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MASTER THESIS

**AN EMPIRICAL ANALYSIS OF THE EFFECTIVENESS
OF AUTOMATIC ENROLLMENT PRIVATE PENSION
SYSTEM IN TURKEY: NUDGE THEORY
PERSPECTIVE**

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ABSTRACT

AN EMPIRICAL ANALYSIS OF THE EFFECTIVENESS OF AUTOMATIC ENROLLMENT PRIVATE PENSION SYSTEM IN TURKEY: NUDGE THEORY PERSPECTIVE

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Social Security Systems are very important in terms of people's economic welfare and macroeconomic balances of countries. Many reforms have been implemented over time to ensure the sustainable structure of the social security system. The most important one may be, the Private Pension System which is a complement to Social Security. However, participation level to the Private Pension System must be sufficient for the sustainability of the Social Security System. In this sense, participation in the Private Pension System in Turkey could not reach the desired levels. For this reason, the Automatic Enrollment Private Pension system has been introduced by policy makers in Turkey, as in many other countries in the world.

Automatic enrollment directs people towards making more rational decisions by its nature. In this context, the first important finding of the thesis is the similarity between the Automatic Enrollment Private Pension System in Turkey and the Nudge type policies of behavioral economics. The Automatic Enrollment Private Pension System in Turkey aims to increase the economic well-being of people during their retirement by nudging them to stay in the system thanks to their cognitive biases.

The main purpose of the thesis is to determine the demographic and behavioral factors that affect individuals' decisions to leave or stay in the Automatic Enrollment

Private Pension System in Turkey. In this context, two empirical models were created by using the data obtained from online survey of 570 people. According to the results of the first model, while the increase in the monthly income and basic literacy level of the individual increases the probability of leaving from Automatic Enrollment Private Pension System, the increase in the trust of the individual in the system increases the probability of staying in Automatic Enrollment Private Pension System. According to the results of the second model, it was determined that 53% of the individuals who remained in the Automatic Enrollment Private Pension System stayed in the system due to the excessive application and paperwork required to leave the system. When the demographic factors affecting individuals' thinking in this regard are examined, as the age and education level of the individual increases or the number of the individual's household decreases, the probability of staying in the system increases due to the excessive application and paperwork required to leave the system.

In this context, it is necessary to benefit from the findings of behavioral theory in order to increase the effectiveness of the Automatic Enrollment Private Pension System in Turkey. The fact that human behavior is not fully rational allows behavioral policies to achieve more effective results at less cost.

Keywords: Automatic Enrollment Private Pension System in Turkey, Behavioral Economics, Nudge, Default, Probit Model

ÖZ

TÜRKİYE'DEKİ OTOMATİK KATILIMLI BİREYSEL EMEKLİLİK SİSTEMİNİN ETKİNLİĞİ ÜZERİNE AMPİRİK BİR ANALİZ: DÜRTME TEORİSİ PERSPEKTİFİNDEN

YAVUZ SELİM AŞCI

Sosyal Güvenlik Sistemi insanların ekonomik refahları ve ülkelerin makro ekonomik dengeleri açısından oldukça önemlidir. Sistemin sürdürülebilir yapısının sağlanması için tarih boyunca birçok reform uygulanmıştır. Bu reformların en önemlisi olan Bireysel Emeklilik Sistemi, Sosyal Güvenliğin bir tamamlayıcısıdır. Ancak, Sosyal Güvenlik Sistemi'nin sürdürülebilirliği için Bireysel Emeklilik Sistemi'ne katılımın yeterli seviyede olması gerekmektedir. Fakat Türkiye'de Bireysel Emeklilik Sistemine katılım istenilen seviyelere ulaşamamaktadır. Bu sebeple, dünyanın birçok ülkesinde olduğu gibi Türkiye'de de Otomatik Katımlı Bireysel Emeklilik Sistem'i politika yapıcılar tarafından uygulanmaya başlanmıştır.

Otomatik katılım, yapısı itibarıyla insanları daha rasyonel kararlar almaya doğru yönlendirmektedir. Bu bağlamda, tezin ilk önemli bulgusu Türkiye'deki Otomatik Katımlı Bireysel Emeklilik Sistemi ile davranışsal iktisat Dürtme türü politikaların arasında saptanan benzerliktir. Türkiye'deki Otomatik Katımlı Bireysel Emeklilik Sistemi, insanların bilişsel yanlılıkları sayesinde onları sistemde kalmaya doğru dürterek emeklilik dönemlerindeki ekonomik refahlarını arttırmayı amaçlamaktadır.

Tezin temel amacı, bireylerin Türkiye'deki Otomatik Katılımlı Bireysel Emeklilik Sistemi'nden ayrılma veya sistemde kalma kararlarını etkileyen demografik ve davranışsal faktörleri saptamaktır. Bu bağlamda, 570 kişinin çevrimiçi anket cevapları ile iki ampirik model oluşturulmuştur. Birinci modelin sonuçlarına göre, bireyin aylık gelir durumu ve temel okuryazarlık seviyesinin artması Otomatik Katılımlı Bireysel Emeklilik Sistemi'nden ayrılma ihtimalini arttırırken; bireyin sisteme duyduğu güvenin artması Otomatik Katılımlı Bireysel Emeklilik Sistemi'nde kalma ihtimalini arttırmaktadır. İkinci modelin sonuçlarına göre ise Otomatik Katılımlı Bireysel Emeklilik Sistemi'nde kalan bireylerin %53'ünün sistemden ayrılmak için gereken başvuru ve evrak işlerinin fazlalığı nedeniyle sistemde kalmaya devam ettiği saptanmıştır. Bireylerin bu düşüncede olmasını etkileyen demografik faktörler incelendiğinde ise, bireyin yaşı ve eğitim seviyesi arttıkça veya bireyin hane halkı sayısı azaldıkça, sistemden ayrılmak için gereken başvuru ve evrak işlerinin fazlalığı nedeniyle sistemde kalma ihtimali artmaktadır.

Bu bağlamda, Türkiye'deki Otomatik Katılımlı Bireysel Emeklilik Sistemi'nin etkinliğini arttırmak için davranışsal teorinin bulgularından faydalanmak gerekmektedir. İnsan davranışlarının tam olarak rasyonel olmaması, davranışsal politikaların daha az maliyetle daha etkili sonuçlar elde etmesine olanak sağlamaktadır.

Anahtar Kelimeler: Türkiye’de Otomatik Katılımlı Bireysel Emeklilik Sistemi, Davranışsal İktisat, Dürtme, Varsayılan Seçenek, Probit Model

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LIST OF ABBREVIATIONS

AES:	Automatic Enrollment System
BIT:	Behavioural Insight Team
CDF:	Cumulative Distribution Function
IPS:	Individual Pension System
KMO:	Kaiser - Meyer - Olkin
LPM:	Linear Probability Model
PPS:	Private Pension System
SBST:	White House Social and Behavioural Sciences Team
SMaRT:	Save More Tomorrow
SSS:	Social Security System
TSI:	Turkish Statistical Institute
UK:	United Kingdom
USA:	United States of America

INTRODUCTION

The aim of this study is to explore the theoretical policy background of the Automatic Enrollment Private Pension System in Turkey and to investigate the effectiveness of the system and its determinants. In addition, it is aimed to present policy recommendations according to behavioral priorities in order to increase the effectiveness of the policies designed in the future.

People do not act completely rationally when making decisions. On the contrary, they often engage in irrational behaviors. If these irrational behaviors are not taken into account while producing policies, the economic consequences of policies can be devastating. Naturally, these negative consequences that will occur in the market mechanism should be corrected with the policies to be implemented priorly. In this context, there is a need for alternative policy proposals of economic thoughts that accept that human behavior is not completely rational. At this point, studies of behavioral economics in the literature are considered. Nudge-type policies, which is a branch of behavioral economics, come to the forefront in order to increase the effectiveness of policies. Today, Nudge type policies are applied in many areas such as health, education, advertising, finance, marketing, public policies, etc. in the world. It also offers alternative policy recommendations for the continuity of social security systems.

The evolution of behavioral economics throughout history and its theoretical findings have been influential in the development of Nudge theory. According to Thaler (2015, pp. 10-11), for years, many economists ignored calls to use more accurate modeling of behavior in economy. However, after a long struggle and the efforts of young economists, an enriched economic theory "behavioral economics" developed. This is not a new discipline, but a stronger economics developed with psychology and other social sciences, and the accuracy of the predictions is more realistic. Behavioral economics advocates adding human behavior to economic theories, and the most important reason for this is to improve the accuracy of the predictions made with these theories. In this context, in the first chapter of the thesis,

the aspects that behavioral economics criticizes the mainstream neoclassical economic theory, the different assumptions of the two economic thoughts about human behavior, and the behavioral theories and findings in the process until the Nudge theory was born are mentioned. Afterwards, it is aimed to understand the theory by making a detailed literature review of the Nudge theory. In the last part of first the chapter, the literature review of empirical studies of Nudge policies are researched.

Social security systems are very important for the welfare of people and the future of countries. Although the system has faced various crises throughout history, it is still alive thanks to various policies. The last example of these policies is the auto-enrollment policy. This policy is implemented in many parts of the world. Examining the application of the Automatic Enrollment Pension System in Turkey is the main topic of this thesis. Beyond that, there is a great similarity between the auto-enrollment private pension system and the Nudge "Default" type policies of behavioral economics. It is seen that policy makers benefit from behavioral theories while producing this policy. In this context, in the second chapter of the thesis, the developments in the process of evolving the social security system to the Automatic-Enrollment Pension System and its features in Turkey are mentioned. Then, in the last part of the second chapter, empirical literature studies on the Private Pension System and Automatic Enrollment Pension System in Turkey are mentioned.

In the third chapter of the thesis, an empirical study was conducted to determine the effectiveness of the Auto-Enrollment Private Pension System in Turkey and the demographic and behavioral factors of individuals that affect their decisions about the system. The data of the study was created by a survey made to 570 people throughout Turkey. The models of study created according to the Probit model, results that will contribute to the literature have been reached.

CHAPTER ONE

THE THEORETICAL AND EMPIRICAL REVIEW OF THE LITERATURE ON THE NUDGE THEORY

1.1. Introduction

This chapter aims to provide a brief review of the theoretical and empirical literature on the nudge theory. The nudge theory, for the first time, was introduced by Thaler and Sunstein (2008). It stresses the fact that people's behavior can be altered in a predictable way without forbidding any options by their economic incentives. Nudge theory has been an alternative to mainstream economic policies by using behavioral foundations in recent years. In this section, it is aimed to explain the foundations of nudge theory, how it benefits from behavioral economics and how it creates a new option for economic policies. In addition, it has been shown to be a theory that deserves to replace mainstream economic policies in some areas.

The economic policy recommendations of economic theories are closely related to the structural assumptions of these theories on people behavior. In this sense, the mainstream economic theory assume that all people are rational, and they can maximize their utility. In economic terms, the models, forecasts, and policies created are performed within the framework of this assumption. Thanks to the development of psychology and the paradigm shift in economics, new assumptions about human behavior have begun to be produced in recent years. Behavioral economists argue that human behavior cannot be uniform and economic policies cannot be formed by ignoring the diversity in human behavior. And in this context, they produce various theories, especially considering the behavioral realities. According to the behavioral economists, people can make very simple mistakes and they may not maximize their utility in every decision. They also do not behave rationally; they tend to make irrational decisions. In this context, behavioral economists have developed solutions

to make policy making more effective. Considering that human behavior can be irrational, policies that can group behavior patterns and encourage people to make more rational decisions are called Nudge Theory.

The recent literature on the nudge theory provided a new perspective to economic policy making. This new perspective includes ways that are different from mainstream economic theories. It must have succeeded because nowadays, many countries, firms, institutions and policy makers are interested in Nudge all over the world. In this context, many nudge teams have been set up to research and create nudge applications. The two most important examples are Behavioural Insights Team in the UK and White House Social and Behavioral Sciences Team in the USA. The nudge theory has been applied in many fields around the world and has proved its effectiveness. Examples of these fields are economy, medicine, renewable energy, healthy life, business, law, government policies, pension system, charity, security, breaking harmful habits etc. The goal of many nudges is to make life simpler, safer, or easier for people to navigate. Considering this aspect, it can be said that Nudge theory is to encourage and nudge people to make rational and beneficial decisions, taking into account human psychology.

The rest of this chapter is organized as follows. The sections 1.2., 1.3., and 1.4. provides a brief review of the theoretical literature on the behavioral economics which the basis of the Nudge theory. At the same time, the relevant section includes behavioral economics assumptions, theories and findings that allow the nudge theory to be formed. In the sections 1.5., 1.6., and 1.7., the theoretical literature of the Nudge policy is mentioned. In addition to these, Nudge policy making processes and methods, features of nudge and nudge types are examined in these sections. Lastly, the sections 1.8. and 1.9. provides a review of the empirical literature on the Nudge policies which used in various fields. In this context, the advantages of nudge policies compared to mainstream policies are stated in these sections.

1.2. Backgrounds of the Nudge Theory: Behavioral Economics

Behavioral economics is a discipline that increases the explanatory and predictive power of economics by taking into account the capacity and complexity of people with the help of psychology, providing more realistic foundations to the economy (Mullainathan & Thaler, 2000, p. 1; Camerer & Loewenstein, 2003, p. 1). Classical assumptions that human behavior, capacity, and judgment do not reflect reality can cause contradictory results in the economic modeling. According to Barberis (2018, p. 667), the increasing contradictions between the assumption of rationality and empirical facts have played an important role in the development of behavioral economics in the last decades. Especially Thaler's anomalies can be given as examples of these facts. It is explained in detail in the title of Anomalies.

Until the birth of the Nudge theory, behavioral economics made many important contributions to the mainstream theory on psychological foundations of human economic behavior. According to Akerlof and Kranton (2000, s. 715), when variables such as the psychological identity and sociology of individuals are added to economic modeling, the results are more inclusive. However, the link between valuable theoretical contributions made by behavioral economics and their economic policy implications were missing. Actually, the existing economic findings called for a new applicable theory in order to avoid disrupting the market mechanism. Nowadays, the consideration of the nudge theory used by many institutions and governments indicates that it is a very strong candidate to fill this gap. In the background of the development of behavioral theory's field of use, it can be shown that its assumptions about human behavior are more realistic than the assumptions of mainstream theory. Therefore, it is very important to learn how the assumptions of behavioral economics differ from the assumptions of mainstream economics.

1.2.1. Criticism of Homo Economicus

One of the most important assumptions of classical and neo-classical economic thought is “economic man” (Smith, 1759), in other words “homo economicus”. It is a person who takes rational decisions and maximize their own utility in every situation within the framework of its own interest. This is based on the assumption of rationality that the economic agent has full, instantaneous, precise and costless information and uses the information to maximize its own interests (Akdere & Büyükboyacı, 2015, p. 108).

The assumption of rationality, which is the most important feature of homo economicus, requires the following characteristics to hold for each and every people: they exhibit logical behavior, their brains’ capacity to store and process information are unlimited, they pursue their own interests, unsatisfied (always more is better), have full knowledge, do not make emotional decisions, and all individuals have these characteristics (Kaplan, 2014, pp. 36-41; Ruben, 2011, p. 34). In this context, it is seen that the assumption of one type of human used in mainstream economic models. Assuming that every human being has the same characteristics is like limiting human behavior to uniform assumptions, as in the natural sciences. For this reason, it can be said that the mainstream theory shows economics as a natural science rather than a social science with its assumptions.

Recognizing that economics is a social science and the effort to incorporate the variability of human behavior into the model is an important milestone for reaching more realistic results. According to Hursh (1984, p. 435), economics is a science of behavior even though it is highly organized in human behavior. Therefore, economics must benefit from behavioral psychology. In this context, assumptions of human behavior by mainstream economy conflict with social science fundamentals. The types of human behavior could not to be reduced to a single form. Because economy is totally a social science.

Although the rational type of economic individual was at the center of the field of science, 19th century economists were aware of the difference between real human and homo economicus. But homo economicus was a necessary representation for the economy to be conceptualized and to function according to its own laws (Buğra, 1995, p. 119). The assumption by mainstream economic theory that behaviors are uniform and the same in all conditions. Because of there is no uniform behavior in reality, this situation shows that behaviors are not taken into account by mainstream theory as necessary in economic modeling. More than one behavior type and model should be used if behaviors were sufficiently taken into account by mainstream theory.

The concept of "Homo Economicus" has been criticized for its selfish and rationality features, it is claimed that not all people have these two characteristics. For instance, the assumption that people make choices that maximize their interests is systematically violated. As a result of this assumption, the estimates of the economic models that make predictions without taking into account the changes in people behaviors are questionable (Henrich, et al., 2001, p. 77).

On the other hand, Gintis (2000, p. 320) claimed that, the replacement of the concept of homo economicus in economic theory with a more realistic model of individual choice and a model with more diverse strategic interactions is inevitable for the theory's contribution to increase. Also, Thaler (Thaler R. , 2000, p. 140) predicts that the concept of "homo economicus" will evolve into "homo sapiens". He argues that this change is inevitable in order to increase the predictive power of the models to be established in the future.

In the context of these considerations, the inability of the concept of homo economicus to describe human behavior is one of the reasons for existence of nudge theory. One of the aims of nudge theory is prevent the negative consequences of homo economicus assumption to the market mechanism. Therefore, the criticizes to homo economicus is crucial in order to born of the nudge theory.

1.2.2. New Assumptions of Behavioral Economics

Microeconomic foundations of economic theories are based on a specific assumptions about decision making process of economic units. In this sense, people are assumed to be rational, has a willpower and selfish in the standard mainstream economic models and economic forecasts are made within the framework. These assumptions are based on the idea that people make their decisions in a completely rational way. However, these concepts are not matched fully to real life human behaviors. In real life, people may make irrational choices making these questionable. Instead of these, the concepts of ‘‘bounded (limited) rationality’’ (Simon, 1979), ‘‘bounded willpower’’ and ‘‘bounded selfish’’ (Mullainathan & Thaler, 2000) have been brought to the literature by behavioral economists. Related features have been observed with controlled laboratory observations and it has been concluded that people have these features at a limited level (Jolls, Sunstein, & Thaler, 1998).

In a system in which the assumptions of human behavior of mainstream economics prevail, the effect of nudge theory would not be possible. In this context, comprehend of the new assumptions of behavioral economy is crucial in order to put theory into practice.

1.2.2.1. Bounded Rationality

Herbert Simon redefined the concept of rationality by criticizing one of the assumptions of mainstream economics, the assumption that the capacity of economic agents to access information is unlimited. According to Simon, in a world of "global rationality" assumptions, there should be no paradox in the decisions of companies and organizations. Because companies and organizations have unlimited power to access information and therefore all their decisions must be correct. However, this situation does not happen in reality, many companies and organizations can end their activities due to wrong decisions and management. This paradoxical situation disappears only

when there is "bounded (limited) rationality" occurs. This concept created by taking into account the limited knowledge and capacity instead of the unlimited knowledge and capacity of ‘‘economic man’’ (Simon, 1955).

According to the findings of behavioral economics, the concept of perfect rationality cannot completely model human behavior. Most people do not make the decisions that maximize their utility or make them the happiest in the decision process. In this context, the concept of perfect rationality is effective in mathematical models, while the concept of bounded rationality is effective in explaining human behavior (Akdere & Büyükboyacı, 2015, pp. 107-108).

There are many definitions of bounded rationality in the literature (Kaplan, 2014, p. 59): Sgroi and Zizzo (2007) stated that economic agents have bounded rationality due to their limited capacity to analyze data. Heinemann (2000) stated that objective distributions of variables cannot be fully predicted, but a simple model of relationships between variables can be obtained within the framework of bounded rationality. Rubinstein (1998) defines the models in which all decision makers are involved in the selection process as a bounded rationality model. McNellis (2005) defines bounded rationality behavior as the responses of economic decision makers to exogenous variables as asymmetric and nonlinear responses rather than symmetric and linear.

1.2.2.2. Bounded Willpower

Another illusion of standard economic theory is that individuals have a complete willpower. Although not explicitly stated in rational choice theory, there is an assumption that people have a complete willpower to make choices. In other words, this assumption implies that people do not have any willpower problem when making a choice. Due to human nature, individuals do not show enough willpower in every situation. Most people have willpower problems (Kaplan, 2014, pp. 69-70). For example, an overweight person should consume less food because it is harmful to their health, people should stop smoking harmful to health, or people should create

sufficient savings funds by thinking about their future. But all these are actions that cannot be fully accomplished, which may be explained by the inability of people to adequately control their willpower. Hence, assuming that people have ‘‘bounded willpower’’ will lead to more accurate results in explaining economic models (Mullainathan & Thaler, 2000, p. 6).

1.2.2.3. Bounded Selfish

Contrary to popular belief, people can show altruistic behavior. The assumption that people are completely selfish does not reflect the truth. Hence the concept of ‘‘boundedly selfish’’ is more realistic in characterizing people. The concept of selfishness is influenced by culture, environmental factors, lifestyle, past experiences, human character, religions, etc., and exists in varying degrees. People can have different levels of position on a chart ranging from charity to completely selfishness. According to a study conducted in 1993, which is one of the studies that will refute the belief of selfishness, 73.4% of households spend 2.1% of their own income on charity, while approximately 47.7% work voluntarily, on average, 4.2 hours per week (Mullainathan & Thaler, 2000, p. 7). Similar results have been observed in dictator game experiments and other different experiments (Andreoni & Miller, 2002; Bardsley, 2008; Bolton, Katok, & Zwick, 1998).

