Journal of
Business & Financial Affairs

Yalcintas and Iyigun, J Bus Fin Aff 2017, 6:3
DOI: 10.4172/2167-0234.1000289

Research Article Open Access

Game Theory in Organizational Justice: An Experimental Study on Teams

Murat Yalcintas[1]* and Oyku Iyigun[2]

[1]Department of Business Administration, Istanbul Commerce University, Istanbul, Turkey
[2]Department of International Trade, Istanbul Commerce University, Istanbul, Turkey

Abstract

Recent research on organizational justice around the world has established a number of empirical studies. The objective of the present study is to investigate the role of organizational justice perception in a social network within a game theory frame. The paper discusses distributive justice consideration in a team context and the way variations in talent and effort makes a difference to the perceived fairness in teams. The study also aims to contribute to scholarly efforts being undertaken to develop a strong theoretical foundation for understanding organizational justice perception in a social network, by using game theory modelling. The methodology used is an experimental study, which is a modified dictator game, with a production and distribution phase, played first individually then on a team basis.

Keywords: Game theory; Organizational justice; Teams; Fairness; Experimental study

Introduction

Game theory

Game theory is about decision making. It is a technique used to analyze situations where for two or more individuals (or institutions) the outcome of an action by one of them depends not only on the particular action taken by that individual but also on the actions taken by the other (or others). In these circumstances the plan or the strategies of the individuals concerned will be dependent on expectations about what the others are doing [1]. Game theory's application is not limited to a single discipline such as economics or business studies. A wide range of decision problems which can be faced by anyone on any field may be analyzed using game theory models.

Most current economic models assume that people pursue only their own material self-interest. Thus, self-interest should be the principal consideration in the decisions of economic agents. However, there is considerable evidence that considerations of fairness affect economic behavior and the presence of fair-minded people is likely to have economic effects [2]. Experiments conducted using the Ultimatum Game and Dictator Game proved that fairness considerations can play an important role in economic decision making.

The Ultimatum Game is a simple two-person game in which one player (the proposer) receives a monetary endowment from the experimenter and makes an offer regarding how to divide the endowment between himself and a second player (the responder). The responder then decides whether to accept or reject the proposer's offer. If the responder accepts the offer, each player receives payment according to the proposer's offer. However, if the responder rejects the offer, both players receive nothing. Economic models that view humans as rational and self-regarding agents predict that the responder should accept any offer above zero and that the proposer should propose the minimum possible offer to the responder. However, empirical data significantly differ from this theoretical prediction; the mean offer in different experiments is found to be approximately 60/40 (proposer 60%, responder 40%). Furthermore, roughly half of responders rejected unfair offers below 20% [3].

Another type of the economic game is the Dictator Game, where the proposer (the allocator in this case) has the power to allocate the endowment between himself and the second player in any way he sees fit. The second player has no input, whatsoever.

Organizational justice

Organizational justice describes the individual's perception of the fairness of treatment received from an organization and their behavioral reaction to such perceptions [4]. Organizational justice theories center on perceived fairness especially in the workplace. The concept is generally analyzed in three categories such as distributive justice, procedural justice and interactional justice. Distributive justice describes the perceived fairness of outcomes received; procedural justice refers to the perceived fairness of the means used to determine those outcomes, and interactional justice refers to the quality of interpersonal treatment received at the hands of decision-makers [5].

Distributive justice emphasizes the perceived fairness of outcomes. Due to its focus on outcomes, distributive justice is predicted to be related mainly to cognitive, affective, and behavioral reactions particular to outcomes. Thus, when a particular outcome is perceived to be unfair, it should affect the person's emotions, cognitions, and ultimately their behavior (e.g., performance or withdrawal) [6].

