



BEHAVIORAL FINANCE ANALYSIS OF CONSUMER CONFIDENCE IN TÜRKİYE

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Thesis for the Master's Program in Financial Economics

Graduate School
Izmir University of Economics

Izmir
2023

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A Master's Thesis
Submitted to
the Graduate School of Izmir University of Economics
the Department of Financial Economics

Izmir

2023

ETHICAL DECLARATION

I hereby declare that I am the sole author of this thesis and that I have conducted my work in accordance with academic rules and ethical behaviour at every stage from the planning of the thesis to its defence. I confirm that I have cited all ideas, information and findings that are not specific to my study, as required by the code of ethical behaviour, and that all statements not cited are my own.

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ABSTRACT

BEHAVIORAL FINANCE ANALYSIS OF CONSUMER CONFIDENCE IN TÜRKİYE

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Master's Program in Financial Economics

Advisor: Prof. Dr Oğuz Esen

September, 2023

While traditional finance does not take into account psychological and sociological factors in individuals' investment decisions, behavioral finance interacts with these two disciplines. Behavioral finance does not see the consumer as a formulated subject explained only by rational models, but rather explains the causes and course of deviations in investor behavior with psychology-based theories. The mind's reactions are guided by emotions, experiences, and intuitions in addition to knowledge. In order to talk about a clearer decision-making process, people have to harmonize two different realities with each other through the conscious and unconscious. In this context, the rational models and outputs of traditional finance, then the differences between traditional finance and behavioral finance, anomalies, heuristics and biases that shape and play a role in investor/consumer decisions will be discussed. In Türkiye, from a behavioral finance perspective, the relationship between the consumer confidence index and the exchange rate, gold prices, consumer price index, interest rate and the COVID-19 period as a psychological indicator was examined. As a result, it appears that Exchange Rate and Interest Rates significantly affect the Consumer Confidence Index. It has been observed that consumers' reactions to gold prices and

the Consumer Price Index are limited, but the effects of exchange rates and interest rates can be explained by the generally accepted rational rules of the economy. In our study, no significant relationship was found between gold prices, COVID 19 period and consumer confidence index, which are psychological determinants. Market uncertainties are difficult to relate to traditional finance models. Therefore, in extraordinary situations, it would be more realistic to analyze consumer confidence with new financial models and force majeure within more limited time periods.

Keywords: Behavioral Finance, COVID-19 Pandemic and Consumer Confidence, Heuristics, Bias, Consumer Confidence Index



ÖZET

TÜRKİYE'DE TÜKETİCİ GÜVENİNİN DAVRANIŞSAL FİNANS AÇISINDAN İNCELENMESİ

Çakır, Mert

Finans Ekonomisi Yüksek Lisans Programı

Tez Danışmanı: Prof. Dr. Oğuz Esen

Eylül, 2023

Geleneksel finans, bireylerin yatırım kararlarında psikolojik ve sosyolojik faktörleri dikkate almazken, davranışsal finans bu iki disiplinle etkileşim halindedir. Davranışsal finans, tüketiciyi sadece rasyonel modellerle açıklanan formüle edilmiş bir konu olarak görmez, aksine yatırımcı davranışındaki sapmaların nedenlerini ve seyrini psikoloji temelli teorilerle açıklar. İnsan zihninin yatırım kararları ya da tüketici davranışı aşamasında eriştiği çerçeve yalnızca bilgi dağarcığıyla şekillenmektedir. Zihnin tepkileri bilgiye ek olarak mevcut duygu, deneyim ve sezgilere göre yönlendirilir. Daha net bir karar verme sürecinden bahsedebilmek için insanlar bilinç ve bilinçdışı üzerinden iki farklı gerçekliği birbiri ile uyumlu kılmak zorundadır. Bu kapsamda, geleneksel finansın rasyonel modelleri ve çıktıları, ardından geleneksel finans ve davranışsal finans arasındaki farkları, yatırımcı/tüketici kararlarını şekillendiren ve rol oynayan anomaliler, buluşsal yöntemler ve önyargılar ele alınacaktır. Türkiye'de davranışsal finans perspektifinden tüketici güven endeksinin döviz kuru, altın fiyatları, tüketici fiyat endeksi, faiz oranı ve psikolojik gösterge olarak COVID-19 dönemi ile

ilişkisi incelenmiştir. Sonuç olarak, Döviz Kuru ve Faiz Oranlarının Tüketici Güven Endeksi'ni önemli ölçüde etkilediği görülmektedir. Tüketicilerin altın fiyatları ve Tüketici Fiyat Endeksi'ne tepkilerinin ise sınırlı olduğu görülmüştür ancak döviz kuru ve faiz oranlarının etkileri ekonominin genel kabul görmüş rasyonel kurallarıyla açıklanabilmektedir. Çalışmamızda psikolojik belirleyiciler olan altın fiyatları ve COVID-19 dönemi ile tüketici güven endeksi arasında anlamlı bir ilişki bulunmamıştır. Piyasa belirsizliklerinin geleneksel finans modelleriyle ilişkilendirilmesi zordur. Dolayısıyla olağanüstü durumlarda tüketici güvenini yeni finansal modellerle ve mücbir sebepleri daha kısıtlı dönem aralıkları içerisinde analiz etmek daha gerçekçi olacaktır.

Anahtar kelimeler: Davranışsal Finans, COVID-19 Pandemisi ve Tüketici Güveni, Sezgisel Yöntem, Önyargı, Tüketici Güven Endeksi

DEDICATION

to My Family...



ACKNOWLEDGEMENTS

I would like to present my kind appreciation to Prof. Dr. Oğuz Esen with all my sincerity for his precious guidance, endless perspective, and constant support throughout the whole period of this research and my whole academic life.

Last, I would like to share my gratefulness with my precious family.



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LIST OF ABBREVIATIONS

ABD	: Amerika Birleşik Devletleri
APM	: The Asset Pricing Model
BIST	: Borsa İstanbul
CAPM:	Capital Asset Pricing Model
CCI	: Consumer Confidence Index
CPI	: Consumer Price Index
DPP	: Domestic Producer Price Index
INT:	: Interest Rates
IPI	: Industrial Production Index
SPSS	: Statistical Package for the Social Science
TURKSTAT	: Turkish Statistical Institute
REELDK	: CPI Based Real Effective Exchange Rate (2003=100)-Level values.
ADF	: Augmented Dickey-Fuller
RVI	: Retail Volume Index
VAR	: Vector Autoregression Model
VECM:	Vector Error Correction Model
VMA	: Vector Moving Average Model

CHAPTER 1. INTRODUCTION

1.1. Problem Definition

Although information about the inevitable fallibility of human perception has been around for a long time, in addition to daily life, the finance world has considered the assumption that human beings are rational for many years. Misperception is natural feature human minds, and intuitive expectation stem from the consistency of misperception. When making a decision, people compare the phenomenon they are considering with the sketch in their minds. When individuals make a prediction about an event or attribute a probability, they act with this comparison. The more the short-term outcome of the decision fits with the outline in the human mind, the more solid the future of the decision looks, causing people to attribute high probabilities and fairness. Mindsets of individuals include decision making processes and stories. Accordingly, people compare the future scenarios with these decisions and stories. The more a scenario fits the mindset, the more likely it is. On the other hand, when an unconscionable outcome is mentioned, a chain of outcome is not envisioned and the probability of return seems low.

In terms of adaptation and survival, people want to reach a conclusion as soon as possible, make a decision and take an action. Therefore, it is much more inclined to jump to conclusions based on it than examining the level of perception and reasoning at hand. This exposes all kinds of verification and misconception. In the mental world, believing comes before understanding. Understanding an idea implies being ready to believe the result from the start. When individuals feel beforehand what an idea and decision will say within the framework of the mindset, they tend to believe this idea and decision. This mechanism works unconsciously.

The development of the human mind is also directly dependent on the sociocultural environment. Phenomena called emotions, thoughts and behaviors direct human memory. The state of mind is familiar to grasp according to old referential experience. Here is actually a capacity limit represented by the mind. While the individuals thinks that they make a decision by thinking about something, they may reach this conclusion only by remembering and calling the mind. Each past reference points to a descriptive image. The unconsciousness also exhibits appropriate attitudes thanks to its perception and evaluation mechanisms. The mind also comes into play according to classification or prefers to influence the decision only partially as a background spectator.

The decision-making process is a complex issue based on a different framework that encompasses the emotional process, personality traits, behavioral biases, and mental errors. Investor behavior can deviate from logic and reason, depending on market conditions or the psychological consequences of the economic trend, and investors exhibit many behavioral biases that affect their investment decision-making processes. Investing is more than numbers analysis. A large part of investment involves individual behavior. Ignoring these concepts and the functioning of the mind negatively affects portfolio performance interpretations. A good understanding of behavioral biases will enable investors to better analyze the available data during the investment decision and financial instrument choices.

1.2. Scope of the Thesis

The aim of this study is to examine the relationship between consumer confidence index and exchange rate, interest rates, consumer price index, gold prices from traditional finance perspective and COVID-19 pandemic period from a behavioral finance perspective as an exogenous variable. For this purpose, the following hypotheses will be tested.

- Exchange rates affect consumer confidence.
- Gold prices affect consumer confidence.
- The consumer price index affects consumer confidence.
- Interest rates affect consumer confidence.

In the second part of the study, the conceptual framework is presented and the definitions related to the subject are given. In the third chapter, it is aimed to clarify the subject by giving literature information about our variables. In the fourth chapter, the econometric method used is explained and the analysis methods applied to the data are explained. In addition, the findings obtained as a result of the analysis are also included in this section. In the fifth part of the research, the result of the research is included.

1.3. An Overview of the Relationship Between Consumer Confidence Index and Interest Rates, Exchange Rates, Consumer Price Index Gold Prices COVID-19 Period in Türkiye Between 2007 and 2022.

The table below shows a decrease of up to 65% in interest rates from 2018 to the end of 2022. During this period, the consumer confidence index, which was 87% at the beginning of 2018, dropped to 71% by the end of 2022. Irrational pressures on interest rates overshadow the independence and transparency of the markets and are reflected in the consumer confidence index, resulting in a downward movement. In the methodology part of the study, it was stated that the movement in interest rates has a high relationship with the consumer confidence index. Shocks in interest rates have a long-term effect on CCI. Low interest rates in the period between 2008 and 2017 show the consumer's confidence in market balance.

Türkiye's exchange rates, particularly the exchange rate of the Turkish lira against major currencies such as the US dollar and the euro, have been subject to significant fluctuations. Exchange rate fluctuations can affect consumer confidence by affecting import prices, inflation expectations and overall economic stability. The 8.7-fold increase in the exchange rate of 1 US dollar from 2013 to the end of 2022 caused an 87 percent decrease in the consumer confidence index.

In general, gold prices are affected by various factors such as global economic conditions, investor sentiment and market demand. In times of economic uncertainty or market turbulence, gold prices may rise as investors seek safe-haven assets. Higher gold prices may indirectly affect consumer confidence by reflecting concerns about economic stability and potentially influencing spending decisions. It can be said that rising gold prices in Türkiye reflect the need to seek a safe haven in times of increased distrust in the market. On the other hand, sudden increases in gold prices from 2018 to 2022 have limited power to explain the change in consumer confidence index. Even the shock of less than 27% from 2019 to 2020 could not prevent the increase in the consumer confidence index.

The consumer price index reflects changes in the general level of prices of goods and services. Türkiye has experienced periods of high inflation during the specified time period, which may erode purchasing power and negatively affect consumer confidence, but it is considered that CPI shocks show periodic decreasing and increasing trends on CCI and their impact is limited.

The COVID-19 period is an extraordinary moment of crisis and has shaken market

balances quite severely. People's psychological reflexes create anomalies in the market. The variable taken as "0" in our study and in the table, except for the pandemic period, affects the year in a 9-month period as of March 2020. The years 2021 and 2022 are the periods when the pandemic effect is completely affected. In our study, The COVID variable was added to the model as an exogenous variable to reduce the endogeneity problem. Thus, it is aimed not to ignore the theoretical impact of COVID, which had significant effects on economic activities at the global level between March 2020-2022.

Table 1. Average Annual Values of Variables (Source: www.tcmb.gov.tr)

Date	CCI	Interest Rates (%)	Gold	CPI (Monthly Change %)	USD Buying TL	CPI Based Real Effective Exchange Rate	COVID
Avr 07	96,08	22,04	697	0,7	1,3	119,24	0
Avr 08	81,49	19,5	870	0,8	1,3	118,78	0
Avr 09	82,74	12,1	975	0,5	1,55	111,4	0
Avr 10	91,47	9	1223	0,5	1,5	121,91	0
Avr 11	95,03	9	1565	0,8	1,67	107,39	0
Avr 12	90,6	9,33	1669	0,5	1,79	109,86	0
Avr 13	93,82	7	1406	0,6	1,9	108,02	0
Avr 14	92,74	12	1265	0,7	2,19	102,57	0
Avr 15	88,21	10,8	1158	0,7	2,72	100,39	0
Avr 16	91,62	9,5	1249	0,7	3,02	100,39	0
Avr 17	90,68	9,25	1257	0,9	3,64	90,09	0
Avr 18	87,76	22,82	1270	1,6	4,83	77,16	0
Avr 19	79,74	21,5	1393	0,9	5,67	75,08	0
Avr 20	80,95	17,5	1774	1,1	7	67,31	0,833
Avr 21	78,99	19,08	1800	2,7	8,83	60,41	1
Avr 22	71,35	14,85	1801	4,3	16,54	54,34	1

CHAPTER 2. THEORETICAL BACKGROUND

2.1. Behavioral Finance Concept

2.1.1. Behavioral Finance Definition

Traditional finance approaches claim that investors act with the information they obtain from the market, think rationally, and do not consider the possibility that human emotions can affect financial decisions (Çam and Hirka, 2021, p. 96). Although the idea of rational individual suggests that the individual adheres to the principle of rational thinking in all situations, it is seen that there are significant deviations and anomalies in financial decisions, especially in cases of increased uncertainty such as crisis, and the homo economicus individual of classical approaches disappears (Aydın and Ağan, 2016, p. 95). Despite the emergence of many theories based on the rational behavior of the individual, where homo economicus thought has been questioned significantly since the 1970s, interdisciplinary searches have increased in the finance science literature, where these deviations cannot be explained, and the behavioral finance approach, which includes human psychology in the equation, has gained importance (Akdeniz and Turan, 2021, p. 1017).

Behavioral finance approach, which is based on the idea that the individual does not always act rationally, is based on the assumption that people are under the influence of many psychological variables when making investment decisions. Due to these effects, people make systematic mistakes and the rational individual of traditional thought disappears (Öncü and Özevin, 2017, pp. 583-584). Behavioral finance approach has identified two focal points to detect anomalies, behaviors and prejudices that are incompatible with rationality, and developed its conceptualizations accordingly (Pompian and Longo, 2004, p. 9). Although the basic expectation regarding the rational individual is to reflect the obtained information to the decisions, people can act with their emotions while interpreting the market data and fall into cognitive misconceptions (Jagongo and Mustwenje, 2014, p. 92). The behavioral finance approach is to explain these psychological and emotional factors that shape individual decisions and financial markets and to develop a new finance model (Chaffai and Medhiolup, 2014, p. 527).

Behavioral finance; It is a theory based on the idea that a person, who is assumed to act rationally while deciding on investments, may behave differently than expected by

being influenced by some psychological factors (Öncü and Özevin, 2017, p. 584). Behavioral finance, unlike traditional economic theories, tries to explain the facts through individual behaviors (Süer, 2007, p. 97). Because, in the field of finance, as in all other fields, the idea that it is not possible to explain human behavior only with mathematical data, statistics or reason, and ignoring the main psychological factors means moving away from rationality. Behavioral finance explains people's investment behaviors by including psychological elements, and the "rational person" approach is replaced by the "normal person" approach with complex emotional and cognitive tendencies. The normal person modeled by behavioral finance represents an average person with his intelligence and expectations. Therefore, in addition to financial information and analysis, intuitions are also effective in the decisions he takes (Aren, 2019, p. 129).

The first emergence of the behavioral finance approach as a theory was in the article titled "Prospect Theory: Decision Making Under Risk" co-authored by Tversky and Kahneman in 1979. Accordingly, Expectancy Theory; It has become a model used to explain the phenomena or anomalies that cannot be explained with the existing models. In the same year, behavioral finance took its place in the literature both as an application and as a concept, and the irrational behaviors of investors began to be explained through this model. Behavioral finance tries to understand the decision-making behavior by focusing on human psychology and individual tendencies in the field of finance, and this approach clearly differs from classical approaches (Küden, 2014, p. 102). In fact, it was the 1960s that drew attention to cognitive psychology and compared the human brain to a complex device in this sense. Since these years, the ability and capacity of the human brain to process information have begun to be evaluated for the first time with concepts such as memory, decision making or problem solving, and Edwards, Tversky and Kahneman have been the psychologists who have contributed the most to this field (Tufan and Sariçiçek, 2013, p. 162).

Behavioral finance is based on the idea that people are not rational, it makes use of psychology, sociology and even anthropology while examining the infrastructure of financial decisions, and makes inferences in connection with different disciplines. Accordingly, both individual and institutional needs, demands and expectations can be behind financial behaviors and decisions, and attitudes contrary to what traditional approaches envisage can be encountered. These anomalies were the factor that played the most role in the formation of the concept of behavioral finance (Paksoy and Aykut, 2021, p. 51).

Behavioral finance theory is based on the view that individuals can deviate from rationality by being influenced by different psychological factors while making investment decisions, although they are expected to behave rationally. For this reason, the most important issue that behavioral finance focuses on is how psychology affects human behavior and therefore financial decisions. Psychology is a field of science that encompasses all of the desires, wishes, expectations, goals and motivations, emotions, thoughts, illusions and deviations of individuals. The large unexplained fluctuations in the markets over time and the sudden and unexpected drop in share prices have started to draw the attention of financiers to this area. As a matter of fact, the opinion that the large-scale decline in prices, which was experienced in 2000 and called the internet bubble, invalidated the rational theory (Öncü and Özevin, 2017, pp. 583-584).

It is seen that the literature on behavioral finance concentrates on two main areas. The first of these is the detection of anomalies that can be explained through behavioral models, and the second is the detection of individual behaviors and prejudices that are incompatible with traditional rational behavior theories (Pompian and Longo, 2004, p. 9). Much of the research in recent years has pointed out that the classical theories that served as the basis for modern finance are no longer sufficient. The detection of some anomalies in examinations and analyzes in other examples such as expected utility theory or efficient market theory supports this view. Because if an empirical determination cannot be explained theoretically or it is not possible to express it on logical assumptions, there is an anomaly (Öncü and Özevin, 2017, p. 584).

The prominent prominence of intellectual capital in recent years has strengthened the perspective and approach to human beings. Behavioral finance, at this point, focuses on this new and powerful approach and tries to find and explain the psychological factors that are effective in the investment decisions of individuals. Because the most distinctive feature of behavioral finance theory is its claim that human behavior and nature, emotional and cognitive tendencies, which it contains, are a very important predictor of financial decisions, contrary to traditional theories. As the importance attributed to human increases, behavioral finance theory also increases its importance (Doğan, 2016, p. 340).

Daniel Kahneman and Amos Tversky discuss the issue under three main headings in their studies on behavioral finance. The first of these; Shortcuts and cognitive variables that are thought to be effective in decisions made by individuals in uncertain conditions. Latter; In the context of prospect theory, it is thought that the expected benefit is affected by the personal tastes and preferences of investors, and that other references as well as

current ones are effective behind the decisions taken in risky situations. The third is the reflection of the framing effect on financial decisions. The studies of Kahneman and Tversky, both separately and together, in this area have been very effective and guiding in the development of behavioral finance (Eser and Toigonbaeva, 2011, p. 299).

Behavioral finance approach, which was initially viewed with suspicion, gained significant acceptance in the literature with the contributions of Daniel Kahneman. Because, in his studies, Kahneman revealed that investors act with emotions and intuitions rather than information (Ateş, 2007, pp. 45-46). The expectation theory, which Kahneman developed with Amos Taverky in the following years, played an important role in explaining individual behaviors (Çam and Hırka, 2021, p. 962; Aydın and Ağan, 2016, p. 96). With scientific contributions in the following years, the behavioral finance approach gained an important acceptance and became an important model in explaining the deviations and fluctuations in the financial markets (Doğan, 2016, p. 340).

2.1.2. Objectives of Behavioral Finance

The main objective of behavioral finance is to examine the emotional and cognitive tendencies that are thought to be effective in individuals' investment decisions. Because in the traditional finance approach, it is assumed that all individuals act rationally and make decisions entirely focused on increasing their earnings. According to the efficient market hypothesis, information sensitivity, standard expectations and lessons learned from past mistakes, which are considered transparent, explain investor behavior. On the other hand, the factors that determine investor behavior in markets may also be emotional, cognitive or far from standard assumptions, and the sum of these factors may affect the entire financial markets (Paksoy and Aykut, 2021, p. 51).

After the fluctuations in the financial markets that started in the 1970s, the complexity of the markets in the 1980s was very effective in the acceptance of the behavioral approach. On the other hand, behavioral finance models stand out as a model that explains how individuals behave, not how they should behave (Sefil and Çilingiroğlu, 2011, pp. 249-253). Behavioral finance, which argues that people do not exhibit rational behaviors, emphasizes the importance of shortcuts that the human brain uses together with emotions in financial decision processes. The brain works quickly in its own systematic and causes people to make irrational decisions and behaviors by resorting to various shortcuts. A very important part of these shortcuts actually consists of psychological prejudices (Ateş, 2007, p. 50).

It is known that decision tools are used in making investment decisions. The current information system and financial elements in the markets systematically affect people's investment decisions and the results of these decisions. In this context, investor behavior is also the subject of behavioral finance, and the psychological factors and tendencies that guide people's investment behaviors are tried to be determined. In other words, how people interpret market data in the investment market, how they react and how this psychology is reflected in the investment decision is emphasized. (Jagongo and Mustwenje, 2014, p. 92).

As can be understood from the definitions, the main target of behavioral finance is; to explain the psychological and emotional elements that shape the movements of financial investments and financial markets (Chaffai and Medhiolup, 2014, p. 527). Thanks to the implications of behavioral finance for this purpose, it is thought that people will be able to better understand both themselves and the markets, professional consultants will be able to provide more realistic and quality services, and the general picture in the markets can be interpreted more easily. Because many variables such as the psychological state of the investors, their families, close circles, demographic characteristics, the guidance of the intermediary institutions and the effect of the media can have an impact on the investor behavior. Therefore, it requires a very comprehensive perspective (Kendirli and Kaya, 2015, p. 226).

Behavioral finance targets the regular but irrational behaviors exhibited by individuals in financial markets. It is concerned with identifying these behaviors and the psychological tendencies that guide them. Because investors sometimes behave contrary to what is predicted and make mistakes. The tendencies that cause this error are in the field of behavioral finance, and it is tried to explain these tendencies that cause irrational decisions. Behavioral finance approach claims that people both consciously and regularly interpret the information and exhibit individual behaviors accordingly, and aims to explain these (Öztopçu, 2016, p. 16).

Primarily, in the behavioral finance approach; The idea that all people are rational is excluded and accepted as normal. Because it is known that economic theories, in which all people are considered rational, are insufficient to explain investor behavior and market movements. Behavioral finance is different from traditional ones, also in its methodology. Because, in this approach, investor behaviors that are effective in the market are first examined, and then a model that explains investor behaviors is revealed in the light of these examinations. While he accepts people as different and variable assets, not in a standard rationality, he also deals with and explains financial assets through the difference between

market values and the values determined by individual tendencies (Tufan and Sarıççek, 2013, p. 167).

2.1.3. Fundamentals of Behavioral Finance

Behavioral finance, which also received support from psychology in the 1980s, turned all its attention to the psychology, general acceptance and tendencies of investors, claiming that investor behaviors that shape the markets are the result of complex processes that cannot be explained by the assumptions of classical theories. In particular, the great impact of individual risk perception on decision processes was emphasized, and the instantaneous changes created by the psychological fluctuations of individuals invalidated the "rational individual" perception and caused it to be questioned. Another detail that distinguishes behavioral finance from classical finance is the methodologies they use. In studies based on classical finance, a model is first revealed, and then the accuracy of the model revealed by empirical studies is tested. In behavioral finance, it is primarily observing market behavior. Then, it is tried to explain the behavior patterns in the markets with the models created based on observations. In other words, what is tried to be explained in behavioral finance is not how investors should behave, but how they behave (Sefil and Çilingiroğlu, 2011, pp. 249-253).

Behavioral finance; It is accepted as a field that makes use of many disciplines such as psychology, sociology and anthropology in the explanation of market and investor behaviors and acts in order to determine the factors that guide these behaviors. Through the principles of these different disciplines, it is aimed to understand the movements of financial markets more rationally and comprehensively (Cornicello, 2003, p. 23; Otluoğlu, 2009, p. 26).

Decision making is considered by many to be an art. Because it means reaching a conclusion in confusion and requires struggle. On the other hand, it is also a cognitive process that requires conscious choice. The investment decision is also made through a complex process and the right decision is important. In this process, investors carefully examine their markets, take into account criteria such as risk, gain, tolerance and make inferences from these. However, behavioral finance claims that the process and conditions are not the same for every investor, and that these criteria or conditions do not affect every investor equally and in the same way. In this context, it is neither realistic nor necessary to expect every investor to act rationally in all circumstances and at all times (Abdeldayem, 2016, p. 74).

The concept of behaviorism first began to appear in the psychology literature in 1913 and with the work of John D. Watson. It was Adam Smith who first used "risk aversion" and similar concepts in his work titled "The System of Moral Thought", which he wrote in 1759, who laid the groundwork for behavioral finance. The first support for Adam Smith's ideas came from his contemporary, the philosopher Jeremy Bentham. Bentham touched upon the relationship of psychology with financial decisions and behaviors in his own studies and drew attention with his research on the psychological dimension of benefit (Özçelik, 2018, p. 14).

While these developments were taking place in the field of finance, important developments were also experienced in the field of psychology, and John B. Watson's external observation approach and related behaviors began to enter the psychology literature as an alternative to Freud's psychology approach based on introspection. Watson in summary; He stated that it is not possible to fulfill the conditions of being scientific without taking into account the observable and at the same time measurable human behaviors, and he ensured that psychology is among the criteria used in the evaluation of economic behaviors. Cognitive psychology came to the fore together with behavioral psychology, and later it was modeled by some psychologists, including Amos Tversky and Daniel Kahneman, and became an approach used in the field of economics (Eser and Toigonbaeva, 2011, p. 298).

When we look at the studies in the field of behavioral finance, it is seen that the risk perception of the investors and the demand for securities are emphasized. Because the general opinion; people's perception of risk is highly influential in their investment decision, and therefore, the correct perception of risk will also determine whether the investment decision is right or wrong. And if the risk is not perceived correctly, the actions to be taken to eliminate it will be in the wrong direction and ineffective. Behavioral finance focuses on psychological, demographic, socio-economic and directly individual factors that are determinative on a person's risk perception (Kahyaoğlu, 2012, pp. 54-55).

Although there was a prejudiced attitude towards behavioral finance at first, this perspective has turned into a positive one, thanks to the results of recent studies revealing the effect of psychological factors on financial decisions, and prejudices have largely disappeared. As a matter of fact, the researches on human intuitions and decision processes, worked on by psychology professor Kahneman in 1979, broke new ground in both psychology and finance. These studies and the results of Kahneman showed that not only probability calculations, but also psychological intuitions, psychological conditions and

shortcuts can be extremely decisive in the decisions of investors (Ateş, 2007, pp. 45-46). The “Expectation Theory”, which was created together by Daniel Kahnemann and Amos Tversky, shed light on the explanation of the damage caused by irrational behaviors in investors. As a matter of fact, De Bondt and Thaler (1985) later used the Prospect Theory to explain financial anomalies (Çam and Hirka, 2021, p. 962; Aydın and Ağan, 2016, p. 96).

In the following years, these results were supported by various studies, and it was demonstrated with evidence that rational behavior and prescriptive behavior do not always occur in all conditions and in every individual. Life is not always maintained with clear and precise data as mathematical rules. Because human psychology, as the source of many fluctuations, deviations, anomalies or differences, makes the world of finance and financial decisions unpredictable, like everything else. For example, according to the expectancy theory, a significant portion of the decisions taken in risky conditions are based on belief, and people prefer to act intuitively to make such complex situations simple. In other words, contrary to modern finance approaches, it is pointed out that the real risk and the risk perceived by individuals are not the same (Doğan, 2016, p. 340).

While making investment decisions, people tend to make decisions based on other variables in addition to possible risks or gains, and for the satisfaction of the decision maker rather than increasing the profit. Behavioral finance, which analyzes investor behavior through such variables, is increasing its effectiveness as an increasingly important field (Özer and Korkulutaş, 2018, p. 391).

Deviations in the markets and the irrational attitudes of investors are the main subjects of behavioral finance. In other words, stock movements, the functioning of the markets, sudden fluctuations or similar unpredictable situations are tried to be interpreted through individual psychological or social differences, and the complex effect of the human factor in the field of finance is tried to be explained with behavioral finance, as in all areas of human existence (Barak, 2008, pp. 211-212). How and to what extent individual behaviors determine stock markets, stock prices or similar financial parameters, how systematic judgment, possible mental and cognitive errors of investors are affected and affected, are all investigated as the subject of behavioral finance (Ege et al., 2012, p. 176).

Behavioral finance theory claims that individuals do not always exhibit rational behavior, and provides evidence for this claim by making examples from psychology. Accordingly, illusion in perception is one such example, and the human brain functions just like a computer. While filtering the information, it perceives and decides by creating

some cognitive shortcuts and making emotional attachments. Information reaches the brain of the person through such accelerated processes, and the decisions taken accordingly often do not match the decisions taken independently of these processes. These filters created by people and the shortcuts they use to process information are also their psychological biases (Ateş, 2007, p. 50).

2.1.4. Behavioral Finance Models

Behavioral finance models are models created to examine individual behaviors that cannot be explained through traditional finance models and therefore sudden price fluctuations. Behavioral finance models, which were put forward with the assumption that these sudden changes called "anomaly" could be a result of human psychology, also laid the groundwork for behavioral finance. Behavioral finance models that emerged for this purpose also invalidate traditional models that cannot adequately explain investor behavior (Özer and Korkulutaş, 2018, p. 393).

Researchers working in the field of behavioral finance have developed different models. The general approach of these models is that the markets are shaped by investor behaviors, and theoretically, the models also reveal this approach. Behavioral finance models make assumptions based on the findings about investor behavior they reach by taking psychology into account. It is thought that investor behaviors and their effects on the markets can be understood more accurately by making use of investor models based on psychological findings (Ege et al., 2012, p. 176).

Behavioral finance models claim that the current theory of efficient markets is unrealistic. It is seen that there are many empirical studies on this subject recently. Three models, on which these studies have focused in particular, draw attention. The first of these is the "representative investor-representative agent" model created by Barberis, Shleifer and Vishny (1998), the second is the "biased self-forgiveness model" and "overconfidence" models created by Daniel, Hirshleifer and Subrahmanyam (1998), and the third is They are the "interactive relationship" models created by Hong and Stein (1999) (Barak, 2008, p. 212).

2.1.4.1. Expectation Model

Psychologists Daniel Kahneman and Amos Tversky put forward; The name of the theory, which claims that people who have to make decisions in risky situations or in uncertain conditions, are affected by some psychological factors, is the "Prospect Theory".

At the same time, expectancy theory, which is thought to form the basis of behavioral finance theory; It includes a perspective opposite to the expected utility theory put forward by classical finance approaches, and argues that each investor's perception of loss, gain or risk may be different, and that this risk perception is shaped differently in line with the individual expectations of the investors (Paksoy and Aykut, 2021, p. 52).

Since it is predicted that investors will exhibit standard rational behaviors in traditional finance theories, the expected utility theory comes to the fore, and it is claimed that financial decisions taken in uncertain times and conditions are purely utility-oriented. Therefore, a marginal benefit is thought to be a negative value for those who avoid taking risks and a positive value for those who love it (Paksoy and Aykut, 2021, p. 51; (Öncü and Özevin, 2017, pp. 586-588); Sürer, 2007, p. 98). The expected utility theory put forward by Bernoulli is based on the idea that a measurable benefit will explain investor behavior and it is thought that this benefit expectation is behind the decisions taken in case of uncertainty (Tufan and Sarıççek, 2013, p. 175). Contrary to this standard utilitarian approach, the expectancy theory claims that there are other factors that direct investor behavior in uncertain situations and conditions, and that the behaviors that emerge depending on individual expectations may not be rational (Öncü and Özevin, 2017, pp. 586-588; Suer, 2007, p. 98).

In the Expectation Theory put forward by Kahneman and Tversky, the importance and role of the psychology of individuals is stated, and it is also stated that anomalies, intuitions and prejudices are effective in financial decision-making actions (Yaşar, 2008, p. 51). According to this theory, behavioral tendencies cause individuals to move away from rational behaviors that will occur systematically. Investors can take risks with their loss-aversion behaviors, and according to this theory, losses are more important than gains (Kahneman and Tversky, 1979, p. 285). As a result, it was stated with these studies that individuals could not rationally avoid risk (Akdeniz and Turan, 2021, p. 1018).

2.1.4.2. Overconfidence and Attribution Model

The overconfidence model and the biased self-attribution model were shaped based on psychological findings. The starting point of this model of investor overconfidence is cognitive processes such as understanding and comprehension, and evidence based on the results of research. According to this model, investors rely excessively or exaggeratedly on the information they have. In the biased self-attribution model; The investor model, which

connects the investment capacity with the confidence in the information at hand, is illustrated. Both of these models are psychology-based behaviors and are shown among the causes of future autocorrelation in stocks (Barak, 2008, p. 213).

