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ASYMMETRIC MONITORING OF A LAW IN A PUBLIC GOOD GAME:  
AN EXPERIMENTAL STUDY

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Asymmetric Monitoring of a Law in a Public Good Game: An Experimental Study  
Kamu Malı Oyununda Bir Kuralın Asimetrik Denetimi: Deneysel Bir Çalışma

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## TABLE OF CONTENTS

ACKNOWLEDGEMENTS .....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES .....	v
LIST OF FIGURES .....	vi
ABSTRACT.....	vii
ÖZET .....	viii
INTRODUCTION .....	1
SECTION ONE.....	3
1        LITERATURE REVIEW .....	3
SECTION TWO.....	7
2        EXPERIMENTAL DESIGN .....	7
2.1        MODEL.....	7
2.2        PARAMETERS.....	9
2.3        HYPOTHESES.....	10
2.4        QUESTIONNAIRE.....	11
2.5        IMPLEMENTATION.....	13
SECTION THREE.....	15
3        RESULTS .....	15
3.1        EFFECT OF PROBABILITY .....	16
3.2        EFFECT OF ASYMMETRIC MONITORING .....	18
3.3        EFFECT OF CHANGE IN MONITORING REGIME.....	20
3.4        RISK, TRUST, AND GENDER.....	21
CONCLUSION.....	23
REFERENCES.....	26
ANNEX A.....	29
ANNEX B.....	33
ANNEX C.....	39

## LIST OF TABLES

Table 2.2.1: Treatment Conditions.....	9
Table 2.2: Parameters.....	10
Table 2.3: Trust Questions .....	12
Table 2.4: Participant Statistics.....	15
Table 3.1: Summary Statistics on Contributions .....	16
Table 3.2: High Monitoring under Asymmetry vs Symmetry .....	18
Table 3.3: Low Monitoring under Asymmetry vs Symmetry.....	19
Table 3.4: Comparison of Average Contributions in the Second Block.....	20
Table 3.5: Comparison of Averages Period 11 vs. 20.....	21
Table 3.6: Risk Preferences and Trust Measure Summary .....	22
Table A.1: Distribution of Subjects With Respect to Risk Preferences & Trust .....	32

## LIST OF FIGURES

Figure 3.1: Cross-Sectional Average (Sym. Low vs Sym. High) .....	17
Figure 3.2: Average Contributions (Asy. Low vs Asy. High) .....	17
Figure 3.3: Non-Compliance (Sym. High vs Asy. High).....	19
Figure 3.4: Non-Compliance (Sym. Low vs Asy. Low .....	20
Figure A.1: Contributions in Treatment 1 .....	29
Figure A.2: Contributions in Treatment 2 .....	29
Figure A.3: Contributions in Treatment 3 .....	30
Figure A.4: Contributions in Treatment 4 .....	30
Figure A.5: Cross-Sectional Average (Periods 1-20) .....	31
Figure A.6: Cross-Sectional Average (Sym. Low vs Asy. Low).....	31
Figure A.7: Cross-Sectional Average (Sym. High vs Asy. High) .....	32
Figure C.1: Welcome Screen .....	39
Figure C.2: Contribution Decision.....	39
Figure C.3: Contribution Feedback.....	40
Figure C.4: Monitoring Wait Screen.....	40
Figure C.5: Monitoring Feedback.....	41
Figure C.6: Second Block Begins .....	41
Figure C.7: Declaration on Player Type and Monitoring Probability.....	42
Figure C.8: Contribution Decision under Asymmetry .....	42
Figure C.9: Final Profit Feedback.....	43
Figure C.10: Questionnaire 1 .....	43
Figure C.11: Questionnaire – Risk Elicitation .....	44
Figure C.12: Questionnaire – Trust Questions.....	44

## **ABSTRACT**

This paper aims to contribute to the experimental economics literature by testing the effect of asymmetric monitoring on the decision to follow the law with a controlled laboratory experiment. In a repeated public good game, we assign heterogeneous monitoring probabilities to subjects to create an abstract setting where individuals are not treated equally by the law. Average contributions and deterrence rates in treatments with low, high and asymmetric monitoring are compared to understand if the asymmetric implementation of the law affects subjects' contributions to the public good. The experiment consists of two blocks of ten repeated rounds. By changing the monitoring regime in the second block, we aim to investigate how individual behaviour is affected by a shift between symmetric and asymmetric regimes. Experimental results indicate that there is no significant difference between the average contribution or deterrence rates of subjects who are monitored with the same probability under symmetric and asymmetric settings. Subjects who are monitored with high probability contribute more on average, and their contribution level is sustained through repeated rounds. In contrast, the average contribution of subjects who are monitored with a low probability decrease over time. Furthermore, a shift from symmetric to the asymmetric regime had no effect on subjects' behaviour.

**Keywords:** Public Good, Laboratory Experiment, Cooperation, Obligation, Incentive

## ÖZET

Bu çalışmada, bir toplumda kişilerin kurallara uyup uymadığının bireyler arasında asimetric ihtimallerle denetlenmesinin sonuçları kontrollü laboratuvar deneyleri kullanılarak araştırılmıştır. Bir kamu malı oyununda, asgari katkı miktarı uyulması gereken yükümlülük olarak tanımlanmıştır. Bu yükümlülüğe uymanın teşvik edildiği, uymamanın cezalandırıldığı bir deneysel tasarım yapılmıştır. Yükümlülüğün yerine getirilip getirilmediğinin tespiti için kullanılan denetim mekanizması, ödül/ceza katsayısı ve bireylerin kararlarının denetlenme ihtimali üzerinden tanımlanmaktadır. Farklı tretmanlarda denetleme ihtimalinin düşük simetrik, yüksek simetrik veya asimetric olarak tanımlandığı durumlardaki sonuçların analizi yapılarak asimetric denetlemenin etkisinin ölçülmesi hedeflenmiştir. Deney her biri 10 tur içeren iki bölümden oluşmaktadır. İlk bölümde uygulanan denetim mekanizmasının bir referans noktası (norm) oluşturması düşünülmüş, bunun ikinci bölümde uygulanan denetim mekanizmasının sonuçlarına etkisi araştırılmıştır. Deneyden elde edilen bulgular, asimetric denetimin katılımcıların katkı miktarları üzerinde anlamlı bir etkisi olmadığını göstermektedir. Aynı ihtimal ile denetlenen katılımcıların ortalama katkı miktarları ve kurala uyma oranları, simetrik ve asimetric denetim altında anlamlı şekilde farklılaşmamaktadır. Yüksek ihtimalle denetlenen katılımcıların katkı miktarları tekrarlayan turlar boyunca değişmezken, düşük ihtimalle denetlenen katılımcıların katkı miktarlarında azalma gözlemlenmiştir. Deneyin ikinci bölümünde, ilk bölümde simetrik veya asimetric denetim uygulanmış olmasının ikinci bölümde uygulanan denetim koşulları altındaki katkı miktarına etkisi olmadığı tespit edilmiştir.

**Anahtar Kelimeler:** Kamu Malı, Laboratuvar Deneyi, İş Birliği, Yükümlülük, Teşvik

## INTRODUCTION

One major result presented by experimental economics is that institutions matter in individual and collective decision-making processes (Smith, 1994). Institutions affect individual behaviour by laying out the information states and individual incentives. North (1992, p. 477) defines institutions as "...humanly devised constraints that shape human interaction." By setting the rules of the social interaction and defining incentives, institutions affect economic outcomes such as economic development, growth and inequality. Acemoglu and Robinson (2010) claim that economic institutions are the main determinants of cross-country variations in income per capita.

Pamuk (2014) defines institutions as not only the rules but also the way these rules are implemented. That is, rules shape incentives also through their implementation. Another result that is commonly repeated in experimental economics is the fact that fairness considerations play a critical role in the individual decision-making process. One of the main principles of fairness for any legal system is equality before the law. The principle upholds that all individuals should be treated equally by the law. Most of the contemporary constitutions include some form of this principle to declare that all citizens have the right to equal justice under law.

Acemoglu, Johnson, & Robinson (2004) argue that institutions that aim economic growth should uphold the principle of equality before the law. They claim that equality of opportunity in society is necessary to take advantage of good investment opportunities. Although the principle of equality before the law can be traced back to Greek or Roman legal traditions, until the 19th century it was equivalent to the rule of law among the elites and was not inclusive to all individuals (North, Wallis, & Weingast, 2009). Acemoglu & Wolitzky (2018, p. 34), argue that this evolution of the

principle to become more inclusive may be preferable by and beneficial to the elites as “equality before the law enhances the carrot of future cooperation for normal agents. “

Gary S. Becker's seminal work on deterrence theory, *Crime and Punishment: An Economic Approach* (1968), started a strand of literature by incorporating an economic approach to the theory of crime deterrence. The cost-benefit analysis of compliance with the law within the expected utility framework depends on two important parameters, namely, the magnitude of the incentive and the probability that infringement of the law will be detected.

In this thesis, we use a laboratory experiment to explore the effect of possible fairness concerns regarding the monitoring of a rule on the cooperation level of the individuals. The rule or the incentivised obligation<sup>1</sup> in our model is a minimum contribution suggestion which is enforced probabilistically. Subjects under the asymmetric monitoring condition are treated unequally by the centralised authority as the probability that their actions will be monitored is not uniform. We investigate whether the asymmetric monitoring of the rule would cause a decrease in compliance with the rule. Some examples we can present are discriminative behaviour against any group based on gender or race, differential monitoring of taxation for employees and business owners, or neighbouring districts where the probability of detection is not uniform.

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<sup>1</sup> Defining a legal rule as an obligation backed by incentives has its roots in Anglo-Saxon legal traditions (Galbiati & Vertova, 2008). In our case the incentive includes the possibility of reward or punishment. Raz (1980), suggest that not every law would be backed by sanctions. However, he states that an obligative law that expresses duty should be backed by incentives.

Westen (1990) presents seven prescriptions that may be considered equivalent to the axiom of “equality before the law”. The common property of all these prescriptions is that all persons should be indistinguishable from each other before the law. By assigning different monitoring probabilities arbitrarily, we dismantle three of the seven prescriptions of the principle of equality before the law presented in Westen (1990, p.76).

