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Analysis of Saving Behavior within the Framework of Prospect Theory: An Experimental Study[1]

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Abstract

There are many studies conducted on the phenomenon of saving. It is seen that the studies are mostly aimed at testing the relationships between savings, investment and growth. The factors that lead individuals to save are interest rates, income levels and government policies. However, it is important that behavioral economics theoretical-based studies on the phenomenon of savings should be carried out, since it is ultimately human who realizes the savings phenomenon.

In this study, the phenomenon of saving was analyzed from the perspective of behavioral economics with an experimental economic method within the scope of prospect theory. The study aims to reveal that among the reasons people save money, there is also the loss avoidance motive. At this point, it differs from traditional studies and contributes to the literature.

Keywords: Behavioral Economics, Experimental Economics, Saving, Saving Behaviour.
JEL Classification Codes: D01, C9, E21.

Tasarruf Davranışının Beklenti Teorisi Çerçevesinden Analizi: Bir Deneysel Çalışma

Öz

Tasarruf olgusuna yönelik gerçekleştirilmiş birçok çalışma bulunmaktadır. Yapılan çalışmaların çoğunlukla tasarruf, yatırım ve büyüme arasındaki ilişkilerin testine yönelik olduğu görülmektedir. Bireyleri tasarruf etmeye yönelten faktörlere yönelik yapılan çalışmaların sonucunda ise yine çoğunlukla faiz oranları, gelir seviyeleri ve hükümet politikaları karşımıza çıkmaktadır. İnsan davranışlarını merkeze koyan çok fazla çalışma bulunmamaktadır. Ancak tasarruf olgusunu gerçekleştirenin nihayetinde insan olması sebebiyle davranışsal iktisat teorik temelli çalışmaların yapılması önem arz etmektedir.

Bu kapsamda çalışmada tasarruf olgusu davranışsal iktisat perspektifinden beklenti teorisi kapsamında bir deneysel iktisadi yöntem ile analiz edilmiştir. Çalışma insanların tasarruf etme sebepleri arasında kayıptan kaçınma güdüsünün de olduğunu ortaya çıkartmayı amaçlamaktadır. Bu noktada geleneksel çalışmalardan ayrışarak literatüre katkı sağlamaktadır.

Anahtar Kelimler : Davranışsal İktisat, Deneysel İktisat, Tasarruf, Tasarruf Davranışı.
JEL Sınıflandırma Kodları: D01, C9, E21.

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1. Introduction

Savings have a great importance in both micro and macro terms. Individuals who want to live under good conditions, especially during their retirement periods, by guaranteeing their future, have to make savings. Savings not only increase the welfare of individuals in the long run, but also make it easier for countries to reach their macroeconomic goals. At this point, it is seen that developing countries often have the problem of lack of savings (Grigoli and Schmidt, 2014, p. 10). Savings play an important role in achieving and sustaining economic growth and increasing social welfare. The economic crises experienced in history force both individuals and those who manage the country's economies to be more careful about savings. Governments give priority to increase in savings in order to realize new investments, increase production, ensure employment, stability and economic growth (Adelakun, 2015, p. 2).

There are many studies in the literature in the theoretical and empirical field for saving. In particular, it is seen that studies that test the relationships between growth, savings and investments are in the majority. It is generally concluded that savings are affected by individuals' income levels, interest rates and government policies (Rijckeghem and Üçer, 2009, pp. 15-17; Dayal and Thimann, 1997, p. 7; Duesenberry, 1949). It is seen that the studies based on behavioral economics that affect the saving phenomenon are less than these studies that are frequently done. At this point, the effect of the efforts of economics to become a positive original science by breaking away from its psychological and philosophical roots since the 18th century is also important. As a matter of fact, it is seen that economics, which has made an effort to be a positive original science, has become a mathematical science and has become a technical science, and at the same time, has sought an idealized society by internalizing the logic of abstraction (Yılmaz, 2009, pp. 6-12). In fact, economics has even universalized its individual within the framework of a few assumptions. However, recent developments in the science of psychology reveal that human beings cannot be shaped around a few assumptions. In this context, behavioral economics emerged as a result of the multidisciplinary study of psychology and economics (Aktan and Yavuzaslan, 2020, p. 104).

It is seen that behavioral economics includes the issues that mainstream economics (Neo-classical economics) ignores in its analysis and turns to experimental methods that include real people in order to overcome the abstraction and mathematization that economics has reached (Yavuzaslan, 2019, p. 429). As a matter of fact, the main purpose of economics as a social science is human. For this reason, human behavior is of great importance in the analysis of the phenomenon of savings. In this context, it is important to analyze saving decisions from the perspective of behavioral economics as well as traditional economic methods. Because people are affected by many factors that are ignored by mainstream economics, especially psychological and sociological. Despite this, the insistence of explaining people

within the framework of a few assumptions makes it difficult to understand the real person.

In this context, the research includes the analysis of the phenomenon of savings from the perspective of behavioral economics with an experimental study within the scope of prospect theory. By analyzing the findings obtained within the scope of prospect theory, the research aims to highlight that one of the reasons for people to save is loss aversion. In the study, the phenomenon of saving has been analyzed in a way that emphasizes human behavior by separating from traditional economic methods. Thus, the study contributes to the literature by showing that there is a loss avoidance motive as well as macro approaches such as interest rate, income level, government policies that cause people to save. At this point, the research has a unique quality with the way it handles the subject, the research technique and the way of analysis.

