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"Investment behavioural biases: cognitive vs emotional"

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ΒΕΒΑΙΩΣΗ ΕΚΠΟΝΗΣΗΣ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ

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έχει συγγραφεί από εμένα αποκλειστικά και στο σύνολό της. Δεν έχει υποβληθεί ούτε έχει εγκριθεί στο πλαίσιο κάποιου άλλου μεταπτυχιακού προγράμματος ή προπτυχιακού τίτλου σπουδών, στην Ελλάδα ή στο εξωτερικό, ούτε είναι εργασία ή τμήμα εργασίας ακαδημαϊκού ή επαγγελματικού χαρακτήρα.

Δηλώνω επίσης υπεύθυνα ότι οι πηγές στις οποίες ανέτρεξα για την εκπόνηση της συγκεκριμένης εργασίας, αναφέρονται στο σύνολό τους, κάνοντας πλήρη αναφορά στους συγγραφείς, τον εκδοτικό οίκο ή το περιοδικό, συμπεριλαμβανομένων και των πηγών που ενδεχομένως χρησιμοποιήθηκαν από το διαδίκτυο. Παράβαση της ανωτέρω ακαδημαϊκής μου ευθύνης αποτελεί ουσιώδη λόγο για την ανάκληση του πτυχίου μου»

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I declare responsibly that the diploma thesis for obtaining master's degree, University of Piraeus, in Business Administration – Total Quality with an International Orientation entitled "Investment behavioral biases: cognitive vs emotional" has been written by me exclusively and in its entirety. It has not been submitted or approved in the context of another postgraduate program or undergraduate degree, in Greece or abroad, nor is it work or part of work of an academic or professional nature.

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Dedicated to my Parents

and my Siblings

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TABLE OF CONTENT

CHAPTER 2: Behavioural Finance: key aspects

CHAPTER 3: Investment Behavioural Biases: Cognitive Vs Emotional

ABSTRACT

Keywords: *Behavioral finance, Cognitive biases, Emotional biases, Investment decisions, Investor behavior, Debiasing strategies, Financial decision-making*

This thesis examines the intersection of psychology and finance by exploring the impact of cognitive and emotional biases on investment decisions. Traditional economic and finance theories typically presume that investors act rationally, optimizing their decisions based on available information. However, this research challenges this assumption, highlighting the influence of cognitive and emotional biases on investor behavior. The study begins with a comprehensive exploration of cognitive biases such as anchoring, availability bias, representativeness, and confirmation bias. The analysis extends to emotional biases, focusing on overconfidence, loss aversion, and regret aversion. By delving into these biases, the thesis underscores how investors can deviate from rationality, making decisions based on cognitive shortcuts and emotional influences. The research then discusses how these biases influence each phase of the investment process. Confirmatory bias in the pre-investment phase, overtrading during the investment operation phase, and omission bias in the post-investment phase are examined. These discussions illuminate the reality that investment decisions are not made in isolation, but are the product of complex interactions between cognition and emotion. Subsequently, the thesis investigates the potential for debiasing. By advocating for financial education, the deployment of financial advisors, and the support of financial institutions, it argues that a multifaceted approach can help mitigate the effects of cognitive and emotional biases on investment decisions. This thesis adds to the growing field of behavioral finance by highlighting the importance of psychological factors in investment decisions. The findings challenge traditional finance theories that overlook the role of psychology, advocating for a more nuanced understanding of investor behavior. The research also underscores the need for further investigation into this complex interplay of psychology and finance, opening avenues for future studies in behavioral finance.

Acronyms and Abbreviations

BF	Behavioural Finance
BPT	Behavioural portfolio theory
CAPM	Capital Asset Pricing Model
FOMO	Fear of Missing Out
EMH	Efficient Market Hypothesis
OECD	Organization for Economic Co-operation and Development
WTA	Willingness to Accept
WTP	Willingness to Pay

INTRODUCTION

The study of investment behaviours has captured the attention of financial scholars, practitioners, and theorists for many years. This fascination was originally based on the assumption made by traditional economics that market participants, or *homo economicus*, consistently exhibited rationality when making investment decisions (Smith, 1759). Smith's concept of *homo economicus* depicts a consistent method in maximizing utility within specified budget constraints. Consequently, it implies that investors should strive to attain the highest possible returns given a certain level of risk. This idea was further developed through Fama's formulation of the Efficient Market Hypothesis (EMH) in 1965. Fama's EMH suggested that all relevant and available information would be immediately reflected in market prices, making it impossible for any investor to continuously achieve above-average returns (Fama, 1965).

Over the following years, countless abnormalities and empirical contradictions emerged that posed challenges to conventional financial theories such as the EMH and their ability to explain them (De Bondt & Thaler, 1985; Shefrin & Statman, 1985). These inconsistencies included tendencies towards either overreacting or underreacting to new information, observed market volatility, and the presence of both bubbles and crashes—issues that directly contradicted the concept of market efficiency (Shiller, 1981; De Bondt & Thaler, 1985). As a result, a new perspective began to gain prominence in an attempt to address these shortcomings by acknowledging these conflicting findings.

This evolving financial paradigm was behavioural finance, a discipline that seeks to integrate insights from psychology, judgement, decision-making, and economics to produce an accurate and comprehensive understanding of financial decision-making (Kahneman & Tversky, 1979; Thaler, 1980). Behavioural finance recognises that real investors often deviate from the traditional economic models of rational behaviour, thereby introducing systematic biases into their investment decisions (Tversky & Kahneman, 1974). It challenges the assumptions of perfect rationality, selfishness, and willpower that characterize *homo economicus*, and acknowledges that people's cognitive limitations, heuristic-driven biases, and emotional influences significantly impact their financial decisions (Ricciardi & Simon, 2000).

The objective of this thesis is twofold. The primary purpose is to offer a robust exploration of cognitive and emotional biases as pivotal factors influencing investment

behaviour. This exploration acknowledges that individual investors often make errors in judgement that systematically deviate from rational calculations, leading to suboptimal investment decisions. Cognitive biases and emotional biases, which stem from using heuristic shortcuts and limitations in cognitive processing, are acknowledged as significant factors that cause deviations in behaviour (Kahneman, 2011). Both of these types of biases have an impact on our decision-making because they depend on heuristics and the immediate emotional state of an individual.

The secondary objective of this thesis goes beyond merely exploring biases; it aims to delve into the practical implications that arise from these biases. By doing so, this research seeks to gain a deeper understanding of how these biases significantly impact the investment decision-making process. Moreover, one must recognize that these biases may contribute to the persistence of anomalies in market outcomes. In light of this, it becomes clear that behavioural finance remains an important area encompassing both financial market theory and investment practice (Barberis & Thaler, 2003).

The methodological approach utilized in this thesis is an extensive examination and amalgamation of pertinent literature, integrating ideas from scholarly investigation, empirical studies, and theoretical viewpoints on behavioural finance, cognitive psychology, and emotional biases in investment behaviour. By closely examining a vast array of scholarly resources, this study aims to consolidate a coherent storyline regarding the complex connection among cognitive and emotional biases in relation to their influence on investment decisions.

This thesis is structured into three primary chapters, each with its own unique and interconnected purpose. The first chapter adopts a historical perspective on behavioural finance, tracing its development from a critique of conventional finance theories to its integration into the wider realm of financial theory. Throughout this journey, many distinguished scholars make significant contributions to the field, with some even earning prestigious Nobel prizes for their pioneering research efforts.

Transitioning to the subsequent chapter, we embark on a thorough exploration of the fundamental elements and foundational principles of behavioural finance. This endeavour encompasses a detailed examination of dual-process reasoning as posited by Kahneman (2011) and accentuates the essential role that heuristics fulfil in shaping our decision-making procedures. Moreover, it illuminates the complexities of emotional influences on investment decisions and emphasizes the frequently disregarded importance of emotions in the holistic realm of making choices surrounding investments.

In the concluding chapter of this manuscript, a detailed examination is conducted on numerous biases that commonly influence investment behaviour. Throughout this exploration, a clear differentiation is made between cognitive biases and emotional biases. Furthermore, an in-depth explanation is provided regarding the distinct characteristics and origins of these biases, as well as their potential to significantly impact individuals on their investment journeys. The closing section of this chapter delves into a discussion surrounding strategies for mitigating these biases through various means such as financial education, seeking professional guidance, and utilizing the resources offered by financial institutions.

Through a profound examination of these concepts, the primary aim of this thesis is to make a substantial contribution to the current body of knowledge in behavioural finance, with particular emphasis on cognitive and emotional biases. The findings obtained from this research possess the potential to establish a foundation for enhancing investment strategies, formulating groundbreaking financial products, and designing more efficient market regulations. Moreover, by illuminating investors about their potential biases, this study has the power to empower them in making rational decisions based on well-informed judgments that result in profitable investments.

CHAPTER 1

Historical Overview of Behavioral Finance

TABLE OF CONTENTS: 1. 1759 Adam Smith: The Theory of Moral Sentiment - 2. Selden's 1912: Psychology of the Stock Market - 3. The 1940s and 1960s - 3.1. John von Neumann and Oskar Morgenstern: Theory of games and economic behaviour (1944) - 3.1.1. Critics: Allais Paradox (1953) and Ellsberg Paradox (1961) - 3.2. Leon Festinger: (1957) study of cognitive dissonance - 3.3. Arrow-Pratt: discussion of risk aversion and utility function - 4. 1970s and 1980s: the founders of the BF - 4.1. EMH (efficient markets hypothesis) (Fama 1965) – 4.2. Amos Tversky and Daniel Kahneman: Prospect Theory: A Study of Decision Making Under Risk (1979) – 4.3. Richard Thaler: Toward a Positive Theory of Consumer Choice and the collaboration with De Bondt - 5. From 1990s to nowadays - 5.1. Meir Statman - 5.2. Hersch Shefrin: Beyond Greed and Fear: Understanding Behavioural finance and the Psychology of Investing (2002) - 5.3. Robert Shiller: From Efficient Markets Theory to Behavioural Finance (2003) - 5.4. Nobel price to David Kanheman (2002) and Thaler (2017) – 6. Conclusions

The comprehension of financial markets has reached a significant milestone with the emergence of Behavioural Finance. This field distinguishes itself from traditional finance theories by examining human behaviour instead of relying solely on rational and economic assumptions. However, this shift in perspective did not occur suddenly; it evolved gradually over several centuries. By retracing this evolutionary journey, we can develop a deeper understanding of the origins and circumstances that paved the way for the rise of Behavioural Finance. The primary aim of this chapter is to spotlight crucial historical phases, thereby laying the groundwork for a more extensive discussion on the fundamental principles and biases inherent in Behavioural Finance.

1. 1759 Adam Smith: The Theory of Moral Sentiment

The basis of behavioural finance can be traced back to the writings of Adam Smith, a prominent economist acclaimed as the "Father of Modern Economics." While Smith is mainly recognized for his influential work, "The Wealth of Nations" (1776), an equally significant precursor to his ideas on market economics can be found in his philosophical treatise, namely "The Theory of Moral Sentiments" (1759). Embedded within its pages, one can discern an early appreciation for how human psychology impacts economic decision-making.

In "The Theory of Moral Sentiments," the author explores the core of human emotions and their impact on moral judgments. According to Smith, an inherent sense of "sympathy" or "fellow-feeling" resides within us, signifying that our motivations extend beyond individual gain (Smith, 1759). This often neglected notion presents an opposing view compared to the concept of the 'economic man,' who is solely driven by self-interest. Consequently, it establishes a sturdy framework for comprehending different behavioural perspectives.

In the written work crafted by Smith, he unveils the idea of the 'Impartial Spectator,' a concept that recognizes how people possess the ability to detach themselves and impartially view their own actions and feelings (Smith, 1759). This notion holds considerable importance within behavioural finance as it allows individuals to engage in thoughtful introspection regarding their investment choices, acknowledging previous mistakes, and potentially remedying any existing biases they may harbour. Ultimately, Smith's contribution sheds light on how human emotions substantially influence moral evaluations while simultaneously advocating for self-reflection as an avenue for personal growth and advancement.

Furthermore, Smith recognized the complex intricacies of human behaviour, emphasizing that people are not only guided by logical reasoning but also influenced by their emotions and passions. He emphasized the point that individuals often make decisions not solely driven by self-interest, but rather can succumb to instinctual emotional forces even when it goes against their own well-being (Smith, 1759). This acknowledgment of the significant influence of emotions on human behaviour lays the groundwork for exploring behavioural finance.

It's important to emphasize, however, that Smith's ideas were primarily philosophical and weren't explicitly focused on financial decision-making. It wasn't until later on that his insights laid the groundwork for an extensive body of research specifically linking human psychology to financial behaviors.

2. Selden's 1912: Psychology of the Stock Market

As we traverse the realms of behavioural finance, it becomes clear how George Charles Selden's contributions hold utmost importance. In his groundbreaking publication in 1912 titled "Psychology of the Stock Market," Selden thoroughly scrutinized how human psychology magnifies its influence over stock market trends. This represents a significant step forward in the narrative of behavioural finance (Selden, 1912). Selden's groundbreaking research completely transformed the understanding of how psychological factors impact stock markets. It was an especially noteworthy contribution given that financial matters were commonly analysed solely from an economic standpoint at the time. Selden (1912) emerged as a leader among those who advocated for an expanded perspective, one that emphasized not only the role of economic conditions but also recognized the powerful influence exerted by psychological elements in shaping investors' decision-making processes. He stood among the earliest advocates asserting that the stock market is not just a mechanical reflection of economic circumstances, but rather a dynamic arena heavily influenced by human emotions and cognitive biases.

In his assessment of the stock market, Selden drew attention to the significance of collaborative efforts among investors and suggested that the movement of this market largely mirrors the prevailing thoughts or attitudes of its participants. As per Selden, surges in positivity and negativity can wield influence on prices, prompting them to veer away from their genuine worth. The notion of market sentiment introduced by Selden has since become a crucial concept in behavioural finance, which subsequent modern theories delve into with greater detail (Shiller, 2003).

Selden's perceptive investigation into the sentiments of investors demonstrated the profound influence that psychological biases wield over financial decision-making (Selden, 1912). His research unveiled a prevailing pattern in which investors frequently succumb to collective mentality, leading to speculative bubbles and subsequent market downturns. Furthermore, Selden also uncovered an inclination among investors to excessively react to both favourable and unfavourable information. These fundamental principles laid the foundation for subsequent inquiries into behavioural biases like herding conduct and exaggerated responses

Additionally, Selden's research also acknowledged the influence of media and news on the behaviour of investors. He suggested that investors are often influenced by narratives and stories, resulting in trades driven by emotions. This observation emphasizes

the significance of narrative economics, a concept further developed by Robert Shiller (2017), as well as the crucial role played by media influence in studying behavioral finance.

It is noteworthy to mention that despite being groundbreaking at the time, Selden's ideas remained relatively isolated for many years. His work was ahead of its time, introducing concepts and hypotheses that only began gaining recognition and acceptance in later decades of the twentieth century. Nevertheless, his profound exploration of the psychological dynamics within the stock market continues to serve as a vital contribution within behavioral finance literature.

3. The 1940s and 1960s

The historical trajectory of behavioural finance witnesses a pivotal intersection between the 1940s and 1960s.This period, abundant in scholarly discourse and mathematical formulations, witnessed critical analysis and expansion of previous theories. Four salient developments stood out: the game theory by von Neumann and Morgenstern, the criticism of expected utility theory by Allais and Ellsberg, the cognitive dissonance theory by Leon Festinger, and the discourse on risk aversion by Arrow-Pratt.

3.1. John von Neumann and Oskar Morgenstern: Theory of games and economic behavior (1944)

One of the most important advancements in this area was the release of "Theory of Games and Economic Behavior" in 1944 by John von Neumann and Oskar Morgenstern. This pioneering publication presented a comprehensive mathematical exploration of strategic decision-making involving rational actors, thus marking the birth of game theory. In their work, von Neumann and Morgenstern aimed to comprehend and forecast the economic actions of individuals using a structured approach, which laid the groundwork for expected utility theory (von Neumann & Morgenstern, 1944).

Von Neumann and Morgenstern posited that rational individuals, when faced with options involving uncertainty, would inherently select the alternative that provides the highest expected utility. This concept is significant as it constituted the basis of numerous theories and models in economics and finance, most notably, the modern portfolio theory and the capital asset pricing model. The common thread that runs through these theories is the assumption of rationality among market participants, thereby seeking to maximize their expected utility.

3.1.1. Critics: Allais Paradox (1953) and Ellsberg Paradox (1961)

In spite of the widespread application of expected utility theory in economics and finance, its assumptions began to face criticism in subsequent years. Notably, Maurice Allais, in 1953, and Daniel Ellsberg, in 1961, presented paradoxes that exposed the inherent contradictions in the theory's predictions.

Maurice Allais, through his eponymous paradox, demonstrated instances where individuals' choices deviated from the predictions of expected utility theory. Allais proposed scenarios in which individuals displayed behaviour that conflicted with utility maximization, thereby questioning the theory's universal validity (Allais, 1953).

Daniel Ellsberg, building on Allais' criticism, highlighted similar inconsistencies in the expected utility theory. His paradox showed that individuals' decision-making could be dramatically influenced by ambiguous or incomplete information, leading to choices that did not conform to the expected utility theory. Ellsberg's experiment thereby amplified the discussion on the impact of ambiguity aversion on decision-making, a concept that has since become integral to behavioural finance (Ellsberg, 1961).

3.2. Leon Festinger: (1957) study of cognitive dissonance

Simultaneously, the 1950s witnessed developments in psychology that had far-reaching implications for understanding investor behaviour. Leon Festinger, in his groundbreaking work on cognitive dissonance, postulated that individuals strive for consistency within their cognitions. When faced with contradictory information, individuals experience dissonance, leading to discomfort. This discomfort could trigger alterations in beliefs or behaviours, often resulting in decisions that could appear irrational (Festinger, 1957). Festinger's theory played a pivotal role in merging psychology perspectives with the realm of financial decision-making, thus laying down the groundwork for future investigations in behavioral finance. This significant milestone symbolized an important juncture where these two fields began to converge and influence one another, leading to captivating developments and findings that would shape the course of future studies.

3.3. Arrow-Pratt: discussion of risk aversion and utility function

In the span of time, Kenneth Arrow and John W. Pratt introduced conversations regarding the concept of risk aversion and its influence on investment decisions. Their suggestion, known as the Arrow-Pratt measure of risk aversion, built upon the expected utility theory

by acknowledging that individuals' reluctance towards taking risks significantly affects their choices when it comes to investing. The manner in which investors perceive and handle risk was categorized according to the form of their utility function.

Specifically, concave utility functions indicated a preference for avoiding risk, while convex utility functions represented a tendency towards seeking out risky opportunities (Arrow, 1965; Pratt, 1964). This conceptual framework for understanding risk preferences later became instrumental in the development of theories in modern finance and triggered subsequent behavioural finance research examining deviations from rational risk preferences.

4. 1970s and 1980s: the founders of the BF

The birth of behavioural finance as a distinct scholarly discipline can be traced back to the transformative period of the 1970s and 1980s. This era signified a turning point in the field of economics, heralded by the remarkable insights of several pioneering academics. These scholars, daring to challenge the established norm, laid the groundwork for a new paradigm that accounted for the emotional and cognitive factors affecting economic decision-making.

4.1. EMH (efficient markets hypothesis) (Fama 1965)

At the core of the traditional finance theories during this period, one finds the Efficient Markets Hypothesis (EMH), a theory introduced by Eugene Fama in 1965. Fama's EMH was an innovative proposition that argued for the 'informational efficiency' of financial markets. The theory suggested that the prices of traded assets—be they stocks, bonds, or otherwise—accurately reflected all available information at any given time.

In its essence, EMH posited that it is impossible for an investor to consistently achieve returns in excess of average market returns, once the risk is adjusted, based on the available information at the time of the investment (Fama, 1965). The central idea behind the Efficient Market Hypothesis (EMH) centers on the notion that investors behave logically and efficiently incorporate fresh data into their investment decisions. Consequently, this prompt reaction promptly induces changes in asset prices to synchronize with their perceived authentic worth.

4.2. Amos Tversky and Daniel Kahneman: Prospect Theory: A Study of Decision Making Under Risk (1979)

In the face of the ever-dominant Efficient Market Hypothesis (EMH), a countervailing narrative has emerged which challenges its fundamental principles. This opposition was led by psychologists Amos Tversky and Daniel Kahneman, whose groundbreaking Prospect Theory revolutionized our understanding of decision-making.

