

GAZIANTEP UNIVERSITY JOURNAL OF SOCIAL SCIENCES

Journal homepage: <http://dergipark.org.tr/tr/pub/jss>



Araştırma Makalesi • Research Article

Analysis of Non-Physical Money From The Endowment Effect Perspective

Fiziksel Olmayan Paranın Sahiplenme Etkisi Üzerinden Analizi

İbrahim CEVİZLİ^{a*}

^a Dr. Öğr. Üyesi, Bozok Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İktisat Bölümü, Yozgat / TÜRKİYE
ORCID: 0000-0002-1516-5081

MAKALE BİLGİSİ

Makale Geçmişi:

Başvuru tarihi: 7 Mayıs 2024

Kabul tarihi: 23 Eylül 2024

Anahtar Kelimeler:

Davranışsal iktisat,

Deneysel iktisat,

Sahiplenme etkisi,

Para.

JEL Kodları: D09, E07

ÖZ

Teknolojinin ilerlemesi ile hemen hemen bütün ülkeler dijital para başta olmak üzere fiziksel olmayan para birimine geçilmesine yönelik politikaları değerlendirmeye başlamıştır. Nitekim fiziksel olmayan (dijital) para uygulaması Çin, İsviçre, Tayland, Ukrayna, Uruguay ve Güney Kore tarafından daha da ileri götürülerek pilot olarak uygulanmaya başlanmıştır. İçerisinde bulunduğumuz çağda paranın er ya da geç fiziksel olmayan bir hale dönüşmesi kaçınılmaz görünmektedir. Bu kapsamda fiziksel olmayan paranın kısa vadede bireylerin harcama eğilimi üzerindeki etkisinin analiz edilmesi önemini ortaya koymaktadır. Böylelikle çalışma, ileride dijital para gibi fiziksel olmayan bir para uygulaması geçilmesi hâlinde politika yapıcılara öngörü niteliği taşımaktadır. Bu kapsamda çalışmada fiziksel olmayan paranın harcama davranışı üzerindeki etkisi davranışsal iktisadi perspektiften sahiplenme etkisi özelinde bir deneysel çalışma ile analiz edilmiştir. Çalışmada uygulanan deney tamamen gönüllülük esasına dayalı olarak gerçekleştirilmiştir. Uygulama esnasında mahremiyetin korunması hususuna özen gösterilmiştir. Katılımcılara yönelik tüm talimatlar açık ve anlaşılır şekilde tebliğ edilmiştir. Katılımcıların deney esnasında rahat ettirilmeleri sağlanmıştır. Deney kurgulanırken deneklerin verilen teşvik ile ilişkilendirilmesi sağlanmıştır. Ayrıca deneysel çalışmada olması gereken iç ve dış geçerliliğin oluşturulması da mümkün kılınmıştır. Katılımcıların herhangi bir şekilde manipüle edilmesi engellenmiştir. Bu kapsamda çalışmada veriler 26 kişilik bir denek grubuna verilen fiziki para ile fiziksel olmayan paranın harcanma eğilimi gözlenerek toplanmıştır. Sonrasında her iki grubun harcama eğilimi karşılaştırılarak analiz gerçekleştirilmiştir. Çalışmanın sonucunda fiziksel paraya sahip olan grubun fiziksel paraya sahip olmayan gruba nispeten sahiplenme etkisinde kalarak daha az harcama eğiliminde olduğu tespit edilmiştir. Sahiplenme etkisine paralel olarak fiziki paraya sahip olan grubun geç harcama eğiliminde olmasının sebebi para ödemenin açısından da kaynaklanabileceği değerlendirilmiştir.

ARTICLE INFO

Article History:

Received: May 7, 2024

Accepted: September 23, 2024

Keywords:

Behavioral economics,

Experimental economics,

Endowment effect,

Money.

JEL Codes: D09, E07

ABSTRACT

With the advancement of technology, almost all countries have started to evaluate policies for switching to non-physical currency, especially digital money. As a matter of fact, the application of non-physical (digital) money has been taken further and started to be implemented as a pilot by China, Sweden, Thailand, Ukraine, Uruguay and South Korea. In the age we live in, it seems inevitable that money will sooner or later turn into a non-physical form. In this context, the effect of non-physical money on individuals' spending tendency in the short term reveals its importance. Thus, the study provides insight for policy makers in case a non-physical money application such as digital money is adopted in the future. In this context, the effect of non-physical money on spending behavior was analyzed from a behavioral economic perspective with an experimental study specific to the endowment effect. The experiment applied in the study was carried out entirely on a voluntary basis. Care was taken to protect privacy during the application. All instructions to the participants were communicated clearly and understandably. Participants were made comfortable during the experiment. In addition, it was made possible to establish the internal and external validity required in the experimental study. Any manipulation of participants was prevented. In this context, data were collected in the study by observing the tendency to spend physical money and non-physical money given to a group of 26 subjects. Afterwards, the analysis was carried out by comparing the spending tendencies of both groups. As a result of the study, it was determined that the group with physical money tended to spend less due to the ownership effect compared to the group without physical money. In parallel with the ownership effect, it has been evaluated that the reason why the group with physical money tends to spend it late may be due to the pain of paying money.