Thus, the research is based on the analysis of the savings phenomenon from the perspective of behavioral economics with an experimental study within the scope of expectation theory. In this context, firstly saving and the determinants of saving, then behavioral economics and prospect theory, which form the theoretical basis for the research, were analyzed. In the last part, the phenomenon of saving is analyzed with an experimental study.

2. Savings and Determinants of Savings

The word saving is defined in the dictionary of economic terms of the Turkish Language Institution (TDK) as "*the part of the income that is not consumed in a certain period in an economy, that is, not spent*" and "*a part of the current income is reserved for future use without being consumed*". In the Central Bank of Turkey Republic (TCMB) glossary of terms, the word savings is again defined as "*the part of the income that is not spent on consumption as a result of postponing consumption to a future date*". As a matter of fact, it is seen that the phenomenon of saving has been among the most discussed concepts in economic theory since the classical school.

According to the classical school, saving is the source of capital accumulation (Kazgan, 1984, p. 90). In addition, saving was accepted as a virtue in classical economics. For this reason, it is seen that an understanding of encouraging savings prevails in the classical economic period (Skousen, 2016, p. 36). Adam Smith accepted saving and investment as identical and analyzed them as a function of profit. In addition, Smith limited the power of saving and investment to income level (Kazgan, 1984, p. 90). J.B. Say argued that saving is a better form of spending because it is used to raise the necessary capital to increase production (Skousen, 2016, pp. 60-61). Malthus argued that in times of prosperity, the wealthy spend most of their income growth on savings (Kazgan, 1984, p. 108). Senior, on the other hand, argued that saving is giving up the immediate utility and pleasure that money

can provide. For this reason, he claimed that saving is a phenomenon that should be waited patiently due to the services it will cause in the future (Aydın, 2015, p. 210). In addition, according to the classics, savings are an increasing function of interest. Savings increase as the interest rate increases. As a matter of fact, interest is the price of giving up today's consumption (ie saving). Individuals distribute their income between their present and future consumption in a way that maximizes their utility. A positive interest rate will enable individuals to consume more in the future than they do today. Thus, rising interest rates will lead individuals to save more from their income (Yıldırım, Kahraman and Taşdemir, 2101, p. 130).

According to John Maynard Keynes, who is regarded as the founder of the Keynesian school, saving is not a function of the interest rate as classical economists claim. Saving is a function of disposable income. The effect of interest on savings is also realized through income. As a matter of fact, in the General Theory of Employment, Interest and Money, Keynes defines the concept of saving as the remainder of the income after consumption. According to Keynes, the main determinant of consumption and saving level is the national income of the country. As the income level increases, it is expected that the level of consumption and savings will increase. Likewise, Keynes argued that the individual's daily income level determines the level of consumption and savings (Keynes, 1964, p. 63). Although Keynes did not completely exclude interest rates from his theory, he argued that interest has less effect on savings than the Classics (Oktayer, 2002, p. 155). In addition, Keynes argued that saving will depend on income, except in unexpected extraordinary situations, and the subjective factors that determine the saving tendency will change very slowly. Because, according to Keynes, people have accustomed themselves to a certain standard of living. Accordingly, consumption will increase as income increases, but this increase in consumption will be less than the income increase (Savaş, 2007, p. 762). Robertson, on the other hand, added the element of time in addition to this definition and explained the savings as the amount of income earned in the past and not spent on consumption from the income available today. The difference between the two definitions is that one has a static view and the other a dynamic view (Ülgener, 1991, pp. 206-207). Samuelson, one of the thinkers of the Keynesian school of economics, expressed the concept of saving as the resource remaining after consumption expenditures were subtracted from the net real income. Samuelson stated that individuals tend to save by canceling their current consumption for future consumption (Samuelson, 1980, p. 234). Monetarist philosopher Friedman, on the other hand, expressed the concept of saving as a precaution taken for future consumption (Douglas and Isherwood, 1999, p. 65). While J. S. Mill defines saving as “income not consumed by the saver”, hoarding is separated from this concept and defined as “income not consumed in any way”. At the same time, Mill said that savings are a desirable factor for the increase of national capital and the improvement of people's living conditions (Blaug, 2014, pp. 196, 235).