1.3. The Failure of the Behavioral Assumptions of Mainstream Economics: Anomalies

Anomalies are one of the issues that prepare a suitable environment for the formation of the Nudge theory. According to Thaler (1992, p. 9),

‘An anomaly is a fact or observation that is inconsistent with the theory.’

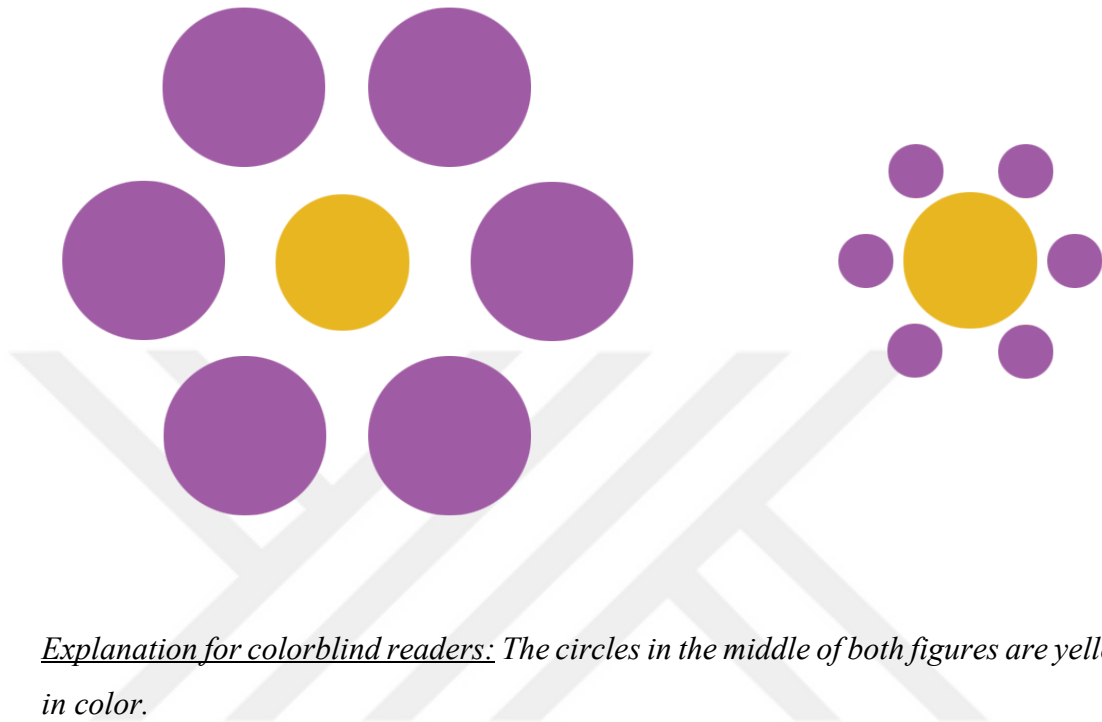
The anomalies considered as a cause of external factors by the mainstream economy. Therefore, the existence of anomalies has not attracted enough attention and assumptions of human behavior were accepted for years. But behavioral economists, especially Thaler (1992, p. 9), are considered to have anomalies in many different subjects and these situations should be involved in theory.

In order to form paradigm shift in economics, it is necessary to take into account the situations of deviation from the theory described as the 'anomaly' of mainstream economy. In order to draw attention to it, Thaler has published many articles¹ about anomalies in Journal of Economic Perspective.

For instance, when Thaler prepared a micro class exam early in his career, the class average test score was 72 out of 100. Although the average test score had no effect on the distribution of the grades, the students complained about the difficulty of the exams and were not satisfied with their own scores. To solve this dissatisfaction, Thaler set the highest score at 137 instead of 100 in the next exam. As a result of next exam, an average of 70 percent of questions answered correctly by the students and it was lower than the previous exam, but everyone was satisfied with this new scoring system, as the score average was 96 out of 137. According to the behavioral model of economic theory, no one should be happier with 70% (96 out of 137) success than 72% (72 out of 100) success (Thaler R. , 2015, pp. 3-4). According to rationality concept of mainstream economic theory, students are expected to be happier with their first exam results than second exam results. But in reality, the students were happier with their second exam results than first exam results. In this context, this is considered an anomaly for mainstream theory.

¹ Thaler has published 19 articles on different anomalies from 1987 to 2006, to see these articles (aeaweb.org, 2022).

Figure 1.1. Titchener Circle



Explanation for colorblind readers: The circles in the middle of both figures are yellow in color.

(Source: brainhq.com)

The figure² above is an illusion discovered by the German psychologist Hermann Ebbinghaus (1850–1909), known as the Titchener circle³. Most people see that the yellow circle in the right figure is bigger than the yellow circle on the left figure. But in reality, the yellow circles on both sides are exactly the same in size. This illusion and many other similar economic anomalies show that contrary to the assumptions of mainstream theory, human brains have not perfect rationality and decision-making ability.

² Explanation for colorblind readers: The circles in the middle of both figures are yellow in color.

³ This illusion shows the limits of attention in determining object size. Because the circles surrounding the yellow circle on the left are larger than the circles surrounding the yellow circle on the right, the yellow circle on the left appears larger. However, the two yellow circles are the same size. It is an example of proving that our brain determines the size of an object by comparing it to the objects around it.

From these aspects, it is a fact that human behaviors and perceptions are not always correct, therefore guiding them to the right decisions thanks to nudge theory and considering the psychological facts can prevent economic system from occurrence of many anomalies.

1.4. Behavioral Theories and Findings

Behavioral economics representatives make various contributions to improve the main theory rather than just criticize the mainstream economic theory. They conduct more realistic studies by observing differences and anomalies in human behavior and producing behavior-centered policies. In this context, the most important behavioral findings and theories need to be grouped and understood in order to make more realistic policies. Relevant behavioral findings and theories are included in this section.

1.4.1. Dual Process Theory

One of the phenomena that affect the decision-making mechanism is the way of thinking. Psychologists have conducted studies for many years to prove that the brain has two ways of thinking. This system called as “Dual Process Theory”. The theory is very crucial because it is related to one of the most important criticisms of behavioral economics to the assumption of rationality. Kahneman (2011) gave a new dimension to the dual process theory by adopting the terms (system 1 and system 2) proposed by psychologists Keith Stanovich and Richard West.

According to Kahneman (2011, pp. 26-27),

- System 1: Works automatic and very fast, requires little or no effort. It does not require any voluntary control everything happens automatically.
- System 2: Works slowly and require concentrate. It directs attention to mental processes that require effort, just as when doing complex calculations.

Some examples of the automatic activities of System 1 are listed below.

- To answer the question $3 + 3$.
- Understanding simple sentences in the mother tongue
- To turn to the source of a sudden sound.
- Realizing which of the two objects is far and which one is close.

Some examples of the activities of System 2 are listed below.

- To answer the question 16×38 .
- Choosing a product in full detail to be purchased among two products.
- Looking for a familiar face in a crowded environment.
- Focusing the attention on a specific situation.

The first system is called the automatic (intuitive) system, while the second system is called the reflective (rational) system. In this context, it can be said that the automatic system is the instinctive reaction of the human, while the reflective system is the conscious thinking reaction (Thaler & Sunstein, 2008, pp. 19-20).

Considering the working principles of these two systems, it seems that people character closely identified with system 2. But most people make most of their decisions with the system 1 in daily life. In this context, it can be thought that the main reason for the deviations from rationality is system 1. Therefore, it is possible that the decisions taken by individuals with the automatic system can be guided in the context of nudge theory. Since the decisions made with system two are more rational, the effect of nudge theory on these decisions can be discussed.

1.4.2. Prospect Theory

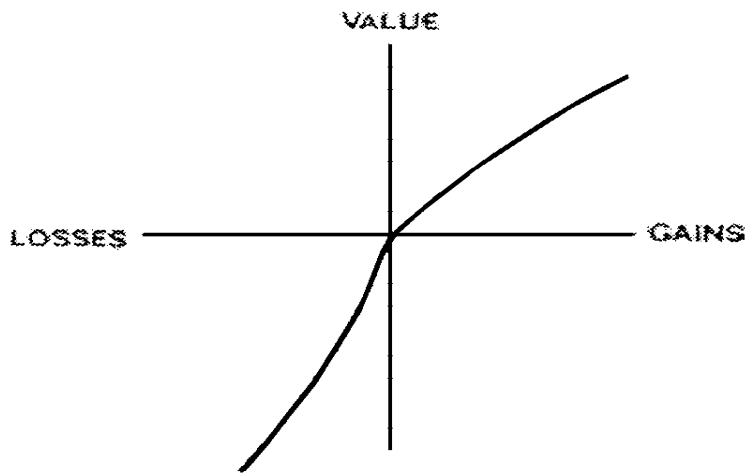
Prospect Theory (Kahneman & Tversky, 1979) emerged as a critique of the Expected Utility Theory (Bernoulli, 1738). The theory which used today in finance studies is based on the observation that the expected utility cannot be maximized. Prospect theory contains a reference point in contrast to Bernoulli's model. Therefore, prospect theory is more complex. If the prospect theory is well understood, it helps the explain about in which situations individuals make mistakes while making a choice. In this context, it will be easier to develop a Nudge application.

People have more sadness when they lose something than their joy when they gain something. In this context, people often tend to loss aversion (Thaler & Sunstein, 2008, p. 51). Espn - Fantasy Nba⁴ is an example of this behavior. In this game, real nba players are drafted by each user at the beginning of the season and distributed to the teams of the participants. Participants who have the right to trade their players with other users during the season often do not tend to realize these rights. Because the participants cannot give up their players to trade with other teams. Participants⁵ make trade offers to much better players in exchange for their players. As a result, people tend to loss aversion behavior and attribute too much meaning to what they have.

⁴ A web-based game where participants collect points with the match statistics of NBA basketball players and compete with each other.

⁵ This example is given by observing the five-year game seasons with the same participants.

Figure 1.2. Gain and Loss Diagram of Prospect Theory



Source: (Kahneman & Tversky, 1979, p. 279)

As in the figure above, generally, while the value function is concave for gains, it is convex for losses. Furthermore, usually it is steeper for losses than for gains (Kahneman & Tversky, 1979, pp. 279-280). In other words, pain of the same amount of loss is bigger than the happiness of the same amount of gain.

According to the theory, people's tendency to take risks differs in situations of certain loss or certain gain. People tend to avoid risk in case of certain gain, while they tend to take risk in case of certain loss. This behavior can be explained with the following example.

- Question 1: Which one would you prefer?

Do you want to earn 900\$ with a certain probability or earn 1000\$ with a 90% probability?

- Question 2: Which one would you prefer?

Do you want to lose \$ 900 with a certain probability or lose 1000\$ with a 90% probability?

In the first question, most people would prefer to earn certain 900\$ by avoiding risk. On the other hand, in the second question, most people would prefer to take risk.

because the absolute loss situation is repulsive for people and leads them to take risks (Kahneman, 2011, pp. 326-330).

Another prediction of the theory is that worth of gains and losses are compared according to wealth of individual rather than only utility amount. For example, in reality, the 500 dollars earned by a person who has 1 million dollars wealth and the 500 dollars earned by a person who has 1000 dollars wealth do not give the same happiness. As seen in the examples, deficiency of Bernoulli's theory is that it does not have a reference point. People make their choices based on their reference points (Kahneman, 2011, pp. 322-326). Daniel Kahneman won the 2002 Nobel Prize in economics for this theory and the related research.

Thanks to Prospect Theory, the decision-making process has gained a new dimension. These psychology-based findings also play an important role in the development of the nudge theory.

1.4.3. Framing Effect

Psychological principles used in decision making deviate in different directions when the same problem is framed in different ways (Tversky & Kahneman, 1981, p. 453). In this way, the situation that decision makers are affected by the directions is called the "framing effect." In this context, framing could use as Nudge applicants. Since the framing effect is an important guidance strategy, it is used effectively in many areas such as politics, economy, advertising, marketing and media, etc.

The famous example of the Asian disease (Tversky & Kahneman, 1981, p. 453) is effective for a better understanding of the framing effect. In this experiment, four different programs are presented to participants.

Question: Imagine that USA preparing for a deadly Asian disease. Two alternative programs have been prepared to battle against disease. The scientific results of the programs are as follows:

- If 'Program A' is adopted, 200 people will be saved.
- If 'Program B' is adopted, 600 people will be saved with probability 1/3 or nobody will be saved with probability 2/3.

According to results, while 72% of participants preferred Program A, 28% of participants preferred Program B.

After the scientific results of the programs are framed differently:

- If 'Program C' is adopted, 400 people will die.
- If 'Program D' is adopted, nobody will die with probability 1/3 or 600 people will die with probability 2/3.

According to results, while 22% of participants preferred Program C, 78% of participants preferred Program D.

It must be noted that while Programs A and C, Program B and D have exactly the same results. But when framed differently, they affect choice preferences of people and it shows the importance of framing effect. The framing effect is an effective theory that can cause different preferences by expressing the same result in different ways.

In another study, when defining a new medical treatment to patients, the disclosure of the survival rate (such as %75) rather than the mortality rate (such as %25) relatively increased the survival rate (Mckenzie & Nelson, 2003, p. 596). In addition, there are other examples⁶ where the framing effect influences human decisions.

⁶ To see more examples about framing effect (Kahneman, 2011, pp. 420-433; Thaler & Sunstein, 2008, pp. 54-56).

Figure 1.3. Perception Manipulation Figure



Source: (myoluker.com)

As seen as figure on above, the presentation (framing) of a reality may direct people to the wrong ideas. In this way, framing effect can deviate individuals from rationality. The results of the framing effect prove that people have cognitive biases, and they need to direct by policy makers in some situations. Therefore, using of framing in Nudge strategies is useful and necessary.

1.4.4. Endowment Effect

Knetsch and Sinden (1984) explored the early laboratory experiment findings of endowment effect. This effect is important for Nudge theory because it is a deviation behavior from rationality. Therefore, it could countable as one of the people's cognitive biases.

Loss aversion and endowment effect are related concept in terms of human behavior. According to Thaler (1980, p. 44), the behavior which is the demand for giving up the goods owned by the individual more than offer for the goods by other individuals called as endowment effect. In this context, two concepts are associated

with each other because individuals exhibit loss aversion behavior for the things they have.

According to the mainstream economics theory, indifference curves never intersect because indifference curves are reversible. In other words, if a person has the good X, she/he is indifferent between keeping this good or trading it with good Y. Likewise, when that person has the good Y, she/he must be indifferent between keeping good Y and trading it with good X. But if there is loss aversion behavior, this reversible is no longer exist and indifference curves could intersect. In order to test this situation, Knetsch (1990) has organized a series of experiments and concluded that the indifference curves are intersected with each other (Kahneman, Knetsch, & Thaler, 1991, pp. 196-197). In this context, it has been proven that loss aversion behavior present. Therefore, people attribute more meaning what they have. In other words, endowment effect occurs.

Ariely (2008, pp. 141-145) conducted a trial at Duke University in order to test the impact of endowment effect. Since the university's basketball court is small, a few of the students will be able to get the tickets. Result of excess demand for tickets, university administration decided to be distributed tickets via draw between students. After this process, while some of the students have had tickets, the other students have not had tickets. The questions were asked to the more than 100 students, including ticket owners and non-ticket owners.

- How much money enough for you in order to sell your ticket? (to ticket owner students)
- How much money can you give to buy tickets? (to non-ticket owner students)

Despite the same efforts to reach the tickets by both group of students, ticket owner students said about 14 times more money than the non-ticket owner students. It seems clear that the ticket owner students are under the impact of endowment effect. As is also understood from the trial results, individuals attribute a meaning to the things they have more than the other individuals attribute a meaning to the same things. This is called as endowment effect.

The fact that people act according to the endowment effect in certain situations, this reality can be helpful in generating many different nudge applications by considering this behavior pattern. Therefore, comprehensible of endowment effect is crucial for the application of nudge theory.

1.4.5. Heuristic and Biases

One of the foundations of Nudge theory is that people have some cognitive biases contrary to the rationality assumption. Behavioral economics adopts the idea of identifying these biases and making economic models in this context. The systematic and repetitive nature of these biases has created the necessity of grouping cognitive biases and created an applicable area for Nudge theory.

Tversky and Kahneman (1974, p. 1124) claimed that people have heuristic principles when they take the decision. These principles are very important to methodize the decision-making process. In later years, behavioral theory used biases in the decision-making process in model predictions. According to Tversky and Kahneman (1974, pp. 1124-1130), the three human heuristic principles are representativeness, availability, and anchoring.

1.4.5.1. Representativeness

Representation is one of the cognitive principles of human that cause deviation from rationality. In the decision-making process, people take into account representativeness when faced with a new case, phenomenon, or etc. and this is the result of the work of system 1.

For instance, people think that a two-meter-tall black American person seems more of a professional basketball player than a 1.65-meter Jewish person. Because while there are many long black basketball players, the number of short Jewish

basketball players is very low. The concept of representation is the result of the connections people make with their previous experiences. If the differences between similarity and frequency diverge are increase, deviations from rationality may occur (Thaler & Sunstein, 2008, p. 26). In this context, representativeness which is one of the cognitive principles of human could useful for Nudge theory.

1.4.5.2. Availability

Availability is the second cognitive principles of human that cause deviation from rationality. In some cases, people evaluate the frequency or likelihood of an event occurring. This evaluation process which consisted by their own experiences is a judgmental heuristic process and it is called as availability (Tversky & Kahneman, 1974, pp. 1127-1128). Availability could use as a Nudge application by governments and public sectors.

For example, the first cases of the Covid-19 pandemic started to appear in China. The pandemic that started in 2019 did not appear in other countries until February 2020. Most people did not care enough when the pandemic was seen in other distant countries. But when the pandemic began to appear in other countries, people became more worried about catching the covid-19 virus. Especially as they follow news from the press, people become more worried after the first cases seen in their own country. People to be more sensitive to the events around them thanks to availability. They make their predictions about the probability of realization a situation by looking at the frequency of occurrence with their environment.

In this context, it seems that availability affects human decisions. For instance, in a period which occur plane crash news, people may be refrain from buy tickets, even though the accident probability is very low. Or if there has been a recent flood disaster, the number of people who have natural disaster insurance increases. Considering these examples, the most important way to prepare the society for bad consequences is to remind them the similar events in the past by government and public sector (Thaler &

Sunstein, 2008, pp. 24-26). In this way, providing availability to the public could a very effective and important Nudge strategy.

1.4.5.3. Anchoring Effect

Anchoring is the third cognitive principle of human that cause deviation from rationality. In many cases, people make their predictions by reference to the starting point. When asked about their thoughts on a topic, even the slightest reference to them can greatly affect their answer. This phenomenon called as anchoring effect (Tversky & Kahneman, 1974, pp. 1128-1130).

Even if an anchor is applied irrelevant to the subject, people can be affected by it. For instance, nine experienced judges read the lawsuit of a woman who was charged with theft. Each of the judges threw dice before deciding on the case. The dice were set to be 3 or 9 only. After a bit, the judges were asked whether they would give more or less punishment than the results on the dice. Afterwards, the judges were asked about their final decisions. According to the average results, judges who has dice scored 9 decided to punishment for 8 months, while judges who has dice scored 3 decided to punishment for 5 months. The reason for this surprising result is that the anchoring effect is effective, even if people believe that anchor is not informative (Kahneman, 2011, pp. 146-147).

According to Thaler and Sunstein (2008, pp. 23-24), the anchoring effect can be used as a nudge strategy in beneficial areas. For example, a charity fundraiser corporation can increase the amount of donations collected through the anchoring effect by regulating donation options. Donation options which are \$100, \$250, \$500, \$1000, \$5000 provide to collect more donations than the form of \$50, \$75, \$100, \$150 dollars. Because donation options act as an anchor for people who have no idea about the amount of donation. Therefore, bigger anchors lead people to donate more.

1.4.6. Mental Accounting

Mental accounting is the cognitive operations performed by households and individuals to organize their financial activities. For example, regular expenditures in households can be organized into categories. The reduction money in one of the categories usually compensated from other sources rather than compensate it by transferring money from other categories. Although it violates the economic principle of financing, mental accounting affects the choices of individuals (Thaler R. , 1999, p. 183).

People can make mistakes while using their mental accounting and they can make different decisions in the same economical situations. In a survey conducted by Tversky and Kahneman (1981, p. 457), people were asked about their decisions in two different scenarios.

- According to the first scenario, imagine that you decide to go to a theater play. The ticket price per person is \$10 and you realize that \$10 in your wallet is missing. Would you still buy a ticket for \$10? While 88% of the participants answer 'yes', 12% of the participants answer 'no' for this question.
- According to the second scenario, imagine that you decided to go to a theater play. Again, ticket price per person is \$10 and you already bought a ticket. But when you decided to entry to the theater hall, you realized that your ticket is missing. Would you buy one more ticket for \$10? While 46% of the participants answer 'yes', 54% of the participants answer 'no' for this question.

Indeed, two situation which showed above are same in economically. But people think about that the ticket cost is \$20 in second scenario. Thanks to their mental accounting, they didn't realize that same ways of two scenario. As a result, mental accounting can create deviations from rationality, as in the example. According to this behavior, Nudge strategy could play an important role to avoid deviations from rationality.

On the other hand, improvements in public policies can be achieved if policy makers understand the logic of mental accounting and produce policies according to

it. For instance, if the goal is to encourage savings, it would be an important solution to direct people to a mental or real account that will keep them from unnecessary expense (Thaler & Sunstein, 2008, p. 52).