- i. Consistency. The law shall not distinguish among persons except in accord with the traits and activities by which they are legally classified.
- ii. Rationality. The law shall not distinguish among people on the basis of arbitrary classifications.
- iii. Procrustes. The law shall not distinguish among people on any basis whatsoever.

The rest of the thesis is structured as follows: Section 1 lists and elaborates on previous literature that we are hoping to contribute. Section 2 describes the experimental design and the implementation of the experimental sessions. Section 3 presents the experimental results, and the Conclusion section is reserved for the discussion of our results and possible extensions to the experimental design.

## **SECTION ONE**

### **1 LITERATURE REVIEW**

Public good game is an abstraction of a social dilemma where individual and group benefit conflict with each other. It is a commonly used tool by experimental economists to investigate cooperative behaviour. An extensive experimental literature in economics that begins with Fehr & Gächter (2000) display that the possibility of costly decentralised punishment causes an increase in cooperation in finitely repeated

public good games. The impact of decentralised punishment in social dilemmas has been extensively analysed in controlled laboratory setting; however, in societies, the behaviour is mainly regulated by the central authority via laws.

The expanding literature called experimental law and economics utilises laboratory experiments to investigate the effect of rules and centralised authority on individual behaviour. Arlen & Talley (2019) and Croson (2009) provide meta-analyses of research conducted in experimental law and economics. Croson (2009) review three groups of research in experimental law and economics. This thesis is closely related to two of these groups, which she defines as experimental work that focuses on the impact of legal institutions and those which investigate questions on foundations of the law.

The latter body of work includes research which focuses on the effect of obligations and laws on individual behaviour. McAdams & Nadler (2005), investigate the impact of an expressive law which is not backed by any incentives in a hawk/dove game, and McAdams & Nadler (2008) investigate the effect of a similar rule on a hawk/dove game and a prisoner's dilemma. Both studies show that expressive laws are effective in coordinating behaviour in the hawk/dove game. However, their abstract law did not affect behaviour in a prisoner's dilemma setting. They conclude that even without incentives, expressive laws serve as coordination devices when there are two equilibria. However, they are not effective in coordinating behaviour in a Prisoner's Dilemma, which has a unique equilibrium. Tyran & Feld (2006) compare the case of no law, mild law, and strict law in a public good game. In their study, centralised punishment does not depend on probabilistic detection, and free-riders are punished with certainty. Under severe law, the sanctions are set such that the profit-maximising action is a full contribution, while in the other two cases, the rules do not alter the

profit-maximising strategy. The authors find that non-detering sanctions that do not alter the dominant strategy do not significantly affect behaviour. Also, they find that severe sanctions induce significantly higher contributions than either of the other two treatments. Galbiati & Vertova (2008) examine the effect of obligations on cooperation levels in a public good game. They compare treatments with no obligation, low obligation and high obligation. Their results suggest that the obligation can affect average cooperation when the minimum contribution required is high. They also show that contributions fall over time in all treatments regardless of the level of obligation. The rate of decline is found to be inversely proportional to the level of minimum contribution level imposed. The incentive mechanism we use in this experiment is adapted from Galbiati & Vertova (2008).

Another body of literature aims to compare the effects of detection probability and magnitude of incentives using empirical or experimental methods. Cornwell & Trumbull (1994) and Grogger (1991) who explore this question by analysing empirical crime data suggest that individuals' decision to follow the law is more sensitive to the probability of arrest rather than the magnitude of the punishment (e.g. prison time). Anderson & Stafford (2003), modify a standard public good game to include centralised punishment for free-riders. By varying the punishment severity and the probability of punishment, they aim to compare the relative effect of these to variables on deterrence. In their experiment, subjects react more to punishment severity than probability. Friesen (2012), examines the same issue using a within-subject design where subjects are asked to make compliance decisions in repeated rounds where enforcement parameters are varied. They conclude that the severity of punishment is more effective in deterring non-compliance.

There exist some studies that aim to investigate the effect of heterogeneity under

centralised authority. Anderson, Mellor, & Milyo (2004) conduct a public good experiment where participants are subjected to unequal conditions through varying fixed payments for different group members. Their results show that inequality causes a decrease in contributions of all group members who are subjected to the unequal conditions. They argue that inequality reduces the groups' ability to cooperate. Nikiforakis, Normann, & Wallace (2010) investigate the effect of asymmetric enforcement in a public good game which includes the possibility of decentralised punishments. They assign different punishment effectiveness (i.e. unit cost for punishing a fellow group member) to subjects in symmetric or asymmetric treatments. Their results imply that asymmetric enforcement is as effective as symmetric enforcement. In their experiment, both types of enforcement mechanisms were able to sustain cooperation.

Riedel & Schidberg-Hörisch (2013) is the most related study to this thesis. They investigate whether people are more likely to break a legal obligation if they perceive it as unfair. Using the same model as Galbiati & Vertova (2008), they investigate the effect of assigning different levels of obligations within the same group. Their results suggest that participants reacted only to their obligations in the presence of asymmetry. Average contributions of participants who were assigned the same obligation in symmetric and asymmetric treatments did not diverge significantly. They also show that obligations affect behaviour in the few initial rounds, although, the effect of the obligations are not persistent through repeated rounds. Moreover, their results suggest that the ratio of subjects who do not comply with their obligation is higher for subjects who face a high obligation compared to subjects who face a low obligation.

## SECTION TWO

### 2 EXPERIMENTAL DESIGN

#### 2.1 MODEL

In a repeated public-good game, we implement an incentivised obligation which is enforced probabilistically. The obligation is a minimum contribution level, and the incentive is the reward or punishment that the subject receives in case her action is monitored. In case a subject is monitored after the contribution decision is made, the subject is rewarded or punished according to the product of an incentive factor and the distance between her contribution and the obligation level. In each period, subjects first decide on their contribution to the public good, and then they are informed about the total contribution of the other members of their group and their earnings from the public pool. Then, it is randomly determined which subjects' decisions will be monitored. Subjects who are chosen for the monitoring process are punished or rewarded according to their contribution. Feedback on the monitoring process is given on an individual basis, and the participants are not informed whether another member of their groups was monitored or not.

The obligation level and the incentive factor remained the same across all treatments. Subjects were monitored either under the symmetric regime with low or high probabilities or under an asymmetric regime where the probability of monitoring was assigned randomly to otherwise identical subjects. Under the asymmetric regime, the subjects were told that they were assigned randomly as either Type A or Type B. The subjects were also informed that there would be an equal number of Type A and Type B player in each group. The magnitude of monitoring probabilities assigned to each type was common knowledge.

Following equation describes the expected individual payoff from each round.

$$x_i(a_i, a_{-i}) = e - a_i + m \sum_{j=1}^n a_j - p \cdot t(s - a_i) \quad (1)$$

Subjects begin each round with an endowment of  $e$  points. Then, they decide on their contribution to the public good ( $a_i \in [0, e]$ ). The sum of contributions from  $n$  group members ( $\sum_{j=1}^n a_j$ ) is multiplied with  $m$ . Each subject receives this reimbursement from the pool independent of their contribution. After the contribution decisions and feedback<sup>2</sup>, the monitoring process begins and subjects who will be monitored are selected randomly with probability  $p$ . Monitored subjects receive a reward or a punishment with respect to the distance of their contribution to the obligation level  $s$  multiplied with the incentive factor  $t$ .

Following the examples of Galbiati & Vertova (2008) and Riedel & Schildberg-Hörisch (2013), we had implemented a partner matching design where the groups formed before the first round of the game were preserved throughout the repeated rounds. Andreoni & Croson (2001) report results from different experiments that compare group matching versus partner matching in public good games. Their results do not demonstrate a consistent conclusion about the effect of the matching scheme. Given that two previous studies to which our work is closely related to use partner matching scheme, and the fact that partner matching is a better presentation of real-

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<sup>2</sup> After the contribution decision, subjects receive feedback on the total contribution of other group members

life examples of inequality before the law where certain groups are discriminated against in a repeated manner, we have decided to implement the partner matching scheme in our experiment.

The experiment consists of four treatments that differ by the magnitude and distribution of the monitoring probability. All the other parameters of the model remain unchanged across treatments.

**Table 2.2.1: Treatment Conditions**

	<b>First Block</b>	<b>Second Block</b>
<b>Treatment 1</b>	Symmetric Low	Asymmetric
<b>Treatment 2</b>	Symmetric Low	Symmetric High
<b>Treatment 3</b>	Symmetric High	Symmetric High
<b>Treatment 4</b>	Asymmetric	Asymmetric

## 2.2 PARAMETERS

We set the parameters to ensure that the incentive mechanism does not distort the social dilemma aspect of the public good game. This condition is met by ensuring that parameters conform to these constraints:

$$\frac{1}{n} < m \quad (2)$$

$$m + p \cdot t < 1 \quad (3)$$

The first constraint ensures that aggregate income for the group is maximised when all group members make a full contribution to the public good. The second constraint is derived from the first-order condition of the expected individual payoff from each round. It ensures that the expected return from each unit of contribution is negative.

Thus, free-riding is still the dominant strategy for the selfish and risk-neutral individual across all treatments. These conditions guarantee that dilemmatic nature of the public good game is preserved.

Similar to Galbiati & Vertova (2008), we set the group size to six. Under the asymmetric condition, each group is divided into two equal sub-groups that are distinguished by their monitoring probabilities. According to Harris, Herrmann, & Knothole (2009), a group size of two does not trigger group mentality. Hence, we divided each session to groups of six participants to avoid the possibility of sub-group members acting as partners rather than group members. Monitoring probabilities were chosen to be as distinct as possible while conforming to the aforementioned constraints.

**Table 2.2: Parameters**

Endowment	$e$	100
Group Size	$n$	6
Marginal Per Capita Return of the Public Investment	$m$	0.2
Obligation Level	$s$	40
Incentive Rate	$t$	1.2
Monitoring Probability (Low)	$p_l$	0.05
Monitoring Probability (High)	$p_h$	0.4

### 2.3 HYPOTHESES

Following previous literature, we hypothesize that the average contributions of participants who are monitored with high probability will be higher. Also, we expect to observe significantly lower contributions under asymmetric monitoring from both types of players. Participants who are monitored with low probability under

asymmetry may contribute less than their counterparts under symmetric monitoring as they will expect that other subjects in their groups who are monitored with high probability will contribute more on average. Furthermore, we predict that subjects who are monitored with high probability will contribute less on average compared to their counterparts under symmetric monitoring. We expect that subjects' having fairness concerns over the monitoring will incur a lesser social cost for disobeying their obligation.

