameriks, A. C. (2018). Measuring Self-Control.

Kadariya, S. (2022). Factors affecting investor decision making: A case of Nepalese capital market. *Journal of Research in Economics and International Finance*, 16-30.

Kahneman, D., & Tversky, A. ((Mar., 1979)). Prospect Theory: An Analysis of Decision under Risk. Econometrica, Vol. 47, No. 2, pp. 263-292.

Kahneman, D. (2019). Maps of bounded rationality: psychology for behavioral economics. *The American Economic Review*, 1449–75.

Kahneman, D. a. (2022). Representativeness revisited: Attribute substitution in intuitive judgment. 48-81.

Kahneman, D. a. (2022). Representativeness revisited: Attribute substitution in intuitive judgment. Heuristics & Biases: *The Psychology of Intuitive Judgment*, pp. 49-81.

Kahneman, D. S. (1982). Judgment Under Uncertainty: Heuristics and Biases. New York: Cambridge University Press.

Khalil, M. S., & Ullah, U. (2021). Effect of COVID-19 on financial markets: Evidence from Pakistan, India and Italy. *Journal of Business & Tourism, 6*(2), 1–10. https://doi.org/10.34260/jbt.v6i2.150

Lin, H.-W. (2021). Elucidating rational investment decisions and behavioral biases: Evidence from the Taiwanese stock market. *African Journal Of Business Management*, 1 630-1641.

Luong, L. P., & Thu Ha, D. T. (2021). Behavioral Factors Influencingindividual Investors' Decision-Makingand Performancea Survey At The Ho Chi Minh Stock Exchange.

Mahmood, I., Ahmed, H., Khan, A. Z., & Anjum, M. (2021). Behavioural Implication of Investors for Investments in the Stock Market. *European Journal of Social sciences*, 240-247.

Malkiel, B. (2019). The Efficient Market Hypothesis and Its. *Journal of Economic Perspectives*, 59–82.

Malkiel, B. (2019). The Efficient Market Hypothesis and Its Critics. *Journal of Economic*, 59-82

Masomi, S. a. (2022). consequences of human behaviors in Economics: the Effects of Behavioral Factors in Investment decision making in Tehran Stock Exchange.

Masomi, S. R., & Ghayekhloo, S. (2021). Consequences of human behaviours' in Economic

Massimo Massa, A. S. (2018). Behavioral Biases and Investment.

Members, R. T. (2015, september 1st). Individual investors. (R. H. Thaler, Ed.) Advancesin beh avioral finance, 2, pp. 543-563.

Nau, R. (2021). Advances in Decision Analysis: From Foundations to Applications. Cambridge University Press.

Naveed, A. (2021). Behavioural Finance : Shaping the Decisions of small Investors of Lahore S tock Exchange. *Inerdisiplinary Journal if Research in Business*, 38-43.

Nofsinger, J. R. (2021). The Psychology of Investing.

Odean, B. M. (2020). The Courage of Misguided Convictions. *Financial Analysts Journal*, 41–55.

Odean, T., & Barber, B. (2020). Trading Is Hazardous to Your Wealth:The Common Stock Investment Performanceof Individual Investors. *The Journal of Finance*, 773-806.

Odean, T. (2018). Are investors reluctant to realize their losses? *Journal of Finance*, 1775-1798.

Odean, T. (2018). Are Investors Reluctant to Realize Their Losses? *The Journal of Finance*, 1775-1798.

Odean, T. (2019). Do Investors Trade Too Much? *The American Eco-nomic Review*, 1279-1298.

Olsen, R. A. ((Mar. - Apr., 2018)). Behavioral Finance and Its Implications for Stock-Price Volatility. *Financial Analysts Journal*, pp. 10-18.

Olsen, R. A. (2018). Behavioral Finance and Its Implications for Stock-Price Volatility. *Financial Analysts Journal*, 10-18.

Peterson, R. (2021). Affect and Financial Decision-Making: How Neuroscience can Inform Market Participants. *The Journal of Behavioural Finance* , 1-9.

Pompian, M. M. (2016). Incorporating Behavioral Finance into Your Practice. *Journal of Financial Planning*.

Rasoul Sadi, H. G. (2021). Behavioral Finance: The Explanation of Investors' Personality and Perceptual Biases Effects on Financial Decisions. *International Journal of Economics and Finance*.

Ricciardi, V., & Simon, H. (2021). Behavioural finance:A new perspective for investors and financial professionals. Working paper.

Sadeghi, M. Y. (n.d.). The Influence of Investor Psychology On Regret Aversion. journal of finance..421 Samir Safi .)2022(.An introduction to statistics .Gaza.

Khan, S., Bangash, R., & Ullah, U. (2023). Unlocking market insights and AI-driven stock return analysis of the KMI-30 index. *Journal of Asian Development Studies, 12*(3).

Saunders, E. M. (2019). Stock prices and wall street weather. American Economic Review, 1337–1345.

Shaheen, Y. (2020). The Percevied Usefulness of Information for Investment Decisions: Eviden ce from Pakistan Securities Exchange[PSE]. *Hebron University Research Journal*, 284-307.

Shefrin, H., & Statman, M. (1984). Explaining Investor Preference for cash dividends. *Journal of Financial Economics*, 253-282.

Shefrin, H. (2020). "Beyond Fear and Greed: Understanding Behavioral Finance and the Psychology of Investing. Harvard Business School Press.

Shefrin, H. (2020). Beyond Greed and Fear: Understanding behavioral finance and the psycholo gy of investing. Harvard Business School Press.

Shefrin, H. (2020). Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing. *Financial Management Association Survey and Synthesis Series*.

Shefrin, H. (2021). Behavioral Corporate Finance. *Journal of Applied Corporate Finance*, 113-124.

Shefrin, H. (2021). Behavioral Finance: Biases, MeanVariance Returns, and Risk Premiums. CFA Institute Conference Proceedings Quarterly.

Suleyman Gokhan Gunay, E. D. (2021). Interaction between Demographic and Financial Behavior Factors in Terms of Investment Decision Making. International Research *Journal of Finance and Economics*, 147-156.

Thaler, C. M. (2015). "Overconfidence vs. Market Efficiency in the National Football League. NBER Working Papers 11270.

Thaler, R. a. (2022). A Survey of Behavioral Finance, Handbook of the Economics of Finance. National Bureau of Economic Research.

Thaler, R. H. (1981). An Economic Theory of Self Control. *Journal of Political Economy*, 392-406.

Ullah, U., Khan, J., Shah, J. A., & Baloch, R. (2023). Customers' experience and perception towards the adaptation of financial services: A special reference to RAAST. *UCP Journal of Business Perspectives, 1*(2). http://ojs.ucp.edu.pk/index.php/jbp/index

Wang, F. A. (2021). Overconfidence, Investor Sentiment, and Evolution. *Journal of Financial Intermediation* 10, 138–170.

Yahyazadehfar, M. a. (2018). The Influence of Investor Psychology On Regret Aversin. *Journal of finance*.

Yates, J. F. (2020). Judgment and decision making. Englewood Cliffs, NJ.

Zhu, Y.-J. L.-S.-Y.-P. (n.d.). The Investment Behavior, Decision Factors and Their Effects Toward Investment Performance in the Taiwan Stock Market.