

The Intrinsic Value of Decision Rights and Reciprocity

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Abstract

This study examines how intrinsic values of owning decision rights change when people are placed in a reciprocal environment. In recent years, the allocation of decision rights in firms has become an important issue in organizational management. Preceding experimental research on principal agent game has shown that reciprocal relationship within memberships lead to decrease productivity due to aversive being controlled. However, the relationship between owning decision right and reciprocity has not yet been clarified. Thus, we designed an experiment to test whether reciprocal environment affect intrinsic values of decision rights. Our findings indicated that people who were assigned in reciprocal treatment had an altered value for owning decision rights.

Keywords: Decision rights, Reciprocity, Social Image, Principal agent game

JEL classification: C72, C91, D23, M54

1. Introduction

How decision rights are appropriately allocated has an important role to play in current organizational design. Recent empirical studies have shown that workers exhibit the largest monetary value in having the freedom of their own discretion (see Mas and Pallais (2017)). Understanding why people value having decision rights and the behavioral mechanisms that exist in the economic outcomes of having decision right is an important concern.

Traditionally, the importance of owning the decision rights has been discussed in the context of liberalism. Berlin (1958) explained the importance of having the right to make decisions in the context of liberty theory. He divided freedom into negative freedom and positive freedom and called positive freedom autonomy. In the social psychology, autonomy is one of the important elements for job satisfaction and productivity. Rian and Deci (1985) emphasized the autonomy is basic wants to

human beings. Recent researches in experimental economics also have shown that the decision right is one of the key factors for organizational productivity.

Principal agent model has long been used for discussion of controlling employee. Using principal agent framework, Falk & Kosfeld (2006) have experimentally shown that principal's goal setting does not work because of agents hate controlled by principals. Their results indicate that agent's negative freedom arises when principals intend to control by goal setting. Burdin, Halliday, & Landini (2018) added third party's goal setting treatment to Falk & Kosfeld (2006) framework, and tested the role of reciprocity in hidden cost of control problem. The reciprocal relationship between principal and agent has crucial role for agent's choice of level of effort.

In the principal's view point, delegation problem is key feature to measure one's willingness to release their own decision rights. Using modified delegation game

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experiment, Fehr, Herz, & Wilkening (2013) have shown that the principals chose excess effort level compared to theoretically optimal because they value owning decision rights more than monetary evaluation of decision rights. In order to capture non-monetary valuation of decision right, Bartling, Herz, & Fehr (2014, hereafter BHF) created elicitation method of the value of owning decision rights. Ferreira, Hanaki, & Taroux (2020) experimentally clarified that the origin of the value of owning decision rights come from subjects want to realize their own choice.

However, it is unknown how the value of decision rights changes in the organizational environment. In particular, it is important in organizational design to examine whether the value of decision rights changes in a mutually beneficial relationship. Not only in the design of new organizations, but also in the design of existing organizations, reciprocal relationships already exist in the organization, and knowing how they affect the allocation of decision rights can lead to more efficient organizational design. In order to clarify the question, we designed to test the effect of reciprocal environment on the value of decision rights.

The experimental results indicated that subjects who were assigned in reciprocal treatment reduced value for owning decision rights compared to control treatment. In this study, the reciprocal relationship and the social image-attached condition were compared to the control condition, and when the results of the social image condition were subtracted to eliminate the effect of social image, the results showed that the reciprocal relationship had a negative effect on the value of decision rights. Furthermore, the results of the regression analysis show that the presence of a conflict of interest has a strong negative effect on the value of decision rights in a reciprocal relationship.

Our results contribute to the growing experimental economics literature on decision rights and control in organizations (Bartling et al., 2014; Burdin et al., 2018; Charness et al., 2012; Ellingsen and Johannesson, 2008; Falk and Kosfeld, 2006; Ferreira et al., 2020; Fehr et al., 2013; Ziegelmeyer et al, 2012). The study also adds to the literature on reciprocity in organizational behavior (Fehr et al, 1997; Güth et al, 1998).

The rest of this paper organized as follows. Section 2 explain the design of experiment. Section 3 show the results of experiment. Finally, section 4 concludes our paper.

