Demand for Giving to Multiple Charities: Theory and Experiments*

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May 25, 2016

Abstract

We study how competition among charities affects individuals’ giving behavior. We characterize a situation where a higher rebate subsidy shifts donations from one charity to another and increases total donations. We conduct two experiments: (i) individualized charitable giving where free riding incentives are shut down; and (ii) multi-donor charitable giving. We derive the demand for giving at different rebate conditions. Consistent with theory, the effect of competition on total donations is on average positive and its magnitude depends on the relative price. The social net benefit of rebate subsidies are calculated by comparing campaign costs and new donations generated.

Keywords: Charitable giving, rebate subsidies, competition, externalities.

JEL Codes: C90, D62, H41

* We are grateful to MITRE Funding from University of Michigan to employ student assistants; Emel Filiz-Ozbay thanks University of Maryland, Department of Economics for their generous departmental research funds. We appreciate all the useful comments by Erkut Y. Ozbay, Yusufcan Masatlioglu, Yesim Orhun and the seminar participants at the New York University, University of Melbourne, and Science of Philanthropy 2015 Meetings. Pak Ho Shen and Juyeon Ha provided valuable assistance in programming, running the experiments and reaching out to the charities in Ann Arbor. We also thank Qiansheng Hou and Quanfeng Zhou for additional research assistance.

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1 Introduction

In the gigantic industry of philanthropy, multiple organizations operate at the same
time and compete constantly. Given that the size of the charitable market is generally
stable at around 2% of GDP, there have been worries both in the media and in academic
research that competition between charities might simply be moving donations between
the organizations and it might even be socially wasteful. In this paper, we focus on the
demand side of this industry and question whether competition among charities triggers
new donations or shifts donations from one charity to another without increasing the
charitable pie.

The first part of our paper provides a theoretical model that studies individuals’
giving behavior when they donate to multiple charities. We assume charities offer rebate
subsidies for charitable donations and the rebates are paid by the third parties. Our
model extends standard public goods provision models used in charitable giving literature
to a multiple charities framework. We provide strong predictions regarding whether
competition using rebate subsidies leads to a simple shift of donations across charities
(i.e., one charity “steals” donations from the other charity) or whether the charitable pie
can be increased, which has important implications for social welfare.

The second part of our paper tests the model’s predictions by using two laboratory
experiments with donations to real charities. In our first experiment, each subject
contributes towards two individualized public goods and determine the levels of
charitable giving singlehandedly. Without strategic incentives, our design provides a
clean environment to provide a strong test of theory. By systematically changing the
rebates provided for donations to one public good relative to the other, we elicit the
demand for giving to multiple charities. We find that when one charity increases the
rebate subsidy, this leads to donation stealing from the other charity, but new donations

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1 For an overview of charitable giving see surveys by List (2011) and Andreoni and Payne (2013). In
addition, the concern that a sudden success of campaigns for one cause may adversely affect giving to
other charities has been raised in media in the emergence of donations after September 11, 2001 attacks,
Hurricane Katrina in 2005, and the Ice Bucket Challenge for ALS research in 2014. For example, see
2 Alternatively, it can be thought as the rebates are paid by the government through tax rebate.
3 See also Eckel and Grossman (1996) for a dictator game experiment where the recipient is a real charity.
are also generated. Therefore, the overall effect of competition on total donations is positive. We provide a comparison for the campaign costs and benefits and argue that rebates are beneficial for individual charities but may be socially wasteful for the charitable sector as a whole. In addition, we find high levels of heterogeneity in the responses of individuals to fundraising campaigns.

Next, we acknowledge that most causes reach out to many people to collect donations. This creates strategic concerns and free riding incentives, so we also conduct a second experiment to check for robustness by randomly pairing two subjects who simultaneously contribute to the same two charities. We find that none of our qualitative results change from the results of the first experiment.