In general, although the studies seem to be clustered within the framework that interest rates and income levels play a role in determining savings, there are other studies in the literature mainly on the determinants of saving. In this context, it is seen that the first study in macroeconomic terms was the absolute income hypothesis by Keynes. As a matter of fact, according to this hypothesis, an increase in disposable income also increases consumption, but the increase in consumption is less than the increase in income. In other words, as the income level increases, there is a decrease in the marginal consumption tendencies of individuals (especially those with high income levels). This leads to an increase in savings (Alimi, 2013, p. 3). Another study focusing on savings is Milton Friedman's Permanent Income Hypothesis. Permanent income refers to the income that individuals think they will continue to earn during the planned period. The permanent income hypothesis emphasizes the tendency of rational individuals to increase their present savings with the expectation that their future income will decrease (Campell, 1987, p. 1255). Another hypothesis, the Life Cycle Hypothesis, focuses on utility maximization. Accordingly, the savings of an individual in a certain period depend not only on the income of the individual at that time, but also on the income that the individual will earn in the past or in the future. Because individuals try to maximize the benefit they will get from consumption throughout their lives (Modigliani, 1986, p. 300). In this hypothesis, people will make negative savings in the periods when they have lower incomes (especially in youth and retirement periods) by adjusting their consumption according to their expected life span, while they will save positively when they are productive and productive (Edwards, 1996, p. 21). In the relative income hypothesis by Duesenberry (1949), the absolute determinant of consumption is the income of other households. That is, consumption is determined by relative income in this hypothesis. This is called the vanity effect on consumption decision. In addition, Duesenberry has brought the wedge effect to the literature by claiming that current consumption is dependent on past consumption. Thus, Duesenberry has shown its effect on savings through consumption. Leland (1968) argued that the main reason for saving is the precautionary motive stemming from the uncertainty of future income. As a matter of fact, Feldstein (1974) named Leland's conservatism hypothesis the transfer savings hypothesis. The main finding of Feldstein is that social security has a significant effect on savings and capital accumulation. The view that changes in consumption (changes in savings) are independent of expected changes in income has become a proposition of Neoclassical theory. As a matter of fact, Hall argued that consumption (saving) will not change in the saving decisions unless there is an unexpected change in income in the random walk hypothesis. Fisher (1930), on the other hand, as the economist who analyzed the optimum distribution of consumption between periods for the first time, optimizing between periods; the marginal benefits of consumption in different periods and interest rates.

Apart from these, Keynes emphasized the psychological reasons that lead people to save and put forward eight reasons to explain this situation. These; preparing

reserves for unseen events (preliminary measure), meeting future needs such as children's education, old age (prudence), investing the funds saved from current income to generate more income in the future (calculation), improving the level of life by spending more in the future (development). Increasing the sense of trust through savings (independence), carrying out speculative activities or business projects (undertaking), bequeathing (honoring), satisfying stinginess or greed (greed, greed) (Peterson, 1994, p. 170). In addition, in the empirical studies in the literature, fiscal policies (government savings, regulations on social security), financial variables (money supply, inflation) and macroeconomic stability indicators are also included as determinants of savings. On the other hand, external factors as well as growth and demographic variables are considered among the determinants of private savings. Expenditure and income policy (such as the structure of taxes), which is among the fiscal policies, can affect the total savings by determining the level of government savings (Dayal and Thimann, 1997, p. 7).

Although the studies differ, it is seen that inflation, urbanization rate, financial depth, income distribution and interest rates also have a significant and positive relationship on savings (Ricciuti, 2003, p. 57). For example, an increase in inflation is expected to increase savings due to precautionary reasons (De Serres and Pelgrin, 2002, p. 128). Increasing urbanization has a decreasing effect on savings rates. Because individuals living in the city have more consumption opportunities than those living in rural areas, the effect of urbanization on savings is negative (Bhandari, Dhakal, Pradhan and Upadhyaya, 2007, p. 209). If the financial system is deep, individuals will be able to access savings tools more easily. This situation, which provides a variety of financial instruments, will offer individuals the opportunity to save more. Therefore, there is a significant and positive relationship between financial depth and savings (Edwards, 1996, p. 39). According to the income distribution effect, individuals with higher incomes tend to save more than those with lower incomes. Empirical studies reveal that the top 20% of the income bracket is the group that saves the most. This rate decreases as one moves towards poverty (Dynan, Skinner and Zel, 2004, p. 438). In addition, the general opinion is that interest rates will increase savings. More precisely, due to the substitution effect, an increase in interest rates is expected to lead to a similar increase in savings. Because this increase in real interest rates reduces consumption and causes an increase in the present value of the principal to be obtained in the next period (Rijckeghem and Üçer, 2009, pp. 15-17).

It is seen that many different studies have been conducted on the determinants of saving in the literature. The vast majority of studies have remained far from focusing on the human being. Indeed, economics is a social science. The main purpose of social sciences is human. The savings in question are also carried out by humans. In this context, the analysis of the phenomenon of saving, which is of great importance for the country's economies, within the framework of human behavior

reveals its importance. As a matter of fact, at this point, behavioral economics stands out with its studies on human behavior in economic issues.

3. Behavioral Economics

In the 18th century, when rationality came to the fore, subjective experiences were excluded from the scope of scientific knowledge because they could not be tested objectively and natural sciences (especially physical science) were the dominant science as a result of admiration for their consistency, it is seen that economics sought a balance as in physical science by imitating natural sciences. Thus, it was inevitable that the language of economics would be mathematics (Yılmaz, 2009, pp. 72-73). In this period when the distinction between positive and normative knowledge was made, economics, aiming to be on a solid ground from a methodological point of view, focused on the objective elements and eliminated the subjective elements by using Occam's Razor[2] (Frey and Stutzer, 2002, pp. 402-435). Afterwards, economics realized its marginalist and econometric revolutions. Thus, economics has turned into a technical science by internalizing mathematization thoroughly and focusing on the logic of abstraction. With this logic of abstraction, the search for idealized facts has become the main factor in the theory and politics by determining the line of economics. After all these developments, Hicks and Allen's (1934, p. 54) substitution of the word "utility" with the word "preference" has caused economics to move away from its psychological roots and ignore real human values.