**H1:** Average contribution of participants who are monitored with low probability will be significantly lower than the average contribution of participants who are monitored with high probability.

**H2:** Contribution level of participants who are monitored with high probability will be sustained through repeated rounds.

**H3:** Average contribution of subjects under asymmetric monitoring will be significantly lower than the contribution of the subjects who are monitored symmetrically.

## **2.4 QUESTIONNAIRE**

After the conclusion of 20 rounds of the public good game, the subjects were asked to answer a questionnaire. Besides demographic information, the questionnaire included questions on risk preference, trust, and inequality aversion.

For the risk preference elicitation, we have chosen the Gneezy & Potters method (Gneezy & Potters, 1997) as the nature of the public good game and our incentive mechanism includes the possibility of loss and gain, Gneezy & Potters method which also includes both of these possibilities (Charness, Gneezy, & Imas, 2013). The students were asked to distribute a certain amount among two different investments

options. One option has a certain return of 1 while the other investment yields a dividend of  $kx$  with probability  $p$ , or the entire investment is lost with a probability of  $1-p$ . Again, this method has similarities to our study where subjects are expected to distribute their income between the safe investment with fixed return and the public investment with the uncertain outcome.

**Table 2.3: Trust Questions**

Question	Answers
I would like to ask you how much you trust people from various groups. Could you tell me for each whether you trust people from this group?	1: completely .67: somewhat .33: not very much 0: not at all
Variable	Group
Ingroup Trust	1. Your family 2. Your neighbourhood 3. People you know personally
Outgroup Trust	4. People you meet for the first time 5. People of another religion 6. People of another nationality

We use the trust questions used in waves 5 and 6 of the World Values Survey (Welzel, 2010). Trust measure is shown to be one of the indicators of the contribution amount in public good games (Gächter, Herrmann, & Thoni, 2004). Thöni (2017) provides a list of experimental research that investigates the relationship between survey measured trust and cooperation in laboratory experiments. They argue that the expanded trust question we have used in our experiments is a better<sup>3</sup> tool for

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<sup>3</sup> Trust measure used in previous waves of the World Values Survey was: “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?” 0:

measuring trust as it distinguishes in-group and out-group trust of the individuals.

## **2.5 IMPLEMENTATION**

Experimental sessions were conducted at Bilgi Economics Lab of Istanbul (BELIS). The subjects were undergraduate students at Istanbul Bilgi University. They were invited and recruited through the Online Recruitment System for Economic Experiments (Greiner, 2015). The experiment was programmed using z-Tree<sup>4</sup> (Fischbacher, 2007) and conducted in Turkish. Participants were assigned to the computer terminals randomly by making them choose cards that denoted terminal number. Terminal numbers were not paired with any personal information to ensure that all decisions subjects make during the experiment are anonymous. The subjects were presented with printed copies of the instructions. Instructions were then read aloud at the beginning of each session. Instructions and an English translation of it can be found in the Appendix.

The subjects were informed that there would be two blocks of ten periods. However, they were not informed about the second block and were told that they would be instructed about the second block as it begins. After the completion of 20 rounds of the game, one of the rounds was picked randomly for the payment. Final payments were determined by multiplying the points they made in the selected round with 0.3

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“Can’t be too careful”; 1: “Most people can be trusted”. Thöni (2015) argues that this question is very unspecific, and the participants do not get a controlled indication about whom they should think of while answering the question.

<sup>4</sup> Zurich Toolbox for Readymade Economic Experiments

TL. The subjects were asked to answer a questionnaire after the completion of the game. Participants received their earnings in cash as they left the laboratory. The average, minimum and maximum earnings were 31.36 TL, 9 TL, and 49.9 TL respectively.

In total, 192 subjects took part in the experiments. 112 (58.3%) of the participants were female, and 158 participants had participated in at least one experiment conducted at Bilgi Economics Lab. On average participants had an experience of 1.53 experimental sessions<sup>5</sup>. Fifty-four subjects participated in Treatment 1, 42 subjects participated in Treatment 2, 30 subjects participated in Treatment 3, and 66 subjects participated in Treatment 4. Subjects were allowed to take part in only one experimental session. Participant numbers of treatments that included asymmetric monitoring were intentionally chosen to be higher to ensure that we would have enough observations for both types of players who were monitored with different probabilities within the same group. The following table represents the summary statistics of the participants.

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<sup>5</sup> In a recent study (Benndorf, Moellers, & Normann, 2017) compare the behaviour of subjects who have previously participated to at least 10 experiments and inexperienced participants. Subjects play a trust game, a beauty contest, an ultimatum game, and a travellers' dilemma. Behavior of experienced subjects varied from inexperienced subjects only in the trust game and they report no significant effect of experience in other games.

**Table 2.4: Participant Statistics**

<b>Gender</b>	Female: 112 (58.3%)	Male: 80 (41.7%)
<b>Faculty</b>	Engineering: 54 (28.3%) Business: 29 (15.1%) Social Sciences: 38 (19.79%) Communication: 15 (7.81%)	Law: 15 (7.81%) Architecture: 8 (4.27%) Vocational School: 10 (5.2%) Health Sciences: 23 (11.9%)
<b>Scholarship</b>	Full: 58 (30.21%) No Scholarship: 19 (9.9%)	Partial: 115 (59.9%)
<b>Taken Game Theory Course</b>	Yes: 28 (14.5%)	No: 164 (85.5%)
<b>Taken Microeconomics Course</b>	Yes: 53 (27.6%)	No: 139 (72.4%)
<b>Experiment Experience</b>	Yes: 158 (82.3%)	No: 34 (17.7%)

## SECTION THREE

### 3 RESULTS

This section describes the experimental results in four sub-sections. We first investigate the effect of monitoring probability on average contribution. The second sub-section explores the effect of asymmetric monitoring by comparing the average contributions of subjects who are monitored with the same probability under symmetry and asymmetry. The third sub-section is reserved for the comparison of the contribution decisions from the second block of 10 periods. The last sub-section is focused on exploring the relationship between risk and trust measures and contributions in the public good game. The following table lays out summary statistics from the first and the last periods of the first block. Non-Compliance is the percentage of participants that contribute less than the obligation level.

**Table 3.1: Summary Statistics on Contributions**

Treatment	Condition	Mean			Median.			Non-Compliance		
		P1	P10	P1-10	P1	P10	P1-10	P1	P10	P1-10
T1 & T2	<i>Sym. Low</i>	38.5	27.1	29.9	40	16	35	48.5%	66.7%	55.4%
T3	<i>Sym. High</i>	37.0	40.9	45.2	40	47	44	33.3%	40%	33%
T4	<i>Asy. Low</i>	37.8	22.8	31.8	40	20	30	39.6%	63.5%	53.3%
T4	<i>Asy. High</i>	40.9	31.3	40.5	40	40	41	30.3%	42.4%	32.7%

Average contributions in the first period do not vary significantly across treatments. The same result is valid for participants who are monitored with different probabilities under the asymmetric regime. The obligation level creates a strong focal point, which demonstrates that laws are capable of coordinating behaviour by expressing norms. However, the effect is not persistent as subjects who are monitored with low probability decrease their contributions in the following periods.

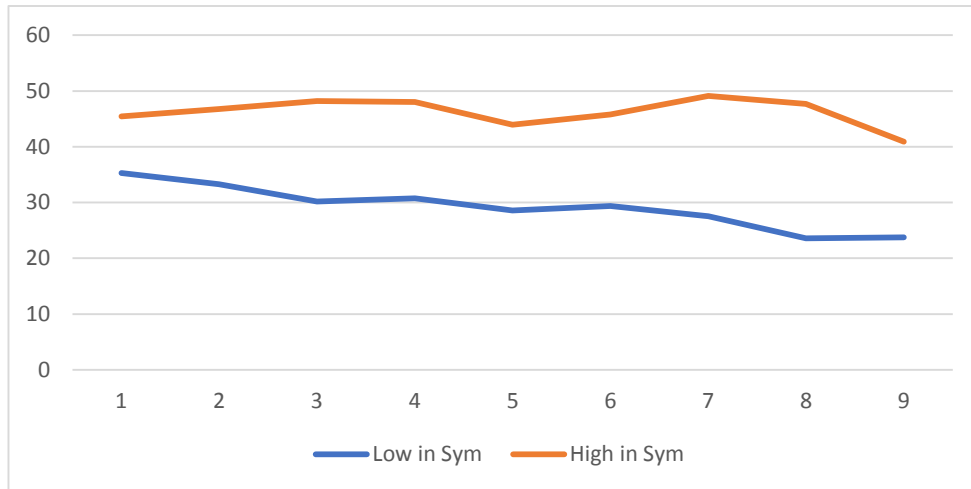
### **3.1 EFFECT OF PROBABILITY**

To examine the effect of the magnitude of the probability of monitoring, we compare average contributions of subjects who are monitored with different probabilities under the same regime. The average contribution of subjects who are monitored with low probability under symmetry is significantly lower than contributions of subjects who are monitored with high probability under the same monitoring condition ( $p=0.0007$ )<sup>6</sup>.