We have three main contributions to the literature. First, we provide a simple theory that analyzes how donors respond to competing charities that use different rebate strategies. Second, we provide the first systematic analysis of individual demand to give in an environment with multiple charities by using a controlled laboratory experiment with actual charitable donations. Unlike previous papers, our paper focuses on identifying the demand for giving to multiple charities at different price conditions. Our paper shows that the effect of rebates on giving is not constant and, therefore, it is important for practitioners and policy makers to understand the demand functions of individuals before they implement their fundraising strategies and adapt policies. We extend our analysis beyond simply identifying whether the charities of interest are substitutes or complements. We question to what extent new donations are generated by different rebate campaigns and how the additional donation amounts compare with its campaign costs. Third, our paper provides evidence on both individualized public goods and standard public goods. This helps us to build a bridge between charitable giving literature and industrial organization literature that extensively studies “business stealing” and “demand expansion” in which firms compete through prices. While the industrial organization literature focuses on consumption goods and does not deal with free riding

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4 For example, Reinstein (2012) focuses on whether expenditure substitution occurs and how it depends on the charities compared by systematically changing the charity being “shocked”. Our paper instead keeps the charity being shocked constant and focuses on studying the demand to multiple charities by identifying the demand at differing price conditions.
incentives, charitable giving literature studies the public goods provision where free riding is an important concern.

The research on the demand side of the market with competing charities is relatively limited. To our knowledge, there are only three related papers that study fundraising strategies that give price incentives in a multiple charity environment. Krieg and Samek (2014) conduct a laboratory experiment where subjects play two public goods games simultaneously with two different groups. They find evidence of complementarities: giving for both public goods increases with a bonus condition for giving to one of these public goods. Reinstein (2012) conducts a laboratory experiment with real donations and finds that when a price shock (due to donation matching) leads subjects to increase their giving to the targeted charity, they are far more likely to decrease their giving to the other unshocked charities. In contrast with Krieg and Samek (2014), positive cross price elasticities between charities that serve similar goals have been identified. In a related paper based on field data, Meer (2016) finds that matching campaigns at DonorsChoose.org increases the likelihood of a project being funded as well as increasing the donations for that project. However, he does not find a significant effect of a matching campaign for one project on donations to other projects. Clearly, the effect of competition on giving is highly context/environment dependent and is not yet clearly understood.

While not in the same context, there are other related papers studying whether fundraising by one charity crowds out giving to other charities. Reinstein (2011) presents the first empirical evidence of “expenditure substitution” in charitable giving by using the 2001-2007 waves of the PSID/COPPS. However, in the context of natural disasters, Deryugina and Marx (2015) and Scharf et al. (2015) do not find expenditure substitution. Harwell et al. (2015) conducts a laboratory experiment with real donations to test whether

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5 Null (2011) also has subjects donating to real charities under different price conditions. However, the aim of that paper is not related to understanding competition across charities. In Null (2011), subjects have a constrained action space and cannot change the amount of total donations under different prices.

6 Cairns and Slonim (2011) look at the substitution effects of the presence of 2nd collections on 1st collections at Catholic Masses and find a negative effect on 1st donations and a positive effect on total donations. Lacetera et al. (2012) studies substitution between neighboring blood drives and finds donations increase with economic incentives but there are large displacement effects. Donors shift their donations to drives with higher economic incentives.
successful advertisement campaigns crowd out giving to other charities. They find that a video-based campaign for one of the charities (while the other charity has no advertisement) fully crowds out giving to the other charities without changing the total donations. At the other end of the other spectrum, Lange and Stocking (2012) provide a field experiment and show that complementarities exist in the competition between charities. In particular, donor list exchanges between rival charities may increase charitable donations.

