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An Experimental Investigation of Charity Rebates^{*}

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Abstract

We investigate experimentally the effects of various sources of rebates on charity donation. Subjects first play a repeated public good game (PGG) with either a low or a high endowment and then have an option to donate to a charity. They may receive a rebate on their donation either exogenously (from the experimenter) or endogenously (from the public account of the PGG), or a rebate might not be available. When the PGG endowment level is low, the endogenous rebate scheme has a negative effect on charity giving. The exogenous rebate scheme, however, does not have any such effect. If the endowment level is high and the rebate is endogenous, then other-regarding preferences become salient and boost up charity donation. Females donate more than males, but only under the endogenous rebate scheme. These results shed light on the effects of the rebate schemes on different income and demographic factors, and provide with relevant policy implications.

JEL Classifications: C91; C92; D64

Keywords: Altruism; Donation; Rebate; Dictator game; Public good game

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1. Introduction

The charity sector, also known as the voluntary sector, is an integral part of an economy and contributes significantly towards the overall welfare. In the UK, for example, the contribution of the voluntary sector into the gross value added (GVA) was £17,1 billion in 2016, while in the same year the contribution of the agriculture sector was only £8,6 billion.¹ Governments from around the world, as a result, are keen on understanding the possible incentive schemes to increase contributions to charity. Furthermore, as Dhami and Al-Nowaihi (2010) indicate, one of the main stylized facts in charity donations is that “*Individual private donors are the largest contributors*”. Hence, it is not surprising that a substantial amount of research has also been carried out to understand the determining factors of individual charity giving and the ways to increase amount given by the individual donors.

While various topics are discussed in the charity donation literature, a popular issue that remains active is the role of charity rebate and its effects on the giving behavior. The theoretical literature on providing rebates for charity donations delineates two effects. First, a rebate will have a direct effect in increasing total charity donations through the channels such as warm glow (Andreoni, 1990), price of giving (Eckel and Grossman, 2003) or conspicuous consumption (Glazer and Konrad, 1996). But, it may also have a negative effect through crowding out (Warr, 1982). In the experimental literature, a rebate is often introduced into a dictator game and the giving is then compared to the case of no rebate in order to test the effects of framing the rebate on the charity donation (Eckel and Grossman, 2003, 2006, 2008; Davis et al., 2005; Davis, 2006). It, however, is rarely examined how the source of the rebate may affect charity donation.

This question is of high importance since this investigation is capable of capturing specific mechanisms behind the decision to give and the amount given that are hitherto overlooked in the literature. When a subsidy / rebate mechanism is employed in the laboratory, it is provided by the experimenter and is thus exogenous to the system. This setting is contrary to most of the field situations. A tax reduction, for example, is equivalent to the rebate or subsidy in the experiment. But since it is budgeted by the tax revenue of the government, in reality it is endogenous to the system. It is well possible that an endogenous rebate scheme results in a very different charity donation pattern than an exogenous one. It may also be possible that this variation itself is diverse across agents – in terms of financial and demographic factors. In this study we introduce an experiment to investigate these issues.

¹ See www.ncvo.org.uk for further detail.

To supplement the gap between real life and the experimental literature, we employ a rebate scheme in which the cost of giving to the charity is budgeted endogenously. Overall, we allow three alternative between-subject charity rebate schemes: no rebate, exogenous rebate, and endogenous rebate. Subjects first engage in a repeated public good game (PGG) with either a low or a high endowment, and then have an option to donate to a charity in a dictator game (DG). When a rebate on donation is available, subjects receive rebate either exogenously (from the experimenter) or endogenously (from the public account of the PGG).

To the best of our knowledge, Chavanne et al. (2011) is the only other study that discusses the relationship between the source of rebate and giving. They demonstrate that the amount given increases only when the experimenter funds the rebate. There are, however, fundamental differences between the current study and Chavanne et al. (2011). To investigate the effects of the source of rebate, Chavanne et al. (2011) use a modified dictator game in which dictators are allowed to spend other group members' endowments to their recipients. As a result, not only they share the cost of giving with others, but they also receive the identical payoff with group members. On the contrary, each subject in our experiment decides how to divide his own endowment between himself and a real charity, although the cost of giving is shared by group members and the individual payoff is not identical across group members.

We employ two different endowment levels in the PGG to capture a possible income effect on giving and any interaction effect with the rebate schemes chosen. It is well known that income level is one of the most important components to explain giving behavior. When an individual has higher income, it leads to a higher donation (Feldstein and Clotfelter, 1976; Andreoni, 1990; Randolph, 1995; Auten et al., 2000, 2002; Andreoni and Vesterlund, 2001; Eckel and Grossman, 2003; Buckley and Croson, 2006; Chowdhury and Jeon, 2014). Hence, it might be possible that a particular rebate scheme affects the giving behavior of agents at a certain income level.

Incorporating the discussions above, we intend to answer the following questions. Is the endogenous rebate scheme as effective in increasing the total level of donations as the exogenous rebate scheme? Does an increase in income increase donation, as has been identified in the literature, independently of the different type of rebate schemes? Furthermore, it is observed in the literature that females are often more generous in terms of charity giving than their male counterpart (Engel, 2010). It is, therefore, of interest to investigate whether the alternative rebate schemes affect male and female donors' behavior differently.