* Sorumlu yazar/Corresponding author.

e-posta: ibrahim.cevizli@bozok.edu.tr

Introduction

When the historical process of money is analyzed, it is seen that it mainly took place in order to facilitate exchange. As a matter of fact, the exchange of goods with goods in the barter economy has reached an unsustainable point with the increasing population. This problem could only be overcome by the occurrence of money. In short, it emerged as an obligation to eliminate the complexity of the payment instrument in the money barter economy. Money is a medium of exchange in providing goods and services that meet people's needs. It also reduces transaction costs. Since it is liquid, the process of converting into assets is very fast.

The phenomenon of money, which started with many substances in nature, was eventually identified with precious metals. With the invention of writing, it began to be written on paper. Ultimately, with the developing technology, it has now started to become non-physical. In this context, world economies create forms of money in accordance with the requirements of the digital age. It is obvious that Central Banks and policy makers will have great responsibilities in this regard.

This change process of money also causes some effects on people's behavior patterns. At this point, behavioral economics comes to the fore by analyzing the behavior of individuals at moments of economic decision with experimental methods. In addition, according to the rational economic individual assumption of the dominant economic thought, individuals behave within the framework of a certain pattern. As a matter of fact, behavioral economics has shown many times in its empirical studies that people do not exhibit a uniform behavior as assumed in economic norms, and that there cannot be a universal rational behavior pattern. In this context, this study; It aims to analyze with an experimental study what kind of impact will occur on individuals' spending tendencies if they switch to non-physical money, specifically the ownership effect from the perspective of behavioral economics. Thus, in the first part, the historical adventure of money, in the second part, behavioral economics and the endowment effect, in the third part, the behavioral economic approaches that form the basis of the study, and in the fourth part, an original designed experimental study has been carried out.

Statistical and econometric models frequently encountered in economics were not used in the study. As a matter of fact, although the science of economics has reached its main goal, it has moved away from humans, turned mathematics from a tool into a goal, and eventually became an abstract and technical science. In order to overcome this abstraction, an experimental method involving real people was applied in the study.

In the literature, studies on digital money have generally focused on cryptocurrencies (Bitcoin, Ethereum, etc.) and their legal processes. However, no study has been conducted on a microeconomic scale on what the impact on individuals might be if countries switch to a non-physical (such as digital) monetary system as a policy. In this context, the study has the feature of being original. In addition, as can be seen from the results of the study, individuals will tend to spend quickly as they will be free from the endowment effect if they switch to non-physical money.

In this context, the study emphasizes this issue and serves as a prediction for policy makers before Central Banks implement digital money. In this way, awareness will be raised and an additional application will be brought to the agenda for policy makers to prevent individuals from falling into vulnerability during the transition to non-physical money such as digital money. This again reveals the importance of the study.

Historical Process of Money

When the existence and development process of money is examined, it is seen that it is not based on a physical, biological, religious or legal structure, but is completely shaped according to the needs of the time. During the Stone Age, when humanity lived in tribes as hunters and gatherers, they did not need the phenomenon called money (Ponting, 2008, p. 29-30). In this period, people benefited from animals and plants in their own living spaces to the extent that climatic conditions and nature allow. As a matter of fact, with the increasing population, the tribes that had difficulty in meeting their own needs in their living space needed other tribes. This situation has brought about the barter phenomenon. The settled life becomes more systematic, the knowledge and experience gained begin to be used; led to an increase in product diversity. This situation also caused conflicts in the exchange of goods. For example, the exchange of fresh fruit and unripe grain has become impossible. The process has brought the barter economy to an unsustainable point (Fidan, Dilek and Esev, 2019, p. 141-162). This situation necessitated the development of new methods. It was obligatory to use a common intermediate good during barter transactions. The Mesopotamian region has been a pioneer in this regard by using intermediate goods such as barley, copper, silver and gold. Of course, in addition to these, 5-4 BC. Oyster shells, which are thought to have been used for centuries, were used as money in addition to being ornaments in Turkish culture. Cloth was also used as a means of payment before (Özyetgin, 2005, p. 154).

In various parts of the world, it is seen that objects such as silk, ax, leather, fur and iron are used as a substitute for money (İzgi, 1978, p. 96). As a matter of fact, with the Lydians starting to use precious metals as a means of exchange, the barter economy lost its importance (Fidan et al, 2019, p. 141-162). The first coin was minted by the Lydian King Kroisos in the 7th century BC (Türe and Savaşçın, 2002, p. 81). In the history, precious metals such as silver and gold, which were produced from precious metals and used as a price measure, were called coins. After the invention of writing, papers with written values began to be used, especially in commercial relations corresponding to large sums. Over time, problems in the transportation, protection and weight of coins accelerated the transition to the paper money system. Thus, the use of paper money, in other words banknotes, became widespread (Fidan et al., 2019, p. 141-162).

A banknote is essentially a worthless piece of paper. It is a representative instrument that can be exchanged for the amount (nominal value) written on it. The low cost of production, the ease of transportation and especially the fact that the desired amount can be written on it has caused it to take place on the basis of commercial activities (Demir and Odabaşı, 2022, p. 217).

The adventure of money is basically divided into four periods by Usta (2018). The first of these, called Money 1.0, dates back to B.C. This is the period that dates back to 5000 B.C., when money first appeared physically. The second period is the Money 2.0 period. During this period, money began to be transferred via telegraph networks for the first time. In this period, which coincided with 1871, money began to separate from its physical form and turn into data for the first time. The third period is the Money 3.0 period. The year 1971 is pointed out as the beginning of this period. During the Money 3.0 period, the United States announced that it would give up indexing the dollar to gold. From now on, money will turn into data in the future, that is, it will turn into a non-physical entity, which is referred to as money 4.0. In this context, it is seen that the money adventure that started with barter eventually turned into non-physical money (Tiryaki, 2016).