The theoretical literature on charitable giving and competitive fundraising has focused mostly on the supply side; in particular, this literature addresses mostly the inefficiencies in the market size, charity selection, and quality of charities. Rose-Ackerman (1982) shows theoretically that in a competitive market with free entry, the overall services will be low and fundraising will be very excessive. Similarly, Aldashev and Verdier (2010) take an industrial organization perspective and show that the number of organizations will be suboptimal in competitive markets with free entry. Scharf (2014) provides warm-glow motives of charities which place a premium on their own service in a certain cause as a reason for inefficient charity selection. Krasteva and Yildirim (2015) endogenize the quality choice by charities and argue that the increased entry to this industry will decrease the quality. Some other papers studying supply side promote competition among charities. For example, Bilodeau and Slivinski (1997) show that having two charities that specialize in the provision of two different public goods might increase total public goods provision compared to having one charity that provides both public goods at the same time. Aldashev et al. (2014) argue fundraising coordination may also eliminate excessive fundraising.

We present our model in Section 2. Section 3 explains the experimental design, procedures and findings. A discussion and conclusions follow.

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Corazzini et al. (2015) provides experimental evidence. Using a threshold public goods set-up, they show that coordination problem increases as the number of charities increases.
2 Model

The form of preferences in charitable giving has been a challenge for economic theory. One approach is to model charities as privately provided public goods. This approach automatically introduces free-riding incentives to the model (Bergstrom, Blume, and Varian, 1986; Andreoni, 1989). In order to capture the empirical findings on high levels of giving, warm-glow giving (by Andreoni, 1989 and 1990) has been proposed as an additional motive for giving.

Since the free-riding problem is not central to our research question, we first assume away the externalities among the donors and model a single-agent charitable giving problem. This scenario not only provides us with a simple benchmark to work on but it also has its own merits. It provides important insights into understanding charities that provide individualized public goods, such as charities matching each donor with a child in need, or a single microfinance project, etc. The single donor case is studied below in Subsection 2.1.

We acknowledge that most causes reach out to many people to collect donations, so the multi-donor case is quite relevant in application. In Subsection 2.2., we introduce the multi-donor model with altruistic preferences.

Our main research question is to understand externalities generated by fundraising campaigns of competing charities on each other. We perform this exercise twice: once for a single donor case and another for multiple donors. This allows us not only to test the theoretical predictions of a well-utilized model in two independent setups but also to apply our findings to both the charities that match donors and causes in a one-to-one fashion as well as the charities that match many donors with a single cause.

2.1 Single Agent

There is an agent endowed with $w > 0$ and she is deciding how much to donate to two charities: A and B. Her utility is a function of her consumption of a private good $x \geq 0$, her donations to charity A, $g_A \geq 0$, and her donations to charity B, $g_B \geq 0$. In this subsection it is assumed that she is the only agent donating to these charitable causes.

We consider the following quasilinear utility function:

$$u(x, g_A, g_B) = x + h(g_A, g_B)$$
where function $h$ is defined on $\mathbb{R}^2_+$, continuously differentiable, increasing, and concave in both arguments. Note that we assume the agent receives utility from the amount of money received by the charity (assuming that the charities have identity function production technologies.) This specification is consistent with the standard public good models (e.g. Bergstrom, et al., 1986). In the single agent case, note that both pure altruism and warm-glow models (Andreoni and Miller, 2002) are the same since the total public good is equivalent to the amount given by the single agent.

Each charity employs rebate strategies in their fundraising campaigns and we denote the rebate rate of charity A by $r_A = (1 - \alpha)$ and the rebate rate of charity B as $r_B = (1 - \beta)$. This means that if the agent donates $(g_A, g_B)$, the agent will consume

$$w - g_A - g_B + r_A g_A + r_B g_B = w - \alpha g_A - \beta g_B$$

and the charities will receive the donations $(g_A, g_B)$. We assume that the rebate amounts are covered by third parties and do not affect how much money the cause receives. One may think of this assumption as an external donor or the government financing the rebates. In our experiments, the experimenter pays the rebate amounts. Hence even with a positive rebate rate, the cause receives the donations fully. In order to have meaningful rebate campaigns we assume that $\alpha, \beta \in [0,1)$. It is important to highlight that, under an interior solution assumption, our theory also applies to matching strategies since rebate and matching strategies become mathematically equivalent, i.e., a matching rate of $m = r/(1 - r)$ is equivalent to a rebate rate of $r$.\footnote{Our data are consistent with an interior solution assumption with minor exceptions.}

We choose to present our results using rebates, since the equivalence of individual’s contributions and public goods levels makes the presentation simpler.