The main results of this study are as follows. The endogenous rebate scheme affects Rich (high PGG endowment) and Poor (low PGG endowment) subjects differently. For Poor subjects the endogenous rebate has a significant negative impact on DG giving, whereas this has no significant effect on Rich subjects. Additionally, the exogenous rebate scheme, the traditional way to adopt the rebate in an experiment, does not have any significant effect on giving. This is in contradiction to a large part of the existing literature.

We further employ the level of contribution in the first round of the PGG as an index of other-regarding preferences. In the high endowment treatments under the endogenous rebate scheme, the pro-social type subjects in the PGG donate also more in the DG compare to selfish participants. But under similar treatments when the rebate scheme is exogenous, there is no difference between the level of donation of pro-social type and selfish type subjects. These results show that other-regarding preferences become salient under endogenous rebate scheme for the pro-social Rich subjects. Our results also shed light on the gender difference with respect to the rebate schemes. Females are more generous than their male counterparts, but only when the rebate is endogenous – indicating a possible need for demographic specific rebate policy.

The rest of the paper proceeds as follows. In Section 2 we describe the experimental design and procedures. Section 3 presents the main results and Section 4 concludes.

2. Experimental design and procedure

We employ a 2×3 factorial design in which in one dimension the endowment is varied in the PGG and, in another, the rebate scheme is varied in the DG. Table 1 summarizes the design.

Table 1. Experimental Design

Rebate Endowment	Baseline (No Rebate)	Exogenous Rebate	Endogenous Rebate
Low Endowment (100 ECUs)	BSL-LOW 32 Obs.	EXO-LOW 36 Obs.	END-LOW 36 Obs.
High Endowment (1000 ECUs)	BSL-HIGH 36 Obs.	EXO-HIGH 36 Obs.	END-HIGH 36 Obs.

Each treatment consists of two parts. The first part is a four-player PGG with partner matching repeated for 20 rounds, and the second part is an individual DG in which the recipient is a real charity.² The subjects know that the experiment consists of two parts, but they are not aware of the contents of the second part when they are involved in the first part. This is done to eliminate any possible expectation effects about the second part on the decision made in the first part of the experiment.

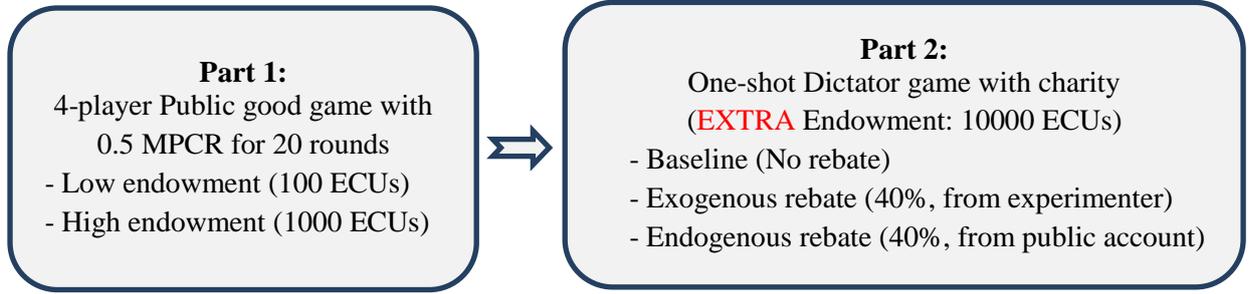
In the first part of the experiment, depending on the treatment, in each round of the PGG subjects are endowed either with 100 Experimental Currency Units (ECUs) or with 1000 ECUs and have to decide how much they will contribute to a public account. The ECUs contributed to the public account is returned to each group member as a payoff of 0.5 ECU (Marginal Per Capita Return (MPCR) = 0.5). At the end of each round, subjects receive information about the current and the past payoffs from the public and the private accounts. However, they are able to infer only the average contribution of other group members, but not their specific decisions.

In the second part of the experiment, subjects play a variation of the dictator game. 10000 additional ECUs are given to each subject as an endowment and they have the opportunity to divide the additional endowment between themselves and the charity as the recipient. Dictators are not allowed to use their incomes from the PGG for the donation purposes, thus the donation amount is between 0 and 10000 ECUs. Furthermore, we introduce three rebate scheme treatments for the Dictator to compensate the cost of donation.

The schemes are no rebate (Baseline), exogenous rebate and endogenous rebate. In the case of a 'no rebate', the second part of the experiment is identical to a standard dictator game with charity. In the exogenous rebate scheme, a subject receives a rebate of 40% of his donation from the experimenter. The endogenous rebate scheme is similar to the exogenous, except for the source of the rebate. Under this latter scheme, a subject receives the same 40% rebate for his donation, but the amount comes from the public good account of the PGG from the first part of the experiment. Group members of the PGG share the cost of their rebates, so the payoffs from the PGG and the DG are linked. Figure 1 summarizes the experimental procedure.