Behavioral Economics, Experimental Economics And Endowment Effect

In the eighteenth century, it is seen that rationalism came to the fore, the legitimate authority to be consulted outside of rational is not accepted, normative-positive knowledge distinction was made, and knowledge that could not be tested objectively was excluded from the scientific knowledge category. In this period, economics also imitated the natural sciences, especially the physical sciences due to the admiration for its consistency, in an effort to be an original science (Yılmaz, 2009, p. 72-73). Although it aims at human as a social science, it has even put human into a mold within the framework of Homo economicus with the effort of being a positive science. Thus, it has become a technical science (Demiröz, 2015, p. 71). Of course, mathematics was the language that economics, which is a technical science, would use (Baç, 2007, p. 2). As a matter of fact, behavioral economists have made one of the most effective objections to the science of economics, where mathematization is no longer a tool but a goal. Their most radical objections were that the individual could not be fitted into a fixed mold. As a matter of fact, experimental methods, which include real people, have been started to be used in order to overcome the abstraction that economics has surpassed (Yılmaz, 2009). Behavioral economics, which emerged as a result of the multidisciplinary study of economics and psychology, continues its studies. As a method, it uses experimental methods that include real people (Ruben and Dumludağ, 2018, p. 33-50). The most prominent of these studies are the ultimatum game, dictator game, public goods game, trust game and expectation theory.

Behavioral economics seems to use experimental methods to explain its theories, arguments and theories. At this point, Ariely (2013) defined the experiment as an instrument that allows slowing down human behavior and examining it in frames. At first, economics was seen as a discipline based on observation and experimental methods could not be used. But then the fact that direct measurements of data became possible formed the basis for the transition of experimental methods to economics. Thus, although experimental methods were used in the natural, physical, chemistry and biological sciences at first, they eventually spread to the social sciences (Smith, 1976, p. 274-279). There is no clear consensus on when economics began to use experimental methods. However, the market experiments of Edward Chamberlin (1940) for his students point to this (Basilgan, 2013, p. 64). After the 1960s, experimental methods began to be used frequently in economics. As of today, it is known that there are more than 200 laboratories today. As a result of these developments, the field of experimental economics has emerged (Loewenstein, 1999, p. 25-34). In fact, neuroeconomics has emerged as a result of the integration of experimental methods with advanced technology. Experimental methods include real people in order to overcome abstraction and mathematization. It also provides observational data. These increase the attractiveness of experimental methods (Baç, 2007, p. 20-21). In addition, the measurability of the relationship between variables makes experimental methods usable (Levitt and List, 2009, p. 2).

Theories produced solely by mathematical modeling, independent of social structure and disconnected from psychological factors, are no longer valid. As a matter of fact, economics is a social science. The target focus is people. Mainstream economics' understanding of humans as independent of space and time, devoid of human factors, and pursuing benefit maximization is unfortunately insufficient to define the real human being. Human behavior should not be considered in such a narrow framework. Analyses need to be made to understand the mechanisms that affect our behavior. In this context, behavioral economics, which stands out by engaging in a multidisciplinary study with other sciences, makes significant contributions to the literature. The endowment effect, which is the main focus of the study, is one of them.

The value of something varies depending on our possession of it. We tend to value something we own or possess more than what we do not have. This situation is known as the “*Endowment Effect*” (Demir, 2013, p. 106). In an experimental study on the subject, a group of

university students was given a glass worth about \$5. Afterwards, they were asked how much they would like to sell these glasses for. The other group, who was not given a glass, was asked the price that they would be willing to buy the same glass. As a result of the experiment, it was seen that those who wanted to buy offered an average of 3.5 dollars. It has been revealed that those who want to sell also want an average of 7.5 dollars. It has been found from the experiment that those who have the glass will be willing to sell for a higher price due to the endowment effect (Coyle, 2010, p. 135). For example, a product that is in the trial period creates an ownership effect on us. Of course, this results in us purchasing that product at the end of the trial period.

Literature Review

The indifference curve, which we often encounter in microeconomics, is the geometric location of points showing different commodity combinations. At the same time, these curves show that there is equal utility level at every point. Indifference curves are convex about the origin. Therefore, it represents diminishing marginal benefit. Indifference curves do not intersect each other. However, studies based on behavioral economics show that this is not actually the case, citing the endowment effect. For example, in his study, Knetsch gave one group of subjects a ballpoint pen with an average price of \$5, while the other group gave \$4.5 in cash. He then made the subjects a series of offers that they could accept or reject, aimed at determining the indifference curve. Knetsch created an indifference curve for each issue, drawing the line between accepted and rejected offers. Then he created the average indifference curve for each of the two groups. As a result of the study, it was seen that the curves were different from those in the traditional theory due to the endowment effect. As a result of the study, it was observed that the curves intersected differently than in the traditional theory due to the endowment effect (Knetsch, 1990).

In another study conducted to analyze the endowment effect; Half of a group of students were given a pencil. The other half was given enough tokens to buy gifts. Afterwards, all subjects were asked to choose between a pencil and two bars of chocolate. As in the previous experiments, a clear endowment effect emerged here as well. As a matter of fact, 56 percent of the subjects who had the pen chose the pen again, while only 24 of the others chose the pen. However, when scoring, it was observed that the subjects who had the pen found the pen more attractive. Here, the subjects were under the influence of endowment effect due to the pain of giving up the pen they owned (Loewenstein and Kahneman, 1991).