The optimization problem of the agent is

$$\max \quad w - \alpha g_A - \beta g_B + h(g_A, g_B)$$

$$s.t. \quad g_A + g_B \leq w, \quad g_A \geq 0, \quad g_B \geq 0$$
Note that the agent can donate at most her initial endowment. The first-order conditions for the interior solution to this optimization problem are
\[
\begin{aligned}
\alpha &= h_1(g_A, g_B) \\
\beta &= h_2(g_A, g_B)
\end{aligned}
\]
where \( h_1 \) and \( h_2 \) are the partial derivatives with respect to the first and second variables, respectively. Define functions \( \tau(g_B) \) and \( \varphi(g_A) \) as implicit solutions to the first-order conditions. Hence,
\[
\begin{aligned}
\alpha &= h_1(\tau(g_B), g_B) \\
\beta &= h_2(g_A, \varphi(g_A))
\end{aligned}
\]
By differentiating the equations above, we get
\[
\tau'(g_B) = -\frac{h_{12}}{h_{11}} \quad \text{and} \quad \varphi'(g_A) = -\frac{h_{12}}{h_{22}}
\]
Note that the sign of these derivatives are the same as the sign of the cross-derivative of \( h \). In particular, \( \tau(g_B) \) and \( \varphi(g_A) \) are decreasing if and only if \( h_{12} < 0 \). Therefore, for \( h_{12} < 0 \), we will call charities A and B strategic substitutes. Otherwise, we call them strategic complements. Assuming that \( h \) is strictly concave, there is a unique solution to the agent’s optimization problem and this occurs at the intersection of \( \tau(g_B) \) and \( \varphi(g_A) \). This is illustrated in Figure 1 for the case of strategic substitution. Note that \( \tau \) is steeper than \( \varphi \). This property guarantees that contributions to each charity would increase if it becomes cheaper to contribute to that charity. A sufficient condition for this property is to have \( |h_{XY}| < |h_{XX}| \) for \( X, Y \in \{1, 2\} \) because that implies that \( 0 > \varphi' > -1 \) together with the previous assumptions we have made.

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\( ^9 \) This will leave her with some positive amount for private consumption even for large \( \alpha \) and \( \beta \) parameters (i.e. small rebate rates.) Hence, we assume that the donors cannot give more than her endowment even though the rebate amount will cover the deficit. Note that without this cap on total giving, a donor with a $10 endowment can give $6 to each charity and still have a positive amount remained for private consumption if the rebate rates are high enough.

\( ^{10} \) They will be constant if the cross derivative of \( h \) is zero.
In the following exercise we will see the effects of increasing the rebate rate for one of the charities on the donations to each charity as well as on total donations.

**Effect of Increasing the Rebate Rate**

Suppose that initial rebate rates of charities A and B are $1 - \alpha$ and $1 - \beta$, respectively. Then, charity A increases its rebate rate to $1 - \tilde{\alpha}$ through a fundraising campaign where $\alpha > \tilde{\alpha}$. Define $\tilde{\tau}(g_B)$ as the implicit solution to the new first-order condition (derived from the derivative of the objective function with respect to $g_A$), i.e.

$$\tilde{\alpha} = h_1(\tilde{\tau}(g_B), g_B)$$

Note that for any $g_B$

$$h_1(\tau(g_B), g_B) = \alpha > \tilde{\alpha} = h_1(\tilde{\tau}(g_B), g_B),$$

and, since $h_{11}$ is assumed to be negative, $\tau(g_B) < \tilde{\tau}(g_B)$. Therefore, increasing the rebate rate will cause a shift of the function $\tau$. Figure 2 illustrates this effect.
Figure 2. Effect of a Rebate Rate Increase by One Charity

