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GRADUATE SCHOOL OF SOCIAL SCIENCES

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MASTER'S THESIS

THE ROLE OF PREJUDICE ON THE INDIVIDUAL INVESTMENT DECISIONS

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APPROVAL PAGE

DECLARATION

I hereby declare that this master's thesis titled as "The Role of Prejudices on Individual Investment Decisions" has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honor.

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ABSTRACT
Master's Thesis
The Role of Prejudice on the Individual Investment Decisions
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Department of Business Administration (English)
Business Administration (English) Program

There are psychological, sociological, demographic, and environmental factors on the basis of the behaviors of individuals. As a result of the perception-thought-decision process, individuals develop a behavioral pattern. Psychological prejudices and cognitive dispositions, which have a critical role in the formation of these behaviors, have an important place in the explanation of irrational financial behaviors that traditional finance theories are insufficient to explain. Behavioral finance is one of the important disciplines in social sciences in order to examine individuals' investment decisions, investment realization and post-investment processes within the framework of these factors.

Cryptocurrency markets are extremely volatile and under-regulated. Therefore, more and more individual investors are trading in such markets every day. Due to high-frequency trading, individuals experience constant mood swings and distortions in their perceptions. As a result, these markets provide a suitable environment for behavioral finance questions to be answered and for observation.

The aim of this study is to analyze the relationship between psychological biases and cognitive dispositions affecting individuals and investment decisions in cryptocurrency markets. The hypotheses were tested with data collected from 399 participants investing in the cryptocurrency markets. SPSS was used for data analysis. As a result of the study, significant findings were found between demographic factors and investment decisions of individuals. In addition, it has been determined that psychological biases are effective on individuals' investment decisions.

Keywords: Behavioral Finance, Investor Behavior, Investor Psychology, Psychological Bias, Cryptocurrency Markets, Financial Investment Instruments.

ÖZET
Yüksek Lisans Tezi
Bireysel Yatırım Kararlarında Önyargının Rolü
İbrahim Emre DURMAZ

Dokuz Eylül Üniversitesi
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İngilizce İşletme Yönetimi Programı

Bireylerin davranışlarının temelinde psikolojik, sosyolojik, demografik ve çevresel faktörler yatar. Algı-düşünce-karar sürecinin sonucunda bireyler davranış biçimi geliştirir. Bu davranışların oluşmasında kritik role sahip psikolojik önyargılar ve bilişsel eğilimler, geleneksel finans teorilerinin açıklamakta yetersiz kaldığı, rasyonel olmayan finansal davranışların açıklanmasında önemli yer tutar. Davranışsal finans, bireylerin yatırım kararı alma, yatırımı gerçekleştirme ve yatırım sonrası süreçlerinin bu faktörler çerçevesinde incelenmesi adına sosyal bilimlerdeki önemli disiplinlerden biridir. Kripto para piyasaları, aşırı oynak hareketler içerir ve düşük regülasyona sahiptir. Bu nedenle, her geçen gün daha fazla bireysel yatırımcı bu tür piyasalarda işlem yapmaktadır. Yüksek frekanslı işlemler nedeniyle, bireyler sürekli duygu değişimleri yaşar ve algılarında sapmalar oluşur. Sonuç olarak bu piyasalar, davranışsal finans sorularının cevaplanması ve gözlem için uygun bir altyapı oluşturur.

Bu çalışmanın amacı, bireyleri etkileyen psikolojik önyargılar ve bilişsel eğilimler ile bireylerin kripto para piyasaları için yatırım kararları arasındaki ilişkiyi analiz etmektir. Hipotezler, kripto para piyasalarında yatırım yapan 399 katılımcıdan toplanan veriler ile test edilmiştir. Verilerin analizi için SPSS kullanılmıştır. Çalışmanın sonucunda, demografik faktörler ile bireylerin yatırım kararları arasında anlamlı bulgular tespit edilmiştir. Ayrıca psikolojik önyargıların, bireylerin yatırım kararları üzerinde etkili oldukları tespit edilmiştir.

Anahtar Kelimeler: Davranışsal Finans, Yatırımcı Davranışları, Yatırımcı Psikolojisi, Psikolojik Önyargılar, Kripto para Piyasaları, Finansal Yatırım Enstrümanlar.

THE ROLE OF PREJUDICE ON THE INDIVIDUAL INVESTMENT DECISIONS

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ABBREVIATIONS

ADA	Cardano
APT	Arbitrage Pricing Theory
BCH	Bitcoin Cash
BTC	Bitcoin
CAPM	Capital Asset Pricing Model
EFM	Efficient Market Hypothesis
ETF	Exchange Traded Fund
ETH	Ethereum
HOT	Holochain
N	Number
SD	Stardart Deviation
IOTA	Miota
XLM	Stellear
XRP	Ripple

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INTRODUCTION

Finance can be defined as the supply of funds needed by individuals and the effective management of existing funds. From the perspective of the individual, each individual need fund for their expenditures and wants to use their savings effectively. The underlying motivation is that individuals want to increase their level of well-being. Individuals invest for purposes such as protecting their savings from inflation and generating income from their savings. While making these investments, they are expected to avoid situations that are against them and to prefer a situation that will benefit them. At least, traditional finance theories work on this basis. However, individuals do not make their investments solely on the line of benefit or loss. Their decisions can be affected by environmental, sociological, psychological, and demographic factors that affect their perceptions. As a result, their behavior is formed. These factors are also effective under financial behavior. Because individuals grow up with these factors from the day they are born. As a result, individuals develop behavioral patterns depending on these. This includes patterns of financial behavior so.

Traditional finance theories claim that individuals' financial behavior is rational. There are also assumptions on the efficiency of market conditions. However, individuals can have systematic errors depending on the deviations in their perceptions while making decisions. For this reason, the judgments of individuals toward situations may differ. Judgments turn into prejudices and cognitive dispositions. The behavioral Finance discipline is based on systematic errors that arise due to psychological prejudices and cognitive dissonance.

The types of financial investment instruments are increasing day by day. Cryptocurrency markets, which are the most up-to-date among them, appear as the markets where behavioral finance effects are observed the most. Cryptocurrency markets are active 24/7 and have a dynamic structure. The fact that cryptocurrency markets are not subject to any regulation and are accessible to every individual enables more and more individuals to trade in such markets. With high volatility and pump & dump movements, individuals experience constant mood swings. This situation creates a suitable basis for analysis on behavioral finance.

The aim of the study is to examine which psychological biases and cognitive tendencies individuals make decisions during their investments. The study has been applied especially on cryptocurrency markets where emotional changes are quite intense and systematic errors can be observed frequently.

The study is divided into 4 parts. In Chapter 1, firstly, traditional finance theories will be explained. These are Efficient Market Hypothesis, Modern Portfolio Theory, Capital Price Asset Model, Arbitrage Pricing Theory. Each traditional finance theory will be explained with its historical data, propositions, and results of its applications. The assumptions of traditional finance theories on the market and the individual will be examined. Behavioral finance theories will be explained in the second main subject in Chapter 1. These are Prospect Theory, Representative Agent Model, Daniel, Hirshleifer and Subrahanyam Model, Hong and Stein Model Based on Interactive Relationship Between Heterogenous Investors. Within each model, there is information about the historical development of the model, its founders, propositions, and past applications. Particularly the Prospect Theory applications of Kahneman and Tversky and the results of the experiments carried out and will be examined in detail because they form the basis of other theories. Prejudices and mental shortcuts will be explained in the last main subject in Chapter 1.

In Chapter 2, financial investment instruments consist of four topics. These are Partnership Instruments, Debt Instruments, Futures and Options Instruments, and Capital Gain Instruments. The cryptocurrencies that are the subject of the study will be examined under the title of Capital Gain Instruments. In Chapter 3, the methodology and findings of the study will be reviewed. Data were collected by the Random Sampling method. The first part of the data is demographic, the second part is cryptocurrency awareness, and the third part is psychological biases. After examining the sections with descriptive and frequency analysis, they will be analyzed with Chi-Square and One-Way ANOVA tests.

The last section will be the conclusion section. In this section, the findings will be explained and discussed. Observations and findings will be compared and explained to the executives in detail.

CHAPTER ONE
TRADITIONAL FINANCE AND BEHAVIORAL FINANCE MODELS AND HYPOTHESIS

1.1. CONVENTIONAL FINANCE

Individuals are existentially utility oriented. For this reason, individuals avoid losses and want to make gains. Rational decision attitude appears here; avoid losses, desire gains. This simple equation forms the basis of traditional finance theories. However, some factors play an important role in the formation of traditional finance theories. These are excellent knowledge, excellent interest, and excellent rationality (Kapoor and Prosad, 2017: 54). Without these three basic components coming together, difficulties arise in the explanations of traditional finance theories.

Traditional finance thinks that people are rational, and they are utility oriented. They are prone to averse uncertainty and risky situation. According to the traditional finance aspect, markets are efficient that everyone who is in the market can reach information at the same time. This should have led the way to fair competition on market, but it doesn't as it seems. There are four assumptions on traditional finance rational behavior, efficient market, designed portfolio with mean-variance base and expected returns that evaluating with risky and risk-free assets (Statman, 2008:19)

Every person has financial decisions even though they don't invest anything. So financial decisions are relatively complex, and it is hard to interpret. Standard finance has emerged and designed to use mathematical formulas to explain and interpret relatively complex financial situations that are difficult to explain in daily life (Pompian, 2011: 10).

1.1.1. Efficient Market

The efficient market hypothesis assumes that all securities which are in a transaction on market reflect their information at the same time whole information which are available. This approach posits that in the market there are sellers and buyers, all traders and investors can achieve information at the same time. If the market reflects all prices fully and true which is subject to trade or investment, this calls an

efficient market. Depending on this situation, a price occurs which calls a balanced price (Fama, 1970: 383).

The efficient market hypothesis can be examined in capital market because although other markets try to conduct their research and implementations mostly allocation and designation efficiency, the capital market firstly is interested in cost efficiency (Blume and Durlauf, 2008: 130).

In case the returns might be predictable, the theory assumes that most investors use them for making unlimited gains. Investor manners must be a suitable efficient market hypothesis, otherwise, they would provide this situation which led the way to earn boundless money that is impossible to get in a constant economy (Timermann and Granger, 2004: 15).

The theory has three assumptions which are about describing markets and investors' possible situations where might occur in the market. The weak form, semi-strong form, and strong form are known as the part of EFM (Fama, 1970: 383).

In weak form (also calls as weak efficient form) assumes that a price of stocks reflects all information that related to past changes of stock prices. This information may be about past prices and trade volume. In consequently of reaching this information which mentioned, making a profit and possible gains would be impossible. So even if used technical analysis, would not help to get the return of investment overly. The semi-strong form, in addition to the weak form, also includes the information which is open to reaching for current publicly like dividend pays, acquisition declarations, implementing new policy accounting. Lastly, strong form refers to that stock prices reflect all potential information that is not necessarily to known by the public (Degutis and Novickyte, 2014: 8).

1.1.2. Modern Portfolio

Harry Markowitz published his article which name is "Portfolio Selection" in 1952. In this article Markowitz claim that a portfolio may select and create in two-stage. The first one is to be created by observation and experience that can end with choosing performing stock that is believed. The second one begins with related beliefs and ends with portfolio selection (Markowitz, 1952: 77).

In the under of assumptions what rational investors, efficient markets, Markowitz assert that investments should be decided according to expected returns and risk amount and standard deviation of previous yields is the only mathematical indicator of it. According to assumptions of MPT, investors desire that earn more money in a certain amount of risk. Investors will be prone to invest in a less risky asset that returns the same rather than a risky asset (Yiğitler and Akkaynak, 2017: 287).

According to Markowitz, too many stocks in a portfolio creates inefficiency. A certain amount and relatively well-researched and selected stocks will help investors maximize their return on this investment. On the other hand, the relation of yields between stocks is also one of the other important issues. In addition to analyzing past data and perform's stocks, the interaction between stocks ought to examine. An investor should consider the correlation between assets invested in. Ignoring this correlation can create a riskier portfolio even though the same level is expected to return when compared with taking consideration into account (Elton and Gruber, 1997: 1744).

1.1.3. Capital Asset Pricing Model

Capital Asset Pricing Model (CAPM) is a model developed by Sharpe (1964), Litner (1965), and Black (1972), and the model is based on Modern Portfolio Theory developed by Harry Markowitz. Although measuring risky assets in MPT are independent, CAPM claim that there is a positive linear correlation between the expected returns by measuring the risk and the market betas corresponding to the systematic risk of the market (Aras et. al., 2019: 187).

CAPM assumes that stock prices reflect relative information about the market and claims that there is a linear relationship between risk and expected return. According to CAPM systematic risk measures are more precise than the total risk for detecting real risk. In this model, the relation between income from securities and market portfolio is explained by providing that beta coefficient which uses as determining systematic risk (Karan and Karadağlı, 2001: 168).

The capital assets pricing model clarifies in under the condition that all market information is available, the relation between risk and expected return. (Bodie's

Investment, 2014: 292). CAPM assumes that investors are rational who adapt to risk aversion and maximize prosperity. Variance and mean of return of investment are the only things that people care about (Blizt et. al., 2013: 4). CAPM assumptions are;

- The markets are large where all investors taking price,
- Cost of transactions and taxes are not in these markets
- All assets which are risky and non-risky, ought to be open and are traded in public
- Risk-free rate which is fixed must be implemented during the borrow and lend process in any amount. (Bodie's Investment, 2014: 292)

1.1.4. Arbitrage Pricing Theory

Arbitrage Pricing Theory is asserted by Stephen Rose (1976). APT, is accepted as one of the members of neoclassical standard finance which claims that markets are competitive and working without any borders (Güçlü, 2006: 3). APT explains that creating a linear return and it is not required any utility assumptions exempt from monocity and concavity. Moreover, APT can be used in both situations which are single periods and multi periods. So, it isn't restricted to a single period (Roll and Ross, 1980: 1174).

According to APT, there are some factors which are interest rates, growth domestic products (GDP), inflation, money supply. Furthermore, it is accepted that there is a positive correlation between risk and return which is created by factors where we referred to those (Solnik, 1983: 451).

Based on APT, there are systematic factors that affect financial assets long term average return. APT does not underestimate the numerous factors that affect the daily price changes of individual stocks and bonds, but it places more emphasis on the important factors that affect the aggregate of assets in large portfolios. By recognizing these factors, portfolio returns might be evaluated concerning intuitions. To get better performance from the portfolio, it is important that understand and build a portfolio and owing to achieve the level of optimal (Yörük, 2000: 88).

APT has three conditions (or assumptions) so as to make evaluations correctly on the theory. These are;

- Capital markets are in full competition,
- Investors always choose more return rather than less return in the condition of certainty,
- The process which is known as stochastic explains how expected returns occur and is shown by factor model (k) (Ross, 1976: 342).

1.1.5. Expected Utility Theory

Expected Utility theory firstly was mentioned by Bernoulli in the 18th century and was developed to explain decisions that are taken under uncertainty. (Tversky, 1975: 163). Afterward, this theory is explained and formulated by John Von Neumann and Oscar Morgerstern. They published an article in 1944 whose name is "Game Theory and Economic Behavior".

Expected Utility theory explains individual behaviors under risk and uncertainty. (Orme and Hey, 1994: 1291). According to the expected utility theory, individuals want to maximize their benefits when deciding between risky options. Therefore, when deciding between risky options, they will measure the benefit of each result with probabilities, and as a result, they will choose the option with the highest weighted sum (Rabin, 1997: 7).

There are four definition for axiom which is implementing on EUT (Tekin, 2016: 91);

- Completeness: It is supposed that there are two options which are named X and Y. In case make choosing between them, X would rather instead of Y, Y would rather instead of X or an indecisive situation may happen.
- Transitivity: Suppose we add one more option which named Z in addition of two of them. If X is at least as good as Y and Y is at least as good as Z, consequently X is at least as good as Z.
- Independence: In this assumption, X, Y, Z are used as draw. Provided that $aX + (1-a)Z > aY + (1-a)Z$ equation is valid, X is better than Y. It may be inferred that their preferences are not depend on Z.
- Continuity: If X is better than Y and Y is better than Z, Y is good as much as $aX + (1-a)Z$ in a probability.

1.2. BEHAVIORAL FINANCE

We mentioned above conventional finance and we can deduct generally that people are rational who are risk aversion and utility-oriented, markets are efficient where you can buy and sell without any border, taxes and some regulations are effective so that make it easy trades and investments. These theories are prone to define market conditions, optimal portfolio selections, and marginal utility.

Traditional finance describes a rational person in two ways; first of them is the decision-making process which is taken by expected utility theory and the second one is that neither any biases nor heuristics don't use to be foreseen on behalf of future decisions (Thaler ,1999: 12).

In market conditions, traditional finance conditions don't work every time. On the contrary to traditional finance assumptions, people are not exactly rational, and markets are not efficient as is assumed. Some experiments which were conducted in this area show that investors have several systematic errors which are predictable, and their decision can be manipulated in some conditions. The behavior of investors under uncertainty and risk is studied under the behavioral finance discipline. During the investment decision process, investors are affected by not only financial parameters but also affected by their internal thoughts, beliefs, and heuristics. This creates a friction point between conventional finance and behavioral finance aspect comes from this conflict. (Aydın and Ağan, 2016: 95)

Behavioral finance can be counted as part of traditional finance so. It tries to query some aspects which EFM isn't enough to explain such as market anomalies. According to research and studies, it is claimed that in certain conditions, people tend to make systematic errors or mental mistakes (Fuller, 2000: 4). When we evaluate security pricing, all prices will be inaccurate because biased decisions may distort the prices on the contrary EFM assumes.

1.2.1. Prospect Theory

As we mentioned above, EFM doesn't suitable to explain such anomalies. Anomalies can be defined as unexpected situations.

Prospect Theory has been put forward with the published study which is "Prospect Theory: An analysis of Decision Under Risk" in 1979. Prospect theory claims that people's tendency of evaluating their gains and losses is different. Investors would prefer to decide with perceived gains rather than perceived losses. It means the same gains and same losses utilities are not the same for us. (Merger, 2005: 1)

Prospect theory asserts that losses affect people more than gains (Kahneman and Tversky, 1979: 263). In research, many experiments are conducted to understand people's manner under determined conditions. For example, problem 11 asks that; (Kahneman and Tversky, 1979: 263) all participants of the experiment had got $1000 in addition to their net assets, and they were asked to choose options A or B. Option A is %50 to get $1000 and Option B is %100 to get $500. %84 of participants selected the option B . Problem 12 includes options C and D and asks that; $2000 was given to all participants regardless of their net assets and they were asked whether they prefer to lose $1000 in %50 possibility or $500 in %100 possibilities. % 69 of participants selected the option C. It is concluded that the decisions of individuals are based on the potential value of gains and losses rather than the final output (Barberis, 2001: 4).

Editing is the first stage of explaining investors' biases through their decisions. The function of the editing phase is to edit and reformat the options to simplify the next evaluation and selection (Kahneman and Tversky, 1979: 263). People determine an evaluating point and according to that make the judgment for losses and gains. There are four fundamental phases for the editing phase;

- Coding: The location of reference points and coding outcomes as gains or losses, turn into probability which affects people's attitude toward expectations.

- Combination: The probabilities correlate with similar outcomes to make them simplify.

- Segregation: All options which are subject to risky review, after they segregate as risky and non-risky.

- Cancellation: Cancellation refers to eliminating common components out of options (Kahneman and Tversky, 1979: 274).

The Value function is the base of prospect theory and shows that losses are affecting people more than gains at the same level. It can seem that losses are convex, and gains are concave. Losses have steeper scope when compare with gains. But the

determinant factor is a reference point which people make a judgment according to this point about their wealth (Levy, 1992: 181). Loss scope is steeper than gain scope. So, people are more susceptible to losses rather than gains. In below, we may see a graph that how is the value function works.

Figure 1: Hypothetical Value Function
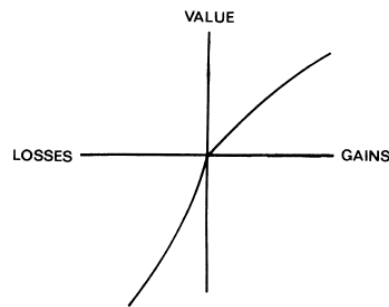
Source: Tversky & Kahnemann, 1979: 271

The Weighting Function explains the qualification reflection pattern of behaviors to risky expectations (Aksoy and Şahin, 2015: 14). Overweighting to small probabilities makes more popular insurance and lottery. Reversely, underweighting to large probabilities led the way to be risk aversion toward possible or absolute gains or being risk-taker toward possible or absolute losses (Levy, 1992: 182-183). The weighting function gets higher values when it is getting close to pole points like 0 or 1. However, it is impossible to reach these poles because they express extreme possibilities and people are not able to interpret or evaluate these.

Figure 2: Hypothetical Weighting Function
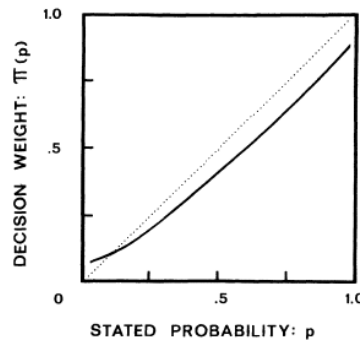
Source: Tversky & Kahnemann, 1979: 271

1.2.2. Representative Agent Model

This model was developed by Barberis, Shleifer, and Vishny and was published as "A Model of Investor Sentiment" in 1998. The model explains underreaction and overreaction with two heuristics which are "representativeness" and "conservatism". Overreaction explains with representativeness and underreaction explains with underreaction. Conservatism is defined as the tendency of not changing their previous manners and beliefs when they confront new information. Representativeness is defined as the tendency to ignore distributed statistical data because of focusing mostly on exceptional factors (Barak, 2008: 212).