Thaler; In his study to demonstrate the ownership effect, he asked the participants the following question. *“If you were offered \$3,000 for your \$200 ticket to the concert of the band you admire, would you sell it?”* However, due to the endowment effect, the participants differed from the rational and self-interested human behavior in traditional economic theory (Kahneman, 2011, pp. 338-339).

In another experiment to analyze the endowment effect, a coffee mug bearing the symbol of Cornell University was used. Half of the participants in the experiment were given coffee mugs. The price of the coffee mug is around \$6. Afterwards, a market was created and the participants who were given coffee mugs were called sellers. Vendors were asked to place their coffee mugs on their desks for a while. In this way, participants who were not given coffee mugs were also able to see their coffee mugs. Buyers and sellers were asked to provide a price for the coffee mug in question. As a result, the average buying price is half of the average selling price. In the study, the fact that the sellers who were initially given the coffee mug want to sell the mug at a high price, and even most of them do not want to sell it, and the buyers offer a low price is again due to the endowment effect (Kahneman, Knetsch and Thaler, 1990, pp. 1325-1348).

Another experimental study based on behavioral economics that serves as a guide to the study in the literature is the ultimatum game. In this study, the volunteers were divided into two as the proposer and the offered. The bidder will be able to give a certain amount of money to the opponent (the offered), including no or all. If the offered accepts the incoming money, both parties will receive their money and the experiment will end. If the offered refuses, the game will end with neither side taking any money. With this experiment, the definition of rational individual, which constitutes the cornerstone of economics, was tested. Normally, the rational individual is expected to accept any positive offer, even if it is less than none. Otherwise, no money will be earned. However, as a result of the applicaiton, it was seen that people do not always act with the assumption of a rational individual, even giving up their own earnings in order to punish the proposer. Especially in offers made below a certain amount (Tompkinson and Bethwaite, 1995, p. 439-451).

The dictator game emerges when the group in the ultimatum game is deprived of the right to reject the offer and the same game is played again. In the dictator game, the person making the offer is expected not to send any amount, as the person making the offer cannot refuse whatever comes from the other party. As a matter of fact, according to the rational individual assumption of mainstream economics, the person should keep all the money for itself. However, at the end of the experiment, it was seen that the group that made the offer still sent a certain amount. Feelings of altruism have been pointed out as the reason for this (Akin and Urhan, 2018, p. 295).

In the study, which analyzes the saving behavior within the framework of the expectation theory, it is concluded that individuals save because they act with loss avoidance motive (Cevizli, 2021).

In another study to measure the effect of perceptions on economic decisions, the same product was tasted with a different unit price tag. Afterwards, the subjects were asked which product they liked. Although the subjects were the same, they claimed that the product with a higher unit price was better. In this study, it was concluded that human behaviors cannot be universalized with a single order. It has been seen that their perceptions are effective, including economic decisions (Cevizli and Bilen, 2021, p. 413-423).

In the experiment known as Pepsi challenge, the subjects were given a taste of pepsi and cola with their eyes closed. They were asked which one they liked. In the meantime, intra-brain movements were examined with the brain imaging system. Afterwards, the same product was shown to the subjects and tasted. The result is that people can give different answers even when they taste the same product (Paulus and Frank, 2003, p. 1311-1315). This study is an accepted study in the field of neuroeconomics. Neuroeconomics emerges as the last point reached by experimental economics as a result of combining experimental methods with advanced technology. The world is still in its infancy.

Inspired by these studies in the field of behavioral economics theoretically based experimental economics, in the following section, the effect of non-physical money on the spending behavior of individuals was analyzed with an experimental study specific to the ownership effect.

Research Method

In the study, the experimental method, which includes real people, was used in order to overcome the abstraction reached by economics. The experimental method used is based on experimental economics, which is a sub-branch of behavioral economics (Smith, 1976; Binmore, 1999; Roth, 1986; Smith, 1994; Soydal, 2010; Hertwig and Ortmann 2001; Guala, 2005; Saral, 2018). It is aimed to predict the spending tendency of individuals in the first place

if non-physical money is implemented. Thus, an empirical analysis was carried out by adopting an objective approach in the study.

Since it was based on volunteerism, the experiment was carried out on people who are willing to participate. First of all, all the instructions for the experiment were communicated to the volunteers in a clear and understandable way. Confirmation that the instructions were understood by the subjects. In the second pahse of the experiment, the subjects were prevented from communicating so as not to affect each other. The subjects answered the questions alone, in a way that they felt comfortable, and in conditions that did not feel like they were being watched by anyone.

Sample of the Research

The application covers 26 personnel in the military unit in Altınova/YALOVA. Information about participants is shown in Table 1. As a matter of fact, in experimental research, having a small number of subjects, such as 15 subjects in each group, can ensure the validity of the results (Arlı and Nazik, 2001). In this context, the number of subjects is sufficient for this study covering a single group.