² The Charity is 'Aldeas Infantiles SOS' (SOS Children's Villages). It is an international charity supporting needy children, and their families and communities.

Figure 1. Experimental procedure



The total payoff of a subject is the sum of the payoff from the PGG and the endowment that he keeps in the DG. Formally, the payoff of player i under the no rebate scheme is:

$$\pi_i^{NR} = \pi_i^{PGG} + \pi_i^{DG} = \sum_{t=1}^{20} \left\{ e_P - c_{it} + \frac{b}{n} \sum_{j=1}^n c_{jt} \right\} + e_d - d_i \quad (1)$$

We denote e_P to the PGG endowment, e_d the DG endowment, c_{it} refers to the player i 's contribution to the public account in the PGG at time t , d_i is player i 's donation to the charity, n identify the group size in the PGG that is equal to 4 participants and b is the marginal per capita return (MPCR) and is 0.5.

With the exogenous rebate scheme, the payoff of player i is the sum of the benefits from the PGG, the endowment kept in the DG and the rebate given exogenously.

$$\pi_i^{EXO} = \pi_i^{PGG} + \pi_i^{DG} = \sum_{t=1}^{20} \left\{ e_P - c_{it} + \frac{b}{n} \sum_{j=1}^n c_{jt} \right\} + e_d - (1 - r)d_i \quad (2)$$

where r is the rebate rate and is equal to 0.4.

The payoff of player i under the endogenous rebate scheme is similar to (2), except for the source of the rebate that comes from the group benefits of PGG.

$$\begin{aligned} \pi_i^{END} &= \pi_i^{PGG} + \pi_i^{DG} = \sum_{t=1}^{20} \left\{ e_P - c_{it} + \frac{b}{n} \sum_{j=1}^n c_{jt} \right\} + e_d - (1 - r)d_i - \frac{r}{n} \sum_{j=1}^n d_j \\ \therefore \pi_i^{END} &= \sum_{t=1}^{20} \{ e_P - c_{it} \} + e_d - (1 - r)d_i + \frac{1}{n} \sum_{j=1}^n \{ b \sum_{t=1}^{20} c_{jt} - r d_j \} \end{aligned} \quad (3)$$

The rebate rate is also 0.4.

We recruited 212 economics and business undergraduate students at the University of Valencia. Six computerized sessions, each for a treatment, were conducted, using z-tree (Fischbacher 2007). Each session had 36 subjects except one (BSL-LOW) that had 32 subjects.

Subjects were randomly allocated to private cubicles and the experimenter read the instruction of the first part aloud. Then subjects answered a pre-experimental questionnaire and played the PGG. Before starting the second part, the experimenter distributed the instruction for the DG and also read it aloud. Moreover, she read the charity's main goal extracted from the charity's webpage. Once everybody finished making decisions, the experimenter announced the total donation made in the room and transformed the total ECUs to be passed to the Charity in Euros. The exchange rate (2000 ECUs = 1 Euro) was a common knowledge. The donation to the charity was done via internet in real time and participants could follow the process through a projector. A randomly selected participant was chosen to supervise the process. The average earnings were 8.50 Euros in the low endowment treatments and 19.50 Euros in the high endowment treatments. The sessions lasted for around 90 minutes.

3. Results

In this section we first report the relevant descriptive statistics and then analyze the effects of the rebate mechanisms and the level of PGG endowments on DG giving. To capture the intrinsic motivation in social behavior, we further investigate the relationship between the contribution in the first round of the PGG and the charity donation. Finally, we investigate how gender affects the decisions on charity donation.

3.1. Descriptive statistics

Table 2 reports average earnings in the PGG by treatment. Since the PGG is adopted to replicate the rebate source in the real life and the main question of this study is to investigate how the source of rebate influences individual's giving behavior, we describe briefly average earnings over treatment from the PGG. Note, however, that since the contents of the second part of the experiment were unknown to the subjects, there should not be any systematic difference between treatments with same endowments.

Table 2. Average (standard deviations) earnings in the public good game

	Baseline (No Rebate)	Exogenous Rebate	Endogenous Rebate	All
Low Endowment	2583.88 (352.81)	2625.53 (290.90)	2751.33 (456.67)	2656.26 (377.09)
High Endowment	23473.97 (2322.81)	26645.28 (4578.06)	26773.03 (3627.02)	25630.76 (3908.19)