Their influential publication in 1979, titled "Prospect Theory: An Analysis of Decision Under Risk," introduced a fresh framework for decision-making that incorporated the psychological complexities experienced by individuals. Such intricacies include aversion to loss and nonlinear probability weighting. This marked a significant departure from expected utility theory, which predominantly formed the basis of traditional economic models at that time. Consequently, this shift in perspective was pivotal (Kahneman & Tversky, 1979).

The revolutionary aspect of Kahneman and Tversky's Prospect Theory lies in the proposal that people assess choices based on potential consequences rather than actual outcomes. A central finding from their theory is the concept of 'loss aversion,' indicating that losses have a greater emotional impact on individuals compared to equivalent gains. Together with other cognitive biases such as the 'certainty effect' and 'possibility effect', these discoveries reveal an extraordinary level of psychological understanding within economics' domain.

4.3. Richard Thaler: Toward a Positive Theory of Consumer Choice and the collaboration with De Bondt

At approximately the same point in history, economist Richard Thaler embarked on a journey to push the limits of economics from a different perspective. Thaler's influential work, "Toward a Positive Theory of Consumer Choice" (1980), pushed back against the standard economic theory of consumer behaviour, proposing a more psychologically nuanced model. Key concepts introduced by Thaler included 'mental accounting', wherein individuals categorize their finances into separate mental 'accounts' and spend differently depending on which 'account' the money is coming from, and the 'endowment effect', which suggested that individuals assign more value to items they own than identical items they do not own.

Thaler's collaboration with Werner De Bondt yielded even more powerful arguments against the EMH. Their influential paper, "Does the Stock Market Overreact?" (1985), provided compelling empirical evidence of long-term price reversals in the stock market. Their findings suggested that the stock market often overreacts to new information, leading to predictable patterns in stock returns (De Bondt & Thaler, 1985). This challenged the prevailing belief in market efficiency and emphasized the importance of cognitive biases in shaping financial decisions.

5. From 1990s to nowadays

Transitioning from the foundations established in the 1970s and 1980s, the 1990s and the subsequent decades have seen behavioural finance flourish and mature as a field of study. Recognised by the scientific community, the insights from this discipline have revolutionized our understanding of financial markets. Let us explore some of the key contributors and their contributions during this period.

5.1. Meir Statman

One of the notable contributors to the field of behavioural finance during this period is Meir Statman, known for his work on how individual behaviour influences investment decisions. He brought to light that investors are not simply concerned with utility maximization, as traditional finance suggests, but their choices are also driven by expressive and emotional benefits (Statman, 1999).

Statman's research proposes a multi-dimensional approach, suggesting that individuals' choices are affected by cognitive and emotional factors, rather than simply by the desire to increase wealth. His work illustrated how various psychological elements, such as the yearning for prestige, social obligations, or excitement, influence the process of making financial decisions.

5.2. Hersch Shefrin: Beyond Greed and Fear: Understanding Behavioural Finance and the Psychology of Investing (2002)

Hersch Shefrin's renowned literary work, "Beyond Greed and Fear: Understanding Behavioural Finance and the Psychology of Investing," has effectively popularized the concept of behavioral finance within both scholarly and professional circles. Within his book, Shefrin delves into exploring how investor behavior and market dynamics are

influenced by certain psychological traits such as overconfidence, denial, and framing (Shefrin, 2002).

With persuasion that stems from engaging examples, Shefrin vividly illustrates the adverse impact these traits can have on investment decisions as well as their contribution to market inefficiencies and systemic risks. Through his insightful research findings, investors, fund managers, and policy-makers are presented with practical knowledge to comprehend and counteract their susceptibility to psychological biases that can disrupt financial markets.

5.3. Robert Shiller: From Efficient Markets Theory to Behavioural Finance (2003)

Renowned for his enduring critique of the Efficient Markets Hypothesis, Robert Shiller has been an influential figure in the field of behavioural finance. In his 2003 paper titled "From Efficient Markets Theory to Behavioural Finance," Shiller presented arguments against the conventional view on efficient markets. He emphasized that market volatility is frequently influenced more by investor sentiment and biases in behavior rather than fundamental information (Shiller, 2003).

Shiller's research has shed light on how psychological factors and irrational conduct can lead to speculative bubbles and subsequent crashes in the market. His ideas have significantly impacted our comprehension of asset pricing and market dynamics, offering a more intricate framework compared to traditional finance models.

5.4. Nobel Prize to Daniel Kahneman (2002) and Richard Thaler (2017)

The acclaimed achievements of Daniel Kahneman and Richard Thaler have truly transformed the domain of economics, leading to their well-deserved acknowledgment through the prestigious Nobel Prize in Economic Sciences. In regards to this considerable honor, Kahneman was lauded in 2002 for his groundbreaking endeavors, where he ingeniously blended psychological research with economic science. His focus centered on investigating how individuals make judgements and decisions when confronting uncertainties within their lives (Nobel Prize, 2002).

Similarly, Thaler's relentless work in behavioral economics earned him the prestigious Nobel Prize in 2017. This distinguished honor acknowledges his significant contributions towards challenging the conventional notion of rational individuals within

economics and promoting more realistic psychological models when analyzing economic decisions (Nobel Prize, 2017).

The recognition of Kahneman and Thaler through the Nobel Prize signifies the great impact behavioral finance has had on economics. It is an acknowledgement of the increasing awareness regarding how cognitive biases and shortcuts shape decision-making, leading to consequential effects on market dynamics. These revolutionary finds have fundamentally altered our understanding of economic and financial decision-making, emphasizing the essential role that psychology plays in both financial theory and practice.

6. Conclusions

In the first chapter, we are taken on an intriguing journey into the development of behavioral finance over time. This captivating expedition transports us back to the 1700s, revealing its origins and following its evolution into a respected field of study in modern times. By immersing ourselves in the extensive historical context of this discipline, we gain a more profound understanding of its intricate nature and significance. Furthermore, we discover how it intersects with economic theory and influences the dynamics within financial markets.

The chapter begins by introducing the profound philosophical ideas of Adam Smith, which recognized the significant impact of emotions and biases on decision-making. This realization set the stage for future breakthroughs in behavioral finance. Later on, psychology gained prominence during the late 19th and early 20th centuries, as demonstrated by Selden's exploration. These developments shed light on human cognition and behavior, setting in motion an integration between psychology and finance.

The timeline stretching from the 1940s to the 1960s holds a significant place in the history of behavioural finance. It was during this time that cognitive psychology emerged and its application in finance posed a challenge to the traditional belief in rational agents.

Moving forward into the 1970s and 1980s, we witness the establishment of fundamental pillars within behavioural finance. Concepts such as the Efficient Market Hypothesis and Prospect Theory were introduced, shedding light on the complexities

involved in making financial decisions. These ideas significantly diverged from traditional economic theory by underscoring the role played by cognitive biases and heuristics.

Advancing into more recent times, spanning from the 1990s up until today, we observe a flourishing state for this field along with its maturation process. Figureheads like Meir Statman, Hersch Shefrin, and Robert Shiller have made notable contributions. They have deepened our understanding of investor behavior as well as market dynamics. The recognition bestowed upon Daniel Kahneman and Richard Thaler through their Nobel Prize successes further validates how behavioural finance is becoming increasingly important and influential within economic theory as well as practical implementation.

To conclude, the history of behavioural finance reveals its significant impact on the field of finance and economics, revolutionizing our understanding of investor actions and financial markets. The evolution of this discipline illustrates its ability to flexibly adapt and grow based on fresh discoveries and real-life occurrences. It offers a valuable perspective that allows us to examine and comprehend the intricacies and complexities involved in making financial decisions. By encouraging a more realistic, comprehensive, and nuanced approach towards finance, it lays the foundation for upcoming chapters that will delve deeper into specific principles, theories, and practical applications within behavioural finance.

CHAPTER 2

Behavioural Finance: key aspects

TABLE OF CONTENTS: 1. Neoclassic Finance - 1.1. Economy and EMH (Efficient Markets Hypothesis) (‘60s) - 1.2. Homo economicus - 2. Behavioural Finance - 2.1. From critics to Neoclassic Finance to Prospect Theory - 2.2. Kahneman’s: System 1 vs. System 2 Thinking (Thinking fast and slow 2011) - 2.2.1. Alone Effect - 2.3. The seven principle of BF (Dawnay, Shah, 2005 Behavioural Economics: seven principles for policy makers) - 2.4. Role of emotions in the investment decision-making process - 2.5. Heuristics and Biases – 3. Conclusions

In Chapter 2 of this thesis, an examination is conducted to unveil the core factors that shape Behavioural Finance (BF). This interdisciplinary field, which combines psychology and finance, is compared with traditional Neoclassic Finance to capture the significance and consequences of its own set of principles. Notably, BF centers on how psychological influences affect investors' financial decisions and the resulting impact on financial markets. This paper explains the key aspects that differentiate behavioural finance from classical theories and showcases its critical relevance in creating a paradigm shift in the realm of finance. Through scrutinizing fundamental principles and emphasizing key takeaway points, issues are raised regarding cognitive biases that may hinder investment decision-making processes while presenting potential opportunities for those who understand how to harness it effectively.

The present chapter builds the foundational understanding of Neoclassic Finance, highlighting its fundamental financial and economic theories. The focus is on exploring Efficient Market Hypothesis (EMH), a critical cornerstone of Neoclassic finance that gained traction in the 1960s. EMH postulates that financial markets manifest informational efficiency with prices fully reflective of available information (Fama, 1970). Furthermore, Homo oeconomicus or more commonly referred to as the "economic man", features prominently in Neoclassical theory due to its assumption the individual always acts rationally and selfishly, optimizing their own utility or profit (Persky, 1995).

The subsequent passage alters its focus on Behavioural Finance, commencing with a retrospective survey of its evolutionary framework from the period it deployed critiques

of Neoclassic Finance to the advent of revolutionary theories like Prospect Theory (Kahneman & Tversky, 1979). Additionally, the chapter expounds on Daniel Kahneman's distinguished work "Thinking, Fast and Slow" (2011) by providing illuminating insights into the duality underlying System 1 and System 2 thinking that significantly impacts financial decisions.

The investigation of the Alone Effect, an intriguing psychological phenomenon, is a crucial aspect to be analyzed. This phenomenon frequently leads to misrepresentation in economic choices resulting in unusual financial occurrences that established economic theories cannot elucidate (McFadden, 1999).

Additionally, this chapter will delve deeper into the seven principles of Behavioural Finance advocated by Dawnay and Shah (2005). These fundamental principles play a key role in facilitating the creation of a policy framework that integrates individuals' and markets' behavioral tendencies. By adopting these approaches, policymakers can gain insights into ways to acclimate policies and regulations quickly alongside individual market evolutions. Hence thereby making well-informed decisions.

The subsequent section of this chapter delves into a more profound analysis of the function emotions perform within the investment decision-making process. Specifically, how do sentiments and emotional responses such as fear and greed impact rationality in investors, ultimately culminating in biases that alter market trends?

Finally, this chapter confronts the idea of heuristics and biases, which play an influential role in Behavioural Finance. These patterns of hasty cognitive judgment and partial thinking significantly shape investor conduct and fiscal decision-making, frequently resulting in deliberate errors or biased outcomes (Tversky & Kahneman, 1974).

By traversing these comprehensive topics, this chapter seeks to demystify the complex interplay of cognitive processes, emotions, and biases within the framework of Behavioural Finance. Through its exploration, it aims to shed light on how these factors deviate from the rational, utility-maximizing assumptions of traditional financial theory, thereby offering a more nuanced understanding of financial behaviour and decision-making.

1. Neoclassic Finance

Neoclassical Finance represents the conventional approach to understanding financial markets. It is deeply entrenched in the principles of rationality and optimization. The foundational assumptions of neoclassical finance rest on the belief that all market participants act rationally, seeking to maximize their individual utility or wealth while being unfailingly mindful of the risk-return trade-off. Essentially, the theories constructed under this paradigm presume an ideal state of affairs where participants are always perfectly rational and markets are perpetually efficient (Fama, 1970).

The concept of rationality in this context implicates two key aspects. First, individuals are considered to have consistent, transitive preferences, which means if an individual prefers investment A over B, and B over C, they will always prefer A over C (Arrow, 1951). Second, individuals are believed to maximize their expected utility. In uncertain scenarios, individuals would evaluate the expected utilities of different outcomes and opt for the one that offers the highest expected utility (von Neumann & Morgenstern, 1944).

The principle of market efficiency, another cornerstone of neoclassical finance, postulates that financial markets are informationally efficient, wherein prices at any given time accurately reflect all available information (Fama, 1970). In effect, it argues that any new information is quickly and correctly incorporated into asset prices, rendering it impossible for investors to systematically achieve abnormal returns.

The normative framework of neoclassical finance profoundly influences the practice and pedagogy of finance. It serves as the basis for popular financial models and strategies, including Modern Portfolio Theory, Capital Asset Pricing Model, and Black-Scholes options pricing model.

Despite its predominant role and critical insights, the neoclassical finance approach has attracted significant criticism. Critics argue that it oversimplifies complex human behaviours and market dynamics by over-emphasizing rationality and efficiency. These critiques, propelling the evolution of finance theory, led to the emergence of Behavioural Finance, which attempts to incorporate psychological insights into finance to offer a more nuanced understanding of financial decision-making. We will examine these aspects in detail in the subsequent sections.

1.1. Economy and EMH (Efficient Markets Hypothesis) (‘60s)

The cornerstone of the neoclassical finance paradigm, the Efficient Markets Hypothesis (EMH), was formally introduced in the 1960s by Eugene Fama. The EMH posits that financial markets are "informationally efficient," which denotes that security prices at any given moment fully incorporate all available relevant information (Fama, 1970). The hypothesis offers a compelling argument concerning the role of information in asset pricing and its implications for investment strategies, corporate finance, and financial regulations.

EMH stems from a competitive market assumption, where numerous profit-maximizing participants analyze and value securities independently, each using their data and analytical methods. Whenever new information becomes available, these participants swiftly adjust their valuation, leading to immediate changes in security prices. Consequently, at any point in time, asset prices reflect the market's collective knowledge and assessment of the asset's intrinsic value (Fama, 1970). Therefore, under the EMH, prices follow a "random walk," suggesting that future price changes are independent of past changes, making it impossible to predict future price movements from historical data (Malkiel, 1973).

EMH is classified into three forms based on the extent of market efficiency - weak, semi-strong, and strong form efficiency.

The weak-form EMH asserts that current security prices reflect all historical price and volume information. It contends that no investor can achieve an abnormal return by developing trading rules based on past prices or by exploiting patterns in historical prices since they are already factored into current prices. This form denies the effectiveness of technical analysis, but not necessarily fundamental analysis (Fama, 1970; Malkiel, 2003).

Semi-strong form efficiency goes a step further to claim that security prices instantaneously adjust to incorporate all publicly available information. This notion discredits both technical and fundamental analysis, positing that neither can consistently produce superior investment results (Fama, 1991).

Lastly, the strong-form EMH posits that prices instantaneously reflect all information, public and private. The implication of strong-form efficiency is profound, suggesting that even corporate insiders with privileged access to private information cannot consistently earn abnormal returns (Fama, 1970).

The EMH, through its various forms, essentially argues that the pursuit of "beating the market" is futile as every security is fairly priced, making it impossible to find undervalued or overpriced stocks consistently.

The advent of EMH represented a significant leap in understanding financial markets' dynamics in the 1960s. It facilitated the development of celebrated financial models and theories, such as the Capital Asset Pricing Model (CAPM) and options pricing models, which rely heavily on the market efficiency assumption. Moreover, it shaped the creation of index funds, a popular investment product offering broad market exposure at a low cost, built on the belief that outperforming the market is an improbable endeavor (Sharpe, 1964; Black & Scholes, 1973).

Despite providing revolutionary insights, the Efficient Market Hypothesis (EMH) has received substantial criticism. Detractors posit that this theory neglects to account for the cognitive biases and irrational tendencies of investors that often influence their decision-making processes. In response to these concerns, behavioral finance emerged as an interdisciplinary field that aims to amalgamate traditional economics and finance with cognitive psychology theories in order to provide a comprehensive understanding of why individuals may act irrationally in various financial contexts (Shiller, 2003; Barberis & Thaler, 2003).

1.2. *Homo economicus*

Embedded in the core of modern finance and economic theory resides an abstract and profoundly picturesque concept of human conduct, commonly known as *Homo economicus* or the 'economic man'. This idea of *Homo economicus*, the logical protagonist, serves as a fundamental presumption in conventional financial doctrines. It embodies an imagined individual who flawlessly interacts with markets through rationality, motivated by self-interest and propelled by an unquenchable yearning to optimize personal satisfaction (Stigler, 1950).

The notion of *Homo economicus* encompasses an individual who is perceived as a rational decision-maker. Their choices are made through a meticulous evaluation of the advantages and drawbacks linked to each available option. Consistently, they select the course of action that will bring them the highest level of contentment or utility. It is assumed that this entity possesses a steadfast and predictable hierarchy of preferences,

whereby if they favor choice A over B, and B over C, then it logically follows that they would also hold a preference for A over C (Samuelson, 1938).

The Ho*mo economicus*, an ideal decision-maker, is not swayed by emotions or cognitive biases. It is expected of this individual to possess comprehensive and accurate information at all times and to correctly analyze it. Furthermore, *the Homo economicus* can assess the potential benefits of all available options and will invariably choose the one that promises the greatest anticipated utility (von Neumann & Morgenstern, 1944).

Moreover, this reasonable individual possesses a boundless capability to compute and resolve intricate issues, allowing for the formation of forecasts about what lies ahead that are typically reliable (known as 'rational expectations' in economic terms) (Muth, 1961). *Homo economicus* exhibits absolute self-restraint and remains unaffected by immediate gratification. Instead, their preferences remain consistent over time without succumbing to self-control predicaments that could potentially result in subpar decision-making (Strotz, 1956).

Furthermore, the *Homo economicus* is commonly characterized as self-centered, prioritizing his personal desires and requirements over considering the needs and aspirations of others. When engaging with others, interactions are approached through a transactional lens, emphasizing how these exchanges can advance one's own interests (Becker, 1976).

The influence of this behavior model is evident in the advancements achieved in economics and finance, such as the creation of contemporary portfolio theory and the concept of an efficient market. Take, for instance, the efficient market hypothesis. It presupposes that investors act rationally to maximize their profits by swiftly incorporating all relevant information into their investment decisions (Fama, 1970). Similarly, modern portfolio theory relies on investors behaving sensibly when optimizing their portfolios according to their risk tolerance and return expectations (Markowitz, 1952).

Although the *Homo economicus* model has played a meaningful role in shaping economic theories and ideas, it has encountered abundant criticism. Detractors argue that the model's assumptions regarding human behavior are overly simplistic and fail to accurately reflect reality. They contend that real-life decision-making is often influenced by cognitive biases, heuristics, emotions, and social factors – elements that the *Homo economicus* model overlooks (Kahneman & Tversky, 1979; Thaler, 2015). Recognizing

these limitations of the *Homo economicus* model has resulted in a surge of interest in behavioral finance – a field dedicated to providing a more genuine portrayal of human behavior within financial markets.

2. Behavioural Finance

The rise of behavioral finance as an important field of study arose from the recognition that conventional or neoclassical financial theories had some deficiencies, primarily due to their reliance on the concept of *Homo economicus* or the rational economic individual. It signifies a departure from neoclassical finance theory by questioning the underlying assumption of rationality and positing instead that real-world investors do not always act rationally, often making decisions influenced by psychological factors (Ricciardi & Simon, 2000).

The significant contributions made by psychologists Amos Tversky and Daniel Kahneman were instrumental in the advancements of behavioral finance. Through their cutting-edge studies on heuristics and biases, it became evident that people often rely on mental shortcuts or 'rules of thumb' when making decisions, which can result in consistent biases in their judgments (Tversky & Kahneman, 1974). This finding about cognitive biases affecting human decision-making marked a clear departure from the conventional *Homo economicus* model, which assumes flawless rationality and complete information processing.

Behavioural finance endeavors to construct a more accurate representation of investor behavior by integrating psychological insights with the field of finance. This discipline delves into understanding how cognitive biases, heuristics, emotions, and social influences impact investment choices and overall market results. These behavioral components may give rise to 'anomalies' or deviations from what one would anticipate according to the rational model of finance (Thaler, 1999).