Table 1: Informaiton of the subjects

| Subject | Age | Education | Income | City |
|---------|-----|-------------------|-----------|------------|
| 1 | 20 | Primary Education | 22.500 TL | Ankara |
| 2 | 22 | High School | 17.500 TL | İstanbul |
| 3 | 25 | High School | 20.000 TL | Kırşehir |
| 4 | 21 | Primary Education | 21.000 TL | Trabzon |
| 5 | 19 | Primary Education | 25.000 TL | Van |
| 6 | 22 | Primary Education | 19.500 TL | İzmir |
| 7 | 23 | High School | 22.000 TL | Eskişehir |
| 8 | 27 | High School | 21.500 TL | Elâzığ |
| 9 | 22 | High School | 17.500 TL | Diyarbakır |
| 10 | 20 | Primary Education | 25.000 TL | Bolu |
| 11 | 21 | Primary Education | 17.500 TL | Ankara |
| 12 | 26 | High School | 28.000 TL | İstanbul |
| 13 | 24 | High School | 30.000 TL | İzmir |
| 14 | 27 | High School | 19.500 TL | Bursa |
| 15 | 24 | High School | 21.000 TL | Isparta |
| 16 | 22 | High School | 22.000 TL | Muğla |
| 17 | 23 | High School | 20.000 TL | Erzurum |
| 18 | 25 | High School | 23.000 TL | Ankara |
| 19 | 27 | High School | 18.000 TL | Kayseri |
| 20 | 21 | Primary Education | 19.000 TL | İzmir |
| 21 | 20 | Primary Education | 20.500 TL | İzmir |
| 22 | 19 | Primary Education | 26.000 TL | İstanbul |
| 23 | 19 | Primary Education | 40.000 TL | İstanbul |
| 24 | 20 | High School | 44.000 TL | Çanakkale |
| 25 | 22 | High School | 33.000 TL | Rize |
| 26 | 23 | High School | 32.500 TL | Bartın |

As seen in Table 1, the participants consist of 7 geographical regions of Turkey. Thus, it was possible to form a heterogeneous group with different cultures.

Data Collection Tools of the Research

The data in the study was obtained by observing the time spent by the physical money given to the participants during the experiment and by asking questions to the participants after the experiment to determine the reason for the behavior that occurred in the application. Thus, qualitative research basic data collection tool was used (Merriam, 2013). The direct access to the documents increases the accuracy and reliability of the study compared to the situation where the documents are obtained outside the research context (Patton, 2014).

Data Collection

In the study, participants were divided into two separate groups: control and experimental groups. 200 Turkish Lira (TL) was physically given to each of the participants in the control group. Participants in the experimental group were not given any physical money or the like. They were told that 200 TL was paid in their names from the canteen and that they could shop for this amount. The experiment was funded by the author. The author of the study worked in the canteen during the experiment to make observation easier.

The experiment was implemented in two phases. In the first stage, the spending tendencies of the physical money given to the participants were observed. Thus, at this stage, the data were obtained through observation. The canteen consists of 4 square meters. Shopping is done through the glass in the canteen door. The other three sides of the canteen are covered with shelves. On each shelf, the product and the price are written below. Incoming customers can easily see the products and prices when they look through the window.

The canteen was opened only at certain intervals by the author during the experiment. The analysis was made on the total amount spent by the subjects daily.

The subjects' spending process took 17 days. Afterwards, the results of the experiment were analyzed. Following the analysis, the second stage of the experiment was carried out. In the second phase, the paper with the question written in Table 2, which also includes the analysis result, was given to the volunteers and they were asked to answer it. The participant who completed the marking process threw the paper into the invisible box. The experiment ended after all participants completed this process.

Table 2: Question asked to subjects

Please read the description below

A glass of approximately \$5 was given to a group of university students to analyze the "Endowment Effect". Afterwards, they were asked how much they would like to sell these glasses for. The other group, who was not given a glass, was asked the price that they would be willing to buy the same glass. As a result of the study, it was seen that those who wanted to buy offered an average of 3.5 dollars. It has been revealed that those who want to sell also want an average of 7.5 dollars. It has been found from the experiment that those who have the glass will be willing to sell for a higher price due to the endowment effect. A product that is in the trial period creates an ownership effect on us. Of course, this results in us purchasing that product at the end of the trial period.

Please answer the following question

As a result of the study, the tendency to spend money in the group with physical money increased significantly after the 11th day. The day they spent the most was the 14th day. On the other hand, the group that did not have physical money had the highest spending tendency on the 6th day. These findings reveal that the group with physical money tends to spend it later than the other group.

Do you think this may be due to the "Endowment Effect" you read above?