As can be seen from Figure 2, increasing the rebate rate of Charity A will lead to a higher level of contribution to Charity A and a lower level of contribution to Charity B.¹¹ This result is intuitive as a higher rebate rate means a lower relative price for Charity A and a higher relative price for Charity B. The effect on the total contribution depends on the slope of function \( \varphi \) at the optimal donation level with initial rebate rates. Since \( 0 > \varphi' > -1 \), as it is the case in Figure 2, total contributions to charities will increase. In other words, a new fundraising campaign generates additional donations.

We may repeat the same exercise for the case of strategic complementarities. Recall that when \( h_{12} > 0 \), functions \( \varphi \) and \( \tau \) are upward sloping. If Charity A increases its rebate rate, this again causes a shift on function \( \tau \) as illustrated by Figure 3. In this case, donations to both charities increase and, therefore, total donations increase as well.

¹¹ Note that if the cross derivative of \( h \) was zero, \( h_{12} = 0 \), and hence if \( \varphi' = \tau' = 0 \), we would have no change in donations to charity B if Charity A increased its rebate rate. The magnitude of the cross derivative, therefore, might shed light on the mixed findings of the previous literature regarding substitution effects.
Our experiments will show that the charities we used in the experiments are in line with the strategic substitutes assumption. Moreover, as we will see later, our data are consistent with the effect summarized in Figure 2.

2.2 Multiple Agents

In this subsection, we assume that there are N agents donating to Charities A and B.\footnote{In our experiments, N=2.} We denote agent i’s endowment by $w_i > 0$. Define the total donations to each charity by $G_A = \sum_{i=1}^{N} g_{iA}$ and $G_B = \sum_{i=1}^{N} g_{iB}$, where $g_{iX}$ is the donation of agent $i$ to Charity X. If the utility function of an agent depends only on her private consumption and how much she gives away (as in the warm-glow theory), then the optimization problem of the agent is the same as in the previous subsection for a single agent. Hence, we would find the exact same individual contributions as before because the warm-glow assumption alone would eliminate the strategic aspect of the game between multiple agents. Therefore, in this section we will analyze altruistic agents. Later when we report the experimental data, we will provide evidence that supports the strategic substitutes assumption.
results we will come back to this theoretical discussion on what the agents’ utility functions may depend on.

For the remainder of this subsection, we assume that the utility function of agent $i$ is quasilinear in private consumption and depends on the total donations to the charities. Hence,

$$u_i(x, G_A, G_B) = x + h(G_A, G_B)$$

Similar to the single agent case in the previous subsection, when agent $i$ donates $g_{iA}$ and $g_{iB}$, and Charity A and Charity B employ rebate strategies with parameters $\alpha$ and $\beta$, the agent’s private consumption equals to $w_i - \alpha g_{iA} - \beta g_{iB}$. Following the methodology of Bergstrom et al. (1986), the equilibrium total contributions to each charity, $G_A$ and $G_B$, must satisfy the following first-order conditions for the agents who contribute positive amounts:

$$\alpha = h_1(G_A, G_B)$$
$$\beta = h_2(G_A, G_B)$$

We can define functions $\tau(G_B)$ and $\varphi(G_A)$ as implicit solutions to the first-order conditions. Note that these are the same functions as we previously defined for the single agent case, but this time they are defined on total donations to the charities. Hence,

$$\alpha = h_1(\tau(G_B), G_B)$$
$$\beta = h_2(G_A, \varphi(G_A))$$

One may repeat the same exercise like the one we performed for a single agent case and analyze the effect of changing the rebate rate of one charity on contributions and redraw all the figures we studied previously by only changing the variables from $g_X$ to $G_X$. All the arguments of the previous subsection will apply here. Note that the contributing agents of this subsection will donate the same total amounts to the charities as was donated for the single agent case. This implies that we expect to see lower average
donations per donor when we have multiple agents rather than a single agent.\textsuperscript{13} This result is intuitive since free riding incentives are now introduced in the model.