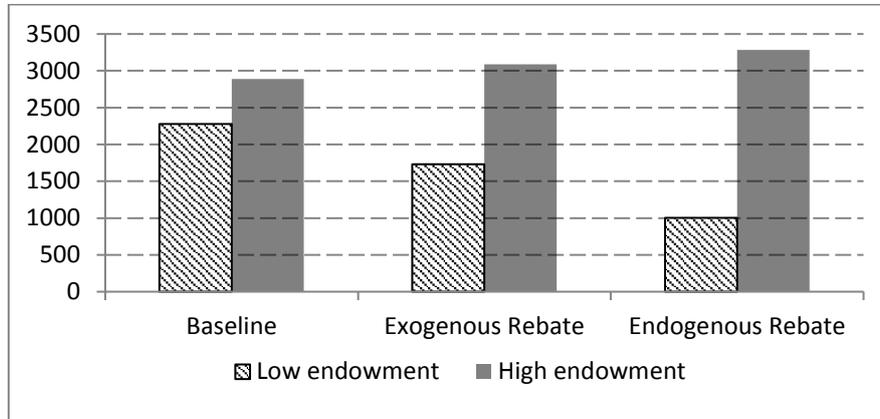
For the case of low endowment, subjects overall earned around 2656 ECUs, and the differences in average earnings across rebate schemes are not statistically significant. Overall average earnings for high endowment is around 25630 ECUs, and average earnings between two rebate schemes, END-HIGH and EXO-HIGH are not significantly different. However one for the BSL-HIGH is significantly less than in the other two rebate schemes.³ It might be caused by the fact that somehow there are more free riders in the BSL-HIGH treatment than in the others. Furthermore, in order to compare the high and the low endowment groups directly, we scaled the earnings of the high endowment group by 1/10 and found that average earnings across all the treatments except BSL-HIGH are not statistically different. The difference in average earnings between the BSL-HIGH and other treatments, however, did not have any significant effect on any of our further analyses.

Turning to the second part of the experiment, Figure 2 depicts the average donations to the charity by treatment in the DG. Recall that an additional endowment was given to the dictators separately, and the earnings from the PGG could not be used in the DG. Comparing average donations between the low and the high endowment groups, we find that the donation in the high endowment group is on average higher. This is in line with the result obtained by Chowdhury and Jeon (2014). They find that the dictators increase the giving amount with an increase in their wealth. Furthermore, this difference becomes more prominent when rebate schemes are introduced. In the baseline treatment, the difference is 610 ECUs but it becomes 1361 ECUs and 2279 ECUs in the exogenous and endogenous

³ Mann-Whitney Test summary BSL-HIGH vs EXO-HIGH: p-value = 0.0015; BSL-HIGH vs END-HIGH: p-value = 0.0002

rebate treatments, respectively. However, the difference is only significant under the endogenous rebate treatment.⁴

Figure 2. Average donations by treatments



Even for the same endowment, rebates play very different roles. For low endowment, the introduction of a rebate reduces the amount donated, with a higher degree of reduction of donation for the endogenous rebate scheme. The average donation in the baseline treatment is 2278 ECUs, but it drops down to 1729 ECUs and 1002 ECUs in the exogenous and endogenous treatments. On the other hand, rebate treatments have positive effects on the giving behaviors in the high endowment treatments. With no rebate, the average donation is 2888 ECUs; whereas average donations go up to 3088 ECUs and further to 3281 ECUs with exogenous and endogenous rebates. These differences, however, are not statistically significant.⁵

From the distribution of average donations across treatments we observe that the level of endowment in the PGG and the rebate scheme in the DG can have heterogeneous effects on giving behavior. We observe a monotonically decrease in donation under the low endowment treatment when we move from the exogenous to the endogenous rebate. However, the average giving increases with any positive rebate scheme under high endowment. Hence, it may be possible that the amount given to the charity is affected differently depending on the treatment we implement. Next, we analyze this issue.

3.2. Treatment effects

⁴ Mann-Whitney Test summary BSL-LOW vs. BSL-HIGH: p-value = 0.25; EXO-LOW vs. EXO-HIGH: p-value = 0.19; END-LOW vs. END-HIGH: p-value = 0.0009.

⁵ Mann-Whitney Test summary BSL-LOW vs. EXO-LOW: p-value = 0.84; BSL-LOW vs. END-LOW: p-value = 0.20; EXO-LOW vs. END-LOW: p-value = 0.20; BSL-HIGH vs. EXO-HIGH: p-value = 0.92; BSL-HIGH vs. END-HIGH: p-value = 0.56; EXO-HIGH vs. END-HIGH: p-value = 0.62.

Now we estimate the effects of the rebate schemes on the giving behavior under a specific endowment level. Since there are a number of dictators who make a zero donation in each treatment⁶, we employ the Tobit model to investigate how much a subject actually donates to the charity. The dependent variable in the Tobit model is the amount given to the charity. EXO and END are treatment dummies for the exogenous and the endogenous rebate schemes respectively (with no-rebate treatment used as the baseline). Profit in PGG is the total earnings from the PGG. We include this to control for any possible income effect that may arise from the first part of the experiment. Female is a dummy variable depicting a female dictator, and NGO is a dummy variable indicating whether the subject self-reported to be a member of NGOs.

Table 3. Treatment effect: Tobit model
Dependent variable: amount donated in the Dictator Game

	Low Endowment		High Endowment	
	(1)	(2)	(3)	(4)
EXO	-521.47 (822.22)	-952.87 (826.13)	-394.56 (1061.25)	-420.37 (1053.40)
END	-1778.18** (851.25)	-1983.02** (837.22)	39.71 (1051.07)	-57.46 (1051.82)
Profit in PGG	0.32 (0.93)	0.47 (0.96)	0.14 (0.11)	0.16 (0.11)
Female		754.98 (709.69)		308.28 (852.59)
NGO		1726.23** (696.66)		1654.91** (804.39)
Constant	730.62 (2485.62)	-747.69 (2564.65)	-952.40 (2746.25)	-2656.91 (2915.59)
# of Obs.	104	103	108	108

Standard errors in parentheses; ***, ** and * indicate significance at the 1%, 5%, and 10% level.