According to this model, it assumes that there is a market that consists of one investor and one security. The investor who is thought like assumption has average presumes and thought whose belong to other investors. The representation investor affects prices and yields with his beliefs and thoughts (Barberis and Shelifer, 1998: 309).

In this model, investors evaluate the profits of the company as a variable in their investment decisions. Even though these profits have a character that is suitable with random walk hypothesis, because of misperception, the companies which make profits consequently will have the tendency to come back their average and they will be in their trend soon after (Fama, 1998: 288).

Markov process is a model which explains investor's perception changes about prices and yields of securities. Underreaction and overreaction concepts are related with these price and yield changes perception. Investors tend to underreaction while they expect to mean-reverting of prices. In here, it is expected that profits went thoroughly in one way and it will return at an average point. It is believed that a new trend has begun after several movements occurring in a row, which creates an overreaction (Barberis and Shelifer, 1998: 318).

1.2.3. Daniel, Hirshleifer and Subrahanyam Model

This model has been built on two psychological biases which are overconfidence and self-attribution. According to overconfidence, investors rely on their knowledge more than they should be (Daniel, 1998: 1841). In financial markets, overconfidence led the way to investors might make wrong evaluations. Therefore, investors make wrong choices because of overconfidence.

Investors who tendency to overconfidence might overvalue share price according to their mental benchmark. Because they thought that the price of share has much higher potential than it does exist. Those investors mostly ignore their errors and discrepancy and put higher value on their presumes (Daniel, 1998: 1841). Although overconfident investors relate their successes with their abilities, they relate their failures with bad luck. Moreover, they want to use their abilities whose supposed that their abilities attribute as supreme. Thence, they underestimate the risk of shares and consequently misinterpret the market (Nofsinger et. al,.2007:426).

In this model, self-attribution manner has been examined also. Self-attribution bias is defined as, establishing a correlation between the investors' confidence in their knowledge and investment performance (Barak, 2008: 212-213). According to this bias, while the investors prone to exalt their successes, they try to explain their failures with external factors. It is claimed that if the decisions of the individuals are correct, these decisions are made by the high abilities of the individuals, and in the opposite cases, the situation occurs due to bad luck or sabotage (R. Shiller, 2003: 94).

Overreaction and self-attribution are psychological biases. In long term, they cause to create negative effects on shares by autocorrelation (Daniel, 1998: 1839).

According to the model, the investors who have private information put a value on their thought rather than public information. This manner gives rise to overreact their thoughts which are approved by themself. Consequently, as far as the model concerned autocorrelation is occurred because of this process (Daniel, 1998: 1843).

1.2.4. Hong and Stein Model Based on Interactive Relationship Between Hetetogenous Investors

Even though this model has the same goal as previous models, it doesn't explain representative behaviors exactly. Rather than, it emphasizes interactive relationship which is between heterogeneous investors (Barak, 2008:213). This model assumes that there are two kind of investors who are newswatcher and momentum traders and they manage all market (Hong, Stein, 1999:2143). It is asserted that these investors are in limited rationality who can use only one type of information. So, we can deduct those investors are not exactly fully rational (Hong and Stein, 1999:2144)

Newswatchers can make predictions on possible future prices by using public information. They don't have any possibility to reach and use current and previous prices of shares. When the new information comes to the market, increases and decreases occur in share prices because of newswatchers. However, share prices generally change slowly. This creates underreaction (Hong and Stein, 1999:2145) Momentum traders take consider into account only price movements when they are in investment. Previous information drives investors to make a decision. This situation led the way to overreaction and creates an offset between newswatchers who are caused underreaction (Hong and Stein, 1999: 2145-2146). This model is accepted applicable and coherent.

1.3. INVESTOR BIASSES AND HEURISTICS

Decision-making is one of the most complex processes which include many determinants. People are not rational and making right decision is not such an easy every time. In addition, making rational decisions requires serious effort. Because it requires a significant amount of thinking action. In order for people to manage their

time effectively, they need to use some mental shortcuts. These are ways that are also called heuristics. Heuristics, which is one of the elements on the basis of making quick decisions, helps us not only in daily life, but also in financial life. However, these helps may not always contribute to us. Because heuristics sometimes create systematic errors and can deviate the decision mechanism in a negative way. Moreover, with the transformation of decisions into behaviors, individuals may suffer serious harm as a result of these behaviors. For this reason, it should not be forgotten that every decision taken based on heuristics will not always lead individuals to the right conclusion or inference. Even though biases are similar to heuristics, there are some fundamental differences. Heuristics are mind-generated shortcuts to make a judgment or inference in the fastest way. Biases, on the other hand, has more of a belief feature. These beliefs have a distorting effect on decisions. Under normal circumstances, decisions that can be taken rationally and for the benefit of the individual may show itself in the opposite direction due to biases. Individuals, especially those in financial markets, may avoid realizing their gains or losses due to the wrong judgments that arise.

1.3.1. Representativeness

Representativeness is described as the tendency to unreasonably relate with a representational feature of a phenomenon to explain or describe another phenomenon (Kahneman and Tversky, 1974: 1125-1126). It is also a mental shortcut known as a heuristic. Representation is an evaluation based on similarity to something rather than using probabilities in decision making. In the other words; representativeness can be expressed as a tendency to evaluate by reference to how much it resembles something (Hayta, 2014: 334). Investors who are influenced by this heuristic often tend to recall the most noticeable and recent events. This causes probability calculations to be ignored. As a result, it may cause wrong decisions (Fuller, 2000: 12).

When investors analyze stocks, they often compare historical prices. As a result of this comparison, they decide which stock is good and which is bad, and they have the illusion of representativeness that price movements will be in this direction in the future (Nofsinger, 2001: 425-451).

The law of small numbers was designed to explain by Kahneman and Tversky to representativeness heuristic. This law claims that small samples within large populations represent the entire population. In case investors make decisions based on small examples, they may make mistakes in their decisions (Tversky and Kahneman, 1971: 105-110).

1.3.2. Availability

Availability can be defined as misleading shortcuts that try to make sense of the probability of realization of a situation according to the degree of recall in human memory or the level of presence in the memory of the individual. In other words; It is a heuristic that occurs in estimating the probability or frequency of a phenomenon. (Kahneman and Tversky, 1974: 1127).

Recent events are remembered more than past events. This is one of the basic assumptions of availability heuristics (Kahneman and Tversky, 1974: 1127). From this definition, it is understood that people aren't interpret all available information while making a decision, but instead overweighting while assessing them (Kliger, 2010: 52).

Availability heuristics can also cause people to make decisions by ignoring the available statistical data because of its stunning information (Hayta, 2014: 334). It can be an example that expressing news or information shared in financial markets as striking may cause an overreaction.

The impact of past experiences on the present is explained by this cognitive tendency. As a result of a bad situation experienced in the past, such as the loss of the investor, it will affect the risk perception of the person. The investor will decide in a risk-averse way. Otherwise, the investor will want to take risks more. His previous gains will give them courage, which will affect the decision-making mechanism.

1.3.3. Anchoring

Anchoring effect can be defined as that people determine a reference point while making decisions and evaluate their decisions according to this reference point (Kahneman and Tversky, 1974:1128). Inferences which are made before making the

final decision are adjusted concerning this initially determined reference point. In case of people are exposed to these reference points too much, their tendency to make judgments are affected by anchors (Furnham, 2011: 37). Reference points are formed by factors such as past experiences, observations and the environment. If an insufficient or erroneous reference point is determined under these factors, judgments and decisions are also negatively affected.

The anchoring effect can be seen in many areas of life. This effect can be obviously observed in negotiation or negotiation processes. Studies in this area support that the final decision of the agreement or negotiation is strongly influenced by the initial offer (Mussweiler, 2000: 1142-1143).

In a study conducted by Kahneman and Tversky (1974), some of the participants were asked the question 1 * 2 * 3 * 4 * 5 * 6 * 7 * 8, the others were asked 8 * 7 * 6 * 5 * 4 * 3 * 2 * 1, and both groups were asked to answer the questions. In this study, which was carried out on examining the reference point, they answered in 5 seconds and the average response of the first group was 512, even though the average response of the second group was 2250. However, correct answer is 40320. It was observed that the participants made mental adjustments in such questions, which were answered in a very short time (Kahneman and Tversky, 1974: 1128).

We can see the presence of this effect in many areas of trading. The asset price, which is determined with the highest price, creates a reference point for people and causes them to make comparisons according to this price (Baker, 2013:394).

Particularly investors carry out their trading transactions by interpreting stock prices with such reference points. Moreover, anchoring effect also be observed in target and prospect oriented transactions. During such transactions, it has been revealed that there are significant deviations in the perceptions and decision mechanisms of investors (Hayta, 2014: 334-335).

1.3.4. Overconfidence

Overconfidence can be defined as individuals have more confidence in the accuracy of their knowledge and abilities rather than they should have been (Hayta, 2014: 336). In other words, it is the situation where people attribute their past

achievements to their own skills and their losses to bad luck (Nofsinger, 2007: 426). Overconfident investors trade by exaggerating their aptitude to choose the next stock to win. Stock price changes by many factors beyond the investor's control and therefore overconfidence in the choice of stocks is also a non-optimal financial behavior that leads to financial losses (Lee-Foo, 2020: 25)

Overconfidence may cause misinterpretation of the risk level. Under normal conditions, the investor is expected to minimize the risk and maximize the profit. However, this cognitive tendency distorts investors from making rational decisions. This phenomenon can be called a temporary blindness and affect the risk perception of investors.

Griffin and Valley (1996) claimed that there are 2 types of overconfidence type in their studies. The first of these is the optimistic overconfidence, which tends to exaggerate the likelihood that one's preferred outcome will happen. The second is the overconfidence on one's own judgment, even if there is no information or result to support one's own knowledge. These two types of overconfidence confuse investors' judgment and can lead to a weak decision making (Griffin and Varey, 1996: 227-231). It can be an example that overconfident investors may invest in stocks or funds that are not eligible to invest, given the market conditions. These types of investors are less willing to acquire new knowledge. Consequently, they are less enthusiastic about personal development (Zacharakis, 2001: 313).

There is some evidence to support that traders trade more often than regular investors. Excessive trading by individual investors exposes them to high levels of risk, and their post-investment experience leads them to make poor decisions (Nofsinger, 2007: 426). However, when comparing the number of overly confident investors to highly skilled investors, it is generally known that there are very few truly highly skilled investors. So, trading frequency is often associated with an overconfident investor.

The large transaction numbers of overconfident investors create extra costs for them to bear. Therefore, there is a decrease in their income. At the same time, risk perceptions change because of investors rely too much on their own knowledge. Due to the misinterpretation of risk perception, investors cannot accurately determine the risk of their portfolios. Hence, they are reluctant to diversify their portfolio.

1.3.5. Optimism

Optimism bias is defined as the propensity to overrate the contingency of positive future outcomes and to underrate or ignore the contingency of future negative outcomes (Brown, 2010: 1). This bias deviate people's expectations and misleads their perceptions in the decision-making process. There are two basic elements that reveal this cognitive tendency; the first is overconfidence and the second is the illusion of control. These elements create valuations and expectations due to overconfidence in events over which people have no control.

Optimism and overconfidence tendencies cause people to overestimate their knowledge, underestimate risks, exaggerate their ability to control events, and ignore inaccurate predictions (Montier, 2002: 145). However, although these concepts seem to explain similar phenomena, there are fundamental differences. Even though overconfidence refers to the individual or investor's own knowledge and abilities, optimism is a cognitive tendency shaped by mostly environmental factors.

Optimism is a frequently observed cognitive tendency that influences investor behavior and decision-making mechanisms. Especially when overconfidence and optimism are used together, they negatively affect investors' rational evaluations. Besides, investors who have optimism ignore negative information about their investments. Consequently, this leads to the same misinterpretations about rational decision making (Southey, 1996: 376-377).

1.3.6. Regret Aversion

Regret is defined as a feeling related to the previous knowledge that a different decision or judgment made in the past might be better than the decisions chosen (Statman, 1985: 781). Because regret is a negative emotion that affects people's behavior and decisions, it creates significant effects in their lives. The fact that people have regret-oriented behavior in order not to experience these negative effects can be defined as regret aversion (Seiler, 2008: 463).

One of the important studies on regret was conducted by Kahneman and Tversky (1982). Participants were asked about the loss of a $ 1200 worth of stock.

Stock losses are of two types; The first is the loss from the bought stock, and the second is the loss from the held stock. Strikingly, 92% of respondents assumed that the active investor would feel more regret than the passive investor. It can be concluded from this study that an action that ends badly creates more regret than a bad result without doing anything (Zeelenberg, 2002: 212-214).

Investors who have losses from their previous investments will make their future investments with this experience. Therefore, investors make decisions with a tendency to regret aversion in order not to experience previous regrets while making an investment decision.

Individuals tend to hold their losing investments for too long and sell their winning investments quickly in order to avoid feelings of regret (Hayta, 2014: 344). On the other words, in the stock market, investors are slow to sell while making losses but hurry to sell when they make a profit, and they do not want to feel regret. However, this bias has a deviating effect on the investor's decisions. The fact that investors want to dispose of their profitable stocks immediately is because they want to make a profit realization due to the losses they have experienced (Ricciardi, 2014: 8). So, the decision-making is likely to be wrong (Ricciardi, 2014: 8).

1.3.7. Herd Effect

In any activity, people can be influenced by others, including financial transactions. For example, the financial behavior of someone who can manipulate the masses, like Elon Musk, can influence their decisions. Such situations may also result from people's rational choices. But people, investors, etc. often come together irrationally in such actions and beliefs to form herd behavior (Hirshleifer, 2003: 25).

For any imitation to occur, people must be aware of the situation and be affected by them. Suppose that the individual intuitively invested without knowing other investors' decisions. The herd effect can be observed only if the individual does not make this investment when he realizes that others have decided not to do this. An example may be that investors change their decision to invest (Sharma, 2000: 280). Here, the situation of investors imitating each other's behavior is seen in different ways. While some of the investors have this behavior unconsciously, some of them get

this effect even though they are conscious. This is an attitude that prevents investors from making rational decisions.

Investors' acquisition of new information or diversification of existing knowledge can influence them with herd behavior. However, the new information that investors have obtained is not by their own efforts, but by imitating the behavior of others. This prevents investors from making rational decisions. Because every action or decision made with the herd effect prevents rational thinking because it is based on copying.

There are many market bubbles that have occurred until this time because of the herd effect. Examples include the internet bubble that emerged in the late 90s or the Florida real estate bubble that triggered the 1928 crisis. In both cases, investors preferred opportunity-oriented investment rather than investment valuation. In both crises, the investor's decision interacts with the decisions of other investors in the market. As a result, sudden price movements occurred and this caused a crisis. Researchers observe the herd effect in two ways. The first is rational and the second is irrational herd behavior. Rational herd behavior basically stems from the representation problem (Hayta, 2014: 341-342). For example, people do not use their knowledge to protect their own benefits and imitate other people's behavior. Investor psychology is largely influenced by irrational herd behavior. For example, investors abandon their beliefs and knowledge and follow the behavior of other investors.

1.3.7.1. Rational Herd

People or investors having a certain amount of information, but the tendency to imitate others due to insufficient level of this information can be defined as rational herd behavior (Welch, 1996: 606). Researchers have examined this type of behavior under three categories.

1.3.7.1.1. Information Based Herding and Cascade

Investment tools are limited and investors make their investments using these instruments. The limited number of instruments causes investors to invest in a similar

way. In this case, the results can be expected to be similar. The important point is that investors tend to follow the individual before them. This individual and all subsequent individuals will act rationally and invest regardless of public data. Because all investors under this influence accept the information of the person who first started the information cascade. Investors ignore their information due to this type of behavior and accept the information of the person who initiated the information cascade as correct (Sharma, 2001: 286).

1.3.7.1.2. Reputation Based Herding

In an uncertainty environment, managers with limited ability adopt the behaviors and decisions of managers they think as more capable than themselves. Underlying this type of behavior is the motivation to avoid loss of reputation, which especially managers may experience after making the wrong decision (Sharma, 2001: 286).

Scharfstein and Stein (1990) claim to have two different executive characters; The first of these is the high-talented and the other is the low-talented one. Investors do not know which manager is talented and which is not, and they compare it to a talented manager to make an inference about it (Teoh, 2001: 22-24). Even if talented managers make mistakes due to the wrong decision, low talented managers will be able to maintain their reputation because they adopt a similar attitude.

1.3.7.1.3. Compensation Based Herding.

Performance comparisons of fund managers are measured by their income. As a result of this comparison, those who earn high income will be considered successful, and those with low income will be considered unsuccessful. Fund managers who do not want to earn low income will tend to imitate the behavior of high performing and income managers and create similar portfolios (Sharma, 2001: 286).

It is claimed that young fund managers lead to herd behavior by imitating the decisions and portfolios of experienced fund managers (Hong et. al., 2000: 121-144). There are two kinds of factors under this type of behavior; these are earning more or

not being fired. Either way, one's motivation is to protect one's own benefits.

1.3.7.2. Irrational Herd

Irrational herd behavior can be defined as imitating the behaviors and decisions of others, leaving aside investors' own thoughts, experiences and knowledge (Teoh, 2001: 28). Irrational herd behavior, unlike rational herd behavior, does not involve conscious imitation. There are psychological factors underlying this behavior. Anxiety and fear of exclusion cause people and investors to exhibit this pattern of behavior.

Irrational herd behavior is often seen in stock markets. Unreasonable pricing in stock pricing can arise due to the panic attitude of investors. This situation is often contagious and leads to the spread of society or investors. Consequently, situations such as excessive volatility of the markets, instability and fragility of the financial system occur (Teoh, 2001: 52). Financial bubbles are formed for these reasons. Irrational herd behavior causes investors to make their decisions based on psychological bias rather than systematic analysis (Hayta, 2014: 342). Therefore, many investors can make wrong decisions and have financial losses as a result.

1.3.8. Framing

Framing effect is called a cognitive tendency that describes how investors react differently by being influenced through the way events are presented and expressed in the decision-making process (Gaeth, 1998: 150-151). The most important point here is the distortion of the situation or case on perceptions due to the different presentation styles.

Kahneman and Tversky, pioneers of behavioral finance, studied this issue in prospect theory. According to their observations, framing a problem in ways of gaining or losing causes variation in answers. They conducted some experiments on this topic and asked questions to the participants in different frameworks. In one of these experiments, participants were told that there was a disease that emerged unexpectedly and was expected to die 600 people. Participants were asked to answer that there are 2 different programs to combat the disease and which one should be implemented. The

following questions were asked in an experiment with 152 participants:

- A: If program A is implemented, 200 people will be saved.
- B: If program B is implemented, 1 \ 3 will probably save 600 people, but with 2 \ 3 chances no one will be saved.

72% of the participants preferred the first option to save 200 people 100%. It is understood that most of the participants are risk averse (Kahneman, 1981:454).

Participants were asked again about 2 different programs to be implemented for the same disease. Questions asked of 155 participants:

- C: If C program is implemented, 400 people will die.
- D: If program D is implemented, 1 \ 3 probability nobody will die, but 2 \ 3 probability 600 will die.

78% of the participants preferred the implementation of the D program. From this result, it can be claimed that people are risk-takers. However, there are two different types of framing in the experiment. Considering the risk factor, it appears that the gaining or losing frames affect the attitudes people face with problems (Kahneman, 1981: 454).

This effect is frequently observed on investors in financial markets. The proportions of the pleasure of gaining and the pain of losing differ from each other. The value function in Kahneman and Tversky's studies supports this situation. According to the study, the pain of losing is higher than the pleasure of gaining (Kahneman, 1981: 457). For this reason, investors consider the loss factor when investing. This causes them not to act rationally and to suffer potential losses or opportunities.

1.3.9. Mental Accounting

The simplest definition of mental accounting is the process people use to interpret and evaluate their financial transactions and decisions (Barberis, 2001: 1253). According to mental accounting, the human mind works similar to accounting processes. The problematic of where resources come from and where to allocate, which is the basis of accounting processes, has been adapted to human behavior by

Thaler.

Mental accounting consists of three basic components. The first component is about how results are perceived, how decisions are made and how decisions made are evaluated. This component can be explained as the comparison of each event with the past and generating new ideas about the future with the data that will come from it. The second component is defined as assigning certain activities to specific sub-accounts. This activity is similar to accounting. The tendency to group the money to be used about where it is gained and where it will be spending is explained by this component. The third component explains the evaluation of these accounts' frequencies by classifying them daily, monthly, and yearly. Based on these components, it is understood that mental accounting affects human decisions and choices (Thaler, 1999: 184).

In an experiment conducted by researchers Prelec and Loewenstein, participants were asked to plan their Caribbean vacation for six months later. Participants were asked to choose one of the following options to finance this cost, as the cost of this vacation was $ 1200.

- A: Payment plan of $ 200 for six months before going on vacation
- B: $ 200 payment plan for six months after returning from vacation

In this question asked to 91 participants, 60% of the participants preferred the early payment plan. In another question asked to the participants, they asked them to assume that they would buy a washing machine and dryer machine for their new residence six months later. For these two machines with a total cost of $ 1200, the following questions were asked:

- C: $ 200 monthly payment plan made six months before machines are delivered
- D: $ 200 monthly payment plan made after the machines are delivered

84% of the participants stated that they prefer to pay after receiving the machines. In this study, it was found that the early paid vacation cost gives more pleasure than paying after returning from vacation. The fact that machines do not make a hedonic difference is an important evaluation tool in cost financing. It can be concluded that consumption has a mutual effect on payment and payment has a mutual effect on consumption. The role of hedonic effects on payment and consumption was made clear in this study (Prelec,1998:6-7).

Sunk cost effect is one of the effects observed in mental accounting processes. This effect can be defined as the impact people have on their future decisions because they have cared about irreversible costs in their past decisions (Blumer, 1985:124-125).