The positive difference that is thought to exist between confidence and certainty explains overconfidence. Overconfident people's beliefs about their knowledge are exaggerated and unrealistic. It is thought that this unrealistic belief affects their investment decisions because they believe that they know more and the truth than anyone else. Researches also confirm that almost more than half of active investors are overconfident and find their abilities above the average (Karaca, 2015, p. 60).

In this behavioral finance model, overconfidence and biased self-attribution tendency are emphasized. Investors who are overconfident in their knowledge and in themselves are rational but believe that they are advantageous and superior to others who do not have the knowledge and skills they have. For this reason, they can sometimes cause an extreme reaction in the markets with the decisions they take. On the basis of this model, there is an interest in the excessive reaction of stock values against private information owned by individuals, and low-level reaction against public signals (Küden, 2014, p. 25).

Research in cognitive psychology shows that the majority of people are overconfident. In other words, the vast majority of people trust the information they have more than necessary, and therefore they perceive the possible risks lower and their knowledge and skills higher. This perception gives people an unrealistic self-confidence that they can easily control all outcomes. Early success in a job is among the reasons that trigger overconfidence, which in the financial world emerges as overconfident investors. Investors, who write these successes directly to their own credit and endure their confidence, make more speculative and risky decisions (Tufan and Sarıçiçek, 2013, p. 169).

The high trading volume that emerges in the financial markets is mostly a result of the overconfidence of the investors. While this trend increases transaction expenditures, it also causes low diversification. As a result, investors who are overconfident in their knowledge and skills by ignoring some risks may lose their earnings or assets (Aydın and Ağan, 2016, p. 98). This feeling of overconfidence also causes excessive optimism, and future projections are made with unrealistic positivity. People make decisions with the expectation that they want it to happen rather than what will happen, and while doing this, they may tend to exaggerate their abilities. Studies indicate that investors have a high tendency to deceive themselves (Aydın and Ağan, 2016, p. 98).

According to Aren (2019, p. 132) quoted from Schaefer (2004); The vast majority

of people tend to exaggerate the accuracy of their decisions and overconfidence. However, this exaggerated and erroneous judgment can lead individuals to other wrong choices and decisions. In other studies, the difference between trust and reality is expressed as overconfidence. Investors who believe they have above-average knowledge, skills, or insight also take on too much risk and make wrong decisions. Every investor will have a unique knowledge and skill, but the investor subject to this behavior model; is an investor who acts by exaggerating his own knowledge and skills and makes financial decisions. For this reason, these investors do not sufficiently consider the risks and uncertainties that will be encountered due to the nature of the markets (Aren, 2019, p. 132). The tendency to overconfidence is mainly discussed under three main headings. The first of these; Estimated Exaggeration- Misadjustment, second; Better-than-Average Rating-Exaggeration of Position and third; Precision is Exaggeration (Aren, 2019, p. 132).

2.1.4.3. Disappointment Avoidance Theory

The concept of regret in its simplest form; It is defined as the negative emotion experienced by the individual when it is understood that the choice made among the alternatives is not the best or the right choice as expected. In other words, the realization that you would be in a better situation if the other alternative was chosen is explained as regret. When it is the opposite, that is, when it is understood that the choice made is correct and appropriate, there is satisfaction and no regret. Therefore, it is thought that not all decisions are focused on avoiding regret, and some decisions are focused on living happiness and satisfaction. Frustration, on the other hand, is often seen and used as synonymous with regret, but essentially it means that the person is not satisfied with the results of the choice he has made, and that he is unhappy by not being able to meet the expected result. Therefore, it expresses a different emotion than regret (Aren, 2019, p. 145).

When this tendency is considered in terms of behavioral finance, it is expressed as the fact that the result of the investment decision taken by the person does not give the desired result and the return is below the expected. In other words, the greater the difference between the predicted and the achieved, the greater the level of frustration. Numerous studies have been conducted on the tendency to avoid disappointment, and it has been concluded that the anxiety of experiencing disappointment negatively affects investment decisions by creating pressure. It is stated in the results of these studies that the level of correct prediction of investors with this tendency is lower than those who do not (Paksoy and Aykut, 2021, pp. 54-55).

2.1.4.4. Regret Theory

Investors naturally want to make accurate predictions and make the right decisions, and that their investments do not result in loss or failure. The regret theory is at this point; It is based on the idea that it is easier to convince the investors who are in profit to sell than the investors who are at a loss, and this situation is defined as the behavior of avoidance of regret. It is thought that the feeling of regret is also effective in the investment decision stage, and the tendency to avoid regret negatively affects the investment decisions of people who are afraid of making mistakes. Because investors with this tendency take their investment decisions not from a macro-scale window, but from a narrow window with the fear of making mistakes and regrets (Öztopçu, 2016, p. 45).

The general tendency of investors; It is known that it is in the direction of holding the depreciating stocks for a longer period of time, in other words, in the direction of selling the stocks that have gained value, in other words, not risking the profit. In economics, this situation is defined as the regret theory. It is stated that the purchase price of that stock is highly effective in the decision of investors to sell any stock. However, this influence can lead to decisions that will result in regret. Daniel Kahneman also draws attention to the fact that the factors underlying financial decisions are not only focused on money, but also states that psychological factors such as avoidance of regret or feeling proud are effective. Investors prefer to make decisions that they will feel safe rather than making decisions that will cause regret (Küden, 2014, p. 59).

2.1.4.5. Representative Investor Model

In the Representative Investor Model, the individual makes two different judgment errors over conservatism and representativeness. Conservatism; It is explained as the inability of individuals to give up their past beliefs and related attitudes despite having new information and data. The representativeness bias is; It is explained as individuals' focusing on the most up-to-date, striking or different-looking options when making a decision, giving weight to them. This approach naturally causes the statistical data to be underestimated. In this model, insufficient reaction of the individual is considered as conservatism, and excessive reaction is considered as representativeness bias (Barak, 2008, p. 212).

This process, which is expressed as a volatile regime perception in the minds of investors, is modeled as the Markov process. Accordingly, insufficient reaction; The belief that a change in a different direction in financial profits will return to the average, while an

overreaction is the tendency to interpret it as a new trend when a reaction in the same direction and consecutively is received. The reaction in these two arc tubes is considered in this model as conservatism and representativeness bias (Küden, 2014, p. 24).

Barberis, Shleifer and Vishny, the creators of the Representative Investment Model, explain this model; They stated that investors made some judgment mistakes in the direction of representation and conservatism while making financial decisions, and that even if the company decisions, which are expected to be more effective, are in accordance with the random walk model, they make investment decisions by showing the shortcut of representation and the tendency of conservatism, and they explained this behavior model as the representative investor model. According to this model, businesses that have grown steadily over time, take into account these performances and turn to the options they deem the latest, the most and the most unusual (Özçelik, 2018, pp. 22-23).

2.1.4.6. Model of Daniel, Hirshleifer and Subrahmanyam

The basis of this theory is the differences in confidence that arise due to the overconfidence of investors and their biased attributions. Research shows that this overconfidence of investors is due to overestimating their individual abilities based on different reasons, through cognitive and psychological studies. In the financial markets, there are analysts or investors who produce information through some tools. If an investor perceives that his ability in this sense is greater than others, he will produce incorrect information or make erroneous decisions. Because this unrealistic over-confidence in the information it produces will create the perception that the investor has more private information signals than public (Daniel et al., 1998, p. 1841).

This behavioral finance model, created by Daniel, Hirshleier and Subrahmanyam, is a model based on the tendency of investors to self-attribute with their overconfidence. The basis of this model is the data and evidence presented by some psychological studies, such as understanding or comprehension, related to the phenomenon of overconfidence. The tendency to attribute oneself to oneself is; It is explained as the relationship between the exaggerated confidence of the individual in his knowledge and the performance that emerges due to the investment. This tendency is basically a psychological behavior and its reflection in future stocks is negative (Daniel et al., 1998, p. 1839).

Although this model put forward by Daniel, Hirshleier and Subrahmanyam is very similar to the representative investor model, the main difference between them is; Although this model is based on psychological perception errors, investors cause an overreaction

when they move against other investors who are rational but do not have private knowledge, by relying on their private information more than public ones (Barak, 2008, pp. 212-213).

2.1.4.7. Hong and Stein Model

Although the Hong and Stein Model basically has common goals with the model put forward by Barberis and others, the main issue is; It is the “interactive relationship between heterogeneous investors”. In other words, this model focuses on the interactive relationship between heterogeneous investors rather than examining or explaining investor behavior. The supposed cognitive biases of individual investors, and more importantly, the interactive relationship between heterogeneous investors is accepted as the starting point of this model. This model claims that there are two main types of investors in financial markets, these are; He calls them “news hunter” and “momentum investor”. It is assumed that these two types of investors act with only one kind of information and their rational structure is narrow. In this context, it is thought that both of these investors have limited rationality and have the standard type of public information that every investor can have. According to this model, bounded rationality; It provides arbitrageurs with a wide and safe space, thus providing more consistent results with reality (Hong and Stein, 1999, p. 2144).

The behavioral finance model developed by Hong and Stein together is known as an interactive relationship-based model that focuses specifically on two types of investors. These investors, both of which are considered not entirely rational, are news hunters and momentum investors. These investors, who have limitations in terms of knowledge and action, pay attention to their cognitive biases and mutual interactive relations rather than their psychology. Hong and Stein's model, in simpler terms; focuses on the combination of over-reaction and lower-level reaction, and adopts the view that there are investors who have special knowledge and low-reactions, who profit from this low-reaction. The general approach to this model is also applicable (Özçelik, 2018, pp. 24-25).

2.1.4.8. Efficient Markets Hypothesis

Even if the efficient market view can be accepted as a benchmark against which market imperfections can be measured, behavioral finance questions its dominance in academic teaching. Classical finance models fail to produce predictions that are vaguely

close to real results in financial markets (Montier 2002). Behavioral finance is often introduced in the context of the efficient market hypothesis. The assumption in the efficient market hypothesis is that profit maximization is the only factor driving investors. This means that investors work rationally and aim to maximize their expected rate of return. When investors receive information about securities, they decide on their own knowledge to buy, sell, issue or hold their securities. The available information is directly related to the decisions of investors. Prices are formed by the intersection of the demand and supply curves. (Smith 2008).

The efficiency of the markets provides an understanding of how stock prices change over time. Determining the true value of the stock is the main purpose of stock valuation. Thus, by comparing the market value with the real value, the investors will determine the stocks whose market value is below the real value and will invest in these securities. In an efficient market, these two values are equal and there is no need to determine the true value of the stock.

Efficient Markets Hypothesis was included in the literature by E. F. Fama in 1970. In the emergence of the hypothesis, the current rules of this market were adapted to the capital markets, taking into account the perfect competition market (Gürsoy, 2014, p. 297).

Because there are always a large number of buyers and sellers in the market, price movements are always efficient (i.e. timely, up-to-date). Therefore, stocks are always traded at their current fair market value. The main implication of the theory is that because stocks are always traded at fair market value, it is nearly impossible to buy undervalued stocks at a bargain or sell overvalued stocks for extra profits.

There are three different variations of the hypothesis: weak, semi-strong and strong form. It represents three different default levels of market activity.

Considering the information that affects market prices, the market is divided into three levels. It is distinguished as weak form, semi-strong form and strong form market efficiency. (Degutis and Novickytė, 2014, p. 9; Fama, 1970, p. 416)

activity level in poor form; It states that stock market prices reflect all past information about the company (prices, trading volume, etc.) and is the lowest level of knowledge of the hypothesis. In a weak-form market, investors cannot obtain returns above normal by using analysis such as time series analysis and technical analysis.

Efficiency level in semi-strong form; It states that the investor cannot generate abnormal returns by using all publicly disclosed information about the company in addition to historical data. For this reason, in the semi-strong form market, investors cannot earn

above normal returns with fundamental analysis such as financial statement analysis as well as technical analysis.

Strong fitness level of activity; It is the highest level of the hypothesis. Stock market prices reflect all public or non-public information. At this level, no one can earn above normal with the private knowledge they have acquired. Because all of the information that has been disclosed to the public or not, reaches all investors very quickly and this information is reflected in the prices very quickly. (Huge, 1995, pp. 32-35; Bildik, 2000, p. 9;).

Although there are many events supporting the efficient markets hypothesis, doubts have arisen regarding the validity of this hypothesis within the framework of recent academic studies. In the findings of the study, it is determined that there are anomalies (extraordinary) in stock returns. Many scientists argue that there are emotions and other factors in investment decisions (Sümer and Aybar, 2017, p. 76).

2.1.4.9. Expected Utility Theory

Expected Utility Theory is another important building block that forms the basis of traditional finance. The expected utility theory, first put forward by Daniel Bernoulli in 1738, was developed in 1944 by John Von Neumann and Oscar Morgenstern in the work published under the title "Theory of Games and Economic Behavior". The expected utility theory has been treated as the theory of decision making under uncertainty and risk until the Prospect Theory, which was put forward by Kahneman and Tversky in 1979.

According to the Expected Utility Theory, individuals act rationally and aim at profit maximization as a result of the choices they will make. According to the theory, although individuals have limitations such as time and income, they show an approach to choose the one that will bring them the most benefit in the direction of their own pleasure. They act rationally, prefer most to members, and make consistent decisions. However, as a result of most academic studies, it has been determined that investors deviate from the assumptions of the expected utility theory.

Expected utility theory is an approach that considers how an individual should act, not how he acts. However, in real life, individuals may be affected by psychological factors (perception, belief, etc.) or act with environmental sensations. Therefore, individuals may not always make self-interest calculations or reason.

As a result, the existence of psychological effects in the decisions people make under risk and uncertainty is at a level that cannot be minimized. Therefore, with the

involvement of psychological factors, the classical expected utility theory ceases to be an appropriate approach, and the foundations of behavioral finance are laid with the "Expectation Theory" of Kahneman and Tversky, which examines human behavior from multiple perspectives. With this theory, human behaviors that traditional models fail to explain are discussed.

Expected utility theory explains the rational decision making process under uncertainty with the help of choices over risky alternatives called "lottery". According to Jehle and Reny (1998), for an expected utility function to exist, an individual's preferences must explain these assumptions; completeness, reflexivity, transitivity, monotonicity, continuity, independence. In the Expected Utility Theorem, if an individual's preferences satisfy these axioms, those preferences are represented by a utility function.

Equation: $p \cdot U(x) \geq q$

If the expected utility of action a in the equation $U(x)$ is greater than b, then one will definitely choose action a. It is clear that the rational decision is to maximize utility.

According to Edwarg Elgar (1998) in the expected utility theory, individuals choose between risks and expectations after uncertainties by multiplying the utility value of the results of decisions with the probabilities and according to the weighted sum obtained. As it may be seen on the graph; utility is measured as a function of absolute wealth and marginal utility decreases as wealth increases.

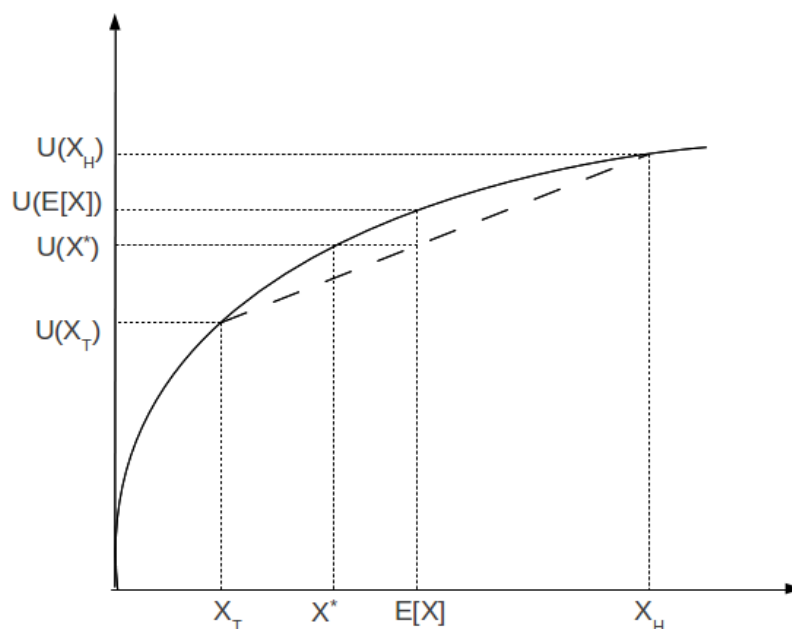


Figure 1. Expected Utility (Source: Ramsey, 1926)

2.1.4.10. Modern Portfolio Theory

Modern Portfolio Theory (MPT) refers to an investment theory that allows investors to build a portfolio of assets that maximizes the expected return for a given level of risk. In other words, it is an investment theory based on the idea that risk-averse investors can create portfolios to optimize or maximize expected return based on a given level of market risk, emphasizing that risk is a natural part of higher reward. It is one of the most important and influential economic theories dealing with finance and investment. Modern portfolio theory is all about the characteristics of returns from alternative investment instruments. The concept of return is always defined as the cash flow to the investor plus the change in market value. To be more precise, a security's "rate of return" is the change in the security's price plus the cash flow accrued to the security's owner over the period divided by the security's original price. The concept of rate of return does not change when different types of assets are taken into account. The return for stocks consists of both dividends and capital gains, while for bonds the interest paid plus the change in price is each divided by the price at the beginning of the measurement period. The problems of portfolio theory are complex because future returns that can rarely be known with certainty need to be estimated. In fact, a risky or stochastic variable must be estimated. There are many financial instruments and alternative physical investments a potential investor can choose from. For most purposes, it is sufficient to produce two measures that describe the probability distribution of returns: (i) a measure of central tendency and (ii) a measure of distribution (Ayan and Akay, 2013, p. 22).

An investor can reduce portfolio risk by holding combinations of instruments that are not perfectly positively correlated. If all asset pairs have a 0 correlation, the portfolio's return spread is the sum over all assets multiplied by the squared fraction held in the asset by the asset's return spread. This theorem states that any portfolio at the efficient frontier can be formed by keeping a combination of any two particular portfolios at the boundary; The last two portfolios given are "mutual funds" in the theorem's name. Thus, in the absence of a risk-free asset, an investor can acquire any desired productive portfolio, even if all that is available is a pair of efficient mutual funds. If the border location of the desired portfolio is between the locations of the two mutual funds, both mutual funds will be held in positive amounts. If the desired portfolio is outside the range covered by the two mutual funds, one of the mutual funds should be short-sold and the size of the investment in the other mutual fund should be larger than the current amount (Jones, 2017, p. 834).

Portfolio diversification strategy reduces risk, and portfolio investment risk is

measured as variance. At the same time, portfolio investment risk depends on both the variance of the individual return and the covariances of the assets. McClure (2010)

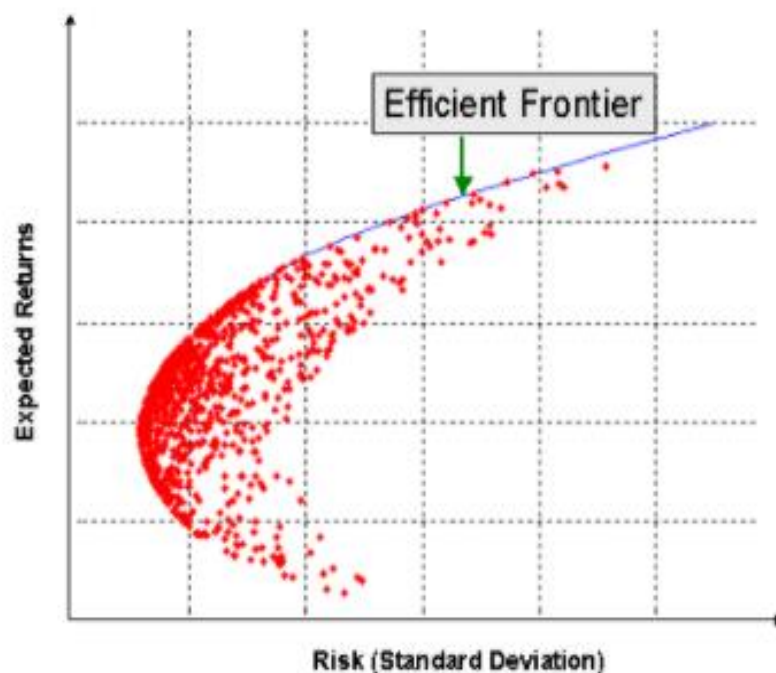


Figure 2. Efficient Frontier (Source: Markowitz, 1952)

Efficient Frontier shows the best combination of securities in modern portfolio theory. It represents the relationship between the expected returns and the risky of the portfolio along the curve. McClure (2010).

2.1.4.11. Capital Asset Pricing Model (CAPM)

The asset pricing model (VFM) is an influential and popular model that describes the price of financial assets such as publicly traded stocks. VFM assumes that investors are risk-averse and demand additional returns as compensation for the risk they assume. Like many other aspects of mathematical finance, VFPM implicitly supports the rational expectations hypothesis. VFM assumes that rational, welfare-maximizing agents will understand and act on an “objective probability law” that measures the relationship between risk and return (Epstein, 1994, p. 284). An efficient market rewards investors' risk-taking with higher returns (Chen, 2021, pp. 1-2).

The pricing of an asset can be viewed as the present value of payments or cash flows discounted for risk and time delays. However, the challenges arising from the discounting process are identifying the relevant factors that affect repayments. Navigating market signals and understanding their impact on returns is the main task of asset pricing and is essential for implementing strategic results. It is very important in the decision-

making process at the firm level and at the macro level. Models developed in the field of asset pricing share the positive and normative tensions present in the rest of the economy. Cochrane (2005) notes that this latter use of asset pricing theory accounts for a large part of its popularity and practical application. In addition, and perhaps most importantly, the prices of many assets or claims regarding uncertain cash flows such as potential public or private investment projects, new financial securities, purchase prospects and complex derivatives are not observed (Çelik, 2012, p. 142).

2.1.4.12. Contrast And Momentum Strategies

Emotional and psychological state of investors is an important factor on investment decisions. Fear and stress, which are among the psychological factors, are shown among the factors that prevent investors from making rational decisions. If an investor makes a decision with only the hope of gaining and fear of loss or a stressful uneasiness, the probability of loss is quite high, no matter how perfect the investment strategy. The inclusion of these elements in the investor's psychology will prevent a high profit.

There are many variables that affect investment decisions. The effect of each variable on each investor is different. Some investors love risk, while others are conservative, looking ahead. In order to explain the effects of these factors, it is necessary to look at whether investors act rationally or irrationally in the decision-making process.

As a result of the findings of most of the studies on people's psychology, it has been determined that people show subjective bias and overconfidence in their own abilities and beliefs. Psychological findings show that people tend to overestimate the accuracy of their current knowledge and their intelligence compared to other individuals. When we examine it from a financial perspective, overconfidence is the fact that the market participant sees his own knowledge and predictions superior to other participants. For this reason, investors become insensitive to risks because they think they are making correct predictions. As they place more value on the information they have acquired, they tend to believe in the accuracy of information that has not been made public and is not known to anyone. For this reason, investors may find themselves in more risky investments as they ignore financial analysis, financial statements and reports and give more importance to information coming from the environment (Daniel, Hirshleifer and Subrahmanyam, 1998).

The state of overconfidence also differs by gender. Barber and Odean examined the overconfidence bias in the context of genders in their study in 2001. Based on psychological studies showing that men are more self-confident than women, they

predicted that men would do more commercial transactions. In studies that used information on 35,000 households between 1991 and 1997, it was found that men made 45% more commercial transactions than women (Dinçer and Yüksel, 2018, p. 549).

Most momentum studies have used cross-sectional momentum as the basis for the selection of securities, selecting stocks based on their relative performance over some previous period (Jegadeesh and Titman, 1993). Moskowitz et al. (2012) found that time series momentum performs well in both absolute and cross-sectional momentum in futures markets in stock indices, bonds, currencies, and commodities. Baltas and Kosowski (2013) confirmed the strong performance of time series momentum strategies and emphasized that they drive the performance of many hedge funds. In contrast, Menkhoff et al. (2012) when examining money markets, he found that cross-sectional momentum outperformed time series momentum. Although previous studies have evaluated momentum strategy in many market environments, most of these studies have focused on stock markets (Asness et al. 2014, p. 78).

2.1.4.13. Prospect Theory

Along with the "Prospect Theory", which was put forward by Amos Tversky and Daniel Kahneman many researchers have revealed in their studies that the cognitive systematics extending from perception to choices and decisions through reasoning are not as rational and consistent as thought. Individuals were far from the ability to grasp the reality that surrounds them and to adapt to it in the most correct way. The need for a realistic adaptation made the individual have a mind fed by systematic errors. Tversky and Kahneman (1979)

Tversky and Kahneman's Prospect Theory points out two important differences from classical economic theory based on mathematical logic. Having a reference point in the human mind about choices and a tendency to avoid harm. Memory, experiences, mind, framing and expectations of individuals create a new systematic in decisions. In addition to the interventions of the conscious, the subconscious is involved in decisions according to risks, threats and expectations and shows that the mind can be deceived in reasoning. The mind does not always work with a logic, it may not be able to detect the inconsistency. Studies in this field reveal that the mind is open to manipulation and that the consciousness should be ready for any change.

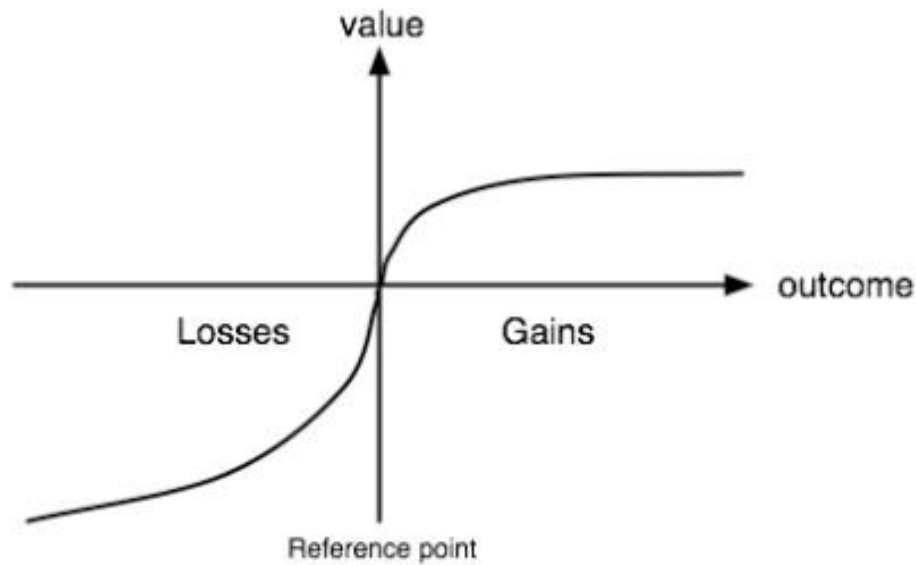


Figure 3. Prospect Theory Tversky and Kahneman (1979)

As seen in Figure 1; The value function appears to be convex in the gain region and convex in the loss region, with the steepness of the slope of the gain region being less than the gain. Investors' sense of unhappiness at the loss does not increase in proportion to the increase in loss if the loss is greater. Prospect Theory is the result of simplifying complex situations or processes through heuristic and cognitive errors. In addition to people's moods, clues obtained from the thoughts and comments of other individuals play an effective role in people's decisions. Nofsinger (2011)

Value is measured over gains and losses relative to a reference point. Marginal value decreases over gains but increases over losses (risk aversion for gains, risk seeking over losses). Schmidta and Zankb (2005) In the Prospect Theory, value function is steeper over losses than over gains (loss aversion). Venkatesh (2002)

2.1.5. Behavioral Tendencies that Prevent Individuals from Making Rational Investment Decisions

According to Otluoğlu (2009, p. 26), in an article by Brian O' Reilly published in Fortune Magazine in 1998,

“it should not be expected that people behave rationally in their investments, given that psychology provides evidence that people do not act rationally in many areas of their lives.” statements are included.

The human brain acts just like a computer, recording information via shortcuts and some emotional filters. Decisions taken based on this information, including emotions, are

naturally not as rational as decisions based on plain reason or knowledge. These irrational tendencies encountered in the decision processes of investors are defined as “*cognitive anomalies*” in behavioral finance (Otluoğlu, 2009, p. 35). Based on the researches, psychological tendencies that can prevent individuals from making rational decisions are mostly; prejudices, intuitions, fears, beliefs, cognitive or emotional elements. (Aydın and Ağan, 2016, p. 96).

Heuristic, which is one of the important concepts used to express behavioral tendencies, is used to express the short paths and predictions that the mind resorts to. It is stated that the number of things the brain handles at the same time is limited to 7. For this reason, in some cases, the brain prefers to use ready-made patterns and shortcuts without entering new processes. Shortcuts that the brain uses without using complex analysis methods are called heuristic in the literature. The most important function of heuristics can be expressed as ensuring that a large number of information and stacks of information are organized and processed quickly without allowing complexity (Kahyaoğlu, 2012, pp. 54-55).

The scope of studies on behavioral finance largely shapes the cognitive and emotional tendencies of individuals. When the results obtained are generalized, it is seen that the source of emotional tendencies is the desire to escape from loss and regret, and the source of cognitive tendencies is the search for a shortcut in the decision process (Sefil and Çilingiroğlu, 2011, pp. 254-255). All kinds of factors that affect the decisions of individuals in a financial investment process and the degree of effectiveness of this element are tried to be determined. Many psychological factors such as avoidance of uncertainty, overconfidence, fear of regret, avoidance of risk, self-attribution, over-optimistic approach or herd behavior, which affect the choice of investment instrument preferred while making an investment, are the subject of behavioral finance studies (Çam and Hirka, 2008). 2021, p. 962).

Among the major assumptions in finance is the linearity of the relationship between risk and expected return. In other words, the expectation of high returns is a condition of taking high risk. The results of studies on this subject also support this assumption. Again, generally accepted, investors are mostly risk-averse. However, this assumption does not apply to all investors. It is unrealistic to claim this. Depending on personality traits, circumstances, or other variables, some investors may be extremely risk-averse, while others may be inclined to take reasonable risks. In other words, the attitude towards risk varies from person to person. These attitudes are determined by the demographic,

psychological, economic, environmental or social conditions of the individuals, and changes in attitudes can be seen over time. In this context, it is possible to say that the risk-return selection undertaken by investors is not static but dynamic. For example, an investor who does not normally have a high tolerance for risk, gains with the high risk taken by someone from his close circle can have an encouraging effect and the person may decide to take the same risk. (Anbar and Eker, 2009, pp. 131-132).

In addition to financial studies, studies in the field of psychology reveal that the human brain processes information through shortcuts as a solution to complexity. For this reason, investors often take shortcuts and judge the future performance of companies by looking at past performances. Likewise, individuals have a high perception of control about a familiar job, and they decide more easily about the jobs they think they can control and know from experience. The effect of the same perception is also seen in investment behavior. People record the emotions they created in themselves and what they felt at that time rather than the events they experienced. For investors, this situation may pave the way for wrong decisions due to different recall of past events (Aydın and Ağan, 2016, p. 110).

Behavioral finance theory is primarily used to explain investments related to stocks, but it is also known to be a guide for other investments. To give an example from our country, the fact that gold and foreign currency investments are generally accepted as a profitable investment in our society is explained as a shortcut of existence when considered in terms of behavioral finance theory. It is observed that investments made in gold and foreign currency are significantly higher in Türkiye even in periods when the return on bank deposits is higher than gold and foreign currency. Therefore, this situation is evaluated as the effect of socio-cultural factors on investment decision in terms of behavioral finance. Because there is a contradiction incompatible with moral values, and this contradiction, which classical investment theories cannot explain, is explained by the short path of existence in behavioral finance and the effect of socio-cultural factors on investor preference (Ateş, 2007, p. 2).

Psychological tendencies, which are effective on individuals' financial decisions, are divided into two as cognitive and emotional tendencies with the most general classification. In financial decision processes, people can act by being affected by their beliefs, future dreams, fears, past experiences, the feelings created by these experiences, and their trust or insecurity. Or they can make decisions by using the intuitive practices they have acquired in line with their cognitive tendencies. Because making an investment decision, even in terms of finance, essentially means making a choice, and psychological

tendencies are sometimes effective in making different decisions with different perceptions of the same option. As a matter of fact, studies in the field of behavioral finance support the reality of this effect (Öncü and Özevin, 2017, p. 589).

2.1.5.1. Emotional Tendencies

It is known that individuals with positive mood exhibit more optimistic approaches than those who do not. Therefore, people's emotions play a decisive role in the evaluation of investments related to both the past and the future. These emotional tendencies are generally listed as follows (Akdeniz and Turan, 2021, pp. 1020-1021).

□ **Self-Control:** The concept of self-control is incorporated in a theory of individual intertemporal choice by modelling the individual as an organization. The individual at a point in time is assumed to be both a farsighted planner and a myopic doer. The resulting conflict is seen to be fundamentally similar to the agency conflict between the owners and managers of a firm. Both individuals and firms use the same techniques to mitigate the problems which the conflicts create (Thaler and Shefrin 1981).

□ **Tendency to Avoid Regrets:** Generally, investors are pleased and proud that they get income when they sell the two stocks whose value has increased, but they wait for the stock that is declining in value and expect it to rise again. Thus, they tend to avoid regret. This tendency actually expresses the dissatisfaction of individuals about what they have lost, and thus the compensatory behavior. Regret aversion refers to the phenomenon that people keep the status quo because they know from experience that options that seem to be favorable given the apparently correct information at the time the decision is to be made, may later turn out to be less favorable than previously assumed. Samuelson and Zeckhauser (1988). Regret aversion therefore is closely linked to the theory of omission bias, which holds that people perceive harmful commissions as worse than corresponding omissions and, therefore, prefer omission to commission. Ritov and Baron (1992).