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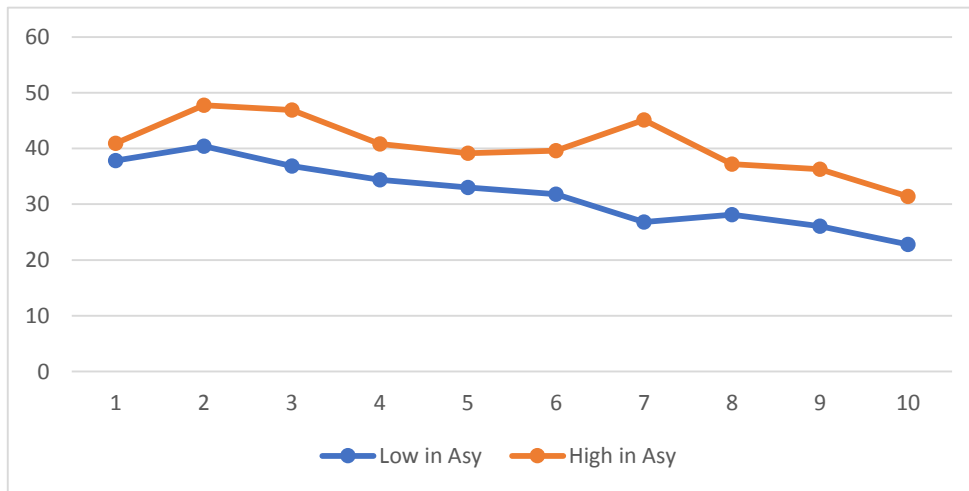
<sup>6</sup> Throughout the thesis we report two-sided p values from t-tests unless stated otherwise. The results also hold as they are reported when analysed using Mann-Whitney U test.

**Figure 3.1: Cross-Sectional Average (Sym. Low vs Sym. High)**



Similarly, the average contributions of subjects who are monitored with low or high probability under asymmetric monitoring differ from each other significantly ( $p=0.0001$ ). These results validate our first hypothesis, which suggests that higher monitoring probability induces higher cooperation under symmetric and asymmetric monitoring.

**Figure 3.2: Average Contributions (Asy. Low vs Asy. High)**



Previous experimental results imply that higher probability of monitoring is effective

in increasing cooperation. Our results expand on these results by showing that the same effect still exists under asymmetric monitoring of the compliance behaviour.

We analyse the sustainability of the cooperation level under different monitoring probabilities by comparing the average contributions in the first and last periods,<sup>7</sup>.

The analysis displays that the average contribution of subjects who are monitored with high probability is sustained throughout the repeated rounds both in symmetric ( $p=0.5289$ ) and asymmetric ( $p=0.1089$ ) conditions. However, contributions of subjects who are monitored with low probability decrease through repeated rounds (*under symmetry:  $p=0.0116$ , under asymmetry:  $p < 0.0001$* ).

### 3.2 EFFECT OF ASYMMETRIC MONITORING

To test our hypothesis that average contributions will be lower under asymmetric monitoring, we compare the average contributions of subjects who are monitored with different probabilities under symmetric and asymmetric regimes.

**Table 3.2: High Monitoring under Asymmetry vs Symmetry**

<b>Sym. High vs Asy. High</b>	<b>p-value</b>
Period 1	0.4643
Period 10	0.2100
Periods 1-10	0.4245

Contrary to our hypothesis, average contributions by subjects who are monitored with

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<sup>7</sup> Dependent samples t-test

the same probability under symmetry and asymmetry do not significantly differ from each other. The same conclusion also holds for subjects who are monitored with low probability. The average contribution of subjects who are monitored with low probability does not significantly differ according to the results of two sample t-tests.

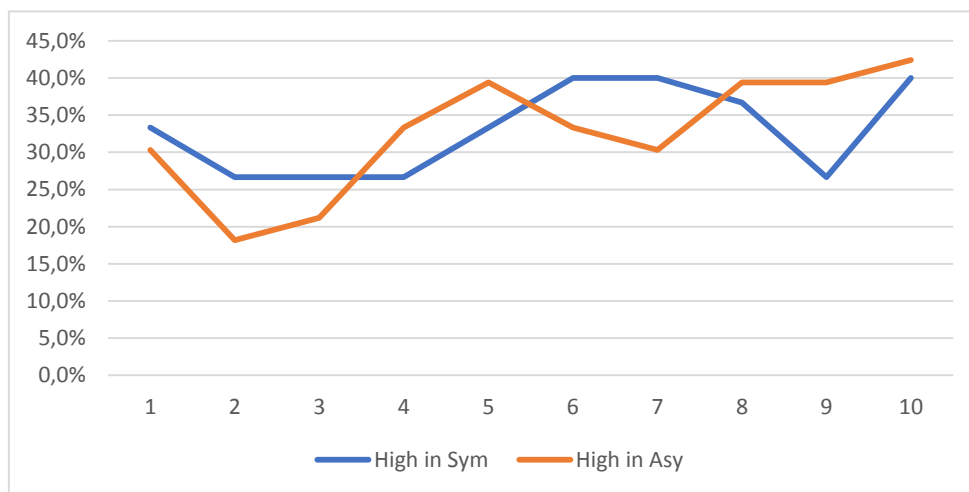
**Table 3.3: Low Monitoring under Asymmetry vs Symmetry**

<b>Sym. Low vs Asy. Low</b>	<b>p-value</b>
Period 1	0.9047
Period 10	0.8511
Periods 1-10	0.6648

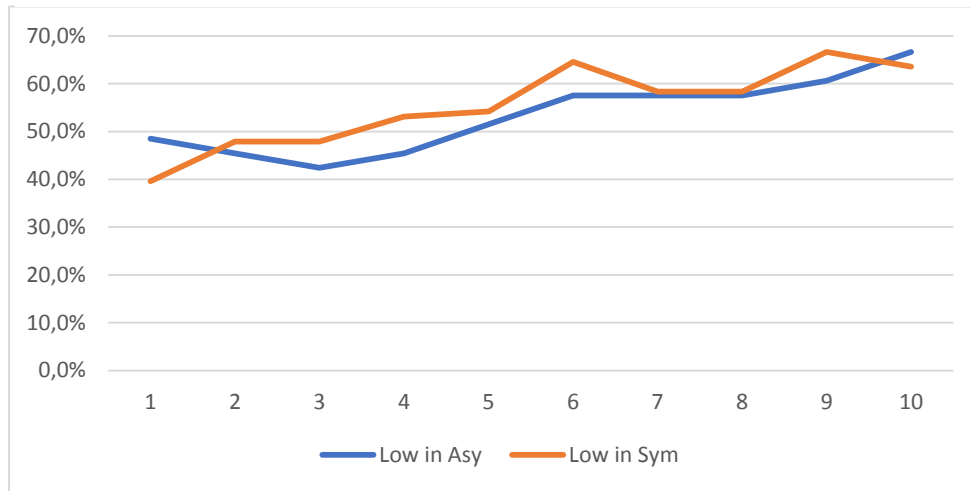
Our analysis suggests that under asymmetric monitoring, participants react only to their own monitoring probability. The manner in which the monitoring is applied to other group members does not affect individual behaviour.

Following figures display the percentage of participants who do not comply with the obligation (i.e. subjects who contribute less than  $s=40$ ).

**Figure 3.3: Non-Compliance (Sym. High vs Asy. High)**



**Figure 3.4: Non-Compliance (Sym. Low vs Asy. Low)**



Similar to the average contribution, the percentage of subjects who contribute less than the obligation level does not differ under symmetric and asymmetric monitoring for subjects who are monitored with the same probability.

### 3.3 EFFECT OF CHANGE IN MONITORING REGIME

In a modest attempt to investigate how changes between different monitoring regimes affect behaviour, we compare average contributions from the second block. We do not observe a significant effect of a shift from symmetric to the asymmetric regime.

**Table 3.4: Comparison of Average Contributions in the Second Block**

	<b>p-value</b>
T1 Low vs T4 Low	0.5607
T1 High vs T2 High	0.9349
T1 High vs T3 High	0.1413
T1 High vs T4 High	0.7393
T2 High vs T3 High	0.1446
T2 High vs T4 High	0.7994

We find no significant difference in average contributions. In Treatments 1 and 2 where subjects are monitored symmetrically with low probability in the first block, the monitoring regime is differentiated by assigning higher probabilities to half of the participants in Treatment 1, and all the participants in Treatment 2. There is no significant difference among the average contributions of the subjects who are monitored with the same high probability in these two treatments. This shows us that an asymmetric increase in probability is as effective as a symmetric increase. The fact that average contributions do not vary significantly for subjects in Treatments 1 and 4 shows that a shift from symmetric to asymmetric monitoring had no significant effect. Participants adapted to the new probabilities assigned to them as soon as the monitoring condition changed. Following table displays that the same results from the first block regarding the sustainability of cooperation under different probabilities, still hold in the second block of 10 periods.

**Table 3.5: Comparison of Averages Period 11 vs. 20**

	<b>First Block Condition</b>	<b>Second Block Condition</b>	<b>Prob.</b>	<b>p-value</b>
T1	Sym. Low	Asy.	Low	0.0466*
T1	Sym. Low	Asy.	High	0.6467
T2	Sym. Low	Sym. High		0.3532
T3	Sym. High	Sym. High		0.9750
T4	Asy	Asy.	Low	0.0200*
T4	Asy	Asy.	High	0.4852

### **3.4 RISK, TRUST, AND GENDER**

In this sub-section, we report results related to the risk attitudes and trust measures of the participants. Also, we report on contributions based on gender. We assign subjects

into two groups with respect to the average risk preference and trust measures. Next table is the summary statistics regarding risk and trust variables across treatments. Frequency of the subjects that are below and above the average values in different treatments can be found in Appendix A.

**Table 3.6: Risk Preferences and Trust Measure Summary**

	<b>Risk Pref.<sup>8</sup></b>	<b>In-Group Trust</b>	<b>Out-Group Trust</b>
<b>Treatment 1</b>	780.09 (400.5)	0.61 (0.18)	0.46 (0.20)
<b>Treatment 2</b>	652.38 (461.87)	0.64 (0.17)	0.52 (0.17)
<b>Treatment 3</b>	815. (374.03)	0.70 (0.12)	0.58 (0.18)
<b>Treatment 4</b>	768.65 (452.01)	0.64 (0.17)	0.49 (0.19)
<b>Aggregate</b>	755.07 (434.08)	0.64 (0.17)	0.50 (0.19)

To observe the possible effect of risk preferences and trust variables on contribution decisions, we compare the average contributions of subjects who are below or above the average in risk and trust values<sup>9</sup>. We have observed that risk preferences have a mild effect on the contribution decision ( $p < 0.1$ ). However, there was no significant difference concerning the in-group or out-group trust variables. As our setting includes uncertainty through probabilistic monitoring, it was expected that risk preferences would affect the subject's behaviour. It is important to note that more observations are needed to reach more conclusive results on the effect of risk preferences and trust.