Imagine you spend $ 100 to attend an activity in city A. Suppose you paid $ 50 to attend city B's event after a few weeks. You think you would enjoy the activity in city B more than in city A. However, shortly before the activities started, you realized that the events in both cities were on the same date. You cannot refund tickets for both events and you must attend one of the events. Which event would you attend?

- $ 100 activity in city A
- $ 50 activity in city B

According to traditional finance theories, it was expected that everyone would prefer the event in city A, where they could get more benefits and enjoy. However, only 46% of the participants would prefer to attend the event in city B. It is clear that the sunk cost of the trip in city A has a distortion effect on the choices of the people (Blumer, 1985: 126-127).

Due to mental accounting, it is difficult for investors to benefit from the correlation between investments, which is the most important tool in creating portfolio and reducing risk. It is necessary to look at the correlation between different investments in order to create a low-risk investment portfolio. In contrast, investors tend to consider each investment separately, open a separate mental account, and neglect the interaction between accounts (Hayta, 2014: 338)

1.3.10. Status Quo Tendency

Status quo can be defined as doing nothing or maintaining a person's present or former decisions (Samuelson, 1988:8). In other words, the status quo bias can be defined as the behaviors of individuals to value the things they have more than they are or to not want to change them. Individuals generally behave with loss aversion when making decisions in an environment of uncertainty. In these cases, individuals tend to repeat the decisions they have made before. According to them, the disadvantage of leaving the existing one and switching to the new one is much higher.

For this reason, risk averse individuals tend to stay in the status quo (Kahneman, 1991:197-198).

Rational decision making, cognitive misperceptions, and psychological commitment are the 3 basic components of status quo bias (Kim, 2009: 569-570). Rational decision making requires evaluating the relative costs and benefits of change before moving to a new alternative. If the costs are greater than the benefits, it causes status quo bias. Loss aversion can be counted as cognitive misperception. Loss aversion can lead to status quo bias. Because of the status quo bias, small losses from the current situation can be perceived as greater than they actually are. Sunk costs, social norms, and efforts to retain control form the basis of the psychological commitment (Samuelson, 1988: 8)

In financial terms, the status quo bias affects the investor's tendency not to evaluate new investment alternatives and to protect existing or previous investment decisions (Tversky, 1991: 1043-1044). Investors may show a status quo bias toward the investment instruments they have or follow for a long time. This bias prevents optimal portfolio diversification and causes investors to continue investing in similar investment instruments and miss potential opportunities or be unable to minimize risk.

1.3.11. Gambler Fallacy

The Gambler's Fallacy is that events that repeat with a certain frequency, take a diverting effect in predicting the next situation (Jahanseb, 2012: 535). According to this error, deviations occur in the perception of individuals as a result of the repetition of an event. Thus, individuals start to make irrational predictions by ignoring the possibility of events.

Here the ''Gambler'' stands out as a metaphor. The gambler thinks that deviations that occur constantly in the same direction will occur in the opposite direction after a certain point. However, the point the "gambler" misses is that you cannot know when the expectation of the next deviation will come true (Kahneman, 1971: 106). For example, suppose you have 7 tails in a row in an experiment to flip a coin. The probability of getting heads and tails on the 8th flip is statistically the same because each shot is a separate event. However, according to "Gamblers", the coin is

more likely to hit heads after the 8th coin flip. This experiment proves how people's perceptions separate from rationality.

The hot hand fallacy, just like the gambler's fallacy, is the error that occurs when predicting the continuation of certain series (Oran, 2010: 299-300). Although the hot hand fallacy claims the series will continue, the gambler's fallacy suggests the series will end. For example, the belief that the next shot will hit after 3-point baskets in a row in basketball leads to this error. Such errors are common in financial markets. The fact that investors make evaluations of securities with these errors, regardless of the data, makes their decisions less rational. As a result, investors may create ineffective portfolios, not be able to minimize risk and even experience serious losses.

1.3.12. Loss Aversion

Individuals' tendencies to loss aversion were explained in the prospect theory published by Kahneman and Tversky in 1979. It has been observed that gains and losses have different effects on individuals and they have demonstrated this in the value function. According to this function, the effect of losses is not at the same level as the effect of gains. In other words, losses affect individuals more than gains (Kahneman, 1979: 247). Therefore, it can be said that individuals' behaviors and decision mechanisms are more oriented towards loss aversion.

Studies in this field revealed that one unit of loss and one unit of gain do not have the same effect on individuals. It has been determined that the average equivalent of a unit loss is 2 units of gain (Pompian, 2006: 208).

In a study conducted by Kahneman and Tversky in 1979 with 72 participants, four different questions were asked to investors under two main topics. First, they were asked to choose one of the expressions below.

- A: 33% probability to gain £ 2.500, a 66% probability to gain £ 2.400, or a 1% probability of 0 gain.
- B: 100% probability to gain £ 2,400

82% of the participants preferred option B. The attitude shown by the participants is that the £ 100, which seems small compared to the overall earnings, is not worth taking this risk. For this reason, they preferred the exact amount which is £

2400.

- C: 33% probability to gain £ 2.500, 67% probability to gain nothing
- D: 34% probability of gaining £ 2,400, 66% probability of gaining nothing

83% of the participants preferred option C. The main motivation for the majority of participants to choose this option is that the 1% difference is worth taking this risk. Participants chose to take this risk and reduce their potential losses. This study revealed that even if they have low returns, individuals prefer to obtain certain or guaranteed returns (Kahneman, 1979: 266). Kahneman and Tversky defined this attitude as the "certainty effect".

This effect is quite common in financial markets. Investors under this influence may prefer less risky assets while creating their portfolios. However, on the other hand, if investors have lost their previous investments, they can make their next investment on more risky assets. Due to the pain of losing, investments made with a completely compensatory attitude, far from rationality, may involve serious risk factors.

CHAPTER TWO
FINANCIAL INVESTMENT TOOLS

Investment instruments will be explained under 4 main groups. These are ownership instruments, debt instruments, futures and options instruments and instruments that provide capital gain.

2.1. OWNERSHIP INSTRUMENTS

2.1.1 STOCKS

Stocks are one of the securities that mediate the supply and demand of funds in the capital markets. Stocks indicate the number of shares of individuals in the company they invest in and provide dividends and capital gains to their owners (Aktaş, 2013: 51). The most important feature of stocks is that they have a risk factor. Therefore, dividend returns, and capital gains are not exactly clear.

The stock represents a certain part of the capital of the company and provides its owner with the opportunity to benefit from all kinds of partnership rights (Aşıkoğlu, 2010: 445-447). These rights;

- Shareholding right,
- Right to vote,
- Dividend right
- Right to purchase new shares with priority,
- Right to receive bonus shares
- Right to get a share from the liquidation,
- Right to information.

There are two types of earnings in stocks; These are dividend income and capital gains Dividend payments are the income that can be acquired by distributing the profits of incorporated companies to the partners at the end of the year. However, future cash flows from stocks are uncertain and there is no maturity (Dabbaoğlu, 2010: 54-55). The fact that the stocks are the stocks of a company requires partnership in the good or bad situations of the company. This situation contains an element of risk and

does not always guaranty to earn money from the investment.

Stocks also impose certain financial responsibilities on their holders. The shareholder is obliged to fulfill his participation commitment at the first establishment or capital increase. The shareholder must bring the promised capital to the company on the dates to be determined by the company's board of directors, from the moment of signing the participation commitment. If it does not pay on time, it is required to pay with the default interest (Canbas, 2006: 29).

2.1.2. Exchange Traded Funds

Exchange traded funds are mutual funds traded on equity exchanges, which are based on an index and aim to reflect the performance of its base index to the investors. In other words, ETF are organizations that bring together small savings of investors in return for participation certificates and include them in the system in order to meet the fund needs of the capital market.

ETFs allows its investors to invest in a specific index through a single purchase of equity. ETFs leads to investing in more than one capital market instrument with one product, thereby ensuring diversification in the portfolio and reducing risk (Balaban, 1995: 23-24)

The advantages ETFs provides to their investors are as follows;

- Shares are traded with high liquidity,
- Distributing the risk of investment funds,
- Benefiting investors from the returns of the markets in which they are invested, offers such advantages to their investors (Arslan, 2010: 5)

Performances with Mutual Fund Performance Measures, Regression Analysis and Manova Technique.

The principles mentioned below explain the basis of ETF,

- Risk Distribution Principle
- Professional Management
- Operating a Securities Portfolio
- Rights Arising from Partnership
- Protection of Assets.

2.1.3. Warrants

Warrants is defined as a securities instrument that gives the holder the right to buy or sell the underlying asset or indicator until a specified date at a predetermined price. This right is used for record delivery or cash settlement. As can be understood from the definition, warrant is an alternative investment tool that provides the right to buy and sell. The most important point here is that there is no obligation to buy or sell the underlying asset at maturity. So, the warrant is an optional product (Gündoğdu, 2012: 58-59).

Some of the features of warrants are as follows;

- Warrants are an option that gives the right (not an obligation) to buy or sell a particular asset at or before a predetermined price and date.

- Warrants are financial instruments listed on the stock exchange and can be easily bought and sold like stocks.

- The underlying assets of warrants can be stocks, indexes, foreign exchange, and commodities (Aras, 2013: 81)

The leverage effect and limited loss feature, make warrant investments became particularly attractive for risk-taker investors. Also, this instrument serves as a means of mitigating the risks that may arise from similar investments or as hedging in general. This makes warrants an important investment instrument (Ziman, 2011: 57).

Warrants include some of the risks listed below;

- Warrants have a certain maturity (limited lifetime).

- The leverage effect can lead not only to high returns but also to high losses.

- Price movements can contribute to investors' gains from their investments, as well as causing them to lose all the money they paid for the warrant.

The most important information to know when investing in this instrument is that it is not possible to own a stock by purchasing a warrant. In other words, by investing in warrants, one cannot directly own stocks, but only the right to buy and sell. For this reason, privileges provided by the share such as the right to receive dividends and voting rights are not included in warrant investments (Gündoğdu, 2012: 60).

2.2. DEBT INSTRUMENTS

2.2.1. Bonds

Bonds are securities issued by the state or private sector companies to provide medium and long-term funds through borrowing (Sevil, 2018: 114). In other description, bonds are debt securities issued by the state or incorporated companies for a term of at least 1 year or longer for the purpose of borrowing money.

Government Bonds are Government Debt Securities issued by the government in order to finance the budget deficits with the current year budget law. Government Bonds are issued by the Republic of Turkey Ministry of Treasury and Finance. It provides a certain maturity yield to its holders.

Private Sector Bonds can be defined as debt securities issued by incorporated companies for a period of more than 1 year. They can be issued with both fixed and variable interest rates. Private sector bonds are based on the principle that the holder receives the interest and principal at the time of maturity. The purpose of the companies in the issuance of these securities is to provide cheap and long-term financial resources (Süer, 2011: 42). Business partners can use this financing tool if they want to meet their fund needs by borrowing instead of accepting a new partner when they have capital requirements. In case companies choose to use this type of financing tool, they undertake to pay the principal at the end of maturity along with regular interest payments to the bond holder (Korkmaz, 2010: 204).

The type of bond issue depends on the financial reputation of the issuing firm. Financially strong firms usually issue standard bonds. Pledge bonds have less risk and therefore a low interest rate. Standard bonds, on the other hand, can pay higher interest rates to convince the investor (Gümüş, 2013: 137).

Firms can issue bonds in order to provide cheaper funds, as interest payments are deducted from the tax base. At the same time, it establishes a debt-receivable relationship with its investor. After the maturity of the debt expires, the legal relationship between the company and the lender ends. Bond issuance includes advantages on behalf of the firm, such as the lender not having any voting rights or not having the right to share the profit. The lender is not concerned with the profit or loss

situation of the company. After the lender receives the principal and interest income, he has no legal relationship with the company. This investment instrument is highly preferred especially for risk-averse investors.

2.2.2. Bills

Bills a short-term debt instrument that can be issued by the state or incorporate companies, with a maturity of more than 30 days and less than 364 days and includes the repayment of the principal with interest at the end of maturity.

2.2.2.1. Treasury Bills

Treasury bills are domestic debt securities based on Turkish Lira or foreign currency issued by the Central Bank for a short term (Öndeş, 2013: 161). The most important feature of the treasury bill is that it is under the guarantee of the state. This means that the interest and principal are guaranteed to be repaid. This factor ensures that the treasury bills are more reliable and risk-free. Due to factors such as these, treasury bills have the largest transaction volume in most countries and are also the most preferred secondary money market instrument.

These securities are sold at a discount. For example, suppose you buy a bond with a nominal value of 1000 TL. The amount you will pay in order to purchase this bond is as much as the interest you will receive at the end of the maturity. For this reason, the purchase price of this bond, where you will earn 10% at the end of maturity, will be 900 TL.

2.2.2.2. Commercial Certificates

Commercial certificates are securities issued by private sector firms to supply their short-term debt needs. Maturities of financing bills are minimum 30 days and maximum 364 days (Bastı, 2013: 188). These securities are issued at a discounted price over a certain interest rate. One of the general characteristics of these securities is the payment of principal and interest at the end of maturity for the holders. However,

although it seems to be a risk-free investment tool for investors, periodic changes in interest and inflation may create a risk of non-repayment.

There is no public offering obligation for financing bills. It can also be offered to the market with or without public offering. However, if companies offer these securities to the public, they are within certain limits. They are also prohibited from issuing new bonds without selling their existing securities (Öndeş, 2013: 162).

These securities cannot be placed on the market through a bank and without a bank guarantee. The most important difference of this security from treasury bills is that there is no government guarantee. Therefore, the decisions made by international rating and evaluation institutions play a decisive role in the future of this financial instrument. In addition, commercial certificates are generally preferred by institutional investors and are traded with high volumes.

2.2.2.3. Bank and Bank Guaranteed Certificates

Securities issued by investment and development banks to meet their fund needs from capital markets can be defined as bank bonds (Güvendi, 2011: 95). These securities can be issued to order or to the bearer. Their maturity is minimum 90 days and maximum 360 days.

Bank guaranteed bonds can be defined as securities issued by incorporated companies as a debtor to the bank, which is their creditor, under the guarantee of the bank (Öndeş, 2013: 161-162). The maturity of these certificates is between 60 and 720 days. Investment and development banks, which are creditors of these certificates issued by incorporated companies within the framework of the rules determined by the Capital Markets Board, are considered both guarantors and partners.

Some of the features of these securities are as follows;

- Cannot be sold through public offering
- Cannot be released in series and does not generate periodic income
- They are sold at a discount from the principal
- The return from such certificates are fixed.

The advantages of these securities are in return, tax and liquidity (Madenoğlu,2022: 16). The advantages of these securities can be explained as the fact

that they provide higher returns compared to treasury bills, the withholding tax rate of 15% applied for other securities is 10% for these securities and they are traded in secondary markets.

2.2.3. Repo and Reverse Repo

Repo can be defined as the sale of financial instruments with the promise of repurchase. Reverse repo, on the other hand, can be explained as a purchase transaction provided that it is sold later. Repo and reverse repo transactions are carried out in the same way. By pledging the securities, they hold, the sides that receive the loan in return have the repo transaction, while the sides that give credit in return for the security they have acquired, the reverse repo transaction

Repo is a repurchase agreement on a predetermined date and at a pre-determined price. One of the most important features of this transaction is that it involves both buying and selling. The order of execution of the transaction is based on the delivery of the securities first and then the receipt of the cash. In the reverse repo transaction, similar to the repo transaction, the security is bought on a predetermined date and price and then sold again at the agreement date and price (Coskun, 2012: 62).

The maturity of the repo is between 1 day and 30 days. This makes repo a short-term investment instrument. Repo interest rates depend on the amount of money in the market. If there is an abundance of money in the market, there may be a decrease in repo interest rates, and an increase in interest rates may occur if there is not enough money in the market (Öndeş, 2013: 167).

Securities that can be used during repo transactions are as follows (Turhan, 2018: 68);

- Government debt securities (GDS)
- Lease certificates
- Revenue sharing certificates
- Private sector debt instruments,
- Central Bank liquidity bills.

Some benefits of repo transactions (Coskun, 2012: 65-66);

- Repo transactions provide leverage and security supply to those who use this instrument. This helps to implement speculative or hedging transactions, which are capital markets investment strategies.
- The securities lending process used during the implementation of repo transactions is a risk-reducing factor. For these reasons, funds are supplied with lower costs.
- Repo offers its investors an alternative investment opportunity.
- Government debt securities, which are generally used, increase the liquidity in the market. Increasing liquidity has a decreasing effect on capital costs.

2.2.4. Lease Certificates

A lease certificate is a securities instrument issued to finance assets purchased or leased by an asset lease company. The holders of these securities are entitled to the income derived from these assets in proportion to their shares.

In addition to being medium or long maturity, these securities offer fixed or variable return options to their investors. The most important feature of these securities, also known as "Sukuk", is that they are interest-free and liquid financial assets. These securities are similar to Mutual Funds, Participation Certificate and Asset-Backed Securities regulated by the Capital Market (Tekin, 2017: 163)

The word Sukuk is derived from the Arabic word "Sakk". Its meaning is used as a certificate granting the right to participate. Sukuk are also known as the Islamic equivalent of bonds. Sukuk's non-interest utilization makes it a security compliant with Islamic rules (Yakar, 2013: 74).

Sukuk differs from bonds because it gives its investor ownership rights along with the cash flow from the invested asset. While bonds offer the opportunity to earn interest, Sukuk offers investors the right to own an asset and benefit from the income without interest (Öndeş, 2013: 160).

There are 3 actors in the functioning of the Sukuk issuance. These; owners of assets (public institutions and organizations), Asset Lease Companies (brokerage houses that bring buyers and sellers together) and sukuk holders (Anadolu, 130). After certifying assets such as real estate, machinery, and equipment in their balance sheets as underlying assets, they transfer the ownership rights of the assets to the investor

through the Asset Lease Company and issue Sukuk.

7 different types of the Sukuk financial instrument are evaluated within the scope of Islamic finance. These;

- Mudaraba Sukuk (Profit Sharing)
- Musharaka Sukuk (Profit and Loss Sharing)
- Musharaka (Profit and Loss Sharing) Sukuk Issuance Method
- Icara Sukuk (Lease Certificate)
- Murabaha Sukuk (Cost and Profit Sharing Sales)
- Salam Sukuk (Prepaid Sale)
- Exception Sukuk (Buying Order)
- Hybrid (Mixed) Sukuk

2.3. FUTURES AND OPTIONS INVESTMENTS

2.3.1. Derivatives

Financial instruments that provide income depending on the returns of the goods or financial instruments to be used as underlying assets can be defined as derivatives. In other words, instruments that enable the purchase and sale of assets to be used as underlying assets with an agreement covering the obligations to be fulfilled at a future date determined from today, are called derivatives (Kurar, 2016: 406).

Valuation of derivative instruments is made with investment instruments traded in the spot market, such as stocks or bonds. In other words, the prices of these instruments are determined according to the prices of other securities. However, the performance of the derivative instrument changes depending on the effectiveness of the underlying asset. Some of these underlying assets are as follows.

- Commodities,
- Metal,
- Electricity,
- Indexes,
- Precious metals,
- Foreign exchange rates or currencies,

- Shares and share warrants of companies traded on recognized stock exchanges and Stock Index,
- Interests.

Each derivative instrument has different properties. Therefore, they can be traded in different markets. In order for a derivative instrument to be traded in organized markets, contracts must be established with certain standards. In case the contracts are determined by the trading parties, derivatives are traded in the over-the-counter markets (Sabuncu, 2015: 271).

Usage purposes of derivative instruments differ. Hedging, speculative and arbitrage derivatives are used by investors as types of usage. Hedging is one of the uses of derivatives markets to reduce or eliminate the risk associated with the price of an asset. Speculative, making predictions on potential future movements in the price of an asset, as well as making futures and option contracts to gain extra leverage is another area of use of derivatives markets. Arbitrage is the last type of use of derivatives to take advantage of price differences in the prices of the same assets in different markets, which are more or less inconsistent (Kumar, 2010: 17).

2.3.2. Forward

Forwards can be defined as contracts in which the maturity, price and amount of any good or security to be delivered at a future date are determined with the current date (Güven, 2018: 126). In other words, forwards are contracts that are traded in over-the-counter markets and involve cash transactions, where the buyer and seller determine and agree on factors such as the type, quality, quantity, future delivery date, and price of a good (Davidson, 1986: 102).

Forward transactions aim to protect the people who have the transaction by minimizing the risks that may arise due to the future price movements of the securities or goods subject to the contract. However, when these contracts made based on assumptions expire, both parties are not winners. While one of the parties will win, the other will lose (Kaygusuz, 2011: 141).

Although forward contracts can be implemented to all goods and market products, they are generally carried out with foreign currency or interest. The maturity

of this instrument is between 1 day and 1 year (Sabuncu, 2015: 272).

Forward contracts are generally preferred by export and import companies. The most important reason for this is to eliminate currency risks in countries where the floating exchange rate system is applied and therefore to minimize foreign trade risks that may occur for companies (Kurar, 2016: 407).

2.3.3. Futures

Futures are contracts that allow the purchase and sale of the goods or financial instruments subject to the contract, with factors such as the currently determined price and maturity (Birgili, 2014: 110). Futures is a standardized trading of forwards in organized markets, rather than over the counter stock market. Contracts established within the framework of criteria such as maturity, deposit, price, transaction and contract size determined by the market, and transactions for the purchase and sale of goods or financial instruments explain futures contracts (Kurar, 2016: 408).