□ **Loss Aversion Tendency and Propensity Effect:** It is based on the idea that people's tendency to lose aversion, albeit at a low level, is higher than a gain at the same level. The propensity effect is used to explain irrational investments. It is thought that the desire to avoid loss, individual prejudices and past regret tendencies are behind the predisposition effect (Akdeniz and Turan, 2021, pp. 1020-1021; Tufan and Sarıçiçek, 2013, p. 171). “*Loss Aversion*”, that is, the tendency of individuals to avoid loss, is also discussed

within the discipline of psychology and is explained as the behavioral imbalance that individuals reveal in equal amounts of loss-gain situations. It is also considered to be a form of emotional deviance and a reference model for other emotional stubs. In fact, in both psychology and economics research, it is seen that individuals tend to minimize losses and maximize incomes (Sefil and Çilingiroğlu, 2011, pp. 260-261). The concept means that we tend to feel worse about a loss of a certain magnitude than if we felt good about a gain of the same magnitude. Benartzi and Thaler (1995) view loss aversion as a property of utility exhibited at the status quo. In summary, the pain of losses outweighs the satisfaction of gains. Kahneman and Tversky's (1979, p. 279) view of loss aversion is as follows: An individual is loss averse if she or he dislikes symmetric 50–50 bets and, moreover, the aversiveness to such bets increases with the absolute size of the stakes. This clearly is a behavioral concept defined entirely in terms of preferences. As such, the concept is model independent. Schmidt and Zank (2005).

□ **Tendency to Control Oneself:** In events that happen out of control, people still have beliefs that they can change the results. This situation, which is called self-control; It means that individuals can control their own overreactions, whether positive or negative. Most investors also believe that they have this skill (Akdeniz and Turan, 2021, pp. 1020-1021). This tendency, which is also referred to as "*the dominance delusion*", also emerges as a result of individuals' excessive self-confidence and is shown among the emotional tendencies behind wrong financial decisions. Because this perceptual misconception about dominating the subject or result causes the individual to take wrong outputs in the process and make mistakes by making decisions based on these outputs (Sefil and Çilingiroğlu, 2011, p. 262).

□ **Ownership Effect and Status Quo Tendency:** The attitude that people take when selling something they own and the attitude they take when buying is often not the same. For example, when they need to sell a house or car of their own, the desired amount is determined not only by tangible values, but also by including intangible values. Ownership effect is a very common situation in financial fields and it is thought that it contributes positively to investors in financial decision processes (Aydın and Ağan, 2016, p. 99; Sefil and Çilingiroğlu, 2011, p. 262).

□ **Hedonic Correction:** It is explained as making an evaluation by combining

today's results with past results, not separately in its own time and reality, but by looking at the total. In addition, individuals' evaluation of existing options in accordance with their own expectations and making them happy and generating possibilities accordingly are considered within the scope of hedonic correction (Akdeniz and Turan, 2021, pp. 1020-1021).

□ **Tendency to Follow the Majority:** The concept of herd psychology is a concept that was first used in the 1840s and in America. Individuals act in accordance with the community's decision without questioning because they believe that the decisions taken by the community are more accurate and beneficial when certain different conditions occur (Akdeniz and Turan, 2021, pp. 1020-1021).

Vulnerability Tendency is one of the most common examples of loss aversion in financial environments. In some studies, the tendency of tendency, which is explained as "*keeping the sale period of the assets whose price goes down longer than the assets that maintain their price or that go up*", basically expresses an irrational attitude, a behavior exhibited to eliminate the dissatisfaction caused by the loss (Sefil and Çilingiroğlu: 2011).

Another important and common type of emotional disposition is optimism. Optimism, which is expressed as individuals' seeing and evaluating events and possible results from the good side, and considered as a deviation from rationality in the field of economics, can lead to wrong financial decisions. Because of this tendency, the value that individuals attach to the expected benefit is higher than it should be in an evaluation that is far from the effect of optimism. Therefore, it is clearly seen that optimism in financial investment decisions will have a direct effect on the results. While the optimism tendency causes the belief of investors that they will not make a loss, investors act with this error and may deviate from rationality (Pompian, 2006, p. 97).

2.1.5.2. Cognitive dispositions

The following misconceptions and other similar cognitive misconceptions and various heuristics (usually referred to as heuristic – means inference/estimation).

Cognitive psychology is a branch of science that investigates both individuals' perceptions of the outside world and the designs of this information in their minds. At the same time, it tries to explain the actions that occur based on those designs. From a broader perspective, psychology draws attention to the fact that many of our behaviors such as thinking, perceiving, learning, remembering, making choices, and making decisions are

formed at the end of cognition processes. From the point of view of behavioral finance theory, it is claimed that these cognitive processes are effective on investors' financial decisions. Behavioral finance models revealed within the scope of the theory argue that psychological tendencies and the biases they cause prevent investors from making rational decisions, and it is not possible to talk about the efficiency of the markets under these conditions. According to the researchers who support this theory, individuals act by being influenced by other factors than the profit-loss account during the investment decision process. These processes, accompanied by cognitive tendencies such as emotional tendencies, result in decisions focused on maximum satisfaction rather than maximum income (Otluoğlu, 2009, p. 1).

The tendency to create shortcuts, which is among these cognitive tendencies, means that the human brain makes inferences through some shortcuts at the decision stage. These inferences are mostly wrong and pave the way for investors to display irrational behaviors in the field of finance. In other words, it causes error and deviation. It is extremely difficult to prevent cognitive tendencies from being included in decision processes. Cognitive tendencies are generally discussed under the following headings (Sefil and Çilingiroğlu, p. 255).

□ **Containment Tendency;** Containment tendency, which is a common cognitive tendency, explains the irrational reactions of individuals in the financial decision-making stage, being influenced by the way the events are presented rather than the reality. In other words, while the investor is at the decision-making stage, instead of evaluating the available options with a rational view and opinion, he concentrates on the option that interests him, that is, frames it and takes a decision under the influence. (Sefil and Çilingiroğlu: 255; Tufan and Sariçiçek, 2013, p. 173).

□ **Mental Accounting Tendency;** Another cognitive tendency that is effective in the decisions of investors in the field of finance is the mental accounting tendency. The first person to come up with this concept is Richard Thaler. The author mentioned this concept in his study (1980) where he focused on expectation theory, and later in 1985, in another study he conducted with Werner F. M. De Bondt, he defined this type of disposition as the cognitive operations that individuals resort to while managing their financial processes. According to this definition, while the financial processes are being organized, investors cannot manage their portfolios correctly and take wrong decisions due to the

deficiencies caused by resource allocation (Sefil and Çilingiroğlu, pp. 256-257; Karaca, 2015, pp. 89-90).

□ **Uncertainty Avoidance:** This tendency, which is intensely displayed by investors, is explained as the tendency of individuals to tend to more predictable risks in conditions of unpredictable risks. The state of uncertainty, which is among the main problems of the decision-making theory, is expressed as the uncertainty of the results of the outputs when the probabilities are not visible. In simpler terms, individuals tend to avoid uncertainty in situations where possible outcomes are unpredictable (Aydın and Ağan, 2016, p. 99).

□ **Tendency to Conservatism;** Another cognitive tendency that affects investment decisions in the financial world is conservatism. Investors showing this tendency act with the motive of protecting their current positions. For this reason, they approach new information that causes mental stress due to its processing difficulty and complexity, and prefer to make decisions based on information based on their current beliefs. In addition, it is noteworthy that individuals who adopt this tendency have low reactions even when they receive and evaluate new information (Sefil and Çilingiroğlu, 2011, p. 258).

□ **Tendency to Surrender;** This tendency states that people's judgments based on possible events are formed depending on whether these events represent certain patterns. The tendency to surrender, which is evaluated in connection with the law of small numbers, is tied to this rule, since the rule that is called the law of large numbers under normal conditions and that large samples reflect the whole of the mass they cover is also valid for small samples. In other words, investors can make decisions based on the characteristics of the samples and make inferences about the whole and move away from rationality (Sefil and Çilingiroğlu, 2011, p. 258; Karaca, 2015, p. 83).

□ **Availability Trend;** Accessibility tendency, which is among the cognitive dispositions exhibited by individuals, basically explains the behaviors based on the higher probability of occurrence of events related to information that people remember more easily, and in parallel, ignoring the possibility of events related to difficult-to-remember information. Kahneman and Tversky (1974), who were the first to examine and examine this tendency, expressed the accessibility tendency as the ease of remembering also affects

the probability calculations of what is remembered (Sefil and Çilingiroğlu, 2011, p. 259).

2.1.6. Relation of Behavioral Finance with Other Disciplines

2.1.6.1. Psychology

Behavioral finance is a field of study that focuses on how psychological influences can affect market outcomes. Behavioral finance can be analyzed to understand different outcomes across various sectors and industries. One of the key aspects of behavioral finance studies is the influence of psychological biases. Behavioral finance biases often lead people to make irrational or harmful investment decisions. Understanding financial behavioral biases can help people make more rational moves with their money.

Individuals do not act only on economic and financial data in their decision-making processes. The events in their minds, their experiences, their approach to opportunities and many other factors affect these decisions (Taner and Akkaya, 2005, pp. 48-49). The behavioral finance approach shows that investors who invest in financial markets do not make rational investments. Investors often fail to make rational decisions because they are normal. The behavioral finance approach, which examines these erroneous, biased or illogical decisions and their reasons, interacts with psychology in these aspects (Sari, 2019, p. 23).

2.1.6.2. Social Psychology

Kayaoğlu et al. (2011, pp. 3-4) state that the behavioral finance theory, which argues that people are not rational in their decisions, is also accepted by social psychology. To give an example, people tend to form opinions easily even though they have little or no knowledge of the other person. It can be said that if the investors do not have sufficient information about the subject, they can easily invest in the securities that they have a positive impression (Tufan, 2008, p. 45).

2.1.6.3. Sociology

Sociology is one of the first accepted social sciences. The word 'sociology' has its origins in the Latin word socius (friend) and the Greek word logy (study). Sociology includes the study of social phenomena, social life, groups, institutions, associations and

societies. It focuses on society from a scientific point of view. Sociology deals with social groups, hierarchies or forms of organization. It combines these organizational forms and functions, which tend to maintain or change their intergroup networks. Sociology deals with the interaction itself. A social group is a system of social interaction. Sociology deals with social relations not because they are economic, political, religious, legal or educational, but also because they are social (Parhi, 2016, p. 7).

The scope of sociology is broad. It ranges from individual to group social systems. Sociology is a science based on the study of people and their cultures. Sociology paves the way for scientists, social thinkers and activists to understand society. It also helps to improve the quality of life of people living in the community. The term sociology was first used in an unpublished manuscript in 1780 by the French essayist Emmanuel-Joseph Sieyès (1748-1836) (Fauré et al. 1999). In 1838, the term was reintroduced by Auguste Comte (1798-1857). Sociology emerged as a scientific discipline in the early 19th century as a fundamentally new type of society based on new principles of social organization and new enlightenment ideas. This has caused a change in people's mentality. This branch of science focuses on the behavior and tendencies of civilized societies. At this point, the behavior of people and the interaction between them fall within the scope of sociology. The qualities that emerge as stereotypes in different segments of society can be understood as a result of sociology. It makes an important contribution to the understanding of values and norms in society (Tezcan, 1985, pp. 4-5). Neither of them makes any sense independently. The basic principles of sociology are:

- The behavior of individuals in social groups is different than when they are independent.
- Individuals who are part of a social group obey the rules of that social group.
- These rules are socially created and enforced.
- Some people have more authority than others in making rules.
- Those who follow the rules are rewarded, those who violate the rules are punished.
- The rules of social groups have a scientific basis. In a society, culture is responsible for giving an identity to the individual.

Culture is absorbed in an individual as soon as he is born and persists until his death.

2.1.6.4. Anthropology

According to Anthropology Aydın and Erdal (2007, p. 3); It is a science that deals with human diversity. This branch of science tries to understand people in terms of cultural

elements, social values and biological elements. This branch of science tries to evaluate how people have changed under different conditions from the moment they emerged, what are the characteristics of this change process, and what effects global events have on this process.

Common intellectual values lie at the heart of sociology and anthropology. The main difference between them is that anthropology mainly focuses on primitive societies while sociology focuses on civilized societies in general (Turner, 1978, p. 8).

The concept of culture is a part of the study of both disciplines, but while anthropology focuses on the content of culture, sociology studies the functions of culture (Bozkurt, 2004, p. 33).

2.1.7. Anomalies in Financial Markets

The word anomaly is defined as something different, abnormal, strange, or not easily classified. A market anomaly, also known as market inefficiency, is a situation in which a security or a group of securities performs differently than expected in the efficient market hypothesis. Anomalies are an indication that financial markets work inefficiently (George and Elton 2001, p. 22). Naik (2014) defines market anomalies as “*deviation from the currently accepted paradigm that is too common to be ignored, too systematic to be dismissed as random error, and too fundamental to adapt by loosening the normative system*”. There are many different types of anomalies in financial markets; some appear once and then disappear, others occur regularly and often (Naik 2014) Anomalies are indicative of inefficient markets, some anomalies occur only once and disappear, others occur frequently or continuously (Tversky and Kahneman 1986). In standard finance theory, a financial market anomaly refers to a situation in which the performance of a stock or group of stocks deviates from the assumptions of efficient market hypotheses. Such movements or events that cannot be explained using the efficient market hypothesis are called financial market anomalies (Silver, 2011).

Seasonal differences in production and sales are a well-known fact in business. Seasonality refers to regular and recurrent fluctuations in a time series that occur periodically in less than a year. Changes in climate, investor perceptions, tax-loss-sales and information hypothesis can be counted among the causes of seasonal changes in time series data, but are not limited to these (Aly et al, 2004, p. 115). However, the presence of seasonality in stock returns violates the efficient market hypothesis, which is an important hypothesis in finance. The efficient market hypothesis is a central paradigm in finance. One

of the explanations regarding the existence of seasonality in stock returns is the “tax-loss-sales hypothesis”. For example, in the USA, December is tax month. Thus, financial institutions sell devalued shares at a book loss to reduce their taxes. As a result of this sale, stock prices fall. But as soon as December ends, people start buying shares and stock prices return as a result. This leads to higher returns at the beginning of the year, known as the "January effect" (Balaban, 1995, p. 140).

2.1.7.1. Calendar Anomalies

Calendar anomalies can be presented as consistent patterns that cannot be described by a theory of finance. Calendar anomalies relate to a specific period of time, i.e. stock prices vary from day to day, month to month, year to year, etc. includes movements. These include the weekend effect, the moon turn effect, the year-end effect, etc. included (Karz, 2011). Calendar and time anomalies contrast with weak-form efficiency because weak-form activity assumes that markets are active at past prices and cannot predict the future based on these fundamentals. However, the presence of seasonality and monthly effects contradicts market efficiency, and in this case, investors may receive abnormal returns (Boudreaux 1995). Doren et al. (2008) found high volatility in the Chinese stock market, and Chinese stocks outperformed in the new year season, not in January. Yakob et al. (2005) found seasonality effects in ten Asia-pacific countries for the period January 2000 to March 2005. They found that this period was an ideal period to study this effect due to stability and was not affected by the financial crisis of the late nineties.

2.1.7.2. Anomalies of the Day

Studies on the day of the week effect indicate that stock returns on certain days differ from the average returns of other days. One of the most common calendar anomalies in stock markets appears to be the day of the week effect (DOWE). Stocks tend to get positive results on Fridays rather than Mondays. This phenomenon is sometimes called the weekend effect and has been documented since the 1970s. But it is not big enough to be a profitable trading strategy. The possible explanation is that companies tend to hold on to bad news until the market closes on Fridays. The day of the week effect can be mainly attributed to the trading patterns of individual investors. According to this effect, it would be beneficial to sell stocks on Fridays and buy them on Mondays. Day of the week effects are also called the Monday effect and the Weekend effect. (Siegel 2014). The average daily return is not the same for all days of the week, as would be expected on the basis of efficient

market theory (Nath and Dalvi, 2004, p. 41). In this context, this seasonality has been studied in both developed and emerging markets. For example, research by Jaffe and Westfield (1989) shows that typically Monday returns are negative and Friday returns are positive in the US, Japan and UK markets. However, in other markets (Aydoğan (1994), Balaban (1995), Özmen (1997)) negative and lowest returns were observed on Tuesday. Merrill (1966) investigated the DOWE and weekend effect in the DJIA and suggested that the stock price is more likely to be higher on weekdays except Monday. However, the first academically documented weekday anomaly in contemporary finance was published by Cross (1973). Applying SandP 500 data for the 1953-1970 period, he analyzed the weekend effect and produced a statistically significant result that Monday stock returns were lower than the previous Friday. The next few studies followed his lead in investigating weekday patterns. French (1980) extended previous research and analyzed the SandP 500 index, as Cross did in 1973. They found that Monday returns were significantly negative and lower than on other days. In addition, Jaffe and Westerfield (1985) examined the weekend effect on capital markets around the world. They found that weekly phenomena exist.

2.1.7.3. Anomalies of the Month

Whether the stock returns provide a different return in any month of the year compared to other months and whether they have different characteristics is examined in the anomalies related to the months (Barak, 2006, p. 137). Among the seasonal anomalies, the most announced is the January effect. It has been examined that stock returns in financial markets are higher in January compared to other months, and especially small stocks tend to perform better. Therefore, it is an anomaly trying to explain why it provides higher returns compared to other months. The most researched reason for the January effect is the tax loss sales hypothesis. According to this hypothesis, investors tend to reduce their taxes by realizing losses at the end of the year, which causes a depression in stock prices. After the end of the year, stocks return to their equilibrium levels and provide high returns in January. Another explanation for the January effect is the information hypothesis. Many companies' fiscal years end at the end of December. Before the financial year-end accounting information is released, there may be uncertainty in the financial markets, which may cause a depression in stock prices. When the information is published in January, stock prices rise to the equilibrium level again. According to the information hypothesis, if the fiscal year ends in December, stock returns in December should be lower than in January. January stock returns of companies that end the accounting year in a month

other than December should not differ significantly from the returns of other months (Karan, 2001, p. 285).

2.1.7.4. Holiday Anomalies

One of the most famous seasonalities is the pre-holiday effect. It is one type of effect that the returns on the last trading days before the holiday are usually higher than on the normal days. Barone (1990) claimed that the returns of the last trading days before the holidays are clearly higher than the returns of ordinary days in the Italian stock market. Arsad and Coutts (1997) noticed that there was a pre-holiday effect in the FTSE-30 during the period 1935-1994. In recent years, Chong et al. (2005) extended their valuable research to determine whether the holiday effect is diminishing in leading international markets such as the UK, Hong Kong and the USA. As a result of the study, they determined that the market order decreased in the last transactions before the holiday, and only one stock market in the USA had a statistically significant effect. Marrett and Worthington (2009) examined Australian markets in the context of small-cap firms in the 1996-2006 period. They found that the holiday effect was overwhelmingly present in retail markets and no statistically significant post-holiday returns were expected for all markets in the country.

2.1.8. Differences Between Traditional Finance and Behavioral Finance

The most basic point on which traditional economics is based is that investors act in their own interests and are rational. Investors, however, act irrationally because decisions are inadvertently influenced by state of mind, emotions, beliefs, and interpretations of information. Behavioral biases influence the actual investment decision making process. Traditional finance argues that investors act rationally by processing all available mathematical and statistical information while making investment decisions. However, scientific studies conducted in recent years have revealed that investors do not fully use all resources when making investment decisions and they deviate from rationality (Müldür, 2019, p. 38).

According to traditional finance;

- Both the market and investors are completely rational.
- Investors really care about utilitarian features
- Investors have excellent self-control
- Markets are active.

Behavioral finance, by examining investor behaviors that cause deviations from

rationality, emerged as an opposition to traditional economic models, with the view that the individual is not always rational and that investors tend to make mistakes about reason in some cases.

Traditional finance theory is based on the existence of efficient markets as well as accepting the investor as rational. It predicts that investors who invest under uncertainty and risk have chosen the best risk/return option. Efficient Markets Hypothesis (EMH) and Expected Utility Theory are important studies within the scope of traditional finance theories. Behavioral finance, as a criticism, argues that these theories are insufficient to explain stock returns and that the psychology of individuals should be included in these theories.

Kahneman and Tversky's (1979) work on decision making and judgment has become one of the most important points in the behavioral finance literature by breaking new ground in finance and economics.

Today, behavioral finance has become important with the presentation of evidence that EMH and traditional theories are insufficient to explain emerging market anomalies. It has gained a good place in the field of finance by gaining momentum with many master's and doctoral studies. Before explaining the theories, it is useful to define the concepts of risk and uncertainty (Singh, 2010, p. 2).

2.1.9. Concepts of Risk and Uncertainty

Financial decision making, which is a future-oriented action, includes risk and uncertainty elements because the future cannot be known with certainty (Öçal and Çolak, 1999, p. 14). As a result of the fact that certainty about the future cannot be predicted today, the concepts of risk and uncertainty emerge. These concepts are different from each other in terms of the meaning they carry. While the meaning of the word risk is negative, the word uncertainty, which includes risk, does not have a positive or negative meaning. The main difference between risk and uncertainty is that risk is measurable, while uncertainty is not measurable or predictable (İğdeli and Sever, 2018, p. 2).

Risk can be quantified. Rather, uncertainty refers to situations or events for which there is insufficient information to determine objective probabilities. Therefore, the situation is defined as uncertain when the information necessary to understand and predict developments or changes that may occur in a given context is insufficient or unavailable. The key element in making the distinction between risk and uncertainty is probability.

Uncertainty refers to a questionable thought. This is due to the lack of information

about what will or will not happen in the future. Uncertainty turns into a risk to the extent that future situations and conditions can be predicted and possible probabilities can be calculated. Where there is risk, there is information about the probability of loss and gain.

With its meaning in economics, risk refers to the measurability of uncertainty. The financial meaning of risk is the probability that the expected return will deviate from the actual return. The concept of risk represents both the positive and negative aspects of these deviations.

In decision making under risk, all possible options and the variable values that determine their consequences are known, whereas in the case of uncertainty they are not known. Risk is basically the probability that something bad will happen. In business and finance, risk is the probability that the actual outcome of an investment will differ from the expected outcome. Risks may include the possibility of losing all or part of the original investment in a business. However, it also includes the possibility of making a profit. Risk can be calculated to some extent using historical data and market factors. The higher the risk an investor is willing to take, the greater the return. No investment is risk-free, but there are some investments that have lower risks than others (Quintana, 2012, p. 11).

Risk is divided into two groups as systematic risk and unsystematic risk. Systematic risk can affect the entire economic market or a larger part of the market. Examples of this are interest rate risk, inflation risk, political risk and currency risk. Unsystematic risk, on the other hand, is a type of risk that only affects a particular company or industry. This may be due to a change in management, new competitors in the market, regulatory changes that will affect sales, or a recall of a product.

Slovic (1987) underlines that important contribution to the current understanding of risk perception have come from geography, sociology, political science, anthropology, and psychology.

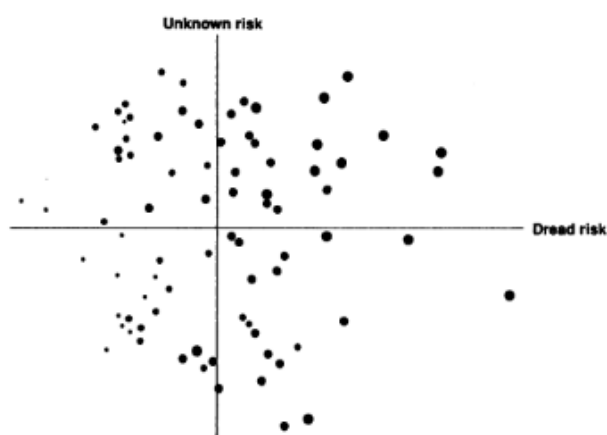


Figure 4. Perception of Risk Slovic (1987)

Slovic (1987) also refers to that research has shown that lay people's risk perception and attitudes are closely related to the position of a hazard within this type of factor space. Most important is the horizontal factor "dread risk". The higher a hazard's score on this factor (the further to the right it appears in the space), the higher its perceived risk, the more people want to see its current risks reduced, and the more they want to strict regulation employed to achieve the desired reduction in risk.

2.2. INVESTMENT AND INVESTOR CONCEPTS

2.2.1. Investment and Investor Definition

In the most general sense, investment is defined as the additions made to the capital stock within a certain period of time (Eğilmez and Kumcu, 2008, p. 90). Investing involves allocating capital (money) to projects or activities that are expected to generate a positive return over time. The definition of investor and investment is among the basic elements that determine the scope of application of rights and obligations under international investment agreements. In other words, investment is defined as the commitment of current financial resources to achieve higher returns in the future. From an economic point of view, investment and savings are different; Saving is known as the total earnings not spent on consumption, whether or not invested to generate higher returns. Consumption is defined as the total expenditure made by a person on goods and services used to meet his needs in a given period. In addition to investment or savings, consumption values can be determined at the macroeconomic level or at the individual level with different statistical methods. There are three different elements of investment: time, return and risk. To briefly touch upon these elements, the sacrifice is made in the present tense and is evident. On the other hand, the income and size of the income at the next stage is uncertain (Hamurcu,2016, p. 12).

Investment is undoubtedly the most important and crucial variable in the economy. It is plausible, however, that the civilization built by human hands from the first day it emerged in the world to the present day is thanks to investments. The development of every country also depends on investment firmly and deeply, because without investment, human progress would probably be stalled. The functioning of the economy is based on increasing the capacity to produce goods and services, that is, economic growth, and thus the main objective is to expand the stock of goods and services that will be used to produce others

in real terms and in a narrower sense. (Hamurcu,2016, p. 14).

Financial investment, on the other hand, is the acquisition of profit and income by using existing assets in security instruments in order to make a profit in the next period. Investors make a decision based on expectations, uncertainty and risk ratios in the process ahead while converting their savings into investments today. An investment contract is valid only for investors who qualify for security under the relevant provisions and for investments made by these investors. Only such investments and investors can enjoy protection and be entitled to file a claim for settlement of disputes. Investment agreements generally only apply to investments of those who qualify as covered investors under the terms of the agreement. Therefore, the definition of the term "investor" may be critical for determining the scope of an investment agreement (Akman, 2001, p. 27).

The Investment Committee, in its discussions on the interpretation of the provisions of investment contracts, identified the definition of investor and investment among the key elements of these contracts. He requested the Undersecretariat to conduct legal research and analysis by looking at state practices and case-law on these issues in order to improve mutual understanding and the results of agreements. As factual research, this document does not necessarily reflect the views of the OECD or member governments. It cannot be interpreted as biased about ongoing or future negotiations or disputes arising from international investment agreements.

As the nature of international economic relations has changed, the concept of what constitutes foreign investment has changed over time. The development of the types of assets that can be protected under international investment treaties has expanded considerably since the middle of the nineteenth century. Before then, cross-border capital flows typically took the form of European investors lending to borrowers in other European States (Kindleberger 1993, pp. 208-224). The consolidation of business entities to form transnational corporations (TNCs) with global name recognition has placed high value on certain trademarks associated with high quality and/or high demand goods. Therefore, the regulation of intellectual property has become an increasingly important concern for national and international law. In the 19th century, many advanced economies that concentrated their productive resources in the manufacturing sector began to shift a large portion of these resources to the services sector, and continued developments in communication and transportation made it possible for service providers to serve customers (UNCTAD 2004). As can be understood from this, changing conditions create new investment avenues in foreign countries. In other words, the number of foreign capital

assets that have economic value and can therefore be considered as foreign investment is increasing.

The goal of investors, real and legal persons under economic conditions is to increase the total return of their assets (stocks, bonds and other securities) as much as possible by considering 4 risk factors (Demirtaş and Güngör, 2004, p. 109). Net increases in investments make a positive contribution to the capital stocks of countries. This phenomenon is valid for social capital as well as physical and human capital. Social capital is seen as a key enabler of resource exchange, both within and between firms (as well as all economic actors), and thus an important driver of value creation. The more firms can build and remove social capital in their internal and external relationships, the greater the potential value creation benefits firms can expect as a result (Maula et al., 2003, pp. 117–118).

2.2.2. Individual Investors and Their Characteristics

An individual investor or retail investor is someone who deposits their own money, usually through an online broker, bank, or mutual fund. Individual investment behavior can be conceptualized as individuals' preferences to purchase small amounts of securities on their own account (Nofsinger and Richard, 2002). In the literature, economists, sociologists, and psychologists all try to explain individual investor behavior in various ways. For example, economists have largely focused on the "rationality" or "irrationality" of investors' decisions. In addition, while sociologists explain investment behaviors by focusing on the social environment of individuals, psychologists try to clarify individual investment behaviors by focusing on individual characteristics (Shafi, 2016, p. 61). In other words, individual investment behavior refers to how investors judge, predict, analyze, and review their decision-making procedures, which includes investing psychology, information gathering, understanding, research, and analyzing financial issues. This behavior requires making rational decisions in order to maximize returns based on the information available by making decisions independent of the emotions of the investors (Shikuku, 2014, p. 9; Schermelleh 2003, p. 25). For this reason, it is assumed that investors will be rational to maximize their assets and have to decide on their investment strategies by considering risk-return (Jagongo and Mutswenje, 2014, p. 92). However, it is argued that individual investment behavior is based on both rational factors and psychological factors. Psychological factors are accepted as an important component that has a significant impact on the attitudes and behaviors of individuals regarding investment decisions. For

example, when individuals are in a good mood or have positive emotions, they are more optimistic in their financial judgments, and they are expected to be more pessimistic if their negative effects are predominantly (Phan and Zhou, 2014, p. 77). Psychological factors refer to moods, influences, thoughts, feelings, and other cognitive characteristics that affect investors' behavior and attitudes. These factors also represent the defining characteristics or personality traits that cause individuals to affect financial decisions or investment behaviors (Sarwar and Afaf, 2016, p. 2).

Every business owner has to find sufficient funds or resources to start, maintain and expand their operations. These funds are raised through formal or informal capital or financial markets and their derivatives. For this reason, the types/classifications of investors and entrepreneurs are important, as the components of social capital have different effects with different characteristics. A detailed classification by the European Private Equity and Venture Capital Association (EVCA) classifies investor types as institutional investors, endowment, family office, foundations, trust fund, other asset managers, government agencies, and government wealth funds (EVCA, 2012, p. 6). However, although various designations have been created for investors, the three most common types of investors are generally referred to as private equity investors, venture capitalists and corporations (NZ Trade and Enterprise, 2009, p. 19).

The core elements of private equity and venture capital are investments in non-listed companies, equity capital in nature, medium to long-term and growth potential companies, which can eventually be realized through commercial sales or public offerings (Missankov et al., 2006, p. 9). Private equity investments consist of money invested in non-public companies, and as a result; They are not advertised on any exchange. Private equity investors are mainly paid when the enterprise goes public, is sold or merged with another enterprise, or when its capital structure changes. Another classification of private equity investors in this respect includes “formal” (venture capitalists) and “informal” (business angels) investors (Filatotchev et al., 2006, p. 1).

Unregistered investors; private individuals who directly invest venture capital in non-listed companies with no family ties (Mason and Harrison 2000). Thus, informal investors include business angels as well as private investors who contribute relatively small amounts of money and do not take an active part in the investment object.

All non-institutional venture capital investors, including family and friends; Investors who invest in start-ups not founded by the investor himself, i.e. family investments, friends, colleagues, etc. are included. However, investments in stocks and

mutual funds are excluded (Reynolds et al., 2003).

Institutional venture capitalists; consists of investors making professional investments for long-term, non-quoted venture capital financing in start-ups where the primary reward is final capital gains backed by dividends (Wright and Robbie 1998).

Characteristics of Individual Investors: Individual investor can be defined as individuals who do not allocate all of their income to consumption expenditures and partially invest in the future, act on their own behalf and have an account in the market (Temizel, Sarıkaya, and Bayram, 2010, pp. 1-20). According to another definition, an individual investor is an investor who makes transactions on his own behalf and does a small amount of transaction accounting, and tries to manage his own funds with little or no professional support (Karan, 2004, p. 699). It can be shown that individual investors are generally investors with relatively small transaction amounts who invest in their own names and accounts, and that individual investors are affected by a number of personal, financial and environmental factors in their investment decisions (Elmas 2010, p. 8).

Individual investors generally invest in smaller amounts than institutional investors. Individual investors tend to invest small amounts, like any paycheck. They usually invest through mutual funds at work or buy exchange-traded funds (ETFs) from an online broker (Doğan, 2013, p. 388).

It is the fact that the changes in the investor profile, which are effective on the financial markets, become an element that needs to be taken into account day by day (Saraç and Kahyaoğlu, 2011, p. 136). While individual investors are making investment decisions, it is necessary to analyze and evaluate which factors are affected by them. While making investment decisions, individual investors are under the influence of three main factors: personal, financial and environmental. The first of these factors is personal factors such as having sufficient information and time, age, gender, health status, income level, lifestyle, expectation and psychological state of the investors. The second factor is financial factors such as the preservation of the existing capital in the hands of the investors, the increase in the value of the capital and the desire to earn a permanent income. The third factor, environmental factors, is accepted as the social and cultural situation, reference group, group and family relations in which the investors are involved (Özaltın, Ersoy, and Bekçi, 2015, pp. 402-404).