A. YES

B. NO

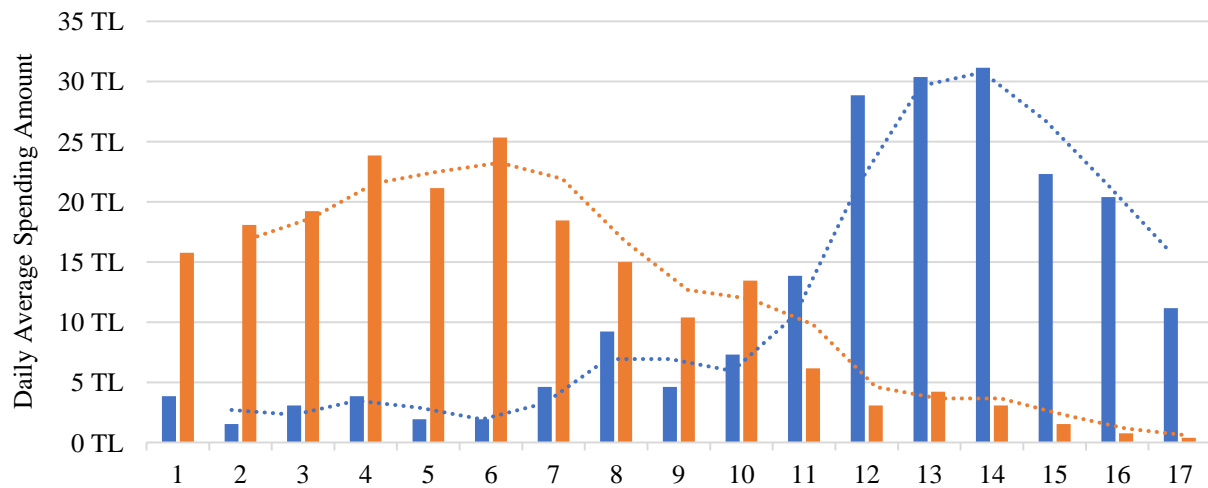
Analysis of Data

The expenditures of the participants are shown in Figure 1. In the analysis, the numbering method was preferred in order to protect the privacy of the subjects. In this context Subjects numbered 1-13 constitute the control group, while subjects numbered 14-26 constitute the experimental group.

| Control Group | | | | | | | | | | | | | |
|--------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. |
| | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject |
| 1. Day | 5 | 0 | 15 | 0 | 5 | 0 | 0 | 5 | 0 | 10 | 0 | 10 | 0 |
| 2. Day | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 10 | 0 | 0 | 0 |
| 3. Day | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 5 | 0 | 0 | 0 | 0 | 20 |
| 4. Day | 0 | 10 | 0 | 0 | 0 | 0 | 5 | 0 | 15 | 0 | 0 | 0 | 20 |
| 5. Day | 0 | 0 | 0 | 10 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 10 | 0 |
| 6. Day | 0 | 0 | 0 | 5 | 10 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7. Day | 5 | 5 | 10 | 0 | 10 | 0 | 5 | 0 | 10 | 10 | 0 | 0 | 5 |
| 8. Day | 0 | 15 | 25 | 0 | 5 | 5 | 40 | 20 | 0 | 0 | 0 | 10 | 0 |
| 9. Day | 15 | 0 | 0 | 15 | 5 | 10 | 0 | 5 | 0 | 0 | 0 | 0 | 10 |
| 10. Day | 20 | 15 | 0 | 0 | 15 | 5 | 0 | 0 | 20 | 0 | 0 | 0 | 20 |
| 11. Day | 10 | 10 | 15 | 15 | 15 | 35 | 10 | 25 | 10 | 0 | 10 | 0 | 25 |
| 12. Day | 25 | 15 | 40 | 20 | 25 | 40 | 35 | 25 | 0 | 50 | 30 | 40 | 30 |
| 13. Day | 20 | 30 | 50 | 25 | 35 | 20 | 35 | 35 | 10 | 45 | 40 | 20 | 30 |
| 14. Day | 15 | 45 | 15 | 25 | 40 | 20 | 0 | 40 | 50 | 60 | 50 | 20 | 25 |
| 15. Day | 25 | 30 | 20 | 30 | 15 | 20 | 25 | 15 | 30 | 15 | 40 | 15 | 10 |
| 16. Day | 30 | 15 | 10 | 40 | 15 | 20 | 25 | 10 | 45 | 0 | 30 | 20 | 5 |
| 17. Day | 30 | 10 | 0 | 15 | 0 | 10 | 5 | 10 | 10 | 0 | 0 | 55 | 0 |
| Experimental Group | | | | | | | | | | | | | |
| | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | 22. | 23. | 24. | 25. | 26. |
| | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject | Subject |
| 1. Day | 15 | 20 | 5 | 35 | 10 | 0 | 15 | 0 | 35 | 20 | 25 | 25 | 0 |
| 2. Day | 10 | 25 | 5 | 35 | 10 | 0 | 15 | 5 | 35 | 25 | 25 | 25 | 20 |
| 3. Day | 25 | 40 | 10 | 40 | 15 | 0 | 15 | 0 | 40 | 20 | 25 | 20 | 0 |
| 4. Day | 30 | 45 | 15 | 45 | 15 | 0 | 20 | 5 | 35 | 25 | 30 | 20 | 25 |
| 5. Day | 5 | 50 | 5 | 15 | 10 | 30 | 25 | 0 | 45 | 30 | 30 | 30 | 0 |
| 6. Day | 40 | 15 | 25 | 10 | 25 | 50 | 25 | 15 | 10 | 35 | 15 | 30 | 35 |
| 7. Day | 30 | 5 | 20 | 10 | 25 | 40 | 35 | 0 | 0 | 30 | 10 | 35 | 0 |
| 8. Day | 0 | 0 | 35 | 5 | 30 | 0 | 40 | 20 | 0 | 15 | 5 | 5 | 40 |
| 9. Day | 0 | 0 | 40 | 0 | 35 | 0 | 10 | 40 | 0 | 0 | 5 | 5 | 0 |
| 10. Day | 0 | 0 | 15 | 0 | 10 | 45 | 0 | 40 | 0 | 0 | 15 | 5 | 45 |
| 11. Day | 0 | 0 | 10 | 0 | 5 | 10 | 0 | 15 | 0 | 0 | 10 | 0 | 30 |
| 12. Day | 5 | 0 | 0 | 0 | 0 | 5 | 0 | 20 | 0 | 0 | 5 | 0 | 5 |
| 13. Day | 15 | 0 | 0 | 5 | 0 | 10 | 0 | 25 | 0 | 0 | 0 | 0 | 0 |
| 14. Day | 15 | 0 | 0 | 0 | 10 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 |
| 15. Day | 10 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16. Day | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17. Day | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Figure 1: Spending tendencies and duration of participants

In order to better analyze the observation results presented in Figure 1, the results are shown in graph.