The difference of these transactions from forward transactions is that the responsibilities of buyers and sellers are not against each other, but against the institution performing the exchange transaction. Thus, the transactions of buyers and sellers are guaranteed by the exchange where the transaction takes place. This resulted in an increase in transaction volume following the confidence atmosphere that emerged (Elliot, 2005: 3-4). However, a certain amount of deposit is required for the security of the transaction. In addition, exchanges have service fees of 1% to 1.5% of the total transaction cost to do this transaction. The extra cost inclusion of future contracts, which offer a safer service option compared to forward transactions, reveals the difference between them (Tsai, 2009: 8-9).

2.3.4. Options

Options are a type of contract that gives the parties the right to buy or sell within a certain period of time, under specified conditions (Black, 1973: 4). In other words, options are the contract that grants the purchaser the right to buy or sell goods, financial instruments, or foreign currencies with a determined price, quantity, and quality until

certain maturity, and liable the seller (Kurar, 2016: 408).

In this type of contract, there are two parties, namely the buyer and the seller. The person who has the right to use the goods or financial instrument specified in the option contract in return for a certain premium is called the buyer or option owner. Those who prepare and sell these contracts with a certain premium and therefore come under responsibility are called sellers (Güven ,2018: 127)

Option types are divided into two according to their maturities. These; (Bak, 2012: 41).

- American type options: Options that can be used by the option buyer at any time before the option expiration are American type options.
- European type option: Options are defined as European type options if they can only be used on maturity.

Options provide two types of rights. The call option gives the parties the right to buy, while the put option gives the right to sell at a certain price (Elliot, 2005:6). Options transactions are traded in both over-the-counter markets and organized markets (Kumar, 2010: 22).

2.3.5. Swap

Swap contracts can be defined as contracts in which the principal or interest payments of the buyers and sellers are exchanged with a predetermined contract (Smith, 1988: 34). In other words, swap contracts occur when buyers and sellers barter their payment obligations for a certain period and amount (Tuncay, 2014: 3).

During swap transactions, spot and forward transactions are realized at the same time. Namely, the sales of forward contracts bought on the spot or the purchase of forward contracts sold on the spot are transactions carried out during the swap process. These transactions take place under bank supervision in organized markets (Kurar, 2016: 408).

Swap transactions can occur in two different ways. Money swaps and interest swaps can be given as examples. Money swaps are exchanges of two currencies of the same amount to be repaid in exchange rates and original currencies previously fixed by a certain agreement, provided that they are repaid at the end of maturity. Replacing

a debt of a certain size with a different interest rate, in the currency specified in the swap contract, can be defined as an interest rate swap (Yılmaz, 2013: 395).

Those who prefer this process have two main purposes. Avoiding interest and foreign exchange risks that may occur due to economic and political reasons can be counted among these purposes. In addition to these basic objectives, use methods such as arbitrage, increasing the amount of return on assets, risk minimization, resource cost reduction is available in swaps (Sabuncu, 2015: 272).

2.4. INVESTMENTS BASED ON CAPITAL GAINS

The increase in the value of the capital asset is called capital gain (Burman, 1999: 10). Capital assets can be defined as stocks, bonds, foreign exchange, precious metals or cryptocurrency. Gains or losses to be obtained from the sale of these assets lead to gains or losses of capital gains.

The features of capital gain can be explained as follows;

- They are not continuity and therefore do not bring a regular income.
- Polarity occurs periodically on certain capital assets.
- It is formed by other factors rather than just the participation of individual investors.
- Investors who want to earn income on capital assets determine their periods themselves.

2.4.1. Currency

Foreign currency can be defined as the value of the national currency compared to the foreign currency (Yapraklı, 2019: 1).

Foreign currency is a financial instrument used by both individual and institutional investors for gains on capital. This instrument, which is used for earnings that can be gained on capital in countries implementing the floating exchange rate system, works with the increase or decrease in exchange rate movements. Arbitrage transactions made with foreign currency can be made through exchange offices as well as banks. With banking applications, individuals have become more sensitive to exchange rate movements and respond more quickly to price movements. In this way,

they can earn profits on foreign currency exchange. Foreign currency deposit accounts are accounts where individual or institutional (excluding banks) investors, who invest their investments in foreign currency, deposit their savings in banks over a predetermined maturity and interest rate. With this investment, investors gain the opportunity of fixed income in addition to exchange rate movements. There is the risk of excessive currency movements and this risk belongs to the investors.

2.4.2. Gold

Gold is an investment tool that has been in our lives since ancient times. It is used not only by individual but also by institutional investors to preserve value and generate profits. Due to the standard value and stable structure of gold by the whole world, it makes it the most preferred precious metal investment and is very popular. Gold, which was the reserve currency of countries until the 19th century, was fixed to a certain parity over the dollar with the Bretton Wood's conference. However, this parity is not applied today. Nevertheless, due to its highly correlated relationship with the dollar, gold causes investors to experience gains or losses with both its own value movements and dollar movements. Gold is the preferred investment tool for investors to protect their savings from inflation, stagflation or devaluation. It can be traded at the spot price, or it can be used as a deposit in future contracts, derivative products or banks.

2.4.3. Blockchain

Blockchain technology was introduced to the world with the "Bitcoin: A Peer-to-Peer Electronic Cash System" article published by Satoshi Nakamoto in 2008. This technology aims to reduce dependence on centralized institutions during data transfers and to apply these transfers in the form of distributed transactions electronically (Ahram, 2017: 3).

Blockchain is a technology protocol that allows the exchange of data between two parties without the need for any intermediary. The identities of the parties in this network are encrypted. They also carry out their transactions anonymously.

Transactions are added to a chain of transactions that cannot be changed and distributed to all users on the network. The data used during these transfers are recorded sequentially in blocks. When one of the blocks created in this way is filled, a new block is created and they are connected to each other in a chain (Güven, 2018: 44).

2.4.3.1. Bitcoin

Bitcoin is a cryptocurrency that is not issued by any central authority and collectively manages transactions using peer-to-peer technology with operators on the network .

Bitcoin is a type of cryptocurrency that is not physically available and has balance records in ledgers that are accessible to everyone. Transactions such as keeping these ledger records and approving transfer transactions are carried out with very powerful computing power.

Bitcoin is a virtual network with open-source software that allows users to freely transfer their digital currencies to each other. Bitcoins consist of different digital signature chains stored in digital wallets installed on the user's computer. These wallets generate key codes for sending and receiving bitcoins. The transfer of the bitcoin is processed using this digital key to confirm the addition of the current owner's private digital key to the recipient's previous transaction sequences. After the coin has been transferred, it appears on the date of the recorded transactions in the buyer's wallet, including the most recent transaction (Bjerg, 2015: 55).

Bitcoin is the crypto money that makes it possible to make money transfers between individuals without intermediaries (Güven, 2018: 30).

Bitcoin is not produced from a single center. The production of bitcoins is carried out by using the power of the processors of computers in the distributed network. Bitcoin is not produced from a center. Instead, the processing power of computers in the decentralized global network is used. Bitcoins are produced by people called miners, who solve complex math problems that arise during the transfer by competing with each other. Anyone can become a miner thanks to the miner software running on open-source code. (Çarkacıoğlu, 2016: 15).

Bitcoin issuance takes place by the production of blocks. They receive rewards after each block produced by miners within the network. This award is halved for every 210,000-block production. Miners who produced the first 210,000 blocks earned 50 bitcoins per block (Güven, 2018: 101). As of May 2021, 652,076 blocks were produced, and the prize awarded for each block currently produced is 6.75 bitcoins).

Bitcoin is a crypto currency with a bidirectional, distributed structure and limited supply (Berg, 2014: 75) The Bitcoin supply is limited to 21,000,000. As of May 2021, the total number of bitcoins in circulation is 18,702,506 and the price of bitcoin is $58.830.Total bitcoin issuances are expected to be completed by 2040.

2.4.3.2. Ethereum

Ethereum is the first major blockchain network that supports Turing complete scripting through smart contracts, also known as Ethereum Virtual Machine-specific transaction codes, used for distributed computing (Kim, 2018: 91).

Ethereum can be expressed as a cryptocurrency that supports the transfer of tokens known as ether between Ethereum accounts. Ether is a completely digital currency and can be sent instantly to anyone anywhere in the world. Known by the code ETH, ether is a decentralized and limited cryptocurrency whose supply cannot be controlled by any government or company. ETH can be used by people all over the world thanks to its characteristics such as making payments, storing value, or using it for collateral.

Ethereum provides people and companies to code programmatically and reliably enforce complex financial deals globally. This led to a stunning change, contributing to the creation of new business models and the development of the digital economy (Tikhomirov, 2018: 9).

The Ethereum supply is given to the miner who quickly finds the hash value of the block during each block generation gets 5 ether rewards, which constitutes the supply. However, unlike bitcoin, it is not yet known how much ether will be supplied. Each block produced brings with it the problem with a higher degree of difficulty (Güven, 2018: 109).

Gas (also called ether) is the fuel of computing in Ethereum. The distributed application platform charges users for the execution of a contract, thus avoiding wasting other resources. There is a need for gas depending on how much energy and power will be consumed for the operations to be performed here, and this creates a difference in costs since it will be done with ether (Greech, 2018: 116)

Ether has the second highest volume in the cryptocurrency markets. As of May 2021, there are 115,790,135 ETH in circulation and its price is $ 3,668

2.4.3.3. Ripple

Ripple is the name of the company that works on the currency transfer and payment settlement system and records these transactions in ledgers on a network. Ripple provides reliable and fast transaction opportunities on behalf of both parties involved during transactions.

With the Ripple cryptocurrency XRP, it allows its users to make transactions in a very short time frame. As such, XRP has the potential to pay 1,500 transactions per second and payment under 4 seconds. Ripple aims to establish a fast and low-cost payment system in response to the high costs incurred during transactions, especially in the banking and finance sectors.

Records of all transactions taking place in the system are kept in XRP Ledgers, which are open source and distributed (Armknetch). XRP Ledger is a distributed, open-source and permissionless blockchain technology that can complete transactions in a very short time like 3-5 seconds. The direct transfer of XRP without intermediaries provides fast and effective solutions for exchanges between different sides.

100 billion units of XRP were produced before the Ripple company was established, and most of this amount is held by the ripple company. Mining cannot be done as it cannot be produced anymore. However, XRPs charged as a commission from the transactions on the network is deleted from the system. This causes a decrease of the XRP supply (Güven, 2018: 119).

XRP is the 6th largest cryptocurrency in the cryptocurrency market. As of May 2021, 35,108,326,973 XRPs are in circulation and the price of XRP is $ 1.57.

2.4.3.4. Cardano

Cardano is a smart contracts platform that runs on blockchain. Cardano shows the difference that it uses dual-layer smart contracts for identity management and product traceability products, even though it works with features similar to ethereum

Cardano is the structure that combines distributed applications with technologies that work for security and sustainability for systems and communities. Cardano is the structure that combines distributed applications with technologies that work for security and sustainability for systems and communities. Cardano, like Etherium, is a platform that works on the blockchain with proof of stake.

Cardano is a 3rd generation blockchain project that continues its development with a scientific approach and whose basic design principles are security, scalability and interoperability. Cardano uses the cryptocurrency "ADA" while working, and a similar relationship to the relationship between ETH and Ethereum exists between ADA and Cardano.

ADA is the 5th largest cryptocurrency in the cryptocurrency market. The total ADA in circulation is 31,948,309,441 and its price is $ 1.71 as of May 2021. Its total supply is 45,000,000,000.

2.4.3.5. Stellar

Stellar is an open network for storing, moving or transferring money, designed to operate on a single network of all financial systems in the world.

Stellar is traded in cryptocurrency markets with the XLM token, also known as Lumen. XLM, which can be used by individuals on the Stellar network, offers low-cost, inter-account payments for banks, payment systems and people, thanks to distributed ledgers running on the blockchain.

Stellar is run by a nonprofit organization. Similar to Ripple, it continues to work with a low fee and high speed focus. The fee for transactions executed on the Stellar network is 0.00001 XLM.

Factors such as Fiat-based and Paypal demand high transaction fees in cross-border payments, and the increase in bitcoin and ethereum transaction fees day by day,

make Stellar stand out. Of the total supply of 50,001,803,216 XLM, there are currently 23,061,608,638 XLM in circulation. Ranking 16th in the cryptocurrency market by volume, XLM's price as of May 2021 is $ 0.5885.).

2.4.3.6. Litecoin

Litecoin is a peer-to-peer cryptocurrency that makes it possible to transfer money anywhere in the world very quickly and at a very low cost. Lite coin operates decentralized on a distributed and open network and is not bound by any authority.

Litecoin is known as the silver of the cryptocurrency market as it is the same as the bitcoin working mechanism and is the most adopted cryptocurrency not only for miners but also by exchanges (Ahamad, 2013: 44).

Litecoin is an alternative to the fast computing and heavy transactions required in bitcoin processes, as it is possible to mine even on computers at home. While the average block generation in Bitcoin processes is 10 minutes, this time is 2.5 minutes for litecoin. The total supply of bitcoin is 21,000,000 while the total supply for litecoin is 84,000,000 (Bhosale, 2018: 134).

Litecoin, known with the LTC icon, is the 10th crypto currency with the highest volume in the crypto money markets. As of May 2021, 66,752,415 LTC is in circulation and its price is $ 350.33.

2.4.3.7. Bitcoin Cash

Bitcoin cash, which emerged as a result of the fork of Bitcoin in 2017, is the name of the crypto money created to implement the system known as peer-to-peer electronic cash. Although it has a similar function to Bitcoin, the block size of 8 MB, which is 1 MB in bitcoin, works with faster confirmation of transactions and more effective processing of processes (Webb, 2018: 291).

The slowness of bitcoin transactions compared to its counterparts in the world, while bitcoin can perform 2-7 transactions per second, VISA performs 1700 transactions, causing a discussion between bitcoin developers and miners. As a result of the resulting dispute, the event known as hard fork occurred and bitcoin cash

emerged.

Bitcoin cash, known with the BCH code, is the 10th highest volume cryptocurrency in the cryptocurrency market. There are a total of 18,732,069 BCHs in circulation and its total supply will be 21,000,0000. As of May 2021, its price is $ 1,329.61.

2.4.3.8. Miota

IOTA is a distributed ledger designed for the Internet of Things, whose purpose is to solve problems in the Internet of Things ecosystem, to ensure the execution of transactions and to record the data resulting from these transactions

Unlike other cryptocurrencies, IOTA does not use blockchains. For this reason, mining operations are not available since there are no blocks. IOTA uses the tangle structure instead. However, the working mechanism is similar to the proof of work structure (Güven, 2018: 122-124).

IOTA is the 29th cryptocurrency with the highest transaction volume in the cryptocurrency market. All of the 2,779,530,283 IOTAs, which are in total supply, are in circulation. As of May 2021, its price is $ 2.20.

2.4.3.9. Dogecoin

Dogecoin is a "joke" themed cryptocurrency developed by Jackson Palmer and Billy Markus. Dogecoin is an open-source cryptocurrency and processes its transactions on the blockchain and on the litecoin infrastructure. (Usman W. Chohan, 2021: 2)

Dogecoin, like other cryptocurrencies, uses cryptography on the blockchain to ensure secure transactions. Dogecoin uses the Proof-of-work system and can be mined. (Rodeck, 2021: 5)

Dogecoin, the project launched in 2013, is known for its extremely volatile nature. Dogecoin is frequently seen on social media such as Reddit and Twitter with the motto "To the moon". The most well-known person among its investors is Elon Musk.

Dogecoin is the 12th cryptocurrency with the highest transaction volume in the cryptocurrency market. All the 132,670,764,300 Dogecoin's, which are in total supply, are in circulation. As of May 2021, its price is $ 0.64.

CHAPTER THREE
METHODOLOGY AND FINDINGS

3.1. PURPOSE AND IMPORTANCE OF THE RESEARCH

Cultural and demographic factors lie in the basis of the behavior of individuals. These two basic factors shape human psychology and naturally play a decisive role in human decisions, attitudes, and behaviors. The rational attitude underlying the traditional finance approach differs from the behavioral finance approach at this point. The traditional finance approach assumes that individuals are rational and aim to maximize their benefits under all circumstances. However, there is a situation like this; Individuals cannot act rationally in all circumstances due to these two factors affecting their psychology. At this point, the behavioral finance approach allows us to clarify human behaviors that contain systematic errors and are not rational, which traditional finance theories cannot explain. Cryptocurrency markets, which include elements and concepts such as the number of transactions, the existence of exchanges operating 24/7, excessive volatility, social media, and informatics, attract more and more individual and institutional investors every day. Individuals are exposed to much more information in such markets. Therefore, the psychology of individuals is constantly changing due to factors such as excessive information flow, continuity, and volatility. In other words, cryptocurrency markets are the markets where the behavioral finance approach is observed most effectively.

The study aims to explain the cognitive and biased factors that are effective in the investment preferences of individuals, according to the behavioral finance approach, through the investors who have transactions in the cryptocurrency markets. Because the study is carried out on individuals who were trading in cryptocurrency markets, it has a different viewpoint to discover the psychological effect of cryptocurrencies on individual investors. Cryptocurrency markets, which are not regulated in general, unlike traditional investment instruments, contain excessive risk as a result of volatile movements, but create high gains or high losses for their investors. Due to the advantages of easy access to these exchanges and very low money to enter these exchanges, a wide demographic population invests in such markets.

3.2. RESEARCH DATA, SAMPLE AND METHODOLOGY

The study was carried out through a questionnaire. The study consists of 41 questions in total. 41 questions consist of 3 sections: demographic information, cryptocurrency awareness and psychological biases. Participants were asked questions about demographic information, age, gender, educational status, marital status, income status, and internet usage status. The cryptocurrency awareness section in the survey study was prepared using the scale in the article "Crypto Currency Awareness in Turkey and Motivations of Businesses that Accept Crypto Currency" (Karaoğlan, 2018; 19). The psychological biases section in the survey study was used by adapting the scale in the article "An Empirical Research on Investor Biases in Financial Decision-Making, Financial Risk Tolerance and Financial Personality" (Bayraktaroğlu, 2016; 12) to cryptocurrencies. In order to measure the psychological bias attitudes of the participants, questions were asked to measure the degrees of representativeness, availability, anchoring, overconfidence, optimism, herd effect and regret aversion.

Cronbach Alpha value is used to measure the reliability of the questionnaire questions. The comparison value of the Cronbach Alpha value is 1. The closer the value obtained after the analysis of the survey study is to 1, the more reliable it is. However, Cronbach Alpha values greater than 0.7 are generally accepted as reliable in the academic field. The result of the Cronbach alpha evaluation for cryptocurrency awareness was determined as "$\alpha = 0.8011$". This means that the cryptocurrency survey is a reliable survey.

In this study, factor analysis was applied for cryptocurrency awareness. The "Varimax Rotation" method was applied, and the Kaiser-Meyer-Ohlin (KMO) Measure of Sampling value was 0.831. Bartlett's Test of Sphericity value was 852,453 and was observed as $\chi2=852,453$ and $P(0,000)<0,05$. This means that there is a correlation between the two risk and novelty factors in accordance with the analysis. Factor analysis was applied to determine the validity of the study.

In the survey study, a 5-point Likert scale was used in the questions asked to the participants in the cryptocurrency awareness section. The answers were coded as "Strongly Disagree", "Disagree", "Undecided", "Strongly Agree", "Strongly Agree".

Data were collected by random sampling method. 399 people participated in the study. However, this number decreased to 381 as a result of including only individuals who invested in the cryptocurrency markets or had done so before. The data of the survey study were collected between April and September by random sampling method. At the end of the study, the data were analyzed in the SPSS 26.0 package program. Chi-Square and One-Way ANOVA analysis techniques were applied to analyze the data. Chi Square test is a non-parametric test method and is applied to test whether there is a significant relationship between two categorical variables. One-Way ANOVA test is a test method that measures parametric values. Since the survey consisted of parametric and non-parametric data and significant correlation tests were conducted between them, both analysis techniques were used.

3.3. FINDINGS OF THE RESEARCH AND EVALUATION OF THE RESULTS

3.3.1. Demographic Characteristics Analysis of Individual Investors

The demographic characteristics of the participants were analyzed by frequency analysis, which is a descriptive statistical analysis method. A total of 381 participants were eligible for the study. Under normal conditions, 399 people participated in the study, but 18 people were excluded from the study because they did not trade in the cryptocurrency markets. All of the participants are individuals who are currently trading or have traded in the cryptocurrency markets.

Table 1: Distribution of Participants Regarding Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	118	31,0	31,0	31,0
	Male	263	69,0	69,0	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the descriptive data shown in the table, 31% of the total 381 participants were female and 69% were male

Table 2: Distribution of Participants Regarding Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	63	16,5	16,5	16,5
	26-33	229	60,1	60,1	76,6
	34-40	48	12,6	12,6	89,2
	41-47	38	10,0	10,0	99,2
	48 and more	3	,8	,8	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

When the age distribution of the descriptive data is analyzed, the largest part of the participants was between the ages of 26-33 with 60,1%. While the 18-25 age group ranks second with 16.5%, the 34-40 age group has a 12.6% share, the 41-47 age group has 10%, and the 48 and older participants have a 0.8% share in distribution.

Table 3: Distribution of Participants Regarding Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	133	34,9	34,9	34,9
	Single	248	65,1	65,1	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

The table shows the information gathered about the marital status of the participants. It was observed that while 34.9% of the participants are married, 65.1% are single.

Table 4: Distribution of Participants Regarding Degree of Education (Last Graduated)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School and Less than High School	35	9,2	9,2	9,2
	Associate Degree	42	11,0	11,0	20,2
	Bachelor Degree	233	61,2	61,2	81,4
	Master's Degree and higher	71	18,6	18,6	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

It is observed that undergraduate graduates are in the first place with 61.2% in terms of the education status of the participants. Participants with a master's degree or higher ranked second with 18.6%, followed by associate degree graduates with 11% and high school graduates with 9.2%

Table 5: Distribution of Participants Regarding Income (TL)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3000-6000 TL	226	59,3	59,3	59,3
	6000-9000 TL	84	22,0	22,0	81,4
	9000-12000 TL	36	9,4	9,4	90,8
	12000-15000	16	4,2	4,2	95,0
	15000 and more	19	5,0	5,0	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

When the answers of the participants are examined on the income group, it is seen that the individuals with an income between 3000-6000 TL have the highest rate with 59.3% among participants. Afterward, the 6.000-9.000 TL range takes second place with 22%, while those with an income between 9.000-12.000 TL get a share of 9.4%. Those with an income of 15,000 TL or more have a 5% share, and those with an income between 12,000-15,000 TL have a share of 4.2%.