One of the key characteristics of behavioral finance is its attention to how investors develop convictions and reach decisions when faced with uncertainty. The conventional theory in finance proposes that investors adopt the Bayesian model, wherein they update their initial beliefs with new information to arrive at revised beliefs (Bayes & Price, 1763). Nevertheless, behavioral finance emphasizes that investors frequently deviate from the principles of Bayesian updating and are susceptible to various biases like overconfidence and representativeness. These biases can result in errors in forecasting (Rabin, 1998).

Moreover, the field of behavioral finance puts forth the idea of 'bounded rationality' as a means to understand our decision-making process. From this perspective, investors operate with imperfect rationality, but they strive to be 'as-if' rational considering their cognitive limitations. Initially introduced by Herbert Simon, this concept suggests that individuals are only reasonably rational due to constraints related to their cognitive abilities, access to information, and time (Simon, 1955). Consequently, they tend to satisfice rather than aiming for the optimal choice as traditional theories may predict (Simon, 1956).

Furthermore, behavioural finance brings attention to the role of emotions and their impact on financial decision-making. While traditional finance largely overlooks the role of emotions, considering them as noise or irrational behaviour, behavioural finance posits that emotions play a crucial role in shaping our financial decisions. For example, fear and greed are often cited as powerful emotions driving investment behaviour, leading to market volatility and potential financial crises (Lo, Repin & Steenbarger, 2005).

Finally, behavioural finance has shed light on the significant impact of social factors on financial decision-making. For instance, it highlights the phenomenon of herding, where investors follow the behaviour of others rather than making independent decisions based on their own information and analysis. This can lead to price bubbles and crashes as the market overreacts to new information (Bikhchandani & Sharma, 2001).

2.1. From critics to Neoclassic Finance to Prospect Theory

The advent of Behavioural Finance is inextricably linked to the limitations of Neoclassical Finance and the criticism it attracted. The criticism primarily stemmed from the seemingly unrealistic assumptions of neoclassical finance, particularly the concept of 'Homo Economicus,' which assumes that all investors are rational, act in their self-interest, and possess an ability to process all available information (Fama, 1970). These assumptions were soon challenged as empirical observations revealed instances where market participants demonstrated behaviour inconsistent with the 'rational man' concept.

Maurice Kendall, in his 1953 critique of the Efficient Market Hypothesis (EMH), raised an early concern. He observed that share prices displayed a random walk behavior, suggesting that markets possess inherent unpredictability. This challenges the predominant belief that markets consistently incorporate all available information (Kendall, 1953). As subsequent research emerged, anomalies and patterns were detected

in stock price movements which contradicted the tenets of EMH; examples include the January effect and momentum effect. These findings presented additional evidence suggesting that markets may not be entirely efficient (Rozeff & Kinney, 1976; Jegadeesh & Titman, 1993).

Amidst the mounting criticisms, psychology was making great strides in understanding human decision-making. These advancements conflicted with the idea of rationality in Neoclassical Finance. The groundbreaking research conducted by Tversky and Kahneman (1974) shed light on heuristics and biases that showcased how individuals often diverge from rationality in predictable manners. They introduced concepts like anchoring, representativeness, and availability which clarified how people tend to rely on cognitive shortcuts when faced with uncertainty, ultimately leading to consistent biases.

Kahneman and Tversky's (1979) research in 1979 led to the development of Prospect Theory, a groundbreaking approach that posed a challenge to the widely accepted Expected Utility Theory in economics. Initially proposed by von Neumann and Morgenstern (1944), Expected Utility Theory hinges on the notion that individuals take decisions based on maximizing their expected utilities. However, over time, critics have grown sceptical about this theory's rationality assumptions since there is an accumulating empirical evidence that raises doubt.

Prospect Theory, a behavioral economics theory, came about through observations of human behavior. It incorporates psychological components that can affect decision-making processes. The principle of differential valuation between losses and gains is one such aspect. People exhibit stronger aversion to the prospect of losing than gaining something. Moreover, humans have a tendency towards making choices based on potential gains or losses relative to a fixed point compared to the overall result itself, as per this theory's tenets. This inclination often prompts individuals to demonstrate risk-averse traits while presented with potential rewards and risk-seeking characteristics in situations where they might face losses (Kahneman & Tversky 1979).

Prospect Theory fundamentally embodies a pragmatic and empirically substantiated account of how humans evaluate uncertain prospects and generate resolutions. Through encompassing the boundaries of reasoned thought and psychological inclinations, it has instigated profound reconsideration for comprehending economic

decision-making. Consequently, it confronts the conventional neoclassic finance framework while forging a path to advance Behavioral Finance theories.

The shift from Neoclassical Finance to Prospect Theory played a crucial role in the emergence of Behavioural Finance as a distinct area of study. By consciously incorporating psychological and cognitive aspects, it was able to produce a more profound comprehension of investor behavior, thus presenting an all-encompassing portrayal of financial markets that adheres closely to reality. This move represented a significant departure from the idealistic perception of an efficient and rational 'Homo Economicus' towards recognizing investors as inherently flawed creatures who are vulnerable to weaknesses and emotional influences. As such, this transition marked the relevance of considering human aspects in financial decision-making processes over pure logic.

2.2. Kahneman's: System 1 vs. System 2 Thinking (Thinking fast and slow 2011)

Daniel Kahneman, an innovative figure in behavioral finance, challenged the conventional perception of 'Homo Economicus' through his groundbreaking book "Thinking, Fast and Slow" (2011). This influential work provided a comprehensive framework that investigated intricate facets of human cognition and its role in decision-making. By exploring how individuals perceive information and form judgments, the book proved pivotal in uncovering various observed patterns within financial markets. In summary, this work showcases the complexity inherent to human thinking and its impact on economic behavior.

Kahneman's groundbreaking model delves into the essence of cognition via a dual-process theory. This theory highlights the existence of two unique faculties within the human mind, aptly referred to as the System 1 and System 2 processes (Kahneman, 2011). The former is colloquially referred to as the "fast" system governing our automatic, subconscious, and instinctive cognitive functions. Conversely, System 2 operates as an ostensible "slow" system responsible for executing rigorous, conscious and deliberate mental processes ensuring our decisions are well-thought-out.

System 1 is proficiently and expediently executed, devoid of conscious exertion or self-directed regulation. This process thrives on habitual responses that are swiftly devised through accumulation of sentiments from past exploits, cerebral shortcuts, and awareness. Its competence lies in the expeditious processing of voluminous information, thereby enabling individuals to maneuver their everyday lives without prolonged mental

scrutiny. However, its reliance on automaticity and cognitive shortcuts can introduce biases and systematic errors into decision-making (Kahneman & Tversky, 1974). For example, the availability heuristic - when individuals base decisions on easily recalled examples - or the anchoring bias - where initial information heavily influences subsequent judgements - can lead to decisions that diverge from rationality as defined by classical economics (Tversky & Kahneman, 1974).

In contrast, System 2 is linked to a slower and more deliberate thought process. It demands mental exertion and intense focus, often utilized in intricate tasks such as solving mathematical problems or making decisions involving several variables. System 2 possesses the ability to employ logic and reasoning, rendering it more dependable in providing accurate assessments. Nonetheless, it functions at a reduced pace and necessitates a greater allocation of cognitive resources compared to System 1 (Kahneman, 2011). This dichotomy between swiftness and precision, automaticity versus effortfulness lies at the heart of Kahneman's dual-process theory.

Kahneman's explanation of these two cognitive systems holds significant implications for comprehending financial decision-making. According to the framework proposed by Kahneman, financial decisions should not be viewed as solely arising from logical and analytical thinking (referred to as System 2) as believed in neoclassical finance theories. On the contrary, they often fall under the influence of instinctive and automatic processes (known as System 1), leading to biases and mistakes rooted in cognitive shortcuts.

The disposition effect is a well-known phenomenon in behavioral finance. As Shefrin and Statman (1985) have pointed out, this behavior shows how investors have a tendency to sell investments that have gained value while holding onto the ones that are losing money. To delve deeper into this behavior, we can turn to Kahneman's framework for understanding human decision-making. Two key concepts underlying this behavior are loss aversion and mental accounting heuristic, both of which stem from System 1 thinking as proposed by Kahneman and Tversky (1979).

Understanding the relationship between System 1 and System 2 can provide insight into why financial education and information disclosure don't always lead to optimal financial decisions. Despite possessing the requisite knowledge (System 2),

individuals' choices regarding their finances can still be impacted by their cognitive biases and emotional responses (System 1) (Thaler & Sunstein, 2008).

2.2.1. Alone Effect

The phenomenon referred to as the "Alone Effect" plays a crucial role in investigations into behavioral finance and cognitive psychology. Though it may sound uncomplicated, this effect holds great significance when it comes to comprehending how our behavior and decision-making differ from the rationality assumed by neoclassical economic models. While the "Alone Effect" is not explicitly defined in Kahneman's dual process theory, we can connect its origins to different cognitive and behavioral phenomena discussed in his research (Kahneman, 2011).

The Alone Effect, also known as the concept of altering one's actions in response to a perceived observation or social visibility, encompasses the innate human inclination to behave differently when others may be watching. This alteration may lean towards more socially approved conduct, despite it primarily originating from subjective perception (Latane, 1981). Rooted in an amalgamation of social psychology, behavioral economics, and behavioral finance, this effect deepens our comprehension of how individuals' decision-making is shaped by their surrounding social environment.

The Alone Effect is largely fueled by social norms, which are informal guidelines dictating appropriate behavior within specific social circles or societies. People often conform to these norms in order to receive societal approval and avoid disapproval (Cialdini & Trost, 1998). The inclination to adhere to social norms, coupled with the perception of being observed, can cause individuals to make choices that they perceive as socially acceptable, even if those choices contradict their personal preferences or defy rationality from an economic standpoint (Akerlof, 1980).

Taking into consideration the principles of behavioral finance, one important factor that can have a substantial influence on investment decisions and market dynamics is what is known as the Alone Effect. This effect occurs when investors believe that their choices in investments are being observed by others, which then makes them more inclined to invest in funds that are deemed socially responsible or ethical, even if these funds offer lower levels of return on investment (Riedl & Smeets, 2017). This behavior is motivated by the desire to project an image of social responsibility to those around them, thus reinforcing the impact of the Alone Effect on financial decision-making.

In addition, the Alone Effect has the potential to amplify herd behavior in financial markets. This well-documented phenomenon illustrates how investors may yield to the investment decisions of others rather than relying on their own information and analysis (Banerjee, 1992). The apprehension of appearing different or opposing the perceived wisdom of the majority can cause investors to conform to prevailing market trends, even if these trends do not align with their personal investment analysis or risk preferences (Shiller, 1995).

Finally, in addition to affecting individual decision-making, the Alone Effect can also have implications for corporate financial decisions. It is common for managers to consider the opinions of shareholders, regulators, and the general public. Because of this external scrutiny, managers may opt for decisions that prioritize maintaining a positive public perception or avoiding any controversy. This may come at the expense of overall firm performance—a contradiction from a neoclassical standpoint. These choices further emphasize how social visibility and the Alone Effect play a significant role in influencing financial decision-making processes (Graham, Harvey, & Rajgopal, 2005).

2.3. The seven principle of BF (Dawnay, Shah, 2005 Behavioural Economics: seven principles for policy makers)

Behavioural finance, as an area of study, utilizes the principles and insights of behavioural economics to shed light on puzzling irregularities witnessed in financial markets. These anomalies cannot be fully explained by conventional economic theories (Barberis & Thaler, 2003). Notably, Dawnay and Shah (2005) put forth seven fundamental principles that examine how human cognition and emotions greatly impact economic decision-making. Such principles offer a comprehensive perspective on understanding the patterned behaviors exhibited within financial markets. By considering the role of human psychology, we gain valuable insight into explaining these behaviors.

I. **Other People's Behaviour Matters:** This principle recognizes the fact that individuals' conduct can be influenced by the actions and viewpoints of their peers, a phenomenon referred to as 'herding' in financial literature (Banerjee, 1992). Herding has the potential to cause market trends that deviate substantially from fundamental values, as investors imitate the investment choices of others rather than making independent decisions grounded in their own analyses.

II. **Habits are Important:** This principle acknowledges the fact that individuals have a tendency to engage in repetitive patterns of behavior, even when these behaviors may not be logical or ideal (Ainslie, 1992). These patterns can become firmly entrenched and resistant to alteration, impacting various elements of financial decision-making, such as choosing investment portfolios and engaging in risk-taking activities.

III. **People are Motivated to 'Do the Right Thing':** The third principle expounds on the significance of ethics and social norms in influencing economic decision-making (Elster, 1989). Frequently, individuals make choices that are consistent with their moral values or societal standards, even if such decisions don't yield maximum economic benefits. As a result, we witness remarkable phenomena such as ethical investing, whereby people select investments that mirror their social or environmental beliefs.

IV. **People's Self-Expectations Influence How They Behave:** This principle emphasizes the influence of self-perception on economic actions (Bem, 1972). People tend to act in a manner that aligns with their self-image and assumptions. This can have an effect on financial choices, such as individuals who consider themselves as risk-takers being more inclined to participate in speculative trading.

V. **People are Loss-Averse:** Loss aversion, a principle based on prospect theory, suggests that individuals tend to place greater importance on avoiding losses rather than acquiring equivalent gains (Kahneman & Tversky, 1979). Consequently, this tendency can influence financial behaviors like the disposition effect. This effect manifests when investors retain losing investments for an extended period in order to evade potential losses, contrasting their behavior with winning investments kept for shorter durations.

VI. **People are Bad at Computation:** The sixth principle relates to the mental constraints that arise when individuals are confronted with intricate economic choices (Tversky & Kahneman, 1974). These limitations may engender certain cognitive shortcuts or biases, like anchoring and overconfidence, which can greatly sway financial decision-making.

VII. **People Need to Feel Involved and Effective to Make Changes:** The last principle underscores the significance of agency and self-efficacy in making

decisions (Bandura, 1977). When people have faith in their own capacity to make wise decisions, they are more likely to engage in financial activities such as saving or investing. Acquiring the essential knowledge and skills to foster effective decision-making abilities is of utmost importance for individuals.

These principles serve as a strong framework for comprehending the psychological and social factors that impact financial behavior. In the realm of behavioral finance, they are crucial because they not only question the conventional ideas of rationality in neoclassical theory but also provide valuable insights for creating policies and interventions that take into account these behavioral inclinations. Gaining knowledge about these principles empowers us to craft more detailed and practical models of financial behavior, ultimately leading to more efficacious policy measures within the finance field.

2.4. Role of emotions in the investment decision-making process

In behavioral finance, the significance of emotions in making investment decisions sets it apart from traditional neoclassical finance theory. The prevailing belief in finance holds that investors are rational individuals who consistently aim to maximize their wealth or utility (Fama, 1970). In contrast, behavioral finance recognizes that emotions greatly influence investor behavior and can lead to choices that may deviate from strict rationality (Lo, Repin & Steenbarger, 2005).

To gain a genuine comprehension of how emotions wield their influence over the investment process, it is crucial to recognize that they are not merely side effects of decision-making; rather, they are fundamental elements woven into the entire mechanism. Emotions deliver swift and instinctive assessments of choices available, impacting preferences and decisions (Damasio, 1994). Additionally, emotions hold the power to shape our perspective on risk, a core element pivotal to making investment decisions (Loewenstein, Weber, Hsee & Welch, 2001).

Two particular emotions—fear and greed—are often emphasised in discussions of investment behaviour. Fear can lead to risk-averse behaviour and potentially precipitate a selling frenzy in declining markets, exacerbating market volatility (Shefrin, 2002). On the other hand, greed can encourage excessive risk-taking, contributing to investment bubbles (Shiller, 2000). The interplay of fear and greed can lead to dramatic market fluctuations, reflecting not only the objective financial data but also the collective emotional state of investors (Thaler, 2016).

Beyond fear and greed, other emotions such as regret, overconfidence, and pride also play essential roles in investment decision-making. Regret theory proposes that people anticipate and seek to avoid the pain of regret in their decision-making, which can lead to investment inertia or the disposition effect (Shefrin & Statman, 1985). The state of being overconfident can lead to two common investing mistakes: excessive trading and suboptimal diversification. When investors possess an inflated sense of their abilities in predicting market movements, they tend to engage in too much trading and fail to diversify their holdings effectively (Odean, 1998). Pride, which is similar to overconfidence, can also contribute to poor investment outcomes as individuals become stubborn and unwilling to recognize their errors. This persistence often results in the unwarranted adherence to unsuccessful strategies (Arkes, Hirshleifer, Jiang, & Lim, 2008).

The intricate relationship between emotions and decision-making in investments is further complicated by their interaction with cognitive processes. One way this occurs is through the affect heuristic, which shows how emotional reactions can influence judgments and decisions, especially when faced with uncertainty (Slovic et al., 2002). Moreover, moods, which are diffuse and mild emotional states, can also have an impact on investment decisions. For instance, research suggests that sunny weather is associated with higher stock returns, indicating that positive moods may encourage more optimistic investment behaviors (Hirshleifer & Shumway, 2003).

The impact of emotions on investment decisions extends beyond mere theory. It holds crucial practical importance for financial advisors, fund managers, as well as individual investors. By recognising and understanding emotional influences, these parties can develop strategies to mitigate their potentially adverse effects. These strategies might include automated investing systems to reduce the influence of short-term emotional reactions, or "cooling-off" periods to allow for more deliberate and less emotionally-driven decision-making (Benartzi & Thaler, 2007).

2.5. Heuristics and Biases

The field of behavioural finance pays considerable attention to the role of heuristics and biases in financial decision-making. Essentially, heuristics are mental shortcuts or "rules of thumb" used to simplify complex decisions, while biases are systematic errors in judgment and decision-making (Tversky & Kahneman, 1974). Although heuristics can be

useful, they can also lead to biases and errors, particularly when applied inappropriately or in complex financial situations (Gilovich, Griffin & Kahneman, 2002).

One of the most fundamental heuristics in decision-making is representativeness, where people judge the probability of an event by considering how much the event resembles the essential features of the parent population or the process by which it is generated (Tversky & Kahneman, 1974). However, this heuristic can lead to the base-rate fallacy, where individuals ignore base rates and over-rely on specific information (Bar-Hillel, 1980). In financial decisions, this could mean investors overreact to new information, ignoring the historical performance of an asset.

The availability heuristic, a mental shortcut used to gauge the frequency or likelihood of an event based on how easily similar instances or connections come to mind, can impact financial decision-making (Tversky & Kahneman, 1973). This cognitive tool can lead to availability bias, whereby recent or emotionally impactful information carries excessive weight in our judgments (Schwarz et al., 1991). To illustrate this phenomenon, consider investors who might overestimate the probability of significant market disruptions if they have witnessed them recently or if those events were exceptionally dramatic.

Another cognitive shortcut, known as anchoring, involves using an initial piece of information to influence subsequent judgments (Tversky & Kahneman, 1974). This tendency can cause individuals to be anchored in their original investment decisions even when faced with new data that logically warrants a change in perspective (Furnham & Boo, 2011). Consequently, this phenomenon may result in unfavorable financial outcomes such as persistently holding onto underperforming stocks for longer than necessary.

The confirmation bias brings with it a widespread bias in financial decision-making. It occurs when individuals lean towards information that reaffirms their preconceived notions or hypotheses, even if the information lacks veracity (Nickerson, 1998). This bias can cause investors to seek out and overvalue information that supports their existing investment strategies and to undervalue or outright ignore conflicting information.

Overconfidence bias, where individuals overestimate their knowledge or ability, is a significant issue in financial decision-making (Daniel, Hirshleifer & Subrahmanyam, 1998). Overconfident investors might trade excessively, unduly influence market prices,

and underestimate risks, leading to suboptimal investment outcomes (Barber & Odean, 2000).

The disposition effect, a bias observed in investment behaviour where investors are more likely to sell assets that have increased in value and hold onto assets that have decreased in value, has been attributed to prospect theory and mental accounting (Shefrin & Statman, 1985). This effect contradicts the rational economic behaviour of cutting losses and letting profits run.

Finally, behavioural finance also considers the impact of framing, where the presentation or "frame" of information influences decisions. Framing effects can lead to inconsistent choices in financial decision-making, depending on how options are presented (Tversky & Kahneman, 1981).

3. Conclusions

In the culmination of Chapter 2, a comprehensive analysis of the salient theories and concepts that underscore both neoclassical and behavioural finance has been presented, each carrying profound implications for our understanding of financial markets and economic behaviour.

Neoclassical finance, predicated on the notions of the Efficient Market Hypothesis (Fama, 1965) and the Homo Economicus (Stigler, 1976), posits an inherently rational market, one devoid of informational asymmetries, and populated by investors who make decisions devoid of cognitive or emotional biases. While EMH and Homo Economicus model have been foundational in shaping financial theories and policy-making, they have been challenged for their oversimplification of market dynamics and human behaviour.