However, recent developments in the science of psychology reveal that the definition of a single type of person can no longer be realistic. Thus, increasing the explanatory power of existing theories by including other issues ignored by mainstream economics in the analysis has begun to be discussed. In this context, behavioral economics studies are carried out as a result of the multidisciplinary study of psychology and economics (Ruben and Dumludağ, 2018, pp. 33-50).

Although behavioral economics seems to have taken place in the recent past, its history actually goes way back. Even in Smith's "The Theory of Moral Sentiments" and "The Wealth of Nations", there are emphases on human psychology. As a matter of fact, in The Theory of Moral Sentiments, it is emphasized that human is a social being. This shows the situation in which people tend to share their own and others' pain and joy, thus sympathizing with joy rather than pain, and tending to hide their poverty. In the book The Wealth of Nations, it is emphasized that people do not only act with the impulse of self-interest, but also interact with other people while getting what they want on the subject (Ruben et a, 2018, pp. 38-39). As a

[2] Occam's Razor was invented in the 14th century by William of Ockham. Although originally Ockham, it is often used as Occam in the literature. This principle argues that the phenomenon to be explained should be explained with as few assumptions as possible. Ockham is the name of a vault in the south east of England.

matter of fact, George Katona, one of the early behavioral economists, called economists to analyze economic events together with the science of psychology in 1951 (Camerer, Loewenstein and Prelec, 2004, p. 6). Afterwards, Herbert Simon, one of the early behavioral economists, emerged. Simon criticized the rational human assumption of neoclassical economics and studied decision-making processes (Hattwick, 1989, p. 142). According to Simon, universal rationality is not possible because the organism's own knowledge and abilities limit rationality (Can, 2012, p. 95). In addition, Simon brought the concept of limited rationality to the literature with his studies. Afterwards, while the studies in the field of behavioral economics increased rapidly, it is seen that this term was first used by Kenneth E. Boulding in 1958. The first academic journal published in the field of early behavioral economics was "The Journal of Behavioral Economics" in 1971 (Hattwick, 1989, p. 142).

After the developments in the cognitive field, it is seen that behavioral economics started to take the mainstream economic theory as a reference with the studies of psychologists such as Kahneman and Tversky in the field of behavioral economics. Thus, the distinction between early and recent periods in behavioral economics emerged. The most important difference between the early period and the recent period is that while the early period rejected the mainstream, it tried to increase its explanatory power by justifying these models with cognitive constraints based on the models of the recent mainstream (Ruben et al, 2018, p. 45). When it comes to today, it is seen that neuroeconomics and experimental economics have emerged as two sub-branches of behavioral economics with the developing technology. Thus, theories have been developed about how individuals make decisions in the face of economic situations. Undoubtedly, the first of these theories is the prospect theory, which took place in order to criticize the expected utility theory.

According to the expected utility theory proposed by Bernoulli (1738), people make their decisions based on probabilistic calculations. As a result of the calculation, the option with the highest mathematical return is preferred. In this theory, it is assumed that people will not use any other method other than mathematical probability calculation in economic decision moments. Because the rational economic individual behaves in this way and chooses the one with the highest mathematical return and therefore the one that provides the most benefit. Therefore, focusing on expected return in theory, psychological factors have been completely ignored. It is focused on the fact that people take the decision with the highest expected return and act in a way that will provide them the most benefit (Tekin, 2016, p. 79). However, Kahneman and Tversky (1979) criticized this situation and developed the Prospect Theory. In fact, they emphasized that people are affected by psychological factors in many moments, including the moment of economic decision. Because in daily life, people can attribute different values to economic loss and gain situations even if they have the same return mathematically. In other words, people do not calculate value over mathematical returns as in prospect theory (Kahneman, 2003,

pp. 162-168). Because individuals evaluate their values psychologically, not as an ultimate being. The expectancy theory that emerged to explain this situation is expressed with an S-shaped value function (Kahneman, 2018, pp. 505-506).

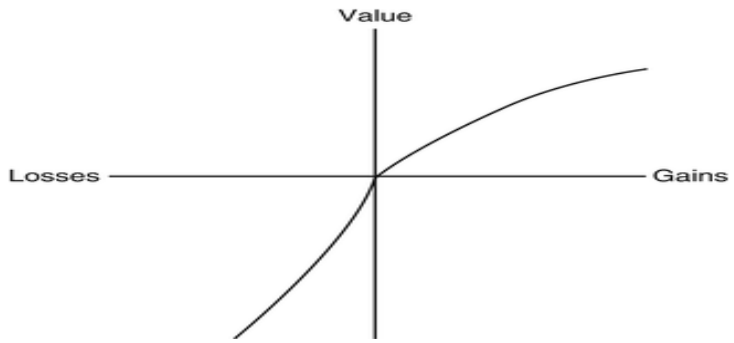

Figure 1: Prospect Theory Value Function
Reference: Kahneman, 2018, p. 506.