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<sup>8</sup> The amount allocated to the risky investment out of 2000 points.

<sup>9</sup> In this sub-section we report two tailed p-values from Mann-Whitney rank-sum test

When the participants are grouped with respect to gender, we observe no significant difference between contributions in the first round. However, focusing on the average contributions through periods 1 to 10, we find that females contribute significantly more than males ( $p = 0.0172$ ). Contributions by both genders significantly decrease through the repeated rounds (*male*:  $p < 0.0001$ ; *female*  $p < 0.05$ ), however erosion of the contribution of females is less than males.

### CONCLUSION

We aimed to measure the effect of asymmetric monitoring on individuals' decision to comply with an obligation. Our experimental results reveal that there exists no significant effect of asymmetric monitoring on individual behaviour. Comparing the average contributions of participants who are monitored with the same probability under symmetric or asymmetric monitoring, we do not observe a significant effect. The result is consistent for both types of subjects who were monitored with low or high probabilities. The obligation level expressed by our rule creates a strong focal point in the first round. Contribution of each type of player under either monitoring regime did not differ significantly, and the average contribution was very close to the obligation level in every treatment. Moreover, our analysis also revealed that the contribution level of subjects who were monitored with high probability was sustained through repeated rounds. In contrast, the average amount of contributions by subjects who were monitored with low probability decreased significantly over the repeated rounds of the game.

We also did not observe any significant effect of ex-ante versus interim implementation of the asymmetric condition. Contribution of participants who were subjected to different monitoring conditions in the first block equalled each other as

soon as they were shifted to the same monitoring regime.

Subjects were able to explain their decisions or line of reasonings in the questionnaire by answering an open-ended question. These replies suggest that subjects under asymmetric monitoring did not perceive the heterogeneity of the probability as unfairness. They take their assigned monitoring probabilities as given, and they see it as a result of their own luck. Moreover, it is also possible that the subjects perceived the asymmetry as a part of the rule and not an unfair enforcement of the obligation. We believe that the arbitrary distribution of the probabilities and the fact that higher probability also meant a higher possibility for a reward were two main reasons behind the lack of effect of the asymmetric monitoring.

Previous experimental results from public good games conducted in Turkey differ from those conducted in Europe by two main factors. Subjects, on average, contribute less in Turkey (Kistler, Thöni, & Welzel, 2017). Moreover, when there is the possibility of decentralised punishment among subjects, Turkey is one of the few countries where anti-social punishment (i.e. free riders punishing contributors) is observed (Herrmann, Thöni, & Gächter, 2008). Diverging experimental results might be an indicator of the characteristics of the economic and political institutions in Turkey. It could be argued that the repetition of the experiment in other countries may yield different results.

Furthermore, the experiment could be replicated after removing the possibility of reward. Potentially, subjects may perceive this as unfair enforcement of the law when higher monitoring probability directly translates to a higher probability of punishment without the possibility of reward. Additionally, the experiment could be repeated after changing the way we assign the probabilities. Instead of randomly assigning the

probabilities, a characteristic (e.g. gender) may be chosen to distinguish participants who are monitored with high or low probability. It is within possibility that subjects will react to the asymmetric monitoring if one or several of these changes are implemented to the experimental design.

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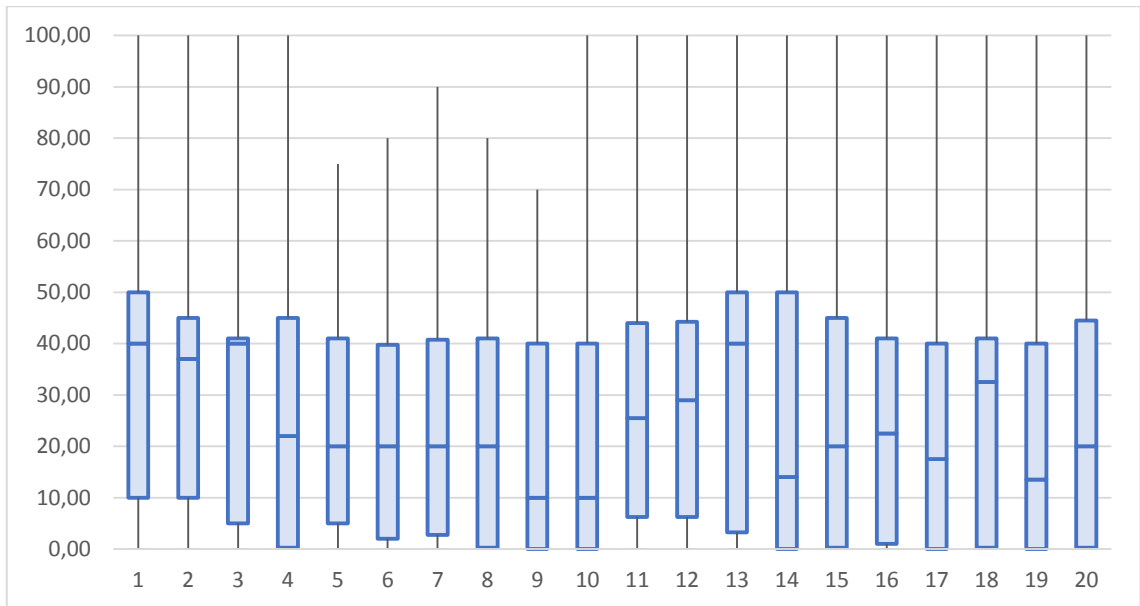
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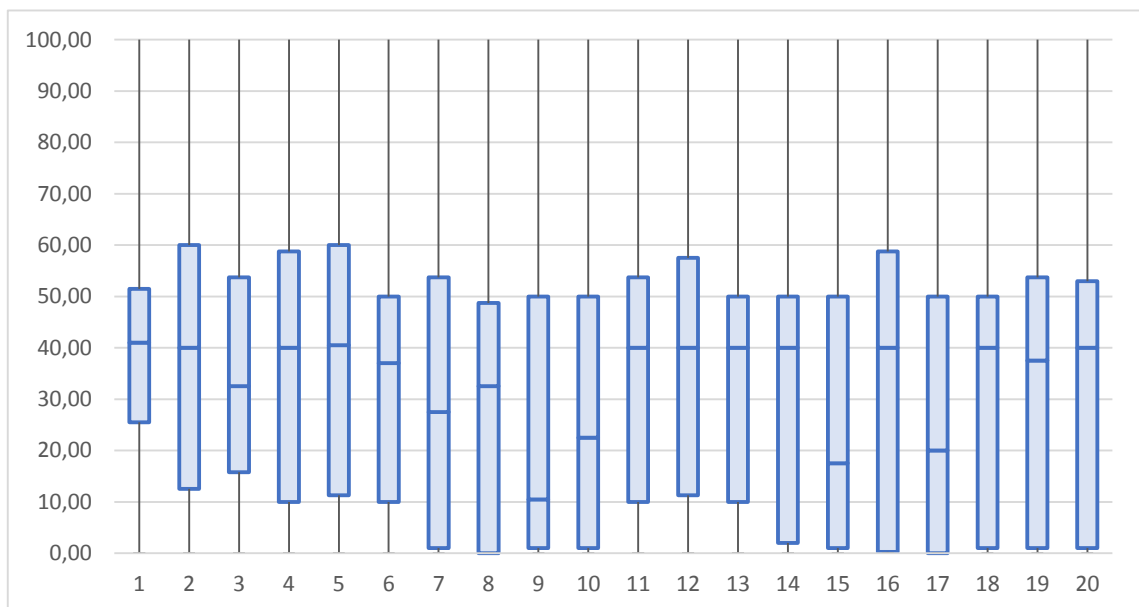
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## ANNEX A

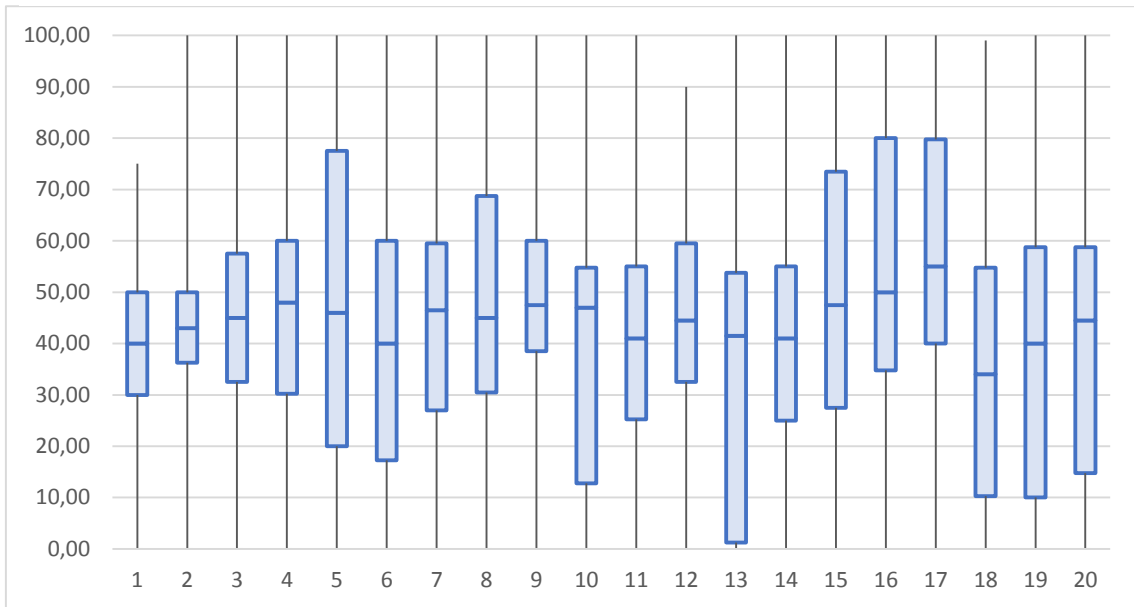
**Figure A.1: Contributions in Treatment 1**