From the criticisms levelled at neoclassical finance emerged behavioural finance, a discipline that incorporates psychological insights into financial theory. This domain fundamentally shifts the perception of investors from the paragons of rationality postulated by neoclassical finance, to beings susceptible to cognitive errors and emotional biases. The seminal works of Kahneman and Tversky (1979) underpin this field with the introduction of Prospect Theory, which challenges the Expected Utility Theory and sheds light on how individuals assess potential losses and gains, leading to decision-making that often contradicts normative models.

This chapter delved deeper into the intricate workings of the human mind, discussing Kahneman's (2011) concepts of System 1 and System 2 thinking, revealing the interplay of intuitive, fast-paced decision-making and more deliberate, logical thought processes. While considering investor behavior, the 'Alone Effect' was explored. The concept highlights how solitary decision-making can result in more advantageous choices compared to group settings. This emphasizes the importance of individual contemplation when making decisions.

The investigation of investor behaviour has progressed significantly due to the survey of different principles in behavioural finance, highlighted by Dawnay and Shah's study (2005), which emphasize the intricate and multifaceted nature of human decision-making. In particular, principles such as loss aversion and over-optimism have helped develop our understanding of how investors process information and make decisions. Their importance cannot be understated in refining our comprehension of investment-related cognition.

The chapter also highlights the essentiality of emotions when it comes to making investment decisions. Whereas previously, these emotions were deemed insignificant in financial decision-making; it is now accepted that they significantly influence investors' behavior, leading to suboptimal judgments (Loewenstein, 2000). This realization underscores the need for investors to account for their emotional state while navigating available investment options.

Ultimately, the chapter provided a detailed analysis of heuristics and biases, exploring the ways in which cognitive shortcuts and innate biases can lead to decision-making that deviates from logical economic predictions. Tversky and Kahneman's (1974) work extensively studied these topics, encompassing ideas such as representative heuristic, accessibility heuristic confirmation bias, overconfidence bias and more. These discoveries have been critical in understanding the psychological underpinnings of investor behavior while affecting logical progressions.

CHAPTER 3

Investment Behavioural Biases: Cognitive Vs Emotional

TABLE OF CONTENTS: 1. Cognitive Bias (D. Kahneman, A. Tversky, Judgment under Uncertainty: Heuristics and Biases 1974) - 1.1. Representativeness Bias - 1.1.1. Gambler's Fallacy - 1.1.2. Hot hand Fallacy - 1.2. Availability Bias - 1.2.1. Recency Bias 1.3. Familiarity Bias - 1.3.1. Home Bias 1.4. Anchoring - 1.4.1. Conservatism - 1.4.2. Ambiguity/Uncertainty Aversion - 1.5. Cognitive Dissonance - 1.5.1. Confirmation Bias - 1.6. Mental Accounting - 1.6.1. Sunk-cost Effect - 1.6.2. House-money Effect - 1.6.3. Behavioural Portfolio Theory - 1.7. Framing - 1.7.1. Money Illusion - 1.8. Overconfidence - 1.8.1. Illusion of control - 1.8.2. Illusion of knowledge - 1.8.3. Self-attribution Bias - 1.8.4. Hindsight Bias - 2. Emotional Bias - 2.1. Loss-Aversion Bias - 2.1.1. Myopic Loss Aversion - 2.1.2. Status Quo Basis - 2.1.3. Endowment Effect - 2.1.4. Attachment Bias - 2.2. Affect heuristics - 2.3. Regret Aversion - 2.3.1. Action and Omission Bias - 2.4. Disposition Effect - 2.5. Optimism Bias - 2.6. Pessimism Bias - 2.7. Self-control Bias - 2.8. Over/Under-reaction - 2.9. Media Response - 2.10. Social interaction - 2.10.1. Herding - 3. How cognitive and emotional biases influence investments - 3.1. Investment: definition and process of investment - 3.2. Probable mistakes in the investment phase - 3.2.1. Before the investment operation (confirmatory bias) – 3.2.2. During the investment operation (overtrading) - 3.2.3. After the investment process (omission bias) - 3.3. The process of debiasing: is it possible? - 3.3.1. Financial education (OECD 2005) - 3.3.2. Financial Advisory (Consolidated Financial Act - Legislative Decree 58, 1998) - 3.3.3. The support or guidance of Financial institutions - 3.2.2. During the investment operation (overtrading) – 3.4. Conclusion

Chapter 3 navigates the labyrinth of cognitive and emotional biases, which has long been a subject of profound examination in the realm of behavioral finance. Drawing on the foundation laid in the previous chapters, it ventures into a detailed analysis of various behavioural biases that investors typically exhibit. The crux of this investigation is rooted in the groundbreaking work of Kahneman and Tversky (1974), who presented a novel understanding of human judgment under uncertainty, positing that investors often rely on heuristic principles or mental shortcuts, resulting in systematic biases.

The chapter's first segment meticulously dissects cognitive biases, which are primarily mental errors caused by our simplified information processing strategies. This section takes an in-depth look at diverse cognitive biases such as Representativeness Bias,

Availability Bias, Familiarity Bias, and Overconfidence, among others. The conversation encompasses notable phenomena such as the Gambler's Fallacy, Hot Hand Fallacy, and the illusion of control and knowledge. Each bias is scrutinized through the lens of academic literature, providing a nuanced understanding of how they manifest and impact investor decisions.

Following the dissection of cognitive biases, the chapter delves into the realm of emotional biases. These biases, deeply seated in the affective aspects of decision-making, tend to be more instinctive and less conscious. Loss-Aversion Bias, Regret Aversion, and Disposition Effect are but a few of the biases explored in this segment. This exploration elucidates how these emotional biases often skew investment decisions, fostering irrational and detrimental investment behaviours.

The subsequent section ventures into the broader implications of these biases, examining how they mould investment decisions. This discussion incorporates an inspection of the typical mistakes investors commit at different stages of the investment process, and the potential repercussions of such biases on their financial decisions.

Lastly, the chapter rounds off with an exploration of possible debiasing processes, assessing the feasibility and methods of mitigating these cognitive and emotional biases. A discussion on the role of financial education, advisory, and institutional guidance is undertaken, shedding light on potential strategies for counteracting the adverse effects of these biases on investment decisions.

In essence, Chapter 3 represents a deep dive into the fascinating world of cognitive and emotional biases. It aims to unravel how these biases infiltrate the investment process, their impact on decision-making, and the potential remedies that can help mitigate these pervasive investment pitfalls.

1. Cognitive Bias (D. Kahneman, A. Tversky, Judgment under Uncertainty: Heuristics and Biases 1974)

Cognitive bias, as first posited by Kahneman and Tversky (1974), refers to the systematic errors in judgment and decision-making that arise from our cognitive processing systems. These biases are the products of mental shortcuts, or heuristics, which humans often employ when processing information and making decisions, particularly under conditions

of uncertainty or complexity. While these heuristics simplify cognitive processes and enhance decision-making efficiency, they also introduce systematic errors or biases.

Cognitive biases permeate various aspects of human decision-making, including, notably, financial and investment decisions. Cognitive biases in this context represent the psychological tendencies that cause individuals to make financial decisions that deviate from rationality, thereby undermining the traditional financial theory's assumption of homo economicus – an economic agent who behaves perfectly rationally (Samuelson, 1947). Cognitive biases, as proposed by Kahneman and Tversky (1974), thus offer a more realistic picture of financial decision-making, reflecting the imperfect and fallible nature of human cognition.

In the realm of cognition, Kahneman and Tversky (1974) comprehensively examined several notable cognitive biases such as the representativeness bias, availability bias, and anchoring. An instance of the representativeness bias can be observed when individuals assess the likelihood of an event based on its resemblance to preexisting stereotypes or representative examples. This particular bias has the potential to misguide investors into making inaccurate prognostications or decisions rooted in irrelevant or deceptive information. Additionally, we encounter the availability bias wherein decision-making hinges on readily recallable or easily accessible information. Consequently, investors might overemphasize recently elapsed events or data while undermining statistically weightier information.

Cognitive biases play a prominent role in shaping the decisions made by investors, consequently impacting the overall outcomes of investments. These biases often lead to choices that do not align with traditional finance models, which emphasize rationality and maximizing gains. Consequently, these observations have spurred the emergence of behavioral finance - a discipline that integrates psychological perspectives into financial decision-making (Shefrin, 2000).

Kahneman and Tversky (1974) illustrate how cognitive biases significantly diverge from conventional logical frameworks utilized in economic and financial decision-making processes. By comprehending these biases and their influences on decision-making, one can develop a more comprehensive understanding of how investors genuinely act when confronted with matters pertaining to finance.

1.1. Representativeness Bias

Originally proposed by Kahneman and Tversky in 1974, representativeness bias is a cognitive heuristic that individuals utilize to estimate the likelihood of an object A belonging to a class B. This estimation is based on how closely A resembles or represents B. Essentially, individuals tend to equate resemblance with probability, potentially leading to judgment errors or biases.

This bias can significantly impact financial and investment decisions. For instance, investors might assess the quality of an investment solely based on its past performance or characteristics associated with successful investments, without considering whether these characteristics truly affect the investment's future prospects (Tversky & Kahneman, 1974). Consequently, this can result in suboptimal choices and strategies as investors disregard the intricacies of the financial market and rely primarily on superficial similarities or patterns.

One specific manifestation of representativeness bias in financial decision-making is base rate neglect, where individuals disregard general or base-rate information when specific or case-based information is available (Barberis, Shleifer, & Vishny, 1998). For instance, an investor may focus on the performance of a specific stock and ignore broader market trends, leading to potentially misguided investment decisions.

Another associated concept is the law of small numbers, a tendency to perceive random events as being less variable than they truly are (Tversky & Kahneman, 1971). This can lead investors to see 'patterns' in what are in reality random sequences of returns, contributing to the belief in hot hands or winning streaks in stock picking.

1.1.1. Gambler's Fallacy

The Gambler's Fallacy, also known as the fallacy of the maturity of chances, is a specific manifestation of representativeness bias. It originates from the mistaken belief in the "law of averages", whereby individuals wrongly assume that a sequence of independent random events will 'balance out' (Tversky & Kahneman, 1971).

In a prime example, let's consider when someone sees a series of red outcomes on the roulette wheel and falsely assumes that the next spin is more likely to land on black. This belief stems from a desire for things to "even out" or revert back to average. However, what they fail to acknowledge is that each spin of the wheel is an independent event

unaffected by prior results. In truth, the probabilities remain consistent regardless of previous sequences (Ayton & Fischer, 2004).

The Gambler's Fallacy has proven influential in various investment decisions as well. Individuals who succumb to this bias may wrongly believe that if a stock has risen or fallen in price over several periods, it must be due for a reversal; their assumption being that changes in value are destined to equalize with time (Odean, 1998). This misunderstanding of random fluctuations in stock prices can lead them astray and result in sub-optimal investment choices and financial losses.

Moreover, the Gambler's Fallacy has also been associated with other investment behaviors. For instance, it has been suggested as one potential explanation for why investors tend to sell winning stocks too quickly while holding onto losing ones—an act commonly known as the disposition effect (Shefrin & Statman, 1985). The erroneous belief that a streak of success for a particular stock will eventually end may trigger premature selling actions. Additionally, the notion that there will be a turnaround after experiencing multiple losses might cause individuals to cling onto underperforming investments far beyond what would be wise.

1.1.2. Hot hand Fallacy

The hot-hand fallacy, also known as the belief in a "hot hand," is when someone mistakenly thinks that a person who has succeeded in a random event is more likely to continue succeeding in future attempts (Gilovich, Vallone, & Tversky, 1985). This misconception comes from not understanding how random sequences work and goes against the gambler's fallacy. Unlike the gambler's fallacy which expects the outcome to change after a streak, the hot-hand fallacy believes that the streak will continue.

This term originated in sports, particularly basketball. Fans and players alike believe that when someone makes several successful shots in a row, they are on fire or "hot" and have a higher chance of making future shots. However, studies analyzing shot patterns consistently show that these apparent streaks can be explained by randomness alone and do not support the existence of a "hot hand" (Miller & Sanjurjo, 2018).

In the context of financial investment, the hot hand fallacy may influence investors to misjudge the likelihood of a fund manager or a stock continuing a streak of high returns (Malkiel, 1995). An investor influenced by the hot-hand fallacy might allocate more

resources to assets that have demonstrated recent positive returns, erroneously believing that their past performance is indicative of future returns.

The hot hand fallacy can lead to a significant risk of misallocation of resources and the potential for substantial financial losses. For example, it may cause investors to buy high under the false assumption that a well-performing stock will continue to rise, and consequently, they may sell low when the 'hot' performance inevitably cools off (Barber & Odean, 2000).

Like other cognitive biases, the hot-hand fallacy underscores the importance of recognizing and combating biases in the investment decision-making process to enhance investment performance. Recognizing these biases can help investors make more rational decisions and mitigate potential financial losses.

1.2. Availability Bias

Availability bias is a cognitive bias whereby individuals make judgments about the probability of an event based on how easily instances or occurrences can be brought to mind (Tversky & Kahneman, 1973). It is one of the three heuristics—alongside representativeness and anchoring—that Kahneman and Tversky proposed to explain human decision-making under uncertainty.

The availability bias emerges because the ease of recall serves as a mental shortcut or heuristic in estimating probabilities. Specifically, if events or instances are more readily remembered—often due to their vividness, recency, or emotional impact—they are perceived as being more probable than events or instances that are not as readily brought to mind (Tversky & Kahneman, 1974).

In the context of investment decision-making, the availability bias can significantly impact how investors perceive risk and subsequently how they make investment decisions. For instance, dramatic or recent events, such as stock market crashes or economic crises, are often more available in investors' minds, leading to an overestimation of the likelihood of such events reoccurring. This, in turn, may lead investors to make overly cautious investment decisions, potentially missing out on opportunities for higher returns (Shefrin, 2002).

Conversely, during bullish markets, positive news stories are more readily available, and investors may underestimate the probability of negative market events,

leading to excessively risky investment behaviors (Barber & Odean, 2001). Moreover, information about widely covered companies is more available to investors, which can result in an overweighting of these firms in investment portfolios, a phenomenon known as the attention bias (Barber & Odean, 2008).

Availability bias thus underscores the broader theme of this thesis: how cognitive biases can lead to systematic errors in investment decision-making. By understanding the influence of such biases, individuals and institutions may adopt strategies or mechanisms to mitigate their impact, thereby improving the efficiency and effectiveness of investment decisions.

1.2.1. Recency Bias

Recency bias, a subcategory of the availability bias, is a cognitive bias that causes individuals to weigh recent events more heavily than older events (Kahneman, 2011). This bias can significantly affect decision-making and perception of occurrences because it can lead to an over-emphasis on the latest information, neglecting historical data.

In the context of investing, recency bias may lead investors to make investment decisions based on the most recent market trends, neglecting the longer-term history of asset performance (Kahneman, 2011). For instance, if an investment has been performing well recently, investors may overestimate its future performance, not taking into account the potential cyclical nature of investment returns (Chopra, 1998). Likewise, if a particular asset or market has been performing poorly, an investor influenced by recency bias might extrapolate this recent negative performance into the future, potentially leading to overly pessimistic projections (Green, 2006).

Recency bias can also lead to excessive trading. For example, investors might be likely to sell winning investments too quickly, driven by the recent memories of price increases, and hold onto losing investments for too long, buoyed by the hope of a rebound which may be based on more recent information (Odean, 1998).

Furthermore, the presence of recency bias can play a role in the formation of market bubbles and subsequent crashes. During a time of prosperous markets, investment performance that has been strong as of late may cause investors to become overly optimistic, driving up prices. Conversely, in a period of declining markets, recent

underperformance can instigate an excessively negative outlook, hastening the decline of the market (Barberis, Shleifer & Vishny, 1998).

Henceforth, comprehending recency bias can greatly assist investors in making more judicious decisions by urging them to take into account a wider range of information and not succumb too heavily to recent trends in the market. This aligns with the overarching objectives outlined by this thesis — to shed light on how cognitive biases may impact investment behavior and how knowledge about these biases can enhance decision-making processes.

1.3. Familiarity Bias

Familiarity bias, a cognitive bias that inclines individuals towards the familiar or well-known, leads them to favor investments they consider familiar over those they see as unfamiliar (Huberman, 2001). This bias can be seen as a safety measure wherein investors feel more secure and less uncertain when dealing with known entities.

In the realm of investments, familiarity bias takes on various forms. Investors may exhibit a preference for stocks in companies they are employed by, companies within their industry, or companies whose products and services they frequently consume (Huberman, 2001). It can also extend to a tendency to invest in domestic stocks rather than foreign ones—an inclination known as home bias—arising from investors' familiarity with local businesses and markets (French & Poterba, 1991).

The consequence of familiarity bias may result in suboptimal diversification of investment portfolios. As investors concentrate their holdings in a few familiar investments, the risk level of the portfolio increases (Goetzmann & Kumar, 2008). This lack of diversification could stem from the mistaken notion that familiar investments entail less risk compared to unfamiliar ones—a concept referred to as the "local less risky" hypothesis (Merton, 1987).

The implications of familiarity bias for financial markets can be substantial. Ovepricing certain securities is one possible outcome if many investors prioritize them due to their familiarity (Grinblatt & Keloharju, 2001). Moreover, this biased mindset has potential drawbacks when it comes to ensuring efficient allocation of capital since investors might overlook potentially profitable but less familiar investment opportunities (Ferri & Kaci, 2018).

In the context of this thesis, understanding familiarity bias and its impact on investment decisions allows us to better comprehend the cognitive errors that investors may commit. Knowledge of these biases can inform strategies for educating investors and helping them make more informed and rational decisions.

1.3.1. Home Bias

Home bias is a specific manifestation of the familiarity bias in the realm of investment decisions. It refers to the observed phenomenon where investors display an inclination towards investing a larger proportion of their portfolios in domestic assets, disregarding the benefits of international diversification (French & Poterba, 1991). This over-representation of domestic securities in an investor's portfolio compared to a global market portfolio constitutes home bias.

The concept of home bias contradicts the basic tenets of modern portfolio theory, which advocates for international diversification to maximize risk-adjusted returns (Markowitz, 1952). Economists have grappled with the existence of home bias, given the theoretical prediction that investors should hold globally diversified portfolios to minimize risk through international diversification (Solnik, 1974).

The home bias phenomenon has sparked various theories to understand its roots. Two significant factors are familiarity and preference for the known, as investors tend to view domestic investments as less risky than foreign securities (Huberman, 2001). Additionally, information asymmetry contributes in this regard; investors often believe they possess more or superior information about domestic companies compared to foreign ones, which consequently lowers the perceived risk of investing in domestic stocks (Brennan & Cao, 1997)

Another perspective to understanding home bias comes from behavioral finance, which suggests investors' overconfidence in their knowledge and ability to interpret information about domestic firms, leading to a preference for home investments (Odean, 1998). Additionally, institutional factors, such as transaction costs, tax advantages for domestic investments, and restrictions on international investments, could also contribute to the home bias (Cooper & Kaplanis, 1994).

While the home bias has declined over the years with the globalization of financial markets and easier access to foreign investments, it remains a prevalent aspect of investing

behavior (Bekaert & Wang, 2010). Understanding the home bias can be crucial in devising strategies to encourage investors to diversify their portfolios internationally, thus better managing risk and potentially improving returns.

1.4. Anchoring

Anchoring is another pervasive cognitive bias that plays a significant role in investment decisions. Coined by Kahneman and Tversky (1974) in their pioneering work, anchoring refers to the tendency of individuals to rely too heavily, or 'anchor', on an initial piece of information (the 'anchor') when making decisions.

When it comes to making investment decisions, the phenomenon of anchoring can often lead to predictable mistakes. For example, investors may get fixated on the price they initially paid for a stock or its previous high or low points, while ignoring other important factors such as changes in the company's fundamentals, the economic climate, or market sentiment (Fenton-O'Creevy et al., 2003). This tunnel-vision approach might result in less-than-optimal choices since being anchored to an arbitrary or outdated number could cause investors to overvalue or undervalue an asset.

Concrete evidence supports the existence of anchoring in financial markets. Studies indicate that financial analysts frequently anchor their earnings forecasts based on historical data, which leads to consistent inaccuracies (De Bondt & Thaler, 1990). Furthermore, anchoring effects have been found to impact asset pricing and contribute to interesting trends like price momentum and mean reversion (Barberis et al., 1998).

