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ANALYSIS OF INDIVIDUALS' FINANCIAL DECISIONS WITH BEHAVIORAL FINANCE APPROACH

Nihal MIRZALIYEV

2504190033

Tez Danışmanı

Dr.Öğr.Üyesi Reşat Can AKKAY

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ÖZ

BİREYLERİN FİNANSAL KARARLARININ DAVRANIŞSAL FİNANS YAKLAŞIMI İLE ANALİZİ

Nihal Mirzaliyev

Davranışsal finans, finansal kararların davranışsal ve psikolojik sonuçları ile ilgilenmektedir. Geleneksel finans, yatırımcıları kendi faydalarını en üst düzeyde tutmayı hedefleyen rasyonel bireyler olarak tanımlamaktadır. Davranışsal finans yaklaşımı ise bu durumun her zaman geçerli olmadığını savunmaktadır. Bu yaklaşıma göre bireysel yatırımcılar finansal kararlar verirken çeşitli psikolojik önyargı ve eğilimlerden etkilenmektedir. Bu bağlamda geleneksel finansın öne sürdüğü Etkin Piyasalar Kuramı'nın dayandığı koşullar her zaman sağlanamamaktadır.

Bu çalışmada İstanbul ilinde ikamet eden bireysel yatırımcıların, yatırım kararları alırken, davranışsal finansın öne sürdüğü aşırı güven, kendini onaylatma, öngörü, muhafazakarlık, mevcudiyet, kayıptan kaçınma, aşina olanı tercih etme, zihinsel muhasebe, pişmanlıktan kaçınma, belirsizlikten kaçınma, ve sürü davranışı gibi psikolojik önyargı ve eğilimlere sahip olup olmadıkları araştırılmaktadır. Çalışmanın uygulama kısmında, bu on bir önyargı ve eğilim bağımlı değişkenler olarak ele alınmakta; ekonomi/finans eğitimi olanlar ile olmayanlar arasındaki farklar bu çerçevede incelenmektedir. Bu bağlamda çalışmanın temel amacı; bireysel yatırımcıların bu önyargı ve eğilimlerden kaçınmalarında, ekonomi/finans alanında eğitim almış olmalarının bir etkisinin olup olmadığının tespit edilmesidir. Bu amaca yönelik olarak, İstanbul'da ikamet eden 434 bireysel yatırımcıya anket çalışması uygulanmış ve elde edilen veriler SPSS 26.0 istatistik programı kullanılarak analiz edilip ve yorumlanmıştır. Yapılan analizler sonucunda, sadece pişmanlıktan kaçınma eğiliminin ekonomi/finans eğitimi alan ve almayan yatırımcılara göre farklılaştığı tespit edilmiştir. Anket uygulanan grup için diğer tüm önyargı ve eğilimler açısından, ekonomi/finans eğitimi almış olmanın bir fark yaratmadığı görülmüştür.

Anahtar Kelimeler: Geleneksel Finans, Davranışsal Finans, Beklenti Teorisi, Psikolojik Önyargılar, Yatırımcı kararları.

ABSTRACT

ANALYSIS OF INDIVIDUALS' FINANCIAL DECISIONS WITH BEHAVIORAL FINANCE APPROACH

Nihal Mirzaliyev

Behavioral finance deals with the behavioral and psychological consequences of financial decisions. Investors are characterized in traditional finance as rational individuals who aim to maximize their benefits. The behavioral finance approach claims that this is not always applicable. According to this approach, individual investors are impacted by various psychological biases and tendencies while making financial decisions. In this context, the conditions based on the effective market theory established by traditional finance cannot be always provided.

In this study, it is investigated whether individual investors residing in Istanbul have psychological biases and tendencies such as overconfidence, confirmation, hindsight, conservatism, availability, loss-aversion, familiarity, mental accounting, regret aversion, ambiguity aversion, and herd behavior while making investment decisions. In the empirical part of the study, these eleven biases and tendencies are considered dependent variables; the differences between those who have economics/finance education and those who do not are examined within this framework. In this context, the main purpose of the study is to determine whether there are any impacts on individual investors who have economics/finance education and who do not in their avoidance of these biases and tendencies. To achieve this goal, a questionnaire study has been applied to 434 individual investors residing in Istanbul, and the data obtained has been analyzed and interpreted using the SPSS 26.0 statistical program. As a result of the analysis, only regret aversion bias differs between investors who have studied and have not studied economics/finance, according to the statistics. In terms of all other biases and tendencies, having an economics/finance education does not appear to make a difference for the surveyed group.

Keywords: Traditional Finance, Behavioral Finance, Prospect Theory, Psychological Bias, Investor decisions.

PREFACE

While traditional finance theories argue that investors make rational decisions, behavioral finance models have been developed to explain observations that traditional finance theories fail to fully explain. Investors' psychological biases influence their investment decisions and decision-making processes, causing them to deviate from rationality and engage in irrational behavior.

The main purpose of the study is to determine whether there are any impacts on individual investors who have economics/finance education and those who do not in their avoidance of these biases and tendencies. In this context, first of all, the concept of market efficiency is discussed and findings that contradict the concept of efficiency, in other words, anomalies, are included. Then, the psychological biases were looked at, and empirical studies on the subject and their results were reviewed and talked about. In the continuation of the study to achieve this goal, a questionnaire study has been applied to 434 individual investors residing in Istanbul, and the data obtained has been analyzed and interpreted using the SPSS 26.0 statistical program.

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LIST OF ABBREVIATIONS

BIST	: Borsa Istanbul
CAPM	: The capital asset pricing model
EUR	: Euro
TL	: Turkish Lira
OECD	: Organization for Economic Co-operation and Development
OTC	: Over the Counter
ISDA	: International Swaps and Derivatives Association
P/E	**:** Price to Earnings Ratio
SPSS	: Statistical Package for the Social Sciences
S&P 500	: Standard and Poor's 500
US	: United States
USD	: United States Dollar

INTRODUCTION

Behavioral finance is a field that combines behavioral and psychological theories with traditional financial and economic theories (Singh and Shivaprasad, 2018, p.3). Furthermore, “Behavioral finance is commonly defined as the application of psychology to finance” (Pompian, 2006, p.4). Traditional finance disregards the behavioural and psychological aspects of an individual's financial decisions. Traditional finance models argue that markets are efficient, investors are rational and have the same expectations and characteristics. However, after a while, these models were criticized for being insufficient to explain the development of the financial market. It became necessary to find alternatives to traditional financial models. A revival of interest in these subjects among economists began in the late 1970s with the publication of some papers presenting models based on the idea of probability weighting. The most well-known is the prospect theory of Tversky and Kahneman, which permitted the analysis of behavior contradictory to the expected utility theory (Quiggin, 1993).

Evidence found by Kahneman and Tversky (1979) claims that people do not every time select the options which will maximise their utility. In theoretical terms, individuals are risk-averse about their gains and risk seekers about their losses; this is the core of prospect theory. Furthermore, the way the decision problem is presented may cause participants to deviate from rational behaviour (Kahneman et al., 1979, p. 273). More clearly, behavioural finance substitutes normal people for rational people in standard finance. Rational people are those who are logical in their decision-making. Normal people are not irrational. Indeed, we are mostly intelligent and usually normal-smart. But sometimes we are ‘normal-stupid’. Normal humans are not entirely logical because they are persuaded by cognitive biases and heuristics during decision-making. It does not, however, imply that they are completely irrational (Statman, 2014, p.65).

Behavioral finance is primarily concerned with the identification and interpretation of abnormalities in stock markets, other financial markets, corporate settings and, in general, all financial decision-making scenarios. Although psychological and sociological processes that influence human behavior are frequently

explored in behavioral science; their significance in finance and economics is relatively a new research area. Human behavior is usually ambiguous and unexpected. Nonetheless, using tests and observations, behavioral finance experts discovered a plethora of biases that influence human behavior. But detecting and classifying the biases that lead to erroneous investing decisions by investors is exceedingly challenging. Biases are people's systematic mistakes of judgments when they make a decision (Kahneman et al., 1998, p. 2).

To sum up, the decision-making procedure is imperfect. Usually, investors have a tendency to make investment selections that maximise their satisfaction rather than their maximum utility.

This thesis's main objective is to investigate whether being educated in the fields of economics or finance will help individual investors to escape psychological biases while making financial decisions. This thesis consists of six sections. In the first chapter, the basis of finance and finance theories will be emphasized. The traditional finance and finance models will be discussed considering the conceptual framework. Also, anomalies, which are contradicting the efficient market hypothesis, will be examined. In the second chapter, prospect theory and various models of behavioral finance will be discussed in detail. Common behavioral biases that affect human behaviors and decisions will be explained. The third section will inform about the research's purpose, design, hypothesis, and questions. In addition, the dataset of the study and the sample population will be introduced. In the fourth section, the questionnaire data will be investigated empirically with the help of the SPSS software. The data will be analyzed under three main headings: demographic facts, financial profile, and behavioral biases. The aim here is to analyze the survey sample in a more detailed way. In the fifth section, survey-based research will be conducted to explore whether being educated in the fields of economics or finance will help individual investors to escape psychological biases while making financial decisions. Finally, in the last part, the findings are summarized and some remarks for future research are presented.

CHAPTER ONE

FINANCE AND FINANCE THEORIES

In this section, the basics of finance and finance theories are emphasized. The traditional finance and finance models are discussed in the light of the conceptual framework.

1.1. The Conceptual Framework of Finance

Finance is an essential component of living, and therefore it is important to get some insights of how it influences people as individuals. When people decide to purchase a house or a car or plan for their future, they should deal with overall financial concepts. Even if people make a career in a non-finance field of work, they will find themself using finance concepts to manage their work and their private life. Besley and Brigham showed in their study that individuals with more knowledge about finance generally retire comfier and are richer than individuals who have no or limited knowledge. Although finance is hundreds of years old, it has been, and still is, an evolving discipline, with no boundaries in sight (Besley and Brigham, 2015).

Professionally and scientifically, finance has undergone important modifications during the last 40 years. Prior to 1973, there were neither option exchanges nor any widely acknowledged mechanism for pricing options. Currently, the global trade in derivatives markets represents much more money than the amount of money spent for the trade of goods and services internationally (OTC derivatives totaled $15.8 trillion[1], goods $5.8 trillion, services $1.6 trillion at the end of 2020[2]). Besides, finance helped other fields like engineering, telecommunications, and manufacturing to evaluate and enhance their developments by providing different financial methods and tools. This shows that finance functions are used in other areas.

[1] Roman, Olga, "Key Trends in The Sıze And Composıtıon Of Otc Derıvatıves Markets in the Fırst Half Of 2021", ISDA, 2021, https://cutt.ly/AG6DGsh

[2] United Nations Conference on Trade and Development, "Global trade hits record high of $28.5 trillion in 2021, but likely to be subdued in 2022", 17 February 2021, https://cutt.ly/0G6G43E

In brief, knowing fundamental financial concepts is becoming more and more of a need in today's jobs (Wijst and Nico, 2013).

In addition, it is useful to evaluate finance within the scope of businesses. In the companies' point of view, the importance of finance has increased in recent years. The effects of globalization and the economic crises after the 1980s pose a threat to companies to survive. Companies now have to follow the financial developments in the world economy and have begun to strengthen their management of finance to find financial resources and use them effectively. A company must operate in a commercial and economic environment. The financial environment or financial system forms components of the overall economic environment. The economic environment affects the financial system and the financial system, in turn, affects companies' investment and financial decisions. For instance, a change in the interest rate policy of the central bank directly influences the finance managers' decisions about the long-term financing of equity and debt. When interest rates decrease, old debts may be retired, and new debts may be arranged at a reduced cost. Because of the interdependence between the financial environment and the firm's financial decision-making, the financial manager must have a complete understanding of the financial system to make successful decisions about real and financial investments while minimizing the risks. The finance managers can successfully contribute to the firms' value maximization aim by making optimal financing and investment decisions. Financial assets and financial intermediaries or institutions make up the financial system. According to the Organization for Economic Co-operation and Development (OECD), a financial system is made up of institutions and markets that work together in a complicated way to raise money for investments and provide tools like payment systems for financing business activities. In other words, the many parts or components of the financial system are intricately linked and changed regularly. The financial system has grown increasingly and become globalized, liberalized, and integrated throughout time. Consequently, financial managers must think globally and act locally (Banerjee, 2017, p.22).

1.2. Different Definitions and Scope of Finance

The definition of finance has changed throughout time as its function has evolved and improved. Finance was concerned with the purchase and management of assets on behalf of individuals and businesses in the early twenty-first century. The focus was laid on the securities (or investment products) used to distribute assets, the institution which acted as middlemen between lenders (savers) and borrowers (investors), and the financial market wherein they functioned. The definition has evolved through time to include a business's financing needs, and as a result, the focus has shifted from an external (outside the firm) approach to one that addresses a firm's internal finance needs. As a result, finance can be thought of as the process of allocating scarce resources across time. These resources might be either financial (money, stocks, bonds) or physical (property, minerals, and products), necessitating different sorts of decisions (Bennett et al., 2017, p.4). Obtaining funds and then distributing them for a certain purpose are both financial decisions. Because the costs and benefits of borrowing and lending activities are spread out across time and are not known with certainty, it is critical to determine them. In other terms, because costs and benefits emerge in the future, there is some uncertainty about whether the predicted costs and benefits will be materialized (Bennet, et al, 2017).

Finance explains how individuals choose among unknown future values. Finance is the branch of economics that explores how individuals share out limited resources that have alternated, between many competing goals. The main causes of economic problems are lack of resources and not enough of them to reach all goals and use them in other ways that are possible. Finance explores such difficulties in terms of choices, including money, risk, and time. Financial issues can affect individuals, businesses, and governments which are examined under the headings of personal finance, corporate finance, and public finance. Financial decisions can be made directly or through intermediaries on behalf of stockholders or investors (Wijst and Nico, 2013, p.1). To put it another way, in finance, people are concerned about money and the future at the same time. Businesses and governments raise cash by issuing debt instruments and then using this cash for operations, while investors

distribute their funds amongst financial assets to achieve higher returns (Drake and Fabozzi, 2009, p.1). One of the concise definitions of finance in the literature is made by Khan and Jain: "Finance may be defined as the art science of managing money" (Khan and Jain, 2008, p.3).

Finance is related to money decisions, or even more accurately, cash flows. Financial decisions involve how corporations, governments, and individuals raise and use money. Three broad concepts should be comprehended to understand the financial decisions: Ceteris paribus, (1) more is preferred over less; (2) cash received sooner is more beneficial; and (3) less risky assets are preferred over riskier assets. Companies that make the decisions with this idea in mind can offer better goods to customers at lower prices, pay higher wages to employees, and provide better returns to shareholders who put up the funds required to form and run a business. Overall, after which, it makes sound financial management a key contributor to the well-being of both individuals and the overall public (Besley and Brigham, 2015, p.5).

Finance is generally related to three concepts: (1) Financial Management, (2) Capital markets, and (3) Investments (Brigham and Houston, 2015, p.4).

Corporate finance, which is another name for financial management, is the process of figuring out how much and what sorts of assets to acquire, how to get the cash to buy those assets, and how to run a company to make it as valuable as possible. For-profit and nonprofit organizations are both subject to the same principles. Interest rates, stock and bond prices, and the prices of other financial instruments are all decided in capital markets (Brigham and Houston, 2015, p.4).

According to another approach, financial management is a field of study that involves decision-making. This choice involves the amount and mix of assets as well as the grade and structure of financing. It is important to have a clear knowledge of the objectives to make the best decision. This goal is to focus on developing a mechanism for managing a company's internal investment and finance. Profit maximization and wealth maximization are the two most used techniques. The term objective has been used in the sense of an object, a goal, or a decision criterion. The objective guides investment, finance, and dividend policy decisions. Therefore, what is relevant is not

the overall objective but an operationally useful criterion: It should also be noted that the term objective provides a normative framework. Consequently, a company should try to realize policies that must be adhered to if specific objectives are to be achieved (Singla, 2019, p.12).

Capital markets involve the markets in which interest rates, along with stock and bond prices, are defined. Furthermore, the financial institutions which provide the capital to businesses are operating here. Banks, insurance firms, investment banks, mutual funds, stockbrokers, and other financial organizations connect "savers" who have funds to invest and companies, businesses, individuals, as well as other entities that need capital for diverse reasons (Brigham and Houston, 2015, p.4).

The term "investment" refers to a choice made on stocks and bonds, and it encompasses a wide range of activities: (1) The mission of security analysis is to establish the correct value of certain securities. (2) Portfolio theory is focused on determining the optimal method for structuring portfolios or stocks and bonds baskets. To reduce risks, rational investors prefer to have diverse portfolios, thus selecting a well-balanced portfolio is critical for each investor. (3) The market analysis examines whether the bond and stock prices are "too low," "too high," or "about right" at any particular time. Behavioral finance is a part of market analysis, and it examines investor psychology to see if stock values have risen to excessive-high levels in a speculative bubble or driven down to unreasonable low levels due to irrational pessimism (Brigham and Houston, 2015, p.5). As can be seen, finance has been defined from different perspectives and it is related to different fields of economy. Especially the behavioral finance approach provides a new perspective on the topic and will be our main interest in the continuation of the study.