2. Experimental Design

2.1. Elicitation of Intrinsic Value of Decision Rights

We adopt BHF paradigm for estimation of intrinsic value of decision rights. To elicit one's intrinsic value of decision rights, we have to prepare three kinds of games. Delegation game, control lottery game, and delegation lottery game.

Delegation Game

In the delegation game, we elicit principal's indifference point for delegate decision right to the agent. The delegation game defined as follows. Assume, there are two players principal (P hereafter) and agent (A hereafter). They choose simultaneously project A or B, and P's effort level $E \in [0, 100]$ and A's effort level $e \in [0, 100]$. Success probability of project depends on the effort level of a player who has decision rights. P prefers the project A, and A prefers project B, and both prefers rather than failure. Project probabilistically end with success or failure. Initially, P has decision right to which project are chosen, and he can exhibit \underline{e} as minimum requirement level of agent's effort level e . Delegation occurs if and only if $\underline{e} \leq e$.

Lottery Games

After the delegation game finished, both players P and A

engages in 20 rounds lottery games. They show certainty equivalent for the variable reward lottery. The purpose of lottery games is elicitation of Intrinsic value of decision right through cancelling out the risk attitudes in P's choice in delegation games. The first ten rounds of game are named control lottery which made of P's project choice and effort level E . The latter ten rounds of game are named delegation lottery which made of P's minimum requirement level \underline{e} for the A. In this game, subject report their desirable fixed reward ce point compared to two probabilistic variable reward point. After the experiment, they throw two 10 face dice to get random number $r \in [0, 100]$. If $ce \geq r$, a subject earns reported fixed point reward, otherwise ($ce < r$), she earns probabilistic reward. This elicitation method is based on BDM (Becker, DeGroot, & Marschak (1964)).

Control Lottery

In the control lottery, variable reward point is determined by principal's project choice A or B, and effort level E . For example, in the game 1 P selected project A and effort level $E = 50$. The cost of owning decision right is $C(E) = 0.01E^2 = 25$.

Low point lottery \underline{P} : $100 - 25 = 75$ with 50%

High point lottery \bar{P} : $220 - 25 = 195$ with 50%

Delegation lottery

In the delegation lottery, variable reward point is determined by principal's minimum requirement level of agent's effort \underline{e} . For example, 40 P selected $\underline{e} = 40$ in game 1.

Low point lottery \underline{P} : 100 with 60%

High point lottery \bar{P} : 190 with 40%

2.2. Hypothesis and treatment design

In order to examine the relationship between reciprocity and intrinsic value of decision rights, we implemented

four treatments. Figure 2 shows treatment design of experiment. Treatment 1 aims complete replication of BHF for comparison, thus T1 is seen as control treatment. Treatment 2 repeats T1 twice. Since the reciprocal situation is a repeated assignment, we prepared T2 to control for the effect of repetition. Treatment 3 test the effect of reciprocal environment on intrinsic value of decision rights. The roles of subject switch between the first half experiment and the second half. Further, partner is sitting next to subject¹. Communication is forbidden in the experiment; however, it may affect subject's behavior. To eliminate the effect of social image, T4 is the condition which partner is sitting next to subject.

According to literature, two-sided reciprocal relationship in principal agent model allow players to raise effort levels which leads to play more efficiently for their common profit². In the reciprocal environment, effort level of player may have increase for common benefit, however, we can predict desire to own decision rights will be decreased because of the origin of intrinsic value of decision rights come from the self-reliance motivation as shown in Ferreira et al. (2019).

Therefore, we hypothesize the intrinsic value of decision rights in reciprocal environment are smaller than that of non-reciprocal environment.

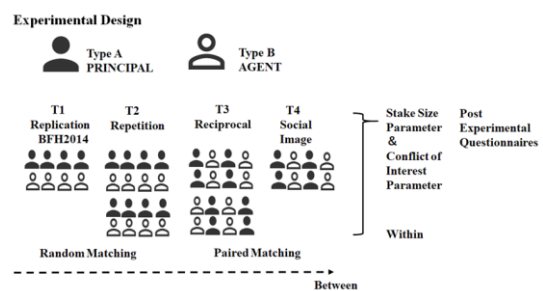


Fig. 1 Design of experiment

¹ Pure reciprocal treatment was difficult for some technical problems and financial constraint.