Table 3 includes the results of Tobit regressions for the two endowment levels with and without controlling for the demographic variables. The rebate schemes play very different roles in determining the giving behavior. For exogenous rebate, the price of giving 1 ECU is 0.6; hence in line with existing studies showing that giving is price elastic, one would

⁶ Here are the percentages of dictators with zero donations by treatment: 34.39% for BSL-LOW, 30.56% for EXO-LOW, 44.44% for END-LOW, 25% for BSL-HIGH, 30.56% for EXO-HIGH and 22.22% for END-HIGH. We run Probit regressions to check whether the rebate schemes affect dictator's positive donation. There are, however, no treatment effects on the likelihood of making a positive donation. The results are reported in Appendix I.

expect the donation to increase.⁷ We, however, find that exogenous rebate scheme does not have a significant effect on the charity donation. Although uncommon, this phenomenon is not unheard of. Marcuello and Sala (2001) among others also find no crowding-out effect (among Spanish subjects), which in spirit is similar to our result.

More interestingly, the endogenous rebate scheme has significant effects, but only under the low endowment treatments. This scheme decreases the amount of charity donation by 1778 and 1983 ECUs (17.8% and 19.8% of the endowment given) compared with the BSL. This may come from three channels: the preference for the rebate system, warm glow, and money perception. First, the donors realize that an endogenous rebate scheme will essentially be cross subsidized from another source, and they might not be favorable to this idea. They may also anticipate that some of the other dictators will donate some amount that will reduce the final PGG payoff, and as a result their own total payoff. To compensate for the reduction of the PGG payoff, they reduce their own giving. Second, part of the warm glow effects gets reduced when the rebate scheme is introduced, possibly mediated by a crowding out effect, and as a result the donors donate less. Third, although the monetary income from the PGG is controlled for in the regressions, we expect that the level of income from the PGG has a negative effect on individuals' money perception and the amount of donation becomes sensitive to the income level. Wiepking and Breeze (2012) summarize the effects of money perception on giving behavior, asserting a negative relationship between financial income and money perception (in terms of retention and inadequacy). They show that those who feel more financially insecure are willing to donate less. In our setting of the PGG a subject with a low endowment earns significantly less and the average earning under low endowment is significantly lower than the endowment given for the dictator game. This may cause the subjects in the low endowment to become cautious and more worried about their financial situation. In END-LOW, all these three effects work in the negative direction and as a result the charity donation declines. However, in END-HIGH, although the first two sources impose negative effects, money perception brings in a positive effect on giving. Consequently the variable END turns out to be not significant in the regressions under high endowment.⁸

⁷ There is a stream of literature (Feldstein and Clotfelter, 1976; Feldstein and Taylor, 1976; Clotfelter, 1985; Feenberg, 1987; Randolph, 1995; O'Neil et al., 1996; Jouffaian, 2000; Tiehen, 2001; Auten et al., 2002; Eckel and Grossman, 2003, 2006, 2008; List 2011) that investigate similar issues.

⁸ No statistical difference between EXO and END are found. Mann-Whitney Test summary EXO-LOW vs. END-LOW: p.value=0.1962; EXO-HIGH vs. END-HIGH p.value=0.6161

These results may provide directions regarding employment of subsidy schemes for charity donation across income levels. If an endogenous rebate scheme is implemented to encourage charity giving regardless of income level, it might not only fail to increase the charity amount, but may also result in a reduction in donation from the lower income donors.

Focusing on the demographics, subjects who reported to be members of NGOs are more likely to donate a larger amount. This may occur due to two reasons. First, the membership might indicate an intrinsic altruistic nature of those subjects. Second, it might be that subjects try to justify their behavior and report the NGO membership accordingly. Hence, it is important to investigate the relationship between revealed social preference and corresponding giving behavior.

3.3. Social preference types and charity donation

The PGG in the first part of the experiment also allows us to further analyze the relative social preferences of the subjects. If a subject is relatively more other-regarding compared to his group member(s) in the PGG, he might contribute more than others. This, in turn, may reflect his behavior in the DG. To capture this, we rank the subjects in ascending order of their public good contribution in the very first round (in case of a tie, we compare their contributions in the next round to decide upon their ranks). Then, we categorize the subjects as two types: pro-social and selfish. Pro-social type includes subjects who contributed the highest or the second highest amount in their group. People who are not pro-social type are defined as selfish type.