The formal principle of distributive justice could be stated as "Equals should be treated equally, and unequals unequally, in proportion to their relevant similarities and differences" [7]. The specific application of this formal principle depends on how one defines "equality" and "relevant similarities and differences". Thus, two main types of distribution problems arise; Fixed Pie and Effort Dependent. Fixed pie problems concentrate on how to distribute a finite quantity of benefits and are mostly analyzed with economic games in order to

***Corresponding author:** Murat Yalcintas, Department of Business Administration, Istanbul Commerce University, Istanbul, Turkey, Tel: +904440413; E-mail: myalcintas@ticaret.edu.tr

Received September 06, 2017; **Accepted** September 22, 2017; **Published** September 29, 2017

Citation: Yalcintas M, Iyigun O (2017) Game Theory in Organizational Justice: An Experimental Study on Teams. J Bus Fin Aff 6: 289. doi: 10.4172/2167-0234.1000289

determine the rules of distribution which will be considered fair by all the concerned parties.

Thus, another major question on distributive justice is how the distribution of the benefits can be affected by the differences in talent and effort? Different theories of distributive justice; strict egalitarianism, libertarianism and liberal egalitarianism give different answers to this question. Strict egalitarian theory believes that people are not responsible for their effort and talent so equal sharing is the fair sharing. Libertarianism argues that talent and effort should be taken into consideration, thus benefits should be distributed as per the production levels. Between them, liberal egalitarianism view effort as within and talent beyond individual control, and thus believe that redistributive policies should aim at equalizing differences due to differences in talent but should allow for inequalities due to differences in effort [8].

Social preference is an important parameter which affects the distributive choice. For example it has been shown that people from high income countries are less egalitarian and assign greater importance to entitlement considerations than the people from low-income countries [9]. Also experiments with children suggests that social experiences also play a role in shaping children's fairness preferences [10]. It has also been observed fairness considerations continue to be important as people move from being students to becoming more active participants in the economy and that exposure to market institutions seems to trigger fair-mindedness [11]. Furthermore a research made to measure response in the brain to inequality proved a striking correlation between the hemodynamic response in the striatum and the self-reported evaluation of the income distributions [12].

Team behavior

Economic action does not take place in a barren social context, but is instead embedded in a social network of relationships. A social network can be defined as a "set of nodes (e.g., persons, organizations) linked by a set of social relationships (e.g., friendship, transfer of funds, overlapping membership) of a specified type" [13]. Networks being web of relationships formed by people or organizations, they virtually affect everything people or organizations do.

Since social network theory focuses on links between network actors rather than on the actors themselves, the network level of analysis is represented by relationships among three or more actors. So, given that teams are characterized by interdependent relationships between members, teams are considered as a type of social network [14]. The team context offers an additional range of stimuli capable of altering members' beliefs and reactions. In particular, team contexts result in more intensive social comparisons among individual members because of the increased frequency and importance of team interactions [15].

Teams can be defined as a collection of individuals who work together to complete some task, who share responsibility for collective outcomes, and who see themselves and are seen by others as a social entity [15]. Many economic decisions are made by group of individuals (teams) instead of by a single individual. Families, board of directors, committees are some examples. Teams also act as a mechanism for pooling knowledge as well as creating synergy and flexibility. Studies suggest that working within a team can impact on the decisions made by team members, which exceeds a collection of individual decisions [16].

In decision making individuals and teams are expected to behave differently. One reason is that teams are more rational than individuals [17]. Also social dynamics within a team can cause decisions made by teams differ from decisions made by individuals. In this sense, group polarisation hypothesis is a well-established phenomenon; decisions in a group move to more extreme points in the same direction as the average of the group members' initial individual decisions. Dominant explanations of this phenomenon are Social Comparison Theory (SCT) and Persuasive Argument Theory (PAT) [18].

According to SCT, people are motivated to perceive and present themselves in a socially desirable way. To accomplish this, a person observes how other people behave and then adjusts her behavior to present herself in a socially more favourable way. Alternatively, according to PAT, people are influenced by the number and persuasiveness of the arguments they are exposed during the group discussion. If the initial mean choices of the group members exhibit a preference towards a particular position, it is very likely that there will be more persuasive arguments in favour of this position during the discussion.

For example in a team dictator game, according to SCT, if the participants perceive that other-regarding behaviour is socially desirable then team decision will be more other-regarding than individual decisions. Alternatively, PAT claims that for teams in which participants' individual decisions tend to be other-regarding, the team decision will be more other-regarding since group discussion will generate more arguments in support of other-regarding behaviour.