The root causes of this anchoring bias can be attributed to cognitive limitations people face when dealing with complex decisions like evaluating investments; individuals tend to rely on mental shortcuts known as heuristics (Tversky & Kahneman, 1974). Additionally, discomfort with uncertainty may drive this behavior as reliance on anchors offers a sense of certainty even if they are irrelevant or outdated.

Recognizing and understanding the impact of anchoring is crucial for both individual investors and financial advisors alike. It enables individual investors to acknowledge their own biases and enhance their decision-making processes. Financial advisors can also utilize this knowledge in order to better guide their clients and overcome any personal biases that may influence their investment recommendations.

1.4.1. Conservatism

Conservatism, which is also known as belief revision, refers to a cognitive bias documented by Edwards (1968). It describes the tendency of individuals to inadequately update their beliefs when presented with new evidence. As a result, people tend to overly uphold their prior beliefs while underreacting to new information.

In the world of investing, conservatism bias can lead to suboptimal decisions. Investors exhibiting this bias may be slow in incorporating new information into their evaluation of stocks. Consequently, they respond late to recent events (Chopra et al., 1995). This delay can cause stocks to be either undervalued or overvalued and can lead to mispricing and lower investment returns.

Moreover, conservatism bias contributes to observed phenomena in financial markets such as post-earnings-announcement drift. This refers to the continued movement of stock prices in the direction of an earnings surprise for weeks or even months after its announcement (Bernard & Thomas, 1989). Additionally, conservatism bias plays a role in enhancing predictability of stock returns since investors' underreaction leads to slower adjustments in stock prices towards their true values (Barberis, Shleifer, & Vishny ,1998).

Psychological factors like cognitive dissonance and mental accounting are at the root of conservatism bias. Cognitive dissonance arises from individuals experiencing discomfort when encountering information that contradicts their existing beliefs. Consequently, they often dismiss or ignore contradictory information (Festinger, 1957). Mental accounting involves categorizing and evaluating financial outcomes which could hinder proper integration of new information (Thaler, 1985).

Recognizing and addressing conservatism bias can have significant implications for improving investment decision-making. By acknowledging the potential of this bias, investors and financial advisors can strive to incorporate new information more fully and promptly, potentially enhancing their investment performance and efficiency.

1.4.2. Ambiguity/Uncertainty Aversion

Ambiguity aversion, sometimes also referred to as uncertainty aversion, is a cognitive bias in which individuals prefer known probabilities over unknown ones (Ellsberg, 1961). It is a bias that elucidates the behavior of individuals when confronted with uncertainty, a common occurrence in the field of investments. Ambiguity aversion can significantly

influence an investor's decision-making process and, by extension, their portfolio selection.

The bias was first proposed by Daniel Ellsberg in his paradox, suggesting that people generally prefer taking risks in situations where the probabilities are known, rather than in situations where the probabilities are unknown (Ellsberg, 1961). It delineates the preference of known risk (risk where the likelihood of outcomes is known) over ambiguity (risk where the likelihood of outcomes is unknown), despite the potential return being the same.

In the sphere of investments, ambiguity aversion can lead to investors avoiding stocks or financial instruments with unclear outcomes or where they feel the information is inadequate or excessively complex (Vissing-Jørgensen, 2003). Investors demonstrating ambiguity aversion may choose more familiar, albeit potentially less profitable, investments over unfamiliar ones. As such, it may lead to a misallocation of resources, with investors potentially missing out on profitable opportunities due to their avoidance of uncertainty.

Moreover, the fear of ambiguity can offer insight into certain market occurrences, such as the limited involvement in stock markets or the preference for domestic stocks over international ones by investors (Vissing-Jørgensen, 2003). Additionally, it can contribute to instances of price bubbles and crashes. Initially, investors tend to react minimally to ambiguous news resulting in sluggish adjustments in prices. However, later on they tend to overreact due to the influence of bandwagon effects leading to significant price fluctuations (Daniel, Hirshleifer & Subrahmanyam, 1998).

Gaining a clear understanding of this aversion towards uncertainty is essential in developing more effective investment strategies and financial models. By incorporating investors' unease with unpredictability, we will be able to present a more realistic depiction of investment behavior. Ultimately aiding us in making wiser financial decisions when faced with uncertain circumstances.

1.5. Cognitive Dissonance

The concept of cognitive dissonance, which was introduced by Festinger in 1957, refers to the uncomfortable state of psychological tension that occurs when a person simultaneously holds conflicting cognitions. These conflicting cognitions can include

ideas, beliefs, values, and emotional reactions. In order to ease this discomfort, individuals typically strive for consistency among their thoughts. When inconsistencies arise, they must make changes to eliminate or reduce the dissonance.

When it comes to making investment decisions, cognitive dissonance can lead to inconsistent behaviors and poor financial choices. For instance, an investor may come across information that contradicts their initial investment decision. This creates dissonance because it conflicts with the investor's belief that they have made a wise investment choice (Harmon-Jones & Mills, 2019).

To resolve this dissonance, investors often resort to ignoring or distorting the contradictory information (Harmon-Jones & Mills, 2019). This may explain why investors tend to hold onto losing investments longer than what is financially advisable—a behavior commonly referred to as the disposition effect (Shefrin & Statman, 1985). Selling at a loss triggers dissonance because it challenges their belief in their own investing prowess. Consequently, they persist in holding onto the losing investment in hopes of a rebound rather than confronting the discomfort caused by admitting a poor decision.

Cognitive dissonance plays a role in the confirmation bias, as it causes investors to seek information that supports their existing beliefs and disregard or downplay contradictory information (Nickerson, 1998). Consequently, cognitive dissonance can distort reality for investors, leading to excessive confidence and underestimation of investment risk.

Recognizing cognitive dissonance allows investors to acknowledge their biases and potentially steer clear of common investment mistakes. It emphasizes the significance of implementing disciplined investment processes and strategies that promote objectivity while minimizing the impact of cognitive dissonance on decision-making. Furthermore, comprehending these psychological biases is crucial for financial advisors in guiding their clients' investments wisely and managing expectations effectively.

1.5.1. Confirmation Bias

Confirmation bias, a term that was first introduced by Peter Wason in 1960, refers to a type of cognitive bias in which individuals have a tendency to actively seek out, interpret, and remember information that aligns with their existing beliefs or hypotheses (Wason,

1960). This serves as a psychological mechanism aimed at maintaining one's current worldview and minimizing cognitive dissonance (Nickerson, 1998).

When it comes to the world of investments, confirmation bias can significantly influence the decision-making process. Investors who harbor strong preconceived notions about an investment often focus selectively on evidence that supports their views while disregarding contradictory information (Rabin & Schrag, 1999). Take for example an investor who firmly believes in the potential profitability of a particular stock; such an individual may place greater emphasis on positive news stories concerning the company while downplaying or overlooking any negative news. This can lead to an overly optimistic assessment of the investment's potential returns and an underestimation of its associated risks.

Confirmation bias is a psychological phenomenon that clarifies why some investors choose to cling on to unsuccessful investments instead of cutting their losses. Acquiring confirmation bias may lead an investor to focus on positive news or hopeful signs concerning investments in order not to sell the investment (Shefrin, 2001). Their motivation is clear- sticking with the initial decision requires maintaining belief in its correctness.

The outcomes of confirmation bias can have significant implications for investment performance. Less diversified portfolios and returns that result in missed opportunities are two potential detrimental effects (Kahneman & Riepe, 1998). Moreover, there continue to be cases where this fixation causes distorted perceptions of reality and contributes towards bubbles or spikes. This confusion arises from values circulating market sentiments wherein these investments form part of undervalued or overvalued market conditions (Shiller, 2003).

All investors as well as financial advisors need to identify the negative impacts posed by confirmation biases and accordingly take necessary corrective actions. To overcome such biases effectively we must actively search for evidence which runs contrary to our preconceived notions/opinions; consider apparent opposing viewpoints alongside seeking help from unbiased objective sources. Financial advisors themselves have a vital role they can play by continuously challenging their own clients' assumptions via providing authentic objectively based guidance during crucial moments. Employing this balanced approach will mitigate the deleterious influence exerted by certain

predispositions known as cognitive biases among any inconsistent decision making especially prevalent in this industry comparatively (Kahneman, 2011).

1.6. Mental Accounting

Richard Thaler's concept of mental accounting has aided in revealing how individuals assess and categorize economic outcomes subjectively (Thaler, 1985). This practice consists of segregating one's wealth into different accounts based on various criteria such as the source of income or intended use. Such subjective measurements are not genuine indicators of economic reality, however.

The decisions made through the process of mental accounting have a substantial influence on an individual's financial choices encompassing investment, savings and spending habits (Thaler, 1999). Specifically, in relation to investing, mental accounting can result in behaviors that diverge from traditional economic theories. Investors may consider "dividend income" distinctively than "capital gains," even though both generate some investment return. This differential treatment may lead investors to exploit dividend-paying stocks, overlook their overall wealth or total returns which may contradict rational economic perspectives (Shefrin & Statman, 1984). This observation highlights how mental accounting can influence one's decision-making progress concerning investments and potentially lead to irrational financial choices.

In addition, mental accounting can restrict diversification within investment portfolios. Many investors separate their investments into distinct mental accounts and fail to consider the entire portfolio holistically. Consequently, they miss out on the advantages of diversification (Barber & Odean, 2001).

Furthermore, mental accounting influences how investors perceive gains and losses. The concept known as loss aversion suggests that people feel the pain of losses more acutely than the pleasure derived from equivalent gains. In an investment context, this may cause individuals to hold onto declining investments longer with hopes of a rebound while quickly selling profitable ones in order to secure immediate gains—a behavior commonly referred to as the disposition effect (Shefrin & Statman, 1985).

Mental accounting, at its core, elucidates why individuals sometimes make choices that might appear nonsensical when viewed through the lens of conventional economics. This concept grants us a meaningful outlook on understanding actual financial behaviors

and bestows valuable wisdom to financial advisors endeavoring to aid clients in making optimal monetary decisions (Thaler, 2008).

1.6.1. Sunk-cost Effect

The occurrence referred to as the sunk-cost effect, or the sunk-cost fallacy, is a notable component of mental accounting. It involves a cognitive bias where individuals persist in pursuing a decision primarily because they have already invested a significant amount that cannot be recovered (Arkes & Blumer, 1985). According to economic theory, only future costs and benefits should shape decision-making; however, the presence of the sunk-cost effect indicates a departure from rational behavior in this regard (Staw, 1981).

Regarding financial decision-making specifically, individuals influenced by the sunk-cost effect may hold on to an underperforming asset due to being fixated on its initial cost rather than considering its future value as an investment (Thaler, 1980). Consequently, the sunk-cost effect can lead to improper allocation of capital when investors continue investing in something that is unlikely to yield positive returns—essentially throwing good money after bad—and thus potentially exacerbating financial losses (Arkes & Ayton, 1999).

It is often helpful to explain the existence of the sunk-cost effect within the framework of loss aversion. This concept suggests that individuals dislike acknowledging losses (e.g., sunk costs) more intensely than they experience pleasure from equivalent gains (Kahneman et al., 1991). Furthermore, psychological commitment also plays into this phenomenon whereby individuals choose to adhere faithfully because it aligns with their desire for consistency in their actions (Cialdini, 2001).

Appreciating and comprehending how and why the sunk-cost effect operates is crucial not only for those involved in providing financial guidance but also for professionals engaged in investment management. By acknowledging the existence of this bias, investors and financial advisors can develop strategies to minimize its potential negative impact, such as setting predefined exit points for investments (Weber & Camerer, 1998). Recognizing and addressing the sunk-cost effect can result in more rational financial decision-making and better investment outcomes (Strough, Mehta, McFall, & Schuller, 2008).

1.6.2. House-money Effect

The house-money effect is another manifestation of mental accounting, which deviates from the traditional rational economic theory. This bias is termed after the behaviour of gamblers who, after winning, tend to be more adventurous with their winnings because they perceive it as the "house's money" (Thaler & Johnson, 1990). This effect suggests that people tend to take more risks when they are playing with what they perceive to be found money or profits, reflecting the malleability of people's attitudes towards risk depending on the source of the money.

Investors, much like gamblers, can be influenced by the house-money effect. They may be willing to invest their recent gains in higher-risk assets because the money feels less like their hard-earned savings and more like a windfall or a gain that could be risked (Weber & Zuchel, 2005). This deviation from risk-aversion can be explained by prospect theory, which suggests that individuals value gains and losses differently, depending on whether the outcomes are framed as gains or losses (Kahneman & Tversky, 1979).

The phenomenon known as the house-money effect has the potential to cause significant mistakes in investment. This is particularly true when an investor, buoyed by recent profits, heedlessly ventures into risky assets without adequately assessing the associated risks (Statman, Thorley, & Vorkink, 2006). It is crucial for financial advisors to recognize this cognitive bias in their clients and promote a disciplined investment approach grounded in long-term financial objectives rather than short-lived investment outcomes (Post et al., 2008). The psychological foundations of the house-money effect shed light on the indispensable role that emotions and perceptions play in making financial decisions. Consequently, comprehending behavioral finance becomes even more essential.

1.6.3. Behavioural Portfolio Theory

Behavioural portfolio theory (BPT) is a model that incorporates cognitive biases, like mental accounting, into the structure of constructing portfolios. BPT, developed in 2000 by Shefrin and Statman, differs from the mean-variance portfolio theory which assumes investors are rational actors who seek to maximize utility by choosing an optimal mix of risky assets.

In contrast, BPT suggests that investors place less emphasis on the overall risk-return characteristics of their portfolio. Instead, they allocate assets into distinct mental accounts based on specific goals or levels of aspirations. Each account represents a different objective and involves a particular trade-off between risk and return. The foundation level consists of secure investments intended for avoiding monetary catastrophe. As we ascend higher in these mental accounts, we encounter progressively riskier investments tailored towards achieving ambitious goals.

This theory provides a more nuanced understanding of investor behaviour, acknowledging that people often think in terms of separate mental accounts rather than aggregating all their wealth into a single pot. The pyramid structure of portfolios in BPT captures the 'safety-first' principle wherein investors ensure the attainment of minimum acceptable goals before seeking higher, but riskier, returns (Barberis, Huang, & Santos, 2001).

Investment decisions under BPT may lead to suboptimal portfolios from a traditional finance perspective. For instance, the mental separation of investments into different layers may lead to insufficient diversification, or to portfolios that do not maximise expected utility based on the risk-return trade-off (Shefrin & Statman, 2000). Despite these potential downsides, BPT represents an important stride towards incorporating realistic behavioural elements into portfolio theory.

In practice, understanding BPT can aid financial advisors in better assessing client needs and motivations. When advisors recognise that clients may have different mental accounts for different goals, they can tailor their advice accordingly and align it more closely with clients' behavioural tendencies and personal objectives (Das, Markowitz, Scheid, & Statman, 2010). Thus, BPT underscores the significance of behavioural biases in shaping investment decisions and their potential impact on portfolio construction.

1.7. Framing

Daniel Kahneman and Amos Tversky's landmark work in prospect theory (1981) has extensively explored a cognitive bias known as framing. Framing refers to the presentation or framing of choices, which can have a significant impact on individuals' decision-making. This concept emphasizes that how information is presented, its "frame," can greatly influence perception and subsequently shape decisions.

At its core, framing posits that people base their decisions on potential gains or losses relative to a specific reference point, rather than solely focusing on the overall outcome (Kahneman & Tversky, 1979). This cognitive process can lead to irrational decision-making since attention revolves around possible gains and losses instead of ultimate results.

Framing becomes particularly relevant in the context of investments as it exerts substantial effects. For instance, an investment option framed as having an 80% success rate might be chosen over one presented as having a 20% failure rate, even though both probabilities are essentially equal (Levin et al., 1998). Consequently, investors may make suboptimal choices when influenced by how investment-related information is framed.

Moreover, framing effects extend beyond decision-making scenarios; they also affect investors' perceptions of risk and reward. Depending on whether the frame accentuates potential gains or losses, individuals may either lean towards risk aversion or seek out risk (Tversky & Kahneman, 1981).

In essence, framing plays a pivotal role in investment decision-making by demonstrating how cognitive biases distort rational choices leading to potentially unfavorable investment outcomes. For this reason it is crucial for investors to understand framing and be mindful of its potential implications when making investment decisions.

1.7.1. Money Illusion

The economist Irving Fisher introduced the concept of the "money illusion" in 1928. According to this concept, individuals tend to focus on the face value of money rather than considering its actual worth (Fisher, 1928). This bias is a specific type of framing effect where people overlook factors like inflation or changes in purchasing power.

According to economic theory, rational actors should not show preference for nominal or real values as only the latter affects their purchasing power. However, empirical research has proven that people frequently exhibit the money illusion by behaving as if nominal changes in price levels matter (Shafir, Diamond & Tversky, 1997).

Investors who fall victim to the money illusion may perceive a nominal increase in their investment's value as an actual increase, even when inflation has eroded their returns' purchasing power. For instance, they might favor a positive nominal return over

a negative real return despite the fact that the latter carries greater purchasing power (Modigliani & Cohn, 1979).

Furthermore, on a larger scale, the impact of money illusion can extend to financial markets. This cognitive bias contributes to mispricing within stock exchanges since investors can be deceived by inflation into believing that equities offer higher real returns and thus lead to inflated stock prices (Modigliani & Cohn, 1979).

1.8. Overconfidence

Overconfidence, a prevailing cognitive bias within the field of behavioral economics and finance, often manifests as an excessive sense of certainty regarding one's judgments or an overestimation of one's abilities (Moore & Healy, 2008). According to Kahneman and Tversky (1979), this bias is characterized as a systematic error that fosters unrealistic optimism about the accuracy of predictions and forecasts.

The impact of overconfidence can be especially significant in financial decision making, particularly when it comes to investment choices. Research conducted by Barber and Odean (2001) revealed that overconfident investors tend to trade more frequently due to their belief in possessing superior information and prediction capabilities. However, this heightened trading frequency often leads to reduced investment returns owing to transaction costs- even if these investors possess average market information and abilities.

Furthermore, Malmendier and Tate (2005) demonstrated that overconfidence can also exert influence on corporate policies. Their findings indicate that CEOs with an inflated sense of confidence are more inclined towards value-destroying mergers and acquisitions, investing in risky projects while avoiding external financing opportunities despite potential benefits.

Moreover, it is worth noting the link between the same bias seen in overconfidence with what is known as the "illusion of control." This phenomenon refers to individuals significantly overestimating their ability to control events or outcomes; consequently, influencing their perception of risk and decision-making under conditions of uncertainty (Langer, 1975). In the realm of finance, this translates into investors taking on greater risks based on the misguided belief that they have better control or can predict market outcomes more accurately than they actually can.

1.8.1. Illusion of control

The concept of the illusion of control, which was first introduced by Langer in 1975, is a cognitive bias that occurs when individuals mistakenly believe they have more power over events than they actually do. This bias tends to arise in situations where outcomes are influenced both by skill and chance, leading people to exaggerate the role of their abilities while underestimating the role of luck (Langer, 1975).

Furthermore, the illusion of control is closely connected to overconfidence. Individuals who overestimate their capabilities are also likely to overestimate their ability to control uncontrollable factors (Langer, 1975; Moore & Healy, 2008). This false sense of control can prompt individuals to take unnecessary risks which they would otherwise avoid if they had a more accurate understanding of their influence on outcomes (Presson & Benassi, 1996).

Within financial decision-making contexts specifically, the illusion of control can have significant consequences. For instance, investors may mistakenly believe that they possess the capability to accurately predict or manipulate market outcomes. Consequently, this belief leads them towards engaging in riskier investment behaviors (Odean, 1998). Unfortunately, this illusory sense of control over market outcomes often results in suboptimal investment decisions and diminished returns on investments (Barber & Odean, 2001).

In an investigation conducted by Fenton-O'Creevy et al. (2003) regarding financial traders and the illusion-of-control phenomenon: those traders who perceived greater levels of control over market events tended to execute more trades and assume higher levels of risk-taking. However, it's worth noting that this increased activity did not translate into superior investment returns as expected; instead emphasizing how damaging the effects can be for those influenced by this bias.

1.8.2. Illusion of knowledge

The illusion of knowledge bias, which is often associated with excessive confidence, refers to the mistaken belief that one's understanding is more accurate or dependable than it truly is. Alpert and Raiffa (1982) first introduced this term, which has since been extensively explored in fields like cognitive psychology and behavioral finance.