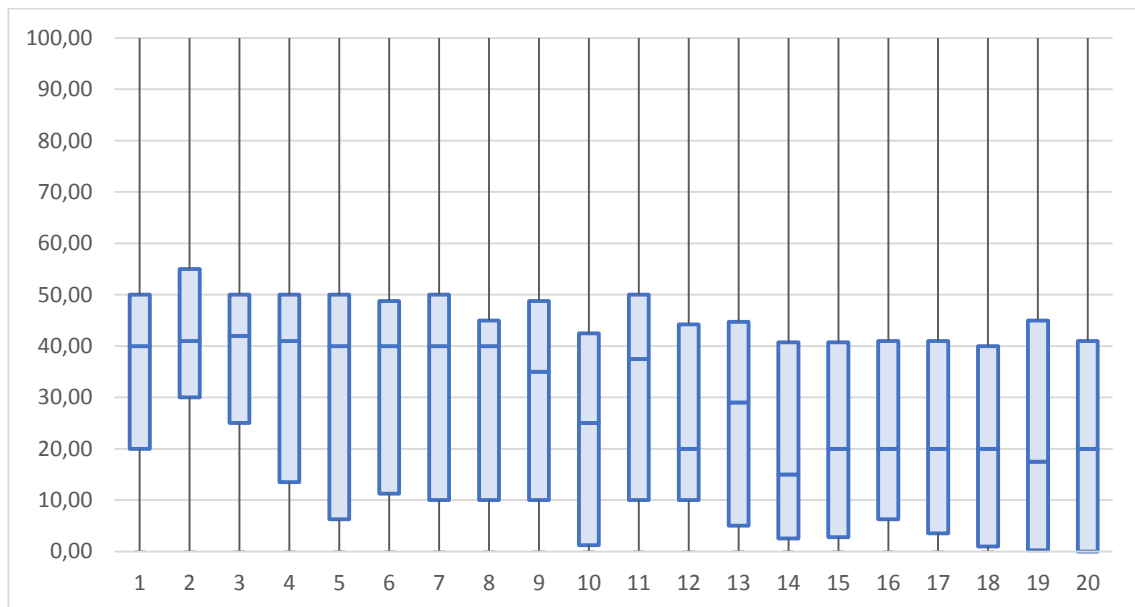
**Figure A.2: Contributions in Treatment 2**



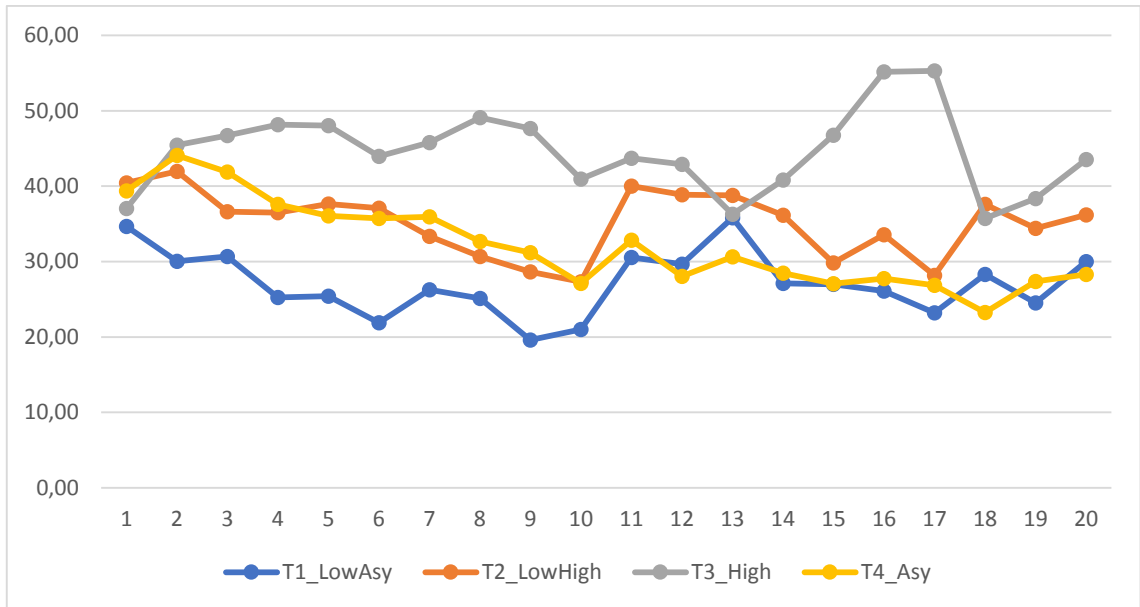
**Figure A.3: Contributions in Treatment 3**



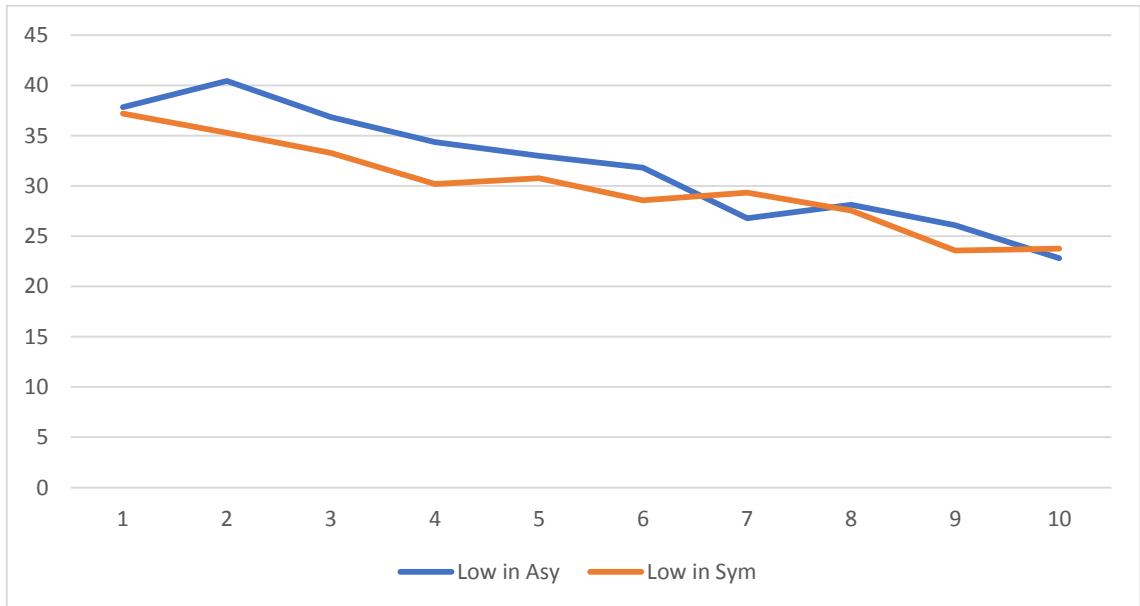
**Figure A.4: Contributions in Treatment 4**



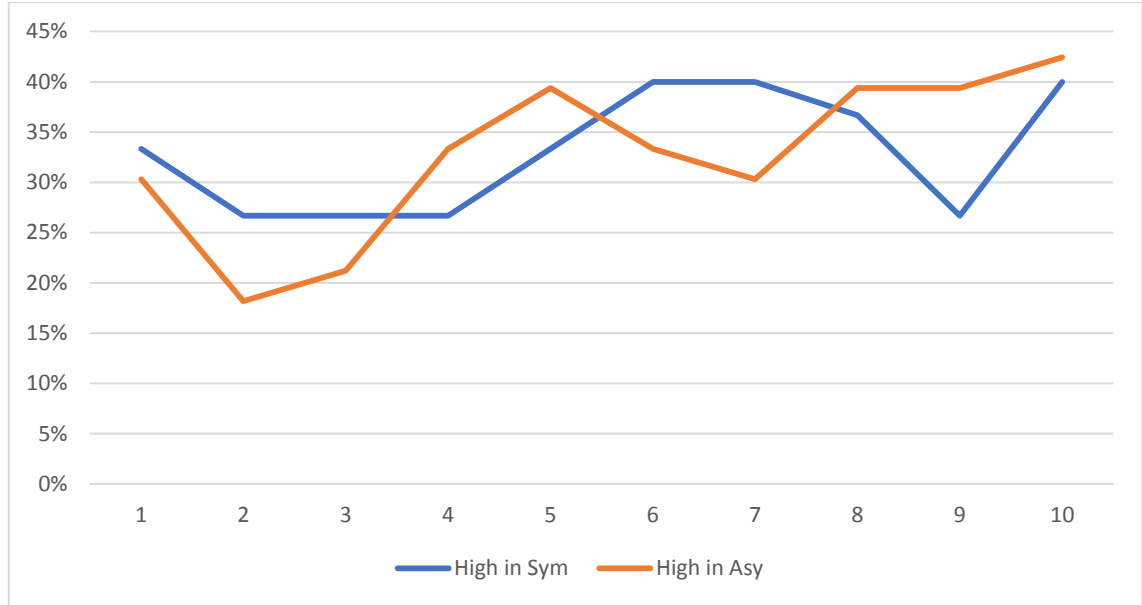
**Figure A.5: Cross-Sectional Average (Periods 1-20)**



**Figure A.6: Cross-Sectional Average (Sym. Low vs Asy. Low)**



**Figure A.7: Cross-Sectional Average (Sym. High vs Asy. High)**



**Table A.1: Distribution of Subjects With Respect to Risk Preferences & Trust**

		<b>Risk</b>	<b>In-Group Trust</b>	<b>Out-Group Trust</b>
<b>Treatment 1</b>	< Average	29 (53.7%)	22 (40.7%)	25 (46.3%)
	>Average	25 (46.3%)	32 (59.3%)	29 (53.7%)
<b>Treatment 2</b>	< Average	30 (71.4%)	16 (38.1%)	18 (42.9%)
	>Average	12 (28.6%)	26 (61.9%)	24 (57.1%)
<b>Treatment 3</b>	< Average	14 (46.7%)	6 (20%)	9 (30%)
	>Average	16 (53.3%)	24 (80%)	21 (70%)
<b>Treatment 4</b>	< Average	37 (56.1%)	28 (42.4%)	29 (43.9%)
	>Average	29 (43.9%)	38 (57.6%)	37 (56.1%)

## ANNEX B

- Instructions in Turkish:

### **Deney Yönergesi**

Bu bir karar alma deneyidir ve bilimsel bir projenin parçasıdır.