Table 6: Distribution of Participants Regarding Daily Internet Usage Per Day (Personal)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-1 hour	4	1,0	1,0	1,0
	1-3 hours	109	28,6	28,6	29,7
	3-6 hours	144	37,8	37,8	67,5
	6 hours and more	124	32,5	32,5	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

In the question directed to the individuals about their daily personal internet use, 37.8% of the individuals who use the internet for 3-6 hours take the first place. Individuals using it for 6 hours or more took 2nd place with 32.5%, while those using it for 1-3 hours got 28.6% and those using it for 0-1 hours got 1%.

Table 7: Distribution of Participants Regarding Cryptocurrency Awareness (How much do you know about cryptocurrencies?)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I know a lot, I have cryptocurrencies.	129	33,9	33,9	33,9
	I have knowledge but I do not have cryptocurrencies	77	20,2	20,2	54,1
	I have partial knowledge.	142	37,3	37,3	91,3
	I've heard of it but I don't know exactly what cryptocurrencies are.	30	7,9	7,9	99,2
	I have no idea	3	,8	,8	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the information given by the participants in the table about their knowledge of cryptocurrencies, 33.9% of the participants state that they are very knowledgeable about cryptocurrencies and that they also have crypto money, while this rate is observed as 20% for individuals who do not have crypto money but have knowledge. Participants who know partially about cryptocurrencies have the highest

share with 37.3%, while participants who have heard before but do not have an idea about crypto money have a share of 7.9%. Individuals who have no idea about cryptocurrencies are 0.8% of the total participants.

Table 8: Distribution of Participants Regarding Cryptocurrency investment amount (How much do you trade on the cryptocurrency exchange?)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-2000 TL	223	58,5	58,5	58,5
	2000-4000 TL	44	11,5	11,5	70,1
	4000-6000 TL	26	6,8	6,8	76,9
	6000-8000 TL	9	2,4	2,4	79,3
	8000 TL and more	79	20,7	20,7	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the answers given to the question about the crypto money investment amount asked to the participants, 58.5% of the participants stated that they invested in the range of 0-2000 TL. The rate of participants who invested 8000 TL or more was in the 2nd place with 20.7%, while the investment between 2000-4000 TL was ranked 3rd with 11.5% and the investment of 4000-6000 TL was in the 4th place with 6.8%. The rate of individuals who invested 6000-8000 TL was 2.4%.

Table 9: Distribution of Participants Regarding Parity table (On which parity do you measure your crypto money investments?)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	TL	169	44,4	44,4	44,4
	USD	187	49,1	49,1	93,4
	EURO	9	2,4	2,4	95,8
	BTC	13	3,4	3,4	99,2
	BNB	1	,3	,3	99,5
	ETH	2	,5	,5	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the answers of the participants to the question on which parity they measure their crypto money investments, USD received a 49.1% share, while TL received a 44.4% share, making up the majority of the participants' answers. Bitcoin 3.4%, Euro 2.4%, Ethereum 0.5% and Binance (BNB) 0.3%, showed other distributions among the total participation.

Table 10: Distribution of Participants Regarding Cryptocurrencies

		Responses		Percent of Cases
		N	Percent	
Which cryptocurrencies do you have an opinion?	Bitcoin	372	15,9%	98,2%
	Ethereum	310	13,2%	81,8%
	Ripple	238	10,2%	62,8%
	Cardano	136	5,8%	35,9%
	Stellear	133	5,7%	35,1%
	Litecoin	204	8,7%	53,8%
	Bitcoin cash	175	7,5%	46,2%
	IOTA	108	4,6%	28,5%
	Hot	173	7,4%	45,6%
	Doge	251	10,7%	66,2%
	Xem	89	3,8%	23,5%
	Rvn	106	4,5%	28,0%
	diger	45	1,9%	11,9%
Total		2340	100,0%	617,4%
a. Group				

Source: by the Author of the Dissertation

In the question asked about the participants' awareness of cryptocurrencies, it is seen that bitcoin awareness ranks first with 98.2%. While 81.8% of the participants have an opinion about Ethereum, it is followed by Dogecoin with 66.2% and Ripple with 62.8%. Investors' opinions about cryptocurrencies were 53.8% in Litecoin, 46.2% in Bitcoincash, and 45.8% in Holochain (HOT).

3.3.2. Cryptocurrency Awareness Analysis of Individual Investors

Participants' cryptocurrency awareness was analyzed under two factors. These are novelty and risk factors. Participants were asked 7 questions for novelty and risk

factors. The measures of the propositions were tested with the options "1-Strongly Disagree", "2-Disagree", "3-Undecided", "4-Agree", "5-Strongly Agree".

3.3.2.1. Risk

The distribution of the answers of the participants within the framework of the risk factor of their cryptocurrency awareness is below.

Table 11: Mean, SD and Variance Related to Risk

		Bubble	Has not worth	Risky
N	Valid	381	381	381
	Missing	0	0	0
Mean		2,83	2,51	4,1
SD		1,358	1,293	1,029
Variance		1,845	1,672	1,058
Range		4	4	4

Source: by the Author of the Dissertation

"Cryptocurrency is a bubble" is the first proposition of the risk factor. The distribution of the answers of the participants is in the table below.

Table 12: Distribution of Participants Regarding Bubble Perception on Cryptocurrencies

Bubble		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	82	21,5	21,5	21,5
	Disagree	79	20,7	20,7	42,3
	Undecided	104	27,3	27,3	69,6
	Agree	53	13,9	13,9	83,5
	Strongly Agree	63	16,5	16,5	100
	Total	381	100	100	

Source: by the Author of the Dissertation

When the findings were examined, it was determined that the participants were

confused about whether the cryptocurrencies were bubbles or not. 27.3% of the participants are undecided. However, in general, respondents don't tend to view cryptocurrencies as bubbles.

"Cryptocurrencies have no value" is the second proposition of the risk factor. The distribution of the answers of the participants is in the table below.

Table 13: Distribution of Participants Regarding No Value Perception on Cryptocurrencies

Has not worth		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	104	27,3	27,3	27,3
	Disagree	104	27,3	27,3	54,6
	Undecided	89	23,4	23,4	78
	Agree	43	11,3	11,3	89,2
	Strongly Agree	41	10,8	10,8	100
	Total	381	100	100	

Source: by the Author of the Dissertation

Participants think that cryptocurrencies have value. Although 54.6% of the respondents think that cryptocurrencies have value, 22.1% of them argue that cryptocurrencies have no value.

"Cryptocurrency is risky." is the third proposition of the risk factor. The distribution of the answers of the participants is in the table below.

Table 14: Distribution of Participants Regarding Risk Perception on Cryptocurrencies

Risky		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	2,9	2,9	2,9
	Disagree	13	3,4	3,4	6,3
	Undecided	79	20,7	20,7	27
	Agree	102	26,8	26,8	53,8
	Strongly Agree	176	46,2	46,2	100
	Total	381	100	100	

Source: by the Author of the Dissertation

The findings show that respondents generally consider cryptocurrencies to be risky. 63% of respondents consider cryptocurrencies to be risky. Although 27% of respondents are undecided, 10% of respondents consider cryptocurrencies risk-free.

3.3.2.2. Novelty

The distribution of the answers of the participants within the framework of the novelty factor of their cryptocurrency awareness is below.

Table 15: Mean, SD and Variance Related to Novelty

		Financial Novelty	Information Technology Novelty	Potential Usage of Cryptocurrency	Investment on Cryptocurrency
N	Valid	381	381	381	381
	Missing	0	0	0	0
Mean		4,15	4,1	4,11	3,47
SD		1,039	1,036	1,039	1,099
Variance		1,079	1,073	1,079	1,208
Range		4	4	4	4

Source: by the Author of the Dissertation

"Cryptocurrency technology has brought a great innovation to the financial world." is the first proposition of the novelty factor. The distribution of the answers of the participants is in the table below.

Table 16: Distribution of Participants Regarding Financial Novelty Perception on Cryptocurrencies

Financial Novelty		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	11	2,9	2,9	2,9
	Disagree	18	4,7	4,7	7,6

	Undecided	60	15,7	15,7	23,4
	Agree	104	27,3	27,3	50,7
	Strongly Agree	188	49,3	49,3	100
	Total	381	100	100	

Source: by the Author of the Dissertation

Participants consider that cryptocurrencies are a novelty for the financial world. 76.6% of the participants think that cryptocurrencies are novelty for finance. Those who have the opposite opinion are only 10.5% of the participants.

"Cryptocurrency technology has brought a great innovation to the information technologies world." is the second proposition of the novelty factor. The distribution of the answers of the participants is in the table below.

Table 17: Distribution of Participants Regarding Technological Novelty Perception on Cryptocurrencies

Information Technology Novelty		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	13	3,4	3,4	3,4
	Disagree	13	3,4	3,4	6,8
	Undecided	69	18,1	18,1	24,9
	Agree	112	29,4	29,4	54,3
	Strongly Agree	174	45,7	45,7	100
	Total	381	100	100	

Source: by the Author of the Dissertation

Participants think that the technologies of cryptocurrencies create innovations in the world of information technologies. 75% of the participants have this judgment. Although 6.8% of the investors have the opposite opinion, the remaining 18.1% are undecided.

"In 10 years, many people will start using cryptocurrencies." is the third proposition of the novelty factor. The distribution of the answers of the participants is in the table below.

Table 18: Distribution of Participants Regarding Usage Perception on Cryptocurrencies

Potential Usage of Cryptocurrency		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	10	2,6	2,6	2,6
	Disagree	20	5,2	5,2	7,9
	Undecided	66	17,3	17,3	25,2
	Agree	106	27,8	27,8	53
	Strongly Agree	179	47	47	100
	Total	381	100	100	

Source: by the Author of the Dissertation

Participants supported the idea that within 10 years, many people will use cryptocurrencies in their daily lives. 74.8% of the participants have this idea. However, 25.2% of the participants are undecided and 7.9% do not agree with this opinion.

"It is logical to invest in cryptocurrencies." is the fourth proposition of the novelty factor. The distribution of the answers of the participants is in the table below.

Table 19: Distribution of Participants Regarding Investment Attitude Toward on Cryptocurrencies

Cryptocurrency is risky.		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	21	5,5	5,5	5,5
	Disagree	34	8,9	8,9	14,4
	Undecided	156	40,9	40,9	55,4
	Agree	85	22,3	22,3	77,7
	Strongly Agree	85	22,3	22,3	100
	Total	381	100	100	

Source: by the Author of the Dissertation

Investors are ambivalent about cryptocurrencies as a logical investment tool. 40.9% of the participants stated that they were undecided. Although 44.6% think it is

logical to invest in cryptocurrencies, 14.4% of the respondents have the opposite view.

3.3.3. Psychological Bias Analysis of Individual Investors

Participants' psychological biases were analyzed as representativeness, availability, overconfidence, optimism, regret aversion and herd effect. In order to determine the psychological biases of the participants, they were asked 24 questions.

3.3.3.1. Representativeness

The table shows frequency data about the representativeness tendencies of the participants. The representativeness tendencies of the participants were measured with 4 questions asked to them. The other tables below show the response distributions for each question.

Table 20: Mean, SD and Variance Related to Representativeness

	Rep_1	*Rep_2*	*Rep_3*	*Rep_4*
N	381	381	381	381
Mean	1,91	1,7087	1,6850	1,6037
SD	,282	,45498	,46511	,48978
Variance	,079	,207	,216	,240
Range	1	1,00	1,00	1,00

Source: by the Author of the Dissertation

In the first table, "Ayşe is 31 years old, single, outspoken and intelligent. Ayşe majored in philosophy. As a student, she was heavily involved in discrimination and social justice issues. She also participated in anti-nuclear demonstrations." After the definitions were given, the participants were asked to answer about Ayşe by choosing one of the options below.

Table 21: "Ayşe is a bank clerk" Proposition

Rep_1		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ayşe is a bank clerk..	33	8,7	8,7	8,7
	Ayşe is a bank clerk and activist..	348	91,3	91,3	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

Although the answer "Ayşe is a bank clerk" was preferred by 8.7%, the answer of "Ayşe is a bank officer and activist" was answered by 91.3%. Here, it was observed that a very large part of the participants made inferences with the representativeness bias. Because "philosophy, discrimination and social justice issues" in the definitions evoked the option of activism for individuals.

The table below shows the answers of the participants to the statement "High quality products are expensive".

Table 22: "High quality products are expensive". Proposition

Rep_2		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	270	70,9	70,9	70,9
	No	111	29,1	29,1	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

Although 70.9% of the participants chose the option stating that this proposition is true, 29.1% did not agree with this proposition. In this question, representativeness biases affect the participants, and it was observed that the majority of the participants made inferences from the price.

In the question in which the participants were asked to choose one of the possible answers of the coins tossed six times, one of the answers came up heads repeatedly, but the other option came up with a coin toss.

Table 23: Coin Toss Proposition

Rep_3		Frequency	Percent	Valid Percent	Cumulative Percent
	TTTTTT	120	31,5	31,5	31,5
Valid	TYYTTY	261	68,5	68,5	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

Although each situation in the coin toss game has a 50% probability independently of each other, 68.5% of the participants preferred situations that were different from each other. Actually, the probability of both happening is the same. However, since the probability of the repeated event to occur in the perceptions of the individuals is lower, they preferred the event that occurred differently from each other. For this reason, the representativeness bias in individuals has been observed in this question.

It is aimed to observe how the past price movements affect the future judgments of the investors by representativeness bias, with the sentence; "I think that if a cryptocurrency has performed badly/well in the past 6-12 months, that crypto money will also lose/gain in the future".

Table 24: Cryptocurrency Future Performance Proposition

Rep_4		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	230	60,4	60,4	60,4
	No	151	39,6	39,6	100;0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the answers, 60.4% of the investors stated that the past price movements will be effective on the future price movements, while 39.6% stated that the past price movements will not be effective on the future price movements. As it can be understood from answers, the majority of the investors acted within the framework of past price judgments and representativeness bias.

In the framework of the questions asked to measure the Representativeness bias of the participants, it is observed that the majority of the investors have this bias. It has been determined that investors had systematic errors in their decision-making processes, and therefore, they made their decisions biasedly due to factors such as historical data and attributions, and they may have been away from rationality.

3.3.3.2. Availability

Availability bias was tested with 2 questions directed to the participants. The table shows the distribution of the participants.

Table 25: Mean, SD and Variance Related to *Availability*

	Av_1	Av_2
N	381	381
Mean	1,36	1,39
SD	,480	,487
Variance	,230	,238
Range	1	1

Source: by the Author of the Dissertation

Availability bias was tested with 2 questions directed to the participants. The table shows the distribution of the participants.

With the AV_1 question, the participants were asked about the use of the letter K in Turkish words.

Table 26: "K" Letter Frequency Proposition

	Av_1	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	There are more words starting with "K" in Turkish words.	245	64,3	64,3	64,3
	Turkish words with the third letter "K" are more common.	136	35,7	35,7	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

64.3% of the participants preferred the option stating that the words starting with the letter "K" in Turkish words are more than the words with the third letter "K". 35.7% of them stated that the words with the third letter "K" will be more than the words with the first letter "K". Words starting with the letter "K" are easier to guess than words with the third letter "K". In other words, it is easier to come to mind than words with the 3rd letter "K". Words starting with the letter "K" in Turkish are more common and easier to guess. Therefore, an availability bias is observed in the participants.

The AV_2 question was asked to measure the attitudes of the participants about potential losses from different investment instruments.

Table 27: Potential Losses Attitudes Proposition

	Av_2	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	The loss rate in crypto currency investments is higher.	234	61,4	61,4	61,4
	The rate of loss from stock investments is higher.	147	38,6	38,6	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the distributions, 61.4% of the participants stated that the losses from crypto money investments could be more. On the other hand, 38.6% of the participants stated that more loss could be made from the stock investment. It offers investors a freer but more risky market due to factors such as the fact that the crypto money markets work 24 hours a day, 7 days a week, and are not controlled by the authorities. In other words, excessive risk arises as a result of excessive volatility. This situation both increases and decreases earnings. As a result, both gains and losses occur at higher rates. Each participant in the study has invested in cryptocurrencies and naturally experienced both gains and losses. For this reason, considering that their most recent investments are on crypto currency, they are expected to remember their high losses in the stock market, which is in a downtrend, and to make their choices in this area.

3.3.3.3. Overconfidence

Overconfidence bias was measured with 5 questions asked to the participants. Questions were asked about the overconfidence level of the participants. The table shows their distribution.

Table 28: Mean, SD and Variance Related to *Over Confidence*

	Con_1	Con_2	Con_3	Con_4	Con_5
N	381	381	381	381	381
Mean	1,43	1,3228	1,77	1,4856	1,4357
SD	,496	,46817	,420	,50045	,49650
Variance	,246	,219	,177	,250	,247
Range	1	1,00	1	1,00	1,00

Source: by the Author of the Dissertation

In the question coded with Con_1, participants were asked for their opinions on the proposition "Satoshi Nakamoto is the creator of Bitcoin".

Table 29: "Satoshi Nakamoto is the creator of Bitcoin" Proposition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	216	56,7	56,7	56,7
	No	165	43,3	43,3	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

Although 56.7% of the participants preferred the answer "yes", 43.3% of the participants preferred the answer "no".

In Con_2, a question was asked about how confident the participants were in their answers to Con_1 proposition.

Table 30: Trust the Answer of Con_1 Coded Proposition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Sure	258	67,7	67,7	67,7
	Not Sure	123	32,3	32,3	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

When the distributions are examined, 67.7% of the participants stated that they were sure of the answer they gave in the previous question. The remaining 32.3% of the participants stated that they were not sure about the previous answer.

Con_3, with the statement "I am better than other investors in choosing cryptocurrencies and I see the factors affecting cryptocurrencies before anyone else" wanted to measure the attitudes of the participants about their self-confidence.

Table 31: Early awareness self-confidence proposition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	87	22,8	22,8	22,8
	No	294	77,2	77,2	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

Response distribution of the participants was 22.8% "Yes" and 77.2% "No". When the results are evaluated, it is understood that the participants have a lack of self-confidence to foresee the factors affecting the market.

Con_4 measures the knowledge level of the participants about investment.

Table 32: Investment Knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low Knowledge	196	51,4	51,4	51,4
	High Knowledge	185	48,6	48,6	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

It is seen that there is a balanced distribution in the answers to this question. Although 51.4% of the participants describe themselves as having low knowledge, 48.6% see themselves as having high knowledge.

Con_5 was asked to measure the level of participants' ability to find well-performing cryptocurrencies in the market early and add them to their portfolios.

Table 33: Cryptocurrency Control Ability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low Control	215	56,4	56,4	56,4
	High Control	166	43,6	43,6	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the distribution of the answers given, it is understood that the participants do not feel confident about their knowledge and skills. Even though 56.4% of respondents have low control, and 43.6% have high control of detecting cryptocurrencies that are performing or can perform well.

This scale, which measures overconfidence bias, shows that participants lack self-confidence when it comes to cryptocurrency gains and losses. One of the most important factors here is the knowledge and skill deficiencies of the participants. These deficiencies cause lower self-confidence and lead to deviations in their decisions.

3.3.3.4. Optimism

The optimism biases of the participants were tested with 3 questions. The distributions of the answers are below.

Table 34: Mean, SD and Variance Related Optimism

		OP_1	OP_2	OP_3
N	Valid	381	381	381
Mean		1,0184	1,1496	1,43
SD		,13447	,35715	,496
Variance		,018	,128	,246
Range		1,00	1,00	1

Source: by the Author of the Dissertation

Below is the distribution of answers to the question "How optimistic are you about the better economy in the future? ", which is coded as OP_1.

Table 35: Optimism about Economy of Future

	OP_1	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I am not optimistic	374	98,2	98,2	98,2
	I am optimistic	7	1,8	1,8	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

According to the response distributions, the participants have a very pessimistic view of the future. The participants who gave the pessimistic answer are 98.2% of the total participants. 7 people who representing only 1.8% are optimistic about the future.

Below is the table showing the answer distribution for the question "How optimistic are you that a cryptocurrency you bought will gain in value in the future" is coded with OP_2.

Table 36: Optimism about Cryptocurrency's Future

OP_2		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I am optimistic	324	85,0	85,0	85,0
	I am not optimistic	57	15,0	15,0	100,0
	Total	381	100,0	100,0	

The pessimistic attitude of the participants is also seen in this question. 85% of respondents expect their cryptocurrencies to perform positively in the future. Only 15% of respondents have no the expectation that the value of the cryptocurrencies they invest in will increase.

The extreme volatility of the cryptocurrency markets negatively or positively affects the mood of the investors. Due to the fluctuations in cryptocurrencies at the time of the survey, sometimes investors lost their hopes on cryptocurrency earnings. Monthly price movements of Bitcoin, the reference currency of crypto money markets, are seen between March and September, which covers the dates when the survey is open to the participants.

Table 37: Price movements of Bitcoin

SEP 2021	43.823,3
AUG 2021	47.130,4
JUL 2021	41.553,7
JUN 2021	35.026,9
MAY 2021	37.298,6
APR 2021	57.720,3
MAR 2021	58.763,7

Source: by the Author of the Dissertation

It is clear that the sudden rises and falls in the market affect the trust and belief of the participants in cryptocurrencies. Therefore, it is natural for the participants to show an optimistic attitude.