Individuals influenced by the illusion of knowledge falsely believe they possess a deeper and wider grasp of a particular domain of knowledge. Their misplaced assurance in their understanding can lead them to overestimate the accuracy of their predictions or forecasts, resulting in poor decision-making (Alpert & Raiffa, 1982; Kahneman, Slovic, & Tversky, 1982).

In the realm of finance, succumbing to the illusion of knowledge can lead to several sub-optimal choices. For example, investors may overrate their comprehension of specific stocks or sectors. This inclination causes them to overlook critical details or misunderstand intricate financial information. Consequently, such errors in judgment can consequently drive poor investment decisions that negatively impact financial outcomes (DeBondt & Thaler, 1995).

This misconception also contributes significantly to what is known as the "amateur investor" phenomenon (Barber & Odean), wherein individuals with limited financial expertise perceive themselves as having sufficient know-how to make well-informed monetary choices based on shallow or incomplete information (Heath & Tversky).

It should be noted that multiple studies have demonstrated how even experienced finance professionals are not exempt from falling prey to the illusion of knowledge bias. Stotz and von Nitzsch (2005), for instance found that seasoned investment advisors tend to overstate their level of understanding while making overly hopeful forecasts.

Thusly interpreting this fallacy becomes an essential component for comprehending how financial decisions are made effectively. Diluting its effects necessitates cultivating an awareness regarding our own limitations and embracing humility when confronted with intricate financial matters.

1.8.3. Self-attribution Bias

The self-attribution bias is a cognitive bias in which individuals credit themselves for successful outcomes while blaming external factors for their failures (Miller & Ross, 1975). This bias falls under the category of self-serving biases and distorts people's views on causality, credit, and blame, leading to an excessively positive self-image.

In the context of financial decision-making, the self-attribution bias becomes particularly relevant. Investors influenced by this bias view their successful investments as a result of their own skills and expertise, but attribute unsuccessful investments to bad

luck or unfavorable market conditions (Shefrin, 2001). This bias can lead to overconfidence and encourage risky behavior when individuals exaggerate their ability to predict and control market outcomes (Daniel et al., 1998).

Furthermore, the perception of financial advisors can also be affected by the self-attribution bias. Investors may credit wise decision-making in selecting and following a financial advisor for successful advice but blame advisors' incompetence or poor market conditions for any negative outcomes they experience (Gervais & Odean, 2001).

The implications of the self-attribution bias are significant when it comes to managing investments and risk. By making individuals believe that their successes are a result of skill rather than luck, this bias promotes riskier investment behavior (Barber & Odean, 2001). Over time, it could lead to less diversified portfolios and potentially poorer investment results (Odean, 1999).

Ultimately, combating and understanding the impact of self-attribution bias on financial decision-making requires raising awareness about its existence. Additionally fostering critical reflection on both success and failure causes in investment outcomes is crucial. As suggested by Kahneman and Tversky (1979), considering alternative explanations for investment results not immediately attributed to oneself may serve as one potential strategy. Encouraging such reflexivity could help counteract the effects of self-attribution bias while promoting more objective and balanced decision-making.

1.8.4. Hindsight Bias

Hindsight bias, also known as the "knew-it-all-along" effect, is a concept in psychology where people believe that they predicted or could have predicted an event after it has happened (Fischhoff, 1975). This bias can distort individuals' memories of their own predictions and expectations, making them falsely believe that they knew what would happen.

In the field of finance, hindsight bias can have a significant impact on investors' behavior and attitudes (Biais & Weber, 2009). For example, an investor may recall thinking that there would be a stock market crash after it actually happens, even if they didn't truly expect it. This can result in them overestimating their ability to predict future movements in the market and making potentially risky decisions (Pompian, 2011).

Hindsight bias also affects how individuals learn from past financial decisions. If people think they accurately predicted previous outcomes, they might not feel the need to change their decision-making strategies or seek new information. This hampers learning and adaptation, which could lead to repeating mistakes and less-than-ideal outcomes (Roese & Vohs, 2012).

Moreover, hindsight bias influences how investors interpret financial advice and information. In hindsight, people might remember their financial advisors' predictions differently so that they align with what actually happened. This alters their assessment of the advice's quality and affects trust in and reliance on financial advisors (Odean & Barber, 2001).

Empirical studies provide proof of hindsight bias in various financial contexts. For instance, Camerer et al. (1989) discovered that traders exhibited hindsight bias by overestimating their own predictions of future prices in an experimental market.

All things considered, hindsight bias poses formidable obstacles to perceiving reality accurately and making optimal decisions in finance Recognizing this phenomenon allows for its mitigation through techniques such as documenting decisions and utilizing debiasing approaches (Hogarth & Soyer, 2015).

2. Emotional Bias

The presence of emotional bias in the realm of finance and investment is significant as it signifies how deeply an individual's emotions and moods influence their decision-making process. Numerous studies have highlighted that logical reasoning and cognitive processes are often disregarded when overshadowed by prevailing emotions (Loewenstein, Weber, Hsee, & Welch, 2001).

Emotional biases in financial decision-making become particularly prominent when individuals face uncertain situations with high stakes and complex choices. These circumstances are commonly encountered within the financial and investment domain (Kuhnen & Knutson, 2011). The effect of emotional biases can cause individuals to deviate from decisions that would be considered optimally rational or appropriate; potentially leading to financial losses and unfavorable outcomes.

One crucial example of an emotional bias observed in finance is loss aversion. This bias manifests itself through a stronger inclination towards avoiding losses rather

than pursuing gains (Kahneman & Tversky, 1979). As a result, investors may hold onto failing investments for extended periods beyond what rational thinking dictates - all driven by hopes of recouping losses. Conversely, they may prematurely sell prosperous investments to secure immediate gains.

Another emotional bias, fear, can drive risk-averse behavior and lead to overly conservative investment decisions, potentially limiting financial growth (Shefrin, 2002). Conversely, greed can induce excessive risk-taking, potentially leading to substantial financial losses.

The role of optimism and overconfidence, while partially cognitive in nature, also possesses an emotional component. Overly optimistic investors may underestimate the potential for losses, leading to risky investment behaviors (Barber & Odean, 2001).

Research into neuroeconomics has started to unravel the neural mechanisms underlying emotional biases. Studies have found that brain regions responsible for processing emotions, such as the amygdala, are active during financial decision-making and can impact risk preferences (Kuhnen & Knutson, 2005).

2.1. Loss-Aversion Bias

Loss-aversion bias, initially proposed by Kahneman and Tversky (1979) in their groundbreaking work on prospect theory, refers to the tendency of individuals to prefer avoiding losses over acquiring equivalent gains. It is thought to manifest from the psychological pain associated with losses, which tends to be more potent than the pleasure derived from a gain of a similar magnitude. Consequently, loss aversion can result in suboptimal financial decisions and behaviors, particularly in the domain of investment.

Financial decision-makers suffering from loss-aversion bias may cling to losing investments for longer than is rationally justified, anticipating that prices will rebound and allow them to recoup their losses (Shefrin & Statman, 1985). This desire to avoid realizing a loss can lead to what is known as the disposition effect, wherein investors have a propensity to sell winning stocks too quickly and hold onto losing stocks too long (Odean, 1998).

On a broader scale, loss aversion can lead to an overly conservative investment approach. Investors may choose safer, lower-yield investments to mitigate potential losses, even if

the long-term expected return of riskier portfolios is higher (Benartzi & Thaler, 1995). This tendency can restrict their overall financial growth and hamper wealth accumulation.

In the context of finance professionals, loss-aversion bias may also affect the decision-making process. For instance, fund managers, eager to avoid losses, may herd with their peers, copying popular investments to minimize the risk of poor relative performance (Scharfstein & Stein, 1990).

Methods to combat loss-aversion bias involve implementing tools for decision-making, such as visual representations that elucidate the potential outcomes of long-term investments. Additionally, adopting systematic investment strategies that minimize emotional reactions can be advantageous in mitigating this bias (Benartzi & Thaler, 2004). Furthermore, receiving behavioral coaching can also aid investors in comprehending and conquering this cognitive inclination.

2.1.1. Myopic Loss Aversion

Myopic loss aversion, a concept introduced by Benartzi and Thaler (1995), combines the biases of loss aversion and mental myopia or short-sightedness. This phenomenon occurs when individuals excessively evaluate outcomes and consequently develop an intensified fear of losses, as they constantly witness the possibility of negative outcomes. This can greatly impact investment decisions and behavior, often leading to conservative investing strategies and lower returns.

Benartzi and Thaler (1995) proposed in their influential paper that investors who frequently monitor their portfolio performance are more likely to encounter losses due to the inherent unpredictability of financial markets. Consequently, this frequent observation triggers a bias towards avoiding losses, resulting in overly cautious investment decisions. They suggested that investors who check their portfolios more often tend to opt for less risky investments, even though riskier options could offer higher expected returns over a longer period of time.

Myopic loss aversion is associated with detrimental financial behaviors such as reluctance to take calculated risks and a preference for short-term rather than long-term investment strategies. These behaviors can lead to suboptimal financial performance and potentially compromise wealth accumulation efforts (Gneezy & Potters, 1997).

Thaler et al. (1997) expanded the investigation into myopic loss aversion by showing its relevance to market phenomena such as the equity premium puzzle, wherein stocks have historically had much higher returns than bonds, despite the greater risks associated with equity investment. This puzzle could be partially explained by investors' myopic loss aversion leading them to avoid riskier equity investments in favor of safer bonds, thus driving up the returns required to attract investors to equities.

Mitigation strategies for myopic loss aversion include reducing the frequency of portfolio performance evaluation, behavioral coaching, and the use of decision aids that demonstrate long-term investment outcomes (Benartzi & Thaler, 2004). However, the effectiveness of these approaches varies and further research is required to determine the most effective interventions.

2.1.2. Status Quo Bias

Status quo bias, a cognitive and emotional bias, refers to the inclination of people to prefer maintaining the current situation and sticking with decisions that were already made (Samuelson & Zeckhauser, 1988). This tendency to preserve the status quo often leads to inaction and can influence decision-making processes in various areas, including finance.

Emotionally speaking, the status quo bias can be linked to loss aversion since any changes from the current state are typically seen as potential losses. Individuals might feel uncomfortable when contemplating change and therefore become overly attached to their present circumstances (Kahneman, Knetsch, & Thaler, 1991). This behavior is often observed in portfolio choices where investors display a predisposition for retaining their existing assets even if it would be financially advantageous to alter their portfolio allocation (Dalton & Rapa, 2014).

Moreover, decision complexity can further exacerbate the impact of the status quo bias. Iyengar and Lepper (2000) pointed out that when faced with numerous options individuals may experience "choice overload," causing them to stick with the default option or maintain the status quo. This behavior is particularly noticeable when it comes to retirement savings decisions where average investors might find themselves overwhelmed by a wide range of investment choices (Choi, Laibson & Madrian, 2004).

The status quo bias carries significant financial implications. In personal finance, for instance, it can result in suboptimal investment decisions and hinder wealth

accumulation (Madrian & Shea 2001). In corporate finance settings too managerial reluctance towards implementing necessary changes in business strategies could eventually affect overall firm performance negatively (Hartman & Doane, 2007).

Mitigation strategies for status quo bias often involve simplifying choice architecture and decision-making processes (Thaler & Sunstein, 2008). Another approach to combat this bias is through financial education and increased awareness about the costs of inaction (Fernandes, Lynch, & Netemeyer, 2014).

2.1.3. Endowment Effect

The endowment effect, a prominent bias in the field of behavioural economics, can be defined as the tendency for individuals to assign more value to items merely because they own them (Thaler, 1980). This propensity often manifests as a disparity between the minimum price someone is willing to accept to part with an item that they own (willingness to accept or WTA) and the maximum price they are willing to pay to acquire the same item (willingness to pay or WTP), with the WTA often exceeding the WTP (Kahneman, Knetsch, & Thaler, 1991).

From an emotional bias perspective, the endowment effect is often explained through the lens of loss aversion (Tversky & Kahneman, 1991). When one owns an object, its perceived value is often associated with the potential loss experienced if it were given away, rather than its inherent or market value. Hence, the emotional attachment to the owned object is thought to contribute to the increased valuation (Morewedge & Giblin, 2015).

In the realm of finance and investment decisions, the endowment effect can lead to suboptimal outcomes. For instance, investors may hold onto underperforming assets for longer than rationally warranted because they overvalue these assets due to ownership (Shefrin & Statman, 1985). Furthermore, homeowners may demand unreasonable selling prices for their property, driven by an inflated perception of its worth (Case & Shiller, 1988).

While the endowment effect's existence and strength can be influenced by various factors such as cultural background and the nature of the goods in question (Weber & Hsee, 2000), it is prevalent and impactful enough to necessitate attention in financial decision-making.

Numerous approaches have been put forth to alleviate the endowment effect. Among these strategies is raising awareness among decision-makers about the presence of this bias. By presenting transparent and unbiased information regarding the intrinsic value of an item and fostering comprehension of the marketplace, it is possible to diminish this phenomenon (List, 2003). Furthermore, engaging in simulated market experiences that involve frequent buying and selling can also aid in curbing the endowment effect, as these activities have the potential to cultivate more rational and impartial assessments of prices (Lerner, Small, & Loewenstein, 2004).

2.1.4. Attachment Bias

Attachment bias is a type of emotional bias that arises from an individual's excessive emotional connection to an object, idea, or investment. Although it falls under the endowment effect umbrella, attachment bias differs in that ownership is not necessarily required for the bias to occur (Kahneman et al., 1991). Instead, this bias pertains to the emotional bond formed over time or through personal experiences.

In terms of investment decisions, attachment bias can lead investors to hold onto assets for longer periods than what rational financial analysis would advise due to their emotional affinity towards those investments (Shefrin, 2000). For instance, they might stubbornly cling onto stocks of a company they have a personal affiliation with even when economic indicators suggest selling would be the wiser choice (Weber & Camerer, 1998).

Additionally, individuals can develop an attachment bias towards specific investment strategies or economic theories. This can result in a lack of diversity within their investment portfolio and an overwhelming concentration of risk (Barber & Odean, 2001). Notably, attachment bias is not limited only to individuals; institutional investors can also fall victim to this bias due to their emotional attachment to certain business models or industry sectors (Cohen, 2009).

Various methods have been proposed for mitigating attachment bias. Education and increased awareness regarding emotional biases can promote more objective decision-making (Ricciardi & Simon, 2000). Additionally useful is seeking guidance from financial advisors who are detached from the emotions associated with investments as they provide a more impartial viewpoint that may counteract the effects of attachment bias (Mullainathan et al.,2012).

Furthermore, systematic decision-making approaches, such as strict adherence to predetermined investment policies, prove effective in minimizing the impact of emotional biases, including attachment bias. One way to address the impact of attachment bias could be to establish clear investment goals that assist in maintaining objectivity (Bodie et al., 2008). Conducting regular performance reviews of investment portfolios and being willing to adapt strategies based on objective performance metrics can also diminish the influence of attachment bias (Benartzi & Thaler, 2007).

2.2. Affect heuristics

The concept of the affect heuristic is rooted in the research conducted by psychologists Paul Slovic, Melissa Finucane, Ellen Peters, and Donald MacGregor (2002). It serves as a mental shortcut that individuals use to make decisions or judgments. Instead of objectively analyzing the information at hand, this heuristic relies on emotions or 'gut feelings'.

Generally regarded as an emotional bias, the affect heuristic gives priority to emotional responses over rational analysis. According to Slovic et al. (2002), individuals often lean on their immediate emotional reactions when assessing risks or benefits of an event. Positive emotions tend to lead to underestimation of risks and overestimation of benefits; whereas negative emotions have the opposite effect. This bias has significant implications for financial decision-making, causing people to base their investment choices on emotional responses rather than comprehensive financial data (Loewenstein et al., 2001).

In the realm of investments specifically, the affect heuristic can result in irrational decisions where investors are influenced more by their feelings towards a particular investment rather than conducting a thoughtful analysis of its potential risks and rewards. For example, an investor might feel positively towards a company due to its environmental practices and thus underestimate the financial risks associated with investing in it (Statman, 2004).Similarly, investors might hold onto losing stocks for longer than is advisable due to the negative emotions associated with recognising a loss - an example of how the affect heuristic can lead to the disposition effect (Shefrin & Statman, 1985). Conversely, the affect heuristic may lead to overconfidence and excessive trading if an investor has had positive past experiences with specific investments (Barber & Odean, 2001).

Mitigation strategies for the affect heuristic in financial decision-making involve encouraging individuals to focus more on objective data and less on their emotional reactions. This can be achieved through education about the pitfalls of emotional biases and the importance of rational analysis in investment decision-making (Ricciardi, 2008). Furthermore, utilising tools such as robo-advisors, which base their recommendations on algorithms rather than emotions, can help investors make decisions that are less influenced by the affect heuristic (Baker & Dellaert, 2017).

2.3. Regret Aversion

Regret aversion bias, first introduced by Bell (1982), is the inclination for individuals to avoid making decisions that they anticipate will bring about regret in the future. This bias arises from the emotional uneasiness associated with realizing that an alternative choice could have resulted in a more favorable outcome. Concerning finance, regret aversion can significantly impact an investor's behavior, usually leading to cautious strategies and a reluctance to take calculated risks.

From a theoretical standpoint, regret aversion is connected to the broader framework of prospect theory (Kahneman & Tversky, 1979). Prospect theory suggests that individuals are adverse to losses and that the subjective impact of a loss is felt more strongly than an equivalent gain. Consequently, in order to evade the painful feeling of regret that comes with experiencing losses, investors might adopt overly careful investment strategies or hold onto losing investments longer than rationality dictates in order to avoid facing regrets (Shefrin & Statman, 1985).

Specifically, within the investment realm, regret aversion has been linked to various maladaptive behaviors. For instance, investors may refrain from selling underperforming investments due to their desire not to face remorse associated with accepting financial losses—a behavior known as the disposition effect (Shefrin & Statman). Furthermore, fear of future regrets may also lead investors astray by discouraging portfolio diversification since they may hesitate investing in unfamiliar or perceived risky assets (Goetzmann & Kumar, 2008).

Strategies aimed at mitigating the influence of regret aversion on financial decision-making often revolve around fostering objective evaluation of choices and outcomes. Educating investors about common impacts and potential pitfalls related to regret aversion in investment decision-making can help them recognize and counteract

this bias effectively (Ricciardi, 2008). Additionally, utilizing decision-making tools that promote diversification while discouraging overreaction towards short-term losses can prove advantageous (Barber & Odean, 2000). Automated investing platforms may also limit emotional involvement in investment decisions, thereby mitigating the potential of regret aversion to skew decision-making outcomes (Baker & Dellaert, 2017).

2.3.1. Action and Omission Bias

Biases relating to action and omission showcase the impact of regret aversion on decision-making (Zeelenberg, 1999). The action bias involves a preference for taking action instead of remaining inactive when faced with a choice (Bar-Eli et al., 2007). This bias emerges from the belief that action signifies progress and leads to positive outcomes. In financial contexts, individuals may engage in unnecessary trading or adjust their investment portfolios out of a firm conviction that any sort of action is better than opting for inaction. While it holds true that certain situations warrant decisive action, this mindset is not applicable universally. Excessive trading tends to incur higher transaction costs and can detract from long-term investment performance (Odean, 1999).

Conversely, the omission bias centers around the inclination to favor inaction over taking initiative, specifically when said initiative carries potential negative consequences (Ritov & Baron, 1990). This bias stems from apprehension about experiencing regret after making an erroneous decision. For example, investors might abstain from selling underperforming assets due to apprehensions regarding subsequent rebounds following the sale — fears centered on potential regrets dictate such responses. It is also worth noting that this disposition hinders portfolio rebalancing efforts since investors shy away from altering their positions out of dread associated with making unfavorable choices (Kahneman & Tversky, 1982).

Both biases hold considerable sway over financial decision-making processes and ultimately shape investment outcomes significantly. The action bias begets excessive trading practices and inflated costs while the omission bias results in missed opportunities and suboptimal portfolio structures. However, being cognizant of these biases along with their prospective impacts allows investors to navigate decision-making more effectively.

Strategies aimed at counteracting these biases include adhering steadfastly to long-term investment plans and utilizing automated tools designed for investments; supplementing knowledge through financial education enhances awareness surrounding

these biases as well as their ramifications (Barber & Odean, 2001; Thaler & Sunstein, 2008). Furthermore, enlisting the assistance of financial advisors who offer impartial counsel and mitigate the effects of these biases yields significant benefits (Ricciardi, 2008).