"Groupthink" process also, where individuals suppress dissenting opinions in the interest of the group, affect decisions made by a group [19]. Gender may also effect group decision. There is evidence from a group dictator game that groups are more generous and equalitarian when women are in majority [20].

Although in a dictator game setting, Cason and Mui [18] reported that teams are more other-regarding than individuals and explained this behavior by referring to SCT, most of the research on team decision making suggest that teams behave more selfishly, less trustingly and less altruistically than individuals [21-23].

Methodology

Purpose of research

The objective of the present study is to investigate the role of organizational justice perception in a social network within a game theory frame. The paper discusses distributive justice consideration in a team context and the way variations in talent and effort makes a difference to the perceived fairness in teams.

Data collection

In order to examine the variations in prevalence of different fairness ideals among individuals and teams, the study uses a specific research design. Data are collected from a modified version of the dictator game experiment used by Cappelen et al. [8]. The results of the modified dictator game, with a production and distribution phase, played first individually then on a team basis, is analyzed to determine whether effort and talent matters for people in the distribution of benefits in a team context.

Fairness choices

In the administered dictator game, the distribution phase was preceded by a production phase and the participants differed with respect to both effort and talent. Thus, as in the Cappelen et al. [8] case,

different fairness ideals provide different answers to the question of what is a fair distribution of the total production. We assumed that each player was either motivated by one of the three fairness ideals (egalitarianism, liberal egalitarianism and libertarianism) or he/she was merely self-regarding.

In the experiment, we simulated a setting where participants differed in both effort (within individual control) and talent (beyond individual control). Effort (Ei) is the time the participant i works on a certain project. Talent (Ti) is the hourly fee the participant i receives for working on this project. So, the income generated by each participant in the production phase is the multiplication of his effort with his talent; Ii=Ei × Ti. (I1=e1 × t1 and I2=e2 × t2).

The distribution phase of the dictator game is a two-party setting, with two participants. The total income to be distributed is given by I(e,t)=I1(e1,t1)+I2(e2,t2), where e=(e1,e2) and t=(t1,t2). Each participant proposed an amount of income p1 for herself and p2 for her partner. And naturally p1+p2=I.

Egalitarians believe that people are not responsible for their effort and talent, and therefore they believe equal sharing is the fair distribution. Thus, for a fair distribution p1 must be equal to p2 whatever I1 and I2 is. It means whatever difference there is in effort and talent, p1=p2 always.

The libertarians on the other hand believe that each person should be given whatever she produces. So from this perspective, p1 must be equal to I1 and p2 must be equal to I2. Due to differences in talent and effort, I1 can differ from I2. That is why in a fair solution from libertarian perspective, p1 may differ from p2.

Liberal egalitarian view claims that people are responsible for their efforts and not for their talents. It means that a fair distribution is to give to each person a share of the total income equal to her share of the total effort.

Thus p1=(e1/e1+e2) × I and p2=(e2/e1+e2) × I.

The participants

The participants of the experiment were the graduate and undergraduate students of the Business School of the Istanbul Commerce University. They were not informed about the purpose of the experiment, they were only asked to contribute to a paper to be presented at the EMNET conference. The participants were also informed that they may earn money during the experiment which they could collect from the experimenters later.

78 students participated to the experiment. In order to determine the fairness consideration of each participant we had four different sessions where the participants were paired as individuals. Later, as a second stage, we had three more sessions where the participants were paired as teams of three individuals. Each session consisted of students from the same class, i.e., graduates or undergraduates.

The students were guaranteed total unanimosity. Each of them was assigned a code so that neither the experimenter nor any other participant might know the choices she made.

The Experiment

At the beginning of each session all the participants were informed about the rules and the whole procedure was explained. They were also told that all of their choices, either individually or as a team, would be anonymous.

At the production phase of the first game, participants were given four different scenarios where there were different working hours and different prices per working hours for themselves and their pairs. They have been informed that under these four different scenarios the production value is the product of the working hour and the price per working hour. Then each participant has randomly received a sheet containing four different scenarios of production.