Graph 1: Observation results

When Graph 1 is analyzed, it is seen that the participants in the control group made the highest daily average expenditure on the 14th day. The experimental group made the highest expenditure on the 6th day. This finding shows that the control group tends to spend later than the experimental group. As a matter of fact, when the graph is examined, it is obvious that the spending tendency of the control group occurred in the second half of the experiment. On the contrary, it was realized in the first half of the experimental group. This analysis also supports the finding obtained.

The answers given by the subjects to the question asked in the second part of the experiment are shown in Table 3.

Table 3: Responses of participants to the question

| Subject s | Yes | No | Subjects | Yes | No |
|-----------|-----|----|----------|-----|----|
| 1. | √ | | 14. | √ | |
| 2. | √ | | 15. | | √ |
| 3. | √ | | 16. | √ | |
| 4. | √ | | 17. | √ | |
| 5. | √ | | 18. | √ | |
| 6. | | √ | 19. | | √ |
| 7. | √ | | 20. | √ | |
| 8. | √ | | 21. | √ | |
| 9. | √ | | 22. | √ | |
| 10. | √ | | 23. | √ | |
| 11. | √ | | 24. | √ | |
| 12. | √ | | 25. | | √ |
| 13. | √ | | 26. | √ | |

According to Table 3, 85% of the participants stated that this was due to the endowment effect. In fact, approximately 93% of the subjects in the control group stated that it was due to the endowment effect. These are the groups that experienced the endowment effect in the

construction of the experiment. In fact, 77% of the group, which is assumed not to have experienced this emotion, stated that it would be due to the endowment effect.

Conclusion

With digitalization, the developments and series of events that our age will bring have begun to reveal themselves. As a matter of fact, digitalization, which is the determining factor of the century, also lays the groundwork for the digitalization of money. The money produced, stored and traded in the digital environment will not be in physical size. This will lead to changes in social life, especially in the economy. The finding obtained in this study confirms this situation.

According to the results of the study, non-physical money tends to be spent more quickly than physical money. This is because non-physical money does not create the endowment effect like physical money. As a matter of fact, it was observed in the study that the control group, that is, those who had physical money, tended to spend it later than those who did not have physical money. In fact, the question asked in the second part of the experiment was answered in a way that supports this finding. As a matter of fact, since the study is original, the results cannot be compared with the results conducted in another country.

Credit card use may be an example of this situation. As a matter of fact, the money used in credit cards ultimately replaces the non-physical money in this study. Here again, it is relatively easier to spend virtual money on credit cards because there is no endowment effect. As a matter of fact, I think the reason why the debt ratio on credit cards is high can be attributed to this.

This result is a prediction for policy makers. As a matter of fact, non-physical money tends not to create an endowment effect like physical money. This will cause the money to be spent unusually quickly. Of course, this means undesirable consequences for individuals. For this reason, policy makers should take measures to overcome this problem before transitioning to digital money. In this way, both the transition to digital money will be ensured and people will be prevented from having problems until the next salary period.

In addition, economics has now transformed mathematicalization from a tool into a goal. In fact, mathematization has become so internalized that it has almost turned into an intellectual game. Although economics aims at humans as a social science, it has become abstract and a technical science. However, behavioral economics applies experimental methods that include real people to overcome this abstraction. For this reason, attention should be paid to behavioral economic studies.

References

- Akın, Z., Urhan, B. (2018). *Davranışsal oyun teorisi*. Eds.: D. Dumludağ, Ö. Gökdemir, L. Neyse, R. Ester, *İktisatta Davranışsal Yaklaşımlar*, (2nd ed., p. 75-100). İstanbul: İmge Kitabevi.
- Arlı, M., Nazik, H. (2001). *Bilimsel araştırmaya giriş*. Ankara: Gazi Kitabevi.
- Ariely, D. (2013). *Akıldışı ama öngörülebilir: Kararlarımızı biçimlendiren gizli kuvvetler*. İstanbul: Optimist Yayıncılık.
- Baç, M. (2007). *İktisadi analizin disiplinlerarası uygulamalarında durum ve öngörüler*. Date of Access: 18.02.2023, <http://research.sabanciuniv.edu/848/1/BacTUBAmakale.pdf>.
- Basilgan, M. (2013). İktisat ve deneysel yöntem: Deneyler, tartışmalar ve gelecek. *İstanbul Üniversitesi Siyasal Bilgiler Fakültesi Dergisi*, 48, 61-89.
- Binmore, K. (1999). Why experiment in economics? *The Economic Journal*, 109(453), 16-24. <https://doi.org/10.1111/1468-0297.00399>.