Hypothesis 1. The IV of Treatment 3 are smaller than T1.

There are growing literatures on the role of social image in the experimental economics, for example it is known that identifying partner's face will increase the amount of donations in the dictator game experiments. Thus, we hypothesize the intrinsic value of decision rights in social image environment are smaller than that of non-social image environment.

Hypothesis 2. The IV of Treatment 4 are smaller than T1.

We can obtain the pure effect of reciprocal relationship from the subtraction between T3 and T4. If the pure effect of reciprocal relationship exists, the subtraction from T4 to T3 are positive. Thus, we hypothesize below.

Hypothesis 3. The IV of the subtraction Treatment 4 and Treatment 3 are positive.

We did not change lottery game in T3 and T4 because of BHF implicitly assume the conditional effect in delegation game are projected to P's project choice, E and \underline{e} . Different points to T1 in experimental conditionings are, thus, reciprocal condition and matching in delegation games. We can test additionally within treatment condition stake size and conflict of interests. There are two levels in stake size, as shown in Table 1, payoff and cost parameters in game 6 to 10 are doubled in game 1 to 5. There are three levels in conflict of interests, Conflict of interest is defined as the principal's relative payoff difference between project alternatives A and B, denoted as $\alpha = (P_B - P_0) / (P_A - P_0)$. We can see Games 5 and 10 have "no conflict of interest" ($\alpha = 1$), games 1, 2, 6, and 7 have a "low conflict of interest" ($\alpha = 0.75$), and games 3, 4, 8, and 9 have a "high conflict of interest" ($\alpha = 0.5$).

3. Results

3.1. Basic statistics

In total 596 subjects are participated in this experiment, and 298 principals expressed their intrinsic value of decision rights. As shown in Table 4, Females are 144 (48.32%). Ages of subject were between 18 and 24 (median 21).

3.2. Intrinsic value of decision rights between Treatments

In the rest of the section, we analyze the intrinsic value of decision rights as measured by the distance in certainty equivalents of the delegation lotteries and the control lotteries: $IV = ce(DL) - ce(CL)$.

The main results of our experiment in Figure 2, x axis is treatment conditions, y axis is mean IV. Figure. 3 presents mean IV comparison among Treatments. The mean value of T1 is 27.6, and T3 is 22.1, thus IV in T3 is significantly smaller than that of Treatment 1 at 5% level ($p = 0.041$, Welch)³. This result suggests that on the average reciprocal environment have negative impact on the IV.

Result 1: Reciprocal treatment significantly decreases subject's average IV.

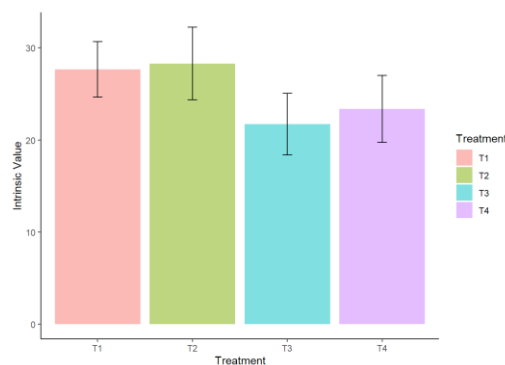


Fig.2 Mean IV comparison of treatments, error bar shows one standard error of mean