Below are the answer distributions for the question "Suppose that you have just bought a cryptocurrency and you are quite optimistic for its future. In this case, how does a bad news you just received affect your optimism" is coded as OP_3.

Table 38: Optimism about Cryptocurrency's Future

OP_3		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	It doesn't affect you; you keep your optimism thinking that good news will come later.	217	57,0	57,0	57,0
	You worry, you review your investment to sell.	164	43,0	43,0	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

57% of the respondents reported that their optimistic attitude would not change with the bad news and they would not worry. The remaining 43% said they might be worried and consider selling their cryptocurrencies.

3.3.3.5. Regret Aversion

The regret aversion tendencies of the participants in their investments were tested with 5 questions asked to them. The answer distributions of the coded questions are below.

Table 39: Mean, SD and Variance Related Regret Aversion

		Reg_1	Reg_2	Reg_3	Reg_4	Reg_5
N	Valid	381	381	381	381	381
Mean		1,53	1,52	1,7743	1,81	1,8136
SD		,500	,500	,41861	,392	,38990
Variance		,250	,250	,175	,154	,152
Range		1	1	1,00	1	1,00

Source: by the Author of the Dissertation

The questions asked to the participants and coded as REG_1 are as follows; "Assume that you have lost a cryptocurrency investment soon. You are planning to invest again, and you have two options. These are cryptocurrencies with high market cap and cryptocurrencies with average market cap. Also, the risks and returns of cryptocurrencies are the same. You can choose from the options below. which one will cause you to regret more?". The answer distributions of the question are below.

Table 40: Cryptocurrency value and Losses Relation with Respect to Regret

REG_1		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Investing in high value cryptocurrencies and making a loss.	179	47,0	47,0	47,0
	Investing in mid-value cryptocurrencies and making a loss.	202	53,0	53,0	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

47% of the participants preferred to invest in crypto money, which has a high market cap. 53% of the participants stated that they would prefer medium value crypto money investment. The answers to this question are fairly evenly distributed.

The question encoded with REG_2 is as follows; "While making an investment, which of the following situations will cause you to regret more?". The distribution of the answers is in the table below.

Table 41: Regret with Opportunities or Losses on Investment

REG_2		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Loss of the cryptocurrency you invested in.	181	47,5	47,5	47,5
	The appreciation of a crypto currency that you predict will increase in value but have not invested in.	200	52,5	52,5	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

47.5% of the participants stated that they would feel more regret if the value of the cryptocurrencies they invested in decreased. 52.5% of the participants stated that they would regret more if they did not invest in cryptocurrencies that they expected to increase in value and as a result of the increase in the value of the cryptocurrencies they did not buy.

The question coded with REG_3 and asked to the participants is as follows; "Assume that you have invested in a crypto and its value increases. Is the statement "You sell immediately without waiting for it to rise further because if its value drops you will regret not selling." true or false for you?" The distribution of the answers to the question is in the table below.

Table 42: Potential Future Price Movements and Regret Expectation

REG_3		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	86	22,6	22,6	22,6
	Yes	295	77,4	77,4	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

With a regret aversion tendency, 77.4% of respondents indicated that they would sell immediately if the value of the cryptocurrencies they invested increased.

Because they are afraid of the decrease in the value of the crypto money they invest. 22.6% of the participants do not show a tendency to regret aversion. They are confident in their investments and like to take risks.

The question coded with REG_4 and asked to the participants is as follows; "You have recently lost in a cryptocurrency. If you want to invest again, which of the following would you prefer?" The distribution of the answers to the question is in the table below.

Table 43: Regret Attitude on Investment After Losing

REG_4		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	You choose cryptocurrencies with high returns and risks to cover the loss on your investment.	72	18,9	18,9	18,9
	Even if you lose on your investment, you will be cautious and prefer more stable cryptocurrencies because you do not want to lose again.	309	81,1	81,1	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

81.1% of the participants stated that they will prefer more stable and safe instruments in their future crypto money investments, even if they lose from their previous crypto money investments. The remaining 18.9% stated that they will invest in cryptocurrencies that have more risk but provide more returns in their next crypto money investments to cover their losses from their past crypto money investments. According to the ratio of the answers, it can be said that the majority of the participants have a tendency to regret aversion.

The question coded as REG_5 and asked to the participants is as follows; Which of the following defines you for the statement "If the cryptocurrency I invested in depreciates, I will not sell the cryptocurrency and wait until it comes back to the price at which I originally bought it. After the loss is gone, I can sell the

cryptocurrency." The distribution of the answers to the question is in the table below.

Table 44: Depreciation Effect on Regret Perception

REG_5		Frequency	Percent	Valid Percent	Cumulative Percent
	No	71	18,6	18,6	18,6
Valid	Yes	310	81,4	81,4	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

81.4% of the respondents stated that if the cryptocurrencies they invested incur a loss, they would not sell them until they reached the first price they purchased. The reason for this is that participants are afraid that they will feel regret if they sell their cryptocurrencies at a low price. 18.6% of the participants stated that they might sell the cryptocurrencies in their portfolio even if they have a loss.

3.3.3.6. Herd Effect

Three questions were asked to measure the participants' herd effect attitudes. The distribution of the answers to the questions is in the table below.

Table 45: Mean, SD and Variance Related Herd Effect

		Her_1	Her_2	Her_3
N	Valid	381	381	381
Mean		1,18	1,38	1,68
SD		,386	,487	,467
Variance		,149	,237	,218
Range		1	1	1

Source: by the Author of the Dissertation

The question coded as HER_1 is as follows; Do you agree with the statement "I follow the actions of the person/people whom I believe to have good financial knowledge." The distribution of the answers to the question is in the table below.

Table 46: "I follow the actions of the person/people whom I believe to have good financial knowledge." Proposition

HER_1		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	312	81,9	81,9	81,9
	No	69	18,1	18,1	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

81.9% of the participants stated that they followed the actions and decisions of individuals they knew or believed to have high financial knowledge. The remaining 18.1% stated that they do not follow such individuals with high financial knowledge. From here, it is observed that the participants are under the herd effect. Especially in market conditions where information flow is intense, such as crypto money markets, individual investors do not have a chance to manage excessive information flow. This is why they tend to follow cryptocurrency analysts and social media influencers.

The question coded as HER_2 is as follows; "Investing in a cryptocurrency that no one has invested in is risky." Do you agree with the statement?". Answer distributions of the questions are in the table below.

Table 47: "Investing in a cryptocurrency that no one has invested in is risky." Proposition

HER_2		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	235	61,7	61,7	61,7
	No	146	38,3	38,3	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

61.7% of the respondents stated that a cryptocurrency that no one has invested in would be too risky. The remaining 38.3% stated that it would not be too risky to invest in crypto money that no one has invested in. In this respect, it can be said that the participants came to judgment by being under the influence of the herd.

The question coded as HER_3 is as follows; "If your social circle tells you to increase or decrease the value of any cryptocurrency, did you buy or sell the cryptocurrency they told you?". The distribution of the answers to the question is in the table below.

Table 48: "Social environment effect for investment decision on cryptocurrency" Proposition

HER_3		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	122	32,0	32,0	32,0
	No	259	68,0	68,0	100,0
	Total	381	100,0	100,0	

Source: by the Author of the Dissertation

68% of the participants stated that they did not buy the crypto money that the people around them recommended. The remaining 32% stated that they invested in crypto money with such recommendations.

3.4. ANALYSIS

3.4.1. Gender-Cryptocurrency Awareness

H_0: Gender has no effect on cryptocurrency awareness.
H_1: Gender has an effect on cryptocurrency awareness.

The above hypotheses are used to reveal whether there is a significant relationship between the gender of investors and their awareness of cryptocurrencies.

Table 49: The Effect of Gender on Cryptocurrency Awareness

			Your Gender.		Total
			Female	Male	
How much do you know about cryptocurrencies	I know a lot, I have cryptocurrencies	Count	25	104	129
		Expected Count	40	89	129
		% knowledge about cryptocurrency	19%	81%	100 %
		% gender	21%	40%	34%
	I have knowledge but I do not have cryptocurrencies	Count	24	53	77
		Expected Count	23,8	53,2	77
		% knowledge about cryptocurrency	31%	69%	100 %
		% gender	20%	20%	20%
	I have partial knowledge.	Count	51	91	142
		Expected Count	44	98	142
		% knowledge about cryptocurrency	36%	64%	100 %
		% gender	43%	35%	37%
	I've heard of it but I don't know exactly what cryptocurrencies are.	Count	18	12	30
		Expected Count	9,3	20,7	30
		% knowledge about cryptocurrency	60%	40%	100 %
		% gender	15%	5%	8%
	I have no idea	Count	0	3	3
		Expected Count	0,9	2,1	3
		% knowledge about cryptocurrency	0%	100%	100 %
		% gender	0%	1%	1%
Total		Count	118	263	381
		Expected Count	118	263	381
		% knowledge about cryptocurrency	31%	69%	100 %
		% gender	100%	100%	100 %
χ2=22,903, df=4, P(0,000)<0,05 H0:Reject H1:Accept					

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the gender of individual investors and their awareness of cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.000), and therefore the H_1 hypothesis was accepted. In other words, there is a significant relationship between gender and cryptocurrency awareness.

According to the findings, the majority of male respondents stated that they know a lot about cryptocurrencies and have cryptocurrencies. Among the male participants, those who gave this answer were observed as 40% of the total participants. 43% of female respondents stated that they have partial knowledge about cryptocurrencies. Looking at the results, it became clear that there was a difference for cryptocurrency awareness between the two genders.

3.4.2. Education Level-Cryprocurrency Awareness

H_0: Education level has no effect on cryptocurrency awareness.
H_1: Education level has an effect on cryptocurrency awareness.

The above hypotheses are used to reveal whether there is a significant relationship between the education level of investors and their awareness of cryptocurrencies.

Table 50: The Effect of Education Level on Cryptocurrency Awareness

<table>
<tr><td colspan="3" rowspan="2"></td><td colspan="4">Education Level</td><td rowspan="2">Total</td></tr>
<tr><td>High School and Less than High School</td><td>Associate Degree</td><td>Bachelor's Degree</td><td>Master's Degree and higher</td></tr>
<tr><td rowspan="16">How much do you know about cryptocurrencies?</td><td rowspan="4">I know a lot, I have cryptocurrencies.</td><td>Count</td><td>15</td><td>12</td><td>87</td><td>15</td><td>129</td></tr>
<tr><td>Expected Count</td><td>11,9</td><td>14,2</td><td>78,9</td><td>24</td><td>129</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>12%</td><td>9%</td><td>67%</td><td>12%</td><td>100%</td></tr>
<tr><td>% education</td><td>43%</td><td>29%</td><td>37%</td><td>21%</td><td>34%</td></tr>
<tr><td rowspan="4">I have knowledge but I do not have cryptocurrencies</td><td>Count</td><td>6</td><td>10</td><td>34</td><td>27</td><td>77</td></tr>
<tr><td>Expected Count</td><td>7,1</td><td>8,5</td><td>47,1</td><td>14,3</td><td>77</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>8%</td><td>13%</td><td>44%</td><td>35%</td><td>100%</td></tr>
<tr><td>% education</td><td>17%</td><td>24%</td><td>15%</td><td>38%</td><td>20%</td></tr>
<tr><td rowspan="4">I have partial knowledge.</td><td>Count</td><td>12</td><td>15</td><td>91</td><td>24</td><td>142</td></tr>
<tr><td>Expected Count</td><td>13</td><td>15,7</td><td>86,8</td><td>26,5</td><td>142</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>9%</td><td>11%</td><td>64%</td><td>17%</td><td>100%</td></tr>
<tr><td>% education</td><td>34%</td><td>36%</td><td>39%</td><td>34%</td><td>37</td></tr>
</table>

						%
I've heard of it but I don't know exactly what cryptocurrencies are.	Count	2	4	19	5	30
	Expected Count	2,8	3,3	18,3	5,6	30
	% knowledge about cryptocurrency	7%	13%	63%	17%	100%
	% education	6%	10%	8%	7%	8%
I have no idea	Count	0	1	2	0	3
	Expected Count	0,3	0,3	1,8	0,6	3
	% knowledge about cryptocurrency	0%	33%	67%	0%	100%
	% education	0%	2%	1%	0%	1%
Total	Count	35	42	233	71	381
	Expected Count	35	42	233	71	381
	% knowledge about cryptocurrency	9%	11%	61%	19%	100%
	% education	100%	100%	100%	100%	100%
χ2=23,822 , df=12, P(0,022)<0,05 H₀:Reject H₁:Accept						

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the education level of individual investors and their awareness of cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.022), and therefore the H_1 hypothesis was accepted.

43% of High School and Less than High School individuals, the largest population among them, implied they know a lot about and own cryptocurrencies. 36% of associate degree graduates, who have the highest share in their distribution, stated that they have partial knowledge about cryptocurrencies. 39% of individuals with a bachelor's degree, the largest population among them, stated that they had some knowledge of cryptocurrencies. The most preferred option among graduates of master's degree and higher education was "I have knowledge, but I do not have any investment in cryptocurrency".

3.4.3. Daily Internet Usage- Cryprocurrency Awareness

H$_0$: Daily internet usage has no effect on cryptocurrency awareness.

H$_1$: Daily internet usage an effect on cryptocurrency awareness.

The above hypotheses are used to reveal whether there is a significant relationship between the daily internet usage of investors and their awareness of cryptocurrencies.

Table 51: The Effect of Education Level on Cryptocurrency Awareness

<table>
<tr><td colspan="3" rowspan="2"></td><td colspan="4">Daily internet usage (Personal)</td><td rowspan="2">Total</td></tr>
<tr><td>0-1 hour</td><td>1-3 hours</td><td>3-6 hours</td><td>6 hours and more</td></tr>
<tr><td rowspan="20">How much do you know about cryptocurrencies?</td><td rowspan="4">I know a lot, I have cryptocurrencies.</td><td>Count</td><td>2</td><td>27</td><td>51</td><td>49</td><td>129</td></tr>
<tr><td>Expected Count</td><td>1,4</td><td>36,9</td><td>48,8</td><td>42</td><td>129</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>2%</td><td>21%</td><td>40%</td><td>38%</td><td>100%</td></tr>
<tr><td>% internet usage</td><td>50%</td><td>25%</td><td>35%</td><td>40%</td><td>34%</td></tr>
<tr><td rowspan="4">I have knowledge but I do not have cryptocurrencies</td><td>Count</td><td>0</td><td>19</td><td>30</td><td>28</td><td>77</td></tr>
<tr><td>Expected Count</td><td>0,8</td><td>22</td><td>29,1</td><td>25,1</td><td>77</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>0%</td><td>25%</td><td>39%</td><td>36%</td><td>100%</td></tr>
<tr><td>% internet usage</td><td>0%</td><td>17%</td><td>21%</td><td>23%</td><td>20%</td></tr>
<tr><td rowspan="4">I have partial knowledge.</td><td>Count</td><td>1</td><td>45</td><td>56</td><td>40</td><td>142</td></tr>
<tr><td>Expected Count</td><td>1,5</td><td>40,6</td><td>53,7</td><td>46,2</td><td>142</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>1%</td><td>32%</td><td>39%</td><td>28%</td><td>100%</td></tr>
<tr><td>% internet usage</td><td>25%</td><td>41%</td><td>39%</td><td>32%</td><td>37%</td></tr>
<tr><td rowspan="4">I've heard of it but I don't know exactly what cryptocurrencies are.</td><td>Count</td><td>1</td><td>15</td><td>7</td><td>7</td><td>30</td></tr>
<tr><td>Expected Count</td><td>0,3</td><td>8,6</td><td>11,3</td><td>9,8</td><td>30</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>3%</td><td>50%</td><td>23%</td><td>23%</td><td>100%</td></tr>
<tr><td>% internet usage</td><td>25%</td><td>14%</td><td>5%</td><td>6%</td><td>8%</td></tr>
<tr><td rowspan="4">I have no idea</td><td>Count</td><td>0</td><td>3</td><td>0</td><td>0</td><td>3</td></tr>
<tr><td>Expected Count</td><td>0</td><td>0,9</td><td>1,1</td><td>1</td><td>3</td></tr>
<tr><td>% knowledge about cryptocurrency</td><td>0%</td><td>100%</td><td>0%</td><td>0%</td><td>100%</td></tr>
<tr><td>% internet usage</td><td>0%</td><td>3%</td><td>0%</td><td>0%</td><td>1%</td></tr>
</table>

Total	Count	4	109	144	124	381
	Expected Count	4	109	144	124	381
	% knowledge about cryptocurrency	1%	29%	38%	33%	100%
	% internet usage	100%	100%	100%	100%	100%
$\chi 2=23,626$, $df=12$, $P(0,023)<0,05$ H_0:Reject H_1:Accept						

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the daily internet usage of individual investors and their awareness of cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.023), and therefore the H_1 hypothesis was accepted. In other words, there is a significant relationship between daily internet usage and cryptocurrency awareness.

3.4.4. Gender-Cryprocurrency Investment Amount

H₀: Gender has no effect on cryptocurrency investment amount.
H₁: Gender has effect on cryptocurrency investment amount.

The above hypotheses are used to reveal whether there is a significant relationship between the gender of investors and their investment amount of cryptocurrencies.

Table 52: The Effect of Gender on Cryptocurrency Investment Amount

			Your Gender.		Total
			Female	Male	
How much do you trade on the cryptocurrency exchange?	0-2000 TL	Count	89	134	223
		Expected Count	69,1	153,9	223
		% investment amount	40%	60%	100%
		% gender	75%	51%	59%
	2000-4000 TL	Count	11	33	44
		Expected Count	13,6	30,4	44
		% investment amount	25%	75%	100%
		% gender	9%	13%	12%
	4000-6000 TL	Count	6	20	26
		Expected Count	8,1	17,9	26
		% investment amount	23%	77%	100%
		% gender	5%	8%	7%

	6000-8000 TL	Count	3	6	9
		Expected Count	2,8	6,2	9
		% investment amount	33%	67%	100%
		% gender	3%	2%	2%
	8000 TL and more	Count	9	70	79
		Expected Count	24,5	54,5	79
		% investment amount	11%	89%	100%
		% gender	8%	27%	21%
Total		Count	118	263	381
		Expected Count	118	263	381
		% investment amount	31%	69%	100%
		% gender	100%	100%	100%
$\chi^2=24,015$, df=4, P(0,000)<0,05 H$_0$:Reject H$_1$:Accept					

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the gender of individual investors and their investment amount of cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.000), and therefore the H$_1$ hypothesis was accepted. In other words, there is a significant relationship between gender and cryptocurrency investment amount.

The investment amount between 0-2000 TL is the most preferred investment amount by both male and female participants. While 75% of female participants preferred this range, 51% of male participants preferred this investment amount. However, the main difference was observed in the investment amount of 8000 TL and more. 27% of male participants stated that they invested 8000 TL or more and showed a high distribution in the two extreme frequencies.

3.4.5. Education Level-Cryprocurrency Investment Amount

H$_0$: Education level has no effect on cryptocurrency investment amount.
H$_1$: Education level has effect on cryptocurrency investment amount.

The above hypotheses are used to reveal whether there is a significant relationship between the education level of investors and their investment amount of cryptocurrencies.

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Table 53: The Effect of Education Level on Cryptocurrency Investment Amount

			Education Level				Total
			High School and Less than High School	Associate Degree	Bachelor Degree	Master's Degree and higher	
How much do you trade on the cryptocurrency exchange?	0-2000 TL	Count	17	26	129	51	223
		Expected Count	20,5	24,6	136,4	41,6	223
		% investment amount	8%	12%	58%	23%	100%
		% gender	49%	62%	55%	72%	59%
	2000-4000 TL	Count	1	5	32	6	44
		Expected Count	4	4,9	26,9	8,2	44
		% investment amount	2%	11%	73%	14%	100%
		% gender	3%	12%	14%	9%	12%
	4000-6000 TL	Count	2	2	19	3	26
		Expected Count	2,4	2,9	15,9	4,8	26
		% investment amount	8%	8%	73%	12%	100%
		% gender	6%	5%	8%	4%	7%
	6000-8000 TL	Count	0	2	6	1	9
		Expected Count	0,8	1	5,5	1,7	9
		% investment amount	0%	22%	67%	11%	100%
		% gender	0%	5%	3%	1%	2%
	8000 TL and more	Count	15	7	47	10	79
		Expected Count	7,3	8,7	48,3	14,7	79
		% investment amount	19%	9%	60%	13%	100%
		% gender	43%	17%	20%	14%	21%
Total		Count	35	42	233	71	381
		Expected Count	35	42	233	71	381
		% investment amount	9%	11%	61%	19%	100%
		% gender	100%	100%	100%	100%	100%
χ2=21,014 , df=4, P(0,050)<0,05 H₀:Reject H₁:Accept							

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the education level of individual investors and their investment

amount of cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.050), and therefore the H_1 hypothesis was accepted. In other words, there is a significant relationship between education level and cryptocurrency investment amount.

3.4.6. Gender-Cryprocurrency Exchange Parity

H_0: Gender has no effect on cryptocurrency exchange parity.
H_1: Gender has effect on cryptocurrency exchange parity.

The above hypotheses are used to reveal whether there is a significant relationship between the gender of investors and their exchange parity of cryptocurrencies.