1.3. Theories, Models, and Hypotheses of the Traditional Finance Approach

Traditional finance models argue that investors are rational and have the same expectations and characteristics. At the same time, traditional finance models argue that they desire the maximum benefit and that the markets are efficient. However, after

a while, these models were criticized for being insufficient to explain the development of the financial markets (Gumus, 2013, p.75).

In this section, before examining behavioral finance, which shows that investors may behave irrationally, traditional finance theories, models, and hypotheses that laid the groundwork for the emergence of behavioral finance are explained in detail. Many of the theories that make up behavioral finance have been formed by the fact that the theories of traditional finance are far from explaining the current changes in the financial markets. To understand the emergence and the scope of behavioral finance, it is useful to explain traditional finance theories.

Within the scope of Traditional Finance Theory, (i) Expected Utility Theory, (ii) Modern Portfolio Theory, (iii) Capital Asset Pricing Model, and (iv) Efficient Market Hypothesis are discussed and analyzed in the continuation of our study.

1.3.1. Expected Utility Theory

Even though it was published by Bernoulli in 1738, the expected utility was not widely utilized until John von Neumann and Oskar Morgenstern (1944) included it in their theory of games, more than two centuries later. Frank P. Ramsey had introduced a theory of subjective probability and expected utility a few years earlier (1931), but it remained mostly unnoticed until the publication of Leonard J. Savage's classic about the foundations of statistics (1954). Savage created the first comprehensive axiomatization of subjective expected utility, which combines the idea of personal probability with the idea of expected utility. He did this by looking at Ramsey, von Neumann, and Morgenstern's work on expected utility and de Finetti's work on subjective probability from 1937 (Fishburn, 1982).

Individuals find it challenging to foresee the results and possibilities of certain decisions. L. Savage's (1964) subjective expected utility theory is a utility function based on an individual's subjective probability evaluation. Here the subjective probability estimate is multiplied by the individual's preferences (Barberis and Thaler, 2002).

Expected utility theory remains the dominant approach for modeling decision-making under risk. As the main tool for decision-making since World War II, it has been used to create economic and financial predictions, to give directions in management science, and to describe various aspects of psychology. Moreover, expected utility is the commonly used economic technique to address public policy decision-making; comparing the projected costs and benefits of a proposed public policy implicitly presupposes those economic actors maximize expected utility (List and Haigh, 2004, p.945).

The expected utility theory has various assumptions. Accordingly, the expected benefit is maximized by multiplying the choice that seems the most beneficial by the gain from events. In other words, much is better than less. If X benefits more than Y, the decision-maker will necessarily choose X between X and Y. With another assumption, decisions are made consistently. Among the three choices, if X benefits more than Y and Y benefits more than Z, the individual will choose undoubtedly X. Again, if we look at the theory, the decision-makers find the possibilities for uncertain situations to maximize their utility. The probabilities found are put in the order within the utility function. In the assumptions mentioned above, the individual is a rational person. The expected utility theory is not concerned with what people do. It is the approach that deals with what people should do. It is among the various criticisms made to the utility theory that the behavior of the observed human being and the human behavior assumed in theory are expected to contradict each other (Bostancı, 2003).

The expected utility model has been one of the famous success stories of contemporary economic analysis. The expected utility model allows the use of standard methods of comparative statistics and dynamics for the analysis of choice under uncertainty. In the following years, some contributions were made by following the expected utility model. A revival of interest in these subjects among economists began in the late 1970s with the publication of a number of papers presenting models based on the idea of probability weighting. The most effective was the “Prospect Theory” of Tversky and Kahneman, which permitted the analysis of behavior contradictory to the expected utility theory. There are now dozens of competing

models and considerable works that investigate theoretical properties and compare their empirical performance (Quiggin, 1993).

1.3.2. Modern Portfolio Theory (Mean-Variance Model)

The Markowitz Mean-Variance Model is crucial in the evolution of theoretical standard finance. Before the contribution of H. Markowitz, the discipline of finance depended far less on the mathematical approach (Khoshnood and Khoshnood, 2011).

Markowitz is generally considered the originator of modern portfolio theory (1952, 1959). The theory was first explained in a way that was easy to understand in the author's first book and essay on the subject. Markowitz framed the portfolio problem as a selection between the mean and variance of the assets in the portfolio. The author demonstrated the basic theorem of mean-variance portfolio theory, namely keeping constant variance, maximizing expected return, and keeping constant expected return to minimize the variance (Elton and Gruber, 1997, p.1744). In other words, the Markowitz Mean-Variance states that all materials about a portfolio of risky assets that are important to a risk-averse investor can be summarized in two parameters: the standard deviation and the expected value of the portfolio return, which are abbreviated as a risk and return (Khoshnood and Khoshnood, 2011, p.97). To sum up, in this theory, an optimal investment combination is one in which the highest possible level of return is obtained for the lowest possible level of risk. Investors are advised to diversify their assets to decrease risk while increasing profit.

1.3.3. Capital Asset Pricing Model

The capital asset pricing model (CAPM) by William Sharpe and John Lintner in 1964 and 1965 is the start of asset pricing theory. Sharpe was awarded the Nobel Prize in Economics in 1990 for his work on this model.

The Capital Asset Pricing Model (CAPM) is a quantitative model that describes the connection between risk and expected return and is used to price riskier securities. The notion is applied to the valuation of a single portfolio and/or securities. According to the approach, there are two different ways in which investors should be reimbursed: risk and the time value of money (Fama and French, 2004).

Sharpe and Lintner claimed that all investors are risk-averse, have the same expectations, and maximize the expected utility of their end-of-period wealth. As a result, all investors have the same set of opportunities. They also claimed that a risk-free asset exists, and that investors can lend or borrow an unlimited quantity of this asset at a fixed rate; the risk-free rate and asset returns are regularly distributed. More crucially, they claimed that all assets are perfectly divisible and priced in a perfectly competitive market. Another underlying assumption of CAPM is that there are no market imperfections such as taxes, restrictions, or short-selling limits and that markets are frictionless, with costless information available to all investors at the same time (Mirza and Shabir, 2005, p.37).

Some may argue that the majority of the assumptions given above are unrealistic. Regrettably, the model's empirical record is poor. The empirical problems with the CAPM could be due to theoretical flaws as a consequence of multiple simplifying assumptions. They could, however, be caused by challenges in putting valid model tests in place (Rossi, 2016, p.605).

1.3.4. Efficient Markets Hypothesis

Eugene Fama's efficient market hypothesis originated in 1969, became the dominating theory favored by the academic world during the 1970s, and has been one of the basic paradigms of finance ever since. According to the efficient market hypothesis, asset values (such as bonds, property prices, or stock prices) instantly and completely mirror every existing relevant information. The concept can be summarized as follows: The value of a stock or portfolio representing an index equal "the mathematical anticipation, conditional including all available information, of the current value of factual subsequent dividends accruing to that stock or portfolio". In other words, "price equals the optimal forecast of it." (Shiller, 2003, p.85). The theory's practical explanation is that it is unfeasible to "beat the market" consistently and over a long time, because asset values only react to fresh information from news, which is inherently unpredictable. As a result, companies always trade at their fair value, making it impossible for investors to acquire cheap or overpriced equities and outperform the market by picking the right stocks or buying at the right time—there is

no "free lunch". The only option to obtain a better return is to choose riskier assets. As a result, no risk-adjusted investing strategy exists that can consistently provide higher returns (Barberis and Thaler, 2002, p.1054).

The theory is founded on various assumptions. The most important ones are that market participants have rational expectations and value securities rationally based on these expectations, that the public reacts sufficiently on average, and that as new information becomes available, market participants modify their expectations appropriately and properly (Shiller, 2003, p.83). Briefly, the efficient market hypothesis presumes that since individuals value wealth, their behavior in making financial decisions is rational - but it still refuses to explain several important questions in financial decision-making, as for why investors trade or why returns differ across stocks other than risk reasons (Subash, 2012, p.5).

Tests for measuring the degree of reflection of the price on the market were examined in three groups:

i. The weak form

According to the weak form of the efficient market model, by examining the prices of the securities, excessive profit cannot be obtained. Although the weak market form prevails, price changes are accidental. This shows that the price changes in the two different periods are independent of each other, trading by using historical information does not give the investor any extra return, and no strategy, including technical analysis, works in the long run. In these markets, investors cannot access new information at the same time and some information that is hidden from the public is shared among selected investors (Fama, 1970, p.383). Therefore, if the market is active in the “weak form”, it is not possible to obtain excessive returns by performing the technical analysis (Degutis and Novickyte, 2014, p.8).

ii. Semi-strong form

According to the semi-strong form of the efficient market model, prices of financial assets reflect current public information. The market reflects all the information shared with the public. This shared and historical information is used to determine stock prices. Investors are shown as the first owners of the information as

they learn this information from inside. Because the forecasts and explanations made are effective in pricing the stock, market participants cannot earn higher returns than normal (Fama, 1970, p. 383). In other word, all publicly available information includes, in addition to past prices, fundamental data on the firm's product line, quality of management, balance sheet composition, patents held, earning forecasts, and accounting practices. Again, if investors had access to such information from publicly available sources, one would expect it to be reflected in stock prices (Bodie et al., 2014, p.354). In markets which are active in a semi-strong form, investors cannot get higher than normal returns because all information is reflected in the prices.

iii. Strong form

According to the strong form of the efficient market model, securities pricing is based on securities evaluation. Prices include not only public information but also information on all aspects of the economy. When insider information in a fully active market at the same time reaches investors, prices in the market will be fair (Fama, 1970, p.384). Similarly, in competitive asset markets, traders have rational expectations and prices reflect all proprietary information about the asset's value. Therefore, if traders have rational expectations, they cannot be exploited by insider learners (Laffont et al., 1990, p.86). In other words, in the "strong form" of the efficient market model, current stock prices reflect all the information possible, without having to be public (Degutis and Novickyte, 2014, p. 9).

In summary, according to the efficient market hypothesis, while investors in the stock market seek alternative ways, they all converge on the same behavior. For this reason, while the markets are approaching the perfect competition market, no investor can exploit the market for a long time (Haque et al., 2011. p.153). The basic hypothesis defending that the market is efficient also states that the stock price shows a random walk.

While there are several studies and empirical data to support the idea, there are also some empirical and theoretical challenges to its validity. Several anomalies have emerged over the years that call the hypothesis's basic assumptions into question.

According to Grossman and Stiglitz, as cited by Subash (2012), the existence of an efficient market is unfeasible since information is perfect, and if it is, investors have no motivation to expend resources to get the information. One of the primary reasons for the emergence of behavioral finance was the increasing number of anomalies and inaccuracies in the efficient market theory.

1.3.5. Findings Contradictions with the Efficient Market Hypothesis: Anomalies

According to the efficient market hypothesis, the share prices of firms trading on the market are bought and sold at their true worth. It is assumed that the actors in the market will evaluate and implement all of the information they possess. Furthermore, it is assumed that economic actors do not make consistent and systematic errors in their future expectations. Individuals are also thought to be impacted by political events (Sarfati and Karabulut, 2004, p. 64). This is true for traditional finance which assumes that individuals are rational but it's not true from the perspective of behavioral finance which examines the rationality of people (Statman, 2008, p.1).

Individuals in the market are not rational in most cases. Even when the securities market receives fresh information at the same time, it does not always respond in the same manner. Prices in the stock market fluctuate randomly (Fama, 1970, p. 385). Namely, no knowledgeable or uninformed market participant can out-earn the market, according to this premise. So, employing some ways to generate additional money is futile. Nevertheless, several studies have produced results that contradict the efficient market theory and concluded that time influences return. This case is accepted as an "anomaly." (Pilatin, 2020).

According to Sing and Bahl (2015: p.52), anomalies are abnormal behavior of financial markets. These anomalies are the emergence of market events whose explanation is outside the scope of standard financing.

The main difference between the traditional finance theories and behavioral finance theories arises due to the existence of four anomalies namely, (i) calendar

anomalies, (ii) sectional anomalies, (iii) technical anomalies, and (iv) pricing anomalies.

1.3.5.1. Calendar Anomalies

According to Efficient Market Theory, stock returns, are not affected by time. Namely, periods are insignificant in respect of returns. The theory emphasizes that utilizing observed return trends to forecast future returns and get abnormal returns is unfeasible. However, calendar anomalies are in contradiction with this viewpoint. Numerous studies suggest that stock returns may be predicted and those more negative or positive returns are obtained over particular periods (Barak, 2008, p.126).

Calendar anomalies are connected to a certain period, such as stock price fluctuation from day to day, month to month, year to year, and so on which include the weekend effect, the turn of the month impact, and the end-of-the-year effect (Karz, 2010).

1.3.5.1.1. Daily Anomalies

In recent years, scientific research on the markets in the United States, Europe, and the Far East have determined that certain days of the week provide statistically significant positive or negative returns. Monday has been the most noticeable day in most of the studies. Cross (1973) conducted the first study on the influence of the day of the week. He investigated the returns on the Standard and Poor’s index of S&P 500 equities from 1953 to 1970. He discovers that Fridays have a mean return of 0.12 percent, whereas Mondays have a mean return of -0,18 percent.

Similarly, French (1980) examined the day of the week impact using the return of the S&P 500 index from 1953 to 1977. He discovered similar results with Cross's study in which Mondays have negative returns, but Fridays have positive returns.

According to Smirlock and Starks (1986), on Monday, stock prices are expected to decrease. This indicates that the closing price on Monday is lower than the preceding Friday's closing price.

1.3.5.1.2. Monthly anomalies

Anomalies are investigated concerning months to see whether stock prices are bigger in one month than in others, or whether they exhibit distinct features. Namely, the anomalies of the months are expressed as the increases or decreases in stock returns in any month of the year (Rozeff and Kinney, 1976).

In this regard, studies have been conducted to determine whether there is any influence during the months, the first and second portions of the months, or the beginning or end of the year. According to studies, some months give more or lower returns than others (Cheung and Coutts, 1999).

According to Gulfraz et al. (2007), stock prices are most likely to increase on the last trading day of the previous month and the first three trading days of the next month.

1.3.5.1.3. Yearly Anomalies

The yearly anomaly, according to Agrawal and Tandon (1994), exhibits the change in stock prices and trading volume on the stock markets during the final week of December and the first part of January.

If more clearly defined, this type of anomaly, according to Schwert (1983, p.14), might be explained by the tax impact. He demonstrates that some investors sell stocks towards the end of the year to claim short-term capital losses on their tax returns. That "selling pressure" may lead stock prices to fall towards the end of the year, only to rise in the first week of the following year.

1.3.5.1.4. Anomalies Related to Holiday

According to Pelenk (2019; 34), in many countries, share returns give investors a higher profit than the average return on trading days before vacations. Holiday anomalies include weekend holidays of the stock exchange as well as religious and official holidays as pre-and post-holiday intervals.

In terms of company size, the holiday impact is extremely important; pre-holiday returns are substantial for small firms, while post-holiday returns are significant for large companies, and post-holiday returns are very high indifferent of a specific day of the week (Pettengill and Jordan, 1988, p. 50).

When studies and research are analyzed, it is noticed that variations in stock price movements are not counted in the anomalies linked to holidays when the stock market is closed for any exceptional reason. Namely, the scenario relating to stock price fluctuations during unexpected holiday periods is not counted in the holiday anomaly (Barak, 2006, pp. 147- 148).

1.3.5.2. Sectional Anomalies (Cross-Sectional)

Sectional anomalies refer to the presumable superior performance of specific shares relating to others (Banz, 1981). For instance, the well-known size anomaly states that firms with a smaller market capitalization outperform stocks with a greater market capitalization in the future. The sectional anomalies are discussed under three subsections: (i) the size effect, (ii) the price to earnings ratio anomaly, and (iii) the neglected firm effect.

1.3.5.2.1. Size Effect

Standard asset pricing models, which play a significant role in modern finance, assume that people are risk averse. Furthermore, the model presumes a positive relationship between the risk of an asset as well as its projected return. Nevertheless, Sharpe (1964), Lintner (1965), and Black (1972) found in their publications that the relationship between average returns and risk is just weakly meaningful (Schwert, 1983, p. 4).

As a result of this poor relationship, new benchmarks are started to be investigated. As a consequence of their investigations, Fama and French (1992) argue that not only beta value but also company size and book-to-market equity, account for the variance in cross-sectional anticipated returns. However, Banz (1981) and Reinganum (1981) were the first studies about the size effect in the early 1980s. Thereafter, the size effect has become a major study topic. According to Banz and

Reinganum (1981), small companies earn greater average returns than big companies. Namely, they claim that businesses with a high market value generate lower risk-adjusted returns.

1.3.5.2.2. Price to Earnings Ratio Anomaly

According to Bont and Thaler (1985), a price-to-earnings ratio anomaly occurs when equities with a low price-to-earnings ratio generate a better risk-adjusted return than stocks with a high price-to-earnings ratio. This occurs because firms with a low price-to-earnings ratio are typically underpriced. After all, investors become pessimistic regarding their returns after a string of poor earnings or bad news. A firm with a high price-to-earnings ratio is likely to be overpriced.

Basu (1977) investigated the link between the P/E ratio and the performance of equities securities from 1956 to 1971. The researcher discovered that low P/E portfolios outperform high P/E portfolios in terms of absolute and risk-adjusted returns. Jensen, Sharpe, and Treynor's performance criteria are used to assess the performance of portfolios created by the author.