In each scenario a random working hour (0 or 5 or 10 hours) and a random fee per hour (1 TL or 2 TL) was assigned to each participant. The value of each participant's production (generated income) is equal to her working hour multiplied by her working fee. In the same sheet, each participant could also see her pair's working hour, working fee and value of production (generated income). In the scenarios, the pairs had once the same working time, then different working times, once the same working fee, then different working fees.

In the distribution phase, each participant was asked to propose a distribution of the total production value for the two participants (herself and her pair). Actual payment for each participant was determined by randomly choosing one distributional proposal among the four. The participants later claimed their earnings from this stage by presenting the codes assigned to them.

Fort the next stage of the experiment, participants were randomly placed into groups of three, provided that each participant in the group had a different fairness approach; liberal, egalitarian, liberal egalitarian, self-regarding and trading off between different approaches. A trading off participant is a participant who adopts different fairness ideals under different scenarios.

Each team had a sheet containing eight different scenarios with different working hours and hourly fees for themselves and for their paired team as in the first stage. Then each team was asked to propose a distribution of the total production value for the two teams. Actual payment for each team was determined randomly among the distribution proposals and each team member received equally one third of the team's earnings. The participants later claimed their earnings from this stage by presenting the codes assigned to them. The total earning of each participant for the whole experiment was the sum of their earnings in the first and second stages.

Results

Different scenarios lead to four different distribution situations. First there were situations where both participant had the same working time and working fee. The three fairness ideals required the same fair distribution in this case, both participant get an equal share of the total production value. Second, there were situations where the participants had the same hourly fee but different working hours. In this situation, liberal egalitarian and the libertarian fairness ideals coincide, egalitarian ideal differs. Third, there were situations where the participants had the same working hours but different hourly fees. All the fairness ideals except for libertarianism consider an equal distribution fair in such a situation. Fourth there were situations where the participants had different working hours and different hourly fees. All the fairness ideals give different distribution solutions in this case.

At the first stage, when the participants played the dictator game individually, we estimated the prevailing fairness ideals as follows; out of 78 participants, 30 participants turned out to be libertarian, 14 egalitarians, 20 liberal egalitarians and 4 self-regarding. 10 participants offered solutions where they made tradeoffs between different considerations (Table 1).

	Quantity	Percentage
Libertarian	30	38%
Egalitarian	14	18%
L. Egalitarian	20	26%
Self-Regarding	4	5%
Trading-off	10	13%
Total	78	100%

Table 1: Individual fairness ideals in the individual dictator game (Stage 1).

	Quantity	Percentage
Libertarian	5	19%
Egalitarian	5	19%
L. Egalitarian	8	31%
Self-Regarding	2	8%
Trading-off	6	23%
Total	26	100%

Table 2: Team ideals in the team dictator game (Stage 2).

Since the sum of libertarians and liberal egalitarians is 64%, without taking into account trading off participants, it is clear that participants care who contributed to the production of the total income.

In the second stage, there were 26 teams with a total of 78 participants. Each team consisted of three members. There were 22 teams where each member had a different fairness ideal. Due to uneven distribution of fairness ideals among participants, we had four teams where two or more members had the same fairness consideration.

At the second stage, teams' fairness considerations were estimated as follows; out of 26 teams 8 teams turned out to be liberal egalitarian, 6 teams traded off between different approaches, 5 teams libertarian, 5 teams egalitarian and 2 teams self-regarding. The percentage distribution of the fairness ideals for the teams are given in Table 2. For simplicity, the figures are rounded to whole numbers.

The fairness ideal of each member of the team, as well as the corresponding team fairness ideals are given in Table 3.

Table 4 shows how decisions made by teams differed from decisions made by individuals. Comparing the decision percentages of stage 1 and stage 2, we can observe how the distribution of individual choices for different fairness ideals differed from that of teams.

Based on Table 4, our main observation is that there is a considerable decrease in the libertarian fairness consideration from stage 1 to stage 2. To counter this decrease, there are slight increases in the egalitarian, liberal egalitarian and self-regarding approaches. But the main increase occurred in trading-off. Trading-off means, the individual participant in stage 1 or the team participant in stage 2 opted for different fairness ideals at the same game. Since there were more than one scenario (4 in stage 1, 8 in stage 2) for each stage, some participants preferred one type of fairness ideal for one scenario and then another type of fairness ideal for another scenario at the same game.