- Cevizli, İ. (2022). Analysis of saving behavior within the framework of prospect theory: An experimental study. *Çankırı Karatekin İktisadi ve İdari Bilimler Fakültesi Dergisi*, 12(1), 205-228. DOI: 10.18074/ckuibfd.997256.
- Cevizli, İ., Bilen, M. (2021). Perceived utility: An experimental study in behavioral economics. *Bingöl Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 5(2), 403-426. DOI: 10.33399/biibfad.912011.
- Coyle, D. (2010). *The soulful science: What economists really do and why it matters*. USA: Princenton Universty Press.
- Demir, Ö. (2013). *Akıl ve çıkar: Davranışsal iktisat açısından rasyonel olmanın rasyonelliği*. Bursa: Sentez Yayıncılık.
- Demir, O., Odabaşı, H. (2022). Merkez Bankası dijital para sisteminin avantaj ve dezavantajları neler olabilir? *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 61, 199-222. DOI: 10.18070/erciyesiibd.981733.
- Demiröz, D. (2015). *İktisat ve psikoloji, iktisat sadece iktisat değildir*. Ankara: Efil Yayınevi.
- Erkuş, H., Gümüş, A. (2019). Blockchain ve kripto paraların kullanımı üzerine bir değerlendirme. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, 7(2), 41-46. <https://doi.org/10.18506/anemon.427976>
- Fidan, M., Dilek, S., Esev, A. (2019). Düünden bugüne paranın tarihi ve Türkiye’de kâğıt para kullanımı. *Kilis 7 Aralık Üniversitesi Sosyal Bilimler Dergisi*, 9(18), 141-162. DOI: 10.31834/kilissbd.613107
- Guala, F. (2005). *The methodology of experimental economics*. USA: Cambridge University Press.
- Hertwig, R., Ortmann, A. (2001). Experimental practices in economics: A metodological challenge for psychologists? *The Behavioral Sciences*, 24(3), 383-403. <https://doi.org/10.1017/S0140525X01004149>
- İzgi, Ö. (1978). XI. Yüzyıla kadar Orta Asya Türk Devletleri’nin Çin’le yaptığı ticari münasebetler. *Tarih Enstitüsü Dergisi*, 9, 87-106.
- Kahneman, D. (2011). *Fast and slow thinking*. Allen Lane and Penguin Books, New York.
- Kahneman, D., Knetsch, J. L., Thaler, R. H. (1990). Experimental tests of the endowment effect and the Coase theorem. *Journal of political Economy*, 98(6), 1325-1348.
- Knetsch, J. L. (1990). *Derived indifference curves*. Simon Fraser University: Working Paper.
- Levitt, S. D., List, J.A. (2009). Field experiments in economics: The past, the present, and the future. *European Economic Review*, 53(1), 1-18. <https://doi.org/10.1016/j.euroecorev.2008.12.001>.
- Loewenstein, G. (1999), Experimental Economics from the vantage-point of behavioural economics. *The Economic Journal*, 109(453), 25-34. <https://doi.org/10.1111/1468-0297.00400>.
- Loewenstein, G., Kahneman, D. (1991). Explaining the endowment effect. *Unpublished manuscript*.
- Merriam, S. B. (2013). *Nitel araştırma: Desen ve uygulama için bir rehber* (S. Turan, Trans. Ed.). Ankara: Nobel Yayın Dağıtım.
- Özyetgin, A. M. (2005), Eski Türklerde Ödeme Araçları: Kâğıt Para Çav’ın Kullanımı Üzerine. Orta Zaman Türk Dili ve Kültürü Üzerine İncelemeler. İstanbul: Ötüken Yayınları.
- Patton, M. Q. (2014). *Qualitative research and evaluation methods*. (M. Bütün and S. B. Demir, Trans. Eds.). Ankara: Pegem Yayıncılık.
- Paulus, M. P., Frank, L. R. (2003). Ventromedial prefrontal cortex activation is critical for preference judgments. *Neuroreport*, 14(10), 1311-1315. DOI: 10.1097/01.wnr.0000078543.07662.02
- Ponting, C. (2008), *Dünyanın Yeşil Tarihi*. İstanbul: Sabancı Üniversitesi Yayınları.

-
- Roth, A. E. (1986). Laboratory experimentation in economics. *Economics and Philosophy*, 2(2), 245-273. DOI:10.1017/S1478061500002656.
- Ruben, E., Dumludağ, D. (2018). İktisat ve Psikoloji. Eds.: D. Dumludağ, Ö. Gökdemir, L. Neyse, R. Ester, *İktisatta Davranışsal Yaklaşımlar*, (2nd ed., p. 33-51). İstanbul: İmge Kitabevi.
- Saral, A. S. (2018). Labaratuvar deneyleri: Metodolojik bir bakış. Eds.: D. Dumludağ, Ö. Gökdemir, L. Neyse, R. Ester, *İktisatta Davranışsal Yaklaşımlar*, (2nd ed., p. 341-361). İstanbul: İmge Kitabevi.
- Smith, V. L. (1976). Experimental Economics: Induced value theory. *American Economic Review*, 66(2), 274-279. <http://www.jstor.org/stable/1817233>.
- Soydal, H. (2010). *Yeni ekonomi: Kuantum-Nöroekonomi*. Konya: Palet Yayınları.
- Tiryaki, G. (2016). *Para ve finansın dönüşümü*. Ankara: Efil Yayınevi.
- Tompkinson, P., Bethwaite, J. (1995). The ultimatum game: Raising the stakes. *Journal of Economic Behavior and Organization*, 27(3), 439-451. [https://doi.org/10.1016/0167-2681\(94\)00035](https://doi.org/10.1016/0167-2681(94)00035).
- Türe, A., Savaşçın, M. Y. (2002). *Anadolu antik takılar*. İstanbul: Goldaş Kültür Yayınları.
- Usta, A. (2018). Paranın serüveni kripto paraların öncesi ve sonrası. *Bankalararası Kart Merkezi Yayınları*. Date of Access: 21.01.2023, <https://fintechistanbul.org/2018/06/12/paranin-seruveni-yayinlandi/>
- Yılmaz, F. (2009). *Objektivizm ve relativizmin ötesi*. İstanbul: Paradigma Yayıncılık.
-