1.3.5.2.3. Neglected Firm Effect

Numerous studies show that equities that are less often suggested by specialists or have small trading volumes perform better than other stocks. This is known as the "neglected firm effect." Bauman conducted pioneering studies in this field in 1964 and 1965, demonstrating that unpopular stocks outperform popular stocks.

Karan (2000) examines the neglected firm effect by employing monthly data over the period 1996-1998 and categorizes equities as popular or ignored. Thereafter, he investigates the relationship between systematic risks and stock returns monthly by following the mentioned categorization. He discovers that disregarded firm equities are less prone to systematic risk than major corporation stocks. Another result is that investors who invest in neglected company stocks have greater risk-adjusted returns than those who invest in popular equities.

1.3.5.3. Support and Resistance Anomaly (Technical Anomaly)

Bodie et al. (2014), state that when the market has weak form efficiency, prices already available reflect prior information, and technical analysis is useless. As a result, the investor cannot outperform the market by generating more returns based on technical analysis and historical data. But Brock et al. (1992) show that the use of support and resistance points allows investors to earn greater profits which are called support and resistance anomalies. Pompian (2006) investigates the topic under the headline technical anomalies. Accordingly, support is the lowest position in the past, whereas resistance is the highest point in the past. The movements noticed at those points are critical. A new trend begins when a support point is broken downward. This scenario should be followed with a sell signal. If the price moves away from the support level, the negative trend will come to a stop. If prices break through resistance levels, the upward trend will continue. Price passing through resistance points is interpreted as a buy signal. When price reverses from resistance levels, the rising trend is considered to have failed.

1.3.5.4. Pricing Anomalies

According to Barberis et al. (1998), pricing anomalies are handled as extreme reaction and low reaction anomalies in two different ways.

1.3.5.4.1. Overreaction

Overreaction is characterized as when the average return after a series of good news announcements is lower than the average return after a series of bad news announcements (Barberis et al., 1998, p. 313). Stock price movements are influenced by a variety of variables. These price changes are heavily influenced by human psychology. Individuals might overreact or underreact more than expected in various circumstances. Likewise, investors in the stock market may respond to the market developments more than expected which is called overreaction. In other words, overreaction by investors to a stock leads stock prices to increase more than usual or fall more than usual (Hong et al, p. 294).

1.3.5.4.2. Under Reaction

The missing reaction anomaly happens when the stock market fails to reflect the expected increase as a result of positive news about a stock. When the situation is precisely the opposite, that is, when unfavorable news about the stock or the company does not result in a drop in share price, the same word, missing response anomaly, is employed. When there is a missing reaction, investors do not immediately respond to a new market or share condition. However, the situation improves in time. After a certain period, the stock price recognizes the value of the information and responds (Barberis et al., 1998, p. 311).

In addition to all anomalies listed in this sub-section, there are many abnormalities connected to the weather, human mental states, geomagnetic storms, and so on (Oran, 2008). To sum up, there is no doubt that these experimentally detectable abnormalities exist. Even Fama (1991) acknowledges the existence of these anomalies, despite their major role in the emergence of the efficient market hypothesis. The question is whether they arise as a result of market inefficiency or due to other problems and luck. Finding an anomaly that contradicts the efficient market hypothesis is easy. Nevertheless, it is quite difficult to explain why they arise. To explain the anomaly, the Prospect theory has been offered. Kahneman and Tversky (1979) suggest a view that attempts to describe anomalies in prospect theory through employing behavioural techniques.

CHAPTER TWO

BEHAVIORAL FINANCE THEORY, MODELS, AND INVESTOR TRENDS

In this chapter, the behavioral finance theory as well as its historical development, and investor trends in behavioral finance will be discussed in detail. Furthermore, in various models of behavioral finance, as well as we'll go through some of the most frequent kinds of cognitive bias that have an impact on how people act, think, and make decisions.

2.1. Behavioral Finance Concept and Its Historical Development

Behavioral finance is a field that combines behavioral and psychological theories with traditional financial and economic theories. Behavioral finance discusses the causes of various business anomalies, as well as the human errors that lead to such anomalies (Sing and Shivaprasad, 2018). In a broader sense, the failure of standard expected utility maximization of rational investors within the framework of efficient markets to explain a lot of empirical models has reasoned the rise of behavioral finance research. Behavioral finance seeks to solve these discrepancies by providing explanations based on human behavior, both individually and in groups (Kent and Nofsinger, 2010).

"Behavioral finance is commonly defined as the application of psychology to finance" (Pompian, 2006, p.4). Behavioral finance is concerned with the behavior of investors and how psychological factors affect stock prices. Behavioral finance substitutes normal people for rational people in standard finance. Rational people are those that are logical in their decision-making. As it is mentioned in the first section, normal people are not irrational. Indeed, we are mostly intelligent and usually normal-smart. But sometimes we are 'normal-stupid' (Statman, 2014, p.65). Normal humans are not entirely logical because they are persuaded by cognitive biases and heuristics during decision-making. It does not, however, imply that they are completely irrational (Statman, 2014). The theories of traditional finance assume that individuals are

rational beings and explain how they should behave according to profit maximization. Alternatively, behavioral finance studies how people behave in a financial setting. In a sense, we can say that it is the state of psychological tendencies in financial decision-making. The main research subject is the mechanism of action of psychology on finance. In other words, behavioral finance investigates the effects of emotional states and cognitive tendencies on financial decisions and the consequences of these interactions in financial markets (Nofsinger, 2018).

It is shown in another definition that behavioral finance is the study of how psychology impacts financial decisions in households, markets, and organizations (Bondt et al., 2008, p.8). Recent studies on behavioral finance theory also explore the culture, sense of fairness, social responsibilities, and other emotional desires in investor decisions (Statman, 1999). According to Singh et al (2021:3), the fundamental weakness of traditional finance is the assumption of rationality, which results in market anomalies. Examples of market anomalies include the dot-com bubble (1999) and the real estate bubble (2006), which contributed to the subprime mortgage crisis. The result of these bubbles points out that investors are not always impartial, and behavioral variables or prejudices might influence an investor's investment decision.

Though behavioral finance is a new discipline, financiers and economists have discussed individual investors, psychologies, and the behavioral patterns individuals exhibit when making financial decisions in their books and work in the past. The imperative works of Adam Smith sparked research in this area in the 18th century. ‘‘The Theory of Model Sentiment” (1759) and ‘‘Wealth of Nations” (1776) are two significant books (Singh, 2021, p.3). Although this research stressed the role of psychology in economic behavior, his work was met with a lot of criticism. With the contribution of psychologists in the 1960s and 1970s, a new era in finance began, and the study of heuristics discovered several biases by analyzing economic decisions (Chetna, 2014). Nobel laureates Kahneman and Tversky are commonly referred to as the "fathers of behavioral finance." They are recognized for their groundbreaking work in the field of behavioral finance. They began their research in 1971 with a paper titled "Belief in the Law of Small Numbers." They published a paper titled “Judgement Under Uncertainty: Heuristics and Biases” in 1974 (Singh et al., 2021, p.3). Another

author who contributed to behavioral finance is Richard H. Thaler. He supported the theory of Kahneman and Tversky in his works and contributed to the development of behavioral finance (Karan, 2004).

2.2. Relationship of Behavioral Finance with Other Sciences

Behavioral finance discussions exist in the literature in a variety of forms and perspectives. Many researchers and authors have contributed their opinions and definitions of the topic. According to Ricciardi and Simon (2000), behavioral finance is about creating robust explanations for psychology, sociology, and finance. When dealing with behavioral finance, traditional finance remains the focal point; nevertheless, the behavioral components of psychology and sociology are important parts of this field of study (Ricciardi and Simon, 2000, p.27)

Behavioral finance studies the behavior of financial markets, drawing on the sciences that study human behavior. Behavioral finance, which was established to clarify how emotional and cognitive errors impact investors and decision-making processes, uses cognitive psychology, social sciences, and anthropology to clarify irrational investor behavior that standard rational models lack. Furthermore, behavioral finance is a relatively young but fast-growing topic that attempts to explain how people's psychology, thinking, and behavior influence their financial decisions by combining traditional economics and finance with cognitive and behavioral psychology. Behavioral finance, as a sub-discipline of behavioral economics, applies the findings from psychology and sociology to finance theories (Baltussen, 2009, p.2).

Psychology, social psychology, anthropology, and sociology disciplines connected to behavioral finance, and the impacts and relationship of these disciplines on behavioral finance will be discussed in the rest of the research.

2.2.1. Psychology

Behavioral finance explores the role of psychology in investors' decision-making processes and its impact on financial markets, not accepting the assumption that individuals are completely rational. Based on psychology, behavioral finance shows that individuals are irrational. Moreover, many studies have shown that this

situation is continuous rather than valid in certain periods and affects all segments of society regardless of their demographic characteristics. The first study that adapted the discipline of psychology to stock markets was Selden's book "Psychology of Stock Markets" published in 1912 (Ricciardi and Simon, 2000, p.26).

There are different definitions for this branch of science, which is a part of behavioral finance. Psychology is defined as "the study of behaviors and mental processes with scientific methods" (Atkinson et al., 1983, p.8). Ricciardi (2005, p.12) defines psychology as a branch of science that studies behaviors and cognitive processes and how these methods are affected by physical, mental, and external factors.

Psychology and behavioral finance are related to thinking processes and cognitive psychology. The study of how psychology influences financial decision-making and financial markets are known as behavioral finance. Since psychology studies human judgment, attitudes, and health, it can provide valuable information about how human activities vary from conventional economic assumptions (Shefrin, 2001).

2.2.2. Social Psychology

People's desire to live together inherently or because of a need has been a fact since ancient times. The needs of the established communities have revealed that social conditions have a great impact on human behavior. The science of human behavior is commonly known as psychology, and social psychology is the branch of psychology that deals with human interaction. The establishment of general laws by systematic observation is regarded as one of science's important goals (Kenneth, 1973, p.309). In other words, psychological human behavior is described as an individual's acts, emotions, opinions, memories, and inferences that are influenced by culture, society, and personality. The scientific field of social psychology, on the other hand, is characterized as the study of the existence and causes of individual actions, feelings, and thinking in social situations (Nordin et al, 2012, p.352). Social psychology also supports the argument that behavioral finance claims that people do not always act

rationally. At this point, behavioral finance and social psychology are associated with each other (Kiyilar and Akkaya, 2016, p.117).

2.2.3. Sociology

Sociology is made up of two words: “socius” which means companion or partner, and “logos”, which means science or study. According to Harry M. Johnson, sociology is the science that studies social groupings (Rao, 2012, p.16) while Jay Gabler (2010, p.2), describes sociology, briefly, as the scientific study of society. Sociologists employ scientific techniques and methodologies to investigate why and how people behave the way they do when they make contact in groups. The scope of sociological study is quite a broad field, spanning from the examination of random street encounters to the exploration of global social dynamics (Giddens, 2006, p.4).

Subash (2012, p.10) emphasizes that financial decisions are a consequence of social interaction rather than being made in isolation. This statement counters the underlying premise that individuals make decisions free of outside influences. In this context, the social structure based on different behavior patterns, differences of opinion, and opinions that arise with culture, status, role, social class, groups, and social institutions establish a link between sociology and behavioral finance (Ricciardi and Simon, 2000). As Schiller has underlined in his work, behavioral finance should be evaluated from a broader social science perspective, including psychology and sociology” (Shiller, 2003, p.83).

2.2.4. Anthropology

The relationship between anthropology and behavioral finance is due to the science of economic anthropology, where anthropology unites social and economic life. Economic anthropology is divided into sub-branches such as realism, culturalism, and formalism (Kiyilar and Akkaya, 2016, p.119). Economic anthropology is the study of human economic activity in its broadest historical, spatial, and cultural contexts. It has a complicated association with economics, a field of which it is extremely critical (Hann and Hart, 2011). Economic anthropology explores also the social dynamics of

financialization, as well as the role and centrality of financial markets, structures, beliefs, and behaviors in the global social economy and daily life (Ho, 2015).

2.3. Behavioral Finance Theories and Models

Various models have been developed by many scientists within the scope of behavioral finance. These developed models generally try to reveal that the market is affected by the investors' behavior. These models are built on the assumptions based on the results obtained from the experimental studies of psychology about the investors' behaviors. In this section prospect theory and various models of behavioral finance are discussed in the light of the behavioral finance theories and models.

2.3.1 Prospect Theory

Prospect theory is about making decisions under the condition of risk. Sometimes decisions become riskier when it is impossible to predict the repercussions or results of events with clarity. On the other hand, individuals should make a lot of decisions in conditions of uncertainty which increases the risk (Rose, 1998, p.15). As both a normative and descriptive model of rational choice, expected utility theory has been less successful at predicting how people will act when they are exposed to risk. This has led to the rise of Prospect theory as a major alternative to expected utility theory. The expected utility theory presupposed that individuals' attitudes toward risk are constant, unaffected by the way a specific decision is stated (or framed), and unaffected by the decision maker's mood or under different circumstances. Nevertheless, observations have shown that decision-makers frequently violate the assumptions of the expected utility theory. For example, terminal cancer treatment with a 1 in 10 chance of saving the patient's life is identical to cancer treatment with a 9 in 10 chance of death (assuming people can only live or die), and yet terminally ill cancer patients themselves would likely be more interested in pursuing this treatment when described as the likelihood of living than when described as the likelihood of dying.[3] Such inconsistencies in real life which cannot be explained with the

[3] Psychology, "Prospect Theory", 2022, https://cutt.ly/jG6L0Ew

assumptions of the expected-utility theory led some researchers like Kahneman and Tversky (1979) to develop some theories like Prospect Theory as an alternative explanation of decision making under risk (Levy, 1992, p.174). Since that day, the Prospect Theory has begun to get attention and increased its popularity as one of the cornerstones of the literature (Levy, 1992, p.171)

2.3.1.1. The Editing and Evaluation Phase

Prospect Theory is established for basic prospects with monetary outcomes and stated probabilities. The theory involves two stages in the decision-making process: an initial editing phase and an evaluation phase (Kahneman and Tversky, 1979, p.274). The editing stage is about making a preliminary study which includes the simplified representation of these prospects. Editing involves some mental operations which simplify the decision-making problem by considering the possible outcomes and related probabilities. Coding, as the first step of the editing process, includes the establishment of a reference point and framing of outcomes as deviations (losses or gains) from that reference point to understand one's attitude toward risk. Simplification includes rounding off the probability of outcomes to zero, which might disrupt calculations of expected utility. Detection of dominance, including discarding extremely unlikely outcomes by rounding their probability, includes the search and elimination of dominated alternatives. The determination of the probabilities associated with identical outcomes and the segregation of a riskless component of a prospect from a risky component are other steps in the editing phase (Kahneman and Tversky, 1979, p.274).

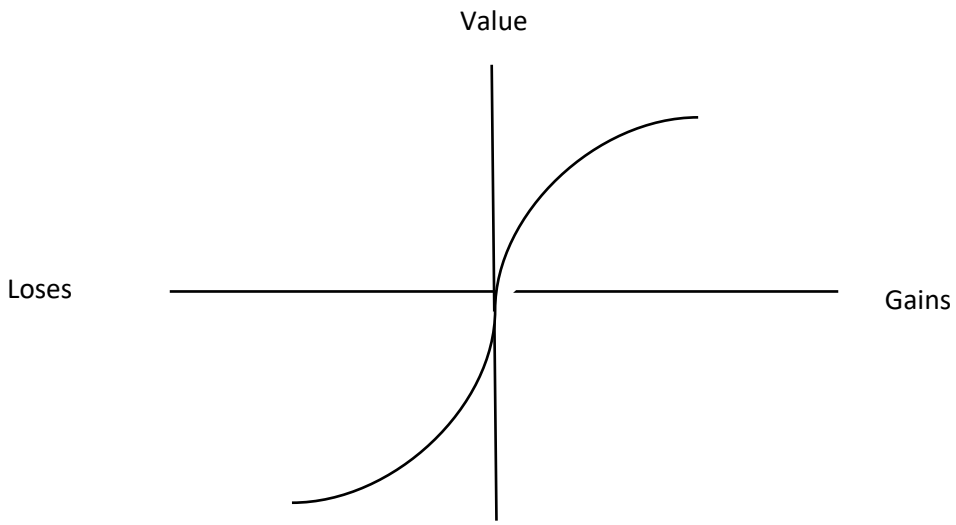
In the evaluation stage, the edited prospects are evaluated and the one with the highest value is chosen based on two functions, namely the value function and the weighting function that are used to compare prospects (Levy, 1992).

2.3.1.1.1. Value Function

There are three critical aspects of the value function. Firstly, the value function is defined based on the deviations from the reference point. To put it another way, value is assigned to changes in value rather than to absolute value in this context.

Nearly no attribute can be judged in isolation; rather, it can be judged in relation to something else. For example, a person is tall solely in comparison to those who are shorter. Or a person is happy just in comparison to others who are unhappy. Similarly, prospect theory estimates that the value assigned to the option is established only by comparison with other options, and the option utilized in this comparison is therefore of crucial significance. Winning an all-expenses-paid trip to Florida might sound wonderful compared with an all-expenses-paid trip across the street. But that trip to Florida might not sound nearly as wonderful when compared with an all-expenses-paid trip to Fiji. In prospect theory, this comparison is referred to as a reference point, and the value of an object is defined by the difference in value between the object under examination and that reference point, rather than by the object's absolute value. This means that people might accept an option in one situation that they reject in another. (Kahneman and Tversky, 1979, p.279)

Second, the value function is S-shaped and predicted to be concave for gains above the reference point and convex for losses below the reference point (Kahneman and Tversky, 1981, p.451). A typical S-shaped value function is presented in Figure 2.1.