Personal Factors: Personality is the characteristic integration of behavioral patterns, interests and tendencies, abilities and orientations. Since personality traits are behaviorally important, these personality traits gain importance in terms of finance as a

result of predicting the actions taken in investment decisions. While some investors take more risk to get more returns, others prefer less risky investments because they are afraid of losing (Armağan, 2007, p. 46; Tufan, 2008, p. 45). The age of individual investors is an important factor. It is possible to evaluate risk and return and return preferences by looking at the age of the person. Age is one of the most widely used criteria to categorize and classify investors for financial risk. While older investors are generally classified as low investment risk groups, young investors are classified as high investment risk groups (Anbar and Eker, 2009, p. 136; Barak, 2008, p. 31). High-income investors can easily accept risky investments than lower-income investors. In other words, we can say that as the age and income increase, the confidence of the investors in themselves and their investments also increases. Considering the assumption that women have a higher risk perception than men in terms of the effect of gender on investment decisions, it is thought that there may be some differences between male and female investors in terms of the level of psychological factors affecting risk perception. Kahyaoglu, 2011, p. 33). Dwyer, Gilkeson, and List (2002) found that knowledge of financial markets and investments weakens the effect of gender on risk taking, and that men have lower tolerance for financial risk, partially explained by women's financial knowledge. While an individual with a high level of education may save on investment decisions by doing more analysis and analysis, an individual with a low income may save more conservatively than those with higher incomes. The status, authority and beliefs of people in society are largely determined by their education level. Therefore, education, lifestyle and income level will affect investor behavior (Aksulu, 1993, p. 16-18). In addition, different results have been obtained in studies on whether marital status has an effect on financial risk perception. While some studies have found that married people have more financial risk tolerance (Anbar and Eker, 2009, p. 138), others have found that single people have more financial risk tolerance than married people.

Financial Factors: Financial factors that are effective in investing the deposits of individuals can be listed as cash flow, risk, liquidity, return rates and investment period (Ayvalı, 2014, p. 50). Savers avoid constant inflation while investing. Because even if inflation causes an increase in the book value of assets, this increase will not cause an increase in the equity price of the enterprise. On the contrary, it may cause a decrease in stock prices (Akgün, 1996, p. 265). Savers care about inflation and interest rates in their economic forecasts and for this purpose they direct their investments to investment instruments that will protect their savings from alternative investment instruments (Schaof,

1993, pp. 100-101). For example, liquidity reflects the ability of an investment to be quickly and cost-effectively payable. When evaluated in this sense, it is clear that more cash assets will be more attractive and therefore the demanded amount will be higher as other things are fixed (Mishkin, 2010, p. 93). Individual investors direct their investments to areas with higher value or income that exceeds the inflation rate to increase the value of their investments. While doing this, they try to choose the most suitable one among alternative investment instruments. An important factor affecting investment goals is that individual investors are also in constant demand for a certain income. For this reason, maximum income and security factors gain weight for individual investors (Usul et al., 2002, p. 140).

Environmental factors: Environmental factors are the socio-cultural environment, immediate environment, family and other environmental impact groups that are affected by the investments of investors. The attitudes and thoughts of individuals are greatly influenced by the cultures in which they live. In other words, the sociocultural status of the individual also affects the decision-making process. Individual investors want to get the approval and opinion of decision makers because they do not have enough information about investment instruments. Naturally, these people are usually family members (Usul et al., 2002). Since the saver also lives in a group or family, the influence of this group or family in decisions cannot be ignored. When people are alone in the decision-making process, they need the approval of the group or family because they feel insecure that they have the idea of making a wrong decision. The characteristics of individual investors in terms of risk perception are effective in making investment decisions. The investor defines risk as losing money or doing something uncomfortable. They perceive negative news about a vehicle; they are unfamiliar with the high risk level. Investors think they can reduce risk by investing in popular instruments that everyone is interested in. Investors tend to mix past and future potential risks (Karan, 2004, p. 699). Reference groups are one of the environmental factors that affect the behavior of individuals. Reference groups are defined as social groups that are important to the individual and shape the individual's attitudes and behaviors. According to a study, it has been determined that 80% of an individual's purchasing decisions are influenced by the direct recommendation of another person (Hsu et al., 2006, p. 474). Individual investors are influenced by the groups they belong to when making investment decisions. Taking the advice of those who have invested in the stock market for years seriously and taking it as a reference is an example of this situation.

2.2.3. Risk Perception of Individual Investors

The concept of 'risk perception' refers to how investors view the risk of financial assets based on their concerns and experience. Investors' perception of risk is an important factor affecting their investment decisions. The impact of risk perception on an individual investor's investment decisions is a rising topic in the behavioral finance literature. Risk is a natural feature of any financial investment. The probability that the actual return on an investment is less than the expected return. Perception is the process by which a person seeks a superior explanation for sensory information, so that the investor can make a final judgment based on their expertise and past experience (Riaz, 2012). The concept of 'risk perception' refers to how investors view the risk of financial assets based on their concerns and experience. Risk perception is the rational or irrational belief that an individual, group, or society has about the chance of a risk occurring or the extent, magnitude, and timing of its effects. What complicates financial risk analysis is that each investor has his own risk tolerance and perception of risk. Investors' perception of risk is an important factor affecting their investment decisions. Investment decision generally refers to the decision by investors where, when, how and how much funds to invest in various financial products/instruments with the aim of generating income or value. Here, the concept investment decision is defined as the decision made by individual investors when investing in mutual funds. Behavioral finance researchers have discovered that decisions can be influenced by unavoidable psychological and emotional factors. A better understanding of these factors will help investors make an appropriate investment decision and avoid repetitive mistakes in finding the best financial investment path in the future. Investors often evaluate the risk and return of an investment decision. An investor's decision-making behavior is influenced by their attitude to risk. At different levels of risk perception, individual investors think differently about their investments and make different decisions. Investors take risks based on their interpretations and perceptions, which ultimately affects their behavior towards risky investment decisions (Obamuvi, 2013).

2.2.3.1. Investors Who Love Risk

The term risk-loving is generally understood as the willingness of investors to take financial risks with the expectation of making a potential profit. Measuring the degree of risk aversion at any given time is critical to financial stability, as spikes in risk premiums in the past, declines in market liquidity and sharp declines in asset prices have often been associated with loss of risk appetite. Loving risk encompasses the concept of risk aversion,

but it is a somewhat broader concept as it is also influenced by the amount of (objective) uncertainty about asset price movements at any given time. In other words, liking risk depends not only on the degree to which investors dislike uncertainty, but also on the overall level of uncertainty and their perceptions about the underlying factors driving asset prices. None of these factors are directly observable from asset prices, but simply a combination of them. However, since the degree of affinity for risk is generally considered to be fairly stable, risk affinity indices are generally considered to track changes in investor uncertainty, and the degree of aversion to risk decreases as uncertainty increases. Risk premiums embedded in asset prices are affected by the degree of affinity for risk as well as the riskiness of the asset in question.

2.2.3.2. Investors Indifferent to Risk

It refers to a mindset in which a person is indifferent to risk when deciding to invest. This mindset is derived not from calculation or rational inference, but from an emotional choice. A person with a risk-neutral approach does not focus on risk, regardless of whether it is something stupid or not. This way of thinking is always situational and may be based on price or other external factors. Risk neutral is a concept used to describe the mindset of an individual analyzing alternative investments. If a person focuses only on potential benefits, regardless of risk, they are considered risk neutral.

2.2.3.3. Investors Afraid of Risk

A risk-averse person has the trait of preferring to avoid loss rather than gain. Risk-averse investors tend to be conservative in their investment approach, preferring minimal risk and stability as opposed to more aggressive growth strategies or goals. This feature is often attributed to investors or market participants who prefer investments with lower returns and relatively known risks to investments with potentially higher returns but also involving higher uncertainty and greater risk. Risk-averse investors focus on protecting their capital, so they are less willing to take risks for more substantial earning potential. Risk-averse investors may prefer fixed income assets such as bonds or stocks with lower volatility, among others. Diversification helps investors reduce risk because it increases your chances of not losing money. A common risk-related concept that compares the risk level of an individual investment or portfolio with the overall risk level of the stock market is the concept of beta. A risk-averse investor tends to avoid relatively higher-risk investments such as stocks, options, and futures. They prefer to stick to investments with

guaranteed returns and low or zero risk. These investments include government bonds and Treasury bills.

Risk-averse investors looking to protect their investments should consider the pros and cons of various investment strategies. Common investment strategies that a risk-averse investor can follow are;

Income investing is when investors aim to invest in low-risk assets in a way that provides regular, **reliable income**. For example, they can hold bonds that will protect their capital over the long term while paying regular interest payments or fixed income. Bonds can have varying degrees of risk, but are generally considered lower risk than stocks because they are less susceptible to economic risks or geopolitical turmoil. Government and municipal bonds are considered a safe type of fixed-income asset because governments have the right to raise taxes to pay off if necessary. Generally, the interest on these bonds is also tax-free. Investors using a fixed income approach should be mindful of the risk of inflation, or the risk that the rate of inflation will exceed the amount of fixed income, so that the investor loses purchasing power.

Value investors aim to buy undervalued stocks, meaning they trade at lower prices than the company's true value or actual value. The idea is that the prices of these stocks will increase over time as investors recognize their true value. Value stocks are generally considered lower risk relative to the broader market, but investors should keep in mind that stocks can take time to turn around and have a greater risk of price volatility than growth stocks. Hence, this strategy is more suitable for long-term investors.

Diversification: Investors who diversify their portfolios with various assets reduce their risk. Diversity can be increased by investing in different types of assets such as stocks, bonds and real estate. Diversity can also be added by changing the size of the companies or sectors to be invested in.

2.2.5. Factors and Prejudices Affecting Investor/Consumer Decisions

According to classical economics, individuals act rationally while making decisions under uncertainty and risk. However, individuals do not live under the same conditions and with the same psychology in social life. These factors vary according to the flow of life. Therefore, investors, who are market participants, may act within their feelings and prejudices by not acting rationally while making decisions under uncertainty and risk. These psychological factors that come into play are very effective on investor decisions. Psychological factors and cognitive biases that affect investor decisions;

“Over-Confidence, Over-Optimism, Representative Bias, Conservative Tendency, Anchoring (Foundation), Availability (Existence) Bias, Mental Accounting, Uncertainty Avoidance, Investor Sensitivity, Over-Reaction, Under-reaction, Framing Effect, Herd Behavior.” such criteria.

As a result of the findings of most of the studies on people's psychology, it has been determined that people show subjective bias and overconfidence in their own abilities and beliefs. Psychological findings show that people tend to overestimate the accuracy of their current knowledge and their intelligence compared to other individuals. When we examine it from a financial perspective, overconfidence is the fact that the market participant sees his own knowledge and predictions superior to other participants. For this reason, investors become insensitive to risks because they think they are making correct predictions. As they place more value on the information they have acquired, they tend to believe in the accuracy of information that has not been made public and is not known to anyone. For this reason, investors may find themselves in more risky investments as they ignore financial analysis, financial statements and reports and give more importance to information coming from the environment (Daniel, Hirshleifer and Subrahmanyam, 1998).

1. Overconfidence

The state of overconfidence also differs by gender. Barber and Odean examined the overconfidence bias in the context of genders in their study in 2001. Based on psychological studies showing that men are more self-confident than women, they predicted that men would do more commercial transactions. In studies that used information on 35,000 households between 1991 and 1997, it was found that men made 45% more commercial transactions than women (Dinçer and Yüksel, 2018, p. 549).

2. Excessive Optimism

Excessive optimism bias carries the approach of individuals to see everything as rosy. Individuals with such an attitude see the best in everything and think that every situation is an absolute good way out. Since they always see the glass as half full, they have a high belief that everything they want will be in line with their wishes and that nothing negative will happen. The results of many studies have revealed that people's beliefs are influenced by the over-optimistic bias. People defend their own abilities, achievements, and knowledge levels, and view themselves better by placing them above average.

Market participants with an over-optimistic bias tend to be over-optimistic about

the economy and the securities they invest in. They think that no bad event can affect them and that their investments will not suffer. An overly optimistic investor will not be able to see the bad sides of his investments as a result of such wrong beliefs and thoughts, and will cause him to accept it as right by not realizing his mistake.

3. Representativeness Bias

The biases of market participants regarding a particular investment have an important place in their decisions. Investors look for similarities between their current situation and the past by reflecting their past experiences to the future (Karaa, 2015, p. 15).

Market participants with representational bias make investment decisions using small sample groups based on the conclusion that the results obtained from large and small sample groups will have exactly similar probability distributions. The representation bias increases with the law of small numbers, in which market participants accept that events in the past will continue in the future and use small sample groups. With the law of small numbers, investors give more importance to short-term averages of success, not considering long-term averages. For example, if Tofaş stock has yielded high returns in a year, investors expect that performance in the future as well. In fact, this is a kind of trap for market participants. (Karan, 2013, p. 726)

As a result, representation bias prevents market participants from accurately calculating information about the market and companies, causing losses.

4. Conservative Tendency

Conservatism is the tendency of investors to rely on the past, instead of accepting new views and possibilities, on which they rely on the past to make their decisions. Investors with a conservatism tendency are very slow in changing their existing beliefs in response to current situations, in other words, they become conservative (Bodie et al., 2012, p. 269).

Studies conducted on the science of psychology have shown that individuals seek information that supports their current beliefs in the past and accordingly do not act objectively. Contrary to the representation bias, investors who tend to be conservative show a low reaction to new information in the market. The low reaction of investors to new information in the market will cause the same investment movements to be experienced in the past. If the investors' shares have lost in the past, they will lose again, and if they have won, they will gain again.

In order for market participants to avoid the harms of conservatism, they should not exaggerate the informational evidence supporting their past views, be open to new views and analyze them, and take a more objective approach.

5. Anchoring

When individuals approximate a situation, they determine a starting point for themselves and then make their predictions based on this baseline. This situation, which Kahneman calls "Anchoring Tendency" in his work, means that people make use of past experiences when making decisions about the future, and they predict future information by choosing the past situation as a baseline and adding on to it. (Kahneman, 2003, p. 1470)

The anchoring effect was scientifically demonstrated as a result of the study of Kahneman and Tversky in their 1974 article "*Decision Making Under Uncertainty: Intuitive and Prejudice*". In this study, individuals were asked to estimate the proportion of African countries with United Nations membership. In order to do this, it was asked to spin the wheel with numbers between 1 and 100, and it was asked whether the number that would come across when the wheel was turned would be lower or higher than the African rate. It has been determined that the predictions of individuals are mostly affected by the random number determined at the beginning. Then, when these individuals were asked to compare their predictions with 10, they guessed correctly 25%, and when compared with 60%, they estimated correct 45%. (Barberis and Thaler, 2003, p. 1068). As a result of the experiment, it has been revealed that the starting point is much lower than the reality, as a result of which it is desired to be estimated as it decreases. (Tversky and Kahneman, 1974, p. 1130)

In order to avoid the anchoring trend, the market participant should consider the analysis from a broad perspective, not relying on a single mainstay. Otherwise, the investor runs the risk of losing.

6. Availability (*Availability / Availability*) Bias

Presence bias was first addressed by Kahneman and Tversky in 1974. It's the ease with which people are familiar and mindful when estimating the probability of any outcome, associating that outcome with their life. In these situations, where human memory is at the forefront, familiar results that come to mind more easily are remembered easily rather than possibilities that individuals have difficulty in imagining or understanding. When making a decision, people perceive the probability of events that are easy to

remember faster than the probability of occurrence of events that are difficult to remember. For example, as a result of the smoke coming out of the chimneys of people using wood/coal stoves in winter, spreading to the environment, it arouses the connotation that there is a fire nearby in those who perceive the smell. While fires are common in our country, people cannot realize the truth because the burning smell caused by fires creates a more familiar perception in people and evokes their memories more easily than the burning smell caused by stoves as a result of stoves being rare and wood/coal burning, and this causes them to fall into cognitive errors. Dom, 2003).

The accessibility bias is also encountered in financial markets. Investors can evaluate the possibilities that may arise in the decision-making process according to the experiences they have gained by looking at the past period. For example, investors' tendency to stocks with high demand in the market or market participants' lack of interest in the stock market for a long time after a crisis can be given. The number of market participants with a tendency towards accessibility is increasing in uncertain and difficult to obtain information markets. As a result, there is an overreaction and no return can be obtained.

7. Mental Accounting

There is a financial accounting system that businesses have created so that people can maintain their lives and keep them under control, such as the expenditures they make, the returns they earn, the budget schemes they create to keep and grow their capital, and the accounting transactions they keep and report. People apply this system in their decisions (earning, spending, saving). Each financial decision affects or concerns another. For example, a decision taken to make a profit can affect the expenditures, and a decision to spend can affect the savings. These financial accounts help people in solving their problems. These financial methods that people create in their minds to direct their lives (how they will use their money) are called mental accounting in the field of behavioral finance.

Thaler mentioned that there is no such modeling of mental accounting, unlike the management accounts that businesses create with technical information. In mental accounting, old accounts based on old experiences are in memory. Individuals also consider these past accounts when making decisions, and this information brought back from memory is effective on the decisions made by individuals.

In mental accounting, individuals calculate their decisions and their results

separately. A good example of this is when a person divides his earnings into two, allocating one part to his basic needs and the other part to his luxuries, and keeping the account accounted in his mind while doing this. While this individual keeps an accounting of his expenditure on luxury needs and spends as he pleases, on the other hand, he is careful in spending on his daily basic needs.

According to the mental accounting theory, first proposed by Thaler, people attribute different functions and meanings to their existing assets. As a result of this, people move away from rationality and show an irrational attitude and damage their existing savings. For example, individuals avoid paying interest-bearing credit card debts to the bank while saving money to buy a house or car. However, as a result of this, there will be a serious loss in savings at the end of the year and this mental accounting will cause people to reduce their net savings value. Individuals would have acted more profitably and rationally if they spent their savings, which they kept on the sidelines, for interest-bearing expenses, without any interest gain. The fact that people ignore this situation and makes buying a house more important than paying debts is due to the personal values and meanings of the house. This leads them to behavioral misconceptions and harms them (Aytekin and Aygün, 2016, p. 146).

Another misconception caused by mental accounting is that the money that people receive as a result of both bonuses and gifts when there is no account is spent more easily than the money obtained as a result of hard-earned labor. This attitude, which people create with the thought of "what comes from life goes to the right", causes them to behave irrationally and makes them fall into behavioral mistakes. In fact, the rational behavior that should be taken here is that instead of wasting that money, it is necessary to act carefully and in a controlled manner, such as the attitude shown to the money earned by hard work.

Mental accounting also shows its effect in the field of finance. Investors' tendency to mental accounting affects their decisions and causes them to make irrational decisions. Since mental accounting will cause investors to separate their investments into separate accounts (some of them are compulsory education, some of them are retirement), the investor may deviate from his financial purpose and direction and the general portfolio situation may suffer (Bayar, 2012, p. 42).

In order to prevent this loss, damage and irrational behavior, the market participant should not forget the function and importance of money, should not waste time in separating their accounts, should have the habit of saving and act rationally by using their savings to pay off their debts.

8. Tendency to Avoid Uncertainty

When making decisions, people avoid taking decisions in uncertain situations where they cannot foresee the consequences and predict their possibilities. This situation, which was first discussed by Daniel Ellsberg in 1961, became the subject of behavioral finance under the name of uncertainty avoidance tendency. People with this tendency prefer to bear the risks in the possibilities they know/familiar with, rather than bear the risks under uncertainty. In other words, it is the case of people choosing the known over the unknown. Individuals prefer the option with more knowledge and experience in cases where the probability of winning or the risk of losing is equal. (Döm, 2003, p. 85)

In an example study, a lantern consisting of a total of 100 balls with red and white colors, 50 red and 50 white, of which the distribution is known, and the distribution of which is unknown, was placed in front of the citizens. Citizens were asked to bet on which bell they would prefer for a white ball to be drawn from the bells. And the citizens, who formed a large number, showed an uncertainty avoidance bias by choosing a lantern consisting of 50 red and 50 white balls, the distribution of which they knew.

There is also a tendency to avoid uncertainty in financial markets. Investors exhibiting this tendency tend towards securities that they consider to be safer and predictable risk. Thus, they show a protective behavior against the securities they will invest. In addition, market participants with a tendency to avoid uncertainty make their investment decisions in the direction of the stocks they are familiar with. For example, investors are in favor of investing in the stocks of the country of their citizenship rather than investing in foreign (foreign country) stocks. And they are of the opinion that the risk of this is less. Market participants with this attitude also avoid diversifying their portfolios (Bayar, 2012, p. 46).

9. Avoidance of Regret

Regret is the feeling of being dissatisfied and exposed as a result of the perception that it is too late to do so in the event that undesirable results are obtained as a result of the decision taken or an effort is made to change the decision with the thought that the decision made is wrong. Regret is a negative and effective state.

When people make mistakes in their decisions, they feel regret regardless of the scale of the mistake. Regret has an impact on the decisions people make. That's why they try to have minimal regrets or even no regrets while making their decisions. These attitudes of people are included in the literature as a tendency to avoid regret.

When we examine the financial markets, investors hold the stocks that make them lose (in their portfolios) while they sell the stocks that provide returns to avoid regret. In the formation of any cash requirement, it is willing to bear the tax burden that will occur in order to meet this need, and disposes of the yielding share certificates. However, if market participants prematurely dispose of their yielding stocks, they will be deprived of a sustainable income from which they can earn, and the fact that they hold the losing stocks will cause them to lose even more. Market participants delaying selling their losing stocks and immediately selling the stocks they gain are given as an example of regret avoidance bias (Döm, 2003, p. 86).

As a result, investors who tend to avoid regret, keep stocks that are likely to cause loss in their portfolios, aiming not to regret having made a bad investment and not to incur losses.

10. Herd Behavior

According to traditional economic theories, human is modeled as a rational being and the psychological state of the individual while making a decision is ignored. However, the individual is a psychological being with feelings and intuitions by nature. Therefore, the individual may not always act rationally in his decisions and may deviate from rationality. Behavioral finance theories, which deal with the deviations of individuals from the said rationality, and which emerged with the inclusion of psychology in financial issues, focused on the psychological behaviors of people and irrationality in their decision-making processes. Herd behavior is one of the psychological factors that affect the decisions of the individual that behavioral finance examines, and one of the reasons behind it being irrational (Doğukanlı and Ergün, 2015, p. 10).

EMH, one of the classical economic theories, is based on the assumption that market participants have the statistics and forecasts they reach while making decisions, with full information capacity and easy access to information. Therefore, it is accepted that these are reflected in the prices and that the market is efficient. In an active market, price fluctuations, bubble formations, or price bubbles, which mean the deviation of the security from its true value, are not expected. However, bubble formations, bubbles and crises are experienced in financial markets. The herd behavior effect lies behind the mispricing and misappraisal of financial assets, which is one of the reasons for the occurrence of these situations.

Herd behavior, which means that market participants make decisions based on the

investment movements of other market participants, regardless of their own knowledge, estimations and valuations, causes investors to change their current decisions, imitate other investors and increase their psychological biases. As a result, the investor moves away from rationality and becomes included in the herd and market efficiency deteriorates. Thus, investors who act with herd behavior create a herd that can influence the entire financial market (Altay, 2009, p. 82).

We will discuss the herd behavior, which paves the way for financial crises and has been the subject of many literature studies in recent years, in more detail below.

In the literature, it is called herd behavior when an individual is influenced by the behaviors, perspectives and ideas of other members of the society he belongs to, changing his own thoughts and attitudes, acting like them by following the majority, and imitating them. Herd behavior is very effective on individuals. Most of the time, it causes the individual to take decisions that should not be made on his own or to exhibit behaviors that he basically avoids by acting with herd psychology. As an example, the behavior of people who are afraid of hurting even an ant, with the psychology of lynching, can be given as an example.

One of the reasons why herd behavior occurs even though it has negative, irrational or harmful consequences is people's sensitivity to the environment and their desire to adapt, based on social pressures such as making themselves accepted by others and fear of exclusion. The other reason is that even if the individual normally sees that behavior as wrong and not logical for him, the majority accepts that behavior in the individual because he/she does that action and keeps the probability and risk of the situation being wrong low.

Financial Herd Behavior: In financial markets where herding behavior is observed, the decisions of market participants are made by the decisions of other market participants instead of their own individual analyses. Therefore, the investor pays attention to the behavior of other investors by closing himself off to current information and shows the bias to imitate them.

The synchronous trading of a group of market participants in the same direction and depending on the same security is called financial herd behavior. By ignoring the existing analyzes and individual evaluations, the market participants included in the herd think that they have better knowledge of that group directly without examining the knowledge level of the group they join, that is, in short, the fact that other market participants automatically do that move because they are doing the same behavior. can lead to a lower level of knowledge than it should be. Because the investor has the belief to keep the knowledge of

the herd above his own level of knowledge. For this reason, the general knowledge level used in decision making decreases (Amirat, and Bouri, 2009, p. 84).

The existence of herd behavior was detected simultaneously with the first existence of financial markets and has become the subject of many studies in the literature due to the financial crises experienced. Herd psychology creates price bubbles in financial markets and causes stock prices to be below or above normal. As a result, market efficiency deteriorates and the equilibrium is deviated. For this reason, herd behavior creates negative and undesirable effects, especially in financial markets during the crisis. From the tulip speculation that took place in the 17th century, the sharp price volatility in the world stock markets between 1974-1982, the overvaluation of the stock market and real estate markets in Japan in the 1980s, and the Media and Telecom bubble that occurred in 2000, financial markets have experienced overvaluation and He expressed the collapse or rise that occurred together with the concept of herd behavior in general terms (Ede, 2007, p. 75).

The reasons for the herd behavior include the belief that other market participants will have this data, considering that the market participant himself does not have information that can affect the price of the security, evaluating the market interest average by comparing the performance of the portfolio managers, and applying the psychological choice for the market participant to be included in the herd. (Bikhchandani and Sharma, 2000, p. 278).

Investors trade with the available information they collect, and this information affects the price of the security. According to EPH, financial markets show strong efficiency in the long term in terms of the knowledge they possess. However, this efficiency disappears as the investors trading in the financial market act according to the transactions made by other investors in line with the information they have, rather than their own individual evaluations.

In many cases herd behavior is not a profitable investment strategy. Investors who are trying to increase the return on their investments begin to buy and sell their current securities frequently when they move away from their own evaluations and are led by other investors, that is, they are included in the herd. As a result, the investor has to bear the high transaction cost and moves away from the profit. For example, an investor may think that if a stock price is 10 TL, which is not even worth 1 TL, that stock is getting cheaper and vice versa. Because the herd, which influences the market, can raise prices suddenly or easily lower them. Therefore, the investor in the herd may fall into these artificial moves and deceive himself by holding on to the losing stocks, while immediately selling the

profit-making stocks, acting like a long-term investor. Therefore, herd behavior is the main cause of asset bubbles in financial markets.

The most prominent example of herd behavior in the financial world was the Dotcom (internet) bubble in technology stocks in America in the early 2000s. Investors exhibiting herding behavior are highly ambitious and therefore expect high returns from their transactions. Although dotcoms do not have reliable financial models, market participants have invested large sums in most of them. The reason behind these decisions of these investors, who invest their money in this way without thoroughly analyzing the source they will make an investment decision, is that other investors make the same decision.

Herd behavior is divided into two as rational herd behavior and irrational herd behavior.

Rational Herd Behavior: In rational herding behavior, portfolio managers imitate other portfolio managers' behaviors by refusing to use their existing knowledge in order to protect their personal interests and dignity.

The extrinsic value model of knowledge, proposed by Caplin and Leahly in 1994, states that individuals see the information they have as incomplete and they tend to follow other individuals by giving more importance to the information they have. It is defined as a rational behavior that portfolio managers tend to imitate the actions of other portfolio managers if they do not have sufficient knowledge about the investment instruments in the financial market and if they doubt the accuracy of their existing data. If a portfolio manager makes an investment decision based on psychological intuitions and then sees that other portfolio managers turn to different investment decisions, he abandons his current decision, or vice versa, if he buys a financial asset that he has given up before, if other market participants buy it again, this portfolio manager is included in the herd. The most important reasons for rational herd behavior in financial markets; lack of information, reputational concerns and wages. Accordingly, rational herd behavior; information-based herd behavior (information waterfall), reputation-based herd behavior and wage-based herd behavior are discussed in three parts.

Irrational Herd Behavior: Studies based on classical economic theory suggest that investors who trade in financial markets act based on informational reasons and act rationally by displaying rational behaviors, while research on behavioral finance considers the psychological factors that are ignored in classical economics rather than information-based reasons, and reveals the irrational behavior of investors. The fact that market

participants completely ignore their personal decisions in the form of uninformed social pressure, fashion and integrity of social thought and as a result follow and imitate the behavior of others is characterized as irrational herd behavior.

According to Kahn (2004), the reasons for the irrational behavior of investors during the investment decisions are; It combines three elements: intuitive simplification, self-deception, and social interaction. Intuitive simplification occurs when a subset of information is chosen because of limited attention, memory, or information processing ability. It causes investors to change their personal information and to predict the future based on the current event. In the case of self-deception, investors see their own abilities as the reason when they are successful in their decisions and as bad luck when they fail in their decisions. This causes investors to tend to be overconfident. In social interaction, which is the last element, investors obey the behavior of the group they belong to and show herd behavior (Altay, 2008, pp. 34-35).

Asch (1995), a research psychologist, suggested that the main reason why individuals tend to follow each other and show herd behavior is social pressure or group pressure. Asch explains the irrational herd behavior with an experiment he has done. In the experiment, a group of people who knew each other and whose number was between seven and nine was considered. Individuals are seated around a table and two pieces of paper are presented in front of them. One of the papers has a single vertical line of standard size, while the other has three vertical lines of different sizes. And the group was asked which of the lines on the paper with the three lines had the same size as the standard line on the first piece of paper. Individuals seated in a certain order answered the questions in the same order and all individuals answered the questions correctly in the first round. In the second round, the papers continued to be presented in a different way and everyone in the group answered the question in the same way. When it comes to the third round, the individual sitting at the end of the table started to give different answers than the others. While the questions were being continued in this way and the rounds continued to progress, the individual sitting at the end of the table started to act more cautiously and think about the answers to the questions. The subject that is taken as the basis in the experiment is the individual sitting at the end of the table. It was agreed before the experiment that the people sitting outside of this individual would not answer the questions correctly after the tours reached a certain point. As a result of the experiment, it was observed that 40% of the individuals who made their choices voluntarily turned their decisions into the decisions of the individuals who made the wrong choice. Individuals who change their decisions

voluntarily and tend to follow the majority, have been included in the herd by hiding their own information even though the correct answer is obvious. When the individual contradicted his own answer and the group's answer, he became helpless as a result of the fear of being excluded from the group and the perception that the group would see him as incomplete, and he acted according to the majority's decision by ignoring his personal information.

11. Framing:

People are often shaped by decision frames. If a frame triggers a positive or negative situation or emotion, the individual's preference is determined accordingly. The way you ask the question also affects the answer you get. This concept can be encoded as manipulation ability. Tversky and Kahneman (1981) asked participants in a study which program they would choose to combat an epidemic that is thought to cause 600 deaths in the USA.

- Program A predicts that 200 people will survive.
- Program B says 1/3 probability 600 people will survive, 2/3 probability no one will survive.
- If Alternative Program C is implemented, 400 people will die.
- In Alternate Program D, there is a 1/3 probability that no one will die and a 2/3 probability that 600 humans will survive.

Although the same programs are mentioned as examples of positive and negative framing, there is variation in the percentages of people who choose the programs. 7% of the participants chose Program A, 28% chose program B with risk, 22% chose program C with definite results, and 78% chose program D with risk. In the negative frame, the participants were interested in the risky program.

The framing effect in finance is indexed to the risk-return relationship. Normally, investors expect high returns from high-risk investments and low-returns from low-risk investments. However, the concept that interrupts this relationship is the framing of risk perception. Statman and Fisher and Anginer (2008) defines that investor do not frame risk and return together, they often use better and worse frameworks, so that investors often take more risk than they think they are taking.

The human mind tends to make decisions that are easy to compare. Consumers give the valuation of product prices based on avoidance of excess. In a study Tversky and

Simonson (1992), when participants were asked to choose two products, half of those who bought the cheaper product did not want to buy the third, higher-priced product. The cheapest product is considered cheap compared to the two more expensive products. Pricing of options can also guide investors and consumers according to the framing.

It is generally short-term implications that shape investors in their risk preferences. Instead of a more professional risk analysis with the last 5-year or 10-year projections, the preferences are made according to the popular financial instruments offered to the public's suggestion or the daily influence of the market. Framing can be considered as a shortcut in summary.

2.3.Variable That Drive Financial Investment: Consumer Confidence Index (CCI)

2.3.1. Concept of Consumer Confidence

The concept of consumer trust is a subjective concept. There is no single definition agreed on this concept and no single accepted method to measure consumer confidence (Merkle, Langer, and Sussman, 2004, p. 4). Consumer confidence is a measure of optimism about the performance of the economy, which is expressed by consumers' savings and expenditures (Özpınar and Özman, 2017, p. 3). Although it differs in some points, it generally changes in line with economic variables such as interest rates, inflation and unemployment (Fisher and Statman, 2003, pp. 115-116).

Consumer confidence, which is a short public expression of economic conditions, is an economic indicator that is closely watched and discussed. As a matter of fact, policy makers and economists closely follow consumer confidence, which they consider as a useful economic forecasting tool (Merkle, Langer, and Sussman, 2004, p. 3). According to Garner, consumer confidence is in a strong relationship with conventional macroeconomic variables. He argued that the emotions and thoughts of consumers are affected by many economic factors such as national income, commodity prices, exchange rates, industrial production and inflation in addition to psychological, social and political factors (Garner, 1991; Topuz, 2011, p. 54).