Table 54: The Effect of Gender on Cryptocurrency Exchange Parity

				Your Gender.		Total
				Female	Male	
On which parity do you measure your crypto money investments?	TL		Count	67	102	169
			Expected Count	52,3	116,7	169
			% Exchange Parity	40%	60%	100%
			% Gender	57%	39%	44%
	USD		Count	42	145	187
			Expected Count	57,9	129,1	187
			% Exchange Parity	23%	78%	100%
			% Gender	36%	55%	49%
	EURO		Count	2	7	9
			Expected Count	2,8	6,2	9
			% Exchange Parity	22%	78%	100%
			% Gender	2%	3%	2%
	BTC		Count	6	7	13
			Expected Count	4	9	13
			% Exchange Parity	46%	54%	100%
			% Gender	5%	3%	3%
	BNB		Count	1	0	1
			Expected Count	0,3	0,7	1
			% Exchange Parity	100%	0%	100%
			% Gender	1%	0%	0%
	ETH		Count	0	2	2
			Expected Count	0,6	1,4	2
			% Exchange Parity	0%	100%	100%
			% Gender	0%	1%	1%
Total			Count	118	263	381
			Expected Count	118	263	381

	% Exchange Parity	31%	69%	100%
	% Gender	100%	100%	100%
$\chi2=17,134$, df=5, P(0,004)<0,05 H_0:Reject H_1:Accept				

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the gender of individual investors and their exchange parity of cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.004), and therefore the H_1 hypothesis was accepted. In other words, there is a significant relationship between gender and cryptocurrency exchange parity.

It was observed that female participants used TL parity when evaluating their investments. 57% of female participants stated that they evaluate their cryptocurrency investments on TL parity. In male participants, this situation was observed on USD parity. 55% of male respondents stated that they value their cryptocurrency investments in USD base currency.

3.4.7. Cryprocurrency Awareness- Cryprocurrency Exchange Parity

H_0: Cryptocurrency awareness has no effect on cryptocurrency exchange parity.

H_1: Cryptocurrency awareness has effect on cryptocurrency exchange parity.

The above hypotheses are used to reveal whether there is a significant relationship between the cryptocurrency awareness of investors and their exchange parity of cryptocurrencies.

Table 55: The effect of cryptocurrency awareness on cryptocurrency exchange parity

| | | | How much do you know about cryptocurrencies? | | | | | |
			I know a lot, I have cryptocurrencies.	I have knowledge but I do not have cryptocurrencies	I have partial knowledge.	I've heard of it but I don't know exactly what cryptocurrencies are.	I have no idea	Total
On which parity do you measure your crypto money investments?	TL	Count	38	34	76	19	2	169
		Expected Count	57,2	34,2	63	13,3	1,3	169
		% Exchange Parity	23%	20%	45%	11%	1%	100%
		% Knowledge	30%	44%	54%	63%	67%	44%
	USD	Count	86	36	58	6	1	187
		Expected Count	63,3	37,8	69,7	14,7	1,5	187
		% Exchange Parity	46%	19%	31%	3%	1%	100%
		% Knowledge	67%	47%	41%	20%	33%	49%
	EURO	Count	1	2	4	2	0	9
		Expected Count	3	1,8	3,4	0,7	0,1	9
		% Exchange Parity	11%	22%	44%	22%	0%	100%
		% Knowledge	1%	3%	3%	7%	0%	2%
	BTC	Count	2	4	4	3	0	13
		Expected Count	4,4	2,6	4,8	1	0,1	13
		% Exchange Parity	15%	31%	31%	23%	0%	100%
		% Knowledge	2%	5%	3%	10%	0%	3%
	BNB	Count	1	0	0	0	0	1
		Expected Count	0,3	0,2	0,4	0,1	0	1
		% Exchange Parity	100%	0%	0%	0%	0%	100%
		% Knowledge	1%	0%	0%	0%	0%	0%
	ETH	Count	1	1	0	0	0	2
		Expected Count	0,7	0,4	0,7	0,2	0	2
		% Exchange Parity	50%	50%	0%	0%	0%	100%
		% Knowledge	1%	1%	0%	0%	0%	1%
Total		Count	129	77	142	30	3	381
		Expected Count	129	77	142	30	3	381
		% Exchange Parity	34%	20%	37%	8%	1%	100%
		% Knowledge	100%	100%	100%	100%	100%	100%
$\chi2=41,353$, df=20, P(0,003)<0,05 H_0:Reject H_1:Accept								

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the cryptocurrency awareness of individual investors and their exchange parity of cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.003), and therefore the H_1 hypothesis was accepted. In other words, there is a significant relationship between cryptocurrency awareness and cryptocurrency exchange parity.

3.4.8. Cryprocurrency Investment Amount- Cryprocurrency Exchange Parity

H_0: Cryptocurrency investment amount has no effect on cryptocurrency exchange parity.

H_1: Cryptocurrency investment amount has effect on cryptocurrency exchange parity.

The above hypotheses are used to reveal whether there is a significant relationship between the cryptocurrency investment amount of investors and their exchange parity of cryptocurrencies.

Table 56: The effect of cryptocurrency investment amount on cryptocurrency exchange parity

			How much do you trade on the cryptocurrency exchange?					Total
			0-2000 TL	2000-4000 TL	4000-6000 TL	6000-8000 TL	8000 TL and more	
On which parity do you measure your crypto money investments?	TL	Count	123	14	9	2	21	169
		Expected Count	98,9	19,5	11,5	4	35	169
		% Exchange Parity	73%	8%	5%	1%	12%	100%
		% Investment Amount	55%	32%	35%	22%	27%	44%
	USD	Count	81	29	16	7	54	187
		Expected Count	109,5	21,6	12,8	4,4	38,8	187
		% Exchange Parity	43%	16%	9%	4%	29%	100%
		% Investment Amount	36%	66%	62%	78%	68%	49%
	EURO	Count	7	0	1	0	1	9
		Expected Count	5,3	1	0,6	0,2	1,9	9
		% Exchange Parity	78%	0%	11%	0%	11%	100%
		% Investment Amount	3%	0%	4%	0%	1%	2%
	BTC	Count	10	1	0	0	2	13
		Expected Count	7,6	1,5	0,9	0,3	2,7	13
		% Exchange Parity	77%	8%	0%	0%	15%	100%
		% Investment Amount	5%	2%	0%	0%	3%	3%
	BNB	Count	1	0	0	0	0	1
		Expected Count	0,6	0,1	0,1	0	0,2	1
		% Exchange Parity	100%	0%	0%	0%	0%	100%
		% Investment Amount	0%	0%	0%	0%	0%	0%
	ETH	Count	1	0	0	0	1	2
		Expected Count	1,2	0,2	0,1	0	0,4	2
		% Exchange Parity	50%	0%	0%	0%	50%	100%
		% Investment Amount	0%	0%	0%	0%	1%	1%
Total		Count	223	44	26	9	79	381
		Expected Count	223	44	26	9	79	381
		% Exchange Parity	59%	12%	7%	2%	21%	100%
		% Investment Amount	100%	100%	100%	100%	100%	100%
$\chi2=39,579$, df=20, P(0,006)<0,05 H₀:Reject H₁:Accept								

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the investment of individual investors and their exchange parity of cryptocurrencies, the P value at the 95% confidence level is less than 0.05

(P=0.006), and therefore the H_1 hypothesis was accepted. In other words, there is a significant relationship between cryptocurrency investment amount and cryptocurrency exchange parity.

3.4.9. Gender-Risk Perception

H_0: Gender has no effect on cryptocurrency risk perception on individual investors.

H_1: Gender has effect on cryptocurrency risk perception on individual investors.

The above hypotheses are used to reveal whether there is a significant relationship between the gender of investors and their risk perceptions.

Table 57: Mean and SD Related with Gender and Risk Perception

Gender	N	Mean	SD
Female	118	2,9915	0,88617
Male	263	2,7909	0,90411
Total	381	2,853	0,90223

Source: by the Author of the Dissertation

Table 58: One-Way ANOVA Results Related to Gender and Risk Perception of Investors

ANOVA				
	Sum of Squares	df	Mean Square	Sig.
Between Groups	3,279	1	3,279	0,045
Within Groups	306,045	379	0,808	
Total	309,325	380		

Source: by the Author of the Dissertation

According to the results of the One-Way ANOVA test on whether there is a significant relationship between the gender of individual investors and their risk

perception on cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.045), and therefore the H_1 hypothesis was accepted.

3.4.10. Investment Amount-Risk Perception

H_0: Investment amount has no effect on cryptocurrency risk perception on individual investors.

H_1: Investment amount has effect on cryptocurrency risk perception on individual investors.

The above hypotheses are used to reveal whether there is a significant relationship between the investment amount of investors and their risk perceptions.

Table 59: Mean and SD Related with Investment Amount and Risk Perception

Investment Amount	N	Mean	SD
0-2000 TL	223	2,9357	0,89675
2000-4000 TL	44	2,7121	1,00023
4000-6000 TL	26	2,5256	0,84943
6000-8000 TL	9	2,2963	0,82402
8000 TL and more	79	2,8692	0,8497
Total	381	2,853	0,90223

Source: by the Author of the Dissertation

Table 60: One-Way ANOVA Results Related to Investment Amount and Risk Perception of Investors

ANOVA				
	Sum of Squares	df	Mean Square	Sig.
Between Groups	7,996	4	1,999	0,043
Within Groups	301,329	376	0,801	
Total	309,325	380		

Source: by the Author of the Dissertation

According to the results of the One-Way ANOVA test on whether there is a significant relationship between the investment amount of individual investors and their risk perception on cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.043), and therefore the H_1 hypothesis was accepted. When the findings were examined, it was observed that individuals with an investment amount between 0-2000 TL were the group with the highest risk perception. The group with the lowest risk perception consists of individuals with an investment amount of 6000-8000 TL.

3.4.11. Marital Status-Novelty Perception

H_0: Marital Status has no effect on cryptocurrency novelty perception on individual investors.

H_1: Marital Status has effect on cryptocurrency novelty perception on individual investors.

The above hypotheses are used to reveal whether there is a significant relationship between the marital status of investors and their novelty perceptions.

Table 61: Mean and SD Related with Investment Amount and Novety Perception

Marital Status	N	Mean	SD
Married	133	3,8383	0,7719
Single	248	4,0262	0,67587
Total	381	3,9606	0,71549

Source: by the Author of the Dissertation

Table 62: One-Way ANOVA Results Related to Marital Status and Novelty Perception of Investors

ANOVA				
	Sum of Squares	df	Mean Square	Sig.
Between Groups	3,055	1	3,055	0,014
Within Groups	191,479	379	0,505	
Total	194,534	380		

Source: by the Author of the Dissertation

According to the results of the One-Way ANOVA test on whether there is a significant relationship between the marital status of individual investors and their novelty perception on cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.043), and therefore the H_1 hypothesis was accepted. According to the findings, it was determined that the perception of novelty of the single participants was higher than the married participants.

3.4.12. Daily Internet Usage-Novelty Perception

H_0: Daily personal internet usage hours have no effect on cryptocurrency novelty perception on individual investors.

H_1: Daily personal internet usage hours have effect on cryptocurrency novelty perception on individual investors.

The above hypotheses are used to reveal whether there is a significant relationship between the daily personal internet usage of investors and their novelty perceptions.

Table 63: Mean and SD Related with Daily Internet Usage and Novelty Perception

Daily Internet Usage	N	Mean	SD
0-1 hour	4	4	0,677
1-3 hours	109	3,8165	0,75664
3-6 hours	144	3,974	0,64891
6 hours and more	124	4,0706	0,73981
Total	381	3,9606	0,71549

Source: by the Author of the Dissertation

Table 64: One-Way ANOVA Results Related to Daily Internet Usage and Novelty Perception of Investors

ANOVA				
	Sum of Squares	df	Mean Square	Sig.
Between Groups	3,794	3	1,265	0,049
Within Groups	190,74	377	0,506	
Total	194,534	380		

Source: by the Author of the Dissertation

According to the results of the One-Way ANOVA test on whether there is a significant relationship between the daily personal internet usage of individual investors and their novelty perception on cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.049), and therefore the H_1 hypothesis was accepted. According to the findings, as the time spent personally on the Internet increases, the perception of novelty on cryptocurrencies also increases. The novelty perception of individuals who spend 1-3 hours daily on the Internet personally is the lowest among the total participants. The participants who use the internet for 6 hours or more daily, they are the participants with the highest perceptions of novelty.

3.4.13. Cryprocurrency Awareness -Novelty Perception

H_0: Cryptocurrency awarenesshave no effect on cryptocurrency novelty perception on individual investors.

H1: Cryptocurrency awareness have effect on cryptocurrency novelty perception on individual investors.

The above hypotheses are used to reveal whether there is a significant relationship between the cryptocurrency awareness of investors and their novelty perceptions.

Table 65: Mean and SD Related with Daily Cryptocurrency Awareness and Novelty Perception

Cryptocurrency Awareness	N	Mean	SD
I know a lot, I have cryptocurrencies.	129	4,2229	0,64819
I have knowledge but I do not have cryptocurrencies	77	3,9091	0,69052
I have partial knowledge.	142	3,8662	0,67744
I've heard of it but I don't know exactly what cryptocurrencies are.	30	3,5	0,81473
I have no idea	3	3,0833	0,87797
Total	381	3,9606	0,71549

Source: by the Author of the Dissertation

Table 66: One-Way ANOVA Results Related to Cryptocurrency Awareness and Novelty Perception of Investors

ANOVA				
	Sum of Squares	df	Mean Square	Sig.
Between Groups	19,016	4	4,754	0,000
Within Groups	175,518	376	0,467	
Total	194,534	380		

Source: by the Author of the Dissertation

According to the results of the One-Way ANOVA test on whether there is a significant relationship between the cryptocurrency knowledge of individual investors and their novelty perception on cryptocurrencies, the P value at the 95% confidence

level is less than 0.05 (P=0.000), and therefore the H_1 hypothesis was accepted. The findings show that the more knowledge about cryptocurrencies, the higher the perception of innovation about cryptocurrencies.

3.4.14. Investment Amount -Novelty Perception

H_0: Cryptocurrency investment amounthave no effect on cryptocurrency novelty perception on individual investors.

H_1: Cryptocurrency investment amount have effect on cryptocurrency novelty perception on individual investors.

The above hypotheses are used to reveal whether there is a significant relationship between the cryptocurrency investment amount of investors and their novelty perceptions.

Table 67: Mean and SD Related with Investment Amount and Novelty Perception

Investment Amount	N	Mean	SD
0-2000 TL	223	3,7713	0,7204
2000-4000 TL	44	4,108	0,60856
4000-6000 TL	26	4,0385	0,6771
6000-8000 TL	9	4,1389	1,06881
8000 TL and more	79	4,3671	0,51084
Total	381	3,9606	0,71549

Source: by the Author of the Dissertation

Table 68: One-Way ANOVA Results Related to Investment Amount and Novelty Perception of Investors

ANOVA				
	Sum of Squares	df	Mean Square	Sig.
Between Groups	22,444	4	5,611	0,000
Within Groups	172,091	376	0,458	
Total	194,534	380		

Source: by the Author of the Dissertation

According to the results of the One-Way ANOVA test on whether there is a significant relationship between the cryptocurrency investment amount of individual investors and their novelty perception on cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.000), and therefore the H_1 hypothesis was accepted. There is a positive correlation between the amount of cryptocurrency investment and the novelty perception of the participants. That is, if the amount of cryptocurrency investment of the participants increases, their perception of novelty also increases.

3.4.15. Cryprocurrency Exchange Parıty-Novelty Perceptıon

H_0: Cryptocurrency exchange parity have no effect on cryptocurrency novelty perception on individual investors.

H_1: Cryptocurrency exchange parity have effect on cryptocurrency novelty perception on individual investors.

The above hypotheses are used to reveal whether there is a significant relationship between the cryptocurrency exchange parity of investors and their novelty perceptions.

Table 69: Mean and SD Related with Cryptocurrency Exchange Parity and Novelty Perception

Exchange Parity	N	Mean	SD
TL	169	3,7899	0,74019
USD	187	4,1056	0,6588
EURO	9	3,9444	0,79822
BTC	13	4,0577	0,7228
BNB	1	4,5	.
ETH	2	4	1,06066
Total	381	3,9606	0,71549

Source: by the Author of the Dissertation

Table 70: One-Way ANOVA Results Related to Cryptocurrency Exchange Parity and Novelty Perception of Investors

ANOVA				
	Sum of Squares	df	Mean Square	Sig.
Between Groups	9,273	5	1,855	0,002
Within Groups	185,261	375	0,494	
Total	194,534	380		

Source: by the Author of the Dissertation

According to the results of the One-Way ANOVA test on whether there is a significant relationship between the cryptocurrency exchange parity of individual investors and their novelty perception on cryptocurrencies, the P value at the 95% confidence level is less than 0.05 (P=0.002), and therefore the H_1 hypothesis was accepted. The most significant difference between the findings was between TL and USD. The novelty perceptions of the participants who evaluate their cryptocurrency investments in USD is higher than the novelty perception of those who evaluate their investments in TL.

3.4.16. Marıtal Status-Herd Effect

H_0: Marital status have no effect on the tendency to follow individuals who are considered to have high financial knowledge.

H_1: Marital status have effect on the tendency to follow individuals who are considered to have high financial knowledge.

The above hypotheses are used to reveal whether there is a significant relationship between the marital status of investors and their tendency to follow individuals who are considered to have high financial knowledge.

Table 71: The effect of marital status on herd behavior for cryptocurrencies

			Marital Status		Total
			Married	Single	
Herd Effect	Yes	Count	101	211	312
		Expected Count	108,9	203,1	312
		% HerdEffect	32%	68%	100%
		% Marital Status	76%	85%	82%
	No	Count	32	37	69
		Expected Count	24,1	44,9	69
		% HerdEffect	46%	54%	100%
		% Marital Status	24%	15%	18%
Total		Count	133	248	381
		Expected Count	133	248	381
		% HerdEffect	35%	65%	100%
		% Marital Status	100%	100%	100%
$\chi2=4,877$, df=1, P(0,027)<0,05 H0:Reject H1:Accept					

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the marital status of individual investors and their tendency to follow individuals who are considered to have high financial knowledge, the P value at the 95% confidence level is less than 0.05 (P=0.027), and therefore the H_1 hypothesis was accepted.

The ratio of following individuals who are considered to have high financial knowledge by single participants is 85% among single participants. This ratio is 76% for married participants.

3.4.17. Income -Herd Effect

H_0: Income have no effect on the tendency to follow individuals who are considered to have high financial knowledge.

H_1: Income have effect on the tendency to follow individuals who are considered to have high financial knowledge.

The above hypotheses are used to reveal whether there is a significant relationship between the income of investors and their tendency to follow individuals who are considered to have high financial knowledge.

Table 72: The effect of Income on Herd Behavior for Cryptocurrencies

			Income (TL)					
			3000-6000 TL	6000-9000 TL	9000-12000 TL	12000-15000	15000 and more	Total
HerdEffect	Yes	Count	193	66	30	13	10	312
		Expected Count	185,1	68,8	29,5	13,1	15,6	312
		% HerdEffect	62%	21%	10%	4%	3%	100%
		% Income	85%	79%	83%	81%	53%	82%
	No	Count	33	18	6	3	9	69
		Expected Count	40,9	15,2	6,5	2,9	3,4	69
		% HerdEffect	48%	26%	9%	4%	13%	100%
		% Income	15%	21%	17%	19%	47%	18%
Total		Count	226	84	36	16	19	381
		Expected Count	226	84	36	16	19	381
		% HerdEffect	59%	22%	9%	4%	5%	100%
		% Income	100%	100%	100%	100%	100%	100%
χ2=13,522 , df=4, P(0,009)<0,05 H0:Reject H1:Accept								

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the income of individual investors and their tendency to follow individuals who are considered to have high financial knowledge, the P value at the 95% confidence level is less than 0.05 (P=0.009), and therefore the H_1 hypothesis was accepted.

3.4.18. Income -Representativeness

H_0: Income have no effect on the perception that quality things are expensive.

H_1: Income have effect on the perception that quality things are expensive.

The above hypotheses are used to reveal whether there is a significant relationship between the income of investors and their perception that quality things are expensive.

Table 73: The effect of Income on Representativeness for Cryptocurrencies

			Income (TL)					Total
			3000-6000 TL	6000-9000 TL	9000-12000 TL	12000-15000	15000 and more	
Representativeness	Yes	Count	162	55	27	8	18	270
		Expected Count	160,2	59,5	25,5	11,3	13,5	270
		% Representativeness	60%	20%	10%	3%	7%	100%
		% Income	72%	66%	75%	50%	95%	71%
	No	Count	64	29	9	8	1	111
		Expected Count	65,8	24,5	10,5	4,7	5,5	111
		% Representativeness	58%	26%	8%	7%	1%	100%
		% Income	28%	35%	25%	50%	5%	29%
Total		Count	226	84	36	16	19	381
		Expected Count	226	84	36	16	19	381
		% Representativeness	59%	22%	9%	4%	5%	100%
		% Income	100%	100%	100%	100%	100%	100%
$\chi2=10{,}171$, $df=4$, $P(0{,}038)<0{,}05$ H_0:Reject H_1:Accept								

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the income of individual investors and their perception that quality things are expensive, the P value at the 95% confidence level is less than 0.05 (P=0.038), and therefore the H_1 hypothesis was accepted.

3.4.19. Daily Internet Usage -Representativeness

H_0: Daily personal internet usage has no effect on the perception that quality things are expensive.

H_1: Daily personal internet usage has effect on the perception that quality things are expensive.

The above hypotheses are used to reveal whether there is a significant relationship between the daily personal internet usage of investors and their perception

that quality things are expensive.