Source: Kahneman and Tversky, 1979.

Figure 2. 1: S-shaped value function

To put it more clearly, the graph's right-hand side depicts the realm of gains, while the graph's left-hand side depicts the domain of losses. The slope indicates the curve's sensitivity to change; it is most sensitive to change nearest the origin and gradually becomes less sensitive as it advances away from this reference point. Thus, for any given change, there are more impacts closer to the starting point than farther away from it. (Rose, 1998, p.15). For instance, the difference between winning $5 versus $10 appears rather distinctive, but winning $1,000 and winning $1,005 seems relatively small, even though the objective difference ($5) is identical. The S-shaped curve, in theoretical terms, suggests that individuals are risk-averse in the domain of gains and risk seekers in the domain of losses; this is the core of prospect theory. (Levy, 1992, p.171).

Thirdly, the value function is steeper for losses than for gains (Kahneman and Tversky, 1979, p.279). This implies relative loss aversion. In other words, a loss is more painful than a gain of the same magnitude. The pain of losing money is often higher than the joy of winning the same amount, as seen by people's unwillingness to take fair bets on a coin flip (Kahneman and Tversky, 1981, p.451). For instance, losing twenty dollars hurts more than finding twenty dollars gratifies. This expresses loss aversion by implying that the marginal utility of gains diminishes quicker than the marginal disutility of losses. Figure 1 illustrates a common S-shaped value function. (Levy, 1992, p.171).

2.3.1.1.2. Weighting Function

The weighting function is the second component in the evaluation phase of Prospect Theory. In the weighting function, each outcome is given a decision weight. The weight does not equate directly to the standard notation of probability (Rose, 1998, p.29).

The weighting function has the following characteristics: Firstly, the function does not operate consistently near the endpoints, implying absolute certainty on one hand and absolute impossibility on the other. As a result, the function is defined as (1) = 1 and (0) = 0 (Kahneman and Tversky, 1981, p. 451). To put it another way, individuals have a difficult time dealing with probability at extreme ranges. They may

take occurrences that are extremely probable but uncertain as certain, or they may take situations that are highly unlikely as impossible (Rose, 1998, p.29).

The second critical component of the weighing function is that those with low probability are exaggerated, and those with high and medium probabilities are subjectively understated (Kahneman and Tversky, 1981, p.451). To put it another way, occasions that are not judged to be very likely are considered more important than they deserve. This occurs, for instance, when individuals assign a high level of risk to an environmental toxin that has a very low possibility of causing harm to any given individual (Rose, 1998, p.31).

In this context, Prospect Theory may explain the background of several regularities that appear as anomalies from the perspective of traditional economic theory like people's willingness to take out expensive small-scale insurance when buying appliances. In summary, Kahneman's and others' empirical work demonstrates various regularities in choice under uncertainty, and the concepts integrated with prospect theory contribute significantly to explaining these regularities. Kahneman's research results have given economics researchers new ideas, and they have been important in the development of subsequent models because they have shown how people may be irrational in real life. Prospect theory has made significant strides in providing a more accurate description of individual behavior under risk than expected-utility theory. It currently forms the foundation for the majority of practical empirical work in the literature (Kahneman and Smith, 2002).

2.3.2. Representative Agent Model

According to this model, the representative investors are subject to two sorts of judicial errors: conservatism and representativeness. Conservatism is the investor's unwillingness to modify their old thoughts and opinions in the face of fresh facts and knowledge. Representativeness is that when investors make decisions, they have a propensity to exaggerate the most noticeable and unusual components as well as to ignore statistical characteristics of the distribution population (Barberis, et al,1998).

People subject to conservatism might ignore the full information content of an earning perhaps because they still cling to their prior estimates of earnings. Particularly, people tend to underweight beneficial statistical evidence relative to the less useful evidence used to form their priors. Likewise, individuals might be categorized as being overconfident about their prior information (Barberis, et al,1998, p.315).

As said previously, representativeness is another critical factor. According to Tversky and Kahneman (1974, p.33): “A person who follows this phenomenon evaluates the probability of an uncertain event, or a sample, by the degree to which it is (1) similar in its essential properties to the parent population (2) reflects the salient features of the process by which it is generated.” For instance, if a comprehensive description of an individual's personality fits the subject's interactions with members of a specific profession, the subject tends to considerably overestimate the actual probability that the given individual is a member of that profession.

Conservatism has substantial weight but low strength, and individuals are unimpressed by the low strength and respond only minimally to evidence, although the evidence's weight calls for a more significant reaction. When the evidence is strong but of low weight, on the other hand, overreaction happens in a way that is consistent with the evidence's representativeness. Indeed, representativeness can be understood as a tendency to pay undue attention to the strength of highly salient evidence despite the fact that it is given a relatively low weight in the analysis.

2.3.3. Model of Daniel, Hirshleifer and Subrahmanyam

This approach is founded on investors’ overconfidence and changes in confidence as a result of biased self-attribution of investment outcomes. The concept of investor overconfidence is based on a wide body of research from cognitive psychology studies and surveys demonstrating that individuals mainly overestimate their abilities in a variety of contexts. If an investor overestimates her ability to generate information or to identify the relevance of existing data that others neglected, she will underestimate her forecast errors. It is likely that if she is more overconfident

about signals or assessments with which she has a greater personal involvement, she will also tend to be overconfident about the information she has generated but not about public signals. Thus, the approach defines an overconfident investor as one who overestimates the precision of her private information signal but underestimates the precision of information signals publicly received by the whole market (Daniel et al., 1998, p.1841).

The model suggests that the overconfident-informed investor overweighs the private signals relative to the prior, causing the stock price to overreact. When public information signals arrive, the inefficient deviation of the price is partially corrected, on average. On subsequent dates, as more public information arrives, the price, on average, moves still closer to the full-information value. Thus, a central theme of this model is that stock prices overreact to private information signals and underreact to public signals (Daniel et al., 1998, p.1841). This theory is based on the premise that an important class of mistakes by investors involves the misinterpretation of genuine new private information. Thus, our model endogenously generates trading mistakes that are correlated with fundamentals (Daniel et al., 1998, p.1865). The model is based on overconfidence about private information, the model predicts that return predictability will be the strongest in firms with the greatest information asymmetries. This also implies greater inefficiencies in the stock prices of small companies (Daniel et al., 1998, p.1867).

2.3.4. Interactive Relationships Model between Heterogeneous Investments

While this model serves the same function as the previous two models, it focuses on the interactive relationship amongst heterogeneous investors rather than describing representative investor behavior. To put it widely, less of the action in our model comes from particular cognitive biases that we ascribe to individual traders, and more of it comes from the way these traders interact with one another. According to the model, the market has two sorts of investors: "news-watchers" and "momentum investors". Neither type is fully rational in the usual sense. Rather, each is boundedly rational, with the bounded rationality being of a simple form: each type of agent is

only able to “process” some subsets of the available public information (Hong and Stein, 1999, p. 2144). The news-watchers make forecasts based on signals that they privately observe about future fundamentals; their limitation is that they do not condition on current or past prices. Momentum traders, in contrast, do condition on past price changes. However, their limitation is that their forecasts must be “simple” (i.e., univariate) functions of the history of past prices (Hong and Stein, 1999, p. 2144-2145). When only news-watchers are active, prices adjust slowly to new information—there is underreaction but never overreaction. However, when momentum traders are included, underreaction is eliminated via arbitrage. After a certain point, momentum traders' attempts to profit from underreaction result in overreaction (Hong and Stein, 1999, p. 2145).

2.4. Investor Trends in Behavioral Finance

People, as discussed in previous sections, have an eagerness to be rational and assume that they make rational decisions. Nevertheless, there are several observations of abnormalities that need to be explained. Behavioral finance is primarily concerned with the identification and interpretation of abnormalities in stock markets, corporate settings, other financial markets, and, more generally, all financial decision-making scenarios. Although the sociological and psychological processes which influence people's behaviour are frequently explored in the field of behavioural science, the significance of these fields in finance and economics is relatively recent. Human behavior is usually ambiguous and unexpected. Nonetheless, using tests and observations, behavioral finance experts discovered a plethora of biases that influence human behavior. But detecting and classifying the biases that lead to erroneous investing decisions by investors is exceedingly challenging. Biases are systemic mistakes in judgement made by humans when making decisions (Kahneman et al., 1998, p. 2).

Even though there are different elements and terminology in the related articles regarding how persons are impacted in general in decision making and might make mistakes, Hirshleifer established a categorization and investigated these errors and impacts under four headings. According to Hirshleifer, biases that influence investor

behavior are divided into four categories as (i) self-deception, (ii) heuristics, (iii) emotions, and (iv) social interactions (Oran, 2008).

2.4.1. Self-deception

Self-deception refers to a person's inclination to believe that he or she is more talented, wiser, or better than others. This form of prejudice is caused by learning constraints, despite economists' beliefs that individuals would behave rationally since they have learned from prior failures; yet they do not recognize them as mistakes. The discoveries of self-deception may be classified into the following categories as (i) overconfidence, (ii) confirmation bias, (iii) hindsight bias, and (iv) conservatism bias (Montier, 2002, p.2):

2.4.1.1. Overconfidence

Individuals have overconfidence in their talents. Individuals are overconfident, according to one of the most convincing findings in the psychology of judgment. Overconfidence can appear in a variety of ways. Individuals overestimate the dependability of their knowledge as one expression of this fact. When individuals declare they are 90% certain that an event will occur or that a claim is accurate, they may only be true 70% of the time (Thaler and Bondt, 1995, p.389). Likewise, the confidence boundaries elicited are so narrow. Individuals also tend to overestimate their abilities. One well-known study is that 90 percent of Swedish car users count themselves as 'above average.' (Svenson, 1981, p.146). Not just drivers, but also investors, are overconfident. Investors, particularly poorly educated and inexperienced ones, frequently overestimate their ability to estimate securities as they do not recognize their actual capacity; additionally, they gain information from previous experiences as well as prefer to credit their ability for profitable investment and then become overconfident (Gervais and Odean, 2001). Furthermore, Barber and Odean (2001) discovered males trade more and get lower returns because they are more confident in their talents rather than women, particularly when making financial judgments (Barber and Odean, 2001, p.261).

Additionally, overconfidence impacts investors' risk perception and encourages them to underestimate risk for two main reasons. Firstly, they prefer to acquire smaller and newer securities with greater risks, and secondly, they construct undiversified or under diversified portfolios (Nofsinger, 2018). Similar results can be found for other characteristics: well almost all individuals believe they are above average in their capacity to get on with others. The degree of overconfidence varies across domains, which is a specific finding relevant to finance. Individuals are more confident in their forecasts in sectors where they have self-proclaimed competence, holding their real predictive skills constant (Bondt and Thaler, 1995).

2.4.1.2. Confirmation Bias

Most individuals dislike being mistaken since it is difficult to acknowledge. As a result, they are voluntarily and intentionally seeking details that support their thoughts, points of view, and estimates. This need for agreement is accepted as confirmation or a confirmatory bias which helps individuals feel more comfortable hearing their thoughts verified by others (Montier, 2002). Individuals seeking confirmatory information prioritize the correctness and dependability of confirming evidence to safeguard their self-esteem. Confirmation bias causes overconfidence and partiality toward beliefs which confirm our own (Rabin, 1998, p.26). According to Lord et al. (1979), individuals who have strong opinions on complicated social issues are more prone to handle empirical data in a biased manner. Individuals accept evidence that supports their position, but they question evidence that contradicts it. According to the authors, individuals prefer to analyze later facts to retain their previous ideas. Individuals tend to recall the strengths of confirming evidence and the deficiencies of disconfirming evidence throughout this biased assimilation process. The intricacy of information is reduced as a result, and just a few positive impressions are retained. Specifically, data is handled in a biased manner to retain individuals' initial views.

Individuals disregard or underweight information that affects their self-esteem as a result of confirmation bias. Individuals, for example, are hesitant to sell their losses because it demands them to recognize that they made a mistake, which reduces

their confidence. Likewise, investors generally prefer opinions that confirm their previous judgments. Individuals also filter away information that suggests their previous selections were incorrect (Daniel and Titman, 1999, p.29).

2.4.1.3. Hindsight Bias

Hindsight bias is the propensity of individuals, with the advantage of hindsight after an occurrence, to incorrectly think that they forecasted the outcome of that situation in the beginning (Pompian, 2006, p.200). The "I knew it all along" effect is a term used to describe this phenomenon (Hawkins and Hastie, 1990). The use of almanacks causes the hindsight effect (Christensen and Willham, 1991). Because it is simple to look back in time and believe that a given event, such as a football game, a political election, an economic crisis, market bubbles, and so on, might have been predicted (Montier, 2002).

This bias was initially asserted by Baruch Fischhoff. The author explicated hindsight bias by noticing: As reporting on the occurrence of a result grows, so does the perceived possibility of that outcome occurring. Individuals who get information regarding the result are unaware that their view has shifted. When these two elements combine, hindsight bias occurs, and individuals tend to overstate the strength of their prior information. Furthermore, individuals tend to forget their beginning mistakes (Fischhoff, 1975).

According to Kahneman and Riepe (1998), hindsight mistakes are in the following ways: Since hindsight bias creates the false impression that demonstrates the world is more foreseeable than it is, it tends to enhance overconfidence. Many economic specialists' claims that they can forecast crises before they occur, or many market experts' remarks on why the market behaved as it did within a minute from the closing of the share market, are widely known instances of hindsight bias (Kahneman and Riepe, 1998, p.55)

2.4.1.4. Conservatism

The conservatism bias, often defined as the status quo trap, expresses investors' propensity to update their opinions too slowly in reaction to new facts (Barberis et al.,

1998). In other words, conservatism bias causes investors to underreact to new information because they want to preserve their prior estimates or assumptions. The conservative prejudice is at odds with the representativeness bias, which causes individuals to overreact to new information. Individuals may display both prejudices. Individuals exaggerate the most noticeable and unusual components if new information is representative of an underlying model, according to representativeness bias. Nevertheless, if a representative link does not exist, conservative bias reigns supreme and new evidence is overlooked. Individuals remain dependent too heavily on previous views (Ritter, 2003).

We may see conservatism bias in many parts of life as well. For instance, bureaucracies in certain nations fear taking action because the governments may be held accountable afterward. No one can criticize them for doing nothing if they stay conservative and protect the status quo. Furthermore, family men typically prefer to stay conservative and maintain the status quo to escape the burden of making critical decisions for their children's future, particularly when there are several options. Investors, like family men, frequently avoid altering their financial selections since there are too many investment possibilities to consider, and evaluating them requires additional effort (Nofsinger, 2005). Conservatism bias is highly related to confirmation and hindsight biases.

2.4.2. Heuristics

Heuristics are shortcuts that are utilized to lessen mental exertion to simplify complicated activities and make decision-making easier (Tversky and Kahneman, 1974). For instance, when faced with N possible investment opportunities, investors can use the 1/N rule to distribute their resources equally among them, or they might choose to search for prior performance shortcuts as an investment approach (Ritter 2003, p.431).

Aronson and Aronson (1992) identify the following situations that prompt humans to utilize heuristics; (i) when a person is overloaded with information that gets more difficult to comprehend, (ii) when there isn't sufficient time to think about an issue, (iii) when a person does not want to think about happenings that are dependent

on chance, (iv) when a person has insufficient information about the issue on which a decision is made.

In the next section of the task, we will define the most common heuristics in these headings; (i) mental accounting, (ii) familiarity bias, (iii) availability heuristics, and (iv) loss-aversion.

2.4.2.1. Mental Accounting

Mental accounting is an economic notation developed by Thaler in 1980, and it is one of the elements that influence individuals' behavior. Individuals prefer to split their existing and future assets into distinct pieces as a result of this prejudice. In other words, mental accounting is a collection of cognitive operations that people employ to organize, assess, and keep track of their financial actions on a daily, weekly, or monthly basis, and that might impact their decisions (Thaler, 1999b, p. 183). Individuals occasionally separate decisions that should conceptually be merged. For instance, many people have separate household budgets for food and entertainment. They will not eat lobster or shrimp at home, where there is a food budget, because they are considerably more expensive than a fish dish. They will, however, order lobster and shrimp in a restaurant, although the cost is far more than a plain fish supper. They might save money if they instead cook lobster and shrimp at home and go to a restaurant to eat plain fish. They prefer to restrict their food at home because they think about restaurant meals and food at home separately (Ritter, 2003). If we give an example from the investors, imagine an investor who owns 1000 shares of two stocks, each of which is now trading at $10 per share. One stock was acquired for $5, while the other was purchased for $13. If the investor considers selling the stocks separately, he may be hesitant to sell the loser due to loss aversion, but if the two transactions are merged, the investor a net benefit, and no loss need be felt (Bondt and Thaler, 1995, p.391).

According to Thaler (1999b) mental accounting is divided into four categories as (i) how financial decisions are made and assessed; (ii) how consequences are viewed and experienced, (iii) how activities are distributed to particular accounts, and (iv) how frequently accounts are evaluated (Thaler, p.184).