Figure 3 and Figure 4 show the average donations of pro-social and selfish types by rebate scheme for the two endowment levels (the corresponding table is reported in the Appendix). In Figure 3 (Low endowment), regardless of the type, the introduction of any rebate scheme tends to decrease the average donations by group. This is in line with the pattern of the low endowment case we discussed in the previous section.⁹ This behavior could be due to a crowding out effect. Pro-social participants' intrinsic motivation is crowd out as the price of giving decrease (exogenous and endogenous treatments compare with baseline). The same pattern is observed for the selfish participants. However in Figure 4, where subjects have a high level of endowment in the PGG, the average donations by type vary extensively. A movement from exogenous rebate to no rebate to endogenous rebate scheme has opposite effects on the pro-social and on the selfish types. Under the exogenous scheme,

⁹ Mann-Whitney Test summary BSL-HIGH Pro-social vs. Selfish: p-value = 0.057; END-HIGH Pro-social vs. Selfish: p-value = 0.033

the average donation by the pro-social type is slightly lower than the one by the selfish type, but the difference is not significant. On the other hand, the pro-social type donates significantly higher amounts than the selfish ones in the baseline and in the endogenous scheme

Figure 3. Average donation by player type and rebate scheme: Low endowment

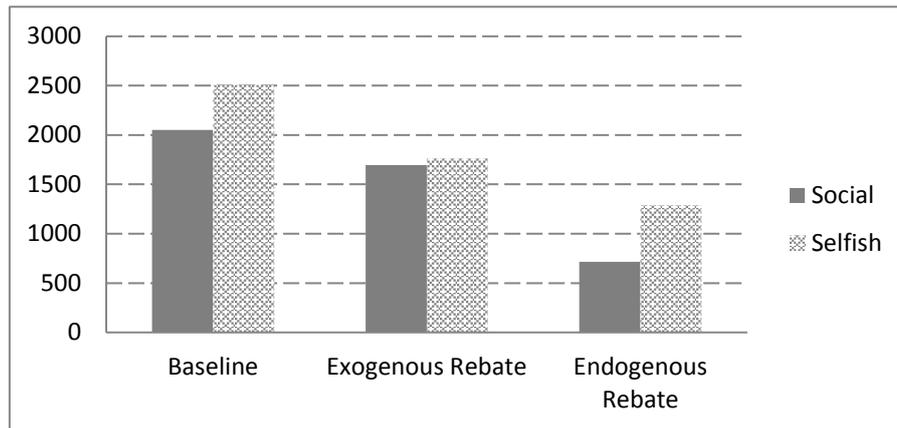
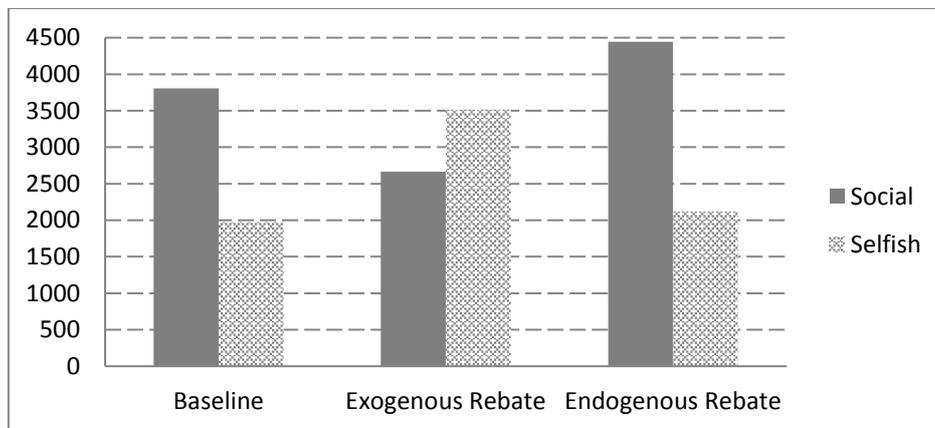


Figure 4. Average donation by player type and rebate scheme: High endowment



We further investigate the effects of the other-regarding preference defined by social types on the actual amount donated for each rebate treatment using a Tobit model. The results are summarized in Table 4. In the analyses reported, the total PGG earnings and demographic variables are employed as controls. The results remain qualitatively same even otherwise.

We introduce a dummy variable SOCIAL TYPE taking value 1 if the subject is of pro-social type. This variable turns out to be highly significant and positive while regressing on the amount donated in the BSL-HIGH and END-HIGH treatments. Pro-social type subjects in the BSL-HIGH treatment are willing to donate around 2413 ECUs more than the selfish type subjects. Similarly in the END-HIGH treatment, the donation by the pro-social

type is on average 3043 ECUs higher than the one by the selfish types. However, pro-social type does not have any significant effect on the charity donation in other treatments. Hence, this result reaffirms that other-regarding preference in the PGG does not matter in determining the donation level in the case of low endowments. In the case of high endowment, it matters except when the rebate scheme is exogenous.