In this function, the gain state is concave (concave), while the loss state is convex (convex). For this reason, the slope in the loss state is higher. This function shows that the meaning or value that people attribute to the moment of loss is more than that to the moment of gain. In short, this situation, which we define as the motivation to avoid loss, expresses that a loss of the same amount is more annoying than a gain of the same amount (Kahneman, 2018, p. 507). That is, people attach more meaning to losses than gains (Tekin, 2016, p. 79). For example, the value attributed to winning 80 Turkish lira (₺) is not the same as the value attributed to losing 80 ₺. Even if the amount is the same, people are more sensitive to losing.

With these theories, Kahneman and Tversky suggested that people actually act according to the prospect theory rather than the expected utility model (Kamber, 2018, p. 184). In addition, in this theory, differentiation from the expected utility function is achieved by using the concept of value instead of the concept of utility (Shiller, 1999, p. 1305). According to prospect theory, people use value functions instead of utility functions and attribute decision weight to possible outcomes. According to prospect theory; the value of the expectation is determined on the basis of the change in the individual's assets rather than the individual's final asset status. The individual's perception mechanism considers changes, not absolute magnitudes (Şener, 2015, p. 60). According to Kahneman and Tversky, we perceive a sensory and perceptual parameter such as brightness, loudness or temperature by comparing it with our past experiences or a reference point formed in the past. Therefore, the same level of wealth; may mean poverty for one person and wealth for another, depending on their current wealth (Kahneman et al, 1979, p. 277).

In addition to these, there are other studies carried out in the field of experimental economics for the definition of rational individual in the field of behavioral economics. For example, in the experimental study to measure the effect of

perceptions on economic decisions, two products that are the same were tasted by the subjects. However, the information that the products are the same was not shared with the subjects. Only the unit price information of the products is given for manipulating the subjects. As a result of the experiment, it has been obtained that people can exhibit different behaviors by developing different perceptions even in the presence of the same product without realizing it, and even in the face of a neurophysiological condition, such as taste, starting from the tongue and going directly to the brain (Cevizli and Bilen, 2021a, pp. 413-423). In the study that analyzes the effect of emotions on rational economic decisions; the subjects were divided into two groups as control and experimental groups. The subjects in the control group were subjected to a preliminary preparation process by performing simple mathematical operations before the experiment started. The subjects in the experimental group, on the other hand, completed the preliminary preparation process by reading a real-life story. The experimental question, which is the main determinant, was asked to the subjects who completed the preliminary preparation process. As a result of the experiment, it has been revealed that, contrary to the rational individual assumption, people do not act with pure reason in the face of an economic decision and at the same time feed on their emotions (Cevizli and Bilen, 2021b, pp. 19-41). [3]

In short, in the recent period, behavioral economics has been ignored by the dominant economic view rather than an effort to create an alternative to the theories that are valid in economics; argues that the inclusion of psychological, sociological and neurological factors in the analyzes should thus increase the explanatory power of existing theories. As a method, experimental methods that include real people are preferred against the abstraction reached by the science of economics. In this context, it is seen that some studies have been carried out in the field of behavioral economics to analyze the savings phenomenon. However, it is seen that the studies are generally carried out within the framework of the methods commonly used in economics.

4. Studies On Savings

A number of studies have been carried out in the field of behavioral economics to reveal the effects that lead people to saving behavior. For example, Katona took the 1960s in America and revealed what people did for savings, emergencies (illness, unemployment), old age and retirement, for the needs of children, for a new house or durable goods, and for vacation. Kotlikoff, on the other hand, found in his study that about 30% of American families' savings are made mainly due to concerns about old age. In the study conducted by Alessie, Lusardi and Aldershof (1997) in the Netherlands, it was shown that one of the most important reasons for saving is precautionary reasons. Johnson (1999) in his study of Asian refugees found that the group saves mainly for emergencies and children's education. In a study conducted

[3] See also; Cevizli, 2021.

in Japan, Horioka and Watanabe (1997) revealed that Japanese families save primarily for retirement and precautionary reasons, just as consistent with the assumptions of the life cycle hypothesis. In the telephone interviews conducted by Harris, Loundes and Webster (2002) on randomly selected families, the savings of Australian families; it turns out that they did it for retirement, vacation and precautionary reasons. Webley, Burlando and Viner (2000) conducted a cross-cultural study to examine savings trends; examined Italian, British and Israeli participants. They found that compared to the British and Israeli groups, Italians tended to save as much as possible and were able to control their spending more easily. For Italians, the most important reason is children's education and health expenditures, while for British participants it is important for future expenditures (Canova, Rattazzi and Webley, 2005, p. 23).

When the empirical studies to determine the factors affecting household savings are examined; Sandoval-Hernandez (2010) examined the period between 1984 and 2006 in Mexico using the cross-sectional data analysis method and concluded that the demographic characteristics and structure of the household and life cycles were effective on savings. Niculescu and Mihaescu (2012) examined the period between 1995 and 2010 in Europe using panel data analysis method and concluded that rural population growth and interest rate affected savings positively, while growth affected negatively. Bozkuş and Üçdoğruk (2007) made a model estimation of the factors affecting household savings preferences in Turkey by using the data of TUIK's (Turkish Statistical Institute) 2003 Household Budget Survey and found that the household saving tendencies are generally closely related to the age of the household head, education level, and income level. have reached their conclusion. Şengür and Taban (2015) examined the factors that affect household savings other than income for the 2002-2013 period using the logit model method and concluded that monthly income, education level affect savings positively, whereas household size and living in rural areas affect savings negatively.