3 Experiment

We designed our experiment to replicate the setup studied in Subsections 2.1 and 2.2.

3.1 Design and Procedures

Our experiments took place at the RCGD Robert B. Zajonc Laboratory at the University of Michigan in April and May of 2015. In total we had 82 participants recruited from the University of Michigan subject pool using the ORSEE recruitment system (Greiner, 2004). Instructions were read aloud to the subjects to create common knowledge. The experiments were programmed and conducted with the software z-Tree (Fischbacher, 2007).

We conducted two experiments: a one-agent experiment (E1) and a two-agent experiment (E2). Note that our treatment variable of interest is the change in rebate rates, and the two-agent experiment was conducted as a robustness check to see whether our results were still valid when free riding was present. Each subject participated in only one of the experiments. E1 had 42 subjects and E2 had 40 subjects.

In our one-agent experiment, subjects contributed to individualized public goods and determined the levels of charitable giving singlehandedly.\textsuperscript{14} This experiment allowed us to shut down free-riding incentives among multiple agents and converted the game into an individual decision-making problem. One advantage of this simple environment was that it provided the best conditions for the theory to work. If the theory was not consistent with our data here, then we did not expect the theory to work for richer environments.

In E1, subjects were asked to make donation decisions to two charitable organizations in the Ann Arbor region under 5 different situations.\textsuperscript{15} At the end of the experiment, one of the situations were chosen at random to determine their payoffs.

\textsuperscript{13} The same level of public goods provision prediction relies heavily on the assumption that we use the same \( h \) function for two versions of the model.

\textsuperscript{14} In order to study determinants of giving in a single charity environment, Ottoni-Wilhelm, Vesterlund, and Xie (2014) also employ an individualized public good experiment. In their study, each subject is paired with a child who has lost his/her home in a fire.

\textsuperscript{15} We kept the number of questions small on purpose in order to allow for subjects to make decisions as careful as possible.
Each subject was randomly assigned to one rescued animal in an animal rescue organization and one homeless person who is a resident of a homeless shelter in Ann Arbor. No two subjects gave to the same animal or the same homeless person. They were told that their donated amounts will be delivered to their assigned homeless person and/or animal in the form of equal-value food or other supplies (such as hygiene products, clothing, etc.).

In each of the 5 situations, subjects started with an endowment of 100 tokens and they decided how many tokens to donate to their assigned animal in the animal rescue organization, how many tokens to donate to their assigned homeless person at the shelter, and how many tokens to keep for themselves. The exchange rate was $1 for every 10 tokens. Subjects were also told that they will receive rebates from the experimenters for the donations that they make.

In all of the situations, subjects were provided with a rebate rate of $r_H = 0.5$ for the homeless shelter. In contrast, the rebate rate for the animal shelter, $r_A$, took values of 0.1, 0.3, 0.5, 0.7 and 0.9 in order to systematically study the effect of changing the rebate strategy of one charity on the donations to both charities as well as its effect on the total donations. It was made clear to the subjects that the experimenter pays the rebates and not the charities.

All five rebate situations were presented on the same screen. We chose not to randomize the order to minimize the subjects’ confusion. The subjects were free to make decisions in any order and revise their decisions before submitting them. Given that we are primarily interested in the changes in donations as a response to the changing rebate rates rather than the absolute donation amounts, we made the changes in the rebate rates as obvious as possible to the subjects.

Subjects were provided with a “calculator” as part of their decision screens. Once subjects entered a rebate rate for donations to the animal shelter, and the possible donation amounts for their assigned animal and their assigned homeless person, the calculator would then provide them with a table with information on the number of tokens left for themselves after donating, the rebate amounts from donations, and the total number of tokens after rebates. Subjects could use the calculator as many times as they liked.
Before the experiment started, each subject took a short quiz to test their understanding. All subjects had to answer the quiz accurately before the experiment could start.