Consumer trust essentially forms the basis of the trust expectation that individuals perceive. On the other hand, the experiences they have in their personal world (micro) and the economic indicators of the country and society they live in (macro) affect this perception of trust. Although consumer trust is conceptually evaluated in the field of

microeconomics in terms of economic theory, macroeconomic developments are also influential in the formation of this perception of trust indirectly (Beşel and Yardımlulu, 2016, p. 476).

Two elements related to the concepts of consumer demand and consumer confidence are investigated: The first is whether consumer demand is directly affected by changes in consumer confidence. The second is; whether consumer confidence reflects changes in income, wealth and interest rates that affect consumer demand. The effects of the decrease in consumer confidence in 2008 on the GDP of 2009 were estimated and it was seen that it largely explained the decrease in 2009 (Heim, 2003, p. 1).

While many economists consider consumer confidence to be endogenous and a reflection of current macroeconomic conditions, others argue that, in line with Keynes' notion of the animal spirit, psychological factors that are not captured by economic variables can influence consumers' decisions. According to economists who support Keynes' view, the desire to consume can be an important factor affecting consumption (Desroches and Gosselin, 2002, p. 1).

Katona pioneered a psychological approach to consumption. In Katona's view, consumer spending is a function of both capacity and desire to consume. In this paradigm, consumption depends on individuals' confidence in their future financial situation. The cornerstone of psychological theory is that the desire to consume cannot be explained solely by consumers' response to economic variables. Their willingness to buy is also affected by unpredictable or non-economic factors such as political crises or wars. According to this view, a fall in confidence can also cause a fall in consumption that cannot be predicted by economic variables alone (Katona, 1975; Desroches and Gosselin, 2002, p. 3).

Consumer confidence is measured by consumer confidence indices. The consumer confidence index, which is realized with the participation and evaluation of consumers, is an important phenomenon in terms of being the mainstay of this study.

2.3.2. Consumer Confidence Index (CCI)

Consumer confidence and its impact on financial activities have attracted the attention of a wide audience, from investors to economists and even policy makers. The relationship between these two elements has been frequently investigated in recent years. consumer confidence; It is measured with the Consumer Confidence Index, which is defined as an economic indicator that conveys the opinions of consumers about their

current situation and their expectations for the future (Eyüpoğlu and Eyüpoğlu, 2018, p. 236).

According to another definition, consumer confidence index is the results of the survey conducted with the household, also called the final consumer (Tunalı and Özkan, 2016, p. 55). Confidence indices are considered as a synthesis of macroeconomic variables and psychological factors (Özpınar and Özman, 2017, p. 3). On the other hand, trust levels of financial units are described as social capital (Özpınar and Özman, 2017, p. 3). Consumers' evaluations about the economy of countries can be reached with consumer confidence indices. These indices are considered as a leading indicator used to closely follow the economic developments in the countries, and they produce important values for economic developments. When this situation is evaluated, the follow-up of consumer confidence indices is seen as one of the indices to be taken into account for Türkiye. The phenomenon of consumer trust is dealt with academically within the field of psychological economy. Evaluated from this point of view, the phenomenon accepts that household purchasing behaviors depend on purchasing power and willingness to buy (Katona, 1968/ Tunalı and Özkan, 2016, p. 55). Consumer confidence was associated with economic developments and economic magnitudes were estimated. Consumer confidence has been a tool used to predict future income and household expenditures (Kandır, 2006, p. 217). In measuring consumer confidence, emphasis was placed on monitoring consumer trends. Focusing on consumer confidence reveals a forward-looking approach that seems compatible with the standard theoretical approach of consumption, REPIH (Acemoğlu and Scott, 1994, p. 1).

2.3.3. Types of Consumer Confidence Indices

Consumer confidence indices are an important indicator of domestic demand and economic growth, and falling below 100 causes an expectation that the consumer's spending orientation will decrease in cases where the economic growth expectation weakens. In this case, monetary policies are implemented to increase consumer spending. On the other hand, in cases where this value exceeds the threshold (100 value); it is thought that the expectation and optimism of the consumer about economic growth is high. If this is optimism; savings policies are put into effect (Aydemir, 2016). Consumer confidence indices are also important because they provide data that can be created and explained earlier than other economic data. In this way, it provides the opportunity to detect undesirable/negative trends in the economy in advance and to take necessary measures

(Özdemir, 2013, p. 72). But while the political significance of consumer confidence is widely acknowledged, some commentators have questioned the usefulness of measuring and reporting consumer confidence as a purely economic indicator, voicing doubts about its meaning or value. Confidence surveys have also recently been criticized for methodological reasons for the types of questions and categories of answers they include. (Merkle, Langer and Sussman, 2004, p. 3). In this part of the study, consumer confidence surveys and consumer confidence indices created as a result of their evaluation are explained.

2.3.1.1. University of Michigan Consumer Confidence Index

The longest running trust survey, the University of Michigan Consumer Survey, started annually in 1946. In 1952, a three-month program was started, the Consumer Confidence Index was created in the same year, and it started to be made monthly in 1978. (Merkle, Langer and Sussman, 2004, pp. 5-6). Michigan surveys contain 50 key questions that explore consumer attitudes and expectations. The sample group was designed to represent all US households and included at least 500 respondents interviewed by telephone (Fisher and Statman, 2003, p. 116; Curtin, yy). Bloomberg provides financial support for the survey study conducted by the University of Michigan. The aim of the survey is to evaluate the potential changes in 27 macroeconomics with 50 questions directed to the participants. Analysis often assigns consumer confidence a primary role in determining economic fluctuations. Similarly, as early as 1965, Adams and Green found that the information in the University of Michigan index overlapped with the information on employment and financial conditions in standard government statistics (Desroches ve Gosselin, 2002, p. 1). In addition to the evaluations of the individuals participating in the survey about themselves and their families, the questions of the survey also include their opinions on macroeconomic variables such as the reliability of the economic policies implemented in the country in the current period, the expected inflation rate, housing interest rates, the state of the markets and unemployment (UMSRC, 2011/Mermer, 2014, p. 6).

2.3.1.2. Conference Board Consumer Confidence Index

The Conference Board Consumer Confidence Index was first introduced in 1967 with a bimonthly survey. Since 1977, it has been carried out monthly (Merkle, Langer and Sussman, 2004, p. 6). The Conference Board survey is designed to represent all US households. Survey questions are sent to 5,000 households and the results are based on approximately 3,500 responses (Fisher and Statman, 2003, p. 116).

The Consumer Confidence Index published by the University of Michigan and the Consumer Confidence Index published by the Conference Board are the two most followed measures of consumer confidence in the United States (Desroches and Gosselin, 2002, p. 1). The questionnaire includes two questions about the current economic situation and three questions about future expectations. In both indices, the weight given to current economic conditions is around 40 percent. There are five basic questions in both indexes (The Conference Board, 2011, p. 3):

- Consumer Confidence Index: average of five indices
- Current Situation Index: Index average of questions 1 and 2
- Expectation Index: The index average of questions 3, 4 and 5 (The Conference Board, 2011, p. 3).

Bram and Ludvigson found that the Conference Board Consumer Confidence Index has higher predictive power. According to Bram and Ludvigson, current situation questions in the Conference Board Consumer Confidence Index are sensitive to unemployment rates and wage/salary payments; Michigan University Confidence Index tends to reflect current changes in the economy (Özpinar and Özman, 2017, p. 6).

Consumer confidence surveys are sent to households on the first day of each month. The answers received after the first estimates are made are used to make the final estimates of the month, and the final estimates are explained together with the data for the next month (Mermer, 2014, p.8).

When the two indices are compared in terms of their long-term performances; It can be stated that the Conference Board Consumer Confidence Index laggedly climbed to a high level in the last stages of economic expansion, where unemployment fell and growth matured. The two indices also differ in terms of volatility; It can be said that the Conference Board Consumer Confidence Index fluctuates in a wider band than the Michigan University Confidence Index (Özpinar and Özman, 2017, p.7).

2.3.1.3. European Union Consumer Confidence Index

The Joint Harmonized EU Program of Business and Consumer Surveys (BCS) was initiated by the Commission decision of 15 November 1961. The first survey was the harmonized business survey in the manufacturing industry in 1962. Since then, the sector coverage of the program has expanded considerably. The BCS program was extended to the construction sector and investment plans in the manufacturing sector in 1966, to consumers in 1972, to retail trade in 1984 and to the services sector in 1996 (European Commission, 2016, p. 2).

The BCS is an element of the Commission's Joint Harmonized EU programme. BCS offers a wide range of information on current economic activities and perspectives based on the views of economic actors such as entrepreneurs and consumers. The information provided is essential for economic observation, short-term forecasting and economic research. Survey data are also used to detect breaks in 29 economic cycles. They are a key complement to official statistics, which are usually only available after long delays (EUROSTAT, 2019)

In the text of the agreement titled "*Joint harmonized EU Business and Consumer Research Programme*" published in the EU Official Journal dated 12 October 2006, it was reminded that the European Commission has an important role in informing the EU authorities, member states and various economic agents on the economic situation and expectations, both at national and Community level. In addition, it was emphasized that one of the means of obtaining timely information about economic developments is business and consumer surveys. Therefore, it is stated that the Commission, through the Directorate General for Economic and Financial Affairs, coordinates regular and harmonized business and consumer surveys in different economic sectors in EU Member States and candidate countries (OJEU, 2006, p. C245/5).

BCS surveys cover industry, services, retail, buildings and consumers. In addition, synthetic indicators such as confidence indicators and economic sentiment indicators are also presented. The data are usually conveyed as the balance between the percentage of positive and negative answers to each question (EUROSTAT, 2019).

Surveys are conducted at the national level in cooperation with institutions such as ministries, statistical institutes, central banks, economic research institutes, business associations and private companies. These institutions work with harmonized survey questions prepared in cooperation with the Commission services. Surveys also have some other common elements in the area of sample design, fieldwork, and data transmission

(OJEU, 2006, p. C245/5).

Since 2007, the Commission has surveyed the financial services sector at EU and Eurozone level. The geographic coverage of the program has been regularly expanded to include all member and candidate countries. As of May 2016, the program covers the 28 member states of the European Union and five candidate countries, Albania, Montenegro, the former Yugoslav Republic of Macedonia, Türkiye and Serbia. The early integration of candidate countries into the program is necessary to provide reliable and comparable data to track their economic situation and to guarantee the production of the right EU aggregates when these 30 countries become EU members (European Commission, 2016, pp. 2-3).

The implementers of the survey at the national level are selected by the commission as a result of calls made every 3-4 years. In order to cover the costs incurred as a result of the application of the harmonized method to the survey institutions, the financial aid was limited to half of the total cost of the survey. If national institutions do not apply to conduct a survey, the commission concludes a service contract with an institution of its choice. In this case, all costs are covered by the commission and the commission owns the copyright of all data (Marble, 2014, p. 9).

2.3.1.4. The Central Bank of the Republic of Türkiye and the Consumer Confidence Index of the Turkish Statistical Institute

The CBRT-TUIK Consumer Confidence Index, prepared in cooperation with the Central Bank of the Republic of Türkiye (CBRT) and the Turkish Statistical Institute (TUIK), has been published since January 2004. The method of the index was changed in 2012 and the focus of the survey was on consumers' individual financial situation, current situation assessments regarding the general economy and their expectations for the future. In addition to the aforementioned issues, it is an index consisting of 18 questions harmonized with the EU, which determines the spending and saving tendencies of individuals. The main index is calculated by the equally-weighted average of the sub-indices of "Expectation of the financial situation of the household", "Expectation of the general economic situation", "Expectation of the number of unemployed" and "Probability of saving", covering one year after the survey (CBRT, 2016, p. 3). The CBRT-TURKSTAT Consumer Confidence Index is published regularly every month after the pilot implementation started in 2003. The CBRT-TURKSTAT Consumer Confidence Index includes questions in four areas to measure consumers' orientation and expectations. These areas are personal financial situation, general economy, expenditures and price

expectations (TURKSTAT, 2018).

2.3.4. Factors Determining The Turkstat Consumer Confidence Index

2.3.4.1. Central Bank Policy Rate

The policy rate is the interest rates of the short-term loans given to the banks to provide the liquidity needed by the central banks and the borrowing made to obtain the excess liquidity. Central Banks calculate policy rates according to the course of inflation and take into account macroeconomic indicators in order to maintain the stability of the market. It discloses this to the public in line with the principle of transparency

2.3.4.2. Gold Prices

As an important metal, gold is an investment tool that is widely used all over the world. Due to the fact that it is an instrument that gives confidence in the markets arising from the fluctuations in the financial markets, it also affects the consumer trends. In addition, the power of central banks is measured by gold reserves.

2.3.4.3. Real Exchange Rate

Real exchange rate is the purchasing power of the national currency over foreign currency. Central banks implement monetary policies to protect the strength of the national currency and to ensure price stability. If the national currency has trouble maintaining its value, the ratio of domestic currency deposits to foreign currency deposits decreases. Kolcu and Yamak (2002).

In the loss of confidence in the domestic currency reaches further dimensions, the foreign currency starts to replace the features of the domestic currency as a medium of exchange and unit of account. However, in order for the currency substitution to reach a meaningful level, it is necessary to provide convertibility to the domestic currency. Calvo and Vegh (1993).

The effects of currency substitution on the economy are the loss of influence of central banks on the monetary policies they follow, the inability of states to benefit from seigniorage revenues, the instability in domestic currency demand and the increase in volatility in exchange rates. Tunay (2001).

2.3.4.4. Bank Deposits

In banking literature, deposit means the money deposited by real or legal persons to institutions authorized to collect money, either gratuitously or gratuitously and on

condition that it is repaid. Çevik (2007)

According to the Central Bank of the Republic of Türkiye; Turkish currency or foreign currency deposits, demand deposits that can be withdrawn at any time by the depositor according to their maturity and account holder, are classified in two different ways as time deposits that are repaid with interest at the end of a certain maturity. Banks today set deposit interest rates on the basis of the inflation rate or a few points. Deposit accounts opened in banks; one, three, six months and annual.

2.4. Consumer Price Index (CPI)

Inflation is the increase in the prices of goods and services. These increases may be due to demand or cost. Central banks are authorized to make this price stability sustainable. Statistical institutions calculate inflation according to the services and goods basket. Fiat indices are used in these calculations. The CPI is based on the price comparison of the goods and services used by the household over the next time period, and purchasing power is measured accordingly.

The CPI approach is a comparative basket of goods and services approach whose list of items is evaluated from a nationwide survey. The total price of a basket of goods is evaluated through a time frame in order to find the real, average rate of inflation. Basically there are two types of CPI; fixed basket indices and cost of living indices (COLI). The purpose of the former (also known as pure price index, a cost of goods index and inflation index) is to measure the average price change of a representative basket of goods and services, which is kept constant over time. On the other hand, the purpose of COLI is to measure the change in the minimum cost of maintaining a given level of utility, welfare over time where the quantities are allowed to vary. The content of the basket of the former is decided by government authorities through an evaluation of surveys, whereas the latter is an indicator whose content is decided by non governmental authorities.

Labor wages in the country are determined according to the CPI. The created goods basket has a wide portfolio and is updated on a monthly basis. Therefore, it is easy to follow the route of the annual price increase. Changes in CPI directly affect individuals' spending patterns and deposit movements.

CPI shows computational difficulties due to the fact that food products, which are used more in daily life, are included in the goods baskets and due to the effect of food price fluctuations. It is also severely affected by taxes and subsidies. Non-tradable goods predominate in the CPI, which creates difficulties in measuring and pricing the foreign

trade balance. Wickham (1987)

CPI is simply made of sub-categories which are grouped for different commodity types. The all item CPI is the aggregate index for all broad commodity groups which are made of special categories. The special categories are the aggregation of "Item Stratum"s - the lowest level of aggregation for which an index is calculated by aggregating price quotes (Boskin, 1998). The index is usually computed yearly, or quarterly in some countries, as a weighted average of sub-indices for different components of consumer expenditure, such as food, housing, clothing, each of which is in turn a weighted average of sub-indices. At the most detailed level, the elementary aggregate level, detailed weighting information is unavailable, so elementary aggregate indices are computed using an unweighted arithmetic or geometric mean of the prices of the sampled product offers. A price index as complex as the CPI is the result of successive aggregations of indices; each aggregation level has its independent weightings, with different "ages." The first stage, hereafter referred to as the "lower level", is the calculation stage that yields the highly detailed indices (often called "micro- indices") for highly disaggregated product categories ("sub-items") for a specific geographic region ("urban area"). The micro-indices are obtained from price quotations collected from sales outlets in the urban areas examined. The second stage, hereafter designated as the "intermediary level", yields the indices for product groupings from the micro-indices. In third and final stage, called the "upper level", the overall price index is calculated from the grouping indices. In each stage, a Laspeyres formula is used (or was used, as we shall see). Upper-level weightings are taken from the national accounts. Intermediate-level weightings are usually taken from public or private surveys of household expenditures, or from other sources such as private panel surveys of distributors, production and import statistics, etc. At the lower level, the lack of information has led to the convention of assigning an identical, fixed weight to each product. There are many CPI measures published by the bureaus of statistics, CPI for All Urban Consumers (CPI-U), CPI for Urban Wage Earners and Clerical Workers (CPI-W) and the Chained CPI-U (C-CPI-U). The CPI-U is the popularly followed inflation measure reported in the financial media. It was introduced in 1978 as a more broadly based version of the main CPI, which was renamed CPI-W. The CPI-W is used in calculating Social Security benefits. The C-CPI-U was introduced in the 1990's as an alternate CPI measure.

The currency loses its value with inflation, and there is an increased orientation to dynamic financial instruments such as gold, foreign currency, and real estate instead of domestic currency. In case of inflation, the tendency of the investor to buy or to take a new

investment risk is not observed.

2.4.1 Where Is CPI Used ?

As there are various dynamics of inflation, setting it to an index is crucial for governments in order to establish a perfect forecast of the future. As many of the macroeconomic policies do stem from a consideration of expected level of price changes (Demand and supply adjustments occur respectively as well), CPI is a widely used as a planning tool for administrative authorities. In other words, the CPI is an indicator of the effectiveness of government fiscal and monetary policy. Governments prefer CPI to be present in their macro level strategies in order to:

- **Track inflation:** CPI is a consistent and promising indicator for volatility. Governments need to observe the inflation trends closely due to many macroeconomic and political reasons such as international borrowings, ...

- **Decide on the economical policies:** The past performances of economic policies are significantly important for future government decisions. They are not only observations for effectiveness but also indication of the validity of support for the existing policies.

- **Make wage and price adjustments:** Governments announce the annual expectations for price rises and make revisions periodically. Companies and institutions adjust their price and wage rates accordingly. The CPI is also used to adjust key elements of the individual income tax to limit the extent to which individuals must pay higher taxes solely because of inflation. For example, the amount allowed for personal exemption, the amount of the standard deduction, and tax brackets are adjusted annually according to changes within the CPI in the US.

- **Provide a proof of National accounting principle:** Although there are numerous ways to analyze the national income or gross product figures, the CPI gives a rough estimation of the upcoming quarters based on the previous period's levels.

- **Find an indicator of price analysis:** There are slight changes in price levels over time. Governments try to find effective ways to track the changes such as Consumer price indices.

- **Look for opportunities in trade:** Making a cross comparison of CPIs in countries is a good alternative to find any arbitrary advantages.

- **Define the changes in market prices and house rents**

2.4.2 Historical Background Of CPI

The Consumer Price Index was initiated during the years of World War I, when rapid increases in prices (such as ship building), made an index necessary for calculating cost-of-living adjustments in (real) wages. The goal was to find eligible weighting patterns for the index, so that it would reflect the relative importance of goods and services purchased in many sectors between 1917 and 1919. Periodic collection of prices was started, and, in 1919, the Bureau of Labor Statistics began publication of separate indices for 32 cities. Regular announcement of the national index was started in 1921. Due to the changes in people's purchasing habits, a new study was made covering expenditures in the years 1934-1936, in order to provide a reliable and recent basis for a comprehensively revised index, which was introduced in 1940. During World War II, when many commodities were scarce and goods were rationed, the index weights were adjusted temporarily to reflect these shortages, and occasionally revised up until the late 1970's when point-of-purchase surveys (POPS) were introduced (Wikipedia). The first Consumer Price Index calculated by Turkish Statistics Institute (TurkStat) was an index using 1927 as the base year. This index was then updated to base years 1938 and 1948. Using 70 items, TurkStat continued its studies on the index by carrying out family surveys in Ankara in 1954 and 1955. As a result, the base years of the index were shifted to 1955 and 1958 and covered 137 items. Later, TurkStat calculated a new index with the base year 1968 for 11 provinces. In this index, 106 to 158 items were covered in different provinces. Between 1968 and 1982, the consumer price index of Türkiye was obtained by weighting the consumer price index for 11 provinces. Percentages of population of each of the 11 provinces were used as the weights for the total population. TurkStat carried out a new Household Income and Consumption Expenditures Survey for places with a population of greater than 10 thousand in 1978-1979, and constructed a new urban area consumer price index with base year using 1978 and 1979 as the base years based on this survey. This index, published since 1982, produced indices for 14 provinces, 5 regions and Türkiye as a whole using prices compiled from 40 urban locations. Due to rapid economic, cultural and social changes in Türkiye, there have been great transformations since 1978 in household consumption and income, in the consumption groups' shares in total consumption, and in the goods that are being consumed. Therefore the representativeness of 1978-1979 = 100 based urban consumer price index was criticized with regard to 1980's actual consumption patterns. Because the index's base year was old and consumption patterns had changed, a new index was called for to replace the former one. New consumer price indices covered

5 regions and 16 cities and were prepared using the results of the "Household Consumer Expenditures and Income Survey" carried out in 1987. The survey covered urban areas in 50 urban settlements with a population of more than 20 thousand. This index was constructed separately for rural and urban areas. Due to rapid economic, cultural and social changes in Türkiye, there have been great transformations since 1987 in household consumption and income, in the consumption group's shares in total consumption, and in the goods consumed. Thus again the 1987 = 100 based urban consumer price index was found to be insufficient to cover actual current consumption patterns. Because the index's base years were out-of-date and consumption patterns have changed, a need for a new index arose. New consumer price indices based on the results of the "Household Consumer Expenditures and Income Survey" carried out in 1994 for urban areas in 62 urban settlement's with a population of more than 20 thousand, had been prepared for Türkiye as a whole, 7 regions and 19 cities. The index was constructed separately for rural and urban areas. In 2003, a new producer price index which was developed geographical, population, expenditure, price features and set weights of index. This latest index based on 2003 was calculated by TurkStat as well. Thus, there are various separate data sets of consumer price index in Turkish history which makes things problematic in terms of a historical comparison.

2.5. Interest, The Theories Of Interest And The Role Of Interest In Monetary Policy

2.5.1. Interest and Its Historical Development

Interest; The borrowing and lending price of capital can also be defined as the reward for saving. In other words, it can be expressed as the cost of the money used by the person in need of funds, and the return on the money lent by the fund lender. When the history of interest is examined, it is seen that it emerged much earlier than monotheistic religions. In the ancient period, the seizure of all products, especially the grain products produced by the farmers, put the farmers in a difficult situation, and they started to entrust the products they produced and the goods they deemed valuable to the temples in order to protect themselves. Thus, with the assurance of those who delivered products or valuables to the temples, their thought that no one could enter a holy place by force, and the priests in charge of the temples were well trained and literate in weighing and measuring the goods brought to the temple, there was no problem in the return of the goods delivered to the

temple by the farmers. . With the realization of these transactions in this way, in the face of the problem of lack of space in the temples as a result of the increasing demand, a price began to be taken against the goods entrusted by the religious officials to protect them. Loans have been started for the products that have been entrusted and protected on the condition that they are returned for a while in order to both eliminate the space occupation problem and meet the needs of another person in need. In the beginning, these transactions were carried out free of charge based on trust, but after a while, it was decided to charge a certain amount, considering that it would contribute to the expenditures of the temples. (Eğilmez, 2019).

While no money was demanded in return for the loan of the goods, which were taken under protection by taking a certain price in the temples, to give them back to those in need when the time came, after a while, a price was started to be made to contribute to the temple expenditures. The goods entrusted by the temple officials for a certain period of time were taken back with the addition of the goods entrusted + the specified amount of goods when the time came. The temples were applying an interest system, which is the same as today's interest understanding, which is provided by goods instead of money, by taking more than the surplus of goods to be paid to the party they entrusted. In other words, the temples were lending the goods borrowed at low interest with a higher interest and were performing today's banking transactions in addition to their religious duties (Eğilmez, 2019).

With the good profits of the debt given in return for interest, some people started to do this work outside the temples. In a competitive environment, due to the increasing prevalence of lenders with lower interest rates than temples and the abuse of interest income, religious officials stated that this was not a good thing and said that it should be banned by the rulers. As a result of the pressures of the rulers to restore order, the lenders in return for low interest increased the interest rates again.

The first regulation in history regarding interest is found in the Code of Hammurabi in Mesopotamia. There are approximately 150 articles in the Code of Hammurabi, and there are also restrictions on interest rates among the laws.

Separate interest rates have been determined for borrowed goods to be returned as money and wheat. Today, interest rates affect the expectations of borrowers and lenders, changing the price levels in the future in the direction of expectations. Domestic and foreign market interest rates are important for the economic performance of countries. The level of interest rates determined by the implemented monetary policies create positive

and/or negative effects on macro variables such as economic growth, foreign trade balance, budget balance, employment and inflation. The fact that the interest rates are too high or too low than they should be indicates that the economic performance of that country is not good. Because an increase in interest rates in an economy will first have a positive effect on foreign investors, and will provide foreign currency inflow for the country where the investment is made, and will increase consumption and investment expenditures and reduce savings, depending on the amount of accumulated foreign exchange and the increase in imports and money supply. In the next stage, the current account balance will deteriorate due to the increase in imports, the country will face a large current account deficit, and as a result, it will end with a major financial crisis and economic crises. The fact that interest rates are set well below the required level and even at negative levels also creates problems in the economies of the countries. When we look at the example of some EU countries and Japan, it is seen that their economies do not realize the planned growth rate or even do not grow in periods when interest rates are very low or negative. The fact that economic individuals do not borrow, do not spend in the low interest period and the real economy does not revive can be shown as the reason for this. Therefore, the fact that the interest rate differentials are high in the economies of the countries, especially according to the development level of the countries, gains great importance in terms of both situations. In this sense, the markets take decisions in line with the interest rates to be determined by the central banks and determine their positions accordingly. In short, interest rates become an important policy tool in terms of the internal and external performance of an economy.

2.5.2. Types of Interest

Interest rates are divided into nominal and real interest rates. The distinction between nominal and real interest rates is very important in economic analysis. Since nominal interest rates can be misleading when calculating the return to be obtained, investors mostly determine their investment decisions based on real interest rates. Nominal interest rate is a rate that is determined in line with mutual agreements in the market in borrowing and lending transactions and determines the return to be added to the principal. It is a variable that is taken into account especially in the determination of inflation expectations (Bulut, 2002). Nominal interest can also be expressed as inflation-adjusted interest. The interest obtained by adjusting the nominal interest rate from the expected inflation rate is defined as the real interest rate (Mishkin, 2007, p. 87). The value of money

changes over time. The purchasing power of a coupon you want to buy at the previous price, for example, an interest coupon of 100 liras one year later, may not be one. Real interest is also the return earned by the owner as the purchasing power of loanable funds. In the case where all other variables are constant (*ceteris – paribus*), as the real interest rate decreases, the amount of consumption increases, on the other hand, the amount saved decreases, and it emerges as a result of economic individuals giving up interest. In other words, the opportunity cost of giving up saving and consuming will be real interest. (Parasız, 2011, p. 69). The fact that the real interest rate shows the cost and return of the firm in firm investments shows that firms take real interest into account. Investors increase or decrease the amount of investment according to the low or high real interest rate in the profitability ratio. In short, expected inflation rates and expected real interest rates are taken into account.

2.5.3. Factors Determining Interest Rate

Ekonomilerde faiz oranlarını direkt ya da dolaylı yoldan etkileyen makro değişkenler birincil ve ikincil faktörler olarak ayrıldığında; birincil faktörler para arzı, para talebi ve enflasyon iken ikincil faktörler ise döviz kuru, kamu iç borçlanması ve uluslararası sermaye akımları olarak gösterilmektedir. Diğer yandan bu faktörler ülke ekonomilerine göre de değişiklik gösterebilmektedir (Masatçı ve Darıcı, 2006).

2.5.3.1. Primary Factors

The primary factors that determine the interest rate are inflation rates and changes in money demand and money supply. In general, the increase in the money supply in the economies decreases the interest rates, on the contrary, the interest rates increase. Increases in money demand increase interest rates and vice versa, interest rates decrease. The relationship between interest rates and inflation differs in the short and long run. In general, short-term interest rates are used by central banks as a policy tool and are regulated by considering inflation rates (Bolatoğlu, 2006).

2.5.3.1.1. Changes in the Money Supply

The monetary policies implemented in today's conditions have different results and effects according to the economic structures of the countries. For example, as a result of the increase in the money supply in the USA, interest rates and economic growth rates are not affected much. This is due to the spending tendency and savings culture of the society.

Due to the economic recession in America, the people do not transfer their money to the real economy, which causes interest rates and economic growth to be unaffected. However, when looking at developing countries; The increase in money supply reduces the interest rate for a certain period of time, then causes an increase in inflation, causing interest rates to increase again (Sever and İğdeli, 2016). In this sense, one of the most important factors used for changes in interest rates is money supply changes.

In Figure 1, at the point where the money demand Md curve and the money supply Ms1 curve intersect, there is an equilibrium in the money market at the i_1 interest rate, then the Ms1 curve will shift to the right with the money supply increase and will turn to the Ms2 position. It will drop to i_2 level. When money supply is desired to be reduced, interest rates will increase as reserve holding costs will decrease (Snowdon and Vane 2012).

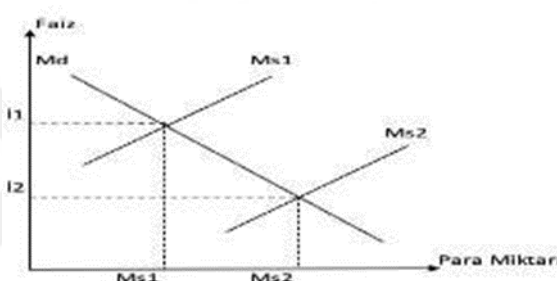


Figure 5. Effect of Change in Money Supply on Interest Rate

2.5.3.1.2. Changes in the Demand for Money

The factors affecting the demand for money are income and price level. When economic individuals increase their income, they will demand more money because they will increase their expenditures, and as a result of the increase in money demand, interest rates will start to increase. On the other hand, since the increase in prices will decrease the real value of the money in hand, individuals will demand more money and interest rates will increase. In Figure 2, at the point where the Money Supply (Ms) curve and the Money Demand (Md1) curve intersect, there is an equilibrium in the money market at the i_1 interest level, then when the money demand is increased, the Md1 curve will shift to the right and become Md2, and the interest rate will decrease from the i_1 level as the opportunity cost of holding money will increase. It will rise to the i_2 level (Snowdon and Vane, 2012).

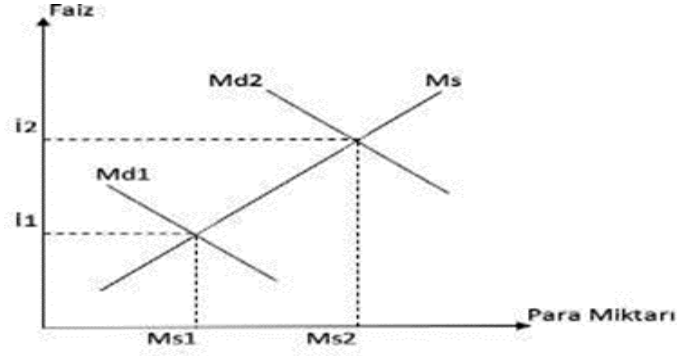


Figure 6. Effect of Change in Money Demand on Interest Rate

2.5.3.1.3. Inflation

The relationship between interest rates and inflation, and the relationship between monetary policies and interest rates and their effects are among the important issues that are constantly discussed in the literature. The positive or negative effects of expected inflation rates as a result of contractionary or expansionary monetary policies reveal the importance of determining interest rates. In this sense, determining the interest rates that should be as a result of expected inflation rates increases the importance of revealing the relationship between inflation and interest.

The fear of high inflation has been particularly worrisome for developing and underdeveloped countries because higher-than-expected inflation will have costly and negative consequences on a country's key indicators such as its payment system, employment, productivity and economic growth. Moreover, this result will present Central Banks with a difficult dilemma. Central Banks will inevitably have to raise short-term real interest rates, which will have demoralizing and negative effects on potential business conditions. However, failure of the implemented policy to respond in a short time may create a crisis of confidence that encourages high inflation to occur; workers and firms demand wage and price increases to protect themselves from higher costs. In short, the hesitant policy of Central banks triggers higher inflation and then they tend to adapt quickly to the realization of monetary growth (Goodfriend, 1993).

Looking at the literature, the Liquidity effect and the Fisher effect, which reveal the extent and effects of the relationship between interest rates and inflationary expectations, draw attention. The liquidity effect can be defined as the relationship between the money supply and interest, which occurs with the opposite reaction of interest rates in the short run to changes in the money supply. Liquidity effect, which was first used in the studies conducted by M. Friedman in 1969, is expressed simply. According to M. Friedman,

individuals' willingness to buy bonds when they have extra money other than their obligatory expenditures will increase bond prices and as a result, interest rates will decrease (Friedman, 1969).