Some researchers have also included psychological factors in their models while examining the reasons that lead people to save. For example, Shefrin and Thaler (1988) included factors such as mental accounting and self-control in their model, which they named "behavioral life-cycle model of saving". According to their model, they discovered that people do not treat all of their wealth in the same way, but spend according to whether money is viewed as current income, current assets, or future assets. In this situation, which they call the wealth effect, it has been revealed that people find what they have more valuable than what they value when they do not have it. Shefrin and Thaler argued that people often adopt rules that limit their spending opportunities, according to their self-control status (Canova et al, 2005, p. 24). In the next part of the research, the phenomenon of saving will be analyzed with an experimental study from the perspective of behavioral economics.

5. Method

In this part of the study, the research method, sample, data collection tools, data collection, data analysis and ethical issues are explained.

5.1. Research Methodology

In the study, the phenomenon of saving was analyzed objectively by testing it with an experimental economic method that is frequently used by behavioral economics.[4] Therefore, an econometric/statistical analysis, which is widely available in the economics literature, has not been performed.

With the use of experimental methods in economics, the field that tests the theories, basic arguments, theories and models of economics on real subjects is defined as experimental economics. Although experimental economics is seen as a sub-branch of behavioral economics, it is seen that there are obvious similarities and even mutual interactions between them (Soydal, 2010, p. 97). As a matter of fact, Ariely (2013, p. 72) defined an experiment as the instrument that allows the human behavior to be slowed down and analyzed in frames. Although experimental methods were first used scientifically in sciences such as nature, physics, chemistry and biology, its spread to social sciences was realized in the Leipzeig laboratory with the science of psychology in 1897, accompanied by Wundt. In economics, although there is no definite consensus on the use of experimental methods, the market experiments conducted by Chamberlin to graduate students in 1940 are pointed out (Saral, 2018, pp. 341-342).

In an experimental study, one of the most important and agreed conditions in order to reflect the preferences of the subjects correctly is undoubtedly that the subjects should not be misled in any way. Another important condition is the implementation of incentives for the subjects to reflect their real decisions (Saral, 2018, pp. 341-347). The incentive to be applied should basically meet the criteria of monotony, dominance and salience (Smith, 1976, p. 277). In accordance with the monotony criterion, the incentive mechanism should be implemented in cash. As a matter of fact, due to the uncertainty of applications such as gifts and exam scores, care should be taken when using them. If an incentive mechanism other than cash is to be preferred, this should be supported by strong evidence. In addition, it is seen that the monetary incentive mechanism, which is in harmony with the maximization principle of economics, increases the robustness by reducing the variant. The incentive to be given according to the salience criterion should be associated with the subjects' decisions. In addition, it should be in a framework that the subjects can easily understand. According to the dominance criterion, the incentive mechanism should have a motivating quality. Apart from these, the internal and external

[4] For more information; Roth, 1986; Smith, 1994; Guala, 2005; Friedman, Friedman and Sunder 1994; Binmore, 1999.

validity of the experiment should be designed in a way that accurately reflects causality. In addition, the findings should be in a form that can be generalized in the real world apart from theory. It is also important to protect anonymity and privacy in the experiment. Especially in cases where these issues are not met, even the dominance feature of the promoter is insufficient for the subject to make the right decision. As a matter of fact, the subject should be comfortable during the experiment and the feeling of being observed should not be created. Because if the subject has the feeling that it is being observed, this time it can give its preference to influence others (Hertwig and Ortmann, 2001, pp. 383-403).

In addition to these, the experiment instructions should be understandable and the subjects should be informed about the basic rules before the experiment. It should be confirmed that all information regarding the experiment is understood by the subjects. While the instructions and necessary information are communicated to the subjects, it should be kept short by using plain language so as not to distract the subject. During the experiment, information and instructions for the experiment should be in an easily accessible place. The physical environment in which the experiment is carried out and the equipment to be used during the experiment should be designed in such a way that the subjects cannot see and be affected by each other. In addition, the subjects should be prevented from communicating with the outside, as they may affect the outcome of the experiment (Saral, 2018, p. 352).

The experiment applied in the study was designed with inspiration from the ultimatum game and expectation theory, which are the best-known studies of behavioral economics. [5] As a matter of fact, while the ultimatum game is based on the distribution of 10 dollars, the expectation theory shows that people are more sensitive to loss than gain. Of course, the aforementioned experiments were carried out to detect deviations from the rationality assumption of mainstream economics. However, in this study, it is aimed to clarify the effect of loss aversion motive on saving behavior rather than detecting a deviation in current economic theories. In this context, this relationship was analyzed with an experimental study from the perspective of behavioral economics. Thus, a microeconomic contribution has been made to the existing macroeconomic studies on savings from the perspective of behavioral economics. At the same time, while designing the experiment, the criteria that should be in the experimental study, especially the internal validity criterion specified in the paragraphs above, were taken as basis. In this context, the study has a unique quality.