2.4. Disposition Effect

The disposition effect represents a significant emotional bias affecting financial decision-making, coined by Shefrin and Statman (1985). This bias refers to the tendency of investors to sell assets that have increased in value (winners) while holding onto assets that have decreased in value (losers), contradicting the rational investment strategy of cutting losses and letting profits run.

The disposition effect is a complex phenomenon with multiple factors contributing to its occurrence. One of the underlying reasons for this behavior can be attributed to prospect theory, which was developed by Kahneman and Tversky (1979). According to this theory, individuals tend to evaluate outcomes based on gains or losses relative to a reference point, usually the price at which they bought an asset. The theory explains that people experience more pain from losses than pleasure from equivalent gains, leading them to exhibit risk-averse behavior when it comes to gains and risk-seeking behavior when it involves losses.

Another explanation for the disposition effect comes from the concept of mental accounting suggested by Thaler (1985). It suggests that investors tend to categorize and evaluate their investments separately as distinct "mental accounts." This compartmentalization can lead them to sell winning investments prematurely in order to 'close' an account with a positive outcome while clinging onto losing investments hoping for future recovery.

It's important to note that the disposition effect has negative implications for investment performance. Transaction costs and missed opportunities contribute significantly towards these adverse effects. Odean (1998) discovered that investors who exhibit a strong disposition effect tend to have lower returns due to excessive trading and associated transaction costs.

Further, Barberis and Xiong (2009) highlighted that the disposition effect can lead to suboptimal portfolio selection and risk exposure, as investors tend to sell winning

investments that may continue to appreciate and retain losing investments that may continue to depreciate.

Strategies to counter the disposition effect may include maintaining a long-term investment focus, avoiding frequent checking of portfolio performance, and utilizing 'stop-loss' strategies to limit potential losses (Da Costa et al., 2013). Furthermore, the use of robo-advisors or automated trading systems that are not susceptible to emotional biases can help mitigate this effect (Bhattacharjee et al., 2020).

2.5. Optimism Bias

The optimism bias, a pervasive emotional bias, is a propensity towards maintaining a view of the future that is more positive than warranted by the evidence (Sharot, 2011). It is categorized under the umbrella of 'positive illusions' and has been found to affect various areas, including health, work, and financial planning (Taylor & Brown, 1988).

In financial decision-making, individuals displaying optimism bias tend to overestimate the probability of experiencing positive events (like successful investments or business ventures) and underestimate the likelihood of negative outcomes (like investment loss or bankruptcy) (Weinstein, 1980). This bias, therefore, can lead individuals to underestimate risks and overestimate rewards in their financial assessments, leading to potentially sub-optimal decision making.

Optimism bias is often linked to overconfidence (Barber & Odean, 2001), as optimistically biased individuals not only maintain positive future expectations but also overestimate their personal ability to influence outcomes. This can result in excessive trading, under-diversification, and neglect of relevant information (Daniel et al., 1998).

Research by Kahneman and Tversky (1979) in their development of prospect theory highlighted that individuals displaying optimism bias tend to exhibit a stronger desire to gamble in the domain of losses. This behaviour can lead to riskier financial decisions as individuals may adopt strategies with a higher potential for losses due to their skewed expectations.

Empirical studies indicate that the optimism bias can lead to inferior investment performance. For instance, Odean (1998) showed that individual investors who trade more frequently (a behavior linked to optimism bias) tend to achieve lower returns due to transaction costs. Additionally, Puri and Robinson (2007) found that optimistic business

owners were more likely to experience business failure due to overestimating future sales growth and underestimating costs.

Several strategies may be employed to mitigate the effects of optimism bias. Education about this bias, its impacts, and ways to recognize it in one's decision-making can increase awareness (Larrick et al., 2007). Additionally, decision-making tools that incorporate systematic and analytical methods can help counteract the bias by providing more objective analyses (Ubel et al., 2011).

2.6. Pessimism Bias

The pessimism bias is in opposition to the optimism bias. The latter pertains to individuals overestimating the chances of negative events occurring and underestimating the likelihood of positive outcomes (Baumeister et al., 2001). This bias can have an impact on multiple areas where decision-making comes into play, such as health and relationships. Of particular note are its effects on financial decisions.

In finance, individuals with a strong pessimism bias may exhibit excessive risk aversion, believing that their investments are likely to yield poor returns or that they are more likely to experience financial difficulties (Weinstein, 1987). This overly negative view may deter them from beneficial financial opportunities, such as profitable investments or financial growth strategies (Ricciardi & Simon, 2000).

Pessimism bias, as pointed out by Kahneman and Tversky (1979) in their prospect theory, is closely connected to loss aversion. This bias causes individuals to give more weight to potential losses than the equivalent gains. Consequently, they tend to shy away from financial risks even when there could be greater benefits outweighing the possible negative outcomes.

Empirical studies have revealed that succumbing to pessimism bias can result in suboptimal financial results. Specifically, those affected by this bias invest less in equities and allocate more of their funds into safer assets like bonds, leading to reduced long-term returns (Benartzi & Thaler, 2001). Moreover, Gneezy and Potters (1997) discovered that people with pessimistic biases have a tendency to prematurely sell winning investments while stubbornly holding onto losing ones, ultimately resulting in poorer investment performance.

To mitigate the influence of pessimism bias on decision-making processes it is necessary to elevate awareness regarding its impact. Implementing strategies such as comprehensive financial education can enable individuals to understand the inherent risks and returns associated with different investments as well as recognize how this bias influences their judgment (Hershey & Schoemaker, 1985). Alternatively, employing decision-making tools that provide an objective analysis could counteract the emotional sway of pessimism bias (Loewenstein et al., 2001).

2.7. Self-control Bias

Self-control bias is a prevalent characteristic where an individual's current self makes choices that their future self might regret, often favoring instant gratification instead of long-term benefits (Laibson, 1997). This bias plays a crucial role in understanding personal financial decision-making, particularly in the areas of savings, investments, and retirement planning.

Behavioral economics uses the concept of time-inconsistent preferences to model self-control bias, mainly through the beta-delta model (Laibson, 1997). According to this model, individuals tend to have a preference for immediate rewards and may discount future utility more significantly than rational economic models would suggest. The presence of self-control bias can result in suboptimal financial decisions such as inadequate savings, excessive borrowing or unwise investment choices (Thaler & Shefrin, 1981).

For instance, when it comes to personal savings, individuals with self-control bias may face difficulties building up enough funds for retirement. Instead of regularly contributing to their retirement fund, they might spend that money on immediate desires like luxury items or vacations (Ameriks et al., 2003). Such a short-sighted perspective can considerably undermine their long-term financial security.

Moreover, self-control bias can affect investment decisions. Individuals with this bias might hastily sell off investments after a small immediate gain, missing out on potential long-term growth. They might also make impulsive investment decisions, driven by the lure of immediate gains, instead of a well-thought-out investment strategy (Odean, 1999).

Overcoming self-control bias requires a conscious recognition of the bias and strategies to mitigate its impact. One effective approach is the use of commitment devices, which are prearranged plans designed to help an individual adhere to their long-term goals (Bryan et al., 2010). An example of a commitment device in a financial context is an automatic payroll deduction for a retirement account, which helps ensure regular savings contributions.

2.8. Over/Under-reaction

Over-reaction and under-reaction are important cognitive biases observed in financial decision-making, often in the context of investing. These biases refer to the degree of response an investor exhibits to new information, which can be either too extreme (over-reaction) or too muted (under-reaction).

Over-reaction refers to the behavioural tendency of investors to react excessively to new information. This can lead to a temporary mispricing of assets as the market overvalues or undervalues the impact of the new information on the asset's true value (De Bondt & Thaler, 1985). An example of over-reaction can be seen in the aftermath of surprising earnings announcements where investors may excessively buy or sell stocks based on recent news, thereby causing a short-term inflation or depression of the stock's price that later corrects itself.

Under-reaction, on the other hand, refers to situations when investors do not react sufficiently to new information. It can occur when investors are slow to incorporate the full impact of the news into the asset's price. Under-reaction can result in price momentum, as the asset's price gradually adjusts to the new information over time (Hong & Stein, 1999). An example of under-reaction can be seen in the delayed response to a significant change in a company's fundamental value.

Several theories have been proposed to explain these phenomena. The representative heuristic, a mental shortcut in which people judge the probability of an event based on how similar it is to their stereotypes of similar occurrences, is often used to explain over-reaction (Tversky & Kahneman, 1974). Investors may over-react to new information because they overgeneralize from small samples of data and regard the new information as a new trend.

The anchoring and adjustment heuristic, where people make estimates by starting from an initial value and then adjust insufficiently away from it, is commonly used to explain under-reaction (Tversky & Kahneman, 1974). Investors may under-react because they are anchored to prior information and adjust their beliefs too slowly to new information.

The biases of over-reaction and under-reaction play significant roles in the volatility and momentum observed in financial markets. Understanding these biases can help investors make more informed decisions and avoid common pitfalls in the investment process.

2.9. Media Response

The media, particularly in the context of financial markets, exerts a significant influence on how investors behave. Through their coverage, the media can shape public perceptions and attitudes towards different investment opportunities, ultimately impacting decision-making processes (Tetlock, 2007).

When it comes to financial news transmitted through television, newspapers, and social media platforms like Twitter or Facebook, investors' responses are influenced by what they see or hear. Both the content and tone of the media coverage have an effect on these reactions (Tetlock, Saar-Tsechansky & Macskassy, 2008).

One primary way in which the media affects investor behavior is through how they present information. By framing news in certain ways –either emphasizing positive or negative aspects–the media can make investors excessively optimistic or unduly pessimistic. As a result of these biased perspectives caused by the media's slanting of news stories arises either potential overreaction or under-reaction to market events (Pollock, Rindova & Maggitti, 2008).

Moreover, the build-up up or burst down happens as well due to imitation "herd behaviour" created by the medias themselves where individuals tend to follow everybody else instead of making autonomous decisions based on ample analysis (Banerjee, 1992). Considering today’s rapid dissemination patterns through social media networking initiatives speed up herd behavior rates. This could potentially lead to dangerous market swings such as asset price inflation bubbles occurance.

Equally important is how frequently particular stocks or sectors receive intense focus from the press. When specific investments gain excessive attention from media outlets, some might assume that those projects are significantly safer and profit-yielding than they genuinely are. The visibility effect makes people perceive less known projects risking completely overtaken industries.

Thus, it must be noted however that the impact exerted by mainstream outles' varies among different groups; results do not appear uniform. Projections may vary driven especially at those more conscious participants less vulnerable to cognitive biases (Peress, 2014).

2.10. Social interaction

The realm of behavioral finance has recently started examining the impact of social interactions on investor behavior. It investigates how personal relationships, peer influence, and social networks can shape financial choices made by investors (Hong, Kubik, & Stein, 2004).

The theory of social learning highlights the significance of social interaction in this domain. Individuals learn from one another through observation, imitation, and modeling (Bandura, 1977). Within the context of investing, this phenomenon can manifest itself in various ways. For example, investors may share tips or knowledge about specific stocks or market trends with their social circles which could subsequently affect the investment decisions of others within that group (Shiller & Pound, 1989).

Furthermore, social interaction can lead to herd behavior within financial markets. The inclination to mimic the actions of peers due to the perceived wisdom of crowds or fear of missing out can result in market trends that may not accurately reflect underlying asset values (Banerjee,1992; Bikhchandani et al.,1992).

In addition to this effect on decision-making processes among investors is the influence of social norms - shared expectations within a group regarding appropriate behavior. These norms may play a role at various stages throughout an individual's investment journey; from making initial decisions about investing itself all the way to determining specific assets and risks undertaken (Duflo & Saez ,2002).

It is important to acknowledge that socially driven interactions are not always negative or conducive to irrationality. On many occasions, collaboration between

individuals leads to improved decision-making due to increased exposure to diverse perspectives and information that would have otherwise remained inaccessible as highlighted by Brown et al., (2008). Their research suggested that investors benefit from "local knowledge" shared amongst their respective communities which ultimately fosters superior investment outcomes.

However, evidence also suggests that these same interactions can amplify existing biases present among investors. Setting incentives aside, such instances occur when a group of investors relies on the same sources of information or shares similar interpretations of market events. As a result, their collective decisions tend to reinforce and intensify these pre-existing cognitive biases (Hong et al., 2005).

2.10.1. Herding

Herding refers to a behavioral bias observed in individuals who tend to imitate the actions or behaviors of a larger group (Banerjee, 1992). Within the realm of finance, herding behavior occurs when investors align their choices with those made by the group, disregarding their own private information. Often, this leads to buying or selling stocks based on the actions of other market participants (Bikhchandani, Hirshleifer, & Welch, 1992).

Herding can be classified as either rational or irrational depending on the context at hand (Hirshleifer & Teoh, 2003). Rational herding occurs when investors purposely mimic investment decisions made by others due to a perception that these individuals possess superior information (Scharfstein & Stein, 1990). This approach can prove advantageous if those being imitated are indeed more well-informed.

Conversely, irrational herding manifests when investors mindlessly conform to the crowd without considering their own knowledge or judgment. Such behavior is typically driven by psychological and emotional factors such as FOMO (fear of missing out) or an aversion to regret (Shefrin, 2001). In many cases, this results in suboptimal investment decisions and market price distortions that give rise to bubbles or crashes (Shiller, 1984).

Numerous studies have identified evidence of herding behavior across various financial markets. For instance, Devenow and Welch's research in 1996 demonstrated that institutional investors commonly engage in herding. The study concluded that pension

fund managers frequently mimic each other's investment choices; suggesting concerns about job security and reputation play substantial roles within this group.

In another scenario outlined by Grinblatt, Titman, and Wermers' investigation conducted in 1995 – evidence was found indicating mutual fund managers also exhibit tendencies towards herding. Their findings imply that the desire to protect their professional reputation can influence fund managers to imitate the investment decisions of successful peers.

Herding behavior carries significant implications for financial markets. By exacerbating market volatility and leading to asset price misalignments, herding makes markets prone to bubbles forming and subsequent crashes (Shleifer & Summers, 1990). Understanding herding behavior is therefore crucial for market participants and policy makers alike – particularly in modern times where social media and online trading platforms are capable of amplifying these effects; further heightening the potential impact on market stability.

3. How cognitive and emotional biases influence investments

The interaction between cognitive and emotional biases plays a pivotal role in shaping investors' choices, often resulting in less-than-optimal decisions from an economic standpoint. This section aims to analyze how these biases impact investment decision-making, with a specific focus on their effects on financial market outcomes and the wealth of investors.

Cognitive biases influence the way investors process information and make decisions (Tversky & Kahneman, 1974). For example, the bias of overconfidence can cause investors to overestimate their abilities and the accuracy of their knowledge. Consequently, this leads to excessive trading and potentially lower returns (Barber & Odean, 2001). The representativeness bias can make investors give undue importance to recent trends while neglecting significant historical context. This behavior leads them to chase recent performance or react excessively to recent news without considering long-term patterns (De Bondt & Thaler, 1985). Furthermore, cognitive biases like anchoring can cause investors to be unduly influenced by irrelevant reference points. As a result, notable pricing errors occur along with potential mispricing of assets (Tversky & Kahneman, 1974).

Emotional biases also play a substantial role in shaping investment decisions. Loss aversion is an emotional bias wherein investors feel stronger negative reactions towards losses compared to the positive reactions they experience with gains of equal magnitude (Kahneman & Tversky, 1979). This bias often gives rise to the disposition effect—the tendency for investors to sell successful investments too quickly and retain losing investments for longer periods than rational analysis suggests (Shefrin & Statman, 1985).

The influence of emotional biases is deeply strengthened through social interaction and the occurrence of herd behavior. When investors allow themselves to be guided by either fear or greed, they tend to emulate the investment decisions made by the masses rather than relying on their own judgment or information (Shleifer & Summers, 1990). Such conduct has the potential to intensify market volatility and give rise to asset bubbles as well as crashes (Bikhchandani, Hirshleifer, & Welch, 1992).

Although cognitive and emotional biases can harm individual investor performance, they also play a critical role in elucidating market anomalies that run counter to the Efficient Market Hypothesis; for instance, phenomena like momentum and reversal effects, excessive volatility, and the enigma of equity premium (Barberis, Shleifer & Vishny ,1998).

3.1. Investment: definition and process of investment

Investment plays a central role in economics and finance. At its core, investment involves using resources, usually money, with the intention of generating profits or returns in the long run (Bodie, Kane & Marcus, 2009). There are various forms of investment available - it could be investing in financial instruments like stocks, bonds or mutual funds; investing in physical assets such as real estate or commodities; or even investing in human capital through education and training (Mishkin & Eakins, 2012).

The process of investment typically consists of several steps. It begins by identifying and setting clear financial goals that align with an individual's or organization's needs, risk acceptance level and time frame (Gitman & Zutter, 2011). The next step involves generating and analyzing different investment opportunities available within what is known as the "investment universe". This requires conducting thorough research and analysis to determine the potential return on each opportunity as well as understanding the associated risks involved (Brigham & Ehrhardt, 2011).

Once viable investment opportunities have been identified, the next step focuses on selecting the most suitable investments. This selection process involves comparing potential investments based on their expected return and risk levels while considering how each contributes to the overall investment portfolio (Elton et al., 2014).

Following this selection phase comes allocating funds to these chosen investments. The allocation decision takes into account factors such as an investor's risk tolerance level and time horizon. Risk-averse individuals who prefer shorter-term investments will likely allocate a larger portion of their portfolio towards less risky assets (Bodie et al., 2009).

Lastly, after making these investments come monitoring them over time along with adjusting one's portfolio accordingly. Monitoring activities involve regularly reviewing performance metrics relevant to existing investments including re-assessing financial goals periodically. Adjustments may need to be made by rebalancing portfolios so they remain aligned with both investor objectives and changes occurring within the market (Reilly & Brown, 2011).

3.2. Probable mistakes in the investment phase

In the investment phase, a range of potential mistakes can arise that can adversely impact investment outcomes. Many of these errors are rooted in cognitive and emotional biases that distort decision-making and lead to suboptimal investment choices (Barber & Odean, 2013).

One such mistake is the failure to adequately diversify, often driven by the familiarity bias. Investors may tend to overweight investments in assets they are familiar with, such as their employer's stock or domestic equities, leading to poorly diversified portfolios that are unnecessarily exposed to firm-specific or country-specific risks (Goetzmann & Kumar, 2008).

Another common mistake is chasing past performance, a consequence of the representativeness heuristic. Investors often select investments that have performed well in the recent past under the erroneous belief that past performance is representative of future returns. This behavior can lead to the purchase of investments at peak prices and potential underperformance if mean reversion occurs (De Bondt & Thaler, 1985).

The overconfidence bias can also lead to investment mistakes. Overconfidence can result in excessive trading as investors mistakenly believe they can time the market or

have superior stock-picking abilities. Extensive empirical research has shown that excessive trading often leads to underperformance, particularly after accounting for transaction costs (Barber & Odean, 2000).

Loss aversion and the disposition effect are other biases that lead to investment mistakes. Loss aversion can lead to the tendency to hold onto losing investments for too long in the hope of recovering losses, while selling winning investments too soon to lock in gains, which is known as the disposition effect. Both behaviors can lead to suboptimal investment outcomes (Shefrin & Statman, 1985).

Finally, investors may fail to adequately consider the impact of fees on investment returns, often due to cognitive biases like anchoring and mental accounting. High fees can significantly erode investment returns over time, and neglecting to consider the impact of fees is a common and costly mistake (Gompers & Metrick, 2001).

3.2.1. Before the investment operation (confirmatory bias)

Even before the actual execution of an investment operation, investors can succumb to cognitive biases that may lead to suboptimal decisions. One such bias, which often plays a significant role in this phase, is the confirmatory bias.

Confirmatory bias, also known as confirmation bias, is the tendency of individuals to favor information that confirms their existing beliefs or hypotheses while disregarding contradictory evidence (Nickerson, 1998). In the context of investment operations, investors may selectively search for, interpret, and remember information that supports their preconceived investment decisions, leading to an overconfidence in their choices and the potential overlooking of valuable contrary information (Rabin & Schrag, 1999).

The pre-investment process is fraught with confirmatory bias, as investors may unconsciously grasp onto information that reinforces their hypotheses and either undervalue or ignore contrarian data sources (Gilovich, 1991). This can lead to misguided investment decisions as confirming evidence is relied upon while contradicting viewpoints are overlooked during the decision-making process (Kahneman & Tversky, 1982).