The two-agent experiment was very similar to the one-agent experiment. The main difference was that in this experiment, each subject was anonymously matched with another subject to form a pair. Each pair was randomly assigned to one rescued animal in an animal rescue organization and one homeless person who is a resident of a homeless shelter in Ann Arbor. Similar to the previous treatment, each participant started with an endowment of 100 tokens for each situation. Each member of a pair simultaneously and anonymously decided how many tokens to donate to his/her group’s assigned animal and homeless person, and how many tokens to keep for him/herself. Subjects did not know how much their partner donated until the end of the experiment. Similar to E1, the rebate rate for the donations to the homeless person was fixed while the rebate rate for the donations to the assigned animal varied.

A short questionnaire was implemented at the end of the experiment. In addition to the basic demographics, we have also elicited the donation amounts of the subjects in the last 12 months and their familiarity with the animal and homeless shelters in the Ann Arbor region.

3.2 Results

Experiment 1: One-Agent Case

By changing the rebate rate for donations to the assigned animal we will be able to estimate the conditional best response function for giving to the homeless person, \( \varphi \). Figure 4 shows the average best response. We see the average donations to the assigned animal and homeless person over different rebate rates. In the figure below, the rebate rate for animals increases from 0.1 to 0.9 from left to right.
As expected, donations to the assigned animal increases with the rebate rate. Mann-Whitney tests confirm that the donations increase significantly as the rebate rate increases from 0.3 to 0.5, from 0.5 to 0.7 and from 0.7 to 0.9 (all p-values are less than 0.05). The increase in donations to the assigned animal is not significant as the rebate rate changes from 0.1 to 0.3 (p-value = 0.22). More importantly, it can easily be seen from the figure that the rebate strategy of the animal rescue organization imposes stealing donations from the homeless shelter. However, the change in donations to the assigned homeless person is not statistically significant for one-step changes from 0.1 to 0.3, or from 0.3 to 0.5, etc. All of the p-values are larger than 0.14 for small rebate changes. Stealing becomes statistically significant for larger changes in rebate rates. For example, donations to the homeless person decrease significantly as the rebate rate changes from 0.1 to 0.7 (p-value = 0.02).

We can also investigate whether increasing the rebate rate increases the charitable pie or whether it only shifts contributions from the homeless shelter to the animal rescue organization. Figure 5 summarizes the average donations to the assigned animal and homeless person as well as total giving.

\[16 \text{ Throughout the paper we report two-tailed results.}\]
Table B.1 in Appendix B presents the numbers corresponding to Figure 5 more explicitly. As can be seen from Figure 5, total giving increases with the rebate rate. Total giving significantly increases as the rebate rate changes from 0.7 to 0.9 (p-value = 0.03) as well as for larger rebate changes. We also see that total giving increases more as the rebate rate becomes larger, suggesting a convex total giving function.

![Figure 5. Average Donations at Different Rebate Rates: Experiment 1](image)

We now perform a Tobit regression analysis in order to test the effect of the rebates to the animal rescue organization on giving to the assigned animal, giving to the assigned homeless person as well as total giving (see Table 1).\(^{17}\) Our first independent variable is rebate, which takes values between 0 and 1. We use rebate\(^2\), the square of the rebate rate, to test for nonlinearities. In addition, in some specifications we control for demographics.\(^{18}\) The variable age is the age of the subject in years. The variable female takes a value of 1 if the subject is female and 0 otherwise. The variable econ takes a value of 1 if the subject is an economics major and 0 otherwise. Income is a categorical variable which takes values from 1 to 6, where 1 corresponds to family income being less than $50,000, 2 corresponds to family income being between $50,000 and $75,000, 3

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\(^{17}\) Our results are robust to other specifications such as ordinary least squares method. We choose to report Tobit regressions since approximately 11 percent of our subjects never donate to the assigned animal and 15 percent of the subjects never donate to the assigned homeless person.