1.5. Process of Nudge Theory

Nudge theory is a theory which developed because of the findings of behavioral economics. Thaler and Sunstein (2008) who first introduced the nudge theory in the literature in their books titled ‘Nudge: Improving Decisions about Health, Wealth and Happiness’. They defined the nudge theory as follows,

‘A nudge, as we will use the term, is any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be cheap and easy to avoid. Nudges are not mandates. Putting fruit at eye level counts as a nudge. Banning junk food does not.’ (Thaler & Sunstein, 2008, pp. 6-7)

When the effect of human psychology is considered, details that seem small and insignificant can become important factors that determine preferences. Thaler and Sunstein reinforce the importance of these small details with the following example in their books. Cleaning staff at Schiphol airport in Amsterdam complained of pollution in men's toilets. As a solution to this situation, they put a fly sticker inside the toilet bowls. According to officials, people focused on fly stickers while meeting their needs, and the pollution of toilets decreased by 80 percent (Thaler & Sunstein, 2008, p. 15). This nudge example reveals that every detail is important in making our decisions.

The fact that people make systematic mistakes has increased the importance of nudge theory. According to Ariely (2008, pp. 24-25), humans are much less rational than classical economic theory predicts on human behaviors, but these less rational behaviors are predictable because they are systematically repeated. In this context, the greatest key to success in behavioral economics is the ability to predict these less rational behaviors that repeat systematically. If behavioral economics groups these less rationally predictable behaviors, then the economic models that will be established afterwards can make a great contribution to the main theory. Based on these observations, predictable behaviors can be guided by nudge theory to help the market mechanism work well.

Nudge theory includes policies aimed at making people make rational choices by directing them in certain ways. With these aspects, there are also criticisms that it is a theory useful for manipulation (Mitchell, 2004). But contrary to the criticisms, Thaler and Sunstein stated that the ‘choice architecture’ that designs a good Nudge policy should be in a ‘libertarian paternalist’ approach by giving importance to people's freedom (Sunstein & Thaler, 2003).

In this section, after the definition of the Nudge theory, the concept of ‘Libertarian Paternalism’ and the concept of ‘Choice Architecture’ and the factors that should be considered while designing the Nudge policy are mentioned under the section 1.5.1. and 1.5.2., respectively. After that, features of Nudge and Nudge types are explained under the section 1.6. and 1.7., respectively.

1.5.1. Libertarian Paternalism

According to Thaler and Sunstein, this concept, which comes from the combination of two opposite meaningful words, has more meanings than they are used alone.

“Libertarian paternalism is a relatively weak, soft, and nonintrusive type of paternalism because choices are not blocked, fenced off, or significantly burdened. If people want to smoke cigarettes, to eat a lot of candy, to choose an unsuitable health care plan, or to fail to save for retirement, libertarian paternalists will not force them to do otherwise - or even make things hard for them. Still, the approach we recommend does count as paternalistic, because private and public choice architects are not merely trying to track or to implement people’s anticipated choices. Rather, they are self-consciously attempting to move people in directions that will make their lives better. They nudge.” (Thaler & Sunstein, 2008, pp. 16-17)

Libertarian paternalism is criticized by many libertarian economists. According to Mitchell (Mitchell, 2004, p. 1277), the libertarian paternalism, which is still under discussion today, is designed to direct people in the best direction that paternalist planners have seen, rather than, as mentioned, liberate individuals from their unreasonable tendencies. In this context, it can be suggested that the nudge application process should realize only by reliable institutions and these applications should be controlled by supervision of an audit mechanism.

Despite different thoughts, libertarian paternalism is a form of thought management that allows people to avoid irrational choices. Rather than discussing the libertarian part, focusing on its applicability and its results is better suited to the objectives of this study.

1.5.2. Choice Architecture

Thaler and Sunstein called “Choice Architecture” who designed the Nudge framework and enabled individuals to make better choices for people. In fact, they expand the definition even more,

“If you indirectly influence the choices other people make, you are a choice architect.” (Thaler & Sunstein, 2008, p. 83)

As can be seen from the definition, choice architecture has a certain effect even if it is not aware that the way it choice options will affect decision makers. Governments, corporations, parents, etc. are real-life choice architectures and influence individuals' decisions. Nowadays, when the positive results of nudging are noticed, recommendations from official choice architects (such as Behavioural Insight

Team⁷ and Social and Social and Behavioural Science Team⁸) are taken even in policy making.

There are eleven tools that choice architecture can use to design an effective nudge. These tools are reducing of choice options, using technology and decision aids, using defaults, focusing on satisfaction, allow for limited time, staging of decisions, classifying of options, good and bad labeling, translate and rescale, customized knowledge and concentrate on experience (Johnson, et al., 2012, p. 489).

One of the most famous examples of choice architecture is Carolyn, who is responsible for food service for schools mentioned in the Nudge book. In this example, Carolyn and her friend Adam conducted an experiment to influence children's eating habits by changing the place of foods on the school canteen bracket. The result was 25% successful. With this result, they realized that a nudge could be made to direct people to healthy foods (Thaler & Sunstein, 2008, pp. 1-4). The success of the nudge implementations of directing healthy food, which is widely mentioned in the literature, shows that this area is suitable for choice architecture. Some similar studies can be listed as follows: portion reduction (Stroebele, Ogden, & Hill, 2009), changing the sequence of foods and directing them to healthy foods (Privitera & Zuraikat, 2014), information on nutrition labeling (Kiesel & Villas-Boas, 2013), serving bowl selection (Kleef, Shimizu, & Wansink, 2012) and etc. (Arno & Thomas, 2016).

Sunstein and Thaler, who brought the concept of choice architecture to the literature, prepared six principles for a good choice architecture. The acrostic they form with their first letters makes it easier to keep the nudge theory in mind.

- iNcentives
- Understand mappings
- Defaults
- Give feedback

⁷ The Behavioural Insight Team was established in the United Kingdom in 2010 and produces various Nudge policies, also known as the Nudge Unit.

⁸ The Social and Behavioural Sciences Team is a government agency established in the United States of America in 2015 that develops various social and behavioral policies to improve welfare of American people.

- Expect error
- Structure complex choices

(Thaler & Sunstein, 2008, p. 100)

The combination of bold letters at the beginning of the lines appears as 'nudge'.

1.5.2.1. Incentives

Incentives are also accepted concepts in mainstream economic theory. Although mainstream economic theory has been criticized in some ways, a successful choice architect should use incentives effectively while making a nudge design. In addition, the choice architect must find the answers to the following questions about a good in order to use incentives: who pays, who chooses, who uses, who profits? (Thaler & Sunstein, 2008, p. 97)

1.5.2.2. Understand Mappings

Choosing a type of ice cream is not the same as deciding whether to treat prostate cancer or not, and the second case is much more difficult to decide. Because when choosing ice cream type, people choose the type that includes only the taste they like without considering the calories, but it is much more difficult to decide whether to be treated against prostate cancer or not because it involves issues such as life span, life quality, etc. These two case examples show that the concept of mapping is not the same for every selection. A good choice architect makes the information more understandable (usually using numerical information, for example it is helpful to know that 3 apples are required for a glass of apple juice) and aims to improve people's perception of mapping (Thaler & Sunstein, 2008, p. 92).

1.5.2.3. Defaults

When people make decisions, they favor the options that are easiest and with the least effort, the status quo tendency and have a low opinion about options are some of the reasons for this. Defaults, which has turned into a nudge practice by taking advantage of people's unwillingness to change the continuity of existing options, is the main subject of this study. Therefore, it will explain in detailed in section 1.7.10. of the thesis.

1.5.2.4. Give Feedback

Giving feedback improves people's performance and thanks to a well-designed system, people could learn and correct their mistakes in advance. For example, digital cameras are designed to avoid making mistakes when taking photo by showing a small sample of the photograph on the screen. This sample on the screen warns people about how the photo will come out and preventing them from making mistakes. Another type of feedback is warnings about the future. For instance, before the computer's battery is dead, a warning appears that the battery is running out. With this warning, measures can be taken before the laptop runs out of battery. On the other hand, this warning appears many times, it may increase the possibility of being ignored (Thaler & Sunstein, 2008, pp. 90-91).

1.5.2.5. Expect Error

People can make many mistakes in their daily lives. Well-designed systems help to minimize the mistakes of people by predicting them before. In this context, over the years, new systems have been developed in many areas to reduce people's mistakes. For example, many people may forget to take their card when withdrawing money from an ATM or forget to take the original form when photocopying a document. However, thanks to the developing systems, many ATMs have been developed to prevent this error by giving the card and then the money. As another example, in UK, where the traffic order is different, 'look right' sign is used next to many pedestrian crossings to prevent possible accidents of tourists. Because the traffic pattern in most countries is different from the UK, tourists usually tend to look left first. All these examples prove that possible mistakes can be overcome by expecting before (Thaler & Sunstein, 2008, pp. 87-90).

1.5.2.6. Structure Complex Choices

People may have to make complex choices in life. Choices with a large number of alternatives can be described as complex choices. A good choice architect should create an environment to guide people by minimizing these alternatives whenever possible. For example, a paint shop can have thousands of different colors. It is impossible for customers to choose these colors from a brochure prepared in alphabetical order. Instead, a brochure from the lightest to the darkest color (with similar color transitions side by side) makes customers' choices much easier. The second brochure made in this example is an effective way to structure complex selections (Thaler & Sunstein, 2008, pp. 94-96).

It is obvious that today there are much more effective methods in structuring complex choices than in the past. Nowadays, thanks to the developing technology, people are able to filter by setting their minimum standards for any product they want

to buy online or a new house to move, etc. in internet. As a result of this filtering, they can choose among alternatives closer to target choice by eliminating many alternatives.

On the other hand, when people have to make choices between many alternatives, they often tend to choose the default option. One of the most important reasons the default option strategy is effective is that people have a hard time choosing between complex choices.

1.6. Features of Nudge

In order for a policy to be considered a nudge policy, it must have certain features. In this regard the most important feature is that Liberty-Preserving Approaches, which is the concept that Sunstein's study (2014) brought to the literature, is a concept that directs people in a certain direction, but also do not prevent them to go in the direction of their choice. The approaches includes three main features which are 'Nudges Maintain Freedom of Choice', 'Transparency and Effectiveness' and 'The Need for Evidence and Testing'.

1.6.1. Freedom of Choice

Although nudge theory includes a soft paternalist approach, it guides people in a certain direction while at the same time protecting their freedom of choice. As described in Sunstein's study (2014, p. 583), GPS steer people in a certain direction, but people are free to choose their own direction. In other words, when the choice architecture design a nudge, he/she takes into account the freedom of people. In this context, any obligations for people is absolutely not possible according to a Nudge policy nature.

1.6.2. Transparency and Effectiveness

According to Sunstein (2014, p. 584), governments or institutions should be transparent and open enough while implementing a nudge policy. When the government adopts a program that enables people to automatically enrollment in the pension system or when a large institution designs a program that promotes healthy foods, they should announce the aim and process of the program to the people. Nudge applications should not be hidden and manipulative in anyway.

1.6.3. The Need for Evidence and Testing

As stated in Sunstein's study (2014, p. 585), relying on testable evidence for all feasible policies, including nudges, is crucial. Nudge is very affordable and cost effective in terms of testability. On the other hand, some nudges seem promising in thought but fail in practice. It is important that the designed nudge implementation is testable in order to governments or institutions can determine the correct nudge policy. Undesirable consequences are possible and policy makers should try to estimate these results by testing and taking into account the evidences. For example, officials should test which variation is effective by sending letters of different variants to citizens in order to they pay their tax debts. Otherwise, the policy could be ineffective and it creates extra cost for the governments.

1.7. Main Nudge Types

There can be many different reasons for people's irrational behavior. Therefore, it is useful to know the reasons behind the behaviors. For an election architecture to design a nudge policy, it must correctly identify the causes of irrational behavior. In this context, nudge policies have different methods with certain limits.

1.7.1. Simplification

Complexity is a serious problem. One of the most important findings of behavioral science is that if you want to get someone to do something, you have to provide the easiest way for it (Cabinet Office Behavioral Insight Team, 2012, p. 8). In this context, simple choices are attractive for people. Many programs fail due to complexity in all over the world. Hence, programs, regulations and forms should be prepared simply for more successful results. In many countries, the benefits of major programs (including health, finance, employment, poverty and education) are greatly reduced due to excessive complexity (Sunstein, 2014, p. 585).

For instance, in an experiment with the United States Federal Application for Federal Student Aid (FAFSA), the research team created software that automatically filled two-thirds of the application form to simplify the long and overly complex FAFSA application process. As a result of the simplification process, high school senior or graduate students benefiting from this software have increased their application to the FAFSA by 40%. Furthermore, it appears that they are 33% more likely to receive Pell Grant (which is a major federal donation) (Ly & Soman, 2013, p. 5).

According to a study conducted by Behavioural Insight Team (BIT) in 2011, the return rate of simplified letters was 35%, while the return rate of generic letters was 4%. (letters was related to tax liabilities of doctors) (Cabinet Office Behavioral Insight Team, 2012, pp. 24-25). As a result, complexity creates cognitive overload, and people are likely to stop filling out complex forms. Therefore, simplification is a highly effective nudge type.

1.7.2. Using Social Norms

The human community lives together and when people make their decisions, they are influenced by the decisions of the people around them. Social norms often

guide our behavior in society and have a strong influence on our reactions (Cabinet Office Behavioral Insight Team, 2012, pp. 22-24). In this context, social norms are one of the most important practices in order to nudge people in a certain direction. Social norms are used in nudge theory to impose certain behaviors on society such as reducing environmental pollution, paying taxes on time, reducing discrimination, maintaining social order, etc. For example, the sign of a certain street, "the overwhelming majority of people living here are keeping their place clean" of text that will enable them to keep their surroundings clean, by increasing people's awareness.

According to Sunstein (2014, p. 586), using social norms can reduce criminal and harmful behavior. Sometimes people engage in undesirable behavior, in such cases it can be helpful to emphasize what people think they should do rather than what they are actually doing (such as "about 90 percent of people living in Ireland believe that they should pay their taxes on time."). In these aspects, using social norms are one of the most effective nudging methods.

1.7.3. Increase in Ease and Convenience

Accessible choices are always more likely for people to choose. Considering this, it is an effective nudge strategy to make the options easier and presented to people in order to make the desired choices. The best example of related the subject is that Carolyn's repositioning of food in the school cafeteria in Sunstein and Thaler's book. Carolyn, who owns the school cafeteria, has switched healthy foods to children's eye level, as a result the strategy, this foods consume increased 25% more. The fact that children choose healthy foods that are more accessible and visible shows that they are more willing to make easy choices (Thaler & Sunstein, 2008, pp. 1-2).

In a study conducted by E. Dayan and M. Bar-Hillel to determine the which choices are easy for people, it was concluded that the menu design was effective in people's choices. The results of study show that items placed at the beginning or end of the menu list were twice as popular than placed in the middle of the list (Dayan & Bar-Hillel, 2011, p. 333).

According to Sunstein (2014, p. 586), the best slogan in order to explain this subject is "make it easy". According to him, if a choice architecture wants to encourage people to make desirable choice, she/he must reduce the barriers to that choice.

1.7.4. Disclosure

Explaining the consequences of their decisions to people can qualify as disclosure in the nudge literature. Disclosures by government or private agencies is very effective on the individual behavior. Adequate information will increase public attention in most cases. Sunstein (2014, p. 586) claim that disclosure needs to be comprehensible, accessible and simplicity in order to achieve target. Moreover, in some cases, disclosure policies can prevent private and public inattention, incompetence, negligence, corruption and wrongdoing.

1.7.5. Warnings, Graphic or Otherwise

Sometimes people make decisions that have harmful consequences. In order to change a behavior that will cause problems as a result, highlighting its harmful aspects can be a useful awareness-raising strategy. According to Sunstein (2014, p. 586), old letters, bright colors and large fonts are beneficial to attract people's attention as highlighting tools.

The use of visuals and warnings on tobacco products is the most obvious example in this subject. According to the results of a study, larger and more comprehensive warnings of cigarette packs are more effective on smokers (Hammond, et al., 2007).

On the other hand, a study found that bills sent to consumers had a ‘happy face’ if the consumer consumed energy less than average energy consumption, or a ‘sad face’ if the consumer consumed more than average energy consumption,

reducing the overall amount of energy spent (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007, p. 431).

In the other aspect, considering Covid-19 pandemic period, the most common method used by governments is to frequently warn people with the help of both visual and communication tools to prevent the epidemic from increasing. In addition to warnings about wearing masks, social distancing and personal hygiene emphasized in crowded environments, home-stay warnings from communication tools also show that governments use this method today.

1.7.6. Pre-commitment Strategies

Even though people tend to change their mind about the negative behaviors, the result can be different in practice. For such situations, commitment will work. Thanks to fear of loss, commitment makes people more decisive.

There are many projects around the world that use commitment as a nudge. “Stickk” is an example of using commitment strategy. Committers agree to achieve their goals such as losing weight, quit smoking, making more exercise, saving money or etc., within the specified time on this website. Committers who cannot fulfill their commitments have to deposit the specified amount of money on the website. It is claimed that around 40 million people quit smoking with this way (stickk.com, 2022).

Another example is the CARES (Committed Action to Reduce and End Smoking) organization established in 2009 in Philippines. This organization focused on helping people quit or reduce smoking. Similar to the example above, the organization makes a nicotine test to the committers at the end of the promised time, determining whether people fulfill their commitments or not, and finally deduct the promised amount according to committers result (povertyactionlab, 2022).

1.7.7. Reminders

People are dealing with many tasks in their daily lives at the same time, for this reason, they need some reminders about their responsibility, obligations or tasks. Reminders play an important role in order to reach more controlled life (especially for forgetful people). Reminders could be via e-mail or text message for bill payments, upcoming responsibilities, taking medicine, to remember vaccine days etc.

For instance, in an experiment, thanks to the reminder which is sent via sms to the patients who need to use regular drugs, the rate of non-drug use has declined from 25% to 9% (Wald, Bestwick, Raiman, Brendell, & Wald, 2014). In this context, nudge trials with a low effort related to the reminder may result in very large effects.

A reminder information with greatly timing has a significant impact in order to get people to act immediately. A closely related approach, “prompted choice” is an approach in which people are not required to choose but prompted by asked about their choices. Examples of this approach are clean energy or an alternative energy provider, to be organ donors, or a privacy setting on computers.

1.7.8. Eliciting Implementation Intentions

There are many thoughts in the subconscious of people that are ready to act but have not yet been activated. This nudge aims to activate these thoughts mentioned. A simple question about the future can have obvious consequences. For example, “do you think to vaccinate your child in future?” The question can positively influence people to make the right decisions. On the other hand, it can be effective to tell people their own identity (eg. You’re a voter, do you have a voting plan?) (Sunstein, 2014, p. 587).

1.7.9. Informing People About Consequences of Their Own Past Choices

Institutions (public or private) have sufficient data on people's past health expenditures, bills, and other expenditures, etc. One of the problems with people making wrong choices is that they often lack of information about past choices. Sharing these data with people will help them not to repeat the wrong choices they made in the past. In this way, people can be directed towards certain behaviors in the future (Sunstein, 2014, p. 587).

According to Ariely (2008, p. 24), irrational human behaviors are predictable repetitive behaviors. In this context, reminding people of the consequences of their past decisions can be a good nudge strategy to prevent repeatable irrational choices.

1.7.10. Default

The “default” is the main topic of this study, thus this type of nudge is explained in details and examples. Unless people are forced to make active choices, they often choose the default option. This situation can help people to make more efficient choices by using the default option strategy. There are three ways that defaults nudges can influence decisions. First, individuals can assume that defaults are suggested as 'implicit recommendation' (Sher & McKenzie, 2006, p. 467) by decision makers. Second, it takes effort to make decisions, while defaults do not require any effort. Finally, defaults options are seen in the same way as the status quo, therefore decision-makers are directed to the defaults option (Johnson & Goldstein, 2003, p. 1338).

Compared to other equivalent traditional interventions, default is an effective nudge application that achieves more successful results with less cost (has no material cost), less effort and less time consuming (Benartzi, et al., 2017, p. 1042).

When examining the rate of organ donation in Europe, which is the best known example of nudge; Countries which given the chance to 'opt out' (ie default option is to be a donor, individuals can 'opt out' of donation if desired), has a donor rate of 85.9% Sweeden, 99.98% Austria, 98% Belgium, 99.91% France, 99.97% Hungary, 99.5% Poland and 99.64% Portugal. In other countries which given the change to 'opt in' (ie the countries where the default option is 'non-donor', individuals can be donors if desired), has a donor rate of 4.25% Denmark, 27.5% Netherlands, 17.17% UK and 12% Germany (Johnson & Goldstein, 2003, p. 1338). This difference of between Europe countries shows that effective results can be obtained via use of the default option.

One of the most important effects of the default application has been in terms of retirement savings. The 401 (k) participation plan change implemented by a large corporation in the USA has been a milestone for default and pension fund cooperation. In the past, new employees in the USA could only be included in the 401 (k) plan if they requested. The company suddenly changed plans and now hires employees as part of automatic enrollment in the 401 (k) pension fund. In other words, 3% of their income would be transferred to the pension fund, unless the new employees demand otherwise. Madrian and Shea (2000) examined the pension fund data of employees before and after the automatic enrollment decision and observed that the pension participation rate doubled in a short period of time. According to them, the only thing that can explain this incredible change is that the automatic enrollment plan is perceived by employees as an implicit investment advice.

Choosing the default option may be easier and more comfortable for people with complex issues such as choosing a pension fund or insurance program, choosing the features of a purchased computer or other items, etc. Considering these examples in the literature and considering the structure of human psychology, it can be said that the default option is the most effective and applicable nudge type.