A rational decision-maker handles diverse amounts of money differently based on where they are mentally classified. The approach will differ depending on how the money was earned (work, inheritance, or gambling) and how it will be spent (necessities, amusement). When mental accounting is combined with other biases (representativeness, overconfidence), investors perceive risk incorrectly and may diversify insufficiently. Investors are exposed to extreme risks, limited returns, and even losses in the end. Mental accounting could cause investors to assess their investments on different accounts. This may lead to investors overlooking positions that are offset or correlated across accounts (Thaler, 1999b).

2.4.2.2. Familiarity

According to portfolio theory, everyone should engage in all security markets. Many investors, though, continue to overlook significant asset types. Familiarity effects may contribute to nonparticipation (Hirshleifer, 2001, p.1562). Familiarity bias is when investors hold a portfolio biased toward “familiar” assets compared to an unbiased portfolio derived from a theoretical model or empirical data (Baker and Nofsinger, 2010, p.278).

When you're familiar with something, you have a warped perspective of it. Fans of a sporting team, for instance, believe their team has a better probability of winning than non-fans. Investors who are prone to these biases may prefer to invest in companies that are regularly mentioned in the media or recommended by brokerage firms over others.

Investors look positively at investments that they are familiar with. They assume that known assets will provide better returns and lower risk than unfamiliar investments. Investors are subject to a strong tendency to invest in securities based in their home nation and their local area. For instance, Americans predict that the US stock market will do better than the German stock market next year. Simultaneously, Germans think otherwise. Employees feel that their employer's stocks are a safer investment than a diverse stock portfolio and that it has a low-risk profile (Nofsinger, 2001, p.120).

According to Gadarowski (2001), investors who purchased stocks with the most news publicity showed an underperformance in their investment decisions in the following two years. It is observed that investors are more confident and optimistic about trading the stocks that they are familiar with whereas they are pessimistic about stocks.

When evaluating assets, the brain frequently takes the familiarity shortcut. This might lead you to over-invest in stocks that you are most familiar with, such as your employer's stock. In the end, this results in under diversification. You allocate too much of your wealth to your employer, local companies, and domestic stocks (Nofsinger, 2001, p. 120).

2.4.2.3. Availability Heuristics

The ease with which things come to mind is referred to as the availability heuristic, and it is closely linked to attention and experience. Assets that are easier to remember are evaluated to be more prevalent because more prevalent items are realized or reported frequently. Salience eases the remembering of the instances. The effect of witnessing a burning house, for instance, is likely to be higher than reading about a burned house in the newspaper (Tversky et al., 1973).

Likewise, skewed media reporting that increasing attentional bias may cause people to make different decisions. According to research, it is seen that statistically common death reasons are overlooked in the daily paper news whereas disastrous incidents such as fires, drownings, tornadoes, homicides, and accidents were reported disproportionately. Notwithstanding diseases take 100 times as many lives as do homicides, there are around three times as many publications about killings as there are about diseases (Slovic et al., 1980, p.185).

The implications of this prejudice on investor investment decisions were noticed by Pompian (2006). He describes how investors would make investment decisions based on information that is readily available to them, rather than conducting a study to ensure that the investment they have chosen is a solid one. In addition, investors may make investment decisions based on categorical classifications stored

in their minds. As a result, additional categories will be difficult to remember and will be overlooked (Pompian, 2006).

2.4.2.4. Loss-aversion

A forceful gut instinct about preferences is that individuals treat gains and losses differently, and losses, especially, loom larger than gains (Bondt and Thaler, 1995, p.391). This instinct was explained by Markowitz [1952] — who proposed semi-variance could be a better measure of risk than variance — and was included in the prospect theory of Kahneman and Tversky, a descriptive theory of decision making under uncertainty. Changes in wealth, rather than levels, are the carriers of value in prospect theory, and negative developments are weighted more strongly than positive changes (Bondt and Thaler, 1995).

Concerning a gamble from which you can win $200 and lose $100 at the same possibilities. 42.86% of ordinary investors and 37.83% of institutional investors do not want to participate. But, when the repeat number of gambles is increased to 100 times, 88.92% and 91.89% of investors want to conduct the gamble.

The above comparison demonstrates the psychology of loss aversion. Loss aversion, as described by Hirshleifer (2001), is the phenomenon in which individuals tend to be averse to even little risks relative to a reference point, implying a twist in the utility function. This might be due to the cognitive efficiency of mentally discretizing continuous variables, as seen by phrases like "gain," "break-even," and "loss," which emphasize the difference between a gain and a loss. Loss aversion, according to Barberis and Huang (2001), can lead to excessive stock price volatility.

In summary, loss aversion is a significant bias in the day-to-day decision-making process. Loss aversion reflects heuristics in human psychology which support status quo bias thereby making investors resistant to changes. Thinking about change makes one focus on losses instead of potential gains.

2.4.3. Emotional biases

Emotions likely play an important role in such traditionally rational evaluations as time and risk choice and in all or most of the impacts described in the previous sections. Though it is so difficult to define which emotions might influence investor behaviors and through which channels (Hirschleifer, 2001, p.1551), there is a fact that it is impossible to decide without emotions (Damasio,1994, p.331). In this context, the regret and ambiguity aversion aspects of emotion will be discussed in the following two sub-sections.

2.4.3.1. Regret Aversion

Pompian defines regret as the feeling of deep disappointment as a result of making incorrect decisions (Pompian, 2005, p.60). Even for individuals who have been educated to see the difference between bad decisions and bad outcomes, it is often difficult not to feel regret after a bad outcome. Regret becomes of interest to theorists if decision-makers take steps to avoid regret (Bondt and Thaler, 1995, p. 391). Regret theory may help to explain why, as mentioned in the section on loss aversion, investors defer selling equities that have decreased in value while they are selling stocks that have increased in value (Shefrin and Statman, 1994). The concept might be construed to mean that investors delay selling equities that have declined in value to postpone finalizing their mistakes and therefore avoid feeling regret. They sell equities that have gone up in price so that they do not have the regret not doing so before the stock falls.

When an investor sells a stock at a loss, they feel remorse, and when they sell it with a profit, they feel pride. The positive equivalent opposite of regret is pride. It is an ex-post feeling that the ex-ante decision turned out to be better than the disregarded alternative decision (Muermann and Volkman, 2007, p.5).

According to Shefrin and Statman (1985), the pursuit of pride and the battle to avoid regret generate a disposition effect that causes investors to realize gains and postpone losses. Pride and remorse are psychological variables that help people maintain the sensation of making good decisions while avoiding the emotion of making bad ones.

According to Nofsinger (2005), regret is the emotional sorrow that individuals experience when they understand that prior decisions were poor, whereas pride is the emotional satisfaction that people experience when they realized that a decision went well. Additionally, he explained how individuals might make poor judgments when they are influenced by sentiments of pride or remorse.

In summary, a people's emotional response to having made a mistake in judgement that results in an incorrect decision is called "regret." This investor behaviour may stem mostly from the fact that people dislike admitting their mistakes and making poor choices. Therefore, because they despise admitting their error, they attempt to avoid making decisions that could lead to regret

2.4.3.2. Ambiguity Aversion Bias

A common finding in the ambiguity literature is that individuals do not like uncertainties, as well as they are against to ambiguity, particularly when they do not have enough information, that is, they show an inclination to avoid unclear situations and inexplicit information. Furthermore, individuals interpret ambiguity as a source of risk but theoretically, the risk is not the same as ambiguity (Hirshleifer, 2001, p. 1550). Uncertainty is defined as the variance in the probability distribution of possible outcomes according to decision theories that distinguish risk and ambiguity (Camerer and Weber,1992, p.331). Unlike the risk, where there is enough information to infer a single probability distribution, ambiguity describes a situation where information is so insufficient that to predict numerous probability distributions have to predict (Camerer and Weber, 1992).

The propensity of people to hesitate when faced with ambiguity is known as ambiguity aversion bias. This bias describes the reluctance of individuals to gamble when the possibility distributions appear uncertainly (Pompian, 2006, p.129).

The first person to mention ambiguity aversion bias was Knight (1921). Risk, according to him, is a gamble with an exact probability distribution. Additionally, he mentions that "uncertainty" arises when the distribution of probable outcomes from a

gamble cannot be predicted. The author comes to the conclusion that individuals detest ambiguity more than risk (Pompian, 2006, p.129).

The most known distinction between ambiguity and risk has been shown by Ellsberg (1961). As illustrated by the Ellsberg paradox, when given the option of betting on a bucket with 50 red and 50 black balls and simultaneously a bucket with 100 red and black balls in unknown proportions (i.e., the probability distribution is uncertain), decision-makers prefer to bet on the precise bucket. (50 red and 50 black) Simply, the participants were aware of the contents of bucket one; they have a 50% probability of selecting black balls and a 50% chance of selecting red balls. They are confronted with a measurable amount of uncertainty (risk). Uncertainty is reduced due to the availability of information regarding the contents. The absence of knowledge concerning the contents of bucket two, on the other hand, creates uncertainty. As a result, the bulk of the players wagered on red or black balls from bucket one (Epstein and Schneider, 2004).

In prospect theory, ambiguity affects decision weights, which no doubt, in turn, influence the choices (Tversky, 1981). The ambiguity effect has a significant impact on investor choices; it raises risk premiums since a lack of knowledge is linked with a higher risk (Hirshleifer, 2001). Furthermore, individuals have a proclivity to purchase once positive news emerges and sell once negative news arises.

2.4.4. Social Interaction

Financial market participants must create an aspect on which to base their decisions and behaviors. According to Nofsinger (2005, p.157), social interaction creates a significant aspect of the behavioral and decision-making process. In this direction, individuals communicate with one another to gather information and views regarding a decision. The overall optimism or pessimism of society is conveyed through social interaction, which impacts all sorts of decision-makers, including financial decision-makers.

Furthermore, the study of Shiller and Pound (1989) provides empirical proof of the occurrence of social interactions between participants in the financial market.

The survey findings of Shiller and Pound (1989) point out that since investors lack any clear sense of objective proof regarding the values of speculative assets, their opinions about the values may exist through social interaction. Especially during the form of decision-making, investors are influenced by their colleagues' (Chang, 2012, p.1). Different sources of social interaction can be the reason for this influence. The fact is that people and investors interact in so many different ways that it's hard to put them into categories. However, herd behaviour is a common and accepted type of social interaction in markets (Oran, 2008).

In the next section, we will discuss herd behavior aspects of social interaction.

2.4.4.1. Herd Behavior

There are several economic and social contexts wherein our decision-making is influenced by what others around us are doing. The most prominent instances of this statement may be observed in our everyday lives. Mostly our preferences about shops and restaurants to visit or schools to attend are related to how popular they appear to be. Various reproductive decisions (how many children to have, whether or not to use contraception, etc.) are significantly impacted by what other individuals in the same region are doing, according to the research on fertility choices. That kind of impact is also when, for instance, researchers choose to work on a subject that is presently "hot." (Banerjee, 1992, p.797).

The main reason for the formation of such behaviors in humans is that they undergo a mistake known as herd behavior. Herd behavior is the phenomenon of people following a group of people for a certain amount of time, sometimes "even regardless of individual information suggesting something else" (Rook, 2006, p.75).

If we show an example of herd behavior, in 1995, two authors from the United States (US) covertly purchased 50.000 copies of a non-best-selling book. The book became popular on the New York Times bestseller list as a result of their purchasing activity. Notwithstanding the book's content being criticized, clients began to buy it, and it remained on the bestseller list (Bikhchandani et al., 1998, p. 151).

Even totally rational individuals can attend to herd behavior when they consider the decisions of others and even if they recognize that everybody else is behaving in a herd-like manner. This is a distinctive irrational behavior that demonstrates the psychology of investors who imitate others' financial decisions and place too much reliance on public opinion without taking into account their information. And, while this is rational on an individual level, it results in irrational collective behavior in a well-defined sense (Shiller 2000b, p.151).

According to Shleifer and Vishny (1992), the herd effect is when investors buy or sell equities at the same time as other investors. Also, Scharfstein and Stein (1990) state that herd behavior will affect the efficiency of the security market, causing the volatility of stock prices.

Hirshleifer et al. (1994) stated, "Herding refers to a situation in which, under specific conditions, many investors just focus on a subset of securities and do not consider other equities with identical external features."

In brief, it is highly frequent to find certain herd behaviors in history. Unarguably, individuals are not emotionless machines; in reality, they are subject to numerous physiological and psychological limits. One of these constraints is to imitate, which is both natural and instinctual.

CHAPTER THREE

RESEARCH METHODOLOGY

This section will inform about the research's purpose, design, hypothesis, and questions. At the same time, similar studies in the literature will be mentioned. In addition, the dataset for the study and the sample population will be introduced.

3.1 Purpose of the Research

As it is mentioned in the previous chapters, traditional finance is not concerned about the psychological and behavioral factors that are influencing individuals' financial decisions since the main assumption of the approach is the rationality of the financial investors. These psychological and behavioral factors which affect financial decisions define the research area of the behavioral finance approach. Since behavioral finance, as an interdisciplinary approach, has brought some innovative explanations for irrational financial decision-making, it has become one of the main research topics of researchers interested in this subject. The behavioral finance literature consists of many studies which investigate the financial decision-making processes according to factors like age, gender, income level, etc. based on behavioral biases. This study claims to bring a different perspective to the existing literature. The main aim of the study is to examine whether different behavioral biases, which are the subject of behavioral finance, show a difference in terms of individuals who get an economics or finance education and those who do not. The detailed survey of similar studies is as follows.

The studies in the literature can be examined under three categories: those that advocate the positive effect of economics education on financial decisions, those that argue that it has no effect, and those that provide mixed results.

Chen and Volpe (1998), as the pioneering study in this field, find out that individuals with limited financial knowledge frequently hold erroneous views about finances and make errors in financial decision-making. Hilgert et al. (2003) observe a positive association between financial knowledge and financial behavior as a concluding remark of the Survey of Consumer Finances. Clark et al. (2006) state that

financial education can produce substantially impact on how people plan their retirement by improving understanding of financial topics or by providing better options, such as new investment alternatives. Edmiston and Gillett-Fisher (2006) conclude that financial education leads to optimal financial behavior. According to Lusardi and Mitchell (2007), financial knowledge may be a proxy for an individual's cognitive ability. Bayer et al. (2009) find out statistically significant and positive effects of finance/economic education on individuals' financial behavior in workplaces. Bucher-Koenen and Ziegelmeyer (2011) indicate that people with a low degree of financial knowledge and cognitive ability are more likely to suffer from biases and make investment errors. According to Takeda et al. (2013), those who have a high level of investing literacy are less likely to be overconfident.

In contrast, Meza et al. (2008) conclude that financial education and training programmes have minimal effect on encouraging individuals to make better financial investment decisions. Willis (2008) takes a step further and suggests that economic education may even be counterproductive by leading to over-confidence or skepticism as two extreme feelings which affect the financial decision-process negatively. Fernandes et al. (2014) indicate that improvement in financial literacy has a small effect on investors' financial behavior. Sezer and Demir (2015) investigate the association between Turkish investors' financial literacy and behavioral biases. They observe no correlation between investors' behavioral biases and their level of financial literacy.

Atesh et al. (2016), as the only study which have reached mixed results, state that as financial literacy improves, over-optimism, confirmation, and representativeness increase; but overconfidence, cognitive dissonance, framing, and loss aversion biases considerably decrease. In this context, the study of Atesh (2016) has been the first study that disaggregated the financial decision process concerning behavioral biases. This approach provides a deeper understanding of the background of the financial decisions of the investors and their knowledge about finance.

To the best of our knowledge, this study is the first one that employs the disaggregation approach in the investigation of the impact of the behavioral biases on

the financial decision-making processes for the Turkish case with respect to economic education as a benchmark.

3.2. Research Design

As mentioned in the previous section, some psychological factors lead individuals to make irrational decisions while making financial investments. These psychological factors comprise various biases such as overconfidence, confirmation bias, hindsight bias, conservatism, mental accounting, familiarity, availability heuristics, loss-aversion, regret aversion, ambiguity aversion, and herd behavior. In this study, these eleven biases are examined according to their impact on the financial investment decisions of the individuals. In this context, these eleven biases are taken as dependent variables and tried to be examined according to the differences between those who have studied economics/finance and those who have not. The main target here is to investigate whether being educated in the fields of economics or finance will help to escape these biases.

3.3. Hypothesizes

Generally, behavioral finance aims to comprehend the behavior of investors in relation to investment decisions. The main difference is that traditional finance describes how investors, and the market should behave, whereas behavioral finance specifies how investors and markets behave.

Behavioral finance tries to understand how individuals decide, particularly separately and as a group. By gaining an understanding of how individuals and markets act, it may be possible to modify or adapt these behaviors to achieve better economic outcomes. To put it simply, the way investors think and feel impacts the way they behave when making investment decisions. These behaviors are unconsciously impacted by prior experiences, and even conscious investors can stray from logic due to their individual beliefs.