In this context, in the experiment, firstly, 10 Turkish Liras (₺) were distributed to the participants in cash. Afterwards, the subjects were told that they could shop at the mini-market with this money. Thus, it has been observed that how much of the money distributed will be spent and how much will be saved to be spent later. As a result of this observation, it will be revealed which of the spending and saving

[5] For more information; Güth et al, 1982; Kahneman and Tversky, 1979.

behavior of the subjects are more inclined. Afterwards, the subjects were asked to rate the emotional states they felt while buying goods and giving their money. People undoubtedly get some pleasure when they buy something new. At the same time, they experience pain in return for the money they spend while owning this thing. Of course, it is not easy to measure abstract concepts such as pleasure and pain. In order to overcome this difficulty, a 10-point likert scale was created by using the World Values Survey (WVS) questionnaire in the experiment.[6] Finally, the participants were asked about the reason for saving in order to support the finding to be obtained from the research.

In addition, the most important feature that distinguishes economics experiments from experiments in other social sciences is the incentive mechanism (Saral, 2018, p. 348). In this context, the design of the experiment for the use of 10 ₺ is important in terms of the clarity, dominance and monotony criteria of the incentive mechanism. At the same time, the subjects can establish a relationship between this money and the decision they will take. The experiment performed in this basic framework is shown in the following sections.

5.2. Sample

The research includes 36 soldiers in a military unit in Altınova/Yalova. Of course, the number of soldiers serving in the military unit is more than 36. However, the number of people who volunteered to participate in the experiment was 36. In order to avoid the feeling that the identity information of the subjects might be disclosed, the demographic information of the subjects was compiled the day after the experiment. The age range of the subjects participating in the experiment is between 20 and 28, and their monthly income level is between 2800 and 4000 ₺. All of the subjects are graduates of higher education, and there are also associate and undergraduate degrees. The information about the places where the subjects live is shown in Table 1.

[6] For more information: http://www.worldvaluessurvey.org/

Table 1: Where the Subjects Lived

Güneydoğu Anadolu	Gaziantep	1	Karadeniz	Bolu	1
	Siirt	1		Ordu	1
	Şanlıurfa	1			
	Batman	1		Samsun	1
Ege	Manisa	1		Trabzon	2
	İzmir	2		Ardahan	1
Akdeniz	Adana	2	Marmara	Sakarya	1
	Kahramanmaraş	1		İstanbul	4
	Antalya	1			
	Mersin	1		Tekirdağ	1
Doğu Anadolu	Ağrı	1	İç Anadolu	Kırşehir	1
	Diyarbakır	2		Ankara	3
				Konya	1
	Bingöl	1		Kayseri	1
	Van	1		Çorum	1

The subjects consisted of seven different regions of Turkey and have different cultures. Thus, it was possible to reach a heterogeneous group of subjects. This situation also provided the external validity criterion that should be in the experimental study.

5.3. Data Colection Tools

In the research, ranking and classification scale, which is one of the quantitative data collection methods, was used.[7] Being directly accessible to the documents in the study increases their accuracy and reliability compared to the documents obtained outside the research context.[8]

5.4. Data Collection and Analysis

The experiment was carried out in the mini-market of the military unit. The mini-market has a small area of 5 square meters. There is a large opening glass in the front door of the mini-market. As a matter of fact, customers do their shopping here. There are shelves on the other three sides. When you look inside the glass of the mini-market, you can easily see all the products and their prices. The types and prices of the products in the mini-market are shown in Table 2.

[7] For more information; Gürbüz and Şahin, 2014.
[8] For more information; Robson, 2015; Hareket, 2021.

Table 2: Products and Prices in the Mini-Market[9]

Product	Price (₺)	Product	Price (₺)
M.Pazarı Badem	8,5	Algida Cornetto	4,15
M.Pazarı Fındık İçi	7,10	Algida Magnum	4,45
Adalılar Antep Fıstığı	7,5	Algida Nogger	3,15
Adalılar Ay Çekirdeği Siyah	4,05	Şölen Luppo	5,95
Doritos Taco Süper	3,45	Ülker Albeni	1,87
Çerazza Süt Mısır	3,45	Ülker Biskrem	1,70
Çerezza Kokteyl	3,45	Ülker Canpare	1,32
Damla Elmalı Soda	1,03	Ülker Çokoprens	1,50
Damla Sade Soda	0,81	Ülker Halley	1,70
Coca Cola Kutu	3,35	Ülker Hanımeller Kurabiye	2,95
Sprite Kutu	3,35	Ülker Probis Bisküvi	5,25
Cappy Vişne Suyu Kutu	3,35	Ülker Çizi Kraker	1,13
Cappy Karışık Meyve Suyu	1,35	Eti Popkek	1,13
Nescafe 3'ü Bir Arada	0,86	Ülker Coco Star	0,75
Buzdağı Su 1,5 Litre	0,94	Ülker Dido	1,5

The experiment was carried out at 20:00, which is the resting time of the subjects at the end of the day. The experiment started when the subjects came to the mini-market. Each subject was first given 10 ₺ in cash. Then, the subjects were told that they could buy whatever they wanted from these products with their own money or they could save their money to spend later. After making his choice, the subject was given a paper on which the questions in Table 3 were written and asked to answer them.