Deney tamamlanıp laboratuvardan çıkıncaya kadar diğer katılımcılarla iletişim kurmanız yasaktır. Deneyin herhangi bir aşamasında bir sorunuz ya da sorunuz olduğunda lütfen elinizi kaldırın ve deney görevlilerinden birinin yanınıza gelmesini bekleyin. Sorularınızı yüksek sesle sormayın ve diğer katılımcıların dikkatini dağıtacak hareketlerde bulunmaktan kesinlikle kaçının.

Deneyde elde edeceğiniz kazanç alacağınız kararlara bağlıdır ve kazancınızın ne şekilde belirleneceği size verilecek yönergelerde detaylı bir şekilde açıklanmıştır. Bu nedenle, yönergeleri dikkatle okumanız ve anlamanız önemlidir. Elde edeceğiniz kazanç için ödeme, bu deney oturumunun bitiminde hemen ve nakit olarak yapılacaktır. Kazancınız hakkında diğer katılımcılara bilgi verilmeyecektir.

Aldığınız kararlar ve verdiğiniz cevaplar tamamen anonimdir, hiçbir kimlik bilgisi ile eşleştirilmemektedir.

Bu deney her biri birbirinden bağımsız 10 turdan oluşan 2 aşama içermektedir. Birinci aşama (ilk 10 tur) tamamlandığında ikinci aşama hakkında bilgilendirileceksiniz. Her turda sizden bir yatırım kararı almanız istenecektir.

Şu anda laboratuvarda bulunan katılımcılar rastgele gruplandırılmış ve her biri altı kişilik olan gruplar oluşturulmuştur. Katılımcıların alacakları kararlar sadece kendi grup üyelerini etkileyecek olup farklı gruplar arasında herhangi bir etkileşim olmayacaktır.

**[T4: İlk tur başlamadan önce bilgisayar rastgele olarak katılımcıları A veya B tipi oyuncu olarak atayacaktır. Her bir katılımcıya atanan oyuncu tipi deney boyunca aynı kalacaktır. Her grupta 3 tane A tipi, 3 tane B tipi oyuncu bulunacaktır. ]**

**Yatırım Kararı:** Her tur başlarken tüm katılımcılara 100'er puan verilecektir. Her turda bütün grup üyelerinden ellerinde bulunan 100 puanın ne kadarını gruplarına ait ortak bir havuza yatıracakları ve ne kadarını ellerinde tutacakları konusunda bir karar almaları istenecektir. Yatırım miktarı 0 ile 100 arasında [0 ve 100 dâhil] herhangi bir tamsayı olabilir. Grup üyelerinin yaptıkları katkı miktarları ortak bir havuzda toplanacaktır. Havuzda biriken toplam miktar 1.2 ile çarpıldıktan sonra grup üyeleri arasında eşit olarak bölüştürülecek ve dağıtılacaktır. Her bir grup üyesine geri dağıtılan puan elinde tutmayı tercih ettiği puana eklenecektir.

**Denetleme:** Her turun sonunda katılımcıların yaptıkları katkı miktarlarının denetlenme ihtimali bulunacaktır. Denetlenme ihtimali her katılımcı için 1/20 'dir. **[T4: Deney boyunca A tipi oyuncuların katkıları 1/20, B tipi oyuncuların katkıları ise 8/20 ihtimalle denetlenecektir.]** Denetlenmeyen grup üyelerinin puanlarında bir değişim olmayacaktır (Havuzdan aldığı pay + elinde tutmayı tercih ettiği puan). Denetlenen grup üyelerinin ise puanları aşağıda belirtildiği şekilde hesaplanacaktır:

Eğer katılımcının katkı miktarı 40'a eşit ise, katılımcının puanı değişmeyecektir

Eğer katılımcının katkı miktarı 40'tan küçük ise, katılımcının puanı  $1.2 * (40 - \text{Katkı Miktarı})$  kadar azalacaktır.

Eğer katılımcının katkı miktarı 40'tan büyük ise, katılımcının puanı  $1.2 * (\text{Katkı Miktarı} - 40)$  kadar artacaktır.

**Örnek:** Diyelim ki elinizdeki 100 puanın X kadarını ortak havuza yatırma kararı aldınız. Grubunuzdaki diğer beş katılımcının katkı miktarları toplamı da Y oldu.

Elinizde Kalan Miktar:  $100 - X$

Grubunuz Tarafından Havuza Yapılan Toplam Yatırım:  $X+Y$

Her Bir Katılımcıya Geri Dağıtılacak Olan Miktar:  $(1.2 * (X + Y) )/6$

Yatırım Kararları Sonucunda Puanınız:  $(100-X) + (1.2* (X + Y) )/6$

Denetleme: Katkı miktarları belirlendikten sonra bilgisayar belirtilen ihtimaller dâhilinde denetlenip denetlenmeyeceğinizi belirleyecektir. Denetlenme ihtimaliniz  $1/20$  'dir. **[T4: Deney boyunca A tipi oyuncuların katkıları  $1/20$ , B tipi oyuncuların katkıları ise  $8/20$  ihtimalle denetlenecektir]**

Denetlenmeniz durumunda:

Eğer katkı miktarınız  $X$ , 40'a eşit ise, puanınız değişmeyecektir

Eğer katkı miktarınız  $X$ , 40'tan küçük ise, puanınız  $1.2 * (40-X)$  kadar azalacaktır.

Eğer katkı miktarınız  $X$ , 40'tan büyük ise, puanınız  $1.2 * (X-40)$  kadar artacaktır.

Katkı miktarınızın denetlenmemesi durumunda puanlarınızda bir değişiklik olmayacaktır.

**Deney sonu kazancınızın hesaplanması:** Deney tamamlandıktan sonra yatırım kararı almış olduğunuz 20 turdan bir tanesi bilgisayar tarafından rastgele seçilecektir. Bu turda kazandığınız puan 0.3 TL ile çarpılarak deney sonlandığında tarafınıza nakit olarak ödenecektir.

- Instructions in English:

This is a decision-making experiment, and it is part of a scientific project. It is forbidden to communicate with other participants until you leave the laboratory. Should you have a question or a problem at any stage of the experiment, please raise your hand and quietly wait for the experimenter to come to your terminal. Do not ask

your questions out loud and avoid distracting other participants. You can earn money during the experiment. The amount of money you can make depends on the decisions you and the other participants take. The way your earnings will be determined is explained in detail in these instructions. Therefore, it is important that you read them carefully. Your earnings will be paid in cash before you leave the laboratory. The other participants will not be informed about your earnings. Decisions you make and the responses you give are kept completely anonymous. Decisions you make will not be matched with your personal information.

This experiment consists of two parts that each contain ten rounds. When Part 1 is completed, you will be informed about Part 2. In each round, you will be asked to make a contribution decision.

Subjects in the laboratory are randomly assigned to groups of six people. The decisions taken by the group members will only affect their group, and there will be no interaction among different groups.

**[T4: Before the first round begins, the computer will randomly assign subjects as Type A or Type B. The type assigned to the participants will remain the same throughout the experiment. Each group consists of three Type A and three Type B participants.]**

**Contribution Decision:** In each round, each participant will receive an endowment of 100 points. Every participant will be asked to decide what portion of the 100 points they want to contribute to the common pool and what portion they want to keep for themselves. Amount of the contribution can be any integer between 0 and 100 (including 0 and 100). Contributions of all group members will be summed and multiplied with 1.2 and distributed equally among the group members. The distributed amount will be added to the amount subjects chose to keep for themselves.

**Monitoring:** After each round, the contribution of each subject will be monitored with a certain probability. Monitoring probability is 1/20 for every subject.

**[T4: Contributions of Type A participants will be monitored with a probability of 1/20, while the contribution of Type B participants will be monitored with a probability of 8/20.]**

Participants who are not chosen for monitoring will not be affected. Earnings of the participants chosen for monitoring will be determined in the following manner:

If their contribution equals 40, then their points will remain the same.

If their contribution is smaller than 40, then their points will be decreased by  $1.2 \cdot (40 - \text{Participant's Contribution})$

If their contribution is greater than 40, then their points will be increased by  $1.2 \cdot (\text{Participant's Contribution} - 40)$ .

**Example:** Assume that you have contributed X points to the common pool out of the 100 points you have. Also, the total contribution of the other members of your group is Y points.

The amount you reserved for yourself:  $100 - X$

The total amount in the common pool:  $X + Y$

Amount to be redistributed to each group member:  $1.2 \cdot (X + Y) / 6$

**Monitoring:** After the contribution decisions are made, the computer will choose the participants whose contributions will be monitored. The probability that you will be monitored is 1/20.

**[T4: Contributions of Type A participants will be monitored with a probability of 1/20, while the contribution of Type B participants will be monitored with a probability of 8/20.]**

In case you are selected for monitoring;

If your contribution equals 40, then your points will remain the same.

If your contribution is smaller than 40, then your points will be decreased by

$1.2 * (40 - \text{Your Contribution})$

If your contribution is greater than 40, then your points will be increased by

$1.2 * (\text{Your Contribution} - 40)$ .

**Calculation of your final earning:** After the experiment is completed, the computer will randomly choose one round out of the 20 rounds you have played. The points you earned in the chosen round will be multiplied with 0.3 TL and paid in cash to you before you leave the laboratory.

## ANNEX C

- Screenshots of the experiment and the questionnaire

**Figure C.1: Welcome Screen**

1

Merhaba,  
BELİS tarafından yürütülmekte olan karar alma deneyine hoşgeldiniz.  
Şimdi yönerge sesli olarak okunacaktır.

Herhangi bir aşamada sorunuz olursa lütfen elinizi kaldırın ve deney görevlisinin yanınıza gelmesini bekleyin.

**Figure C.2: Contribution Decision**

1

**1. Tur**  
**Yatırım Kararı**

Bu turda elinizde bulunan **100** puanın ne kadarını ortak havuza yatıracığınızı ve ne kadarını elinizde tutacağınız konusunda bir karar almanız gerekmektedir.

Siz ve grubunuzdaki 5 üyenin katkı miktarları ortak havuzda toplanacak, **1.2** ile çarpılacak ve eşit olarak grup üyelerine dağıtılacaktır. Bu miktar, elinizde tutmayı seçtiğiniz miktara eklenecek ve yatırım kararları sonucundaki puanınızı belirleyecektir.