Table 74: The effect of Income on Representativeness for Cryptocurrencies

| | | | \multicolumn{4}{c}{Daily internet usage} | Total |
			0-1 hour	1-3 hours	3-6 hours	6 hours and more	
Representativeness	Yes	Count	2	73	95	100	270
		Expected Count	2,8	77,2	102	87,9	270
		% Representativeness	1%	27%	35%	37%	100%
		% Internet Usage	50%	67%	66%	81%	71%
	No	Count	2	36	49	24	111
		Expected Count	1,2	31,8	42	36,1	111
		% Representativeness	2%	32%	44%	22%	100%
		% Internet Usage	50%	33%	34%	19%	29%
Total		Count	4	109	144	124	381
		Expected Count	4	109	144	124	381
		% Representativeness	1%	29%	38%	33%	100%
		% Internet Usage	100%	100%	100%	100%	100%
*χ2=9,058 , df=3, P(0,029)<0,05 H₀:Reject H₁:Accept*

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between the daily internet usage of individual investors and their perception that quality things are expensive, the P value at the 95% confidence level is less than 0.05 (P=0.029), and therefore the H_1 hypothesis was accepted. According to the findings, if the daily internet usage time of the participants increases, their attitudes towards quality things being expensive also increase.

3.4.20. Gender - Overconfidence

H_0: Gender has no effect on the belief in investing skills of people in cryptocurrency markets.

H_1: Gender has effect on the belief in investing skills of people in cryptocurrency markets.

The above hypotheses are used to reveal whether there is a significant relationship between the gender of investors and their belief in investing skills of people in cryptocurrency markets.

Table 75: The Effect of Gender on Overconfidence for Cryptocurrencies

			Female	Male	Total
			Gender		Total
Overconfidence	Yes	Count	15	72	87
		Expected Count	26,9	60,1	87
		% Overconfidence	17%	83%	100%
		% Gender	13%	27%	23%
	No	Count	103	191	294
		Expected Count	91,1	202,9	294
		% Overconfidence	35%	65%	100%
		% Gender	87%	73%	77%
Total		Count	118	263	381
		Expected Count	118	263	381
		% Overconfidence	31%	69%	100%
		% Gender	100%	100%	100%
χ2=9,941 , df=1, P(0,002)<0,05 H₀:Reject H₁:Accept					

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between gender of individual investors and their belief in investing skills of people in cryptocurrency markets, the P value at the 95% confidence level is less than 0.05 (P=0.002), and therefore the H_1 hypothesis was accepted.

The result of the study is quite interesting. Because, contrary to the hypotheses on overconfidence, people suffer from lack of self-confidence in financial markets. However, when the study is reduced to genders, although the self-confidence rate of male participants is 27%, this rate is 13% for female participants. In other words, men act more confidently than women in cryptocurrency markets.

3.4.21. Age - Overconfidence

H$_0$: Age has no effect on the belief in investing skills of people in cryptocurrency markets.

H$_1$: Age has effect on the belief in investing skills of people in cryptocurrency markets.

The above hypotheses are used to reveal whether there is a significant relationship between the age of investors and their belief in investing skills of people in cryptocurrency markets.

Table 76: The Effect of Age on Overconfidence for Cryptocurrencies

			Age					Total
			18-25	26-33	34-40	41-47	48 and more	
Overconfidence	Yes	Count	23	43	14	6	1	87
		Expected Count	14,4	52,3	11	8,7	0,7	87
		% Overconfidence	26%	49%	16%	7%	1%	100%
		% Age	37%	19%	29%	16%	33%	23%
	No	Count	40	186	34	32	2	294
		Expected Count	48,6	176,7	37	29,3	2,3	294
		% Overconfidence	14%	63%	12%	11%	1%	100%
		% Age	64%	81%	71%	84%	67%	77%
Total		Count	63	229	48	38	3	381
		Expected Count	63	229	48	38	3	381
		% Overconfidence	17%	60%	13%	10%	1%	100%
		% Age.	100%	100%	100%	100%	100%	100%
χ2=11,174 , df=4, P(0,025)<0,05 H$_0$:Reject H$_1$:Accept								

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between age of individual investors and their belief in investing skills of people in cryptocurrency markets, the P value at the 95% confidence level is less than

0.05 (P=0.025), and therefore the H_1 hypothesis was accepted. When the findings were examined, it was seen that the participants between the ages of 18-25 had the highest self-confidence population among the entire participant group. It has been observed that as individuals get older, their self-confidence decreases.

3.4.22. Investment Amount - Overconfidence

H_0: Investment amount has no effect on the belief in investing skills of people in cryptocurrency markets.

H_1: Investment amount has effect on the belief in investing skills of people in cryptocurrency markets.

The above hypotheses are used to reveal whether there is a significant relationship between the investment amount of investors and their belief in investing skills of people in cryptocurrency markets.

Table 77: The Effect of Age on Overconfidence for Cryptocurrencies

			Investment amount					
			0-2000 TL	2000 - 4000 TL	4000 - 6000 TL	6000 - 8000 TL	8000 TL and more	Total
Overconfidence	Yes	Count	35	12	3	3	34	87
		Expected Count	50,9	10	5,9	2,1	18	87
		% Confidence	40%	14%	3%	3%	39%	100%
		% Investment amount	16%	27%	12%	33%	43%	23%
	No	Count	188	32	23	6	45	294
		Expected Count	172,1	34	20,1	6,9	61	294
		% Confidence	64%	11%	8%	2%	15%	100%
		% Investment amount	84%	73%	89%	67%	57%	77%
Total		Count	223	44	26	9	79	381
		Expected Count	223	44	26	9	79	381
		% Confidence	59%	12%	7%	2%	21%	100%
		% Investment amount?	100%	100%	100%	100%	100%	100%
χ2=27,689 , df=4, P(0,000)<0,05 H₀:Reject H₁:Accept								

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between investment amount of individual investors and their belief in investing skills of people in cryptocurrency markets, the P value at the 95% confidence level is less than 0.05 (P=0.000), and therefore the H_1 hypothesis was accepted. The highest level of self-confidence determined in the findings belongs to the participants who invested 8000 TL or more. The lowest level of self-confidence is the investment amount between 0-2000 TL, when examined in terms of the participation population.

3.4.23. Gender - Optimism

H₀: Gender has no effect on the belief that cryptocurrencies will increase in value in the future.

H1: Gender has effect on the belief that cryptocurrencies will increase in value in the future.

The above hypotheses are used to reveal whether there is a significant relationship between the gender of investors and their belief that cryptocurrencies will increase in value in the future.

Table 78: The Effect of Gender on Optimism for Cryptocurrencies

			Gender		Total
			Female	Male	
Overoptimism	I am optimistic	Count	111	213	324
		Expected Count	100,3	223,7	324
		% Optimism	34%	66%	100%
		% Gender	94%	81%	85%
	I am not optimistic	Count	7	50	57
		Expected Count	17,7	39,3	57
		% Optimism	12%	88%	100%
		% Gender	6%	19%	15%
Total		Count	118	263	381
		Expected Count	118	263	381
		% Optimism	31%	69%	100%
		% Gender	100%	100%	100%
χ2=10,952 , df=1, P(0,001)<0,05 H0:Reject H1:Accept					

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between gender of individual investors and their belief that cryptocurrencies will increase in value in the future, the P value at the 95% confidence level is less than 0.05 (P=0.001), and therefore the H1 hypothesis was accepted.

There is a positive attitude among the participants about the future of cryptocurrencies. 94% of female respondents are optimistic that cryptocurrencies will increase in value in the future. Among male participants, this rate is 81%. In other words, female participants have a more optimistic attitude than male participants.

3.4.24. Education Level - Optimism

H_0: Education level has no effect on the belief that cryptocurrencies will increase in value in the future.

H_1: Education level has effect on the belief that cryptocurrencies will increase in value in the future.

The above hypotheses are used to reveal whether there is a significant relationship between the education level of investors and their belief that cryptocurrencies will increase in value in the future.

Table 79: The Effect of Education Level on Optimism for Cryptocurrencies

<table>
<tr><td colspan="3"></td><td colspan="4">Education level</td><td rowspan="2">Total</td></tr>
<tr><td colspan="3"></td><td>High School and Less than High School</td><td>Associate Degree</td><td>Bachelor Degree</td><td>Master's Degree and higher</td></tr>
<tr><td rowspan="8">Overoptimism</td><td rowspan="4">I am optimistic</td><td>Count</td><td>27</td><td>33</td><td>196</td><td>68</td><td>324</td></tr>
<tr><td>Expected Count</td><td>29,8</td><td>35,7</td><td>198,1</td><td>60,4</td><td>324</td></tr>
<tr><td>% Optimism</td><td>8%</td><td>10%</td><td>61%</td><td>21%</td><td>100%</td></tr>
<tr><td>% Education level</td><td>77%</td><td>79%</td><td>84%</td><td>96%</td><td>85%</td></tr>
<tr><td rowspan="4">I am not optimistic</td><td>Count</td><td>8</td><td>9</td><td>37</td><td>3</td><td>57</td></tr>
<tr><td>Expected Count</td><td>5,2</td><td>6,3</td><td>34,9</td><td>10,6</td><td>57</td></tr>
<tr><td>% Optimism</td><td>14%</td><td>16%</td><td>65%</td><td>5%</td><td>100%</td></tr>
<tr><td>% Education level</td><td>23%</td><td>21%</td><td>16%</td><td>4%</td><td>15%</td></tr>
<tr><td colspan="2" rowspan="4">Total</td><td>Count</td><td>35</td><td>42</td><td>233</td><td>71</td><td>381</td></tr>
<tr><td>Expected Count</td><td>35</td><td>42</td><td>233</td><td>71</td><td>381</td></tr>
<tr><td>% Optimism</td><td>9%</td><td>11%</td><td>61%</td><td>19%</td><td>100%</td></tr>
<tr><td>% Education level</td><td>100%</td><td>100%</td><td>100%</td><td>100%</td><td>100%</td></tr>
<tr><td colspan="8">χ2=9,683 , df=3, P(0,021)<0,05 H₀:Reject H₁:Accept</td></tr>
</table>

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between education level of individual investors and their belief that cryptocurrencies will increase in value in the future, the P value at the 95% confidence level is less than 0.05 (P=0.021), and therefore the H_1 hypothesis was accepted.

According to the findings, the higher the education level, the higher the positive expectation about the future of cryptocurrencies. Although there is an optimistic attitude among the participants in general, this situation was observed as 77% in individuals with high school or less than high school education. However, it has been determined that this rate is 96% in individuals with master's degrees and higher education.

3.4.25. Cryptocurrency Awareness - Optimism

H_0: Cryptocurrency awareness has no effect on the belief that cryptocurrencies will increase in value in the future.

H_1: Cryptocurrency awareness has effect on the belief that cryptocurrencies will increase in value in the future.

The above hypotheses are used to reveal whether there is a significant relationship between the cryptocurrency awareness of investors and their belief that cryptocurrencies will increase in value in the future.

Table 80: The effect of Cryptocurrency Awareness on Optimism for Cryptocurrencies

			How much do you know about cryptocurrencies?					
			I know a lot, I have cryptocurrencies.	I have knowledge but I do not have cryptocurrencies	I have partial knowledge.	I've heard of it but I don't know exactly what cryptocurrencies are.	I have no idea	Total
Overoptimism	I am optimistic	Count	91	69	132	29	3	324
		Expected Count	109,7	65,5	120,8	25,5	2,6	324
		% Optimism	28%	21%	41%	9%	1%	100%
		% Awareness	71%	90%	93%	97%	100%	85%

			Count	38	8	10	1	0	57
	I am not optimistic	Expected Count	19,3	11,5	21,2	4,5	0,4	57
		% Optimism	67%	14%	18%	2%	0%	100%
		% Awareness	30%	10%	7%	3%	0%	15%
Total		Count	129	77	142	30	3	381
		Expected Count	129	77	142	30	3	381
		% Optimism	34%	20%	37%	8%	1%	100%
		% Awareness	100%	100%	100%	100%	100%	100%
$\chi2=33,287$, df=4, P(0,000)<0,05 H$_0$:Reject H$_1$:Accept									

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between cryptocurrency awareness of individual investors and their belief that cryptocurrencies will increase in value in the future, the P value at the 95% confidence level is less than 0.05 (P=0.000), and therefore the H$_1$ hypothesis was accepted. According to the findings, the lowest optimism attitude was observed in individuals who had the most awareness about cryptocurrencies. Among the participants who stated that they had a lot of knowledge about cryptocurrencies, this rate was 71%.

3.4.26. Investment Amount - Optimism

H$_0$: Investment amount has no effect on the belief that cryptocurrencies will increase in value in the future.

H$_1$: Investment amount has effect on the belief that cryptocurrencies will increase in value in the future.

The above hypotheses are used to reveal whether there is a significant relationship between the investment amount of investors and their belief that cryptocurrencies will increase in value in the future.

Table 81: The effect of Investment Amount on Optimism For Cryptocurrencies

			How much do you trade on the cryptocurrency exchange?					Total
			0-2000 TL	2000-4000 TL	4000-6000 TL	6000-8000 TL	8000 TL and more	
Overoptimism	I am optimistic	Count	203	36	24	6	55	324
		Expected Count	189,6	37,4	22,1	7,7	67,2	324
		% Optimism	63%	11%	7%	2%	17%	100%
		% Investment amount	91%	82%	92%	67%	70%	85%
	I am not optimistic	Count	20	8	2	3	24	57
		Expected Count	33,4	6,6	3,9	1,3	11,8	57
		% Optimism	35%	14%	4%	5%	42%	100%
		% Investment amount	9%	18%	8%	33%	30%	15%
Total		Count	223	44	26	9	79	381
		Expected Count	223	44	26	9	79	381
		% Optimism	59%	12%	7%	2%	21%	100%
		% Investment amount	100%	100%	100%	100%	100%	100%
χ2=24,883, df=4, P(0,000)<0,05 H0:Reject H1:Accept								

Source: by the Author of the Dissertation

According to the results of the Chi-Square test on whether there is a significant relationship between investment amount of individual investors and their belief that cryptocurrencies will increase in value in the future, the P value at the 95% confidence level is less than 0.05 (P=0.000), and therefore the H_1 hypothesis was accepted. According to the findings, the more the participants invest in cryptocurrency markets, the lower their optimism level. While the highest level of optimism is between 0-2000 TL, when the population is taken into account, individuals with an investment amount of 8000 TL and more have the lowest optimism level.

CONCLUSION

It is clear that individuals do not act rationally while making decisions. This is particularly evident in the cryptocurrency markets. It is seen that the psychological factors that are the subject of the study play an important role in the decision mechanisms of individuals. Individuals whose decision mechanisms deviate make systematic mistakes while making decisions. The increase in the number of transactions of individuals in the cryptocurrency markets and the extremely volatile market make it easier to make these mistakes. Because in this market, individuals are exposed to a lot of information. However, it is not very likely to interpret so much information and make a healthy decision about it. Unlike in the past, we are now in the age of speed. It is very easy to access information, but processing it for individuals is still not as easy as it seems. Mental shortcuts help us at this point, to reach judgment without having to process all this information. But due to demographic factors, these shortcuts can make us make erroneous inferences. Mental shortcuts help us at this point, to reach judgment without having to process all this information. However, due to demographic factors, these shortcuts can make us make erroneous inferences. These shortcuts that individuals use in their investments can be very functional, especially in cryptocurrency markets. Because a new project is launched almost every day and each project has a different manifesto. It is impossible for individuals to have information about all of these projects. Therefore, it is unlikely that they know about the pricing of cryptocurrencies and takes the right position for it. Cryptocurrency market speculators and influencers were aware of this and took action. Moreover, there are a lot of influencers along with speculators in the cryptocurrency markets. Thanks to social media platforms like Twitter or messaging apps like Telegram, individuals tend to constantly search for new cryptocurrency news. As a result, they can be manipulated very easily with the contribution of psychological prejudices. So, in each paragraph in the conclusion, we will examine the effects of these psychological biases on individual investors.

The first paragraph contains the findings of representativeness bias. Representational bias is observed as relating situations or events to people or objects within a certain framework. Representativeness bias is a common psychological bias

in cryptocurrency markets. The relationship between Elon Musk and the market is an important example of representativeness. Elon Musk states that he has Bitcoin, Ethereum, and Dogecoin in his portfolio. Individual investors associate these cryptocurrencies with Elon Musk. After Elon Musk wrote bitcoin in his Twitter bio, after every tweet about the cryptocurrency markets, or after Tesla announced that the company he is the CEO of accepts bitcoin as a payment method, very sudden price movements occurred in the market. In other words, individual investors made their investment decisions according to Elon Musk's tweets or notifications. Therefore, representation bias was observed along with the herd effect. Another example is when cryptocurrencies with good performance and other cryptocurrencies using the same technology have parallel value changes. For example, as a result of the very good performance of the Solana cryptocurrency in a short time, very rapid price changes have been observed in the cryptocurrencies using the Solana infrastructure. Solana has shown a representativeness effect here for cryptocurrencies using the same infrastructure. Normally, these cryptocurrencies did not deserve to be valued or overvalued, but due to Solana's influence, those cryptocurrencies were viewed as potential opportunities for individual investors. These are the psychological representativeness biases of cryptocurrencies on individual investors.

Individuals record some situations they experience as an image in their subconscious without being aware of it. They make judgments by associating the events they encounter with the situations recorded in their subconscious. This is a mental shortcut and is known as availability. In financial markets, it significantly affects individuals' risk attitudes and leads to deviations in their decisions. Individuals have made high profits as cryptocurrencies have reached ATH (All-Time High) levels in April. Therefore, they showed a more risk-taking attitude in their investments. Because the returns they earned on their past investments during their transactions led them to take this decision without their realizing it. With the bear trend that started to form in May, losses started. As a result, investors lost their investments. By July, the risk perception of individuals changed significantly. Because the losses they experienced in May emerged as a negative image in their minds. Therefore, individuals have behaved anxiously even at the slightest investment and exhibited a risk-averse attitude.

The fact that individuals make judgments by making comparisons with the reference points that appear in their minds is called the anchoring effect. These reference points are determined by individuals themselves or by others. Others may be individuals or institutions. The anchoring effect can be seen in different ways. The most common are the evaluations made on the past price movements. The high or low past prices of cryptocurrencies can be interpreted differently according to the expectations of the investors. Namely, the cryptocurrency known as Ripple in the cryptocurrency markets reached ATH in December 2017 and has not seen the price on that date since then. Risk-takers made investments thinking that Ripple had come to that price before and that it could come again in the future or even pass. Risk-averses, on the other hand, refrained from investing, thinking that Ripple had experienced a serious decline before and will continue to do so in the future. The reference point can also be determined by creating a target price. Institutional firms such as MicroStrategy, speculator individuals stated that they predict Bitcoin to reach $150,000 by the end of 2021. With this news, many individual investors bought bitcoin for $60,000. However, bitcoin failed to reach the $150,000 level and individuals faced serious losses due to these mis-set reference points.

Overconfidence has been observed as a result of individuals making profits in a bull trend in cryptocurrency markets. Accordingly, individuals associated earnings with their abilities, ignoring that earnings depend on the trend. Especially in March-April, the majority of investors made a profit because almost all cryptocurrencies reached ATH levels. In other words, these gains were cyclical. This situation, which caused excessive self-confidence in individuals, led individuals to increase their investment amount and increase the number of transactions. The more transactions, the lower the profit. In addition, the start of the bear trend caused investors to lose both their profits and their capital. As seen in the study, investors lost their self-confidence as a result of these losses.

Another psychological bias that distorts individuals' decisions and led them to make systematic mistakes is overoptimism. In the study, it was observed that individuals generally ignored their bad situations. Participants stated that even if the trend in the market turns negative, this is a temporary situation and the markets will return to their old levels or even exceed their old levels. But no trend is endless. Since

excessive optimism affects the decisions of individuals, it has a distorting effect on their financial behaviors. It was observed that the continuous positive perception by social media influencers increased the over-optimistic attitude of individual investors more. A rational individual is expected to avoid harm. However, on the contrary, individuals suffered more losses due to excessive optimism. As a result of these losses, the perception of individuals has turned from over-optimism to over pessimism. Individuals could not catch the changing trend in July due to their changing perceptions. In other words, they displayed behavior that was far from a rational attitude.

Regret is a common feeling in cryptocurrency markets. This situation does not occur only through loss. Missing an opportunity is also one of the situations that will cause regret for individuals. There is an effect known in the literature as "Fearing of Missing Out" (FOMO), and the feeling of regret arises as a result of this situation. The extreme volatility of cryptocurrency markets causes price movements to be continuous. Due to the wide variety of cryptocurrencies, price fluctuations are seen incessantly. Because individuals are constantly under the influence of FOMO, they experience a never-ending feeling of regret. For this reason, they do not want stability in their investments, but constantly want to win. This sense of winning creates hysterical blindness in them and they lose their rational evaluation skills. Due to the FOMO effect, they trade more to avoid missing opportunities. This reduces their earnings in the long, medium, and long term. In the study, the FOMO effect of regret was observed on the participants. However, with the trend turning to the downside, individuals experienced losses. Due to these losses, unlike FOMO, they experienced regrets such as buying and investing. The biggest motivation in these decisions was their past losses.

The herd effect is generally seen in all financial markets. In other words, it is not only seen in cryptocurrency markets. However, the markets where it is most observed are the cryptocurrency markets. The main reason for this is that cryptocurrency markets are more accessible than other markets. A wide variety of investors can easily trade in these markets. This diversity brings with it different demographic structures. Individuals with little or no financial literacy make their investments with the herd effect. Because they do not know about fundamental or

technical analysis and they make up for this by imitating the investment behavior of speculators or influencers. This effect is observed very clearly especially in Twitter. Investing behaviors emerge in the form of a pump and dump strategy. Therefore, individuals are included in groups and increase the influence of the herds. Accordingly, even financially literate individuals begin to be included in these herds. This was observed as social persuasion. Joke-themed coins like Doge, Shiba, Floki have been hyped by social media influencers or speculators. For example, after Elon Musk shared the tweet "Floki Frunkpuppy" on 04.10.2021, there was a 40% increase in a short time. Thousands of investors were involved in the pump movements that lasted for a few days. However, when sales started, a dump occurred. With the herd effect, most of the investors included in this herd made a loss. Among the findings, it was observed that the participants exhibited intense herding behavior.

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