We believe that these results are mainly driven by a combination of money perception effect and other-regarding preference. As discussed in the previous section, the low income level may be prone to the feeling of preservation and worry about financial status. When the endowment is low in the PGG, the effect of money perception dominates the other-regarding preference. Thus the coefficient of pro-social group is insignificant across all the treatments with the low endowment. However if the endowment in (and as a result, income earned from) the PGG is high enough, then the other-regarding preference becomes prominent and has significantly positive effects on giving.¹⁰ Also, this effect can be reinforced with a social image effect.(Andreoni and Bernheim, 2009; Ariely et al. 2009). As in the endogenous treatment participants will know the total cost of his group total donation, pro-social participants would want to signal how social they are and for hence they will increase their level of donation compare with the other treatments.

The non-parametric results discussed above and regression results in Table 4 confirm that when there is no rebate or the rebate is endogenous in the high endowment, the pro-social type is more generous than the selfish one. Interestingly the EXO-HIGH treatment shows a different pattern from BSL-HIGH and END-HIGH treatment. In the EXO-HIGH treatment, the total earnings in the PGG become significant rather than the other-regarding preference. It is possible to explain this in terms of the price elasticity of giving. Since the price of altruism is the lowest with the exogenous rebate scheme, it increases the average donation even for the selfish subjects, but decrease for social type as a consequence of a crowding out effect. Hence, the SOCIAL TYPE turns out to be not significant in the regression.

The coefficient of FEMALE is significant and positive in both END treatments, i.e., females are more generous under the endogenous rebate scheme. Since the price of giving is lower under the endogenous scheme (compared to baseline), at a first glance, this result is in contradiction with the ones by Andreoni and Vesterlund (2001) who find females to be more generous when the price of giving is higher. But, since in the endogenous scheme the rebate

¹⁰ This may also be viewed through the lenses of Impure Altruism. See Andreoni (1990) for the theoretical background and Chowdhury and Jeon (2014) for the mechanisms through which this effect may take place.

comes from the PGG account, the real price of giving depends on the total donation made by group members of the PGG. Hence, this structure is not appropriate to compare to the Andreoni and Vesterlund (2001) analysis. This result, however, is comparable to the ones in Rigdon and Levin (2011) who show that females tend to make higher donations than males when they have to perceive about the possible giving by others.

Table 4. Effects of social preference: Tobit regressions

	BSL-LOW	EXO-LOW	END-LOW	BSL-HIGH	EXO-HIGH	END-HIGH
SOCIAL TYPE	54.09 (1816.87)	-57.47 (1408.63)	-682.14 (762.36)	2412.89*** (665.87)	58.03 (2005.26)	3042.62*** (799.36)
PROFIT IN PGG	3.14 (1.70)	-2.21 (2.19)	-0.39 (0.54)	-0.03 (0.16)	0.35* (0.16)	0.07 (0.12)
FEMALE	823.72 (1474.55)	-265.74 (998.54)	1793.64* (822.81)	-2197.70 (2137.05)	-1497.85 (1841.96)	2741.61** (781.47)
NGO	4375.05** (1428.97)	19.56 (1442.19)	548.42 (538.92)	1190.40 (1585.82)	3730.45* (1369.59)	-754.82 (699.04)
Constant	-8864.03 (5589.01)	6979.44 (6449.13)	379.17 (1742.68)	3030.21 (5969.90)	-8062.47 (5541.27)	-1567.13 (3412.46)
# of Obs.	32	35	36	36	36	36

Standard errors are in parentheses; ***, ** and * indicate significance at the 0.1%, 1%, and 5% level.

4. Discussion

The existing experimental literature on charity rebate rarely considers the source of the rebate budget, and assumes it to be exogenous. In this study we investigate the effects of the sources of charity rebate on donor behavior. We adopt a two part game consisting of a public good game in the first part and a dictator game with real charity in the second. Different rebate schemes that are funded either by the experimenter or from the public account in the public good game are introduced in the dictator game to distinguish between the exogenous versus endogenous source of the rebate. To incorporate any possible interaction with income effect, we also employ either a high or a low endowment level in the public good game.

The results show that giving behavior crucially depends both on the type of rebate scheme and the endowment amount in the public good game. Subjects having a low level of the endowment decrease the amount given to the charity when the rebate is budgeted endogenously. This result may be driven by three factors; preference for the rebate system, warm glow and money perception. The structure of endogenous rebate scheme reduces both the willingness of donation and warm glow, and the low level of the endowment brings up the response of retention and inadequacy and as a result the donation is reduced. On the other hand, in the high endowment treatment under endogenous scheme, social image combined with other-regarding preference become salient and have significant positive effects on giving. Furthermore, the exogenous rebate scheme (the standard treatment in the experimental literature) does not have a significant effect on charity donation across endowment levels. Our results also indicate gender difference when the endogenous rebate was implemented. Since dictator's decision is endogenous with the expectation for group members' donations, female subjects are more generous than males when the rebate scheme is endogenous.