Conclusion

Some of our findings concerning the individual dictator game (stage 1) are in line with Cappelen et al. observations such as "there is considerable pluralism in the fairness ideals that motivate people, even in rather simple distributional situations involving a homogeneous group of students" and "the distinction between effort and talent matters for many people".

But the distribution of fairness ideals among the population differed between two studies. In Cappelen et al. experiment the distribution among the fairness considerations was 39.7% egalitarians, 43.4% liberal egalitarians and 16.8% libertarians, where in our experiment the percentages differed considerably. Furthermore, in Cappelen et al. study around 30% of the participants assigned little importance to fairness considerations 40% of the participants make active trade-offs between fairness and self-interest considerations, and 30% of the participants care mainly about fairness considerations. In our study, the percentage of self-regarding participants turned out to be 5% and 11% made tradeoffs between different considerations.

Team Number	Individual Ideals	Team Ideal
1	E/LE/SR	LE
2	L/LE/TO	E
3	E/LE/SR	LE
4	L/LE/TO	LE
5	E/LE/TO	LE
6	L/L/L	L
7	L/E/TO	SR
8	L/L/L	L
9	L/E/LE	LE
10	L/E/LE	TO
11	L/LE/TO	TO
12	L/E/TO	E
13	L/E/LE	LE
14	L/E/TO	L
15	L/LE/TO	L
16	L/E/LE	E
17	L/LE/TO	TO
18	L/E/LE	TO
19	L/LE/SR	TO
20	L/L/LE	SR
21	L/L/L	E
22	L/E/LE	LE
23	L/LE/SR	E
24	L/E/LE	LE
25	L/E/LE	L
26	L/LE/TO	TO

Table 3: Team compositions in the team dictator game (Stage 2).

	Stage 1	Stage 2	Variation
Libertarian	38%	19%	-19%
Egalitarian	18%	19%	1%
L. Egalitarian	26%	31%	5%
Self-Regarding	5%	8%	3%
Trading-off	13%	23%	10%
Total	100%	100%	

Table 4: Variation of fairness ideals (Stage 1 and Stage 2).

The reason of this variation might be the social preference differences between Norwegian and Turkish participants. In other words, it could be stated that inter-cultural differences among countries, or regions could have a role in obtaining different results. Another reason might be the limited sizes of the sample populations in both experiments; i.e., 96 in Cappelen et al. and 78 in the present one.

Observing data in Table 1, since the sum of libertarians and liberal egalitarians is 64%, not taking into account trading off participants, we may deduce that participants care who contributed to the production of the total income. But at the same time, the sum of liberal egalitarians and egalitarians sum up to 44%. This figure may indicate that students

who took part in the experiment did not hold people responsible for the randomly assigned price, an impersonal factor beyond individual control. This conclusion is in line with other experimenters' findings.

According to data in Table 4, at the first stage of the game, while deciding individually, 38% of the participants opted for a libertarian approach. But at the second stage, while the participants had to make their choices as groups of three, only 19% of the groups preferred a libertarian approach. While we do not have enough observations to draw a definite conclusion, this result suggests that libertarian participants, during group discussion, moved to a more egalitarian position.

One explanation for this move may be that among students egalitarian behaviour was more socially desirable which caused in turn a group polarisation effect. This explanation is supported by Cappelen et al. findings which establish that students, compared to alumni, are motivated to a greater extend by the egalitarian fairness ideals. The authors relate this phenomenon to the labour market experience of the alumni.

Nevertheless, our data are in contrast to the large majority of experimental papers that have shown that "team decisions are more selfish and competitive, less trusting and less altruistic than individual decisions". The reason of this contrast may be that, since the participants of the same sessions were all classmates, they knew each other quite well. Even though their decisions have remained anonymous, the acquaintanceship may have caused other-regarding behaviour. In fact there is evidence that transfers in the dictator game increase with identification of subjects even without revealing decisions. In terms of cultural aspects, Turkish culture could be defined as a collectivist culture. This could be one of the reasons for not obtaining more selfish and competitive team decisions from the students.