A persistent effect of this kind of bias is seen in perpetuated financial market anomalies such as momentum and value effects. Driven by confirmation bias, investors make decisions exacerbating these effects leading to asset prices being driven from their

intrinsic values contributing inevitably towards the creation of financial market bubbles and subsequent crashes (Barberis et al., 1998).

To mitigate this impact, a critical approach towards decision making needs to be fostered. Such measures include actively seeking out disconfirming data in addition to engaging in perspective-taking all while instilling an investment culture based on intellectual humility that recognizes cognitive bias within investor's thought processes (Lilienfeld et al., 2009). Even with those measures in place it is important to remember our human nature; mitigation of complete elimination for confirmatory bias may not always be possible due to deeply rooted tendencies present within human cognition (Evans, 1989).

3.2.2. During the investment operation (overtrading)

In the realm of investment, there exists a pertinent behavioral bias called overtrading. This bias arises when investors excessively buy and sell securities, resulting in higher transaction costs and lower net returns (Barber & Odean, 2000).

Overtrading can be traced back to various cognitive biases. One significant source is the illusion of control, wherein investors inaccurately perceive their ability to impact outcomes (Langer, 1975). As a consequence, these investors may engage in more trading than is warranted due to the mistaken belief that they possess authority over market results. In the context of investing, this illusion can foster an unwarranted sense of confidence in predicting market trends and consequently prompt increased trading frequency (Odean, 1998).

Another factor contributing to overtrading is the self-attribution bias. This particular bias entails attributing successful outcomes solely to one's own skills while deflecting blame for failures onto external factors (Miller & Ross, 1975). For example, if an investor experiences previous triumphs with trades made by them, they may attribute those wins solely to their skills without acknowledging that luck also played a role. Consequently, this can lead them to indulge in greater trade frequency into effect (Daniel et al., 1998).

Overtrading, which is characterized by excessive trading due to an inflated belief in one's own abilities or knowledge, is influenced by the bias of overconfidence (Barber & Odean, 2001). When investors have an exaggerated sense of confidence, they tend to

trade more than necessary because they wrongly assume their personal expertise surpasses that of others in the market (Gervais & Odean, 2001).

The consequences of overtrading can be quite severe. The increased transaction costs and capital gains taxes linked to frequent trading can substantially reduce investment returns (Barber, Lee, Liu & Odean, 2009). Moreover, excessive trading can result in a lack of diversification and expose the investor's portfolio to unnecessary risks (Statman,Thorley & Vorkink, 2006).

To counteract the negative impact of overtrading, it is crucial for investors to recognize these cognitive biases and strive to develop disciplined investment strategies. This includes determining and adhering to specific trading limits while incorporating a diversified, long-term investment plan (Barber & Odean, 2013). Behavioral interventions also prove effective when addressing tendencies towards overtrading; providing feedback on trading performance and highlighting the costs associated with this practice help minimize its occurrence (Choi, Liabson & Madrian, 2010).

3.2.3. After the investment process (omission bias)

The investment process extends well beyond the execution of trades, and decision biases can influence investor behavior in the post-trade phase as well. One of these biases is omission bias, which can significantly affect investment outcomes.

Omission bias refers to the tendency of individuals to favor inaction over action, especially when the potential outcomes of both are equally harmful or risky (Ritov & Baron, 1990). In the context of investing, this bias can manifest as an investor's reluctance to sell underperforming assets or to act on new investment opportunities (Stracca, 2004). It is grounded in the fear of regret; investors may avoid making decisions to prevent the potential regret they would feel if those decisions led to unfavorable outcomes (Zeelenberg, 1999).

One of the most direct manifestations of omission bias in the investment process is the disposition effect, which refers to the propensity of investors to sell winning investments while holding onto losing ones (Shefrin & Statman, 1985). The disposition effect can lead to sub-optimal investment outcomes because investors may cling to underperforming assets in the hope that they will rebound, thereby missing out on better opportunities elsewhere (Kaustia, 2010).

Another manifestation of omission bias is the endowment effect, where investors assign more value to assets they own merely because they own them (Kahneman, Knetsch & Thaler, 1991). This can result in a reluctance to trade or divest from certain assets, even when it would be financially prudent to do so (Thaler, 1980).

The impact of omission bias is not limited to individual investors; it can also influence institutional investors and fund managers. For instance, fund managers may hesitate to deviate significantly from benchmark indices due to fear of underperformance and subsequent criticism, a phenomenon known as "herding" or "closet indexing" (Scharfstein & Stein, 1990).

Omission bias can hinder the effectiveness of an investment strategy by preventing timely decision-making and promoting risk-averse behavior (Ritov & Baron, 1992). Investors, therefore, need to understand this bias and its implications to navigate the investment process more effectively. Individuals should aim to make disciplined investment decisions by separating emotional factors from rational financial analysis. To achieve this, regularly assessing and readjusting investment portfolios is crucial, taking into account both existing holdings and potential new investments (Barber & Odean, 2013). This process promotes objective decision-making and ensures an optimal allocation of resources in the ever-changing market environment.

3.3. The process of debiasing: is it possible?

In order to ascertain the feasibility of debiasing, it is imperative to possess a nuanced comprehension of both the persistence of cognitive biases and the tactics that can be employed to diminish their impact on investor decision-making.

One aspect to consider is that biases have the tendency to become deeply ingrained within an individual's thought patterns. They frequently operate at a subconscious level, rendering them challenging to perceive and alter (Tversky & Kahneman, 1974). Consequently, this presents a significant hurdle when endeavoring to counteract these biases. Furthermore, some scholars contend that cognitive biases may even confer evolutionary advantages by facilitating rapid decision-making in intricate scenarios (Gigerenzer & Gaissmaier, 2011). This underscores the strength of these biases and accentuates the difficulties involved in mitigating their sway. Nevertheless, despite these challenges, research has proposed several strategies that could aid in the process of debiasing.

One notable approach is increasing awareness and providing education. Simply being aware of biases and understanding how they impact decision-making can potentially reduce their effects in certain cases (Morewedge et al., 2015). In an investment context, this could involve educating investors about common biases such as loss aversion or the disposition effect and illustrating how these biases might lead to less-than-optimal investment decisions (Shefrin & Statman, 1985).

Overall, analyzing whether debiasing is achievable necessitates a discerning comprehension of both the endurance of cognitive biases and the potential methods meant to mitigate their influence on investor decision-making. While entrenched within an individual's cognitive framework at times beyond conscious recognition (Tversky & Kahneman, 1974), cognitive biases might even provide evolutionary advantages due to rapid judgments rendered by individuals facing intricate environments (Gigerenzer & Gaissmaier, 2011). The considerable difficulty embodied in reducing confirmed presumptions notwithstanding; attempts at introducing different tactics have been documented for consideration during efforts for bias reduction. Prominently, intensifying consciousness with the aid of education holds promise; recognizing biases and comprehending their far-reaching influence oftentimes renders diminishing effects (Morewedge et al., 2015). Such an educational approach in the investment realm could involve instructing investors about prevailing biases such as loss aversion or the disposition effect, signaling how these can produce nonoptimized investment resolutions (Shefrin & Statman, 1985).

In addition to education, the utilization of decision aids or tools can serve as an effective technique for addressing biases. This approach entails employing computer algorithms or robo-advisors that base investment decisions on mathematical models rather than emotional responses (Baker & Dellaert, 2017). By utilizing these tools, individuals can reduce the impact of biases and foster more objective decision-making.

Another possible strategy involves deploying 'nudges', which are interventions designed to guide individuals towards making superior choices without imposing restrictions on their freedom (Thaler & Sunstein, 2008). For instance, configuring default options in a manner that aligns with favorable outcomes according to societal norms can counterbalance the influence of biases like status quo bias or inertia (Samuelson & Zeckhauser, 1988).

Furthermore, cultivating an atmosphere characterized by reflection and critical thinking can also prove advantageous during the process of debiasing. Encouraging investors to contemplate their decisions attentively, question their assumptions regularly, and entertain alternative perspectives assists in countering biases such as confirmation bias and overconfidence (Larrick, 2004).

3.3.1. Financial education (OECD 2005)

Financial education, as specified by the Organisation for Economic Co-operation and Development (OECD, 2005), serves as a primary approach to counteract the influence of cognitive biases in making investment decisions. The underlying idea is to bolster knowledge and comprehension of financial concepts, empowering investors to make reasoned and impartial choices.

The OECD (2005) defines financial education as the process wherein financial consumers/investors enhance their understanding of financial products, concepts, and risks. Consequently, they are able to cultivate the abilities and self-assurance needed to recognize both risks and opportunities in finance. This empowers them to make well-informed decisions, seek appropriate guidance when necessary, and undertake effective actions that contribute positively towards their financial welfare.

In line with the OECD, receiving financial education has the potential to provide individuals with the necessary tools to not only steer clear of financial fraud and reduce the likelihood of being taken advantage of, but also navigate intricate financial markets (OECD, 2005). More specifically, when it comes to investing, having a strong grasp on concepts such as risk and return, diversification, and the time value of money can potentially counteract certain biases like loss aversion, overconfidence, and the disposition effect (Shefrin & Statman, 1985).

Furthermore, through education in finance, investors can acquire a deeper understanding of the possible pitfalls associated with blindly following financial advice without applying critical analysis. In doing so, they effectively address issues connected to authority bias and social proof (Cialdini, 2001).

According to insights offered by the OECD's framework on financial education; this learning should not be confined to just one event or moment in an individual's life. Rather it should be seen as an ongoing lifelong process that commences at school. This

educational guidance needs to be tailored precisely for each individual at exactly the right time and meticulously designed so as to empower consumers towards taking action—considering their varied needs and circumstances (OECD ,2005).

However, the OECD also cautions that financial education alone may not be sufficient to alter ingrained behavioural biases. Other measures such as good financial consumer protection and appropriate financial incentives should be used alongside education to achieve better financial behaviours and outcomes (OECD, 2005).

3.3.2. Financial Advisory (Consolidated Financial Act - Legislative Decree 58, 1998)

Another crucial tool in the process of eliminating biases is financial advisory services. These services can work in conjunction with financial education to help individuals make well-informed and impartial investment decisions. The Consolidated Financial Act (Legislative Decree 58, 1998) in Italy serves as a regulatory framework for financial advisory services, emphasizing their vital role in guiding investors.

Under this act, financial advisors are expected to uphold integrity, transparency, and a high level of competence (Legislative Decree 58, 1998). It is their responsibility to offer comprehensive and unbiased advice to investors, counteracting the influence of cognitive and emotional biases that humans tend to have.

Financial advisors play an especially significant part when it comes to complex investment situations where cognitive biases such as anchoring, overconfidence, and mental accounting can heavily impact decision-making (Tversky & Kahneman, 1974). By providing objective assessments and clarity, advisors assist investors in navigating these complexities and avoiding common mistakes.

In addition to addressing cognitive biases, financial advisors can also mitigate the effects of emotional biases. For instance, they can combat myopic loss aversion by encouraging long-term investment perspectives and promoting diversified portfolios (Thaler et al., 1997).

Furthermore, Legislative Decree 58 (1998) places great importance on the relationship between advisor and client. Advisors must always prioritize their clients' best interests which helps minimize risks related to manipulation and exploitation—particularly concerning authority bias and herd behavior (Cialdini, 2001).

However, exalted the role of financial advisory may be, some caution must be exercised regarding over-reliance on these services alone. The potential issues that come with relying too heavily on financial advisers should not be ignored. Adhering solely through advisement may highlight investor's lack critical engagement, potentially leading them towards unfavorable outcomes (Merton et al., 2005).

3.3.3. The support or guidance of Financial institutions

Financial institutions have a vital role to play when it comes to debiasing. They can guide and support investors, which is crucial in influencing investment behavior and reducing the negative effects of cognitive and emotional biases (Choi, Laibson, & Madrian, 2011).

Financial institutions offer guidance to investors through various formal methods that aim to assist them in making informed decisions. One approach is by granting access to research and analytics while also providing expert financial advice. In addition, these institutions ensure that the investment process remains transparent and easy to navigate. The purpose of all these efforts is to minimize the influence of biased thinking (Thaler & Benartzi, 2004).

To tackle the problem of overconfidence bias among investors, financial institutions can challenge their excessively optimistic assumptions by presenting data and analytics (Barber & Odean, 2001). Similarly, maintaining a culture of transparency and effective communication helps reduce confirmation bias − a situation where investors lean towards information that confirms their pre-existing notions while disregarding contrasting evidence (Nickerson, 1998).

Moreover, financial institutions possess the ability to effectively counteract herd behavior, which is a common pitfall in investment decision-making. They can achieve this by encouraging critical thinking skills and creating an environment that promotes independent decision-making (Hirshleifer & Teoh, 2003). Additionally, these establishments can assist in minimizing the impact of representative bias through personalized investment advice. Representative bias refers to situations where investors rely on stereotypes rather than focusing on individual characteristics when making decisions about investments (Tversky & Kahneman, 1974).

Financial institutions also play a crucial role in lessening loss aversion, which is a cognitive bias predisposing investors towards avoiding losses rather than attaining

equivalent gains (Kahneman & Tversky, 1979). By providing tools and resources that emphasize long-term investing perspectives, they aid investors in grasping that temporary setbacks are often part of the natural ups and downs associated with investments.

Nonetheless, it is essential to recognize that financial institutions should not absolve individual investors from their responsibility for comprehending their investments. As noted by Kahneman and Riepe (1998), while these institutions may offer tools and resources to support decision-making efforts; ultimately it rests upon each investor to actively engage in informed decision-making.

3.4. Conclusion

The third chapter of this thesis has delved into the complex relationship between cognitive and emotional biases and the investment process. Throughout this exploration, it has become quite evident that these biases have a substantial impact on investment decisions, often to the detriment of investors (Ricciardi & Simon, 2000).

The discussed biases, which covered a range of tendencies from overconfidence and confirmation bias to regret aversion and herd behavior, all showcase how investors can fall into the traps set by their own thoughts and emotions. These traps can result in less-than-optimal investment choices like excessive trading, insufficient diversification, and blindly following past performance (Barber & Odean, 2001; Kahneman & Tversky, 1974; Hirshleifer & Teoh, 2003).

Furthermore, these biases can affect different stages of the investment process. Starting with the pre-investment phase where confirmation bias leads to an excessive reliance on confirming information. Then onto the actual execution phase where overtrading becomes a possibility. Finally ending with the post-investment stage where omission bias prevents rectifying past errors (Rabin & Schrag, 1999; Barber & Odean, 2000; Ritov & Baron, 1990).

However, there is reason for investors to be hopeful as debiasing techniques hold potential. The essay explores strategies that can mitigate the impact of biases, accentuating the significance of financial education, advice, and the role of financial institutions (OECD, 2005; Choi, Laibson, & Madrian, 2011; Thaler & Benartzi, 2004). These approaches can empower investors with the necessary tools and knowledge to navigate investments more objectively and intelligently.

Nonetheless, it would be unfair to place the responsibility of debiasing solely on financial institutions. Investors also have a crucial role in this process. Recognizing their own biases, cultivating critical thinking skills, and actively participating in investment decisions are key steps toward making unbiased and informed choices (Kahneman & Riepe,1998).

In summary, this chapter sheds light on the multifaceted connection between cognitive and emotional biases and investment behavior. These insights reinforce the need for ongoing research and education in this field. As financial markets become increasingly complex, the importance of comprehending cognitive and emotional biases that may influence investment decisions amplifies. Both investors and institutions must work together to ensure that these biases do not compromise the integrity or effectiveness of the investment process.

CONCLUSIONS

The aim of this research was to investigate the cognitive and emotional biases that impact how investors make decisions. Through an in-depth analysis of existing literature, this thesis has discovered essential aspects of human biases that significantly influence investment choices. It highlights the crucial role played by behavioral finance in shaping these decisions.

Firstly, the research objective which underpinned this study inquired into how cognitive and emotional biases affect investment decisions. The exploration started with a comprehensive review of behavioral finance, underlining the evolution of this concept from traditional finance theories (Shefrin, 2002). This field acknowledges the psychological intricacies of the human mind in financial decision-making, a view which standard finance has long disregarded (Statman, 2014).

Addressing the research objectives, the biases were investigated, beginning with the cognitive biases. The relevance of the availability heuristic, which essentially is the human tendency to base decisions on readily available information, was highlighted (Tversky & Kahneman, 1974). A striking example of this bias in the investment context is an investor choosing to invest in familiar domestic stocks over foreign ones, a phenomenon also known as home bias (Coval & Moskowitz, 1999). Confirmation bias and anchoring bias were also investigated, revealing their potential to mislead investors into ignoring disconfirming evidence and clinging to initial information, respectively (Nickerson, 1998; Furnham & Boo, 2011).

A thorough examination of emotional biases followed the cognitive biases. Regret aversion bias was elucidated, indicating how the fear of regret can influence investors to avoid making decisions that could potentially lead to regretful outcomes (Zeelenberg et al., 2002). Overconfidence bias, optimism bias, and pessimism bias were explored, shedding light on how these biases could lead investors to trade excessively, maintain unrealistic positive expectations, and exhibit extreme caution, respectively (Odean, 1998; Sharot, 2011; Puri & Robinson, 2007).

Next, the discussion moved to the profound influence of these biases on investment. It was expounded how these biases could lead investors to make suboptimal investment decisions, such as overtrading, under-diversification, and excessive risk-taking

(Barber & Odean, 2000). Also, it was found that investors often fall victim to the confirmation bias even before starting an investment operation, which can lead to flawed decision-making processes (Nickerson, 1998).

Despite the prevailing impact of these biases, this thesis expounded upon potential approaches to counteracting them. It has been revealed that financial education, seeking advice from financial advisors, and guidance provided by financial institutions can effectively serve as measures in this regard. Through financial education, investors gain the necessary knowledge to combat cognitive illusions, and by utilizing competent financial advisory services, emotional biases can be mitigated (Lusardi & Mitchell, 2007; Hung et al., 2009).

Moreover, the important role played by financial institutions in assisting investors in overcoming their biases was acknowledged, thereby promoting more rational and optimal investment decisions (Thaler & Benartzi ,2004). However, it was also argued that debiasing is an arduous process that demands continuous effort, self-awareness, and professional support.

This research contributes substantially to existing literature through offering a comprehensive analysis of cognitive and emotional biases implicated in investment decision-making. Crucially, the aforementioned exploration uncovers complex dynamics existing between psychological biases and investment behaviors, resulting in a more intricate understanding of the entire investment decision-making process (Thaler, 2016).

The study has a few limitations. Firstly, it only focuses on selected biases. Moreover, the findings may not be widely applicable because individual and cultural differences can influence biases differently (Chui et al., 2010). To address these limitations, future research could delve deeper into these areas by analyzing a wider range of cognitive and emotional biases across different demographic groups.

Additionally, this study emphasizes the importance of understanding the psychological drivers behind investment decisions for various stakeholders. For investors, awareness of these biases can lead to more informed and rational decision-making (Odean, 1998). Financial advisors can also use this knowledge to provide better guidance to their clients (Ricciardi & Simon, 2000). Policymakers could benefit from understanding these biases in order to develop effective regulations and educational programs that promote a more rational and efficient market (Thaler & Sunstein, 2008).

This thesis bridges traditional finance theories with behavioral finance by providing a nuanced understanding of investor behavior. While traditional finance theories assume investors are rational, behavioral finance integrates psychology into finance and acknowledges that investors are influenced by various cognitive and emotional biases (Shefrin, 2002). This integration allows for a more comprehensive perspective that sheds light on the actual behaviors exhibited by investors.

Thus, this thesis reaffirms the importance of cognitive and emotional biases in investment decision-making. It challenges the notion of investor rationality traditionally upheld in financial studies by highlighting the complex nature of investment choices. As Thaler (2016) suggests, "our human limitations and biases prevent us from making perfect decisions", but gaining a deeper awareness of these biases can certainly guide us towards making better-informed choices in our investments.

The pursuit of debiasing may be challenging, but it is certainly worth the effort. By receiving financial education, seeking advice from financial advisors, and relying on the guidance provided by financial institutions, investors can enhance their self-awareness and their ability to counteract biases. As behavioral finance advances and our knowledge about these biases deepens, one can only hope that this progress will lead to more efficient markets and improved investment decisions in the future.

This thesis emphasizes how intricate the investment process truly is. It goes beyond being solely a financial endeavor; it delves into the realm of psychology. As financial markets become increasingly complex, cognitive and emotional biases have a growing influence on investment choices. This thesis serves as an introductory step toward comprehending this intricate connection, paving the way for further research in this captivating field of behavioral finance.

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