Generally, behavioral biases appear when investors are deciding on their investments. This research tries to demonstrate the implications of these biases in individual investors' decision-making processes as well as to determine if there is a

difference between investors who have studied economics/finance and the impacts of these biases. The null hypotheses of the research are as below:

H1: The overconfidence bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H2: The confirmation bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H3: The hindsight bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H4: The conservatism bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H5: The mental accounting bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H6: The familiarity bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H7: The availability bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H8: The loss-aversion bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H9: The regret aversion bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H10: The ambiguity aversion bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H11: The herd behavior bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

3.4. Data Collection and Population

In order to investigate the hypotheses mentioned in the previous section, data was collected through questionnaires from investors with and without economics or

finance education. The scope of the research covers only the province of Istanbul, which has a population size of 15,840,900 people according to the latest data obtained from TUIK. Since the subject of the study is adult financial investors, the total number of people over the age of 18 is taken as the basis of the research population. 11.659.132 of the mentioned population are those who are over the age of 18, according to the latest available data.[4] The sample size has been obtained by employing the Cochran (1963) formula, which shows the minimum number of samples for the research in the case of the population size is more than ten thousand and the population variance is unknown (Israel,1992, p.3).

$$n_0 = \frac{pq.Z^2}{e^2} \tag{1}$$

i. n_0 is the sample size
ii. Z^2 is the abscissa of the normal curve that cuts off an area α at the tails
iii. 1 - α equals the desired confidence level, e.g., 95%
iv. e is the desired level of precision
v. p is the estimated proportion of an attribute that is present in the population, and q is 1-p
vi. The value for Z is found in statistical tables which contain the area under the normal curve. E.g., Z=1.96 for a 95% level of confidence.

According to this formula, a sample size should be at least equal to 384, where the confidence level is 95%, the z-value for the confidence level of 95% is 1.96, desired level of precision is 0.05, and P is the proportion of the population that has the attribute in question and is equal to 0.5.

Before starting the survey, a pilot study was conducted with 50 individual investors residing in Istanbul for the survey created. The pilot study aims to test the

[4] Turkish Statistical Institute, 2022 Adrese Dayalı Nüfus Kayıt Sistemi, February 2022, https://cutt.ly/TG6KoaZ

reliability of the questionnaire and whether the questions are understandable by the participants, and if necessary, to make modifications to the relevant questionnaire before proceeding to the survey study. As a result of the reliability test of the pilot study, the Cronbach Alpha was procured as 0.838. The fact that this value is between 0.80-0.90 indicates that the reliability of the questionnaire is at a “good” level (Bursal, 2019). After the pilot study concluded that both the reliability level of the questionnaire and the questions were understandable by the participants, the questionnaire study was started.

Since the scope of the research is only the province of Istanbul, the survey was applied to individual investors residing in Istanbul by creating an online survey via "Google Forms", in addition to face-to-face interviews and one-to-one participation, between 26.02.2022 and 26.03.2020, and data on 384 people in total were obtained. As the pilot study was seamless, the data from the pilot study was also included in the study data and the study was carried out with a total of 434 individual investors.

For each group, it is aimed to reflect the structure of the population by selecting sample units with the easy sampling method. The sample units were made with the easy sampling method due to the difficulties encountered while applying the survey, such as the time and cost, especially the scarceness of a list of individuals residing and investing in Istanbul, and the inability to get positive feedback. In easy sampling, the units easily reached within the study are included in the sample and the sampling process is carried out (Ozdemir et al., 2015). After the completion of the survey, the data obtained were analyzed and interpreted with the SPSS 26.0 statistical package program.

3.5. Measurement and Questionnaires

The survey method is similar to the method employed in the studies of Hirshleifer (2001), Ateş (2007), Orçun (2016), Atesh et al. (2016), Pompian (2012), Çitilci (2012), and Korkulutaş (2018). The survey study consists of two parts. In the first part of the questionnaire, there are questions about the demographics, income levels, and financial investment preferences of the respondents. In the second part, 28 five-Likert questions are asked to measure financial biases. These biases were

summarized under eleven categories as overconfidence (2), confirmation (2), hindsight (2), conservatism (2), availability (2), loss-aversion (2), familiarity (2), mental accounting (2), regret aversion (4), ambiguity aversion (4), and herd behavior biases (4).[5] Participants were asked to read each statement and choose the suitable option from the five available options (strongly agree, agree, undecided, disagree, and strongly disagree) according to their participation in each statement.

[5] The number in brackets represents the number of questions asked to the participants for each behavioral bias.

CHAPTER FOUR

DATA ANALYSIS AND IMPLICATION

In this chapter, the questionnaire data is investigated empirically with the help of the SPSS software. Before moving to the empirical part, the data has been analyzed under three main headings: (i) demographic facts, (ii) financial profile, and (iii) behavioral biases to look at the survey sample in more detail. Descriptive statistics about the survey sample are given in the next subsections.

4.1. Demographical Information

The demographic information about the respondents has been held through the answers to six questions about gender, age, marital status, education level, job status, and average monthly income of the respondents. Statistical data on demographic information is shown in the continuation of the study via some tables.

4.2.1. Gender of Participants

The gender distribution of respondents is shown in Table 4.1. Accordingly, 51.6% (224 people) of participants are male and 48.4% (210 people) are female.

Table 4. 1: Participants by gender

Gender	Frequency	Percent
Female	210	48.4
Male	224	51.6
Total	434	100.0

4.2.2. Age Range of Participants

To measure the age distribution of participants, five categories are designed, which are shown in Table 4.2. The table shows that the valid replies to this question are 100% (434 people). Out of 434 participants, 27.2% (118 people) of them are between 18 and 27 years old, while 21.7% (94 people) are between 28 and 37 years old. 27.% (117 people) are between 38 and 47 years old. 16.6% (72 people) are between 48 and 57 years old, whereas 7.6% (33 people) are 58 and older.

Table 4. 2: Age categories of the participants

Age Group	Frequency	Percent
18-27	118	27.2
28-37	94	21.7
38-47	117	27.0
48-57	72	16.6
58 and higher	33	7.6
Total	434	100.0

4.2.3. Marital Status of the Participants

The marital status of the participants is shown in Table 4.3. As shown in the table, the valid answers to this question are 100% (434 people). Out of 434 respondents, 38.2% (166 people) of them are single and 61.8% (268 people) of them are married.

Table 4. 3: Marital Status of the Participants

Marital status	Frequency	Percent
Married	268	61.8
Single	166	38.2
Total	434	100.0

4.2.4. Education Levels of the Participants

There are four options to determine the education levels, which are displayed in Table 4.4. The table shows the valid replies are 100% (434 people). According to the table, 3.9% (17 people) of participants graduated from primary school, 11.8% (51 people) have high school diplomas, a large proportion of participants (53.2%) have associate/undergraduate education, and 31.1% (135 people) have a master's degree or higher.

Table 4. 4: Education levels of the participants

Education	Frequency	Percent
Primary School	17	3.9
High School	51	11.8
Associate/Undergraduate	231	53.2
Master/PhD	135	31.1
Total	434	100.0

4.2.5. Job Categories of the Participants

The job categories of respondents are shown in Table 4.5. The participants' jobs are classified of the participants is classified under four main categories. According to the table, the valid answers are 100% (434 people). Out of 434 respondents, 14.1% (61 people) of them are civil servants; 40.8% (177 people) are private-sector employees; 23.7% (103 people) are self-employees; and 21.4% (93 people) of them belong to the unemployed/student groups.

Table 4. 5: Job categories of the participants

Job Groups	Frequency	Percent
Civil Servants	61	14.1
Private sector employees	177	40.8
Self-employees	103	23.7
Unemployed/ Students	93	21.4
Total	434	100.0

4.2.6. The Average Monthly Income

Nine income ranges are identified to classify the average monthly incomes of respondents. All income levels are expressed in Turkish Lira terms and can be seen in Table 4.6. The average monthly income of 5.5% (24 people) of the 434 respondents lies between 0 and 1500, 9.7% (42 people) of the respondents have an income between 1501 and 3000, 7.6% (33 people) have an income between 3001 and 4500, 10.4% (45 people) have an income between 4501 and 6000, the income of 9.7% (42 people) lies between 6001 and 7500, 12.7% (55 people) of them have an income between 7501 and 10000, 19.1% (83 people) of them have an income between 10001 and 20000, the income of 16.1% (70 people) of them lies between 20001 and 40000 and 9.2% (40 people) of them have an income of 40001 and more.

Table 4. 6: The Average monthly income of the participants

The Average of Monthly Income	Frequency	Percent
0-1500	24	5.5
1501-3000	42	9.7
3001-4500	33	7.6

4501-6000	45	10.4
6001-7500	42	9.7
7501-10000	55	12.7
10001-20000	83	19.1
20001-40000	70	16.1
40001 and more	40	9.2
Total	434	100.0

4.3. Financial Profiles of the Participants

The data about the financial profile of the participants was collected with the help of four questions.

4.3.1. The Status of the Participants' Education in Economics or Finance

The distribution of respondents who have studied economics/finance and those who have not can be seen in Table 4.7. As shown in the table, there are 434 valid answers, which represents the research sample. Out of 434 respondents, 47.0 % (204 people) of them are those who have studied economics/finance, whereas 53.0% (230 people) of them have not had an economics/finance education.

Table 4. 7: Participant's Economics or Finance education status

Have you studied/been studying economics or finance?	Frequency	Percent
Yes	204	47.0
No	230	53.0
Total	434	100.0

4.3.2. Risk-taking Status of the Participants

The risk-taking status of respondents is shown in Table 4.8. The risk-taking habits of the participants are classified under three categories (Hensher, 2015, p.25): risk-seeker, risk-neutral, and risk-averse based on the answers. As can be seen in Table 4.8., the valid 434 answers represent 100%. Out of 434 respondents, 28.3% (123

people) of them defined themselves as risk seekers, 38.9% (169 people) are risk neutrals and 32.7% (142) of them belong to the risk-averse group.

Table 4. 8: Risk-taking status of the participants

Risk-taking status	Frequency	Percent
Risk Seeker	123	28.3
Risk-Neutral	169	38.9
Risk-Averse	142	32.7
Total	434	100.0

4.3.3. Financial Assets Preferences of the Participants.

The financial assets preferred by respondents are shown in Figure 4.1. The participants are allowed to choose more than one financial instrument. Hence, 1286 valid answers are collected from 434 participants. Out of 1286 answers, the most preferred financial asset is gold, with a weight of 20.7% (266 people). The other financial product preferences of the participants and their weights in an descending order are as follows: Foreign currency (USD) with 20.2% (260 people), foreign currency (EUR) with 9.1% (117 people), cryptocurrency market (bitcoin, ethereum) with 6.8% (88 people), time deposit (0-1 month) with 6.5% (84 people), cryptocurrency market (other cryptocurrencies, tokens) with 5.4% (69 people), stock market (BIST) with 4.9% (63 people), time deposit (1-3 months) with 3.4% (44 people), foreign currency (others) with 3.2% (41 people), the foreign exchange protected TL deposit account with 3.2% (41 people), Type-A mutual funds (stock weighted) with 2.3% (29 people), Type-B mutual funds (government bond weighted) with 2.2% (28 people), stock market (foreign stock markets) with 2.1% (27 people), time deposit (3-6 months) with 1.7% (22 people), government bonds (maturity longer than one year) with 1.6% (20 people) and other with 6.8% (87 people).

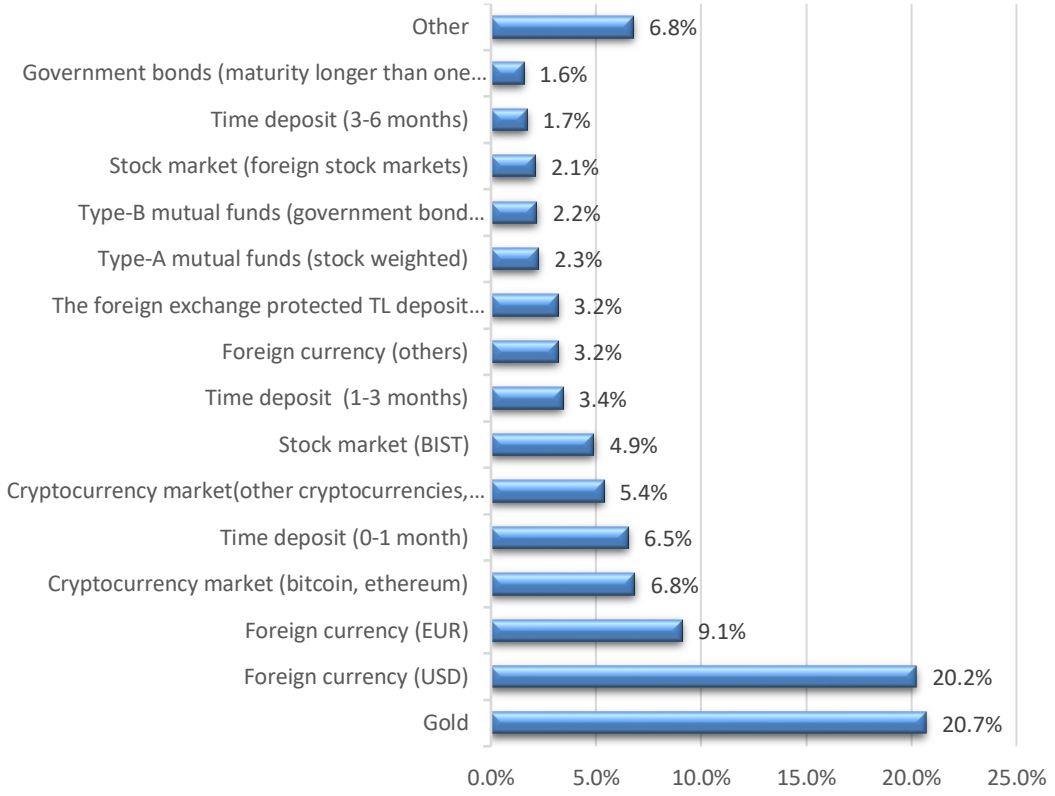


Figure 4. 1: Financial assets preferences of the participants

4.3.4. Information Sources for Financial Investment Decisions

The information sources preferred by respondents are shown in Figure 4.2. As can be seen, the internet (YouTube channels) seems the most popular way among respondents, 16.2% (201 people) as the primary source to get information. Television (economic news and comments) is the second most popular source with a weight of 15.4% (191 people). The other information sources based on the popularity are as follows; social environment (friends, family) 14.6% (182 people), electronic or printed newspaper/magazine (columns, comments) 13.2 % (164 people), my assessments (instincts, feelings) 9.7% (121 people), my assessments (based on econometric models) 9.3% (116 people). Phone applications related to finance (Finanscepte, Cep finance, Investing.com, etc.) have a weight of 9.0% (112 people), while bank or brokerage firm reports as a source are used by 82 people (6.6%). The information provided by the banks and other intermediary institutions via customer representatives weights 6.0% (74 people) among other information sources

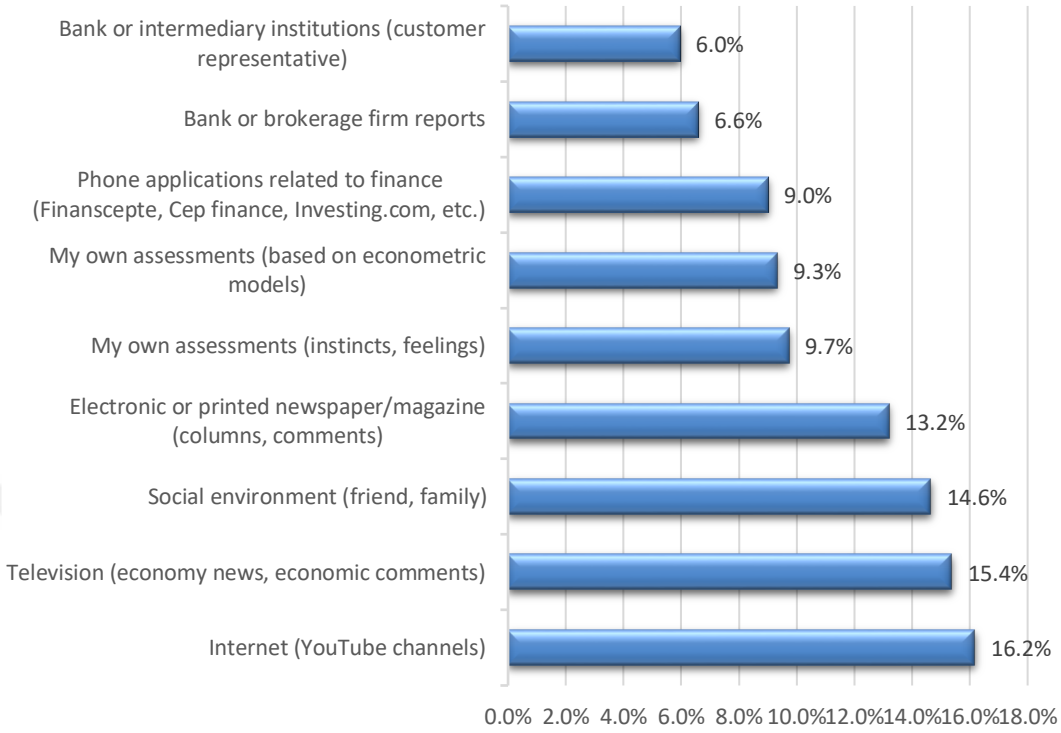


Figure 4. 2: Information resources of participants

4.4. The Psychological Biases Mentioned in Behavioral Finance

As mentioned in the previous chapter, there are some psychological biases stressed in the behavioral finance literature which play important roles in the financial decision-making processes. Each bias is measured with the help of five-Likert questions, and at least two questions are asked for each bias. Participants were asked to give information about how much they agreed with each statement. The degree of the attendance of the survey respondents was identified by the SPSS package program, and the output of the results was mentioned in the continuation of the research.