Default options are being in every aspect of our lives. For example, when we do not use mobile phones for a certain period of time, the screen saver is activated (without our effort) and the phone's screen turns off in order not to consume more energy. This period is coded in the phone when we buy it by default and most of us do not even know about this time. Most people don't even bother to change the default options in our newly purchased products, especially the tech ones.

Most public and private institutions are aware of the impact of 'default options'. This strategy can sometimes be designed in the interests of the companies. For example, the automatic continuation of magazine subscriptions is in favor of that institution and they have designed the default option to serve their interests. Because of such examples, defaults may not always be designed with decision-makers' benefits in mind (Thaler & Sunstein, 2008, p. 85).

1.8. Effectiveness of Nudge Theory

Nudge theory includes a series of directions to enable people to make their decisions in the context of rationality. Governments or private institutions can design a nudge strategy in order to increase total welfare in every area where individuals can make irrational decisions. In the literature, there are nudge studies mainly in areas such as healthy nutrition, organ donation, traffic rules, pension fund and etc. The effectiveness of the studies is important because the nudge policies need to be a plus from the ongoing mainstream policies and should have visible impacts in order for future development.

In this section, empirical literature of the Nudge theory and the advantages of the theory compared to the mainstream economics are given.

1.8.1. Advantages of Nudge Theory

Nudge theory, which is a study of behavioral economics that aims to complete its deficiencies instead of completely replacing the main theory, has obvious advantages in some features.

Nudge theory benefit from the science of psychology. This feature of Nudge theory provides an advantage in results of a new policy. Because, people have some cognitive biases, and these behaviors could have harmful effect on results of their decisions. While making a new policy, the consideration of the policy in aspect of psychology could prevent individuals from the results of irrational choices. Because decision makers are people, it is efficient to enable them to make rational decisions regarding their psychological tendencies. On the other hand, the fact that policy interventions present the same policies to all people with a uniform human delusion may reduce the effectiveness of the policy. Because people are not uniform and generally accepted policies may not have a same effect on every person. Nudge theory is suitable for grouping different opinions of people to produce different policies for each group. In these contexts, one of the advantages of nudge theory is that it is based on psychology.

The other advantage of Nudge theory is that easily applicable. The results of a nudge application created with simple touches could effective rather than many mixed designs. For instance, a default-based nudge study designed to increase organ donation created very effective results in 11 different countries. In the study, the rate of organ donation rate is pretty much in 7 countries where the option to willing donate organs is determined by default, then the 4 countries where the option to not willing donate organs is determined by default (Johnson & Goldstein, 2003). The only change in the default options could create a huge differs in policy results. In this context, Nudge applications require lower effort than traditional policies.

The third advantage of Nudge theory is cost advantage. As in every field, cost analysis is of great importance in policy making. In this context, Nudge applicants shows great performance. According to a study (Benartzi, et al., 2017), one of the most

effective aspects of Nudge is that it can get higher results with low cost. Most nudge applications are less costly than traditional policies. For instance, according to Active-Decision Nudge study on retirement savings (Carroll, Choi, Laibson, Madrian, & Metrick, 2009), increase in contributions to program for the year per \$1 spent is \$100. On the other side, according to Danish Tax Incentives study on retirement savings (Chetty, Friedman, Leth-Petersen, Nielsen, & Olsen, 2013), increase in contributions to program for the year per \$1 spent is \$2.77. Considering these studies, nudge applications are most effective than traditional policies in terms of cost-result analysis.

Especially the covid-19 pandemic process has shown that traditional policies must now be replaced by innovative policies. Although the history of nudge theory goes back before, important research in this field shows that the theory is an area open to development and has many advantages compared to mainstream policies. Rather than linking situations where human behavior is contrary to the mainstream theory to external factors, nudge theory that conducts research to find the causes of those behaviors and can suggest different policies to people in line with these reasons. In this context, the nudge theory can be a policy tool that will be used more in the coming years.

1.9. Empirical Literature on Nudge Theory

There are academic empirical studies that contributed greatly to the development of nudge theory. The areas where nudge applications are generally used in the literature can be listed as follows: healthy nutrition, pension system, renewable energy, organ donation or etc.

Table 1.1. Empirical Literature on Nudge Theory

Studies	Interesting Nudge Area	Method	Main Results
(Benartzi, et al., 2017)	Impact-Cost comparison of Nudge and Traditional Policies	Relative-Effectiveness Calculations	Nudge interventions have a higher impact-cost ratio than traditional policy instrument tools.
(Musher-Eizenman, et al., 2010)	Directed children to healthy nutrition	Hierarchical regression	The distance of the serving bowls to the children is affect their consuming behavior.
(Privitera & Zuraikat, 2014)	Directed individuals to healthy foods	ANCOVA	Foods positioned closer were consumed more, regardless of people's preferences.
(Levy, Riis, Sonnenberg, Barraclough, & Thorndike, 2012)	Labelled color in order to support purchase of healthy foods	Linear regression	Less red-labeled foods were purchased, while green-labeled foods were purchased more by all socio-

			economic groups and races.
(Wansink & Hanks, 2013)	Ranked foods in buffets in order to directed people to healthier foods	Maxwell tests	People often tend to choose the first foods they see at buffets.
(Momsen & Stoerk, 2014)	Directed people to choosing renewable energy	Linear probability, Wilcoxon test	The most effective nudge type default option for directing to renewable energy.
(Johnson & Goldstein, 2003)	Using the default option on organ donation	Multiple regression analysis	There are great differences between the organ donation rates of countries whose default option is to donate organs and not to donate organs.
(Beshears, Choi, Laibson, & Madrian, 2009)	The effect of default option on retirement saving participation	Basic graphic analysis	Participation is increasing significantly in retirement saving system, while

			using automatic enrollment.
(Chetty, Friedman, Leth-Petersen, Nielsen, & Olsen, 2013)	The effect of automatic enrollment to total saving in context of the pension system	Regression discontinuity design (RD), difference-in-differences (DD) design and a regression-kink (RK) design.	Automatic participation is more effective than other subsidy policies in retirement saving system and total saving. In addition, individuals' tendency (active or passive saver) is important in the effectiveness of individual retirement savings policies.
(Madrian & Shea, 2000)	Comparison of private pension participation rate before and after automatic participation	Author's calculation	Participation in the 401(k) system is increasing through automatic enrollment, and the described default fund contribution rate by company has a significant impact

			on individuals' saving behavior.
(Thaler & Benartzi, 2004)	The effect of increasing the contribution rate determined by automatic participation on the savings rate		The Save More Tomorrow plan proposed by the researchers increased participants' savings rate by up to four times.

According to the findings of a study (Benartzi, et al., 2017) which were compared impact cost ratios of nudge interventions and traditional policy instruments, Nudge interventions are an approach that should be used more frequently with traditional interventions. Compiling and comparing empirical studies on retirement savings, university enrollments, energy conservation, and influenza vaccination between 2000 and 2015, the results of the study reported that nudge interventions were more effective in terms of impact-cost. Moreover, the study proposes three recommendations for the future of nudge interventions. First, investments in behavioral policies should be increased. Second, institutions which interested with nudge policies should coordinate with each other and increase development. Finally, behavioral scientists need to conduct more extensive studies to measure the effectiveness of nudge policies.

One of the areas where nudge applications are used the most is healthy nutrition. There are lots of empirical examples of effective choice architecture in the literature related to direct individuals to healthy foods. For example, in a study on children (Musher-Eizenman, et al., 2010), the effect of proximity and distance of food on food consumption behavior was tested. According to results of study, children's cracker and carrot slice consumption was affected by their distance from the serving

bowl. According to this result, directing children to healthy foods can be achieved by keeping healthy foods closer than unhealthy foods to the children.

On the other hand, a similar empirical study was tested on university students. In the study (Privitera & Zuraikat, 2014), the effect of accessibility distance of a food on consumption preference was tested, the foods used were popcorn and apple. According to the results of study, foods that are located close consume more regardless of the consumption preferences of the participants. In the light of these findings, directing individuals to less calorie healthy foods can be achieved with nudge interventions.

Another study in nudge interventions to direct healthy foods is to arrange the foods with red and green labels in addition to changing the positions of the foods (Levy, Riis, Sonnenberg, Barraclough, & Thorndike, 2012). The choice architect study, which equips harmful foods with a red label and beneficial foods with a green label, also tested the effect of intervention according to some different demographic characteristics of the people. According to results of study, as predicted, the rate of purchase of red-labeled foods decreased, the rate of purchase of green-labeled foods increased. This change of purchase rate also occurred in people with all different demographics.

In a study about customers' food choice in buffet areas, the results were quite impressive. The design of the study (Wansink & Hanks, 2013) was as follows: two different buffet sequences were arranged. The first one ranked from healthy to unhealthy foods, and the other one ranked from unhealthy to healthy foods. According to results of study, the 75% of the customers chose the first food they saw, and 66% of customers plates consisted of the first three foods. In summary, people tended to choose the first foods available at buffets. Therefore, ranking foods from healthy to unhealthy helps people in order to their choice healthier foods.

Nudge implementations are also used to encourage people to use renewable energy. A related study (Momsen & Stoerk, 2014) tested which nudge types are effective in area of renewable energy. According to results of the study, defaults nudge implementations were most effective in between other nudge types. Using defaults

nudge implementations increased of choosing renewable energy by 44.6 %. In this context, default options could use in order to direct people choice renewable energy.

The default option which is the one of the most effective types of nudge theory was used in a study (Johnson & Goldstein, 2003) on organ donation. This study was conducted on the basis of eleven countries with similar cultural, religious and educational levels. The fact that only the default option is different provides quite a lot of differences in the rate of organ donation between similar countries. According to the results of the study, the highest organ donation rate from the first four countries (has default option as not willing to organ donation) is the Netherlands with 27.5%, while the lowest organ donation rate from the other seven countries (has default option as willing to organ donation) is Sweden with 85.9%. People in this whole country can change the default option if they want. However, there could be two different reasons why they might adapt to the default option. First, people may avoid the extra effort, and second, they may perceive the default option as a suggestion of policymakers and avoid changing it.

The default option is also very effective on individual retirement savings, similar to organ donation. Saving funds, which is a very important issue economically, can be increased with the automatic enrollment system. In a related study (Beshears, Choi, Laibson, & Madrian, 2009), the effect of the default option on individual retirement savings was examined. According to the results of study, in Company A, which switched to the automatic enrollment system instead of standard enrollment, the rate of employees' participation in the savings plan increased from approximately 60% to 99%. In such an essential economic phenomenon, it is very important to have great results by changing only the default option.

A study of the Danish population (Chetty, Friedman, Leth-Petersen, Nielsen, & Olsen, 2013) tested how subsidies and automatic contribution affect total savings in context of retirement savings policies. In addition, individuals were grouped as active and passive savers in the study. Savers who are more sensitive to price subsidies are grouped as active savers, while savers who are not actively optimizing their portfolios are grouped as passive savers. According to the study, it is estimated that 85% of individuals have passive savings. The effect of retirement savings policies depends on

the active or passive saving tendency of individuals. According to the results of the study, automatic contribution is more effective than price subsidy for the pension system and the effectiveness of nudge policies such as automatic participation higher than subsidies and tax cuts to increase total saving.

Another study (Madrian & Shea, 2000) measures the effect of automatic participation on individual savings funds in the USA. According to the first result of the study, the number of participants participating in the private pension fund has increased as a result of the automatic enrollment policy in the 401(k) system in a large company. Another result of the study shows that the automatic participation and default contribution rate offered by the company to its employees have a significant effect on the saving behavior of individuals. On the other hand, the company's default contribution rate of 3% is perceived by individuals as a recommendation and this situation causing funds to remain at a conservative level.

Another study (Thaler & Benartzi, 2004) used behavioral theory to increase participation in savings funds. The main purpose of the study is to increase the default contribution rate of individuals participating in the savings fund with automatic participation. The proposal offered the Save More Tomorrow⁹ system, which allows individuals to increase their savings contribution rates with each salary increase. According to the results of the study, 78% of individuals who were offered SMarT agreed to participate in the system and 80% of them stayed in the system up to the end of study. In this way, the participants increased their savings contribution rate from 3.5 to 13.6 at the end of 40 months. These results show that the first experiences of the SMarT plan were successful.

⁹ For more detailed information: (Benartzi, Save More Tomorrow, 2022).

CHAPTER TWO

EVOLUTION OF THE SOCIAL SECURITY SYSTEM TOWARDS BEHAVIORAL PRIORITIES

2.1. Introduction

The purpose of this chapter is to introduce the behavioral channels that have been used in recent years to the continuity of the Social Security System. The system has evolved throughout history to ensure its sustainability. The latest version of this evolution in Turkey can be called the Automatic Enrollment Private Pension System. When the content of automatic enrollment is examined, it is seen that policy makers in Turkey have benefited from behavioral channels. In order to reach this conclusion, the following parts were mentioned, respectively.

In the first part, the definition of the Social Security System and the transformative crises it has faced throughout history are mentioned. Financing the Social Security System by many countries has become very difficult. According to experts, the decreasing fertility rate and increasing life expectancy cause an increase in the current elderly population. This situation increases the costs of the social security system and jeopardizes the sustainability of the system. In history, many suggestions have been presented to eliminate this danger. In particular, the proposal of the World Bank's 1994 report was adopted by many countries, and it was envisaged to distribute the public debt burden by individualizing and privatizing pension systems. In this way, it is aimed to reduce costs by taking advantage of increased competition.

At the beginning of the second part, the definition and content of the Individual Pension System with its individualized and privatized form are mentioned and its history and legislation in Turkey were explained. Since the Private Pension Systems

could not reach enough participants, the system could not come out of the crisis completely. The projections of the next year's show that the measures taken for the continuity of the system are not sufficient. In order to solve this financial burden problem, increasing taxes and meeting the burden of the system with increased taxes can be shown as a solution. However, this solution is not preferred because it will impose an extra tax burden on societies. The most logical solution is to find ways to increase participation in the Private Pension System. Behavioral channels were used to encourage people to make individual savings and to reduce their dependency on retirement periods. Behavioral economics argues that human behavior is not completely rational, people have some cognitive biases and that these facts should not be neglected when making policy. Automatic-Enrollment Private Pension System in Turkey, which was prepared by taking these assumptions into account, entered into force as of 1.1.2017. In this context, in the middle of the second part, the legislation and content of the Automatic-Enrollment Private Pension System in Turkey are mentioned. Finally, at the end of the second chapter, the differences between the Voluntary Participation Private Pension System and the Automatic-Enrollment Private Pension System are mentioned.

At the beginning of the third part, information is given about the Behavioral Saving Theory and its related theories. It has been mentioned which assumptions that behavioral economics takes into consideration while making policy. In the middle of the third part, examples of savings plans prepared in accordance with behavioral theory are given. At the end of the third part, the similarities between the Automatic-Enrollment Private Pension System in Turkey and the Behavioral Theory are mentioned and it is proved that it is a policy that represents the behavioral theory.

In the fourth part, literature review on demographic and behavioral factors affecting participation in the Private Pension System in Turkey were compiled.

2.2. Social Security System

‘Social security is the protection that a society provides to individuals and households to ensure access to health care and to guarantee income security, particularly in cases of old age, unemployment, sickness, invalidity, work injury, maternity or loss of a breadwinner.’ (International Labour Organization, 2005, p. 1)

The social security system has two important functions; first, poverty reduction through redistribution; the second function is pension and health insurance. Because of its importance, this system is created under the control of states. In this context, it can be said that one of the most important responsibilities of states is to create a safe social security system.

The social security system is simply that it is a program that provides income transfers from workers to retirees. Roughly, in a population, individuals work in the first three parts of their lives and retire in their fourth period. Contributions of current working individuals to the system are used as funds in order to maintain their welfare during their retirement. In short, the social security system is an intergenerational transfer. In order for this system to be sustainable, some mechanisms must be in place (Cooley & Soares, 1999).

2.2.1. History of Social Security System

The Bismarckian system, known as the origin of the social security system, was discovered in Germany in the last of 19th century by Otto van Bismark. In the literature, this system is seen as the first social security system in the world. The system, which will spread all over the world in the following years, suggested that workers who have reached the age of 65 should be given a small amount of pension. (Palacios & Sluchynsky, 2016, p. 5)

Today, social security is a fundamental human right guaranteed by national constitutions and international conventions. The origin of the modern Social Security System is based on the social insurance report prepared by Sir William Beveridge in England in 1942. The Beveridge model proposed in the report offers a two-stage system. First, treasury funding of family allowance and national health services; the second is to cover the benefit for temporary incapacity with the contributions of the insured employee and the employer to the social insurance system. (Gutiérrez, 2001, p. 2)

Throughout history, there have been differences in the practices of social security and pension systems on a state basis. However, in the second half of the 20th century, some international standards of social security systems were established. The most important of these standards are as follows: "Universal Declaration of Human Rights" in 1948, Convention No. 102 on "Minimum Norms of Social Security" adopted in the 35th International Labor Conference in 1952, ILO Conventions and European Social Security requirement which approved by Turkey in 1976 (Akgeyik, 2010, pp. 48-49).

Many countries have preferred an insurance system based on collective funding in the first half of the 20th century. It was a system that put a burden on the treasury. Due to the Second World War and the economic crises experienced in the first half of the 20th century, this system was replaced by the PAYG (pay-as-you-go) system, which is a "distribution system" (Castro-Gutiérrez, 2001, p. 1). PAYG is a system used for financing social security services, in which the working generation finances the previous generation and the needy individuals in the society. With this method, the burden placed on the treasury for the funding of social insurance is reduced and the possible loss of inflation is prevented. On the other hand, Sinn (2000) states that the PAYG system creates a zero-sum game for future generations due to demographic reasons and believes in the impact of the system.

The PAYG system was successfully implemented until the late 1970s. However, the increase in the elderly population and the decrease in the fertility rate have raised concerns about the high cost of retirement plans and their financial sustainability in the medium and long term. Due to the PayG system, financial

obligations have accumulated in many countries. Because most of the program's features are very generous, and the increasing average age ratio is increasing the costs enormously (Gruber & Wise, 2002, p. 1).

As a result of growing concerns, in 1994, the World Bank published a report called "Averting the Old-Age Crisis: Policies to Protect the Old and Promote Growth" in order to solve the problems in the social security system. The report presented a model that forms the basis of today's private pension systems to the literature. According to the model, a multi-level pension system is expressed. In the first step, it was considered to provide a minimum income guarantee to the needy individuals with public social expenditures. In the second step, it is aimed to create a social insurance system in which the state, employer and employees take responsibility for the financing of social security institutions. In the third step of the model, retirement programs that regulate the voluntary savings of individuals for retirement are recommended (Akgeyik, 2010, p. 49). After the World Bank's proposal report in 1994, many countries switched to this plan. Turkey switched to the private pension plan proposed by the world bank in 2003.

2.3. Individual Pension System

The Individual Pension System is a private pension system that enables individuals to obtain an income that can protect their living standards during their retirement by directing the savings they make during their active working life into long-term investments. By participating in this system voluntarily, individuals create an additional income to the retirement income provided by the social security system. Increasing the welfare of society in the retirement period, creating long-term resources for the economy, to increase employment, contributing to economic development are the primary purposes of the individual pension system (Emeklilik Gözetim Merkezi, 2022).

The pension system, which is a part of the social insurance system, has a deep history in terms of humanity. In history, people in difficult situations (such as the

disabled, poor, needy, etc.) have needed care by the states. With the development of the social state understanding, this situation began to be enacted. The social insurance system, which has developed over the years and its coverage area has increased, is a very important issue today. Nowadays, increasing participation in the system has become an important goal for all states, as this system can be used by the whole population rather than specific groups.

Reasons such as the increase in the average age of the population, the problems in the social security system, low savings rates, high shadow sector and employment, and given early retirement rights in the past have led to the emergence of the private pension system (Can & Eyidiker, 2019, p. 628).

For the first time in the world, Chile started to implement the reform program in 1981, 13 years before the World Bank report. The fundamental basis of the reform is the belief that the social security system managed by the public will be managed more effectively by private funds and intermediary firms (Akgeyik, 2010, s. 74).

The private pension system is very important in terms of two features. First, it enables individuals to save money and increase their welfare in the future. Secondly, the accumulated money is effective in increasing the country's production by being included in the country's financial system (Özen, 2021, p. 913).

The decline in national savings in OECD countries in recent years poses a problem for sustainable investments and growth rates. In this context, the private pension system is a prominent system in terms of maintaining macro balances. And for this reason, many countries are working to increase their savings funds in order to increase their national savings (Altun, 2017).

2.3.1. Private Pension System in Turkey

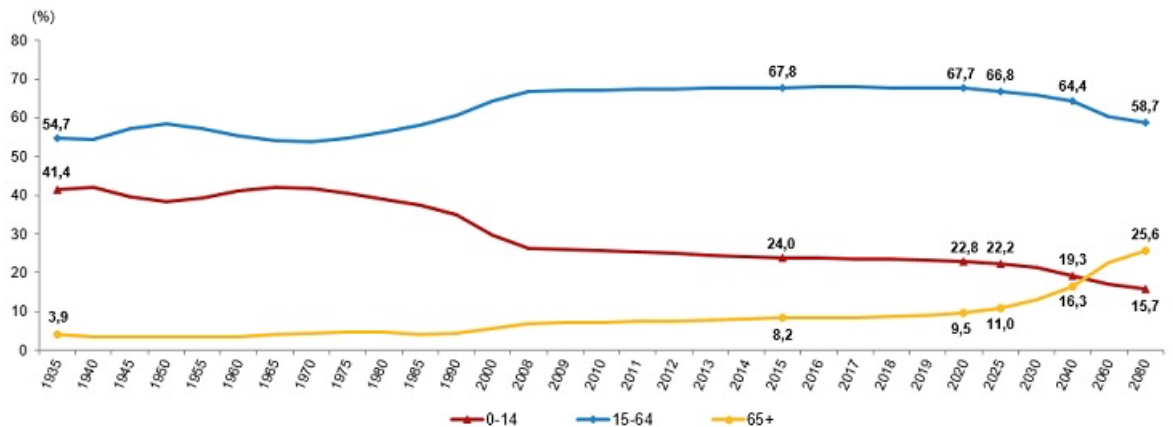
Private Pension System in Turkey entered into force with the Law No. 4632 and started to be implemented in 2003. As of this date, individuals who wanted to open a Private Pension account were applying to insurance companies and making

transactions. The basis of this voluntary system is the effort and action of the individual.