The liquidity effect is related to the short-term response of the monetary policy to be applied in response to the money supply or demand of the market. The liquidity effect shows that there is a negative relationship between inflation expectation and real interest rates in the short run (Bolatoğlu, 2006). Especially, many of the developing countries wanted to keep the interest rate low by applying expansionary monetary policy with the aim of increasing real production and reducing the cost of investment expenditures as a target in economic growth steps. In this sense, the liquidity effect gains great importance for developing countries (Doğan, 2009).

The Fisher Effect is a hypothesis first developed by Irving Fisher in 1930 showing the relationship between inflation and nominal interest rates. Fisher shows in his hypothesis that nominal interest rates are equal to the sum of expected inflation and real interest rates, and accordingly;

According to the Fisher equation: $i = r^* + \pi$

i = Nominal interest rate

r^* = real interest rate

π = expected inflation rate

According to the equation, the continuous increase in the amount of money will result in a decrease in nominal interest rates and then an increase in inflation in the short run, and then gradually interest rates will start to rise again. In the long run, there will be an increase in the amount of money and an interest rate that increases at the same rate as inflation. In other words, while the nominal interest rate and the inflation increase will be at the same rate in the long run, the real interest rate will not be affected by this situation. The reason for this is expressed as the fact that the real interest rate is not affected by monetary variables that affect inflation in the long run (Şimşek ve Kadılar, 2011). Due to the need for foreign capital, especially in developing countries with high inflation rates, the country's interest rate should be higher than that of other countries. Especially in countries with inflation problems, the real return on investment will be low and interest rates will be expected to be high for hedging purposes. The reason why the relationship between interest rate and inflation has weakened in the long run has been the constantly fluctuating inflation rates. In countries where unstable policies and interventions are frequent, unstable interest

and inflation expectations also emerge as a result. (Wood, 1981).

2.5.3.2. Secondary Factors

Secondary factors affecting the interest rate; exchange rate, public domestic borrowing, international capital flows. Ensuring stability in these factors is important in terms of ensuring macroeconomic stability.

2.5.3.2.1. Exchange Rate

With the increase in globalization and the replacement of protectionist policies in domestic and foreign markets by liberal policies, the factors that indirectly affect the interest rate are also increasing. The exchange rate is one of the most important of these factors. The reason for this is considered to be the increase in the demand for foreign currency with the increase in trade between countries and increase the pressure on the interest rate. High interest rates increase the demand for national financial assets, increasing the amount of foreign currency entering the country and increasing the value of the domestic currency. Thus, the demand for domestic investment instruments is also increasing. As interest rates increase, companies and credit institutions increase their interest burden, thus reducing their profits, slowing cash flow, and individuals having difficulty repaying their loans. When the loans are not repaid, the balance sheets deteriorate and the country's currency depreciates by disrupting the economic stability. In addition, as interest payments increase in the public sector, inflation expectations and risk perception increase, therefore, the expected value of the domestic currency decreases and the risk premium increases (Karacan, 2010). The effect of the exchange rate on the interest rate is generally investigated for the crisis periods in which the countries are in (Karaca, 2005). As the exchange rate risk increases, the interest rates also increase (Berumant and Günay, 2003). When we look at the crises experienced especially in developing countries, it is seen that both interest rates and exchange rates have increased.

2.5.3.2.2. Public Domestic Borrowing

Borrowing of the public from individuals and institutions in the country is expressed as domestic borrowing. In domestic borrowing, the idle funds in the hands of the households are transferred to the public in return for a certain maturity and interest rate. While the financing cost of the private sector increases in the face of increasing interest rates due to domestic borrowing, investments also decrease. The increase in public

expenditures due to the exclusion effect leads to a decrease in private sector savings as well as public savings. The most important reason for the increase in interest rates within the framework of the said effect mechanism is that the lenders demand higher interest rates due to the increased risk perception in the face of increasing public debt (Aytaç and Sağlam, 2014). While the public sector shrinks with the increasing interest burden on the one hand, on the other hand, the increase in the financing cost of the private sector will have negative effects on economic growth and may lead to a decrease in the level of national income and welfare.

2.5.3.2.3. International Capital Movements

Today, international capital movements have become increasingly important in both developed and developing countries. In this context, global capital is in constant motion between developing countries in need of financing and developed countries with global funds. This situation causes especially developing countries to give more importance to monetary policies in order to attract global capital and at the same time to use interest rates as an effective monetary policy tool.

It is expected that the movement of global funds between countries will continue until the interest rates expressed in economic theory are mutually equalized (Kula, 2003). This mobility, also called interest arbitrage in the literature, predicts that the capital will continue from the low interest rate to the high interest rate until the interest rates are equalized.

On the other hand, the development of financial markets in developing countries, the increase in the number and variety of securities, the creation of legislation that will make the capital market transparent, the level of economic and political stability in the country will eliminate the sensitivity of the global funds that will come to the country only to interest, and thus reduce the cost of international financing that the country needs.

Due to the fact that foreign capital coming to the country with high interest prefers the financial sector instead of the real sector, the domestic interest rates do not decrease despite the increasing money inflow. The main reason for this dilemma is the high sensitivity of foreign funds to interest rates, in other words, when the interest rates rise, the funds enter the country and when the interest rates fall, they exit the country. This situation, which meets the financing needs of the country in the short term, may lead to the problem of “high interest-low exchange rate” in the medium and long term, and may pave the way for the chronicity of the current account deficit.

2.5.4. The Effect of Interest Rates on Growth

Among the economists' perspectives on interest and theories on how interest rates are determined; Classical Interest Theory, Keynesian Interest Theory and Loanable Funds Theory draw attention. These views put forward that the interest rate should be a variable determined by real factors or that interest should be considered as a purely monetary phenomenon.

According to classical interest theory, interest rates are determined by the supply of savings and the demand for credit. The suppliers of savings are firms that finance investment expenditures and the government that has spent more than its revenues and is willing to finance it. The investments to be made by the investors are realized according to the expected profitability levels. In addition, investment expenditures are inversely proportional to interest rates and directly proportional to savings. Interest rates are the cost of borrowing to finance investment projects. In this context, since the cost of borrowing at a high interest rate will be high, it is thought that investments will decrease, and on the contrary, they will increase.

Keynes explained his views on how to determine interest rates in the short run in his book "The General Theory of Employment, Interest and Money". According to the view called "Liquidity Preference Theory", the interest rate has been put forward to balance the supply and demand of liquid money in the economy (Mankiw, 2010, p. 329). In the theory, also called Keynesian theory of interest, the interest rate is determined in the money market by money demand and money supply.

2.5.5. The Effect of Interest Rates on Unemployment

With the global financialization, especially in developing countries, they preferred high interest low exchange rate policies in order to attract short-term capital inflows. In the low exchange rate environment of countries with high import dependency, the demand for imported products compared to high domestic costs affected the domestic production negatively and subsequently caused the unemployment problem to increase. The decrease in the capacity of exports to meet imports also increased the current account deficit (Gürsel and Ulusoy, 1999, pp. 136-137).

While evaluating the effects of macroeconomic variables and interest rates on the labor market, one should not lose sight of the current economic conditions and the state of expectations. Firms in anticipation of possible increases in production costs will have to

act not only against diminishing profits, but also against excessive expectations. In this context, the reflection of the worsening conditions in the production sector will be directly on unemployment rates, as the general macroeconomic variables are shaped according to expectations. On the other hand, a decrease in any input price can in principle increase output and lead to increased employment in the economy in the long run. However, if the new price level is not expected to last permanently, the employment effects of price decreases will not be permanent. Firms prefer stable prices to better shape their expectations, and the uncertainties in price movements will only remain as the fall in price stimulates the economy for a short time. Interest rates are often a policy tool and are intertwined with expectations about the future state of the economy. In this sense, lowering interest rates can be accepted as an indicator of a possible preventive policy against deteriorating economic conditions. The "price of capital", which is the theoretical equivalent of interest rates, should be adjusted to include the uncertainty surrounding economic activities. Interest rates can act as a determinant of employment in the long run to the extent that they narrow the gap between the rental price and the borrowing rate, but acting by including the uncertainty of real prices in practice will be more revealing on future concerns and unemployment dynamics (Kocaarslan et al., 2020).

Monetary policies implemented by central banks can be effective on unemployment rates. Real interest rates affect the cost of capital; The cost of capital affects the accumulation of capital, the stock of capital affects the demand for labor and the demand for labor affects unemployment. In order for all of this to be relevant to monetary policy, monetary policy must be able to affect real interest rates for a long time. By restraining the decline in capital accumulation, the low real interest rates in the 1970s also limited the rise in the natural rate of unemployment in the 1970s and possibly partially mitigated the rise in labor costs over profit. High real interest rates in the 1980s and early 1990s (as a result of the early 1990s German monetary policy response to German reunification) had the opposite effect, leading to a larger increase in the natural unemployment rate during this period. From the mid-1990s to 2005, the fall in real interest rates probably contributed to the decline in unemployment in Europe. Real business cycle, on the other hand, focused on the effects of real interest rate on labor supply. Ned Phelps drew attention to the effects of the real interest rate on the margins of firms. At this point, interest rate-induced price increases may be effective in the price increase, but the capital accumulation channel is more effective and important in this sense and reveals the relationship between unemployment and inflation. A sustained increase in real interest rates will first lead to an

increase in the actual unemployment rate (the usual aggregate demand effect) and then to an increase in the natural rate of unemployment as capital accumulation declines (Blanchard, 2005).

In the studies of Caplin and Leahy (1996), it was stated that economic agents may expect more reductions in the face of interest rate cuts by monetary authorities during recessions. Therefore, despite the falling interest rates, increases in unemployment rates could not be observed. The results of the study suggest that providing an environment of confidence and reducing price uncertainties may be a more effective policy than interest rates (Caplin and Leahy, 1996).

In the framework of economic and political stability conditions, when the necessary environment of trust is provided and uncertainties are reduced, irreversible investment decisions of companies can reduce unemployment. Since all these structures may differ between countries due to different development levels, macroeconomic characteristics, labor policies and energy import levels, it is possible to come across studies that have different results in different countries in the literature.

Unemployment is seen as a structural problem in Türkiye. Credit-backed import-led growth has been termed "jobless growth". With the CBT's weighted average interest rate, the increase in exchange rates was tried to be limited, on the other hand, the import demand was tried to be reduced by suppressing the effective demand. The reason for this can be evaluated as avoiding the current account deficit in the environment of reversing capital flows.

2.5.6. Effect of Interest Rates on Budget Balance

One of the important issues in the literature is whether interest rates have an effect on the budget deficit or whether increases in the budget deficit lead to an increase in interest rates. In some of the empirical studies, it is stated that the effect of the short-term interest rate applied by the central bank should hide the possible short-term effect of the budget deficit, while the long-term rates are less affected by the actions of the monetary authority (Chopin et al., 1997). On the importance of the relationship between budget deficits, long-term interest rates and the exclusion hypothesis, it shows that if there is a positive relationship between the government's budget deficit and long-term interest rates, then higher deficits will crowd out private spending and slow down economic growth. Short-term interest rates, on the other hand, can stimulate spending and economic growth. Taylor (1995) mentions the long-term effect of the exclusion hypothesis of budget deficits rather

than short-term interest rates. Taylor, L. states that for long-term decisions such as investing in plant and equipment, the long-term interest rate should be a more interesting variable.

Budget deficits are the result of public sector spending more than their income. the budget deficit; The public sector will primarily want to finance it through tax increases, domestic or foreign borrowing or monetary expansion. In the face of chronic high inflation and increasing taxes with high interest rates, the desired result will not be obtained from the tax revenues to be obtained from individuals. In this context, domestic and foreign borrowing or monetary expansion, which is one of the other forms of financing, will be resorted to and an unstable economic structure that is difficult to sustain will be faced. (Aytaç ve Sağlam, 2014) This situation, which has become a vicious cycle, will continue to increase the budget deficits with the addition of new debts on top of the state's old debts with high interest rates.

When the government cannot meet its budget deficits through tax revenues, it has to finance the budget deficit by selling bonds to the public or by borrowing from the central bank. When a borrowing request is made from the central bank, the central bank is in a dilemma as to whether the public deficit should be met. Because if the central bank does not meet the public deficits, the government will implement an expansionary fiscal policy with a policy that is not compatible with the monetary policy, causing interest rates to rise and as a result, the private sector will be excluded. Instead, the central bank may prefer to finance the budget deficit by purchasing securities from the public, but this may result in a further rise in inflation, which is high in the economy. (Aytac ve Sağlam, 2014).

2.5.7. Effect of Interest Rates on Current Balance

Macroeconomic crises in developing countries, including Türkiye, have once again emphasized the need for a clear understanding of the causes of a country's current account balance. Considering that the current account account is used as one of the important indicators for the future behavior of the country's economies and its effect on the daily decision processes of policy makers, its importance increases even more. current account deficit; It is the result of forward-looking savings and investment decisions driven by interest rates, government spending, productivity growth prospects, and many other factors. While a permanent productivity shock that leads to an increase in investments and a decrease in savings may increase the current account deficit, a temporary productivity shock may cause the current account to be in surplus as investments may not be made

(Calderon et al. 2000).

When the short-term interest rates, which are used as a policy tool in monetary expansions implemented by central banks, are reduced, the low cost of short-term capital needs and the appreciation of the country's currency have a positive effect on companies. The decrease in interest rates increases the total credit volume more than it should, and both distorts the resource distribution and also creates a negative effect on other macro variables, especially inflation, and disrupts the economic stability. Households and companies, whose consumption and investment demand increase, increase the credit volume, which enables the economy to grow depending on domestic demand. Growth due to domestic demand will adversely affect foreign trade, especially in countries with high import dependency, together with the weakness of foreign demand, causing the current account to run even more deficit. In order to reduce the current account deficit, which increased due to the total loan volume, higher required reserve ratios were started to be used as a policy tool for the short-term, which started to be used in 2010, and in 2011, a wide interest rate corridor and low policy interest rate were implemented. The policy rate applied by the central bank affects the current account deficit through transmission channels. One of the channels is the exchange rate channel and the other is the credit channel. When the central bank raises the policy rate, it makes TL more valuable by increasing the foreign capital inflow, increases the current account deficit through the exchange rate channel, on the other hand, by controlling the total credit volume, it controls domestic demand and reduces imports, and as a result, it reduces the current account deficit (Cicioğlu et al., 2013).

The monetary policies implemented in the economies of countries that apply flexible exchange rates affect the growth figures by affecting the macroeconomic variables. In particular, when the short-term policy rate is used as a policy tool, it is expected that the total demand will increase within the framework of the low interest policy, and it increases the growth by increasing the total loan volume together with the expansionary monetary policy implemented. Consumption and investment expenditures in economies increase growth on the one hand, and on the other hand, increase the imports of imported consumption and intermediate goods in foreign-dependent countries, bringing along the problem of high current account deficit. From the point of view of the Turkish economy, the high current account deficit during periods of rapid growth reveals that the structural causes of the current account deficit problem should be discussed (Güneş and Yıldırım, 2017).

2.6. Behavioral Finance Impact of the Pandemic on the Consumer Confidence

Index

The aim of this research is to investigate the impact on the consumer confidence index through the lens of behavioral finance. This perspective, combined with traditional financial theories, underscores the significance of psychological and emotional factors in financial decision-making. Research has shown that financial indicators, especially those incorporating emotional and psychological components, such as the consumer confidence index, play a crucial role in economic decision-making (Akerlof ve Shiller, 2009). In this context, the literature highlights the behavioral finance/psychological effects of the pandemic period on the consumer confidence index. An extraordinary period like the pandemic has profoundly impacted consumers' spending habits, savings behavior, and confidence in the economy (Baker ve ark., 2020). Thus, comprehending the behavioral finance/psychological impacts of the pandemic period on the consumer confidence index is pivotal to underscore the influence of psychological elements on economic choices. This aids in enriching the theoretical framework of this study and offers a clearer understanding of the reasons behind the selection of specific variables in terms of behavioral finance (Talwar ve ark., 2021).

CHAPTER 3. LITERATURE REVIEW

Investors try to increase their wealth by taking into account the risk and return relationship of the investment while making investment decisions. Behavioral finance theories argue that investors are influenced by psychological factors during the investment decision stage and make decisions with cognitive and emotional biases. Investors' expectations are one of the psychological factors (Eyüboğlu and Eyüboğlu, 2017). Investor expectations are also affected by the trust perceived by the investors, the experiences of the investors, and the economic conditions of the country and society in which they live. Studies examining the relationship between macroeconomic and microeconomic factors and psychological factors with confidence indices date back to the 1970s for developed countries. It can be said that these studies for our country started in the early 2000s. The Consumer Confidence Index is very effective in reflecting the expectations of consumers, and scientific studies examining the relationship between the Consumer Confidence Index and other factors are included in this section.

3.1. The Relationship Between Consumer Confidence and Exchange Rate

Global, regional and domestic developments and expectations affect the exchange rate, which is one of the pricing mechanisms. Increases in the exchange rate may create negative effects on the consumer and cause a decline in consumer confidence. Alacahan and Yavuz (2017), in their study, determined that the exchange rate is an important factor shaping the economic expectation of the consumer for the future and that there is a short-term relationship between consumer confidence and the real exchange rate. In addition, it was determined that a 1% increase in the real exchange rate decreased consumer confidence by 2.02%. Görmüş and Güneş (2010) found in their study that increases in consumer confidence increase the demand for domestic currency by decreasing the demand for foreign currency in individuals.

Görmüş and Güneş (2010) investigated whether there is a relationship between consumer confidence, Borsa İstanbul 100 index and exchange rates in the 2002: 1 -2008:12 period. The Granger causality test was used as a method in the study and they found that consumer confidence was the cause of the Borsa İstanbul 100 index and the exchange rate was the Granger cause, but exchange rates and stocks did not have a significant effect on consumer confidence.

Beşel and Yarımoğlu (2016) investigated the existence of a relationship between

the Consumer Confidence Index and exchange rates, oil prices and unemployment for the period 2005:01 - 2014:10. Toda-Yamamoto causality test was used as a method in the study. In the results of working; It has been determined that exchange rates are the cause of the consumer confidence index, exchange rates are the cause of the unemployment rate, and oil prices are the cause of the unemployment rates.

Aytekin and Doyar (2019) examined the relationship between Türkiye's Real exchange rate, Total Industrial Production and Consumer Confidence Index for the period 2018:01- 2019:03. Extended Dickey Fuller, Johansen cointegration analysis test and Granger causality analysis test were used for analysis. The findings of the study show that there is a long-term relationship between the variables. There is a bidirectional causality relationship between the exchange rate and industrial production, and the exchange rate is the Granger cause of the Consumer Confidence Index.

Arısoy (2012) applied the VAR Model to the ISE 100 index, real sector confidence index, employment rate, consumer confidence index and industrial production index variables, and calculated the consumption expenditures, real sector confidence index, industrial production index and consumer confidence index in the 2005:01-2012:01 period. It has been determined that it affects the ISE.

İbicioğlu et al. (2013) examined the long and short-term relationships between the exchange rate and the consumer confidence index and found that there are long and short-term relationships between the consumer confidence index and the exchange rate, and that the exchange rate is one of the factors that affect the future expectations of consumers.

Ayuningtyas and Koesrindartoto (2014), considering the period 2000:Q1- 2013:Q4, determined that there was a negative relationship between consumer confidence index and stock return index, and a positive relationship between real sector confidence index and stock return index, as a result of regression analysis.

Kaygısız (2019), selected by analyzing the variables of employment and interest rate, Industrial Production Index, Real Sector Confidence Index, BIST-100 Index, exchange rate, Consumer Price Index and Consumer Confidence Index for the period 2010:01-2018:12 with the VAR model. It has been determined that from macro variables, Consumer Confidence Index and Real Sector Confidence Index are both affected and affect them.

Yazıcı (2019) discussed the period of January 2004-June 2018 in order to analyze the effect of consumer confidence on consumption expenditures for the Turkish economy. By applying the Least Squares (OLS) method, the consumer confidence index has a

positive effect on consumption expenditures, and the Toda-Yamamoto Granger causality analysis has obtained the results that there is a one-way and positive causality relationship from the consumer confidence index to consumption expenditures.

Cingöz and Kendirli (2019) examined the possible relationship between gold prices and the stock market index and the dollar exchange rate. In the study, it was found that the changes in the stock market index and the dollar rate will affect the gold prices in the long run, but they do not affect the gold prices in the short run.

3.2. The Relationship Between Consumer Confidence and Interest Rates

High interest rates are considered as a cost factor for producers. For this reason, investments decrease in periods when interest rates are high, in other words, there is an inverse relationship between interest rates and investments. Increases in interest rates create insecurity in the real sector and cause delays in future investment decisions of companies and cause them not to invest. In the literature on this subject, Canöz (2017) found a one-way causality relationship from the interest rate to the Real Sector Confidence Index in his study. Again, according to Canöz, the increase and decrease in interest rates help us to interpret future economic expectations. Since low interest rates create a positive situation for the financing of investments, real sector representatives decide to invest by looking at interest rates.

Kaygısız (2019) analyzed the relationship between Consumer Confidence Index and Real Sector Confidence Index and exchange rate, BIST100 Index, Industrial Production Index, Benchmark Interest Rate and Employment in the period 2010:01-2018:12 using VAR model. According to the results of the study, it was determined that the Consumer Confidence Index and the Real Sector Confidence Index were both affected by and affected by macroeconomic variables.

3.3. The Relationship Between Consumer Confidence and Consumer Price Index

Consumers' confidence in the future of the economy is very important in terms of economics. This issue is discussed in terms of psychological economics. The important point to focus on here is the purchasing power of consumers and their willingness to buy. Purchasing power depends on one's income, fixed expenses, etc. depends on objective conditions. However, the desire to buy depends on subjective conditions such as the current psychological state of the person, what he needs in the current situation or not (Roos, 2008). In the researches, it has been seen that it is not possible to reach satisfactory results by

examining only the income level of consumers. Consumer confidence indices, which measure both consumption desire and how much this can be realized in real terms, are important in terms of analyzing the consumption behaviors of consumers, as they offer us a distinct perspective (Çelik, Arslanoğlu, and Deniz, 2010).

Küçükçaylı and Akıncı (2018) examined whether there is a relationship between consumer confidence and macroeconomic factors in the Turkish economy in the period 2004:1- 2017:7. Vector Error Correction Model and Engle-Granger cointegration analysis test were used as analysis methods in the study. In the results of working; The increase in BIST100 Index and industrial production increases consumer confidence, but the increase in exchange rates, oil prices, inflation and deposit interest rates reduces consumer confidence.

Sarı and Ilgın (2018) examined the effects of inflation, changes in exchange rates and weighted average funding cost on the Consumer Confidence Index in Türkiye for the period 2011:01- 2018:08. Johansen cointegration test and Granger causality analysis test were used as analysis methods. According to the results of the study; A long-term relationship was found between macroeconomic variables and the Consumer Confidence Index. In addition, one-way causality was found from inflation to the weighted average cost of funding and Consumer Confidence Index, from the Consumer Confidence Index to the weighted average cost of funding, and from the change in the dollar exchange rate to inflation.

Basarir et al. (2019) analyzed the existence of a relationship between the Consumer Confidence Index and financial variables and selected macroeconomic variables in the period of 2012:01- 2018:06. According to the findings obtained; The causality relationship from the Consumer Confidence Index to the industrial production index and the causality relationship from the Borsa Istanbul 100 Index, the US Dollar and the Consumer Price Index to the Consumer Confidence Index have been determined.

Tunalı and Özkan (2016, p. 54), in their study where they analyzed the short and long-term relationships between consumer price index and consumer confidence index, determined two basic 21 variables: consumer confidence index and consumer price index. For each of the aforementioned variables, the data set created through 144 observations at a monthly frequency covering the period 2004:01-2015:12 was used. As a result of the empirical findings, it has been determined that there is a long-term relationship between the consumer confidence index and the consumer price index. In the short term; It has been seen that there is a causality relationship from consumer price index to consumer

confidence index.

3.4. The Relationship Between Consumer Confidence and Gold Prices

The fact that the reasons for the dollar and gold returns discussed in the study are handled within the framework of the economic confidence index should not mean that these two data are not affected by other factors. So much so that there are opinions that these two variables are correlated with each other. (Poyraz and Didin, 2008; Tokat, 2013; Levin, Montagnoli and Wright, 2006; Toraman, Çağırır and Bayramoğlu, 2011; Dooley et al. 1992). The perception that the movements in gold and the dollar affect each other can be briefly explained as follows: while investing in gold and dollars, the decrease in the dollar index is seen as a harbinger of an increase in gold prices, or conversely, the increase in the dollar index can be interpreted as a harbinger of a decrease in gold prices (Kırman, 2016). Apart from these, there are also studies in which other factors affecting the price and return of gold and the effects of these factors on the return of gold are discussed. For example, Elmas and Polat (2014) revealed that gold has a positive relationship with oil, inflation, silver prices, and a negative relationship with index, exchange rate and interest rates. Sarı (2014), on the other hand, reported that the exchange rate was affected by the stock and bond markets. These and similar studies give the result that gold and the dollar rate are also heavily influenced by macroeconomic variables. Ultimately, it will be concluded that the Turkish investor of the US dollar is affected not only by macroeconomic variables, but also by variables such as international politics, media and individual expectations. The volatility in the US dollar price in Türkiye in August 2018 was experienced due to social and political factors and individual expectations influenced by these, rather than macroeconomic variables. Similarly, gold prices and thus real returns can also be affected by economic and non-economic variables. The ratio of the relationship between oil prices and gold is reported as 15.4 according to historical trends (Poyraz and Didin, 2008). There are also studies emphasizing the correlation between gold prices and inflation (McDonald and Solnik, 1977; Jastram, 1977; Jaffe, 1989). When the aforementioned studies are examined, it is seen that there are many factors affecting the real return of gold and the real return of the US dollar.

Küçükçaylı and Akıncı (2018) examined the relationship between Consumer Confidence Index and BIST 100 Index, gold, currency basket, inflation, interest, oil price, industrial production index and unemployment rate. The validity of the long-term relationships between the variables was measured with the Johansen-Juselius Co-

Integration test and the long-term relationship between the variables was determined. As a result of Granger causality analysis findings, one-way causality relationship from Consumer Confidence Index to gold variable, one-way from oil prices, interest rate and inflation to Consumer Confidence Index, bidirectional causality relationship between Consumer Confidence Index and BIST, foreign exchange basket and industrial production index. while found; no causal relationship was found between the Consumer Confidence Index and unemployment.

3.5. The Relationship Between Consumer Confidence and COVID-19 Period

The break in the Sectoral Confidence Indices can be clearly seen in March and later, the date when the Pandemic was declared in Türkiye. However, any break in the Consumer Confidence Index not observed. In addition, considering the months called "New Normal", although there was a rapid upward trend in SGE, there was no such trend in TGE. (Karabulut and Yiğiter, 2020)

Teresiene Keliuotyte-Staniuleniene, Liao, Kanapickiene, Pu, Hu, Yue 2021 used the methods of correlation and regression to assess the impact of the spread of the COVID-19 pandemic on selected economic-sentiment indicators. They selected the following nine dependent variables: (i) Eurozone CCI, (ii) Eurozone manufacturing PMI, (iii) Eurozone services PMI, (iv) United States CCI, (v) United States PMI, (vi) United States services PMI, (vii) China CCI, (viii) China PMI, (ix) and China services PMI.

According to the research, the Eurozone CCI, being on average the lowest of all the regions analyzed (mean—14.508), demonstrated much lower volatility (st. deviation—4.185) than the United States index (st. deviation—16.433), and only slightly higher volatility than the China index (st. deviation—3.796); the lowest value of CCI was observed in April 2020. Being the highest in January 2020 (before the spread of pandemic), the United States CCI experienced the sharpest decline in comparison with other analyzed regions and demonstrated much higher volatility; the lowest values were observed in May 2020 and August 2020 (Figure 1a), which also coincided with the first and the second peaks of COVID-19 pandemic. The China CCI demonstrated the lowest volatility in the face of the COVID-19 pandemic and was on average the highest of all regions analyzed (mean—119.517).

Açikgöz and Günay (2020) states that uncertainty will bring more risks for investors. Türkiye's Economic Confidence Index fell from 97.5 to 91.8 [33] and the Real Sector Confidence Index decreased from 106.9 to 99.7 [34] in March 2020 compared to

the previous month due to the pandemic. The Central Bank of the Republic of Türkiye (CBRT) reduced the inflation rate from 10.75% to 9.75% to improve the financial conditions.

3.5.1. Why is gold considered a psychological indicator in the economy from the behavioral finance perspective?

Gold, which is among the prestigious and traditional financial instruments, is one of the safe savings and investment tools of individuals. The fact that individuals turn to gold according to the risks and uncertainties they perceive in the market shows that they see this financial instrument as a safe haven. Some financial instruments can also be considered as instruments of reputation and status according to the traditional codes of societies. For example; In Türkiye, especially during wedding periods, sales of gold coins increase and the demand for gold increases. Individuals give gold as gifts at weddings as a means of showing their dignity, creating market demand for a purely psychological reason in addition to the generally accepted rules of the market. This factor that affects gold prices is entirely due to the behavioral patterns of individuals.

3.5.2. Why is the COVID-19 pandemic considered a psychological indicator in the economy from the behavioral finance perspective?

People make psychological decisions in events that have a deep impact on their perceptions, behaviors, emotions and the ordinary flow of life. One of the main reasons why the COVID-19 pandemic is followed closely in economic analyzes is the changes it creates in consumer confidence.

Consumers/investors reflect the degree of extreme optimism or pessimism they feel about their financial well-being and the general state of the economy into consumer confidence. They shape the way they perceive events and determine their consumption decisions with the mindsets and biases they have. When people sense uncertainty about their health, income or future, they may choose to reduce their spending and save more due to fear and prejudice. Low consumer confidence index rates that occur in force majeure situations as social crisis, pandemic, war, etc. disrupt economic growth and lead to a decrease in consumer spending.

If investor sentiment is negative, fearful and full of prejudices, it can lead to market fluctuations, sharp declines in asset prices, and perhaps financial crises in the medium and long term. Overconfidence, excessive optimism/pessimism, representative bias,

conservative tendency, anchoring, risk aversion, availability bias, mental accounting, tendency to avoid uncertainty, regret aversion, framing or herding behavior biases can be seen on consumers in times of uncertainty. In times of social crisis and shock, generally accepted models may be inadequate to explain the course of economic indicators and behavioral finance models may be needed more. Monitoring these psychological indicators is crucial to understanding and responding to the economic challenges caused by the pandemic and other crises.

Nowzohour and Stracca (2017), states “*Sentiment may be used to describe economic agents’ views of future economic developments that may influence the economy because they influence agents’ decisions today*”. The economic sentiment includes two opposing dimensions—confidence and uncertainty according to (van der Wielen and Barrios 2020). The COVID-19 pandemic and social and economic constraints induced by this pandemic have undoubtedly brought more tension to the economy (Baker et al. 2020), while at the same time affecting the confidence of households and businesses.

Benhabib and Spiegel (2017) investigated how sentiment or consumer-confidence shocks can influence state outputs and consumptions, and they revealed a significant effect during a one-year horizon. The impact of consumer sentiment on consumption was analyzed by Gillitzer and Prasad (2016). Golinelli and Parigi (2004) investigated consumer sentiment and economic activity and confirmed the consumer-confidence indices’ forecasting ability in the sample and out-of sample periods.

CHAPTER 4. ECONOMETRIC STUDY: EXAMINING THE RELATIONSHIP OF CONSUMER CONFIDENCE INDEX WITH EXCHANGE RATES, GOLD PRICES, CONSUMER PRICE INDEX, INTEREST RATES AND PANDEMICS IN TÜRKİYE TO MEASURE THE INFLUENCE OF TRADITIONAL FINANCE AND BEHAVIORAL FINANCE PRINCIPLES

4.1. Methodology

In the study, the time series method was used as an econometric method that examines the relationship between gold, consumer price index, interest, consumer confidence index, foreign exchange prices and pandemics. In this context;

First, the stationarity levels of the time series were determined by using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests with fixed, fixed-trend and unconstant-trendless models.

Second, with the lag length determination test time was applied for the calculation of the time between two related time series.

Third, Vector Autoregressive Model (VAR) was applied to measure the linear interdependence or interaction between time series. Granger causality test was applied to measure the interaction of the variables with each other. Then, Impact-Response Analysis Results was applied in order to measure the effects of changes between variables on each other. Last, Variance Decomposition Analysis was applied to indicate how much percent of a change that will occur in the CCI variable can be explained by the related variables.

4.1.1. The Concept of Stationarity and Stationarity Tests in Time Series

The stationarity of the variables to be used in the analysis is very important for the reliability of the estimation results. In order for a time series to be stationary, it should follow a probabilistic process whose mean and variance do not change over time, and the common variance between two periods depends only on the distance between the two periods, not on the period in which this common variance is calculated (Gujarati and Porter, 2012).

The econometric findings obtained with the series that do not have a stationary feature, that is, the series containing the unit root, do not reflect the real relationship

between the variables and cause spurious regression. High R2 and significant t-statistics obtained as a result of spurious regression may be misleading. For these reasons, the first step of econometric analysis is to perform the stability analysis of the variables in the model. There are many methods developed for stationarity analysis in time series. In this study, the stationarity properties of the series were investigated using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. These tests are described below, respectively.