Table 4. 9: Behavioral biases are ranked according to their distribution and related statements.

Bias	Statement	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Overconfidence	The gain on my financial investments is generally above the market average	19	78	132	145	60
	I think that the knowledge I have about financial investments is more valuable than the information of other investors in the market	35	103	133	119	44
Confirmation	I consider news and analysis reports that suit my financial investment decision	8	17	48	247	114
	I like to brainstorm with people who confirm my market view	8	28	72	188	138
Hindsight	I can predict which sectors will bring more profit in the medium and long term	22	40	133	181	58
	I can buy a financial product at the right time and sell it at the right time	22	53	148	159	52
Conservatism	If I believe in my investment strategy, I do not rely on new confusing information	24	49	102	168	91
	We should not panic but stick to the original strategy, even if an investment vehicle that we strongly believe will rise begins to decline	16	24	71	194	129
Availability	A financial investment tool repeats its profit/loss performance after a while	17	33	140	169	75
	A remarkable performance that I remember of a financial investment tool affects my decision when I want to invest in the same type of financial investment tool again	6	34	95	223	76

Loss-Aversion	I prefer investment tools with low return and risk over investment tools with high return and risk	15	49	104	201	65
	In case of a loss in my investments, I am more risk averse in my next investments	18	33	103	192	88
Familiarity	If I have to decide between two financial investment tools, I prefer the investment tools I know more about	5	22	31	201	175
	Even if foreign investment tools are more profitable, I prefer local financial investment tools	54	76	106	143	55
Mental Accounting	My sadness over losses in investments has more influence than my joy over gains	35	50	107	172	70
	I distribute my financial investments in a balanced way among financial products	12	46	95	200	81
Regret Aversion	In case of loss, I do not sell the financial product I invested in until I cover my loss	16	54	114	175	75
	I consider the possibility of loss of my financial investments and act accordingly	6	16	45	250	117
	When I make a profit from the financial product I invested in, I immediately sell it	31	92	122	141	48
	I hesitate to invest in a financial asset whose value is declining	19	53	96	189	77
Ambiguity Aversion	I prefer reliable but low-profitable financial investment tools to unreliable but high-profitable financial investment tools	21	65	78	198	72
	I prefer large-scale banks with low interest over small-scale banks with high interest on deposits	22	43	116	185	68
	Some banks and financial institutions may go bankrupt. That's					

	why I keep some of my financial assets out of the financial system	12	24	81	217	100
	I hesitate to invest in a new financial asset that I have not invested in before	13	41	89	219	72
Herd Behavioral	I consider the observations and actions of other investors in the market and generally follow the decisions of the majority	15	53	100	221	45
	I believe that the investment tools preferred by most financial investors provide higher returns	22	45	133	185	49
	When making financial investments, I make decisions by following corporate investors	13	54	112	189	66
	I find the investment decisions of financial investors in the market valuable, and I invest in the financial products they invest in	12	33	131	199	59

Two statements were selected to measure overconfidence bias. According to the first statement, out of 434 respondents (100%), 4.4% (19 people) strongly disagreed, 18.0% (78 people) disagreed, 30.4% (132 people) were undecided, 33.4% (145 people) agreed, and 13.8% (60 people) strongly agreed. The average mean is 3.34. The second statement of overconfidence shows that, out of 434 respondents, 8.1% (35 people) strongly disagreed with the statement, while 23.7% (103 people) disagreed. 30.6% (133 people) were undecided, 27.4% (119 people) agreed, and 10.1% (44 people) strongly agreed. The average mean of the answers is 3.04.

Two statements were employed to measure the confirmation bias. For the first statement, out of 434 respondents, 1.8 percent (8 people) strongly disagreed, 3.9% (17 people) disagreed, 11.1% (48 people) were undecided, 56.9 percent (247 people) agreed, and 26.3 percent (114 people) strongly agreed. The aggregation of the answers shows that 5.7% (25 people) of respondents disagreed with the statement, whereas 11.1% (48 people) were undecided and 83.2% (361 people) agreed. The average mean is 4.02. According to the second statement of confirmation bias, out of 434

respondents, 1.8 percent (8 people) strongly disagreed, 6.5% (28 people) disagreed, 16.6% (72 people) were undecided, 43.3 percent (188 people) agreed, and 31.8 percent (138 people) strongly agreed. When the categories were reduced to three, 8.3% (36 people) disagreed, 16.6% (72 people) were undecided, and 75.1% (326 people) agreed. The average mean of the answers is 3.97.

Two statements were used to measure hindsight bias. According to the first statement, at the aggregate level, 14.3% (62 people) of respondents disagreed with the statement, while 30.6% (133 people) were undecided, and 55.1% (239 people) agreed. The average mean of the answers to the first statement is 3.49. The second statement of hindsight bias shows that at the aggregate level, 17.3% (75 people) of respondents disagreed with the statement, 34.1% (148 people) were undecided, and 48.6% (211 people) agreed. The average mean of the answers is 3.38 for this statement.

Two statements were employed to measure the conservatism bias. The aggregate answers for the first statement showed that 16.8% (73 people) of respondents disagreed with the statement, while 23.5% (102 people) were undecided and 59.7% (259 people) agreed. The average mean is 3.58. According to the second statement of conservatism bias, the aggregate answers have shown that 9.2% (40 people) of respondents disagreed with the statement, whereas 16.4% (71 people) were undecided, and 74.4% (323 people) agreed. The average mean of the answers is 3.91.

Two statements were selected to measure availability bias. For the first statement, the aggregation of the answers has shown that 11.5% (50 people) of respondents disagreed with the statement, whereas 32.3% (140 people) were undecided, and 56.2% (244 people) agreed. The second statement of availability bias shows that at the aggregate level, 9.2% (40 people) of respondents disagreed with the statement, whereas 21.9% (95 people) were undecided, and 68.9% (299 people) agreed. The average mean of the answers is 3.76.

Two statements were employed to measure the loss-aversion bias. According to the first statement, aggregation of the answers shows that 14.7% (64 people) of respondents disagreed with the statement, whereas 24.1% (104 people) were undecided and 61.3% (266 people) agreed. The average mean is 3.58. The second

statement of loss-aversion bias shows that at the aggregate level, 11.8% (51 people) of respondents disagreed with the statement, 27.7% (103 people) were undecided, and 64.5% (280 people) agreed. The average mean of the answers is 3.69 for this statement.

Two statements were employed to measure familiarity bias. The aggregate answers for the first statement showed that 6.2% (27 people) of respondents disagreed with the statement, while 7.1% (31 people) were undecided, and 85.6% (376 people) agreed. The average mean is 4.20. According to the second statement of familiarity bias, the aggregate answers have shown that 30.0% (130 people) of respondents disagreed with the statement, whereas 24.4% (106 people) were undecided, and 45.6% (198 people) agreed. The average mean is 3.16.

Two statements were used to measure mental accounting bias. For the first statement, the aggregation of the answers has shown that 130 people (30. %) disagreed with the statement, while 106 people (24.4%) were undecided and 198 people (45.6%) agreed. The average mean is 3.44. The second statement of mental accounting bias shows that at the aggregate level, 13.4% (58 people) of respondents disagreed with the statement, 21.9% (95 people) were undecided, and 64.7% (281 people) agreed. The average mean of the answers is 3.67 for this statement.

To assess regret aversion bias, four statements were used. According to the first statement, aggregation of the answers shows that 16.1% (70 people) of respondents disagreed with the statement, 26.3% (114 people) were undecided, and 57.6% (250 people) agreed. The average mean of the responses to this statement is 3.5. The second statement of regret aversion bias shows that considering all the responses, we may conclude that 5.1% (22 people) of respondents disagreed with the statement, whereas 10.4% (45 people) were undecided, and 84.6% (367 people) agreed. The third statement of regret aversion bias shows that in aggregate, 28.3% (123 people) of respondents disagreed with the statement, 28.1% (122 people) were undecided, and 43.5% (189 people) agreed. The average mean of the answers is 3.19 for this statement. The fourth statement of regret aversion shows that in aggregate 16.6 % (72 people) of respondents disagreed with the statement, whereas 22.1% (96 people) were undecided, and 61.3% (266 people) agreed. The average mean of the answers is 3.58.

To assess ambiguity aversion bias, four statements were used. The aggregate answers for the first statement showed that 19.8% (86 people) of respondents disagree with the statement, whereas 18.0% (78 people) were undecided, and 62.2% (270 people) agreed. The average mean of the responses to this statement is 3.54. According to the second statement of ambiguity aversion bias, the aggregate answers have shown that 15.0% (65 people) of respondents disagreed with the statement, while 26.7% (116 people) were undecided and 58.3% (253 people) agreed. The average mean of the responses to the second statement is 3.54. The third statement of ambiguity aversion bias shows that in aggregate, 8.3% (36 people) of respondents disagreed with the statement, 18.7% (81 people) were undecided, and 73.0% (317 people) agreed. The average mean is 3.85. The fourth statement of ambiguity aversion shows that in aggregate, 12.4% (54 people) of respondents disagreed with the statement, whereas 20.5% (89 people) were undecided, and 67.1% (291 people) agreed. The average mean of the responses to this statement is 3.68.

Four statements were employed to measure the herd behavioral biases. For the first statement, the aggregation of the answers has shown that 15.7% (68 people) of respondents disagreed with the statement, whereas 23.0% (100 people) were undecided, and 61.3% (266 people) agreed. The average mean is 3.53. The second statement of herd behavioral bias shows that at the aggregate level 15.4% (67 people) of respondents disagreed with the statement, whereas 30.6% (133 people) were undecided and 53.9% (234 people) agreed. The average mean of the answers is 3.45. The third statement of herd behavioral bias shows that, in aggregate, 15.4% (67 people) of respondents disagreed with the statement, 25.8% (112 people) were undecided, and 58.8% (255 people) agreed. The average mean of the answers is 3.56 for this statement. The fourth statement of herd behavioral bias shows that in aggregate, 10.4% (45 people) of respondents disagreed with the statement, whereas 30.2% (131 people) were undecided, and 59.4% (258 people) agreed. The average mean of the answers is 3.60.

CHAPTER FIVE

THE TESTS OF HYPOTHESIZES

The main purpose of this chapter is to test the hypotheses which are mentioned for each bias in the previous chapter according to the answers to the survey questions. Before moving on to the empirical investigation part of the study, the validity of the normality assumption is required to be tested. Normality is the basic assumption of the parametric hypothesis tests in which the population averages are compared. If the data is distributed normally, the “Independent Sample t-test” will be employed to explore whether there is a significant difference between the means of two independent populations. If the assumption of normality is not provided, the “Mann-Whitney U” test, which can be seen as the non-parametric version of the “Independent Sample t-test” will be used. Kolmogorov-Smirnov's one-sample goodness of fit test was implemented to decide whether a parametric or non-parametric procedure was to be followed. According to Siegel and Castellan (1998, pp. 54-55), the Kolmogorov-Smirnov test is one of the most powerful tests to measure the goodness of fit. According to the test results, none of the statements is distributed normally at the 0.05 level of significance. Thus, the Mann-Whitney U is preferred as one of the most used ways to explore the difference between the means of two independent populations in the non-parametric case.

Table 5. 1: Kolmogorov-Smirnov normality test results

Variables	P-value
Overconfidence	0.000
Confirmation	0.000
Hindsight	0.000
Conservatism	0.000
Availability	0.000
Loss-aversion	0.000
Familiarity	0.000
Mental accounting	0.000
Regret aversion	0.000
Ambiguity aversion	0.000
Herd behavioral	0.000

5.1. Tests of Hypothesizes

Hypothesis 1

H_0: The overconfidence bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The overconfidence bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 2: Mann-Whitney U test result for Hypothesis 1

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	224.64	-1.132	0.258
	No	211.16		

The result of the Mann-Whitney U test shows that the Z value is-1.132 and p value is 0.258, respectively as can be seen in Table 5.2. This procedure was followed to determine whether the overconfidence bias factor scores of the individual investors participating in the survey differed according to their variability in studying economics/finance. Since the p value, which expresses the probability that the real value is greater than the calculated critical value (Z), is greater than the α significance level (0.258>0.05), the H_0 hypothesis cannot be rejected. Consequently, at the 95% confidence level, the overconfidence bias does not differ between those who do not have an economics and finance education and those who do.

Hypothesis 2

H_0: The confirmation bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The confirmation bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 3: Mann-Whitney U test result for Hypothesis 2

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	224.42	-1.115	0.265
	No	211.36		

According to Table 5.3, the Z value is -1.115, and the p value is 0.265. Since $p > \alpha$ (0.265>0.05), the H_0 hypothesis cannot be rejected. According to this result, it can be concluded, at the 95% confidence level, that the confirmation bias does not differ between investors who do not have economics/finance education and those who do.

Hypothesis 3

H_0: The hindsight bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The hindsight bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 4: Mann-Whitney U test result for Hypothesis 3

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	228.30	-1.720	0.086
	No	207.92		

Considering Table 5.4, the Z value is -1.720, and the p value is 0.086. Since $p > \alpha$ (0.086>0.05), the H_0 hypothesis cannot be rejected. This result shows that the hindsight bias does not differ between the investors who do not have economics/finance education and those who do, at the 95% confidence level.

Hypothesis 4

H_0: The conservatism bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The conservatism bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 5: Mann-Whitney U test result for Hypothesis 4

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	208.23	-1.487	0.139
	No	225.72		

As can be seen in Table 5.5, the Z value is -1.487, and the p value is 0.139. Since $p > \alpha$ (0.139>0.05), the H_0 hypothesis cannot be rejected. This result can be interpreted as no difference between the investors who do not have economics/finance education and those who do, at the 95% confidence level.

Hypothesis 5

H_0: The availability bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The availability bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 6: Mann-Whitney U test result for Hypothesis 5

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	207.04	-1.678	0.093
	No	226.78		

According to Table 5.6, the Z value is -1.678 and the p value is 0.093. Since $p > \alpha$ (0.093>0.05), the H_0 hypothesis cannot be rejected. According to this result, it is concluded that at the 95% confidence level, the conservatism bias does not differ between investors who do not have economics/finance education and those who do.

Hypothesis 6

H_0: The loss-aversion bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The loss-aversion bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 7: Mann-Whitney U test result for Hypothesis 6

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	213.48	-0.645	0.519
	No	221.07		

Table 5.7 shows that the Z value is -0.645, and the p value is 0.519 respectively. Since $p > \alpha$ (0.519>0.05), the H_0 hypothesis cannot be rejected. This result shows us that, at the 95% confidence level, the loss-aversion bias does not differ between the investors who do not have economics/finance education and those who do.

Hypothesis 7

H_0: The familiarity bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The familiarity bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 8: Mann-Whitney U test result for Hypothesis 7

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	207.68	-1.571	0.116
	No	226.21		

As can be seen in Table 5.8, the Z value is -1.571, and the p value is 0.116. Since $p > \alpha$ (0.116>0.05), the H_0 hypothesis cannot be rejected. According to this result, it can be said that at the 95% confidence level, the familiarity bias does not differ between investors who do not have economics/finance education and those who do.

Hypothesis 8

H_0: The mental accounting bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The mental accounting bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 9: Mann-Whitney U test result for Hypothesis 8

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	210.22	-1.167	0.243
	No	223.96		

The test results for Hypothesis 8 show that the Z value is -1.167, and the p value is 0.243 as can be seen in Table 5.9. Since $p > \alpha$ (0.243>0.05), the H_0 hypothesis cannot be rejected. According to this result, it can be said that at the 95% confidence level, mental accounting bias does not differ between investors who do not have economics/finance education and those who do.

Hypothesis 9

H_0: The regret aversion bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The regret aversion bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 10: Mann-Whitney U test result for Hypothesis 9

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	202.88	-2.305	0.021
	No	230.46		

As it is shown in Table 5.10, the Z value is -2.305, and the p value is 0.021 for the ninth hypothesis. Since $p < \alpha$ (0.021<0.05), the H_0 hypothesis can be rejected. Consequently, it can be said at the 95% confidence level that the investors who do not have economics/finance education exhibited more regret aversion behavior on average compared to the investors who have economics/finance education.

Hypothesis 10

H_0: The ambiguity aversion bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The ambiguity aversion bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 11: Mann-Whitney U test result for Hypothesis 10

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	205.58	-1.881	0.060
	No	228.08		

According to Table 5.11, the Z value is -1.881, and the p value is 0.060. Since $p > \alpha$ (0.060>0.05), the H_0 hypothesis cannot be rejected. According to this result, it can be said that at the 95% confidence level, ambiguity aversion bias does not differ between investors who do not have economics/finance education and those who do.

Hypothesis 11

H_0: The herd behavioral bias in the decisions of individual investors does not differ between those who have studied finance/economics and those who have not.

H_1: The herd behavioral bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not.