The Private Pension System is a pension system created as a complement to social security systems so that participants can maintain their current welfare level during their retirement periods. In this way, objectives such as providing development and creating employment by providing long-term resource increase to the economy are realized.

Considering the improving living conditions, the ratio of the elderly population to the total population is increasing day by day in Turkey. According to the latest data, the elderly dependency ratio in Turkey, which was 12.2% in 2015, increased to 14.1% in 2020. In addition, according to population projections, it is predicted that the elderly dependency ratio will be 16.4% in 2025, 19.6% in 2030, 25.3% in 2040, 37.5% in 2060 and 43.6% in 2080. In this context, when 2020 data is evaluated, Turkey ranks 66th among 167 countries in the world according to the rate of elderly population (Türkiye İstatistik Kurumu, 2022). According to these data, the importance of the private pension system is increasing even more. Because the elderly dependent population is a community that needs to be funded by the working population. If enough participants are provided in an effective and successful private pension system, the burden placed on the working population by individuals during their retirement period will be reduced and it will be more likely to provide sustainable welfare.

Figure 2.1. Population Ratio by Age Group, 1935-2080



Source: (Tüik, 2022)

Today, the participation of private insurance companies in the system plays an important role in the formation of the private pension phenomenon in Turkey. While the previous social insurance system was under state control, the private sector's entry into the system increased efficiency due to reasons such as diversified the funds, increased the rate of return and as professional management of funds.

2.3.2. History of Private Pension System in Turkey

The Private Pension System in Turkey acts as a complement to the social security system and its history goes back decades. The first studies of the system were carried out in 1997 and the important developments since then are as follows (Emeklilik Gözetim Merkezi, 2022) :

- 1997-1999: Social security reform studies were carried out under the coordination of the Undersecretariat of Treasury. As a result of the studies, the government enacted the social insurance reform Law No. 4447 and studies were started for the implementation of the voluntary private pension system.
- 1999: The Individual Pension Commission was established in the Turkish Grand National Assembly.
- 2001: Private Pension Savings and Investment System Law entered into force. With this law, tax incentives were introduced to employers and participants who contributed to the system on behalf of their employees.
- 2003: The first retirement plans were approved, and the system started operating.
- 2013: As of this date, it has been decided to add 25% state contribution to the contribution paid in the Private Pension System by the state.

- 2017: With the amendment made in the Law of Private Pension Savings and Investment System, it was decided that employers include their employees in the pension plan with automatic enrollment.
- 2020: The Insurance and Private Pension Regulation and Supervision Agency was established with the Presidential Decree No. 47.
- 2021: The requirement for the participant to have the capacity to act in order to participate in the Private Pension System has been removed, and it has been regulated that anyone can join the private pension system.

2.3.3. Structure and Characteristics of the Private Pension System in Turkey

The Private Pension System is basically a savings and investment tool. Individuals voluntarily enter the system and deposit regular amounts of money, and as a result, they gain the right to retire. In order for individuals to enter the system, the government benefits them in various ways.

In order to retire, individuals must stay in the system for 10 years from the date of first entry to reach the age of 56. After the conditions are met, individuals can continue to pay contributions in accordance with their request. In addition, individuals are deserved receive a state contribution of 30% of their contribution. Moreover, when individuals staying time in the system increase, the tax ratio will decrease for paying their funds. In addition, the right of the participants to suspend contribution payments and transfer their savings to another pension company is reserved. On the other hand, individuals can choose which funds the accumulated contribution in the system will be invested in according to their risks and expectations (Emeklilik Gözetim Merkezi, 2022).

All savings are managed by professional portfolio management companies audited by the Capital Markets Board. As of April 2022, there are a total of 15 companies and these companies are as follows: Aegon Emeklilik ve Hayat incorporated company, Allianz Hayat ve Emeklilik i.c., Allianz Yaşam ve Emeklilik

i.c., Anadolu Hayat Emeklilik i.c., AgeSA Hayat ve Emeklilik i.c., Axa Hayat ve Emeklilik i.c., Bereket Emeklilik ve Hayat i.c., BNP Paribas Cardif Emeklilik i.c., Cigna Sağlık Hayat ve Emeklilik i.c., Fiba Emeklilik ve Hayat i.c., Garanti Emeklilik ve Hayat i.c., Katılım Emeklilik ve Hayat i.c., Metlife Emeklilik ve Hayat i.c., NN Hayat ve Emeklilik i.c. and Türkiye Hayat ve Emeklilik i.c. (Emeklilik Gözetim Merkezi, 2022).

As of April 8, 2022, there are 7,290,173 participants in the Turkish Private Pension System and a total of 261,625.2 million TL in funds (Emeklilik Gözetim Merkezi, 2022). When the conditions in Turkey are evaluated, this amount of savings shows that the system is successful and effective. Although the system seems successful, increasing the number of participants is one of the main goals. For this reason, as of 01.01.2017, Turkey has implemented the Automatic Participation Private Pension System.

2.4. Automatic Enrollment to Private Pension System in Turkey

In accordance with the provisions of the Private Pension Savings and Investment System Law No. 4632 on automatic enrollment, which entered into force on 1 January 2017, employers are obliged to include their employees in the Automatic Enrollment System. The automatic enrollment system includes paid employees who are citizens of the Republic of Turkey or who have a blue card, affiliated with an employer in the public or private sector. In this framework, employers transfer at least 3% of the monthly salary of their employees to the system. Employees have the right to stay in this system as long as they wish. Participants must remain in the system for at least 10 years and must be 56 years old in order to retire (Emeklilik Gözetim Merkezi, 2022).

Transitions to the Automatic Participation Private Pension System were carried out gradually to avoid congestion. In accordance with the law numbered 4632 the entry of individuals into the system is as follows (Türkiye Sigorta, 2022):

- Employees in the private sector, depending on an employer with 1,000 or more employees, entered the system as of 01.01.2017,
- Employees in the private sector depending on an employer with 250-999 employees, entered the system as of 01.04.2017,
- Employees in the private sector depending on an employer with 100-249 employees, entered the system as of 01.07.2017,
- Employees in the private sector and local administrations and state economic enterprises depending on an employer with 50-99 employees, entered the system as of 01.01.2018,
- Employees in the private sector depending on an employer with 10-49 employees, entered the system as of 01.07.2018,
- Employees in the private sector depending on an employer with 5-9 employees, entered the system as of 01.01.2019.

Individuals are automatically included in the auto-enrollment system by their employers. Notwithstanding, the participants have the right of withdrawal of 2 months. In addition, some advantages of the system determined by policy makers are (Emeklilik Gözetim Merkezi, 2022):

- There is no operating expense deduction in the system.
- Initial funds or additional contributions cannot be deposited into the system.
- There are no entrance fees and administrative expenses in the system.
- Fund changes can be made at most 6 times a year at the end of the initial period. In addition, interest-bearing or interest-free funds can be preferred.
- If participant continue to stay in the system at the end of the 2-month initial period, there is an additional state contribution of 1,000 TL.
- Participants are entitled to a state contribution of up to 30% of the funds accumulated in their account.

As of April 15, 2022, there are 6,262,787 participants in the automatic enrollment system in Turkey and the total amount of accumulated funds is 19.7 billion TL (Emeklilik Gözetim Merkezi, 2022).

2.5. Differences Between Voluntary Private Pension System and Automatic Enrollment System in Turkey

The most decisive difference between voluntary participation and automatic enrollment in the private pension system is the way they enter the system. In the first, individuals apply voluntarily to join the system and sign their contracts with this awareness. But in automatic enrollment, individuals are automatically included in the system. In this way, they do not spend any effort to apply to the system.

The main purpose of the private pension system is for the participants to have additional income during the retirement periods and to maintain their welfare level. In this context, the voluntary private pension structure prevents the system from achieving its main purpose (Meral & Arıcan, 2020). The automatic participation system born with this motivation and its aims to increase the number of individuals participating in the system by including individuals who do not voluntarily participate in the system.

Investment preferences are more in the voluntary-based private pension system than automatic-enrollment system, so it is more suitable for individuals who are financially literate and can save within a plan. On the other hand, investment preferences in the automatic participation system are fixed and simpler.

When evaluated in other basic terms, the voluntary individual pension system and the automatic enrollment system have similar advantages. However, there is behavioral theory at the background of the automatic enrollment system.

2.6. Understanding Behavioral Theory of Saving to Increase Participation in the Private Pension System

Behavioral theory explains the saving behavior by considering the psychological factors, unlike the neo-classical theory which explains the saving behavior only according to economic factors. For example, according to neo-classical theory, individuals spend the annual value of their wealth in each period, and according to this view, each gain (such as retirement bonus or lottery winnings) leads to an increase in consumption at the same rate. But when behavioral factors are considered, people's marginal consumption propensity may differ depending on the source of wealth. For instance, if people's wealth is due to income, they can consume all of it, but if people's income is due to factors such as retirement deposits or houses, this has little or no effect on consumption (Altun, 2017, pp. 306-307).

Considering the influence of behavioral factors, some assumptions of the mainstream may become unrealistic. Saving behavior will be more explanatory if it is based on a model with more factors (especially behavioral factors) rather than a uniform definition.

2.6.1. Self-Control and Behavioral Life-Cycle Hypothesis

Shefrin and Thaler (1978), developed the Economic Theory of the Self-control. Instead of the rational human model of the standard theory, a modeling of the human with a planner and multiple doers was created. In these two decision makers, while planner considering the future benefit, the doers is only concerned with the present moment and it is selfish. In this context, incentives may be needed in order for individuals who do not have a strong self-control mechanism to make the right decisions about the future.

After ten years later from the developed Economic Theory of the Self-control, Thaler and Shefrin (1988, pp. 636-637) developed the Behavioral Life-Cycle hypothesis against the life-cycle hypothesis. This hypothesis, in which behavioral factors are considered, differs from the traditional hypothesis in three ways.

- A single utility function is not possible as behavioral factors are considered.
- Factors that the mainstream hypothesis considers irrelevant (i.e., other than age and wealth) may influence consumption according to the behavioral life-cycle hypothesis. Even the mode of payment can affect consumption.
- Contrary to mainstream theory, actual choices can be strictly within the specified budget.

2.6.2. Describe the Cognitive Biases that Influencing Saving Behavior

Instead of the classical understanding of rational human definition, behavioral theory argues that people have cognitive biases. If these cognitive biases that affect saving are sufficiently identified, people can be nudged to save by preparing appropriate policies. To detect these biases, Dawney and Shah (2005) explain the reasons for individuals' deviations from rationality with seven basic principles.

- The behavior of other people affects the individuals: When making decisions, people copy and get inspired by what other people do. Also, being approved by other people encourages people. Because humans are social beings, people around them have a significant influence on behavior.
- People's habits matter: People do many behaviors in daily life without consciously thinking about it. These unconscious behaviors are their habits. It is very difficult to change people's habits. In this context, it may be beneficial for policy makers to offer incentives for their habits. One of the successful policies implemented to change people's habits was made in Ireland. According to the policy, a small fee is charged for shopping

packages. In this way, many people are directed to bringing their own shopping bags. The same practice started to be implemented in Turkey and had successful results.

- *The behavior of doing the right thing is an important motivation for people:* Belief in fairness has an important meaning for many people. Contrary to neoclassical economics, people have an internal mentality that they do what is right for them and they want to feel comfortable in conscience. In this context, many people make sacrifices. Because they believe that it is true. People may want to do other people a favor even though they have no interests. This behavior is called altruism. Altruism is a behavior that is very difficult to explain in neoclassical theory. On the other hand, even if a person makes a mistake, after paying the penalty, his conscience is relieved, and he can repeat his mistake. The experiment in the work of Gneezy and Rustichini (2000) can be given as an example of this behavior. In this experiment conducted in Israel, parents who late coming to collect their children from day-care center are monetary fined a certain amount. After the penalty, the rate of parents arriving late to day-care increased even more than before.
- *Self-expectations of people influence their behavior:* People creates expectations within themselves and they want their actions to match those expectations. In this regard, the commitments created are usually executed. Because commitments are related to expectations. Especially, written commitments are more effective and more likely to materialize than verbal commitments.
- *People have loss averse behavior:* Gain and loss are not equivalent feelings for people. The sadness of loss is more than the pleasure of gain. For this reason, people have loss aversion behavior. For this reason, people have

loss aversion behavior. Another indicator of this behavior is that people assess more value something that belongs to them. People generally see what they have as more valuable and do not want to lose it. Therefore, they take the risk of losing what they have less than the risk of gaining something else.

- Usually, people are inadequate at computation: People do not calculate probabilities well and generally do not consider low probability events. Therefore, the way of problems and information are presented to them strongly influences their behavior.
- People want to have control in order to change something: When people feel in control, they can be highly motivated to make things better. Otherwise, it creates a feeling of helplessness in people and causes them to lose their motivation. In this context, it would be a more rational method to create systems in which they are in control, rather than just giving information and incentives to them.

Traditional economic models do not include many of the psychological frictions that inhibit savings, such as present bias, carelessness, complexity, and temptation. However, when these frictions are prevented, participation in the savings plan can be increased and savings can be increased at a lower cost (Madrian, 2012, p. 25).

2.6.3. Behavioral Channels that Affect Saving Decision

As in many economic decisions, there are behavioral factors that affect people when making a saving decision. Bernheim and Rangel (2005, pp. 34-35), grouped the possible behavioral channels that influence people's decisions to save as follows:

- *Helping of Professionals in Financial Institutions:* Most people need help from professionals of financial institutions when saving and investing. This help increases their motivation and confidence; therefore, the advice of professionals is very important for individuals.
- *Impact of Social Situations:* One of the important factors that increase the motivation to save is that individuals in the social environment attach importance to saving. Individuals who compete with the people around them are more motivated to save.
- *Keeping Score:* The data about the balance accumulated in the savings accounts of individuals is stored and it is possible to make comparisons. In this way, individuals can have an idea about the adequacy of the savings plan. This roadmap helps them set goals and develop action plans for the future.
- *Intrinsic Motivation:* Developing policies to indicate that saving is a virtuous behavior can positively affect people's saving behavior. It can also be imposed on people that saving has inherently satisfying results.
- *Satisfaction with tax avoidance behavior:* If individual savings plans provide tax deductions, individuals can prefer for these plans. Because avoiding taxes gives people some satisfaction. In this way, people can be directed to save with tax deductions.
- *Mental Accounting:* In order to ensure sustainability in savings funds, deduction penalties given to individuals in case of early withdrawal of

savings in the system can deter them and strengthen their mental accounting discipline.

- Education and Promotion: Some policies (savings plans with tax deduction, improvement of employee pensions, etc.) can increase the promotional activities of insurance companies and encourage employers to provide retirement education. In this way, directing individuals to save is realized through education and promotion.

2.7. Savings Plans Prepared According to the Behavioral Theory

Especially in recent decades, behavioral theory has become influential in explaining the reasons for human decisions. In this context, more realistic applications that are compatible with the behavioral characteristics of people have begun to be designed in many subjects. There are two most important examples of saving plans, created by considering human behavior: Save More Tomorrow and 401(k) with automatic enrollment.

2.7.1. Save More Tomorrow Plan

The Save More Tomorrow plan proposed by Thaler and Benartzi was first tested in 1998 in a medium-sized firm. The purpose of the plan was to design a program to assist employees who want to save more but do not have the willpower to act. According to Thaler and Benartzi's (2001) plan, participants automatically accept that their contributions increase with each salary raise periods. If employees join the system, their contribution starting with the first paycheck after the raise. This feature reduces the perceived loss avoidance of salary. In addition, the contribution rate

continues to increase at each scheduled raise until it reaches a predetermined maximum contribution amount. In this way, inertia and the status quo bias try to keep people in the system. Otherwise, participants can leave the system whenever they want.

Save more tomorrow program is prepared according to 5 psychological principles that form the basis of human behavior. These principles stated by Thaler and Sunstein (2007, p. 112) are as follows:

- Many people want to save more but cannot plan and realize it.
- It is easier to implement will constraints in future than to implement those constraints today. For example, individuals say they will start a diet in the future, but never today.
- Loss aversion: People don't like to see their salary reduction.
- Money illusion: People feel monetary losses in nominal terms, that is, they are not adjusted for inflation.
- Inertia plays a big role.

2.7.2. 401(k) with Automatic Enrollment

In a company in the USA, employees with automatic enrollment are included in the system. Also, no features of the 401(k) plan have been changed. Prior to the change, employees were required to fill out a form to join the 401(k), but after the change they were required to fill out a form to leave the 401(k). The difference in the default option had a significant impact. Madrian and Shea (2000, pp. 40-42), who conducted this study, have proven that automatic enrollment creates an effective "power of recommendation" and increases participation in the 401(k) system. On the other hand, it has been observed that the contribution rates determined by the company for its employees have a significant effect on the saving behavior of the employees. The inertia of employees and the presence of many employees who see default by the company as investment advice can be cited as reasons for the positive impact of this "default" strategy.

In this context, the success of the "default" strategy reveals that people's saving behavior is not only due to economic reasons, but also has psychological reasons.

2.8. The Impact of Behavioral Theory on the Automatic Enrollment Private Pension System in Turkey

As explained in the previous sections, there are two types of retirement plans in Turkey. The first is the voluntary-based private pension system, and the second is the automatic participation-based private pension system. Participation of individuals in the pension system contributes to themselves and the economy of the country they live in in many ways. In this context, it is understood that the automatic enrollment private pension system, which was created by considering behavioral factors, entered into force in order to increase participation in the pension system. Because individuals who already wanted to join the private pension system could apply whenever they wanted. However, until 01.01.2017 in Turkey, there was no private pension program covering individuals who did not apply for various reasons to join the system. In summary, if the behavioral factors on which the auto-enrollment private pension system is based can be clearly identified, future policies can be adjusted accordingly.

If the rational human concept were sufficient, people would not need automatic enrollment systems to saving. Instead, they would sufficiently participate in the existing private pension systems. However, automatic enrollment systems are a system that is prepared by considering some behavioral biases of human and therefore it is effective.

2.8.1. Match the Definition of an Ideal Savings Program Based on Behavioral Factors

There are some clues that the behavioral saving literature was used in designing the auto-enrollment private pension system in Turkey. For instance, according to Thaler (1994, p. 189), considering the behavioral characteristics of individuals that will affect their savings, an ideal savings program should have the following characteristics:

- Rewards should be offered immediately as an incentive for savings.
- An ideal savings program should be clear and easy to use.
- It should be designed that contributions to the program are not included in disposable income.
- The program should be evaluated by many experts.

These features match those of the Automatic Enrollment System in Turkey. In the automatic enrollment system, the features such as the state contribution of 1000 TL at the beginning, the fact that all its features are clearly stated and the developments in the system can be easily followed, the contributions of the participants to the system are cut before their monthly salaries are paid, and the system is designed by many experts are the most important indicators of this. After these arguments, it is clearly established that the automatic enrollment system has been influenced by Behavioral theory as it has the characteristics of an ideal savings program.

2.8.2. Including Default Strategy

Automatic enrollment simplifies the participation of individuals in the system and relieves them of unnecessary workload. Individuals generally tend to save money. In a study by Carroll and others (2009, p. 1649), they compare before and after employees are forced to make an active choice about whether or not to participate in a savings plan. According to the results, only 41% of individuals signed up for savings

plans before they had to make an active choice. On the other hand, 69% of individuals signed up for a savings plan when they were forced to make a decision about whether to save or not. This result shows that individuals generally tend to save, but there are obstacles in front of them to act.

The basic logic of automatic participation comes from the nudge default strategy named by Thaler and Sustein in the field of behavioral economics. Individuals are included in a default option that is beneficial to them. Afterwards, individuals have the right to opt out of this option if they wish. Considering the structure of the auto-enrollment private pension system in Turkey, all working individuals between the ages of 18 - 45 are automatically included in this system. In other words, the default option for employees is to automatically participated them to the system.

Individuals have the right to exit the system at any time, but in order to exit the system, they must prepare the necessary documents and apply. Despite this, most people tend not to abandon the default options. This is due to status quo bias (Samuelson & Zeckhauser, 1988), laziness, inaction, etc. may have such reasons.

Research over the past two decades has shown that although some behavioral traits have been shown to be irrelevant in traditional economic analyses, these traits have significant effects on the behavior of individuals. In this context, the use of automatic enrollment as the default option in retirement plans significantly increases the participation rate. In addition, it is estimated that the effects of nudging strategies such as automatic enrollment may be valid for more than 20 years, contrary to popular belief (Cronqvist, Thaler, & Yu, 2018, pp. 1-2).

As a result, the automatic enrollment private pension system in Turkey is an application that has benefited from nudge strategy of behavioral theory together with the automatic participation default option.