**Denetleme**

Her turun sonunda katılımcıların yaptıkları katkı miktarlarının denetlenme ihtimali bulunacaktır. Denetlenme olasılığı aşağıda belirtilmiştir.

Denetlenmenin sonucu katılımcının katkı miktarına bağlı olacaktır. Katılımcının katkı miktarının denetlenmesi halinde:

Katılımcının katkı miktarının **40** 'a eşit olması durumunda denetlenmenin bir etkisi olmayacaktır.

Katılımcının katkı miktarının **40** 'tan büyük olması durumunda katılımcının puanları **(katılımcının katkı miktarı - 40) x 1.2** kadar artacaktır.

Katılımcının katkı miktarının **40** 'tan küçük olması durumunda katılımcının puanları **(40 - katılımcının katkı miktarı) x 1.2** kadar azalacaktır.

Katılımcının katkı miktarının denetlenmediği durumda puanında bir değişiklik olmayacaktır.

Denetlenme İhtimali: **1/20**

Lütfen elinizdeki **100** puan içerisinde ne kadarını ortak havuza yatırmak istediğinizi belirleyin.

**Figure C.3: Contribution Feedback**

Periyot 1

**1. Tur**  
**Yatırım Kararı Sonucu**

Ortak Havuza Yatırdığınız Miktar: 50

Grubunuz Tarafından Yapılan Toplam Katkı: 140

Havuzdan Geri Dağıtılacak Toplam: 168.0

Havuzdan Her Bir Katılımcıya Geri Dağıtılan: 28.0

Elinizde Tutmayı Tercih Ettiğiniz ve Geri Dağıtılan Miktarların Toplamı: 78.0

**Figure C.4: Monitoring Wait Screen**

Periyot 3

Bilgisayar hangi katılımcıların denetleneceğini belirliyor.

Lütfen Bekleyiniz.

**Figure C.5: Monitoring Feedback**

Periyot 1

**1. Tur**  
**Denetleme Sonucu**

Elinizde Tutmayı Tercih Ettiğiniz ve Geri Dağıtılan Miktarların Toplamı: 118.0  
Siz Denetlendiniz mi? HAYIR  
Denetleme Sonucu Puanınızdaki Değişim: 0.0  
Tur Sonundaki Puanınız: 118.0

**Figure C.6: Second Block Begins**

Periyot 3

**İkinci Aşama Başlıyor**

İkinci aşama başlamadan önce bilgisayar, rastgele olarak, katılımcıları A ve B tipi oyuncu olarak atayacaktır. Katılımcıların atanan oyuncu tipi deney bitimine dek aynı kalacaktır.

Her grupta 3 A tipi ve 3 B tipi oyuncu bulunacaktır.

İkinci aşama boyunca A tipi oyuncuların katkıları **1/20** , B tipi oyuncuların katkıları ise **8/20** ihtimalle denetlenecektir.

**Figure C.7: Declaration on Player Type and Monitoring Probability**

Periyot 3

Bilgisayar tarafından atanan oyuncu tipiniz: A full screen Snip

İkinci aşama boyunca A tipi oyuncuların katkıları  $1/20$  , B tipi oyuncuların katkıları ise  $8/20$  ihtimalle denetlenecektir.

**Figure C.8: Contribution Decision under Asymmetry**

Periyot 12

**12. Tur**

**Yatırım Kararı**

Bu turda elinizde bulunan **100** puanın ne kadarını ortak havuza yatıracığınızı ve ne kadarını elinizde tutacağınızı konusunda bir karar almanız gerekmektedir.

Siz ve grubunuzdaki 5 üyenin katkı miktarları ortak havuzda toplanacak, **1.2** ile çarpılacak ve eşit olarak grup üyelerine dağıtılacaktır. Bu miktar, elinizde tutmayı seçtiğiniz miktara eklenecek ve yatırım kararları sonucundaki puanınızı belirleyecektir.

**Denetleme**

Her turun sonunda katılımcıların yaptıkları katkı miktarlarının denetlenme ihtimali bulunacaktır. Denetlenme olasılığı aşağıda belirtilmiştir.

Denetlenmenin sonucu katılımcının katkı miktarına bağlı olacaktır. Katılımcının katkı miktarının denetlenmesi halinde:

Katılımcının katkı miktarının **40** 'a eşit olması durumunda denetlemenin bir etkisi olmayacaktır.

Katılımcının katkı miktarının **40** 'tan büyük olması durumunda katılımcının puanları **(katılımcının katkı miktarı - 40) x 1.2** kadar artacaktır.

Katılımcının katkı miktarının **40** 'tan küçük olması durumunda katılımcının puanları **(40 - katılımcının katkı miktarı) x 1.2** kadar azalacaktır.

Katılımcının katkı miktarının denetlenmediği durumda puanında bir değişiklik olmayacaktır.

Bilgisayar Tarafından Belirlenen Oyuncu Tipiniz: **B**

A Tipi Oyuncuların Denetlenme İhtimali: **1/20**

B Tipi Oyuncuların Denetlenme İhtimali: **8/20**

Lütfen elinizdeki **100** puan içerisinde ne kadarını ortak havuza yatırmak istediğinizi belirleyin.

**Figure C.9: Final Profit Feedback**

4

Ödeme için Seçilen Tur: 4.0

Seçilen Turda Kazandığınız Puan: 104.4

Size Yapılacak Ödeme: 31.3 TL

**Figure C.10: Questionnaire 1**

Cinsiyetiniz:

Kadın  
 Erkek

Hangi bölüme okuyorsunuz?

ÖSYM burs durumunuzu belirtiniz:

Tam Burslu  
 %75 Burslu  
 %50 Burslu  
 %25 Burslu  
 Bursuz:

Babanızın son meslek olduğu eğitim kurumunu hangisi en iyi ifade eder?

Hiç okula gitmemiş  
 İlk veya orta öğrenim  
 Lise  
 Ön Lisans/Meslek Yüksek Okulu  
 Üniversite (İsimsiz)  
 Yüksek lisans  
 Doktora

Anenizin son meslek olduğu eğitim kurumunu hangisi en iyi ifade eder?

Hiç okula gitmemiş  
 İlk veya orta öğrenim  
 Lise  
 Ön Lisans/Meslek Yüksek Okulu  
 Üniversite (İsimsiz)  
 Yüksek lisans  
 Doktora

Diğer bir tercih için bir derece katıldınız mı?

Evet  
 Hayır

Şahıdsanız konularla daha alırsınız mı? (Böylece çok seçeneğe sahip olabilirsiniz)

Mikroekonomi  
 Oyun Teorisi  
 İktisat

İkinci aşamada yaptığınız katılımların nasıl belirlendiğini kısaca açıklayın

İlkinci aşamada yaptığınız katılımların nasıl belirlendiğini kısaca açıklayın

**Figure C.11: Questionnaire – Risk Elicitation**

Diyelim ki elinizde 2000 TL var. 2000 TL'nin isteğiniz kadar ile bir yatırım yapabilirsiniz.

Yatırım 1/3 ihtimalde size yatırımınız miktarını 2.5 katını kazandıracak. 2/3 ihtimalde de yatırımınız paranızı kaybedecektir.

Yatırım için kullanmadığınız para size elinizde kalacak.

Elimizdeki bu 2000 TL'nin ne kadarını yatırıma ayırmak isteğiniz belirleyiniz (0 ve 2000 arası bir tam sayı giriniz)

Devam

**Figure C.12: Questionnaire – Trust Questions**

Aşağıda belirtilen gruplardan kopyelere ne kadar güvenirsiniz?

Adınız

Tamamen Güvenirim  
 Biraz Güvenirim  
 Pek Güvenmem  
 Hiç Güvenmem

Komşularınız

Tamamen Güvenirim  
 Biraz Güvenirim  
 Pek Güvenmem  
 Hiç Güvenmem

Yatırımınız İnançlılar

Tamamen Güvenirim  
 Biraz Güvenirim  
 Pek Güvenmem  
 Hiç Güvenmem

İşiniz Tamamlayıcı İşadamları

Tamamen Güvenirim  
 Biraz Güvenirim  
 Pek Güvenmem  
 Hiç Güvenmem

Spandan Farklı Dini İnançlara Sahip Kişiler

Tamamen Güvenirim  
 Biraz Güvenirim  
 Pek Güvenmem  
 Hiç Güvenmem

Spandan Farklı Etnik Kölemlerden Kişiler

Tamamen Güvenirim  
 Biraz Güvenirim  
 Pek Güvenmem  
 Hiç Güvenmem

Devam

**ETİK KURUL DEĞERLENDİRME SONUCU/RESULT OF EVALUATION BY  
THE ETHICS COMMITTEE**

(Bu bölüm İstanbul Bilgi Üniversitesi İnsan Araştırmaları Etik Kurul tarafından doldurulacaktır /This section to be completed by the Committee on Ethics in research on Humans)

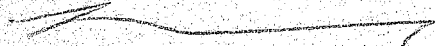
**Başvuru Sahibi / Applicant:** Nedim Okan

**Proje Başlığı / Project Title:** Kamu Malı Oyununda Merkezi Cezalandırma ve Asimetrik GözetlemeÇ Deneysel Bir Çalışma

**Proje No. / Project Number:** 2019-20622-68

1.	Herhangi bir değişikliğe gerek yoktur / There is no need for revision	XX
2.	Ret/ Application Rejected Reddin gerekçesi / Reason for Rejection	

**Değerlendirme Tarihi / Date of Evaluation:** 9 Nisan 2019

  
Kurul Başkanı / Committee Chair

Doç. Dr. İtir Erhart



Üye / Committee Member

Prof. Dr. Turgut Tarhanlı

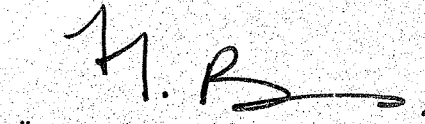


Üye / Committee Member

Prof. Dr. Koray Akay

  
Üye / Committee Member

Prof. Dr. Aslı Tunç



Üye / Committee Member

Prof. Dr. Hale Bolak Boratav