Table 5. 12: Mann-Whitney U test result for Hypothesis 11

Variable	Variable Levels	Mean Rank	Z	P-value
Who have studied finance/economics	Yes	210.94	-1.034	0.301
	No	223.32		

As can be seen in Table 48, the Z value is -1.034, and the p value is 0.301. Since $p > \alpha$ (0.301>0.05), the H_0 hypothesis cannot be rejected. The results show that, at the 95% confidence level, herd behavioral bias does not differ between investors who do not have economics/finance education and those who do.

CONCLUSION

Behavioral finance theory claims that investors trading in financial markets do not always make rational choices. Its reason is that individuals are influenced by certain biases and tendencies while making investment decisions. Due to this, many researchers have done various studies to detect the existence of behavioral finance biases/tendencies, and the number of studies on this subject is increasing every year.

This study was carried out among individual investors residing in Istanbul. This study aims to determine whether individual investors residing in Istanbul demonstrate overconfidence, confirmation, hindsight, conservatism, availability, loss-aversion, familiarity, mental accounting, regret aversion, ambiguity aversion, and herd behavior while making investment decisions. Furthermore, these eleven biases are taken as dependent variables and tried to be examined according to the differences between those who have studied economics/finance and those who have not. The main target here is to investigate whether being educated in the fields of economics or finance will help to escape these biases.

The study was carried out with 434 individual investors residing in Istanbul. Before moving to the empirical part, the data has been analyzed under three main headings: demographic facts, financial profile, and behavioral biases. In terms of demographic characteristics, 51.6% of the sample is male and 48.4% is female. 51.2% of the participants are over 37 years old, 61.8% are married, and 84.3% are investors with associate/undergraduate and postgraduate degrees. In addition, 40.8% of the individuals participating in the survey are private-sector employees and 57.1% make financial investments with an income level of 7500 TL or above. The data about the financial profile of the participants was collected with the help of four questions. According to the outcome, 47% of the sample consists of investors who have economics/finance education, whereas 53.0% of them have not had economics/finance education. Out of 434 respondents, 28.3% of them are risk-seekers, 38.9% are risk-neutrals and 32.7% (142) of them belong to risk-averse groups. The most popular investment instrument was gold, which received 20.7 percent of the vote, and the least popular investment product was options, which received 0.2 percent of the vote. In

addition, the most frequently used source of investment was the Internet (YouTube) with 16.2%, and the least preferred investment source was banks or intermediary institutions with 6%. The result of the research was then investigated concerning financial biases, which are the foundation of behavioral finance. These biases were categorized into eleven groups. Four questions were asked from each of these categories to measure regret aversion, ambiguity aversion, and herd behavior tendencies. To measure the other eight trends (overconfidence, confirmation, hindsight, conservatism, availability, loss-aversion, familiarity, and mental accounting), two questions were asked of each of them. The study consists of 28 questions in total. Participants were required to read each statement and choose the suitable option from the five available options (strongly disagree, disagree, undecided, agree, and strongly agree) according to their participation in each statement. The average of all to the questions is above three which shows a concentration of the participants answers between options "undecided" and "agree". Among the categories, the biggest tendency was seen in the questions measuring confirmation bias. Among these statements, a positive opinion of 83.2% was given to the first statement. A positive opinion was given to the second statement with a rate of 75.1%. The questions assessing overconfidence had the lowest misconceptions of all the categories. Among these statements, a positive opinion was given to the first statement with a rate of 47.2%. A positive opinion given to the second statement, was reported with 37.5% of the expression.

Within the scope of the study, these eleven biases are taken as dependent variables and tried to be examined according to the differences between those who have studied economics/finance and those who have not. Hypotheses testing results show that the regret aversion bias in the decisions of individual investors does differ between those who have studied finance/economics and those who have not. At the 95% confidence level, the investors who do not have economics/finance education displayed more regret aversion behavior on average compared to the investors who have economics/finance education. Speaking more clearly, individual investors who obtain economics/finance education within the scope of the illusion of avoiding regret exhibit more rational behavior compared to those who do not obtain economics and

finance education. On the other hand, the empirical results show that the other ten biases do not differ between the investors who do not have economics/finance education and those who do, at the 95% confidence level.

The empirical findings of the study reveal that the economics/finance education is not eliminating most of the behavioral biases among the financial investors in our sample. The reasons why the bias of regret avoidance gives different results between individual investors who obtain economics and finance education and those who do not, stands as an important question to be answered. In this context, the detailed examination of each bias behind the financial decisions seems crucial to eliminate the irrational financial decision making. Moreover, the examination of these biases will provide more insight about the shortcomings of the educational part of the story. In this sense, there could be some modifications in the design of the finance/economic education which may decrease the impact of the mentioned biases while making financial decisions. Nevertheless, the empirical result of this study is limited with the boundaries of Istanbul. The same analysis may provide different outcomes in different cities, regions or countries. Hence, the comparison of the countries or nations based in this context will provide more information about the irrational financial decision making from the perspective of behavioral finance.

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APPENDIX A

Behavioral Finance Survey Questions

1. Gender:

Male [ ] Female[ ]

2. Age group:

18-27[ ] 28-37[ ] 38-47[ ] 48-57[ ] 58 ve üzeri[ ]

3. Marital status:

Married[ ] Single[ ]

4. Education:

Primary School[ ] High School[ ] Associate/Undergraduate[ ] Master/PhD[ ]

5. Job Groups:

Civil Servants[ ] Private sector employees[ ] Self-employees[ ] Unemployed/ Students[ ]

6. The Average Monthly Income (TL):

0-1500[ ] 1501-3000[ ] 3001-4500[ ] 4501-6000[ ] 6001-7500[ ] 7501-10000[ ] 10001-20000[ ] 20001-40000[ ] 40001 and more

7. Economics or Finance Education status:

Yes[ ] No[ ]

8. Risk-taking status:

Risk Seeker[ ] Risk-Neutral[ ] Risk-Averse[ ]

9. Financial assets preferences:

Foreign currency (USD)[ ]
Foreign currency (EUR)[ ]
Foreign currency (others)[]
Gold[ ] Stock market (BIST)[ ]
Stock market (Foregin stock market)[ ]
Time deposit (0-1 months)[ ]
Vadeli Mevduat (3-6 months)[ ]
Time deposit (6-12 months)[ ]
Time deposit (maturity longer than one year)[ ]
Repo[ ]
Type-A mutual funds[government bond weighted)[ ]

Type-B mutual funds[stock weighted0[ ]
Government bonds (maturity longer than one year)[ ]
Treasury bond(maturity less than one year) [ ]
Futures[ ]
Forwards[ ]
Swaps[ ]
Options[ ]
Sukuk[ ]
Commodity exchange (oil, natural gas, copper, cotton, corn, wheat, sugar, coffee)[]
Crytocurrency market (Bitcoin, Ethereum)[ ]
Crytocurrency market (other cryptocurrencies)[ ]
NFT (Non-fungible token)[ ]
The Foreign exchange protected TL deposit account[ ]

10. Information sources for financial investment decisions:

Television (economy news, economic comments) [ ]
Electronic or printed newspaper/magazine (columns, comments)[ ]
Internet (YouTube channels)[ ]
Phone applications related to finance (Finanscepte, Cep finance, Investing.com, etc.)[ ]
Social environment (friend, family)[ ]
Bank or intermediary institutions (customer representative)[ ]
Bank or brokerage firm reports[ ]
My own assessments (based on econometric models)[ ]
My own assessments (instincts, feelings)[ ]

11. To what extent you Strongly disagree, Disagree, Neither agree nor disagree, Agree, and Strongly agree to the following statement. Please indicate by checking the boxes.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Overconfidence Bias					
1. The gain on my financial investments is generally above the market average					

2. I think that the knowledge I have about financial investments is more valuable than the information of other investors in the market					
Confirmation Bias					
3. I consider news and analysis reports that suit my financial investment decision					
4. I like to brainstorm with people who confirm my market view					
Hindsight Bias					
5. I can predict which sectors will bring more profit in the medium and long term.					
6. I can buy a financial product at the right time and sell it at the right time.					
Conservatism Bias					
7. If I believe in my investment strategy, I do not rely on new confusing information.					
8. We should not panic but stick to the original strategy, even if an investment vehicle that we strongly believe will rise begins to decline					
Availability Bias					
9. A financial investment tool repeats its profit/loss performance after a while					
10. A remarkable performance that I remember of a financial investment tool affects my decision when I want to invest in the same type of financial investment tool again					
Loss-Aversion Bias					
11. I prefer investment tools with low return and risk over investment tools with high return and risk.					
12. In case of a loss in my investments, I am more risk averse in my next investments					

Familiarity Bias					
13. If I have to decide between two financial investment tools, I prefer the investment tools I know more about.					
14. Even if foreign investment tools are more profitable, I prefer local financial investment tools					
Mental Accounting					
15. My sadness over losses in investments has more influence than my joy over gains					
16. I distribute my financial investments in a balanced way among financial products					
Regret Aversion					
17. In case of loss, I do not sell the financial product I invested in until I cover my loss.					
18. I consider the possibility of loss of my financial investments and act accordingly.					
19. When I make a profit from the financial product I invested in, I immediately sell it.					
20. I hesitate to invest in a financial asset whose value is declining					
Ambiguity Aversion					
21. I prefer reliable but low-profitable financial investment tools to unreliable but high-profitable financial investment tools					
22. I prefer large-scale banks with low interest over small-scale banks with high interest on deposits					
23. Some banks and financial institutions may go bankrupt. That's why I keep some of my financial assets out of the financial system.					
24. I hesitate to invest in a new financial asset that I have not invested in before					

Herd Behavioral					
25. I consider the observations and actions of other investors in the market and generally follow the decisions of the majority					
26. I believe that the investment tools preferred by most financial investors provide higher returns					
27. When making financial investments, I make decisions by following corporate investors.					
28. I find the investment decisions of financial investors in the market valuable, and I invest in the financial products they invest in.					

APPENDIX B

Davranışsal Finans Soru Anketi

Cinsiyetiniz:

Erkek[ ] Kadın[ ]

Yaş grubunuz:

18-27[ ] 28-37[ ] 38-47[ ] 48-57[ ] 58 ve üzeri[ ]

Medeni durumunuz:

Evli[ ] Bekar[ ]

Eğitim durumunuz:

İlkokul / Ortaokul[ ] Lise[ ] Ön lisans / Lisans[ ]
Lisansüstü/PhD[ ]

Meslek grubu:

Kamu görevlisi[ ] Özel sektör çalışanı[ ] Serbest meslek[ ]
İşsiz/Öğrenci[ ]

Aylık geliriniz (TL):

0-1500[ ] 1501-3000[ ] 3001-4500[ ] 4501-6000[ ] 6001-7500[ ]
7501-10000[ ] 10001-20000[ ] 20001-40000[ ] 40001 ve üzeri[ ]

Ekonomi veya Finans Eğitim durumu:

Evet[ ] Hayır[ ]

Risk alma durumu:

Risk seven[ ] Risk nötr[ ] Riskten kaçınan[ ]

Finansal varlık tercihleri:

Döviz (ABD doları)[ ]
Döviz (Euro)[ ]
Döviz (diğer)[ ]
Altın[ ]
Hisse senedi piyasası (BIST)[ ]
Hisse senedi piyasası (Yabancı borsalar)[ ]
Vadeli Mevduat (0-1 ay)[ ]

Vadeli Mevduat (1-3 ay)[ ]
Vadeli Mevduat (3-6 ay)[ ]
Vadeli Mevduat (6-12 ay)[ ]
Vadeli Mevduat (1 yıldan uzun)[ ]
Repo[ ]
Yatırım fonu A tipi (hisse senedi ağırlıklı)[ ]
Yatırım fonu B tipi (devlet tahvili ağırlıklı)[ ]
Devlet tahvili (vadesi bir yıldan uzun)[ ]
Hazine bonosu (vadesi bir yıldan kısa)[ ]
Futures[ ]
Forwards[ ]
Swaps[ ]
Options[ ]
Sukuk[ ]
Emtia borsası (petrol, doğal gaz, bakır, pamuk, mısır, buğday, şeker, kahve)[ ]
Kripto para piyasası (Bitcoin, Ethereum)[ ]
Kripto para piyasası (Diğer kripto paralar, tokenlar)[ ]
NFT (Non-fungible token)[ ]
Döviz korumalı TL mevduat[ ]

Finansal yatırım kararları için bilgi kaynakları:

Televizyon (Ekonomi haberleri, ekonomi yorumları)[ ]
Elektronik ya da basılı gazete/dergi (köşe yazıları, yorumlar)[ ]
İnternet (Youtube kanalları)[ ]
Finans ile ilgili telefon uygulamaları (Finans cepte, Cep finans, Investing.com, vb.)[ ]
Sosyal çevre (Arkadaş, aile)[ ]
Banka ya da aracı kurumlar (müşteri temsilcisi)[ ]
Banka ya da aracı kurum raporları[ ]
Kendi değerlendirmelerim (ekonometrik modellere dayanan)[ ]
Kendi değerlendirmelerim (içgüdülerim, hislerim)[ ]

11. **Aşağıdaki ifadelere ne ölçüde katılıyorsunuz, Katılmıyorum, Katılmıyorum, Ne katılıyorum ne katılmıyorum, Katılıyorum ve Kesinlikle katılıyorum. Lütfen kutuları işaretleyerek belirtiniz.**

	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Aşiri Güven					
1. Finansal yatırımlarımdan elde ettiğim kazanç, genellikle piyasa ortalamasının üzerindedir.					

2. Finansal yatırımlar konusunda sahip olduğum bilgilerin piyasadaki diğer yatırımcıların bilgilerine kıyasla daha değerli olduğunu düşünüyorum.					
Kendini Onaylatma					
3. Finansal yatırım kararımla örtüşen haber ve analiz raporlarını dikkate alırım.					
4. Piyasa görüşümü doğrulayan kişilerle beyin fırtınası yapmayı severim.					
Öngörü Yanılgısı					
5. Hangi sektörlerin orta ve uzun vadede daha fazla kar getirebileceğini tahmin edebiliyorum.					
6. Bir finansal ürünü doğru zamanda alıp, doğru zamanda satabiliyorum.					
Muhafazakarlik					
7. Yatırım stratejime inanıyorsam kafa karıştıran yeni bilgilere pek itibar etmem.					
8. Artacağına kuvvetle inandığımız bir yatırım aracı düşmeye başlasa bile panik yapmamalı ve orijinal stratejiye bağlı kalmalıyız.					
Mevcudiyet					
9. Bir finansal yatırım aracı kar/zarar ettiği dönemlerdeki performansını bir süre sonra tekrarlar.					
10. Bir finansal yatırım aracına ait aklımda kalan dikkat çekici bir performans, aynı tür finansal yatırım aracına tekrar yatırım yapmak istediğimde kararım üzerinde etkili olur.					
Kayiptan Kaçinma					

11. Getirisi ve riski yüksek yatırım araçlarına kıyasla getirisi ve riski az olan yatırım araçlarını tercih ederim.					
12.Yatırımlarımda bir kayıp olduğu durumda, sonraki yatırımlarımda riskten daha fazla kaçınırım.					
Aşina Olani Tercih Etme					
13. İki finansal yatırım aracı arasında karar vermem gerekirse, hakkında daha fazla bilgi sahibi olduğum yatırım aracını tercih ederim.					
14. Yabancı yatırım araçları daha karlı olsa bile yerli finansal yatırım araçlarını tercih ederim.					
Zihinsel Muhasebe					
15. Yatırımlarda kayıplardan kaynaklanan üzüntüm, kazançlardan kaynaklanan sevincimden daha fazla etkiye sahiptir.					
16. Finansal yatırımlarımı, finansal ürünler arasında dengeli olarak dağıtırım.					
Pişmanliktan Kaçinma					
17. Zarar durumunda, zararımı karşılayana kadar yatırım yaptığım finansal ürünü satmam.					
18. Finansal yatırımlarımın zarar etme ihtimalini düşünüp buna göre hareket ederim.					
19. Yatırım yaptığım finansal üründen kar ettiğimde hemen satarım.					
20. Değeri düşüş eğilimine girmiş bir finansal varlığa yatırım yapmakta tereddüt ederim.					
Belirsizlikten kaçınma					
21. Güvenli fakat getirisi düşük finansal yatırım araçlarını, güvensiz ve yüksek getirili finansal yatırım araçlarına tercih ederim.					

22. Mevduata yüksek faiz veren küçük ölçekli bankalar yerine düşük faiz veren büyük ölçekli bankaları tercih ederim.					
23. Bazı bankalar ve finans kuruluşları batabilir. Bu yüzden finansal varlıklarımın bir kısımını finansal sistem dışında tutarım.					
24. Daha önce yatırım yapmadığım yeni bir finansal varlığa, yatırım yapmakta tereddüt ederim.					
Sürü Davranışı					
25. Piyasada yer alan diğer yatırımcıların gözlem ve hareketlerine önem verir ve genellikle çoğunluğun kararlarını takip ederim.					
26. Finansal yatırımcıların çoğunun tercih ettiği yatırım araçlarının daha yüksek getiri sağladığına inanırım.					
27. Finansal yatırım yaparken, kurumsal yatırımcıları takip ederek karar veririm.					
28. Piyasadakı finansal yatırımcıların yatırım kararlarını değerli bulurum ve onların yatırım yaptığı finansal ürünlere ben de yatırım yaparım.					