Any modeling exercise is an attempt to simulate real world processes through the use of input data describing physical characteristics of the system, a set of algorithms to transform input data to output parameters of interest, and simplifying assumptions to limit the scope of the model. Therefore, our study has several limitations. The experiment was conducted in only one university with a group of 78 participants. For future studies, the number of participants and the number of scenarios used in the experiment should be increased and the participants should be diversified in terms of age, occupation and nationality.

References

1. Carmichael F (2005) A Guide to Game Theory. Essex: Pearson Education Limited.
2. Falk A, Fehr E, Fischbacher U (2008) Testing theories of fairness-Intentions matter. Games and Economic Behavior 62: 287-303.
3. Takagishi H, Kameshima S, Schug J, Koizumi M, Yamagishi T (2010) Theory of mind enhances preference for fairness. Journal of Experimental Child Psychology 105: 130-137.
4. Aryee S, Budwar P, Chen ZX (2002) Trust as a mediator of the relationship between organizational justice and work outcomes: test of a social exchange model. Journal of Organizational Behavior, pp: 267-285.
5. Iyigun O, Tamer I (2012) The Impact of Perceived Organizational Justice on Turnover Intention: Evidence from an International Electronic Chain Store Operating in Turkey. Journal of Global Strategic Management, pp: 5-16.
6. Cohen-Charash Y, Spector P (2001) The Role of Justice in Organizations: A Meta-Analysis. Organizational Behavior and Human Decision Processes 86: 278-321.
7. Isaac M, Mathieu D, Zajac E (1991) Institutional Framing and Perceptions of Fairness. Constitutional Political Economy 2: 329-370.
8. Cappelen AW, Hole AD, Sorensen EO, Tungodden B (2006) The pluralism of fairness ideals: An experimental approach.
9. Cappelen A, Moene K, Sorensen E, Tungodden B (2013) Needs Versus Entitlements - An International Fairness Experiment. Journal of the European Economic Association 11: 574-598.
10. Almas I, Cappelen A, Sorensen E, Tungodden B (2010) Fairness and the Development of Inequality Acceptance. Science 328: 1176-1178.
11. Cappelen A, Sorensen E, Tungodden B (2010) Responsibility for what? Fairness and individual responsibility. European Economic Review 54: 429-441.
12. Cappelen A, Eichele T, Hughdahl K, Specht K, Sorensen E, et al. (2014) Equity theory and fair inequality: A neuroeconomic study. PNAS 111: 15368-15372.
13. Laumann E, Galaskiewicz J, Marsden P (1978) Community Structure as Interorganizational Linkages. Annual Review of Sociology 4: 455-484.
14. Roberson Q, Colquitt J (2005) Shared and Configural Justice: A Social Network Model of Justice in Teams. Academy of Management Review 30: 595-607.
15. Colquitt J (2004) Does the Justice of the One Interact with the Justice of the Many? Reactions to Procedural Justice in Teams. Journal of Applied Psychology 89: 633-646.
16. Cook G, Gerrish K, Clarke C (2001) Decision-making in teams: Issues arising from two UK evaluations. Journal of Interprofessional Care 15: 141-151.
17. Bornstein G, Yaniv I (1998) Individual and Group Behavior in the Ultimatum Game: Are Groups More "Rational" Players? Experimental Economics 1: 101-108.
18. Cason TN, Mui VL (1997) A Laboratory Study of Group Polarisation in the Team Dictator Game. The Economic Journal 107: 1465-1483.
19. Irving J (1982) Victims of Groupthink. Boston, USA: Wadsworth 12: 247-278.
20. Dufwenberg M, Muren A (2006) Gender composition in teams. Journal of Economic Behavior & Organization 61: 50-54.
21. Luhan W, Kocher M, Sutter M (2007) Group polarization in the team dictator game. University of Innsbruck Working Papers in Economics and Statistics, pp: 1-25.
22. Bohnet I, Bruno F (1999) Social Distance and Other-Regarding Behavior in Dictator Games: Comment. The American Economic Review, pp: 335-339.
23. Hofstede G, Hofstede GJ, Minkov M (1991) Cultures and Organizations, Software of the Mind. London: HarperCollins Publishers.