Table 3: The Question Asked to the Subjects[10]

1. SCORE THE EMOTION OF HAPPINESS YOU FEEL WHEN YOU BUY THE PRODUCTS

HAPPY ⟶ VERY HAPPY

1 2 3 4 5 6 7 8 9 10

2. SCORE THE PAIN OF LOSS THAT YOU FEEL WHEN GIVING THE MONEY

PAIN ⟶ VERY PAIN

1 2 3 4 5 6 7 8 9 10

[9] Prices belongs to July 2021, when the study was carried out. In addition, the mini-market was established to meet the needs of the soldiers. For this reason, the prices of the products in the mini-market are more reasonable than the profit-oriented businesses.

[10] The scales were created using the World Values Survey (WVS).

After marking, the subject folded the paper in half and threw it into the invisible box. Afterwards, the subjects were asked to answer the question shown in Table 4, which includes the last phase of the experiment. After the subjects marked this question, they again threw their papers into the invisible box.

Table 4: The Last Question Asked to the Subjects

3. WHAT MAY BE THE REASON FOR THOSE WHO PREFER TO SPEND FURTHER?
A. To avoid the fear of loss that will occur on people due to spending.
B. Other reasons.

As a result of the experiment, the situation regarding how much of the money the participants spent is shown in Table 5.

Table 5: Expenditures Made by Subjects

Subject	The Money Spent	Subject	The Money Spent	Subject	The Money Spent	Subject	The Money Spent
1	5,05 ₺	10	0 ₺	19	0 ₺	28	3,35 ₺
2	3,35 ₺	11	4,45 ₺	20	1,35 ₺	29	0 ₺
3	0 ₺	12	10 ₺	21	0 ₺	30	2,25 ₺
4	0 ₺	13	8,5 ₺	22	10 ₺	31	10 ₺
5	10 ₺	14	0 ₺	23	5,25 ₺	32	0 ₺
6	4,45 ₺	15	7,5 ₺	24	10 ₺	33	4,15 ₺
7	0 ₺	16	7,1 ₺	25	5,25 ₺	34	2,95 ₺
8	0 ₺	17	4,05 ₺	26	0 ₺	35	8.9 ₺
9	7,5 ₺	18	0 ₺	27	6,19 ₺	36	10 ₺

According to the result, 33% of the subjects saved all their money to spend later. 28% spent between 0-5 ₺, that is, less than half of their money. 22% spent between 5-10 ₺, that is, more than half of them. 17% of the subjects spent all of their Money. In fact, two of the subjects who preferred to spend all of their money asked if they could add more from their own money.

In the questions asked to the subjects using a 10-point Likert scale to measure the pleasure they feel in return for obtaining a product and the pain they feel in return for spending money; the average happiness score was obtained as 4. In other words, the subjects obtained a pleasure level of 4 on a 10-likert scale from the products they obtained by spending their money. The average of the pain experienced by the subjects against losing by spending money was obtained as 7. About 67% of the

subjects answered the 3rd question, why people might prefer to spend later, by choosing option A. On the other hand, 33% showed other reasons.

6. Conclusion

Humans are more sensitive to pain, whether physical (stick in needle) or emotional (broken heart). As a matter of fact, the thought of losing money also creates pain in people.[11] When we feel any pain, our first instinctive reaction is to try to get rid of it. The prospect theory also shows that people attribute relatively more value to losing and gaining something. If we analyze the phenomenon of saving from this perspective, it can be said that people tend to save with the fear of losing. Of course, people get pleasure through consumption. However, the feeling of loss (spending money) that comes with consumption prevents the feeling of pleasure (obtaining a product). Fear of loss causes a behavior in individuals to save by not spending their money. As a matter of fact, the findings obtained from the experiment support this situation. In short, if we repeat the factors that affect people's savings; according to the classical economic view, this phenomenon is the interest rate. As the interest rate rises, people tend to increase their savings. According to the Keynesian economic view, it is the income ratio. People increase their savings as their income ratio increases. As a matter of fact, this study shows that the motivation to avoid loss is among the factors affecting saving.

In this context, in the first stage of the experiment, it was determined that the subjects were more inclined to save or spend. Thus, it was observed which of the savings and spending behaviors the subjects would do with the money given to the subjects. It was observed that the total money spent in the experiment was 152,59 ₺. Thus, 42% of the total money was spent and the remaining 58% was saved to be spent later. This result shows that the participants are more inclined to saving behavior.

In the second stage of the experiment, the effect of loss aversion motivation on the behavior of the participants was analyzed. In order to analyze this situation, the feelings of pleasure and pain obtained by the subjects from the experiment were measured. According to this scale, the subjects achieved an average of 4 pleasure after spending. On the other hand, the pain felt by the subjects after spending their money was obtained at an average of 7 levels. Here, it is seen that the sense of avoidance of loss, which the participants get by saving their money, is more dominant than the sense of pleasure they get from the products they buy. As a matter of fact, this situation coincides with the prospect theory, which shows that people are more sensitive to losing.

[11] In studies using neuroimaging systems, it has been observed that there is activity in the same areas of the brain when experiencing social pain and physical pain (Eisenberger, Lieberman and Williams, 2003, pp. 290-292).

In the third part of the experiment, the participants were asked whether the loss aversion motive affected the saving behavior. 67% of the participants stated that the reason for not spending their money was the fear of losing it. Thus, in the study, it is seen that people are more sensitive to losing, as shown in the prospect theory, and this sensitivity causes people not to spend their money and leads them to savings behavior.

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