It is important to note that this experiment was run in Spain, which has a specific donation culture different from the United State or the United Kingdom where most of experiments were run earlier. Spain is ranked fourteenth in terms of 2018 GDP, whereas the United State and the United Kingdom are first and fifth respectively. However, according to the World Giving Index 2018, Spain is ranked fifty fourth in terms of the percentage of donating money to charity, volunteering time, and helping a stranger, whereas the United States and the United Kingdom are the fourth and the sixth. If we consider only the percentage of people who make a charity donation, thirty five percent people in Spain had given to a charity; but sixty one percent and sixth eight percent of people in the US and the UK had done so. Thus the donation culture may be a factor in explaining some of the current results that are not in line with the existing literature.¹¹

The fact that subjects with different endowment react differently with endogenous rebate scheme is highly relevant in designing policies. These results show that policy makers should be careful in implementing a blanket rebate scheme to encourage charity donation. Current rebate schemes (equivalent to the endogenous rebate) may not have any effect to increase donations among the high income people, but it might cause a decrease in the donation from the lower income people. Moreover if an individual is self-regarding, a tax

¹¹ See Marcuello and Salas (2001) for further discussions in related issues.

deduction for charity donation may have positive influence on the giving and might result in an increase in donation. However the effects of the endogenous rebate scheme may be different across the countries due to the donation culture, the distribution of income and social types. Hence, a policy maker needs to take account of these issues as well.

There are many ways this research can be extended. A real effort wage scheme can replace the public good game. It is also possible to introduce tax to bring this frame closer to field observations. A mix of exogenous and endogenous rebate scheme or a mix of high and low endowment (which are prevalent in some cases in real life) can also be considered. We aim to build upon the current study and consider these issues in the future.

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APPENDIX I

Table 5. Average (standard deviations) donations by preference type

		Baseline (No Rebate)	Exogenous Rebate	Endogenous Rebate
Low Endowment	Pro-social	2050.19 (2797.47)	1694.5 (2455.56)	716.67 (1070.05)
	Selfish	2506.25 (3521.45)	1763.89 (2314.39)	1288.89 (1304.69)
High Endowment	Pro-social	3805.56 (3339.33)	2666.67 (2869.72)	4444.44 (3395.02)
	Selfish	1972.22 (2464.29)	3509.44 (4068.03)	2118.89 (2586.13)

Table. Treatment effect: Probit model

	Low	Low	High	High
Profit in PGG	0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
EXO	0.04 (0.12)	-0.01 (0.13)	-0.09 (0.11)	-0.07 (0.11)
END	-0.10 (0.12)	-0.14 (0.12)	-0.01 (0.11)	0.01 (0.11)
Female		0.23** (0.10)		0.17* (0.10)
NGO		0.21** (0.10)		0.16* (0.09)
<i>N</i>	104	103	108	108

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

APPENDIX II

Instructions for the experiment (BSL-Low treatment)

Part I. Public good game

The purpose of this experiment is to study how individuals make decisions in certain contexts. The instructions are simple and if you follow them carefully you will receive a cash amount at the end of the experiment in a confidential manner, since no one will know the payments received by the other participants. You can ask at any time that you have raised doubts first hand. Out of these questions, any communication between you is prohibited and subject to immediate exclusion of the experiment.

1. The experiment consists of 20 rounds. In each and every one of the rounds are part of the same group of 4 participants, whose composition is determined randomly at the beginning of the experiment and does not vary along the same. At no time will know the identities of other members of your group.
2. At the beginning of each round, each participant receives an endowment of 100 ECU.
3. Your only decision is to choose how you assign the Collaborative Fund. The rest will be automatically allocated to Private Fund.
4. In each round, you will receive information from the appropriations to be made to the Collaborative Fund all members of your group listed from highest to lowest, but not know the origin of each assignment.
5. In determining the profits of the Collaborative Fund is calculated based on the sum of the allocations of all members of your group to the Fund (ie the sum of the allocations of the players 1, 2, 3 and 4 to the Collaborative Fund) . That amount of your group assignments Collective Fund is doubled and divided into four equal parts among the members of the group.
6. Private Fund benefits are equal to your allocation to the fund and not depend on the decisions of others.
7. At the end of each round, you will receive information about your current and past results regarding the benefit you get from the Collaborative Fund, the benefit you get from the Private Fund, your individual benefit and the benefit accrued to date.
8. At the end of the experiment you will be paid accrued benefits over the twenty rounds at the 2000 exchange rate of ECU = 1 €.

Part II. Dictator game

The purpose of this experiment is to study how individuals make decisions in certain contexts. The instructions are simple and if you follow them carefully you will receive a cash amount at the end of the experiment in a confidential manner, since no one will know the payments received by the other participants. You can ask at any time that you have raised doubts first hand. Out of these questions, any communication between you is prohibited and subject to immediate exclusion of the experiment.

1. The experiment consists of only 1 round, where you must decide how to distribute a strictly single 10,000 ECU (any integer from 0 to 10,000) between you and the NGO Support Organization SOS Children.
2. Your earnings at the end of the experiment will come determined only by your decision: ECUs surplus after making the donation will be paid in private at the end of the experiment at a rate of 2,000 ECU = 1 €.
3. To ensure the anonymity of all participants, at any time of the experiment will provide information for decisions other participants make. Similarly, your decision will not be known by anyone, at any time.
4. At the end of the experiment will access the website of the NGO and proceed to deposit the sum of amounts that have been assigned. To ensure the procedure, randomly select a person to monitor that the process is carried out.