4.1.2. Augmented Dickey-Fuller (ADF) Unit Root Test

ADF unit root test is a unit root test developed by Dickey and Fuller (1979). This test, which is used in the literature as an extended DF test, is applied to three different model patterns used as unconstant-no-trend, constant and constant-trend. These pattern patterns are described below. (1)

$$\begin{aligned} \text{No constant term-no trend equation: } & \Delta Y_t = \beta_1 Y_{t-1} + \sum_{t=1}^p \delta \Delta Y_{t-1} + \varepsilon_t \\ \text{Constant term equation: } & \Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \sum_{t=1}^p \delta_i Y_{t-1} + \varepsilon_t \\ \text{Constant term-trend equation: } & \Delta Y_t - \beta_0 + \beta_1 Y_{t-1} + \beta_2 \text{ trend} + \sum_{t=1}^p \delta \Delta Y_{t-1} + \varepsilon_t \end{aligned}$$

In equations 1,2 and 3, Y_t , is the variable whose stationarity is investigated; $\sum_{t=1}^p \delta \Delta Y_{t-1}$ is the dependent variable lags added to the right side of the regression equation in order to eliminate the autocorrelation problem; p is the optimal delay length; ε_t denotes the white noise error term.

The hypotheses regarding the extended Dickey Fuller test are as follows; (2)

$$H_0: \beta_1 = 0$$

$$H_1: \beta_1 < 0$$

The null hypothesis states that the series is not stationary, and the alternative hypothesis states that the series is stationary. According to these hypotheses, for the series to be stationary, the β_1 coefficient must be negative and statistically significant. That is, the t statistic of the coefficient must be smaller than the McKinnon table critical value.

4.1.3. Phillips-Perron (PP) Unit Root Test

In the Dickey-Fuller test, the distribution of random errors is assumed to be statistically independent and with constant variance. By developing this assumption developed by Dickey Fuller, Phillips-Perron made a new assumption regarding the distribution of random errors and that there may be autocorrelation between error terms.

With this assumption, the PP test was developed. There are three models for the PP test, as in the DF test, as unconstrained, constant and constant-trend (Sevüktekin and Nargeleçekenler, 2010).

The statistical value on which the PP unit root test is based is shown below. (3)

$$Z_a = t_a \left(\frac{\gamma_0}{f_0} \right)^{\frac{1}{2}} - \frac{T(f_0 - \gamma_0)S \cdot e(\alpha)}{2f_0^{\frac{1}{2}}S}$$

In equation, γ_0 is the consistent variance of the error term; f_0 denotes the estimator of the error spectrum at zero frequency and S denotes the standard error of the test equation.

The hypotheses regarding the Phillips – Perron test are as follows; (4)

$H_0: \rho = 0$ (The series is not stationary.)

$H_1: \rho < 0$ (The series is stationary.)

The PP unit root test is not effective with small samples, but is effective with large samples. The PP test adds a correction factor to the DF test statistic, and this correction factor is intended to correct the possible autocorrelation and varying variance problem in error terms. Therefore, the PP test is advantageous when autocorrelation or varying variances in equations are uncertain.

ADF and PP unit root test results of the series used in the study are presented in Table 1 for models with and without constant, with and without trend, and with constant and trend.

4.1.4. Co-Integration Test

Co-integration of variables refers to the equilibrium relationship between non-stationary variables. Equilibrium relationship is expressed as that the variables do not act independently of each other. When the ADF and PP unit root tests are examined, it is concluded that the series are not stationary at the same levels and above the I(1) level. Since the series are not stationary at the same level and above the I(1) level, the cointegration relationship between the variables is made with the ARDL bounds test approach.

4.1.5. Vector Autoregressive Model (VAR)

The Vector Autoregressive Model (VAR) developed by Sims (1980), which tries to measure the mutual linear dependence or interaction between multivariate time series, is the multivariate version of the univariate autoregressive (AR) model. In VAR analysis, a vectorial equation system is estimated, in which each time series is internally included in

the system and time series are taken as independent variables up to p delays (Enders, 2010). In this study, a model was obtained by establishing an equation in order to determine the interaction between the republican gold prices and other variables, to reveal the dynamics between the variables and to make predictions for the future.

In order to predict the VAR model, it is necessary to determine the optimal lag length. The appropriate lag length for the VAR model, taking into account the stability of the VAR model, autocorrelation, normality and varying variance tests; It is determined as 4 according to FBE, AIC, SIC and HQ criteria. In this context, the results obtained for the appropriate lag length are shown in Table 5.

4.1.6. VAR Granger Causality Test

The concept of causality can be defined as any cause leading to an effect. Granger (1969) developed a time-series-based approach to determine causality. According to this approach, it is concluded that if x is an effective factor in estimating y, then x is the cause of y. In this direction, it means that if x increases the clarity of the prediction for the future based on the past values of y, it is effective. The causality model within the scope of two variables is as follows; (5)

$$\begin{aligned} \text{and } Y_t &= \sum_{i=1}^m \alpha_i Y_{t-1} + \sum_{j=1}^m \beta_j X_{t-j} + u_{ts} \\ \text{and } X_t &= \sum_{i=1}^m \lambda_i X_{t-i} + \sum_{j=1}^m \delta_j Y_{t-j} + u_{2t} \end{aligned}$$

Four different results emerge from a causality equation for two variables.

1. X is the Granger cause of y.
2. Y is the Granger cause of x.
3. There is no Granger causality between x and y.
4. There is bidirectional Granger causality between the x and y variables.

Table 6 presents the Granger causality results for the variables used in the VAR model in this study.

4.1.7. Impact-Response Analysis

Impact-response functions reflect the effect of a one standard error shock in one of the random error terms on the current and future values of endogenous variables. Which variable is most effective on a macroeconomic quantity can be determined by variance

decomposition; Whether this variable is found to be effective can be used as a policy tool is determined by action-response functions (Özgen and Güloğlu, 2004, p. 97). In other words, impulse-response analysis analyzes the effect of a random 'shock' in one variable on other variables in the system, and in this regard, it plays an important function in guiding economic policies.

4.1.8. Variance-Decomposition Analysis

Variance decomposition investigates what percentage of the change in a variable is due to itself and what percentage is due to other variables. If it explains nearly one hundred percent of the change in variance on its own, it is considered an exogenous variable. The order of the variables in this analysis is very important. The order is from external to internal. Variance decomposition is the second function targeted in VAR. It investigates what percentage of the change in the variance of each of the variables examined is explained by its own lags, and what percentage is explained by other variables. It can also be used as a side evaluation about whether variables are internal or external (Tarı, 2006, pp. 452-453).

4.2. Results

Table 2. Variable Descriptions

	Source	Explanation
CCI	EVDS	Comsumer confidence index (percentage)
COVID		It is a dummy variable determined by the pandemic start and end date announced by WHO. COVID periods are selected as 1 and non-COVID periods as 0.
CPI	EVDS	CPI is the Monthly Percentage Change variable.
GOLD	EVDS	1 Ounce Gold London

		Selling Price (USD/Ounce)-Level values.
INT	EVDS	Policy Rates.
REELDK	EVDS	CPI Based Real Effective Exchange Rate (2003=100)-Level values.

Table 3. Descriptive Statistics

	CCI	COVID	CPI	GOLD	INT	REELDK
Mean	87.07969	0.177083	1.126927	1336.232	13.45833	95.27677
Median	89.20000	0.000000	0.805000	1287.175	11.37500	102.1150
Maximum	99.70000	1.000000	13.58000	1964.400	25.50000	127.7100
Minimum	63.40000	0.000000	-1.440000	625.9400	6.500000	47.69000
Std. Dev.	7.580890	0.382737	1.659460	330.0248	5.258646	21.62637
Observations	192	192	192	192	192	192

When the descriptive statistics shown in Table 1 are examined, it is seen that there is a slight difference between the minimum and maximum values of the variables. While the presence of 192 observations for each variable shows that there is no data loss, the low standard error values as desired are considered positive regarding the consistency of the predictions. The COVID variable was added to the model as an exogenous variable to reduce the endogeneity problem. Thus, it is aimed not to ignore the theoretical impact of COVID, which had significant effects on economic activities at the global level between March 2020-2022.

Table 4. Unit Root Tests

	None	ADF		PP		Trend + Stat.	ADF		PP	
		t-stat	Prob	t-stat	Prob		t-stat	Prob	t-stat	Prob
C C I	Level	-0.703	0.411	-0.759	0.386	Level	-2.677	0.247	-2.641	0.262
	1st diff.	-13.273***	0.000	-13.38***	0.000	1st diff.	-13.22***	0.000	-13.35***	0.000
C P I	Level	-1.937*	0.051	-5.321***	0.000	Level	-3.799**	0.019	-7.475***	0.000
	1st diff.	-6.456***	0.000	-16.33***	0.000	1st diff.	-6.42***	0.000	-16.24***	0.000
G O L D	Level	0.887	0.899	1.066	0.925	Level	-1.989	0.603	-1.893	0.654
	1st diff.	-10.62***	0.000	10.62** *	0.000	1st diff.	-10.71***	0.000	10.71***	0.000
I N T	Level	-1.588	0.105	-1.411	0.147	Level	-3.413*	0.053	-2.682	0.245
	1st diff.	-4.84***	0.000	12.88** *	0.000	1st diff.	-4.836***	0.000	12.85***	0.000
R E L D K	Level	-1.73*	0.08	-1.404	0.149	Level	-2.77	0.21	-3.273*	0.074
	1st diff.	-8.142***	0.000	10.82** *	0.000	1st diff.	-8.437***	0.000	10.90***	0.000

Note: *, ** and *** indicate the significance levels of 10 percent, 5 percent and 1 percent, respectively.

In order for the VAR model to give consistent interpretations, it is critically important that the variables are equally stationary. Table 3 shows the results of ADF and PP unit root tests, which are widely used in the literature and give consistent results. When the level values of the variables are examined, it is seen that all of the probability values, except CPI, are higher than the critical value of 0.05. While the CPI variable is stationary at the none level of the ADF unit root test, it becomes stationary when its first difference is taken. In this case, the basic hypothesis of unit root tests, " $H_0: \rho = 0$ ve $\beta = 0$ " and the hypothesis that the series are not stationary at level are accepted at the 5 percent critical level. However, when the first differences of the variables are taken, the probability values fall below the 5 percent critical value, and therefore the basic hypothesis is rejected, and the variables, which are the alternative hypotheses, are accepted to be stationary in their first differences. Therefore, all series are equally stationary.

Before moving on to the Variance Autoregressive Model, the lag of the model must

be determined. Since the VAR model is a dynamic model, the variables are analyzed with their lags. The lag length test can be seen in Table 4.

Table 5. Lag Length Determination Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3488.590	NA	1.00e+10	37.21904	37.39119	37.28879
1	-2459.872	1980.82 9	231416.5	26.54119	27.14372*	26.78531 *
2	-2422.562	69.8570 2	203152.8*	26.41023*	27.44314	26.82873
3	-2401.532	38.2552 1	212259.4	26.45247	27.91576	27.04534
4	-2373.073	50.2585 7*	205185.2	26.41567	28.30933	27.18291
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

When the test in which the delay length is determined is examined, it is seen that the lowest values are in the 2nd delay in the AIC and FPE tests. It is also seen that the AIC value is lower than the SC and HQ tests. Therefore, the VAR model will be established with two-lag values of the variables. Details about the established VAR model are included in the appendices of the study.

It is very important that the VAR model satisfies the stationarity condition. The fact that the characteristic roots remain within the unit indicates that the model is stable and applicable. Table 5 indicates the roots of the characteristic polynomial of the model.

Table 6. Distribution of Polynomial Roots of the VAR Model

Root	Module
0.971677	0.971677
0.948551	0.948551
0.917970 - 0.084860i	0.921884
0.917970 + 0.084860i	0.921884
0.389627	0.389627

0.129644 - 0.245205i	0.277368
0.129644 + 0.245205i	0.277368
0.248741 - 0.052058i	0.254130
0.248741 + 0.052058i	0.254130
-0.165794	0.165794

Granger Causality analysis was applied to investigate the existence of a relationship between variables. The results of this analysis are included in Table 6. When the relationship between the variables that constitute the purpose of this study is examined, it is seen that there is a significance level of 10 percent from the INTEREST variable to the USD/TL exchange rate. This relationship is interpreted as INTEREST variable is the Granger cause of the EXCHANGE RATE variable at the 10 percent significance level." On the other hand, as expected, the real EXCHANGE RATE variable is also the Granger cause of the CCI variable.

Table 7. Granger Causality Analysis

Dependent variable: CCI			
Excluded	Chi-sq	df	Prob.
CPI	4.319	2	0.115
GOLD	0.286	2	0.866
REELDK	21.527	2	0.000
INT	12.83	2	0.016
All	32.521	8	0.000
Dependent variable: CPI			
Excluded	Chi-sq	df	Prob.
CCI	0.587381	2	0.7455
GOLD	0.050602	2	0.9750
INT	19.82203	2	0.0000
REELDK	6.494599	2	0.0389
All	26.37746	8	0.0009
Dependent variable: GOLD			
Excluded	Chi-sq	df	Prob.
CCI	3.332031	2	0.1890
CPI	0.625388	2	0.7315
INT	1.970151	2	0.3734
REELDK	0.811883	2	0.6663
All	4.581040	8	0.8013

Dependent variable: INT			
Excluded	Chi-sq	df	Prob.
CCI	14.82039	2	0.0006
CPI	1.619347	2	0.4450
GOLD	5.726297	2	0.0571
REELDK	10.66810	2	0.0048
All	27.43352	8	0.0006
Dependent variable: REELDK			
Excluded	Chi-sq	df	Prob.
CCI	2.582733	2	0.2749
CPI	10.92994	2	0.0042
GOLD	2.142927	2	0.3425
INT	3.248283	2	0.1971
All	18.95842	8	0.0151

INTEREST and EXCHANGE RATE variables were found to be Granger causes of the CCI variable at all statistical significance levels. While Granger causality analysis provides information that there is a causal relationship between variables, it does not provide information about the severity and sign of this relationship. Impact-Response analysis and Variance Decomposition analysis will be used to better understand the relationship between these variables.

According to the Impact-Response analysis results in Figure 2.7, the results are considered to be consistent because the values (blue) are distributed within the confidence interval levels (red). In case of a shock in the CPI variable, it is observed that the CCI variable follows a decreasing trend until the 6th period, and it is expected to rise to its normal level again after the 6th period. It has been determined that shocks in the GOLD variable affect CCI in a very limited and positive way. Within the framework of the variables examined in this study, it can be said that one of the variables that has the most impact on CCI is the INTEREST variable. A shock to this variable is considered to have a negative and ever-increasing impact on the CCI, which is expected to last more than 12 periods, in line with expectations. As seen in the graph, the negative impact that started in the 3rd Period increased until the 10th Period and became stable at the end of the 10th Period. A shock in the EXCHANGE RATE variable was observed to have a positive effect on CCI, again in line with theories. Although the CCI rose for a very short period until the beginning of the 2nd period and then entered a downward trend, 12 periods do not seem to be enough for it to return to its previous level. Therefore, it can be considered that the

EXCHANGE RATE variable has a strong, long-lasting and positive effect on CCI.

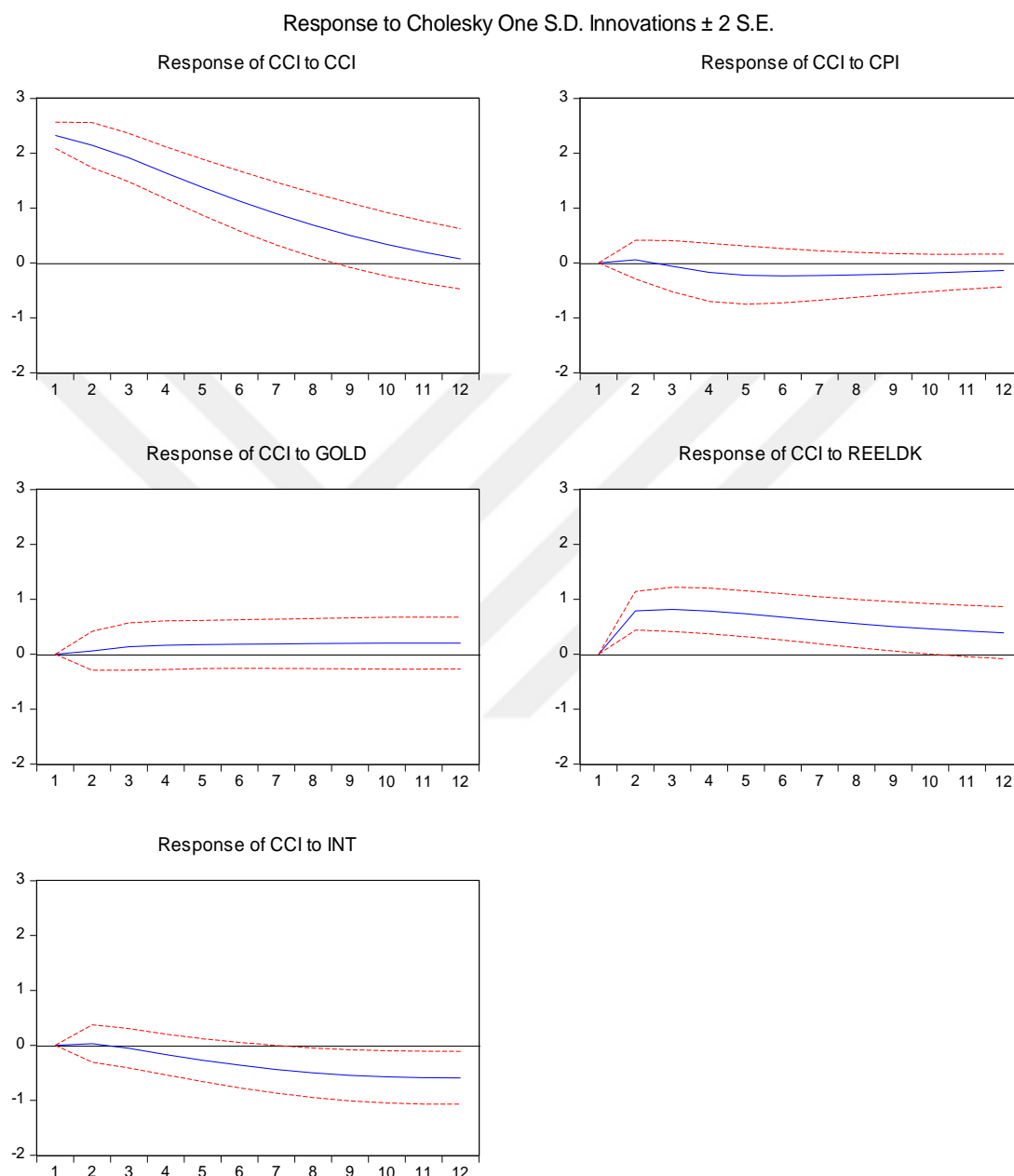


Figure 7. Impact-Response Analysis Results

Apart from the Impact Response analysis, the results of the Variance Decomposition analysis, which was conducted to indicate what percentage of a change in the CCI variable can be explained by the relevant variables, for 12 periods (1 year) are shown in Table 7. As a result of this analysis, as expected, the entire change that will occur in the CCI variable in the first period, when it has no impact on the market, is explained by

itself. However, looking at 6 periods later, 0.61 percent of the change in the CCI variable can be explained by CPI, 0.498 percent by changes in GOLD, 1.026 percent by INTEREST and 12.683 percent by EXCHANGE RATE. 85.173 percent of the change appears to be related to the CCI variable itself.

Table 8. Variance Decomposition Analysis

Period	S.E.	CCI	CPI	GOLD	REELDK	INT
1	2.326832	100.0000	0.000000	0.000000	0.000000	0.000000
2	3.263404	94.04248	0.034174	0.034129	5.879578	0.009644
3	3.875368	91.16999	0.048180	0.151535	8.603741	0.026553
4	4.291076	88.97322	0.201091	0.270388	10.37940	0.175900
5	4.583707	87.02246	0.413328	0.384751	11.67831	0.501151
6	4.792119	85.17339	0.618181	0.498096	12.68356	1.026774
7	4.942895	83.36425	0.796502	0.613772	13.47136	1.754113
8	5.055027	81.57015	0.945402	0.732974	14.09352	2.657951
9	5.141795	79.79925	1.065175	0.855489	14.58573	3.694354
10	5.212259	78.07922	1.157012	0.980244	14.97284	4.810682
11	5.272447	76.44446	1.222947	1.105682	15.27358	5.953333
12	5.326221	74.92713	1.265854	1.230057	15.50362	7.073333

At the end of 12 periods (1 year), the explanatory power of the EXCHANGE RATE (REELDK) variable for the changes in the CCI variable increased to 15.503 percent, while the INTEREST variable increased to 7.073 percent, and the GOLD and CPI variables increased to 1.23 percent and 1.265 percent, respectively. At the end of 1 year, the effect of the CCI variable on the changes that will occur in it has decreased to 74.927 percent.

Table 9. VAR Model

	Consumer Confidence Index	CPI Monthly Change	INT	REELDK	GOLD2
CCI(-1)	0.806698	0.015885	-2.284365	0.028256	0.012355
	(0.08054)	(0.04184)	(1.62608)	(0.09378)	(0.04142)
	[10.0155]	[0.37969]	[-1.40483]	[0.30130]	[0.29831]
CCI(-2)	0.037986	-0.001790	2.827182	-0.089233	0.058403
	(0.07882)	(0.04094)	(1.59120)	(0.09177)	(0.04053)
	[0.48195]	[-0.04372]	[1.77676]	[-0.97237]	[1.44103]
CPI(-1)	0.069161	0.520677	-2.288990	0.552533	0.054936
	(0.14363)	(0.07461)	(2.89977)	(0.16724)	(0.07386)
	[0.48151]	[6.97884]	[-0.78937]	[3.30389]	[0.74380]
CPI(2)	-0.287277	-0.011636	1.231485	-0.285468	0.039985
	(0.14355)	(0.07456)	(2.89806)	(0.16714)	(0.07381)
	[-2.00123]	[-0.15606]	[0.42493]	[-1.70797]	[0.54169]
INT(-1)	0.027119	-0.173791	-0.887765	0.301440	0.964114
	(0.14408)	(0.07484)	(2.90881)	(0.16776)	(0.07409)
	[0.18822]	[-2.32214]	[-0.30520]	[1.79687]	[13.0130]
INT(-2)	-0.175238	0.189933	0.140397	-0.283208	0.004388
	(0.14475)	(0.07519)	(2.92226)	(0.16853)	(0.07443)
	[-1.21063]	[2.52614]	[0.04804]	[-1.68042]	[0.05895]
REELDK(-1)	0.311508	-0.149361	0.788733	1.256597	-0.076493
	(0.06716)	(0.03488)	(1.35581)	(0.07819)	(0.03453)
	[4.63847]	[-4.28169]	[0.58174]	[16.0705]	[-2.21507]
REELDK(-2)	-0.309431	0.139227	-1.192882	-0.257614	0.057014
	(0.06889)	(0.03578)	(1.39083)	(0.08021)	(0.03543)
	[-4.49151]	[3.89068]	[-0.85767]	[-3.21163]	[1.60943]
GOLD(-1)	0.000800	-0.000294	1.188685	0.006151	-0.004281
	(0.00366)	(0.00190)	(0.07380)	(0.00426)	(0.00188)
	[0.21877]	[-0.15479]	[16.1071]	[1.44512]	[-2.27731]

GOLD(-2)	-0.001187	0.000355	-0.234507	-0.006125	0.003774
	(0.00361)	(0.00187)	(0.07279)	(0.00420)	(0.00185)
	[-0.32923]	[0.18932]	[-3.22149]	[-1.45906]	[2.03557]
C	16.21081	-0.164874	65.04217	4.872676	-3.409988
	(3.76170)	(1.95394)	(75.9432)	(4.37983)	(1.93430)
	[4.30943]	[-0.08438]	[0.85646]	[1.11253]	[-1.76291]
COVID	-0.763267	0.627197	19.17803	-1.634317	0.194945
	(0.77194)	(0.40097)	(15.5844)	(0.89879)	(0.39694)
	[-0.98876]	[1.56420]	[1.23060]	[-1.81836]	[0.49112]
R-squared	0.911409	0.505173	0.980200	0.985266	0.950198
Adj. R-squared	0.905935	0.474594	0.978976	0.984356	0.947120
Sum sq. resids	963.7178	260.0176	392788.1	1306.458	254.8167
S.E. equation	2.326832	1.208624	46.97526	2.709179	1.196476
F-statistic	166.4763	16.52016	801.0639	1082.111	308.7394
Log likelihood	-423.8569	-299.4022	-994.8285	-452.7632	-297.4828
Akaike AIC	4.587967	3.277918	10.59819	4.892244	3.257713
Schwarz SC	4.793042	3.482993	10.80327	5.097319	3.462788
Mean dependent	87.00632	1.131263	1343.505	95.08705	13.36316
S.D. dependent	7.586647	1.667416	323.9746	21.66019	5.203055
Determinant resid covariance (dof adj.)	145721.5				
Determinant resid covariance	105161.2				
Log likelihood	-2446.500				
Akaike information criterion	26.38421				
Schwarz criterion	27.40959				

Note: () shows standart errors ve [] shows t-statistics values.

CHAPTER 5. CONCLUSION

Behavioral finance, as of its development, has been closely interested in disciplines such as sociology and psychology and has used it in its models. Behavioral finance takes an approach that recognizes that people cannot be rational. Because when people make decisions, they are under the influence of factors such as environmental and familial factors, as well as their emotions and psychological effects.

Recently, during the COVID-19 pandemic period and post-pandemic times particularly, it has been possible to see that all economic actors adhere to behavioral finance principles rather than traditional finance principles. Because in this period, the decisions of both consumers, producers and investors differ due to uncertainty. In fact, there was an expectation of a crisis. However, this time the crisis looked like a crisis that starts from the real sector and progresses to the financial sector. As it is known, previous crises are those that occur from the financial sector to the real sector. In general, it is possible to see the effect of psychological factors and therefore behavioral finance behind all kinds of economic decisions taken in this process.

In behavioral economics, specific models that directly examine the relationship between consumer confidence index and interest rates, exchange rates, consumer price index, and gold prices may not exist. However, behavioral economic principles and concepts can provide insights into how individuals form their perceptions, make decisions, and respond to changes in these economic variables.

While specific models may not directly incorporate all of these concepts in the context of consumer confidence and the mentioned economic variables, behavioral economics offers a valuable framework to understand how individuals' cognitive biases and heuristics influence their confidence levels and subsequent behavior. Integrating behavioral economic concepts with empirical data can provide insights into the relationship between consumer confidence and interest rates, exchange rates, consumer price index, gold prices and COVID-19 pandemic.

Investor sentiment is one of the explanatory theories that examine these effects. Economic individuals and investors sometimes carry out their transactions in line with rumors in financial transactions, ignoring full and true information. That is why, in the economic process, Consumer Confidence Indices are preferred because the changes in index values are successful as an indicator of reflecting the markets and because they play an active role in the formation of their expectations for the future.

The relationship between consumer confidence and various economic variables, such as exchange rates, interest rates, gold prices, the consumer price index (CPI) and COVID-19 pandemic period is the core of study. Exchange rates, which reflect the value of one currency relative to another, can impact consumer confidence through several channels. A stronger domestic currency can make imports more affordable, potentially boosting consumer confidence by offering a wider range of products at lower prices. Conversely, a weaker domestic currency may lead to higher import costs, which can negatively affect consumer confidence as it may reduce purchasing power and increase inflationary pressures.

Changes in interest rates has the most significant impact on consumer confidence in our study. When interest rates are low, borrowing costs may decrease, making it more affordable for consumers to finance purchases and investments. This can contribute to increased consumer spending and confidence in the economy.

Gold is considered as a psychological factor and safe haven during times of financial crises or economic uncertainty. Therefore, even if consumer confidence declines, investors may turn to gold as a safe asset. This situation limits the impact of gold on the consumer confidence index. In our study, it was determined that gold was not the Granger cause of CCI and shocks in the gold variable had a very limited and positive effect on CCI.

CPI measures the average change in prices of goods and services consumed by households. According to generally accepted macroeconomic rules, changes in CPI affect consumer confidence by affecting purchasing power and inflation expectations. When the CPI increases at a rapid rate, it can erode consumers' purchasing power, leading to reduced confidence and spending. Conversely, stable or declining CPI levels increase consumer confidence by preserving the value of money and ensuring price stability. However, on the other hand, in our study, CPI is not the Granger cause of CCI. In case of a shock in the CPI variable, a decreasing trend in the CCI variable is expected for up to 6 periods, and after 6 periods, the CCI is expected to reach normal levels. This is because consumers' adaptation to CPI increases over time and their reactions to CPI changes normalize.

It's important to note that the relationship between consumer confidence and these economic variables is complex and can be influenced by a range of factors, including economic conditions, government policies, and global market trends. Analyzing empirical data and employing econometric models provided a more nuanced understanding of the relationship between consumer confidence and these variables.

In this study, the relationship between the Consumer Confidence Index, which is

assumed to be an indicator of investor sentiment, and the Exchange Rate, Gold Prices, Consumer Price Index, Interest Rates and COVID period were examined. The COVID variable was added to the model as an exogenous variable to reduce the endogeneity problem. Thus, it is aimed not to ignore the theoretical impact of COVID, which had significant effects on economic activities at the global level between March 2020-2022. According to the results of the research, interest rate that has the greatest impact on CCI. Rate shocks have a negative and ever-increasing effect on the CCI lasting more than 12 periods. In addition, currency has a strong, long-lasting effect on CCI. Gold and CPI are not the granger reason for CCI, but interest rates and currency are the granger reason for CCI.

In impulse-response analysis, While shocks in the CPI variable normalize after a while, the impact of shocks in the gold variable is limited.

In the variance decomposition analysis, the power of currency and interest rate to explain CCI increases. However, the power of gold and CPI to explain the CCI variable remains limited.

While Vuchelen (2004) supports our finding about the interest variable in his study, Vuchelen (2004) examined the relationship between the information content of consumer confidence and some economic and financial variables such as unemployment, growth rate, interest rate and exchange rate in Belgium during the 1985-2000 period. In his research, he determined that the interest rate and the dollar exchange rate have a negative effect on consumer confidence. The coefficient of lagged consumer sentiment drops significantly and two variables (the dollar exchange rate and the short term interest rate) are no longer statistically significant.

Aktaş (2011) supports our finding regarding our Consumer Price Index variable. In the study, as a data set, the relationship between economic indicators such as inflation rates, unemployment rates, exchange rates and Consumer Confidence Index in the sample of USA, England, Türkiye, Japan, Canada in the period 2005:01-2010:12. According to the findings, economic indicators followed the Consumer Confidence Index performance.

The positive relationship between the consumer confidence index and exchange rates suggests that consumer confidence can be considered an indicator in foreign exchange markets (Hau et al., 2009). As consumer confidence in economic prospects increases, demand for foreign currencies may also rise.

In the study, the relationship between Consumer Confidence Index, Exchange Rate, Oil Prices and Unemployment in Türkiye was analyzed with monthly data as of the period

2005:01- 2014:10. According to the results of the Toda-Yamamoto causality test, it was concluded that there is a one-way causality relationship from exchange rate to consumer confidence index, one-way from exchange rate to unemployment rate, and one-way causality relationship from oil prices to unemployment rates. Beşel and Yardımoğlu (2016)

The short and long-term relationships between the exchange rate (USD-TL) and the consumer confidence index in Türkiye were examined and in the study, a total of two variables, the consumer confidence index and the dollar selling rate, were handled and within the scope of the analysis, the period 2004:01-2016:12 for each variable. analyzed using various econometric methods. The result reached in the study is that there is a relationship between the consumer confidence index and the exchange rate between the period examined in Türkiye. It has been determined that a 1% increase in the exchange rate causes a 0.51% decrease in consumer confidence. Also, the relationship between exchange rate and consumer confidence was analyzed with the econometric model and a similar causality relationship was found with Türkiye. Özpınar and Özman (2017).

While (Karabulut and Yiğiter, 2020) analyzed a clear break in the sectoral confidence indices in March 2020 and thereafter, they could not detect this break in the consumer confidence index. In the subsequent "new normal" period that came with the pandemic, they did not see an upward trend in the consumer confidence index. Our study also examines the shocks caused by the pandemic on the consumer confidence index for the longer periods from the beginning of the pandemic until the end of December 2022. We can analyze better the break in the consumer confidence index in this long period.

Teresiene Keliuotyte-Staniuleniene, Liao, Kanapickiene, Pu, Hu, Yue 2021 used the methods of correlation and regression to assess the impact of the spread of the COVID-19 pandemic on selected economic-sentiment indicators. They selected the CCI variables in pandemic period in Eurozone, the United States and China. All regions concluded that the standard deviation in CCIs was high in May 2020 and August 2020, when pandemic cases peaked. Particularly in the United States, which has the highest number of cases, the CCI has had the largest decline but has shown higher fluctuations.

Açikgöz and Günay (2020) states that uncertainty will bring more risks for investors. Türkiye's Economic Confidence Index fell from 97.5 to 91.8 [33] and the Real Sector Confidence Index decreased from 106.9 to 99.7 [34] in March 2020 compared to the previous month due to the pandemic. The Central Bank of the Republic of Türkiye (CBRT) reduced the inflation rate from 10.75% to 9.75% to improve the financial conditions.

Behavioral finance theories and investor sensitivity and psychology have made important contributions in expressing some unexplained phenomena, namely anomalies, seen in financial markets. Behavioral Finance explains the behavior of investors and economic individuals trading in the market. In Behavioral Finance, investor psychology is examined and tried to be explained in terms of its effects on financial markets.