Mean IV of T4 is not significantly smaller than that

	OLS 1		OLS 2		OLS 3		OLS 4	
	Estimates	Std. error	Estimates	Std. error	Estimates	Std. error	Estimates	Std. error
Constant	6.259*	3.457	6.042*	3.415	7.087**	3.004	10.857***	2.926
Conflict 0.75	15.312***	3.192	6.842	5.453	15.312***	3.198	10.977***	2.794
Conflict *1	24.100***	5.667	42.125***	9.739	24.100***	5.656	9.780**	4.655
Stake Size (Double)	20.929***	3.35	20.929***	3.326	19.274***	5.785	11.733***	3.296
T2 Dummy	0.632	4.767	-3.979	4.814	-5.382	3.961	0.632	4.73
T3 Dummy	-1.904	4.248	1.57	4.59	-0.55	3.758	-1.904	4.248
T4 Dummy	-4.298	4.612	-2.594	4.533	-3.232	4.126	-4.298	4.6
T2*Conflict0.75			10.102	9.144				
T2*Conflict 1			2.847	15.757				
T3*Conflict0.75			10.619	7.756				
T3*Conflict 1			-38.612***	14.911				
T4*Conflict0.75			13.313	8.967				
T4*Conflict 1			-35.145**	14.904				
T2*StakeSizeDouble					12.026	9.527		
T3*StakeSizeDouble					-2.71	8.502		
T4*StakeSizeDouble					-2.133	9.23		
Stakesize*Conflict0.75							8.67	6.378
Stakesize*Conflict1							28.640**	11.28
R2		0.046		0.063		0.048		0.053
R2 Adj.		0.042		0.056		0.043		0.047
N		1500		1500		1500		1500

Notes: * p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors are clustered at subject level.

of Treatment 1 at 5% level ($p = 0.48$, Welch). We can not reject null hypothesis that social image condition affects intrinsic value of decision rights.

Result 2: Social image environment has not statistically significant effect on IV.

Next, we test the existence of pure effect of reciprocal environment. We test the hypothesis;

$$H_0: T4 \text{ mean IV} - T3 \text{ mean IV} > 0$$

Result 3: IV subtraction T3 and T4 is positive but not statistically significant.

As a result, we cannot reject null hypothesis there is no difference between T4 IV and T3 IV ($p = 0.414$, Welch). The result indicated that our experiment failed to extract pure effect of reciprocity.

3.3. Regression analysis on situational determinants to intrinsic value of decision rights.

To clarify the situational determinants to intrinsic value of decision rights, we run four OLS regression models. As shown in Table 5, the larger stake size, the higher IV in all four regression models. The conflict of interest is also positive impact on IV. These results are

consistent with BHF.

To understand the direction of the impact of reciprocal environments and conflicts of interest on the value of decision rights, we estimate OLS 2 by including a cross term between Treatment 3 and conflicts of interest in the model. We find that the cross term has a negative impact on the value of decision rights.

Result 4: Stake size have positive impact on subject's average IV in reciprocal environment T3.

We also find the cross term T4 and Conflict of interest 1 has a negative impact on the value of decision rights. On the contrary to strongest conflict, the sign of cross term T3 and Conflict of interest 0.75 is positive. It is common to cross term T4 and Conflict of interest 0.75. These results revealed a tendency to release the decision rights when there was a significant conflict of interest when it was known who the opponent was.

Additionally, cross term stake size and treatment has no significant impact on IV. As shown in OLS 3 in Table 5, coefficient of stake size and T2 has positive sign, but stake size and T3, T4 has negative sign. These results

support the result 1 that reciprocity plays a role in decreasing the IV.

4. Conclusion

Recent years, there is growing literatures on the insight on control problems and decision rights. From the view point of agent, Falk and Kosfeld (2006) have shown that people exhibit an aversion to be controlled by goal setting. As for the reason why these aversions exist, Burdin, Halliday, & Landini (2018) showed in an experiment using third-party goal-setting conditions that the existence of a reciprocal relationship between principal and agent leads to an agent's reluctance to be controlled.

There has been less research on authority where principals try to have control over decisions compared to the issue of agents' aversion to being in control. However, Fehr, Herz & Wilkening (2013) have opened the way to study that principal valuing their own decision-making authority, and Bartling, Herz, & Fehr (2014) have developed a mechanism to measure the value of principal decision-making. Further, Ferreira, Hanaki, & Taroux (2020) clarified the origin of the intrinsic value of decision rights which come from principal has desire to implement their own choice projects. The present paper challenges to clear relationship between reciprocal environment and intrinsic value of decision rights.

Our results indicate that People in a reciprocal environment place less value on making their own decisions. This is something that must be fully taken into account in organizational design. In addition, the greater the conflict of interest, the less likely people in a reciprocal environment will be willing to take decision rights for themselves in a reciprocal environment, which could provide a new perspective on leadership theory and management organization theory in management studies.

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