2.8.3. Awareness of People's Cognitive Biases

When the content of the automatic enrollment private pension system in Turkey is examined, important clues are reached that the system was prepared with a concern that people's cognitive biases would not negatively affect their saving behavior.

For instance, firstly, people stay away from complex investment strategies because their computational abilities are limited. Therefore, in the automatic enrollment private pension system in Turkey, a much simpler and less investment option is offered compared to the voluntary private pension system.

Secondly, in case of exiting the Auto-enrollment private pension system in Turkey before the specified time, no state contribution is given to people as a penalty. This rule is a behavioral way of ensuring that people stay in the system, taking into account that they have a mental accounting.

Thirdly, people have a loss aversion behavior. In this context, the automatic enrollment private pension system cuts the contribution fee from people's salaries before they receive their salaries. In this way, people often do not even realize that the contribution fee is deducted from their salaries and they avoid the psychology of loss.

Fourthly, people are influenced by the people around them when making decisions. Auto-enrollment private pension system in Turkey includes all employees in the system by default. Since this allows most of the people around to be in the system, it can affect the opinions of people who are undecided about continuity in the system.

Lastly, people want to be in control of important matters and to be able to easily make the changes they want about these matters. In this context, the automatic enrollment private pension system in Turkey gives people the right to choose one of several different funds according to the degree of risk. During their staying time in the system, people can change these funds as they wish.

Since all these cognitive biases negatively affect people's savings decisions, it is necessary to design a system that will absorb the negative effects of these biases. In

this regard, these are important clues that the automatic enrollment private pension system in Turkey has been prepared by taking behavioral factors into account.

2.9. Literature of Studies on Private Pension System in Turkey

There are some studies to investigate the factors affecting participation in the Private Pension and Auto enrollment system in Turkey. These studies focused on the effect of some factors to participation in the system, especially demographic characteristics, financial literacy, trust in the system, information about system contents, evaluation of savings in other items, etc.

Aydın and Selçuk (2017) examined the factors that affect people's decisions about the Private Pension System and Automatic Enrollment System in Turkey. In the model in which logistic regression analysis was performed, the relationship of five independent variables with the dependent variable was determined. According to the results: the probability of being included in the private pension system increases as the age of the individuals increases, the individuals in the high-income group are more in the pension system than the individuals in the low-income group, the future-oriented individuals are more likely to be in the Private Pension System than the present-oriented individuals, the probability of being in the Private Pension System is higher in individuals who has internal control than the others. With these aspects, the study touches on the relationship between the personality traits of individuals and their decisions of the Private Pension System and Automatic Participation System.

Uzun and Arslan (2018) investigated the reasons of insufficient participation in the Private Pension System. According to the result, socio-cultural reasons cause insufficient participation in the system rather than economic reasons and incomplete information. According to the study, more than half of the participants have sufficient knowledge about the system. Individuals with a high education level, married, having children and high age are more likely to participate in the system. In addition, it has

been determined that the high income of the individual is not a variable that increases the probability of participating in the Private Pension System.

Oktaç et al. (2019) used logistic regression in their study in which they investigated the factors that are effective in participating the Private Pension System. The variables examined are demographic and socioeconomic variables. In the survey, in which 665 people participated, it was determined that 48.6% of the participants preferred Private Pension System. According to the study, while age, monthly income, monthly income of families and profession of individuals are demographic variables that affect participation in the system; gender, marital status, number of households, etc. are demographic variables that do not affect the decision to participate in the system.

In the survey conducted by Şataf and Yıldırım (2019) on 375 participants in Ordu province, it was aimed to determine the thoughts of individuals about the Private Pension System. According to the results of the study, it is seen that 62.4% of the individuals who participated the system with automatic participation use their right to exit the system. According to the study, the reasons for this are the lack of trust in the system, the evaluation of individuals' savings in other instruments, and the lack of income of individuals. In addition, demographic factors such as age, gender, marital status, education level, monthly income level are also variables that affect participation in the system.

Yemez and Akdoğan (2019) investigated whether consumers' participation in the private pension system changes according to demographic characteristics. The related study was carried out by face-to-face interviews with 430 bank customers in Sivas. T test and one-way ANOVA were applied in the study. According to the results, while there is a significant difference according to variables such as the type of profession, the type of bank customer, the type of intermediary and the number of private pensions owned, the variables such as the age, marital status, education level of the individuals and the private pension ownership of other family members do not show a significant difference. The most important finding of the study is that the biggest obstacle to participation in the Private Pension System is the lack of income level.

Alpagut and İpekten (2020) evaluated the perspectives of the participants on the Private Pension System. The study was created by face-to-face survey method in Erzurum province. The individuals participating in the survey are between the ages of 25-54, 81.6% of them are aware of the Private Pension System and 42.95% of these people are participants in the system. According to the results of the research, while profession, age group and education level are effective in participation in the Private Pension System, gender and marital status do not have any effect on participation in the system.

Kocabıyık and Küçükçakal (2018) investigated the reasons why individuals prefer to leave the Auto Enrollment System or stay in the Auto Enrollment System in the survey study created with the participation of 436 people in the province of Isparta. State contribution, access to collective money in the future and the system being beneficial are shown as the most important factors affecting staying in the Automatic Enrollment System. On the other hand, the most important factors affecting exit from the system are the 3% cut in the monthly earnings, the 10-year progress payment period, and the evaluation of savings in different investment instruments.

Turkmen (2019) investigated the reasons for leaving the Automatic Enrollment System. The study was conducted with Aksaray University employees using face-to-face interview technique. According to the results of the study, financial risk, and the perception that the system has low performance are the most important reasons to leaving of participant from Automatic Enrollment System.

In the article directed by Ünal, Boz and Ataşer (2019), the relationship between financial literacy and demographic variables and individual pension system membership was examined. In the study, 120 of 200 employees working in 24 branches of 17 different banks in the city center of Kütahya were reached on a voluntary basis. According to the results of the study, it is seen that the financial literacy levels of bank employees are high. Financial literacy levels of bank employees who are members of the Private Pension System show a positive and significant difference compared to employees who are not members of the Private Pension System. In addition, it was determined that there were significant differences in financial literacy according to age, education, duration in working life and Private

Pension System membership, while no significant difference was found according to gender, marital status, monthly income and working time in the institution. Financial literacy is effective in determining a person's financial attitudes and behaviors, including spending and savings.

In Özen's study (2021), the level of individuals staying in the Auto-Enrollment Private Pension System in Turkey and the factors affecting their stay in the system are examined. Study data were collected from 778 people by online survey method. According to the results of the model applied to Anova, the probability of individuals staying in the system increases as the level of financial literacy and knowledge about the system increases. On the other hand, the increase in trust in the system increases the probability of individuals staying in the system.

Meral and Şener (2021) examined the factors that determine the preferences of individuals to stay in the Auto-Enrollment Private Pension System in Turkey. In the model in which logistic regression is used, the data were collected from the answers of 405 people using the online survey method. According to the results of the study, increasing the trust in the system increases the preference to stay in the system. No significant relationship was found between the variables of financial management behavior, financial wellness, future time perspective, other demographic variables and staying in the system.

Gulay et al. (2017) evaluated the views of the academicians at Süleyman Demirel University on the Automatic Participation Private Pension System in terms of staying in the system, leaving the system, and being undecided. In the model in which the Anova test was applied, the data were created with the results of the survey answered by 368 people. According to the results of the study, the probability of staying in the system increases as the monthly income of the individuals increases. In addition, a significant relationship was found between the gender of the individual and the decision to stay or leave the system.

Canöz and Baş (2020) examined the participation decisions of private and public academicians in the Private Pension System. The data of the study consists of survey questions answered by 405 participants. The survey questions were divided into

three dimensions with the help of factor analysis. These dimensions are Saving Habits and Investment, Financial Literacy Level, and Future Anxiety and Assurance, respectively. According to the logistic regression model analysis results, the participation decisions of the academicians working in the public sector to the Private Pension System are affected by the variables Saving Habits and Investment, Financial Literacy Level, Future Anxiety and Assurance, gender and tenure. On the other hand, Saving Habits and Investment, Financial Literacy Level and age variables affect the participation decisions of academicians working in the private sector.



CHAPTER THREE

AN EMPIRICAL ANALYSIS: THE DETERMINANTS OF DECISIONS OF INDIVIDUALS IN AUTOMATIC ENROLLMENT PRIVATE PENSION SYSTEM IN TURKEY

3.1. Introduction

Individual Pension Systems, which are basically a part of the Social Security System, are of great importance for the country's economy and the welfare of individuals during their retirement periods. Due to the importance of the system, it is necessary to increase participation in the system. In this context, the last application in Turkey to increase participation in the system is the Private Pension System with Automatic Enrollment. It can be said that automatic enrollment is a policy that is prepared by considering behavioral factors.

The similarity between the Automatic Enrollment Private Pension System in Turkey and the Default policy of the Nudge theory is one of the important observations of this study. It is basically a suggestion of behavioral theory that policy makers direct individuals to rational decisions with small touches via changing default option while making such an important decision that concerns their own welfares and national economies. It is an important requirement to determine the demographic and behavioral characteristics of the participants that affect their preferences about the pension system in order for policy makers to determine how they can make this impact. In this chapter, an empirical study is carried out with the aim of determining this requirement.

Since 2017, working individuals in Turkey are automatically participating in the pension system thanks to the Automatic Enrollment Private Pension System. The system does this by automatically-enroll all working people to the system, that is, by changing their default option to join the system. But then, individuals have the freedom to leave from the system if they want. In this empirical study, it is aimed to determine the demographic and behavioral characteristics that affect the decisions of individuals to continue or leave the automatically enrollment private pension system. In this way, as a result of the study, the factors affecting the decisions of individuals in pension systems will be grouped and suggestions will be made for policies that Turkey can implement about the Private Pension System in the coming years.

In this study, two models were formed. The first of these models is designed to determine the demographic characteristics of individuals which may affect their economic status and behavioral characteristics of individuals which may affect their decisions about the system for both individual groups who stay in or leave from the Automatic Enrollment Private Pension System in Turkey. In the second model, it is aimed to determine the demographic characteristics (which are formed by excluding economic factors) of individuals who remain in the system only. In fact, the second model was designed directly to demonstrate the success of policy makers changing the default option for individuals as automatically enroll the system and to determine the relationship of this success with demographic characteristics. Both models reach important findings. The results of both models prove the behavioral channels that pension systems use today and aim to diversify the behavioral channels in which they will be directed in the future.

The rest of this chapter is organized as follows. Section 3.2. and section 3.3. include the data collection and creation of the survey questions process, respectively. Then, the process of selecting the appropriate model for analysis is included in section 3.4. The empirical analysis and results of the model are given in section 3.5. Finally, the interpretation of the results and policy recommendations are included in the Conclusions and Recommendations section.

3.2. Data Collection Process

In Turkey, the transition to the Automatic Enrollment Pension System has started gradually as of January 1, 2017. Today, individuals between the ages of 18-45 and working in all occupational groups automatically join the system in Turkey. For this reason, the target group of the sample consists of working individuals between the ages of 18-45 across Turkey. In this study, data were collected from 570 participants across Turkey by online survey method. In order to increase the representativeness and predictability of the data, attention was paid to provide a normal distribution to the Turkish population. In this regard, it is aimed that variables such as the female/male ratio, income ratio, and education level are distributed as equally as possible on the sample. All conditions were taken into account in order to ensure the reliability of the data during the survey collection process and data were collected in cooperation with Inocon¹⁰ company.

3.3. The Process of Creating Survey Questions

The study in this thesis completely examines the factors affecting participation in the Automatic Enrollment Private Pension System in Turkey. Hence, due to the cultural and lifestyle differences of the countries, similar studies in Turkey were used in the process of creating the survey questions. In this process, the literature of studies in Turkey has been focused because the legislation of Pension Systems and automatic enrollment in different countries differs.

The demographic factors used in this study consist of age, gender, marital status, number of households, monthly income, and level of education, which are determined to be concentrated in the literature. Demographic questions in the survey were also created in this context.

¹⁰ It is a company that conducts field research in Konya/Turkey.

On the other hand, twelve survey questions were prepared for use in Model 1. When these prepared questions were divided into dimensions according to the Factor Analysis test, four different dimensions were formed.

The first dimension consists of between the tenth and fourteenth questions (5 questions) in the survey, and these questions measure the trust of individuals in the system and their level of expectation from the system. While creating the survey questions in this dimension group, studies of Gülay et al. (2017), Alpağut and İpekten (2020), Özen (2021), Kocabıyık and Küçükçakal (2018), and Şataf and Yıldırım (2019) were inspired.

The second dimension consist of between the fifteen and eighteen questions (4 questions) in the survey, and these questions measure the level of knowledge and awareness of individuals about the content of the auto-enrollment private pension system. While creating the survey questions in this dimension group, studies of Kocabıyık and Küçükçakal (2018), Özen (2021), Gülay et al. (2017) were inspired.

The third dimension consist of between the nineteen and twentieth questions (2 questions) in the survey, and these questions measure the basic financial literacy levels of individuals. While creating the survey questions in this dimension group, questions designed to measure basic financial literacy in Lusardi and Mitchell's study (2011) were used.

The last dimension consists of only twenty-first question (1 question) in the survey, and this question measure individuals' indebtedness and their perception of their income levels. While creating this survey question, studies of Şataf and Yıldırım (2019) and Kocabıyık and Küçükçakal (2018) were inspired.

3.4. Choice of Appropriate Method

In econometric models, variables do not always take numerical values (such as income, price, cost, temperature, height), but they can also be qualitative (such as gender, religion, color, geographical region). However, since qualitative variables do

not contain any numerical values, they need to be arranged for use in econometric analysis. When using such qualitative variables in the model, assigning numerical values such as 1 and 0 to them provides their statistical use. Such variables are called "Dummy" variables (Gujarati & Porter, 2009, pp. 277-278).

In this study, the dependent variable which used for Model 1 is a qualitative variable. The dependent variable is whether the participants are in the auto-enrollment private pension system or not. Participants who into the the auto-enrollment private pension system are coded with '0', while the status of participants who leaving the system are coded with '1'. In such qualitative dependent variable models, The Linear Probability Model (LPM), The Logit Model, The Probit Model and The Tobit Model are generally used for econometric analysis (Gujarati & Porter, 2009, pp. 542-543).

The Linear Probability Model was not used in the econometric analysis of this study for two reasons: first, the estimated probabilities do not have to lie between the limits of 0 and 1, second, it assumes that the LPM response probability moves linearly with the explanatory variable level and this situation causes the partial effect of the explanatory variable to be constant (Gujarati & Porter, 2009, p. 552).

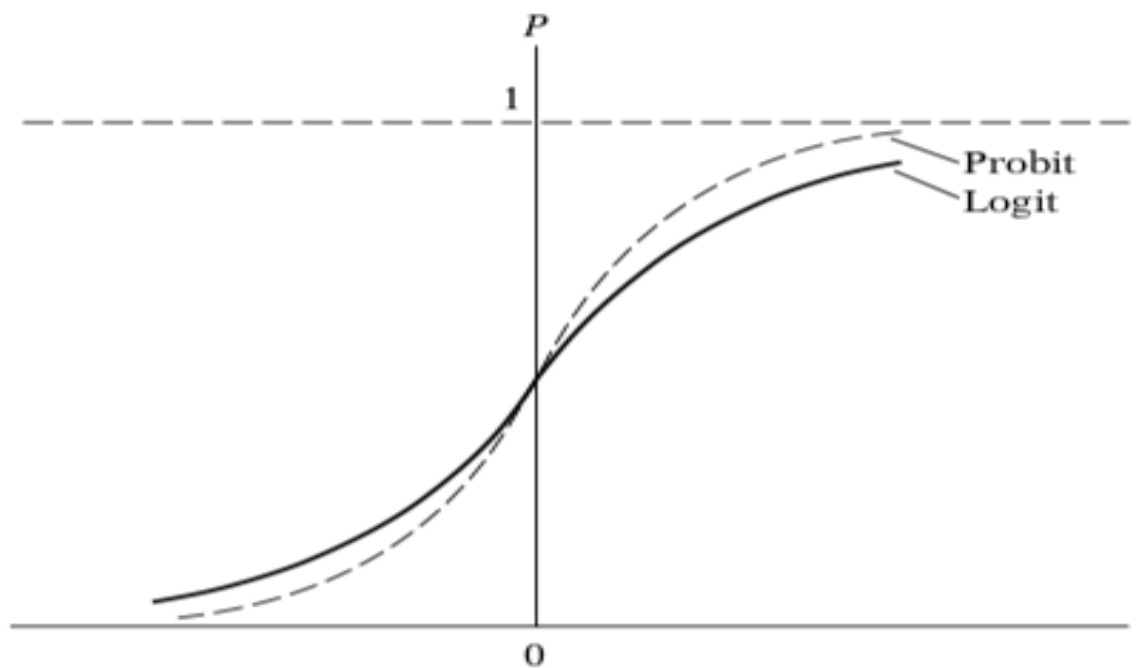
Binary response models are used to overcome these limitations in LPM. In a binary response model, the most important focus is on the response probability of the explanatory variables. Examples of these are the Logit and Probit models. In both models, the response probability of the variables is between 0 and 1 (Wooldridge, 2006, p. 588). For these reasons, Logit or Probit model is frequently applied in the literature as an econometric analysis method to avoid the limitations of LPM.

Logit and Probit models are statistical models used in modeling binary dependent variables. Considering a dependent variable that includes two options, such as the occurrence or non-occurrence of a situation, both models explain the probability that the binary dependent variable will be affected by the explanatory variables in both options. While logit model uses logistic distribution to estimate model parameters, probit model uses normal distribution (Gujarati & Porter, 2009, p. 581). Besides, log-odds is used in the logit model (Gujarati & Porter, 2009, p. 554), while the normal

Cumulative Distribution Function (CDF) is used in the probit model (Gujarati & Porter, 2009, p. 566).

The results of the Logit and Probit models are quite similar. Therefore, there is not a very important determinant difference to choose the appropriate model among them. As seen as the figure 1, the only major difference between them is that the logit curve has slightly fatter tails, that is, it approaches the axes later than the probit curve. Therefore, the conditional probability in logit is slower to approach 0 or 1 than in probit (Gujarati & Porter, 2009, p. 571).

Figure 3.1.: Logit and Probit Cumulative Distributions



Source: (Gujarati & Porter, 2009, p. 572)

When the studies on the private pension system in the literature are examined, it is seen that the probit model is used more frequently to determine the factors affecting participation. For this reason, in this study, the probit model was used in probability calculations and the analysis of the factors affecting participation in the automatic enrollment private pension system.

3.4.1. Theoretical Explanation of the Probit Model

The Probit model is attributed to Chester Bliss who first used the term "probit" (Bliss, 1934), and to John Gaddum who developed the model before in 1933. It is a term derived from the combination of two words as "probability + unit". The term of probit derived from the combination of two words as "probability + unit" (wikipedia, 2022).

In the probit model, the error term is assumed to be normally distributed. In general, the probit model is a preference model that eliminates the problem of not being limited to the estimated values in the linear probability model. Probit model aims to establish a relationship between the 'P' probability values and the explanatory variables, and ensures that the probability values remain between 0 and 1 (Gujarati & Porter, 2009, pp. 553, 566).

$$\text{- If } Y_i = 1 \quad P(Y_i = 1) = P,$$

$$\text{- If } Y_i = 0 \quad P(Y = 0) = 1-P$$

(Equation 1)

Here 'P' value is representing probability. The dependent variable of this study is whether the individual is included in the auto-enrollment private pension system (0) or leaves the system (1). The purpose of the probit model is to predict the effects of the independent variables on the probability of the staying individual in the auto-enrollment private pension system as a dependent variable.

An unobservable utility index (latent variable) is used in probit models. In the example where the dependent variable is individuals' being in the system or not in the system, there is the assumption that this decision of the individual is determined by one or more explanatory variables and depends on the unobservable utility index. For

example, the larger explanatory variable X_i lead to the greater the utility index I_i , that is, the more likely individuals are to leave the system because the index will be closer to 1 (Gujarati & Porter, 2009, p. 566). This is how the probit model is interpreted.

$$I_i = \beta_1 + \beta_2 X_i$$

(Equation 2)

The unobservable index in probit models is important for interpreting the decisions of individuals to stay or leave the system. A new critical or threshold value, I_i^* is assumed. If the I_i value is greater than the I_i^* value, it is predicted that the individual will leave the system. Otherwise, it is estimated that the individual will stay in the system (Gujarati & Porter, 2009, p. 566).

The probability of the difference between these two values can be calculated from the standardized normal Cumulative Distribution Function (CDF), taking into account the normality assumption, as follows:

$$P_i = P(Y = 1 | X) = P(I_i^* \leq I_i) = P(Z_i \leq \beta_1 + \beta_2 X_i) = F(\beta_1 + \beta_2 X_i)$$

(Equation 3)

Here, $P(Y=1|X)$ means the probability of the individual leaving the system given the value(s) of X or the explanatory variable(s) and where Z_i is the standard normal variable. F is standard normal CDF. For the current situation it can be written as:

$$F(I_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{I_i} e^{-z^2/2} dz = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_1 + \beta_2 X_i} e^{-z^2/2} dz$$

(Equation 4)

P represents the probability of an event occurring. Here, the individual's probability of leaving the system is measured by the area of the standard normal curve from $-\infty$ to I_i . For the current situation, $F(I_i)$ is called the probit function (4). Also here, $\pi=3.142$ and Z is a standardized normal variable.