In this study, the relationship between the Consumer Confidence Index, which is assumed to be an indicator of investor sentiment, and the Exchange Rate, Gold Prices, Consumer Price Index, Interest Rates and COVID period were examined. In an explanatory way, the effects of Exchange Rate, Gold Prices, Consumer Price Index, Interest Rates and COVID period on the Consumer Confidence Index were investigated. Representing the investor sensitivity in Türkiye, the relationship between the Turkish Statistical Institute Consumer Confidence Index and the Exchange Rate, Gold Prices, Consumer Price Index, Interest Rates and COVID period (March 2020- December 2022) was examined between January 2007 and December 2022, and the Exchange Rate, Gold Prices, Consumer Price Index, Interest Rates and COVID-19 period were analyzed with the expectations of the investors in Türkiye. The effects of the future concerns arising from the rates on the Consumer Confidence Index were investigated.

Time series analysis model was used to examine the relationship between selected variables within the scope of the research. Again, the determination of causality and the direction of causality between the mentioned variables was carried out with the Granger Causality Test method. According to the results of the Granger Causality Test, it was seen that the other macroeconomic variables, excluding the Exchange Rate and Interest Rates, among the analyzed variables, did not give significant results on the Consumer Confidence Index of the Turkish Statistical Institute. In addition, it was concluded that the Exchange Rate and Interest Rates variable were significant on the Turkish Statistical Institute Consumer Confidence Index and were the cause of Granger.

According to the findings obtained from the analysis, a statistically significant relationship was found between Consumer Confidence and Exchange Rate and Interest Rates. In other words, Interest Rates shocks have a negative and ever-increasing effect on the CCI lasting more than 12 periods. In addition, currency has a strong, long-lasting effect on CCI. While shocks in the CPI variable normalize after a while, the impact of shocks in the gold variable is limited. In the variance decomposition analysis, the power of currency and interest rate to explain CCI increases. With this study, it can be interpreted that the Exchange Rate and Interest Rates in Türkiye played an important role in the consumer

confidence. In this study, it has been observed that the impact of Exchange Rate and Interest Rates has a strong explanatory influence on consumer confidence in the research periods.

Indicators that direct the expectations and tendencies of households can affect consumer confidence. The reflexes and reactions of consumers to every macroeconomic indicator or cyclical development may not be the same. Changes in these indicators and developments or sudden shocks may affect consumer confidence according to consumer behavior. Variables that have limited, strong, positive or negative effects on each other have different explanatory powers.

Changes in the real effective exchange rate in Türkiye pave the way for dollarization in the country, directing them to invest in foreign currency and making consumers vulnerable. Interest rate shocks can also damage consumer confidence with a long-term negative and ever-increasing effect. This can be considered as a reason for the depreciation of the Turkish lira and the demand of consumers to cover the deficit in this depreciation with a financial instrument. It is clear that consumer behavior uncertainties during the COVID period also affect consumer confidence. In our study, it is seen that gold and CPI have a place on consumer confidence with limited effects.

For financial stabilization in the market, it will be very important to analyze the reactions of the decision units in the society to the increase and decrease in financial instruments or in periods that create extraordinary sudden shocks such as the COVID period.

While the relationships between macroeconomic indicators and the consumer confidence index may be explained by the generally accepted rules of the economy, it is not possible to explain the effects on CCI during the COVID-19 pandemic period with growth models. In every economic situation, explaining it with new behavioral finance models will produce more accurate results. It is possible to approach these effects-reactions with many behavioral finance instruments and biases. Overconfidence, excessive optimism/pessimism, representative bias, conservative tendency, anchoring, risk aversion, availability bias, mental accounting, tendency to avoid uncertainty, regret aversion, framing or herding behavior biases can be seen in individuals at times that create unpredictability for the future. It is important to follow these psychological indicators, understand the economic difficulties caused by the pandemic and other global, social crises, and make analyzes by taking into account factors such as emotion, consumer behavior and psychology.

As a result, it is seen that the Exchange Rate and Interest Rates significantly affect the Consumer Confidence Index. Consumer reactions to gold prices and the Consumer Price Index were found to be limited. While at the beginning of the COVID-19 period, consumers reacted based on prejudices, mentalities, fears and emotions due to the shocks they experienced, their reactions to the consumer confidence index become meaningless as consumers get used to and normalize crisis moments over time. In our study, no significant relationship was found between gold prices and consumer confidence index, which are psychological determinants. The impact of periods considered as force majeure such as COVID-19 on the consumer confidence index in Türkiye is limited due to individuals becoming desensitized to the crisis over time. Market uncertainties are difficult to relate to traditional finance models. Therefore, in extraordinary situations, it would be more realistic to analyze consumer confidence with new financial models and force majeure within more limited time periods.

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APPENDICES

Appendix A - Consumer price index

All resources: www.tcmb.gov.tr

Date	CPI (Annual % Change)	CPI (Monthly % Change)
2007m01	9,93	1
2007m02	10,16	0,43
2007m03	10,86	0,92
2007m04	10,72	1,21
2007m05	9,23	0,5
2007m06	8,6	-0,24
2007m07	6,9	-0,73
2007m08	7,39	0,02
2007m09	7,12	1,03
2007m10	7,7	1,81
2007m11	8,4	1,95
2007m12	8,39	0,22
2008m01	8,17	0,8
2008m02	9,1	1,29
2008m03	9,15	0,96
2008m04	9,66	1,68
2008m05	10,74	1,49
2008m06	10,61	-0,36
2008m07	12,06	0,58
2008m08	11,77	-0,24
2008m09	11,13	0,45
2008m10	11,99	2,6
2008m11	10,76	0,83
2008m12	10,06	-0,41
2009m01	9,5	0,29
2009m02	7,73	-0,34

2009m03	7,89	1,1
2009m04	6,13	0,02
2009m05	5,24	0,64
2009m06	5,73	0,11
2009m07	5,39	0,25
2009m08	5,33	-0,3
2009m09	5,27	0,39
2009m10	5,08	2,41
2009m11	5,53	1,27
2009m12	6,53	0,53
2010m01	8,19	1,85
2010m02	10,13	1,45
2010m03	9,56	0,58
2010m04	10,19	0,6
2010m05	9,1	-0,36
2010m06	8,37	-0,56
2010m07	7,58	-0,48
2010m08	8,33	0,4
2010m09	9,24	1,23
2010m10	8,62	1,83
2010m11	7,29	0,03
2010m12	6,4	-0,3
2011m01	4,9	0,41
2011m02	4,16	0,73
2011m03	3,99	0,42
2011m04	4,26	0,87
2011m05	7,17	2,42
2011m06	6,24	-1,43
2011m07	6,31	-0,41
2011m08	6,65	0,73
2011m09	6,15	0,75
2011m10	7,66	3,27
2011m11	9,48	1,73

2011m12	10,45	0,58
2012m01	10,61	0,56
2012m02	10,43	0,56
2012m03	10,43	0,41
2012m04	11,14	1,52
2012m05	8,28	-0,21
2012m06	8,87	-0,9
2012m07	9,07	-0,23
2012m08	8,88	0,56
2012m09	9,19	1,03
2012m10	7,8	1,96
2012m11	6,37	0,38
2012m12	6,16	0,38
2013m01	7,31	1,65
2013m02	7,03	0,3
2013m03	7,29	0,66
2013m04	6,13	0,42
2013m05	6,51	0,15
2013m06	8,3	0,76
2013m07	8,88	0,31
2013m08	8,17	-0,1
2013m09	7,88	0,77
2013m10	7,71	1,8
2013m11	7,32	0,01
2013m12	7,4	0,46
2014m01	7,75	1,98
2014m02	7,89	0,43
2014m03	8,39	1,13
2014m04	9,38	1,34
2014m05	9,66	0,4
2014m06	9,16	0,31
2014m07	9,32	0,45
2014m08	9,54	0,09

2014m09	8,86	0,14
2014m10	8,96	1,9
2014m11	9,15	0,18
2014m12	8,17	-0,44
2015m01	7,24	1,1
2015m02	7,55	0,71
2015m03	7,61	1,19
2015m04	7,91	1,63
2015m05	8,09	0,56
2015m06	7,2	-0,51
2015m07	6,81	0,09
2015m08	7,14	0,4
2015m09	7,95	0,89
2015m10	7,58	1,55
2015m11	8,1	0,67
2015m12	8,81	0,21
2016m01	9,58	1,82
2016m02	8,78	-0,02
2016m03	7,46	-0,04
2016m04	6,57	0,78
2016m05	6,58	0,58
2016m06	7,64	0,47
2016m07	8,79	1,16
2016m08	8,05	-0,29
2016m09	7,28	0,18
2016m10	7,16	1,44
2016m11	7	0,52
2016m12	8,53	1,64
2017m01	9,22	2,46
2017m02	10,13	0,81
2017m03	11,29	1,02
2017m04	11,87	1,31
2017m05	11,72	0,45

2017m06	10,9	-0,27
2017m07	9,79	0,15
2017m08	10,68	0,52
2017m09	11,2	0,65
2017m10	11,9	2,08
2017m11	12,98	1,49
2017m12	11,92	0,69
2018m01	10,35	1,02
2018m02	10,26	0,73
2018m03	10,23	0,99
2018m04	10,85	1,87
2018m05	12,15	1,62
2018m06	15,39	2,61
2018m07	15,85	0,55
2018m08	17,9	2,3
2018m09	24,52	6,3
2018m10	25,24	2,67
2018m11	21,62	-1,44
2018m12	20,3	-0,4
2019m01	20,35	1,06
2019m02	19,67	0,16
2019m03	19,71	1,03
2019m04	19,5	1,69
2019m05	18,71	0,95
2019m06	15,72	0,03
2019m07	16,65	1,36
2019m08	15,01	0,86
2019m09	9,26	0,99
2019m10	8,55	2
2019m11	10,56	0,38
2019m12	11,84	0,74
2020m01	12,15	1,35
2020m02	12,37	0,35

2020m03	11,86	0,57
2020m04	10,94	0,85
2020m05	11,39	1,36
2020m06	12,62	1,13
2020m07	11,76	0,58
2020m08	11,77	0,86
2020m09	11,75	0,97
2020m10	11,89	2,13
2020m11	14,03	2,3
2020m12	14,6	1,25
2021m01	14,97	1,68
2021m02	15,61	0,91
2021m03	16,19	1,08
2021m04	17,14	1,68
2021m05	16,59	0,89
2021m06	17,53	1,94
2021m07	18,95	1,8
2021m08	19,25	1,12
2021m09	19,58	1,25
2021m10	19,89	2,39
2021m11	21,31	3,51
2021m12	36,08	13,58
2022m01	48,69	11,1
2022m02	54,44	4,81
2022m03	61,14	5,46
2022m04	69,97	7,25
2022m05	73,5	2,98
2022m06	78,62	4,95
2022m07	79,6	2,37
2022m08	80,21	1,46
2022m09	83,45	3,08
2022m10	85,51	3,54
2022m11	84,39	2,88

2022m12	64,27	1,18
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Appendix B - Gold Prices 2007-2022 (TP MK LON TL)

Date	Gold Price
2007m01	625,94
2007m02	664,58
2007m03	655,07
2007m04	683,55
2007m05	667,53
2007m06	655,64
2007m07	664,34
2007m08	665,87
2007m09	724,34
2007m10	759,72
2007m11	803,30
2007m12	805,25
2008m01	886,56
2008m02	931,60
2008m03	959,00
2008m04	908,38
2008m05	887,95
2008m06	895,88
2008m07	943,56
2008m08	841,70
2008m09	832,56
2008m10	791,26
2008m11	768,06
2008m12	803,75
2009m01	870,15

2009m02	947,38
2009m03	935,50
2009m04	894,33
2009m05	942,94
2009m06	944,19
2009m07	934,75
2009m08	954,38
2009m09	1.000,19
2009m10	1.040,55
2009m11	1.113,67
2009m12	1.130,19
2010m01	1.104,31
2010m02	1.090,25
2010m03	1.110,81
2010m04	1.151,68
2010m05	1.206,50
2010m06	1.233,38
2010m07	1.191,80
2010m08	1.220,13
2010m09	1.270,50
2010m10	1.336,94
2010m11	1.379,67
2010m12	1.382,42
2011m01	1.349,13
2011m02	1.376,25
2011m03	1.423,63
2011m04	1.455,08
2011m05	1.504,00
2011m06	1.530,37
2011m07	1.568,40
2011m08	1.757,70
2011m09	1.765,90
2011m10	1.678,40

2011m11	1.732,38
2011m12	1.646,40
2012m01	1.657,75
2012m02	1.736,50
2012m03	1.675,80
2012m04	1.650,62
2012m05	1.596,43
2012m06	1.588,25
2012m07	1.594,93
2012m08	1.630,15
2012m09	1.766,00
2012m10	1.742,95
2012m11	1.719,45
2012m12	1.676,68
2013m01	1.663,50
2013m02	1.631,00
2013m03	1.593,10
2013m04	1.495,12
2013m05	1.409,85
2013m06	1.316,12
2013m07	1.279,81
2013m08	1.334,12
2013m09	1.348,93
2013m10	1.307,66
2013m11	1.275,75
2013m12	1.218,76
2014m01	1.249,35
2014m02	1.307,25
2014m03	1.337,75
2014m04	1.303,87
2014m05	1.281,20
2014m06	1.287,62
2014m07	1.314,06

2014m08	1.292,00
2014m09	1.232,75
2014m10	1.209,05
2014m11	1.177,50
2014m12	1.195,56
2015m01	1.244,45
2015m02	1.223,93
2015m03	1.176,65
2015m04	1.198,05
2015m05	1.199,59
2015m06	1.180,32
2015m07	1.127,85
2015m08	1.120,73
2015m09	1.122,83
2015m10	1.155,35
2015m11	1.077,38
2015m12	1.070,85
2016m01	1.100,91
2016m02	1.211,93
2016m03	1.254,46
2016m04	1.241,82
2016m05	1.256,33
2016m06	1.280,55
2016m07	1.336,80
2016m08	1.339,43
2016m09	1.325,01
2016m10	1.262,38
2016m11	1.234,48
2016m12	1.149,51
2017m01	1.187,90
2017m02	1.234,77
2017m03	1.230,22
2017m04	1.274,07

2017m05	1.244,08
2017m06	1.258,97
2017m07	1.239,85
2017m08	1.281,22
2017m09	1.311,75
2017m10	1.277,26
2017m11	1.281,58
2017m12	1.270,85
2018m01	1.333,01
2018m02	1.331,32
2018m03	1.324,69
2018m04	1.333,28
2018m05	1.306,38
2018m06	1.278,50
2018m07	1.237,43
2018m08	1.202,88
2018m09	1.196,70
2018m10	1.221,31
2018m11	1.221,42
2018m12	1.253,95
2019m01	1.286,73
2019m02	1.319,78
2019m03	1.303,78
2019m04	1.285,66
2019m05	1.282,23
2019m06	1.385,80
2019m07	1.414,08
2019m08	1.489,62
2019m09	1.504,65
2019m10	1.495,43
2019m11	1.472,89
2019m12	1.479,18
2020m01	1.561,69

2020m02	1.601,80
2020m03	1.621,58
2020m04	1.679,92
2020m05	1.724,10
2020m06	1.724,82
2020m07	1.847,27
2020m08	1.964,40
2020m09	1.921,06
2020m10	1.903,37
2020m11	1.878,86
2020m12	1.864,98
2021m01	1.872,32
2021m02	1.787,08
2021m03	1.717,01
2021m04	1.758,23
2021m05	1.862,62
2021m06	1.832,85
2021m07	1.810,55
2021m08	1.778,57
2021m09	1.780,26
2021m10	1.777,80
2021m11	1.831,07
2021m12	1.793,21
2022m01	1.811,89
2022m02	1.853,56
2022m03	1.953,40
2022m04	1.943,90
2022m05	1.844,97
2022m06	1.837,12
2022m07	1.745,34
2022m08	1.766,83
2022m09	1.681,17
2022m10	1.659,18

2022m11	1.728,53
2022m12	1.793,53

Appendix C - Interest Rates

Date	Interest Rate
2007m01	22,5
2007m02	22,5
2007m03	22,5
2007m04	22,5
2007m05	22,5
2007m06	22,5
2007m07	22,5
2007m08	22,5
2007m09	22,25
2007m10	21,5
2007m11	20,75
2007m12	20
2008m01	19,5
2008m02	19,25
2008m03	19,25
2008m04	19,25
2008m05	19,75
2008m06	20,25
2008m07	20,25
2008m08	20,25
2008m09	20,25
2008m10	19,75
2008m11	18,75
2008m12	17,5

2009m01	15,5
2009m02	14
2009m03	13
2009m04	12,25
2009m05	11,75
2009m06	11,25
2009m07	11,75
2009m08	10,25
2009m09	9,75
2009m10	9,25
2009m11	9
2009m12	9
2010m01	9
2010m02	9
2010m03	9
2010m04	9
2010m05	9
2010m06	9
2010m07	9
2010m08	9
2010m09	8,75
2010m10	8,75
2010m11	8,75
2010m12	9
2011m01	9
2011m02	9
2011m03	9
2011m04	9
2011m05	9
2011m06	9
2011m07	9
2011m08	9
2011m09	9

2011m10	12,50
2011m11	12,50
2011m12	12,50
2012m01	12,50
2012m02	11,50
2012m03	11,50
2012m04	11,50
2012m05	11,50
2012m06	11,50
2012m07	11,50
2012m08	11,50
2012m09	10
2012m10	9,50
2012m11	9
2012m12	9
2013m01	8,75
2013m02	11,50
2013m03	7,50
2013m04	7
2013m05	6,50
2013m06	6,50
2013m07	7,25
2013m08	7,75
2013m09	7,75
2013m10	7,75
2013m11	7,75
2013m12	7,75
2014m01	12
2014m02	12
2014m03	12
2014m04	12
2014m05	12
2014m06	12

2014m07	12
2014m08	11,25
2014m09	11,25
2014m10	11,25
2014m11	11,25
2014m12	11,25
2015m01	11,25
2015m02	10,75
2015m03	10,75
2015m04	10,75
2015m05	10,75
2015m06	10,75
2015m07	10,75
2015m08	10,75
2015m09	10,75
2015m10	10,75
2015m11	10,75
2015m12	10,75
2016m01	10,75
2016m02	10,75
2016m03	10,50
2016m04	10
2016m05	9,50
2016m06	9
2016m07	8,75
2016m08	8,50
2016m09	8,25
2016m10	8,50
2016m11	8,50
2016m12	8,50
2017m01	9,25
2017m02	9,25
2017m03	9,25

2017m04	9,25
2017m05	9,25
2017m06	9,25
2017m07	9,25
2017m08	9,25
2017m09	9,25
2017m10	9,25
2017m11	9,25
2017m12	9,25
2018m01	9,25
2018m02	9,25
2018m03	9,25
2018m04	9,25
2018m05	9,25
2018m06	19,25
2018m07	19,25
2018m08	19,25
2018m09	25,5
2018m10	25,5
2018m11	25,5
2018m12	25,5
2019m01	25,5
2019m02	25,5
2019m03	25,5
2019m04	25,5
2019m05	25,5
2019m06	25,5
2019m07	21,25
2019m08	21,25
2019m09	18
2019m10	15,5
2019m11	15,5
2019m12	13,5

2020m01	12,75
2020m02	12,25
2020m03	11,25
2020m04	10,25
2020m05	9,75
2020m06	9,75
2020m07	9,75
2020m08	9,75
2020m09	11,75
2020m10	11,75
2020m11	16,5
2020m12	18,5
2021m01	18,5
2021m02	18,5
2021m03	20,5
2021m04	20,5
2021m05	20,5
2021m06	20,5
2021m07	20,5
2021m08	20,5
2021m09	19,5
2021m10	17,5
2021m11	16,5
2021m12	15,5
2022m01	15,5
2022m02	15,5
2022m03	15,5
2022m04	15,5
2022m05	15,5
2022m06	15,5
2022m07	15,5
2022m08	14,5
2022m09	13,5

2022m10	12
2022m11	10,50
2022m12	10,5

Appendix D - Exchange Rates

Date	TP DK USD Buying TL	TP DK USD Selling TL	CPI Based Real Effective Exchange Rate
2007m01	1,42	1,43	112,25
2007m02	1,39	1,4	114,35
2007m03	1,4	1,41	113,06
2007m04	1,36	1,36	116,30
2007m05	1,33	1,34	118,26
2007m06	1,32	1,32	119,54
2007m07	1,28	1,28	119,78
2007m08	1,31	1,31	116,87
2007m09	1,26	1,27	120,41
2007m10	1,2	1,2	126,18
2007m11	1,18	1,19	126,14
2007m12	1,17	1,18	127,71
2008m01	1,17	1,18	127,39
2008m02	1,19	1,19	125,82
2008m03	1,23	1,24	117,72
2008m04	1,3	1,3	111,89
2008m05	1,25	1,25	118,28
2008m06	1,23	1,23	118,82
2008m07	1,21	1,22	119,12
2008m08	1,17	1,18	126,67
2008m09	1,23	1,24	124,91
2008m10	1,47	1,48	113,18
2008m11	1,59	1,6	110,49

2008m12	1,54	1,55	111,12
2009m01	1,59	1,6	110,11
2009m02	1,65	1,66	108,34
2009m03	1,7	1,71	105,76
2009m04	1,6	1,61	110,72
2009m05	1,55	1,56	112,05
2009m06	1,54	1,55	110,74
2009m07	1,51	1,52	112,32
2009m08	1,48	1,49	113,19
2009m09	1,49	1,49	111,92
2009m10	1,46	1,47	114,49
2009m11	1,48	1,49	113,50
2009m12	1,5	1,51	113,62
2010m01	1,47	1,47	119,08
2010m02	1,51	1,51	119,99
2010m03	1,53	1,54	118,78
2010m04	1,49	1,5	123,08
2010m05	1,53	1,54	122,87
2010m06	1,57	1,58	121,54
2010m07	1,54	1,54	120,38
2010m08	1,5	1,51	121,84
2010m09	1,49	1,5	123,16
2010m10	1,42	1,43	126,47
2010m11	1,43	1,44	125,59
2010m12	1,51	1,52	120,17
2011m01	1,55	1,56	115,82
2011m02	1,58	1,59	112,69
2011m03	1,57	1,58	111,62
2011m04	1,52	1,52	114,17
2011m05	1,56	1,57	112,89
2011m06	1,59	1,6	108,98
2011m07	1,65	1,65	104,82
2011m08	1,74	1,75	99,02

2011m09	1,79	1,8	99,67
2011m10	1,83	1,84	101,14
2011m11	1,8	1,81	104,49
2011m12	1,86	1,87	103,31
2012m01	1,84	1,85	105,67
2012m02	1,75	1,76	109,61
2012m03	1,78	1,79	108,05
2012m04	1,78	1,79	109,69
2012m05	1,8	1,81	110,19
2012m06	1,82	1,82	109,89
2012m07	1,8	1,81	110,77
2012m08	1,79	1,79	111,46
2012m09	1,8	1,8	109,51
2012m10	1,79	1,8	110,57
2012m11	1,79	1,79	111,96
2012m12	1,78	1,79	110,94
2013m01	1,76	1,77	113,14
2013m02	1,77	1,78	112,53
2013m03	1,81	1,81	112,66
2013m04	1,8	1,8	113,63
2013m05	1,82	1,83	112,05
2013m06	1,89	1,9	107,91
2013m07	1,93	1,93	107,63
2013m08	1,95	1,96	105,59
2013m09	2,02	2,02	102,69
2013m10	1,99	1,99	104,37
2013m11	2,02	2,03	103,11
2013m12	2,06	2,06	100,89
2014m01	2,22	2,22	95,75
2014m02	2,21	2,22	96,63
2014m03	2,22	2,22	97,25
2014m04	2,13	2,13	102,98
2014m05	2,09	2,09	105,10

2014m06	2,12	2,12	104,44
2014m07	2,12	2,12	104,53
2014m08	2,16	2,16	103,84
2014m09	2,2	2,21	103,43
2014m10	2,26	2,26	104,09
2014m11	2,23	2,24	107,05
2014m12	2,29	2,29	105,69
2015m01	2,33	2,33	108,60
2015m02	2,46	2,46	105,72
2015m03	2,58	2,59	104,59
2015m04	2,65	2,65	103,14
2015m05	2,65	2,65	101,56
2015m06	2,7	2,71	99,09
2015m07	2,69	2,7	100,36
2015m08	2,85	2,85	95,82
2015m09	3	3,01	91,79
2015m10	2,93	2,93	95,03
2015m11	2,87	2,88	100,00
2015m12	2,92	2,92	98,98
2016m01	3,01	3,01	100,02
2016m02	2,94	2,95	101,42
2016m03	2,89	2,9	102,47
2016m04	2,83	2,84	103,33
2016m05	2,93	2,93	100,59
2016m06	2,92	2,92	101,76
2016m07	2,96	2,96	102,51
2016m08	2,96	2,97	101,22
2016m09	2,96	2,97	101,39
2016m10	3,07	3,07	99,94
2016m11	3,27	3,27	96,60
2016m12	3,49	3,5	93,47
2017m01	3,73	3,74	88,87
2017m02	3,67	3,68	90,23

2017m03	3,67	3,67	90,80
2017m04	3,65	3,66	91,61
2017m05	3,56	3,57	92,90
2017m06	3,52	3,53	92,82
2017m07	3,56	3,57	90,60
2017m08	3,51	3,52	90,75
2017m09	3,47	3,47	91,55
2017m10	3,66	3,67	89,26
2017m11	3,88	3,89	85,47
2017m12	3,85	3,85	86,24
2018m01	3,77	3,78	86,84
2018m02	3,78	3,78	86,30
2018m03	3,88	3,89	84,94
2018m04	4,05	4,06	83,14
2018m05	4,41	4,42	79,35
2018m06	4,63	4,64	78,19
2018m07	4,75	4,76	77,02
2018m08	5,73	5,74	65,71
2018m09	6,37	6,38	62,46
2018m10	5,86	5,87	69,99
2018m11	5,37	5,38	75,68
2018m12	5,31	5,32	76,27
2019m01	5,37	5,38	75,75
2019m02	5,26	5,27	77,24
2019m03	5,44	5,45	75,20
2019m04	5,74	5,75	72,49
2019m05	6,05	6,06	69,67
2019m06	5,81	5,82	72,11
2019m07	5,67	5,68	74,78
2019m08	5,62	5,63	76,76
2019m09	5,71	5,72	76,68
2019m10	5,78	5,79	76,88
2019m11	5,73	5,74	77,36

2019m12	5,84	5,85	76,00
2020m01	5,92	5,93	75,59
2020m02	6,04	6,06	75,15
2020m03	6,31	6,33	72,92
2020m04	6,82	6,83	69,21
2020m05	6,95	6,96	68,67
2020m06	6,81	6,82	69,17
2020m07	6,85	6,86	68,35
2020m08	7,25	7,27	63,79
2020m09	7,51	7,52	62,18
2020m10	7,87	7,89	60,44
2020m11	8	8,02	60,32
2020m12	7,72	7,73	61,88
2021m01	7,39	7,41	65,25
2021m02	7,07	7,09	68,80
2021m03	7,63	7,64	65,00
2021m04	8,16	8,17	61,64
2021m05	8,34	8,36	59,80
2021m06	8,6	8,61	59,07
2021m07	8,61	8,63	60,58
2021m08	8,48	8,49	62,15
2021m09	8,51	8,53	62,23
2021m10	9,14	9,16	59,38
2021m11	10,52	10,54	53,38
2021m12	13,53	13,55	47,61
2022m01	13,52	13,54	52,05
2022m02	13,62	13,65	53,80
2022m03	14,57	14,59	53,80
2022m04	14,68	14,71	56,87
2022m05	15,62	15,65	55,49
2022m06	16,96	17	53,01
2022m07	17,39	17,42	53,86
2022m08	17,99	18,03	52,80

2022m09	18,28	18,31	54,18
2022m10	18,56	18,6	55,55
2022m11	18,59	18,62	55,79
2022m12	18,64	18,67	54,85

Appendix E - Consumer Confidence Index

Date	Consumer confidence index
2007m01	93,7
2007m02	94,4
2007m03	93,9
2007m04	95,5
2007m05	96,9
2007m06	96,5
2007m07	97,2
2007m08	99,7
2007m09	98,9
2007m10	97,7
2007m11	93,9
2007m12	94,7
2008m01	92,6
2008m02	89
2008m03	84,3
2008m04	79,5
2008m05	78,6
2008m06	78,8
2008m07	80,6
2008m08	83,4
2008m09	84,3
2008m10	78,9

2008m11	73,9
2008m12	74
2009m01	74,4
2009m02	76,2
2009m03	76,9
2009m04	82
2009m05	84,7
2009m06	87,5
2009m07	85,7
2009m08	85,8
2009m09	86,6
2009m10	85,3
2009m11	83,8
2009m12	84
2010m01	84,3
2010m02	86,5
2010m03	89,1
2010m04	89,9
2010m05	91,2
2010m06	92,7
2010m07	92,7
2010m08	92,8
2010m09	95,2
2010m10	93,3
2010m11	95,5
2010m12	94,4
2011m01	94,4
2011m02	96,1
2011m03	95,9
2011m04	95,8
2011m05	95,3
2011m06	98
2011m07	97

2011m08	94,7
2011m09	95,7
2011m10	92
2011m11	92,7
2011m12	92,8
2012m01	92,7
2012m02	94
2012m03	93,3
2012m04	88,9
2012m05	91,8
2012m06	91,1
2012m07	91,9
2012m08	89,9
2012m09	89,1
2012m10	85,3
2012m11	89,9
2012m12	89,3
2013m01	91,8
2013m02	92
2013m03	92,2
2013m04	92,8
2013m05	95,4
2013m06	94,4
2013m07	95,9
2013m08	94,9
2013m09	91,5
2013m10	93,7
2013m11	96,8
2013m12	94,4
2014m01	91,8
2014m02	89,5
2014m03	92,6
2014m04	97,4

2014m05	95
2014m06	93,2
2014m07	93,1
2014m08	93,2
2014m09	94,1
2014m10	91,7
2014m11	90,9
2014m12	90,4
2015m01	89,6
2015m02	89,1
2015m03	86,7
2015m04	87,5
2015m05	86,7
2015m06	89,3
2015m07	87,5
2015m08	84,8
2015m09	82,2
2015m10	86,3
2015m11	95,2
2015m12	93,6
2016m01	92,2
2016m02	90
2016m03	90,1
2016m04	91,3
2016m05	91,5
2016m06	91,6
2016m07	88,9
2016m08	94,7
2016m09	94,8
2016m10	95,3
2016m11	91,6
2016m12	87,4
2017m01	88,7

2017m02	88
2017m03	90,1
2017m04	92
2017m05	94
2017m06	92,3
2017m07	92,4
2017m08	93
2017m09	92
2017m10	89,9
2017m11	87,6
2017m12	88,2
2018m01	92,7
2018m02	93,4
2018m03	92,5
2018m04	91,7
2018m05	90,7
2018m06	90,6
2018m07	92,1
2018m08	88,2
2018m09	81,1
2018m10	78,8
2018m11	81,2
2018m12	80,1
2019m01	80,5
2019m02	79,2
2019m03	81,3
2019m04	83,6
2019m05	76,9
2019m06	79,8
2019m07	78,3
2019m08	79,1
2019m09	77,7
2019m10	78,5

2019m11	81,3
2019m12	80,7
2020m01	81,4
2020m02	79,6
2020m03	81,1
2020m04	78,1
2020m05	82,7
2020m06	82,7
2020m07	82,3
2020m08	79,4
2020m09	82
2020m10	81,9
2020m11	80,1
2020m12	80,1
2021m01	83,3
2021m02	84,5
2021m03	86,7
2021m04	80,2
2021m05	77,3
2021m06	81,7
2021m07	79,5
2021m08	78,2
2021m09	79,7
2021m10	76,8
2021m11	71,1
2021m12	68,9
2022m01	73,2
2022m02	71,2
2022m03	72,5
2022m04	67,3
2022m05	67,6
2022m06	63,4
2022m07	68

2022m08	72,2
2022m09	72,4
2022m10	76,2
2022m11	76,6
2022m12	75,6

Appendix F - Average Annual Values of Variables

Date	CCI	Interest Rates (%)	Gold	CPI (Monthly Change %)	USD Buying TL	CPI Based Real Effective Exchange Rate	COVID
Avr 07	96,08	22,04	697	0,7	1,3	119,24	0
Avr 08	81,49	19,5	870	0,8	1,3	118,78	0
Avr 09	82,74	12,1	975	0,5	1,55	111,4	0
Avr 10	91,47	9	1223	0,5	1,5	121,91	0
Avr 11	95,03	9	1565	0,8	1,67	107,39	0
Avr 12	90,6	9,33	1669	0,5	1,79	109,86	0
Avr 13	93,82	7	1406	0,6	1,9	108,02	0
Avr 14	92,74	12	1265	0,7	2,19	102,57	0
Avr 15	88,21	10,8	1158	0,7	2,72	100,39	0
Avr 16	91,62	9,5	1249	0,7	3,02	100,39	0
Avr 17	90,68	9,25	1257	0,9	3,64	90,09	0
Avr 18	87,76	22,82	1270	1,6	4,83	77,16	0
Avr 19	79,74	21,5	1393	0,9	5,67	75,08	0
Avr 20	80,95	17,5	1774	1,1	7	67,31	0,833
Avr 21	78,99	19,08	1800	2,7	8,83	60,41	1
Avr 22	71,35	14,85	1801	4,3	16,54	54,34	1