Finally, taking the inverse of ‘equation 3’ to get information from the utility index, I_i and β_1, β_2 , we get:

$$I_i = F^{-1}(I_i) = F^{-1}(P_i) = \beta_1 + \beta_2 X_i \quad (\text{Equation 5})$$

3.5. Results

3.5.1. Findings Regarding the Validity and Reliability Study of the Efficiency of the Automatic Enrollment System Questionnaire

Explanatory Factor Analysis was used to examine the construct validity and the Cronbach Alpha test was used to examine the reliability of the questionnaire, which was organized to examine the factors determining the effectiveness of the Automatic Enrollment System.

3.5.1.1. Construct Validity

Construct validity can be defined as the degree to which a measurement tool can accurately measure the property it aims to measure without comparing it with any

other properties. Explanatory factor analysis is frequently used to determine the validity of aggregate-based scales (Alpar, 2020).

In explanatory factor analysis, it is necessary to check whether the correlation matrix is suitable for dimension reduction. Bartlett's test of sphericity is used for the significance of correlations to detect dimension reduction in the correlation matrix. If p value less than 0.05, it shows that the correlation matrix is suitable for factor analysis. The suitability of the sample examined in the explanatory factor analysis for factor analysis is checked with the Kaiser-Meyer-Olkin (KMO) Sampling Adequacy Measure. For a good factor analysis, the KMO measure is expected to be more than 0.80 (Alpar, Spor Sağlık ve Eğitim Bilimlerinden Örneklerle Uygulamalı İstatistik ve Geçerlik-Güvenirlilik, 2020).

Information on KMO and Bartlett's Sphericity Tests are given in Table 3.1.

Table 3.1. KMO and Bartlett's Sphericity Tests

Kaiser-Meyer-Olkin Sampling Adequacy Measure		,812
Bartlett's Sphericity Test	Chi-Square (χ^2)	1605,232
	Degrees of Freedom (df)	66
	P-Value	<,001

In Table 3.1, the KMO sampling adequacy measure is shown to be 0.812. This ratio is greater than 0.80, which is accepted in the literature. The sample size in the study is sufficient for factor analysis. The p value of Bartlett's test of sphericity is less than 0.001 therefore the correlation matrix was found to be suitable for factor analysis.

The maximum number of dimensions to be derived in exploratory factor analysis is limited to the number of items in the scale, but it is inconsistent with explaining the total change with fewer dimensions than the number of items in the scale, which is the main purpose of this exploratory factor analysis. In this context, determining the number of important dimensions to be determined in explanatory factor analysis methods is one of the important decisions. For this purpose, eigenvalue

criterion, total variance explained and scree plot approach are generally used (Alpar, 2017).

Eigenvalue criterion is one of the most used criteria in factor analysis and principal component analysis. This criterion is based on the logic that what a factor explains should be at least as much as what a variable does. Therefore, in this approach, factors with an Eigenvalue greater than 1 are considered as "important factors", while those with an Eigenvalue less than 1 are considered "insignificant factors" and are not taken into account (Alpar, 2017).

In this context, the eigenvalues and total variance explained of the survey are given in Table 3.2.

Table 3.2. Eigenvalues and Total Variance Explained

Factor	Initial Eigenvalues			Sums of Squares of the Loaded Factors			Sums of Squares of the Rotated Factors		
	Eigenvalue	Variance Explained, %	Variance Explained, Cumulative	Eigenvalue	Variance Explained, %	Variance Explained, Cumulative	Eigenvalue	Variance Explained, %	Variance Explained, Cumulative
1	3,455	28,789	28,789	3,455	28,789	28,789	2,740	22,837	22,837
2	1,833	15,275	44,064	1,833	15,275	44,064	2,500	20,833	43,671
3	1,222	10,183	54,246	1,222	10,183	54,246	1,269	10,576	54,246
4	,975	8,121	62,367						
5	,836	6,965	69,333						
6	,700	5,831	75,163						
7	,645	5,372	80,535						

8	,581	4,840	85,376
9	,523	4,357	89,732
10	,476	3,967	93,699
11	,417	3,472	97,171
12	,339	2,829	100,000

When Table 3.2 is examined, it has been determined that the Eigenvalues of 3 factors are greater than 1. The total variance explained for the 3 factors was found to be 54.25%.

The first factor solution obtained in exploratory factor analysis is sometimes not in a simple interpretable structure. In such cases, the factors can be made more interpretable by rotating them (until the factors' reference axes have another position). This process is known as factor rotation. The most commonly used factor rotation methods in explanatory factor analysis are varimax, quartimax and equimax methods (Alpar, 2017).

The varimax rotation method was used in the study. After the factor rotation process is performed, the loads of the items in the scale are given in Table 3.3.

Table 3.3. Rotated Factor Loads

Items	Dimensions		
	1	2	3
Question 15	,771		
Question 14	,765		
Question 13	,738		
Question 16	,683		
Question 12	,604		-,318
Question 22			

Question 19	,838	
Question 20	,806	
Question 17	,757	
Question 18	,707	
Question 21		,726
Question 23		,674

*.30 points and below are not shown in the table.

Factor load values are related to sample size. Accordingly, a factor load of 0.30 or more is acceptable in a study with a sample size of at least 350, 0.40 or more is acceptable in a study with a sample size of at least 200, 0.50 or more is acceptable in a study with a sample size of at least 120, 0.60 or more is acceptable in a study with a sample size of at least 85 and 0.70 or more is acceptable in a study with a sample size of at least 60 (Alpar, 2020). Since the sample size of the study was 570, the acceptable factor load was determined as 0.30.

After factor rotation, it was determined the first sub-dimension of the questionnaire consisted of 5 questions (12, 13, 14, 15, 16), the second sub-dimension consisted of 4 questions (17, 18, 19, 20), and the third sub-dimension consisted of 2 questions (21, 23). Since the effect of question 22 on factor loadings as a result of rotation was less than 0.30, it was excluded from the study. The names given to the dimensions and the question numbers forming the dimensions are given in Table 3.4.

Table 3.4. Sub-Dimension Names and Question Numbers of the Survey

Sub-Dimensions	Question Numbers
1st Dimension: Trust in the System	12, 13, 14, 15, 16
2nd Dimension: Knowledge About the Content of the System	17, 18, 19, 20
3rd Dimension: Basic Financial Literacy	21, 23

3.5.1.2. Reliability Analysis

Reliability can be defined as a measure of repetition of similar results, consistency in repetitions, stability between independent measurements of a feature, and invariance over time in a measurement process (Alpar, 2020). Cronbach's Alpha likert-type determines whether the items are consistent with each other and whether they can measure a hypothetical variable in data collection scales, semantic difference measures, Stapel scales, other psychometric tests based on total or average scores, and index type measurement tools consisting of combined items (Şencan, 2005).

We interpret that the higher the alpha coefficient of the relevant scale, the more consistent the items in the scale and the items that examine the elements of the same feature, or the more all the items work together. As a result, if the alpha coefficient is high, the answers given by the respondents to the scale items are consistent with each other and the scale consists of items that do not leave the relevant conceptual structure. If the alpha coefficient is between 0.80 – 1.00, the developed scale has high reliability, if the alpha coefficient is between 0.60 – 0.79, the developed scale is quite reliable, if the alpha coefficient is between 0.40 – 0.59, the reliability of the scale is low and if the alpha coefficient is between 0.00 and 0.39, the scale is unreliable (Alpar, 2020).

The internal consistency coefficients (Cronbach Alpha) of the "Trust in the System" dimension are given in Table 3.5.

Table 3.5. Internal Consistency Coefficients Regarding the Trust in the System Dimension

	Variance Item is Removed	When	Correlation of Item to Total	Cronbach's Alpha Value When Item Is Removed	Internal Consistency Coefficients
Question 12	,465		,230	,772	
Question 13	,552		,312	,742	
Question 14	,623		,416	,717	Cronbach's Alpha = 0,781
Question 15	,624		,407	,717	
Question 16	,520		,280	,752	

When Table 3.5 is examined, Cronbach's Alpha coefficient was found to be 0.781 in the internal consistency criteria of the Trust in the System dimension. When this calculated value is compared with the literature, it has been determined that the dimension of trust in the system is quite reliable. The internal consistency coefficients (Cronbach Alpha) of the "Knowledge About the Content of the System" dimension are given in Table 3.6.

Table 3.6. Internal Consistency Coefficients for the Knowledge About the Content of the System Dimension

	Variance Item is Removed	When	Correlation of Item to Total	Cronbach's Alpha Value When Item Is Removed	Internal Consistency Coefficients
Question 17	,602		,371	,753	Cronbach's Alpha = 0,799

Question 18	,547	,313	,779
Question 19	,667	,488	,720
Question 20	,629	,450	,740

When Table 3.6 is examined, Cronbach's alpha coefficient was found to be 0.799 in the internal consistency criteria of the About the Content of the System dimension. When this calculated value is compared with the literature, it has been determined that the About the Content of the System dimension is quite reliable. Since the “Financial Literacy” dimension consists of two questions, the internal consistency criterion was not calculated.

3.5.2. Findings Regarding the Socio-Demographic Characteristics of the Participants and Their Responses to the Questionnaire

The characteristics of the personal information of the participants are given in Table 3.7.

Table 3.7. Demographic Distribution of Participants

		N	%
Age	Between 18 - 23	113	19,8%
	Between 24 - 29	109	19,1%
	Between 30 - 35	101	17,7%
	Between 36 - 41	84	14,7%
	42 or over	163	28,6%

	Total	570	100,0%
Gender	Woman	300	52,6%
	Man	270	47,4%
	Total	570	100,0%
Education	Primary	28	4,9%
	High school	62	10,9%
	University	350	61,4%
	Postgrad	130	22,8%
	Total	570	100,0%
Monthly Income (in TL)	0 - 4250TL	164	28,8%
	4251TL - 6500TL	96	16,8%
	6501TL - 9000TL	121	21,2%
	9001TL - 13000TL	133	23,3%
	13001TL or More	56	9,8%
	Total	570	100,0%
Marital Status	Married	339	59,5%
	Single	231	40,5%
	Total	570	100,0%
Number of People in the Household (number of individuals living in your home)	1	35	6,1%
	2 - 3	201	35,3%
	4 - 5	242	42,5%
	6 - 7	81	14,2%
	7 or More	11	1,9%
	Total	570	100,0%

In Table 3.7., in the distribution of personal data; It was determined that 28.6% of the participants were 42 years old or over, 52.6% were female, 61.4% were University graduates, 28.8% had an income between 0 – 4250 TL, 59.5% are married and 42.5% live with 4-5 individuals.

In Table 3.8, the distributions of the answers given by the individuals participating in the study are shown.

Table 3.8. Responses of Participants

		N	%
1) Are you included in the Automatic Enrollment Private Pension System in Turkey as you take this survey?	Yes	223	39,1%
	No	347	60,9%
	Total	570	100,0%
2) “I continue to stay in the system because I think there is a lot of application and paperwork required to leave the system.”	Yes	116	53,0%
	No	103	47,0%
	Total	219	100,0%
12) “Compared to financial instruments (gold, foreign currency, etc.), I think the Auto Enrollment System has a higher rate of return.”	Absolutely Agree	98	17,2%
	Agree	162	28,4%
	Undecided	201	35,3%
	Disagree	90	15,8%
	Absolutely Disagree	19	3,3%
	Total	570	100,0%
13) “I think that the Auto Enrollment System is safe against external cyber threats (such as theft of personal data and savings).”	Absolutely Agree	41	7,2%
	Agree	100	17,5%
	Undecided	225	39,5%
	Disagree	180	31,6%
	Absolutely Disagree	24	4,2%
	Total	570	100,0%

14) “I think policy makers and government officials are credible regarding the Auto Enrollment System.”	Absolutely Agree	55	9,6%
	Agree	112	19,6%
	Undecided	214	37,5%
	Disagree	167	29,3%
	Absolutely Disagree	22	3,9%
	Total	570	100,0%
15) “I believe that this system will alleviate the social security problems in Turkey.”	Absolutely Agree	67	11,8%
	Agree	150	26,3%
	Undecided	207	36,3%
	Disagree	135	23,7%
	Absolutely Disagree	11	1,9%
	Total	570	100,0%
16) “I think that the investment advisors in the Auto Enrollment System have sufficient knowledge.”	Absolutely Agree	45	7,9%
	Agree	99	17,4%
	Undecided	225	39,5%
	Disagree	185	32,5%
	Absolutely Disagree	16	2,8%
	Total	570	100,0%
17) “I know that the minimum cutting contribution rate in the Auto Enrollment System is 3% of my salary.”	Absolutely Agree	35	6,1%
	Agree	111	19,5%
	Undecided	172	30,2%
	Disagree	196	34,4%
	Absolutely Disagree	56	9,8%
	Total	570	100,0%
18) “I know that the amount corresponding to 30% of the contributions paid by deducting from my salary in the Automatic	Absolutely Agree	24	4,2%
	Agree	90	15,8%
	Undecided	146	25,6%

Enrollment System is recorded in my automatic participation account as a state contribution.”	Disagree	235	41,2%
	Absolutely Disagree	75	13,2%
	Total	570	100,0%
19- “I am aware that an additional 1,000 TL state contribution is recorded in my account in the accounting period following the end of the 2-month initial period, for once upon first login to the Automatic Enrollment System.”	Absolutely Agree	48	8,4%
	Agree	124	21,8%
	Undecided	182	31,9%
	Disagree	166	29,1%
	Absolutely Disagree	50	8,8%
	Total	570	100,0%
20) “I know that if I choose to use my pension right by purchasing at least 10 years' income insurance, an additional state contribution of 5% of my savings is recorded in my account.”	Absolutely Agree	52	9,1%
	Agree	127	22,3%
	Undecided	183	32,1%
	Disagree	178	31,2%
	Absolutely Disagree	30	5,3%
	Total	570	100,0%
21) Assume you have \$100 in your savings account and the interest rate is 2 percent per year. If you never touch the money in the account, how much money will you have in your account at the end of 5 years?	Exactly 102 TL	61	10,7%
	Less than 102 TL	48	8,4%
	More than 102 TL	461	80,9%
	Total	570	100,0%
23) Is this expression true or false? “Buying a single company's stock provides a safer return than buying a mutual fund that includes other stocks”.	True	175	30,7%
	False	395	69,3%
	Total	570	100,0%

It was determined that 60.9% of the participants who participated in the study were not included in the Automatic Enrollment System and 53% of the included

participants thought that the application and paperwork required to leave the system was too much.

35.3% of the participants answered undecided to “Compared to financial instruments (gold, foreign currency, etc.), I think the Auto Enrollment System has a higher rate of return.”, 39.5% answered undecided to “I think that the Auto Enrollment System is safe against external cyber threats (such as theft of personal data and savings).”, 37.5% answered undecided to “I think policy makers and government officials are credible regarding the Auto Enrollment System.”, 36.3% answered undecided to “I believe that this system will alleviate the social security problems in Turkey.”, 39.5% answered undecided to “I think that the investment advisors in the Auto Enrollment System have sufficient knowledge.”, 34.4% disagreed to “I know that the minimum premium cut in the Auto Enrollment System is 3% of my salary.”, 41.2% disagreed to “I know that the amount corresponding to 30% of the contributions paid by deducting from my salary in the Automatic Enrollment System is recorded in my automatic participation account as a state contribution.”, 31.9% answered undecided to “I am aware that an additional 1,000 TL state contribution is recorded in my account in the accounting period following the end of the 2-month initial period, for once upon first login to the Automatic Enrollment System.”, 32.1% answered undecided to “I know that if I choose to use my pension right by purchasing at least 10 years' income insurance, an additional state contribution of 5% of my savings is recorded in my account.”, 80.9% answered “more than 102 TL” to the “ Assume you have \$100 in your savings account and the interest rate is 2 percent per year. If you never touch the money in the account, how much money will you have in your account at the end of 5 years?” question, 69.3% answered “false” to the “Is this expression true or false? Buying a single company's stock provides a safer return than buying a mutual fund that includes other stocks.” question.

3.5.3. Examining the Factors Determining the Efficiency of the Automatic Enrollment System by Probit Method

The binary probit method was used to examine the factors that determine the effectiveness of the Automatic Enrollment System. Separate models were created for the variable of Being Included In The System and for the variable of Paperwork (there is a lot of application and paperwork required to leave the system).

3.5.3.1. Identification of Reasons Affecting Inclusion in the System

The variables used in the Binary Probit Model and the properties of the variables are given in Table 3.9.

Table 3.9. Variables of the Model 1

Variables	Variable Type
Being Included In The System	Dependent Variable
Monthly Income	Independent Variable
Education Level	Independent Variable
Trust in the System	Independent Variable
Knowledge About the Content of the System	Independent Variable
Basic Financial Literacy	Independent Variable
Indebtedness Status and her/his Perception of own Income Status	Independent Variable

Table 3.9. shows the variables included in the model. The results of the Omnibus Test regarding the model significance of the probit model created with the variables mentioned above are given in Table 3.10.

Table 3.10. The Omnibus Test for Model 1

Likelihood Ratio Chi-Square:	26,371
Df:	6
Sig:	<0,001

Table 3.10. shows that the sig value is less than 0.001. Since the obtained sig value is lower than the confidence levels of 90% (0.1), 95% (0.05) and 99% (0.01) used in the study, the probit model created is significant. The effects of the variables on the model are given in Table 3.11.

Table 3.11. Significance of the Effects of Variables in the Model 1

	Wald Chi-Square	df	Sig.
(Intercept)	1,343	1	,247
Monthly Income (in TL):	3,704	1	,048**
Education Level	,062	1	,804
Trust in the System	11,298	1	<,001***
Knowledge About the Content of the System	,770	1	,380
Financial Literacy	6,427	1	,011**
Indebtedness Status and her/his Perception of own Income Status	1,815	1	,178

*** 99% confidence levels, ** 95% confidence levels, * 90% confidence levels

Table 3.11 shows the sig value of the intercept in the model as 0.247. The constant is not significant for the 99% confidence level because the obtained value is greater than 0.01, not significant for the 95% confidence level because it is greater than 0.05, and not significant for the 90% confidence level because it is greater than 0.1.

The sig value of the monthly income variable in the model is 0.048. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, significant for the 95% confidence level because it is less than 0.05, significant for the 90% confidence level because it is greater than 0.1.

The sig value of the education level variable in the model is 0,804. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, not significant for the 95% confidence level because it is greater than 0.05, and not significant for the 90% confidence level because it is greater than 0.1.

The sig value of the trust in the system variable in the model is less than 0.001. The variable is significant for the 99% confidence level because the obtained value is less than 0.01, significant for the 95% confidence level because it is less than 0.05, and significant for the 90% confidence level because it is less than 0.1.

The sig value of the knowledge about the content of the system variable in the model is 0,380. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, not significant for the 95% confidence level because it is greater than 0.05, and not significant for the 90% confidence level because it is greater than 0.1.

The sig value of the basic financial literacy variable in the model is 0,011. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, significant for the 95% confidence level because it is less than 0.05, significant for the 90% confidence level because it is less than 0.1.

The sig value of the Indebtedness Status and her/his Perception of own Income Status variable in the model is 0,178. The variable is not significant for the 99%

confidence level because the obtained value is greater than 0.01, not significant for the 95% confidence level because it is greater than 0.05, and not significant for the 90% confidence level because it is greater than 0.1.

Information on the coefficients of the variables in the model is given in Table 3.12.

Table 3.12. Coefficients of Variables in the Model 1

Parameter	B	Std. Error	95% Confidence Interval Lower	Wald Upper	95% Confidence Interval for Exp(B) Exp(B)	Wald Lower	Upper
(Intercept)	-.351	,3029	-,945	,243	,704	,389	1,275
Monthly Income	,075	,0457	-,165	,014	,928	,848	1,015
Education Level	-,020	,0818	-,140	,181	1,020	,869	1,198
Trust in the System	-,185	,0550	,077	,293	1,203	1,080	1,340
Knowledge About the Content of the System	,048	,0546	-,155	,059	,953	,856	1,061
Basic Financial Literacy	,150	,0592	-,266	-,034	,861	,766	,966
Indebtedness Status and her/his Perception of own Income Status	-,058	,0432	-,026	,143	1,060	,974	1,154

Table 3.12. shows that among the significant variables the change in the Monthly Income reduces the participation in the system by 0.075, change in the Trust in the

System increases the participation in the system by 0.185 and change in the Basic Financial Literacy reduces the participation in the system by 0.130. Information on the marginal coefficients of the variables is given in Table 3.13.

Table 3.13. Marginal Coefficients of Variables in the Model 1

Parameter	B	Std. Error	Sig
Monthly Income	,028	,0457	,046**
Education Level	-,007	,0818	,804
Trust in the System	-,067	,0550	<,001***
Knowledge About the Content of the System	,017	,0546	,377
Basic Financial Literacy	,055	,0592	,009***
Indebtedness Status and her/his Perception of own Income Status	-,021	,0432	,175

*** 99% confidence levels, ** 95% confidence levels, * 90% confidence levels

Table 3.13. shows that among the significant variables the marginal change of a 1-unit increase in Monthly Income reduces the participation in the system by 0.028, the marginal change of a 1-unit increase in Trust in the System increases the participation in the system by 0.067 and the marginal change of a 1-unit increase in Basic Financial Literacy reduces the participation in the system by 0.055.

3.5.3.2. Identifying Reasons Affecting Staying the System Due to Excess Application and Paperwork

The variables to be used in the Binary Probit Model and the properties of the variables are given in Table 3.14.

Table 3.14. Variables of the Model 2

Variable	Variable Type
Application and Paperwork	Dependent Variable
Gender	Independent Variable
Education Level	Independent Variable
Age	Independent Variable
Number of People in the Household	Independent Variable
Marital Status	Independent Variable

Table 3.14. shows the variables included in the model. The results of the Omnibus Test regarding the model significance of the probit model created with the variables mentioned above are given in Table 3.15.

Table 3.15. Omnibus Test for Model 2

Likelihood Ratio Chi-Square:	30,376
Df:	6
Sig:	<0,001

Table 3.15. shows that the sig value is less than 0.001. Since the obtained sig value is lower than the confidence levels of 90% (0.1), 95% (0.05) and 99% (0.01) used in the study, the probit model is significant. The effects of the variables on the model are given in Table 3.16.

Table 3.16. Significance of the Effects of Variables in the Model 2

	Wald Chi-Square	df	Sig.
(intercept)	3,550	1	,060*
Gender	3,060	1	,080*
Education Level	6,576	1	,010**
Age	6,089	1	,014**
Number of People in the Household	4,909	1	,027**
Marital Status	,009	1	,925

*** 99% confidence levels, ** 95% confidence levels, * 90% confidence levels

Table 3.16. shows the sig value of the intercept in the model as 0.060. The constant is not significant for the 99% confidence level because the obtained value is greater than 0.01, not significant for the 95% confidence level because it is greater than 0.05, and significant for the 90% confidence level because it is less than 0.1.

The sig value of the gender variable in the model is 0.080. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, not significant for the 95% confidence level because it is greater than 0.05, significant for the 90% confidence level because it is less than 0.1.

The sig value of the education level variable in the model is 0.010. The variable is not significant for the 99% confidence level because the obtained value is 0.01, significant for the 95% confidence level because it is less than 0.05, significant for the 90% confidence level because it is less than 0.1.

The sig value of the age variable in the model is 0.014. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, significant for the 95% confidence level because it is less than 0.05, significant for the 90% confidence level because it is less than 0.1.

The sig value of the number of people in the household variable in the model is 0.027. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, significant for the 95% confidence level because it is less than 0.05, significant for the 90% confidence level because it is less than 0.1.

The sig value of the marital status variable in the model is 0.925. The variable is not significant for the 99% confidence level because the obtained value is greater than 0.01, not significant for the 95% confidence level because it is greater than 0.05, not significant for the 90% confidence level because it is greater than 0.1.

Information on the coefficients of the variables in the model is given in Table 3.17.

Table 3.17. Coefficients of Variables in the Model 2

Parameter	B	Std. Error	95% Confidence Interval	Wald	95% Confidence Interval for Exp(B)	Wald	
			Lower	Upper	Exp(B)	Lower	Upper
(intercept)	1,474	,7824	-,059	3,008	4,368	,942	20,243
Gender	-,327	,1867	-,693	,039	,721	,500	1,040
Education Level	-,331	,1289	-,583	-,078	,719	,558	,925

Age	-	,081	-,360	-,041	,818	,698	,960
	,200	2					
Number of People in the Household	,237	,106	,027	,446	1,26	1,028	1,563
		9			7		
Marital Status	-	,247	-,508	,461	,977	,602	1,586
	,023	2					

When Table 3.17. is examined, it has been determined that people stay in the system due to application and paperwork because the constant term in the model is significant and positive. Coefficients show that males are more likely to stay in the system due to application and paperwork by 0.327, education level increases staying in the system due to application and paperwork by 0.331, change in the age variable increases staying in the system due to application and paperwork by 0.200, the number of people in the household variable reduces staying in the system due to application and paperwork by 0.237. The marginal coefficients of the variables are given in Table 3.18.

Table 3.18. Marginal Coefficients of Variables in the Model 2

Parameter	B	Std. Error	Sig
Gender	-,118	,0457	0,082*
Education Level	-,117	,0818	,007***
Age	-,071	,0550	,009***
Number of People in the Household	,084	,0546	,023**
Marital Status	,008	,0592	0,924

*** 99% confidence levels, ** 95% confidence levels, * 90% confidence levels

Table 3.18. shows that the marginal change of gender increases staying in the system due to application and paperwork by 0.118, the marginal change of education level increases staying in the system due to application and paperwork by 0.117, the marginal change of age increases staying in the system due to application and paperwork by 0.071 and the marginal change of number of people in the household reduces staying in the system due to application and paperwork by 0.084.



CONCLUSION AND RECOMMENDATIONS

Social Security is an important tool of social state mentality. Thanks to social security, income in a society can be redistributed and all members of the society can be protected. In addition, the system makes significant contributions to both the state and the welfare level of citizens in economic terms. Due to the importance of the system, all states must ensure the sustainability of the social security system in healthfully. However, there has been a need for reform in the social security systems that have faced various crises throughout history. Private Pension Systems, one of the most important of these reforms, are implemented in many countries of the world and have the role of complementing the social security system. The high participation level of individuals in the society to the system is an important requirement for the success of Private Pension Systems. However, in many countries, the lack of participation in the system has made it necessary to bring new solutions to increase participation by policy makers. In this context, the last reform developed to increase the amount of participation in the system is Automatic Enrollment.

Nowadays, Automatic Enrollment in the Private Pension System is implemented by many countries in the world. Automatic Enrollment policy determines the default option of individuals as joining the system and individuals can leave the system if they wish. In this way, individuals do not need to make any effort to join the system. The first finding of this study is that Automatic Enrollment and Nudge Default type policies of behavioral economics are very similar to each other. In other words, it can theoretically be said that Automatic Enrollment is a Nudge default type of policy. Because people's cognitive biases can prevent them from making rational decisions, and nudge policies such as Automatic Enrollment direct them to make rational choices. In addition, when the content of the Automatic Enrollment system is examined, it is clearly seen that behavioral factors of individuals are taken into account in the content of the Auto Enrollment system.

Turkey is one of the countries in the world that implemented the Automatic Enrollment Private Pension System early. Today, Automatic Enrollment is

implemented in many different countries and the rate of individuals leaving the system differs in each country. The reason for this difference can be shown as the economic, cultural, and behavioral differences of the countries' societies. For this reason, the focus of this study is the Automatic Enrollment Private Pension System in Turkey. The transition to the Automatic Enrollment Private Pension System in Turkey started as of 01.01.2017. Since this date, many of the individuals who have automatically joined the system have left the system voluntarily. Although the system was prepared according to behavioral priorities, the high number of individuals leaving indicates the necessity of investigating this situation.

In this study, it is aimed to determine the reasons for individuals leaving the Automatic Enrollment Private Pension System in Turkey. The data of the empirical study was created with the online survey responses of 570 participants across Turkey. Each of these 570 participants consists of individuals who are included in the Private Pension System with Automatic Enrollment. Two models were established in this empirical study. The results for both models were estimated by the Probit method over the SPSS (Statistical Package for the Social Sciences) program.

The purpose of 'Model 1' is to determine the demographic and behavioral factors that affect individuals' decisions to stay or leave the Automatic Enrollment Private Pension System in Turkey. Therefore, the dependent variable of the model is categorically, whether individuals stay in the system or leave the system. Independent variables consist of monthly income level, education level (demographic variables) and three dimensions plus one variable formed as a result of factor analysis. The three dimensions formed are respectively named as follows: 1) the individual's trust in the system and her/his expectation from the system, 2) the individual's level of knowledge about the content of the system, 3) the individual's basic financial literacy level. The extra variable namely as the individual's indebtedness status and her/his perception of own income status.

According to the results of Model 1, the relationship between the monthly income level of the individual and the decision to stay or leave the system was significant at the 95% confidence level. As the only monthly income level of individuals increases by one category, the probability of leaving the system increases

0.028 times. The results of this study and the results of some similar studies in the literature show the reverse relationship between the two variables (Kocabıyık & Küçükçakal, 2018; Gülay, Işık, & Öztürk, 2017). The reason for this difference may be the economic conjuncture of Turkey in recent years. The increase in money supply in Turkey in recent years has increased both the inflation rate and the monthly income level of individuals. On the other hand, since a certain percentage of the monthly income of individuals is transferred to their funds in the Automatic Enrollment Private Pension System, the amount of funds transferred to the system as a contribution for individuals with a high monthly income level is naturally higher than for individuals with a low monthly income level. The increase in this amount of contribution difference may cause individuals with high monthly income to leave the system and use their savings in other areas. In other words, it is understandable that the results are different, since the differences in the contribution margins of high and low-income individuals are not that large in the application dates of other studies in the literature.

According to another result in Model 1, the relationship between basic financial literacy level of the individual and the decision to stay or leave the system was significant at the 95% confidence level. As the only basic financial literacy level of individuals increases by one unit, the probability of leaving the system increases by 0.055 times. When similar studies related to the Automatic Enrollment Private Pension System in Turkey are examined in the literature, the relationship between these two variables is insignificant in Meral and Şener's study (2021), while the relationship between the two variables is positively significant in Özen's study (2021). The difference between the results of this study and Özen's study may be due to the difference in the scales and dependent variables used in the two studies. According to the results of this study, it can be said that the reason for individuals with high basic financial literacy level to leave the system is that these individuals use their savings in different investment instruments. Because there are many studies in the literature stating that individuals with high financial literacy have high savings rates (Lusardi & Mitchell, 2007; Henager & Mauldin, 2015; Sekita, 2011; Mahdzan & Tabiani, 2013).

According to the last significant result of the Model 1, the relationship between individual's trust in the system and the decision to stay or leave the system was

significant at the 95% confidence level. As the only trust in the system increases by one category, the probability of staying in the system increases 0.067 times. In this context, it is concluded that the trust of individuals in the system is an important factor for them to stay in the system. When the studies in the literature are examined, it is clearly seen that similar results have been reached (Meral & Şener, 2021; Özen, 2021; Kocabıyık & Küçükçakal, 2018; Şataf & Yıldırım, 2019).

When the variables that are significant in Model 1 are examined, it is clearly seen that it is possible to increase the number of participants in the system with some policy recommendations. Firstly, since the probability of leaving the system increases as the monthly income of the individual increases, the creation of return opportunities that can satisfy the individuals in the high-income group may make them prefer to stay in the system rather than using their investments in other areas. Secondly, as the individual's basic literacy level increases, the probability of leaving the system increases. In this context, increasing portfolio services in the system and giving individuals with high basic literacy more freedom in their investment decisions in the system may provide an opportunity for them to stay in the system. Finally, as the trust of the individual in the system increases, the probability of staying in the system increases. In this context, more transparent and reliable promotional propaganda will help increase the number of participants in the system.

Other independent variables which are namely the individual's education level, individual's level of knowledge about the content of the system, individual's indebtedness status and her/his perception of own income status were found to be insignificant at the 95% confidence level. Under normal conditions, it is expected that the level of knowledge of individuals about the content of the system will affect their decision to stay or leave the system. However, the fact that this variable is insignificant in this model. This result may show that behavioral factors are more effective when individuals make decisions about the system. In this context, policy makers' production of less costly behavioral priority policies may increase participation in the system. The results of Model 2 also support this inference.

Model 2 is designed to measure the impact of the application and paperwork required to leave the system on the staying decision of individuals in the Automatic

Enrollment Private Pension System. Therefore, the dependent variable in the model is a categorical variable as whether the individual's reason for staying in the system is required application and paperwork or not. According to Thaler and Sunstein (2007, p. 140) , applying and paperwork is a tedious task for people, and most people don't act because of it. According to Model 2 (which was designed with the motivation of this thought) results, it was concluded that 53% of individuals stayed in the system due to excessive application and paperwork. In other words, without the Automatic Enrollment, 53% (perhaps more) of individuals in Turkey would not be included in the Private Pension System. This result is a very important finding for the Automatic Enrollment Pension System in Turkey. Because this success is only achieved by changing the default option. In this way, people who are reluctant to act are nudged in the right direction by deciding to stay in the system. The reason for this is purely the behavioral characteristics of people. In this context, the purpose of Model 2 is to measure the impact of individuals' demographic characteristics on their decision to stay in the system due to excessive application and paperwork. Since the dependent variable in the model is purely a behavioral variable, there is not any variable that measure of individuals monetary situation in the model. The independent variables of the Model 2 are as follows: 1) gender, 2) age, 3) education level 4) number of households and 5) marital status.

According to first result of Model 2, while the relationship between gender of individual and decision to stay in the system due to excessive application and paperwork was insignificant at the 95% confidence level, it is significant at the 90% confidence level. If we interpret the significance of the variable, when only the gender variable is evaluated, men are 0.118 times more likely than women to stay in the system because of excessive application and paperwork.

According to the second result of Model 2, the relationship between age of individual and decision to stay in the system due to excessive application and paperwork was significant at the 95% confidence level. In statistically, an increase only in the age of the individual by one category, increases the probability of staying in the system due to excessive application and paperwork by 0.071 times.

According to the third result of Model 2, the relationship between education level of individual and decision to stay in the system due to excessive application and paperwork was significant at the 95% confidence level. In statistically, an increase only in the education level of the individual by one category increases the probability of staying in the system due to excessive application and paperwork by 0.117 times.

According to the fourth result of Model 2, the relationship between number of households of individual and decision to stay in the system due to excessive application and paperwork was significant at the 95% confidence level. In statistically, an increase only in the number of households of the individual by one category decreases the probability of staying in the system due to excessive application and paperwork by 0.084 times.

According to the last result of Model 2, the relationship between marital status of individual and decision to stay in the system due to excessive application and paperwork was insignificant at the 95% confidence level. Therefore, it can be said that marital status is not related to the dependent variable.

To summarize the results of Model 2, contrary to popular belief, individuals' decisions to stay in the Automatic Enrollment Private Pension System are generally related to behavioral factors. More than half of the individuals who are in the system stated that the application and paperwork required to leave the system is excessive and therefore they continue to stay in the system. When the demographic characteristics of the individuals with this idea are investigated, the probability of staying in the system due to excess application and paperwork increases as the age and education level of the individual increase, and numbers of households of individual decrease.

In this thesis, only the excess application and paperwork variable has been examined. However, there may be other cognitive biases that push individuals to stay in the Automatic Enrollment Private Pension System in Turkey. For instance, the savings decisions taken in the peer group of the individual may affect the individual's savings decision (Duflo & Saez, 2002, pp. 145-146). And therefore, although individuals want to leave the system, they may not act because the individuals around them stay in the system. Or, although individuals prefer to leave the system, they may

continue to stay in the system due to inertia or perceiving automatic enrollment as a suggestion of policy makers (Madrian & Shea, 2000, pp. 40-41). Or lastly, individuals may not be able to leave the system due to the endowment effect (Kahneman, Knetsch, & Thaler, 1991, pp. 194-197). Many behavioral factors such as these may be keeping individuals in the system. For this reason, measuring the effects of related behavioral biases on individuals staying in the Automatic Enrollment Private Pension System in future studies will provide important contribute to the literature.



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APPENDIX A

ONLINE QUESTIONNAIRE FORM

Survey Explanation

BİREYSEL EMEKLİLİK - OTOMATİK KATILIM SİSTEMİ ANKETİ

Değerli katılımcı,

Dolduracağınız anket formu İstanbul Üniversitesi Sosyal Bilimler Enstitüsü, İngilizce İktisat Bölümü bünyesinde olup, Prof. Dr. Muhittin KAPLAN danışmanlığında yürütülen, 'Otomatik Katılım Sisteminin Etkinliğini Belirleyen Faktörlerin İncelenmesi: Türkiye Örneği' başlıklı yüksek lisans tezinde kullanılmak amacıyla oluşturulmuştur. Vereceğiniz yanıtlar bilimsel bir amaca hizmet etmeye yarayacak ve kesinlikle gizli kalacaktır.

Saygılarımızla,

Arş. Gör. Yavuz Selim AŞCI

Türkiye'de 45 yaşını doldurmamış, özel sektörde veya kamu sektöründe çalışan kişilerin otomatik olarak Bireysel Emeklilik Sistemine katılmasına olanak veren "Otomatik Katılım Sistemi" adı verilen uygulama 01.01.2017 tarihi itibarıyla uygulanmaya başlanmıştır.

Question of Survey (1)

1) Anketi çözdüğünüz an itibarıyla Otomatik Katılım Sistemi'ne dahil misiniz? *

☐ Evet

☐ Hayır

Sonraki

Formu temizle

Bu içerik Google tarafından oluşturulmamış veya onaylanmamıştır. [Kötüye Kullanımı Bildirme](#) - [Hizmet Şartları](#) - [Gizlilik Politikası](#)

Google Formlar

Question of Survey (2)

BİREYSEL EMEKLİLİK - OTOMATİK KATILIM SİSTEMİ ANKETİ

 (paylaşılmıyor) [Hesap değiştir](#) 

Adsız Bölüm

2) Sistemden ayrılmak için gerekli olan başvuru ve evrak işlerinin çok olduğunu düşündüğüm için sistemde kalmaya devam ediyorum.

☐ Evet

☐ Hayır

[Geri](#) [Sonraki](#) [Formu temizle](#)

Bu içerik Google tarafından oluşturulmamış veya onaylanmamıştır. [Kötüye Kullanımı Bildirme](#) - [Hizmet Şartları](#) - [Gizlilik Politikası](#)

Google Formlar

Questions of Survey (3 and 4)

BİREYSEL EMEKLİLİK - OTOMATİK KATILIM SİSTEMİ ANKETİ



[Redacted Name]

(paylaşılmıyor) [Hesap değiştir](#)



* Gerekli

PART A (DEMOGRAFİK VE SOSYOEKONOMİK FAKTÖRLER)

3) Yaşınız: *

- ☐ 18-23
- ☐ 24-29
- ☐ 30-35
- ☐ 36-41
- ☐ 42 ve üzeri

4) Cinsiyetiniz: *

- ☐ Kadın
- ☐ Erkek

Questions of Survey (5,6 and 7)

5) Aylık gelir düzeyiniz (TL bazında): *

- ☐ 0-4250
- ☐ 4251-6500
- ☐ 6501-9000
- ☐ 9001-13000
- ☐ 13001 ve üzeri

6) Medeni hal: *

- ☐ Evli
- ☐ Bekar

7) Çocuğunuz var mı? *

- ☐ Evet
- ☐ Hayır

Questions of Survey (8 and 9)

8) Hanehalkı sayısı (evinizde yaşayan birey sayısı): *

- ☐ 1
- ☐ 2-3
- ☐ 4-5
- ☐ 6-7
- ☐ 7 ve üzeri

9) Eğitim seviyesi: *

- ☐ İlköğretim
- ☐ Lise
- ☐ Üniversite
- ☐ Lisansüstü

Question of Survey (12)

BİREYSEL EMEKLİLİK - OTOMATİK KATILIM SİSTEMİ ANKETİ



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* Gerekli

PART B (DAVRANIŞSAL FAKTÖRLER)

12) Diğer finansal araçlara (altın, döviz vb.) kıyasla, Otomatik Katılım Sistemi'nin * getiri oranının daha yüksek olduğunu düşünüyorum.

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

Questions of Survey (13 and 14)

13) Otomatik Katılım Sistemi'nin dış kaynaklı siber tehditlere karşı (kişisel veriler ve birikimlerin çalınması vb. gibi) güvenli olduğunu düşünüyorum. *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

14) Otomatik Katılım Sistemiyle ilgili olarak politika yapıcılarının ve hükümet yetkililerinin güvenilir olduğunu düşünüyorum. *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

Questions of Survey (15 and 16)

15) Sistemin Türkiye'deki sosyal güvenlik sorunlarını hafifleteceğine inanıyorum. *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

16) Otomatik Katılım Sistemi'ndeki yatırım danışmanlarının yeterli bilgiye sahip olduğunu düşünüyorum. *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

Questions of Survey (17 and 18)

17) Otomatik Katılım Sistemi'nde kesilen asgari primin maaşımın %3'ü oranında olduğunu biliyorum. *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

18) Otomatik Katılım Sistemi'nde maaşımdan kesilerek ödenen katkı paylarının %30'una karşılık gelen tutarın, devlet katkısı olarak otomatik katılım hesabıma kaydedildiğini biliyorum *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

Questions of Survey (19 and 20)

19-Otomatik Katılım Sistemi'ne ilk girişte bir defaya mahsus olmak üzere, 2 aylık başlangıç döneminin bitimini takip eden hesap döneminde başlangıç devlet katkısı olarak 1.000 TL ilave devlet katkısının hesabıma kaydedildiğini biliyorum. *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

20) Emeklilik hakkımı en az 10 yıllık gelir sigortası olarak kullanmayı tercih etmem durumunda, birikimlerimin %5'i karşılığı ek devlet katkısının hesabıma kaydedildiğini biliyorum. *

- ☐ Kesinlikle Katılmıyorum
- ☐ Katılmıyorum
- ☐ Kararsızım
- ☐ Katılıyorum
- ☐ Kesinlikle Katılıyorum

Question of Survey (20)

21) Vadeli hesabınızda 100 ₺ olduğunu ve faiz oranının yıllık yüzde 2 olduğunu varsayın. Hesaptaki paraya hiç dokunmazsanız 5 yıl sonunda hesabınızda ne kadar para olur? *

- ☐ Tam 102 ₺
- ☐ 102 ₺'dan az
- ☐ 102 ₺'dan fazla

Question of Survey (23)

23) Şu ifade sizce doğru mu yanlış mı? "Tek bir şirketin hissesini satın almak başka hisseleri de içeren bir yatırım fonu almaktan daha güvenli bir getiri sağlar". *

- ☐ Doğru
- ☐ Yanlış

Questions of Survey (26)

26) Borçlarımın fazlalığından dolayı tasarruf yapmakta zorlanıyorum. *

☐ Kesinlikle Katılmıyorum

☐ Katılmıyorum

☐ Kararsızım

☐ Katılıyorum

☐ Kesinlikle Katılıyorum

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