\(^{18}\) See Appendix A for the questionnaire conducted at the end of our experiment.
corresponds family income being between $75,000 and $100,000, 4 corresponds to family income being between $100,000 and $150,000, 5 corresponds to family income being between $150,000 and $200,000 and 6 corresponds to family income being more than $200,000. Conservative and liberal are two dummies to account for the subject’s political stance (compared to being moderate). Religion takes values 1 to 4, where 1 corresponds to religion being “not important” to the subject and 4 corresponds to “very important”. The variable donated is a measure of donations in the past 12 months and takes values 1 to 4, where 1 corresponds to “less than $5” and 4 corresponds to “more than $20.” The variables know_a and know_h are measures for how familiar the subject is with the animal rescue organizations and homeless shelters in the Ann Arbor region, respectively. They both take values from 0 to 10, where 0 indicates no prior information and 10 indicates a perfect knowledge about these organizations.

The specification 1 in Table 1 shows that giving to the assigned animal increases with the rebate rate. Specifications 2 and 3 show that the relationship is convex, so the marginal increase in giving is higher as the rebate rate becomes larger. Specification 4 shows that stealing is statistically significant and there is a negative relationship between rebate from the animal shelter and giving to the homeless person. Furthermore this relationship is linear according to specifications 5 and 6.\(^{19}\) We see that the overall effect of rebates on total giving is positive (specification 7). However, specifications 8 and 9 suggest a small drop in total giving initially, but further increases in the rebate rate shows positive effects on total giving. This suggests that total giving is a convex function of rebates and has a U-shaped relationship with the rebates from the animal shelter.\(^{20}\) The fact that the effect is not constant not only increases our understanding on the demand for giving in a multiple charity framework, but also helps us evaluate contradictory findings in the literature.

We find a negative relationship between age and giving, but this is only statistically significant at 5% for giving to the assigned animal. Subjects with higher family incomes seem to be more generous to homeless people, but the effect is marginally significant at the 10% level. Finally, if a person knows more about the

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\(^{19}\) We have also tried a third order polynomial but that was not statistically significant either.  
\(^{20}\) This result holds when we run an OLS regression as well.
homeless shelters in the Ann Arbor region, he/she gives significantly more to the assigned homeless person. None of the other variables have a significant effect on giving.

Table 1. Tobit Regression Analysis for Experiment 1

<table>
<thead>
<tr>
<th>Dep. Var.</th>
<th>Giving to Animal</th>
<th>Giving to Homeless</th>
<th>Total Giving</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>rebate</td>
<td>60.42***</td>
<td>1.41</td>
<td>0.31</td>
</tr>
<tr>
<td>rebate²</td>
<td>58.18***</td>
<td>59.65***</td>
<td>-13.69</td>
</tr>
<tr>
<td></td>
<td>(19.76)</td>
<td>(19.85)</td>
<td>(11.75)</td>
</tr>
<tr>
<td>age</td>
<td>-2.45**</td>
<td>-0.25</td>
<td>-2.1</td>
</tr>
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<td>(1.21)</td>
<td>(1.68)</td>
<td>(2.21)</td>
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<td>9.52</td>
<td>11.37</td>
</tr>
<tr>
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<td>(7.53)</td>
<td>(11.73)</td>
</tr>
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<td>-4.89</td>
<td>12.83</td>
<td>10.08</td>
</tr>
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<td></td>
<td>(17.22)</td>
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<td>(13.75)</td>
</tr>
<tr>
<td>income</td>
<td>-1.92</td>
<td>2.98*</td>
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</tr>
<tr>
<td></td>
<td>(1.54)</td>
<td>(1.75)</td>
<td>(2.38)</td>
</tr>
<tr>
<td>liberal</td>
<td>-2.81</td>
<td>8.36</td>
<td>5.85</td>
</tr>
<tr>
<td></td>
<td>(6.04)</td>
<td>(7.85)</td>
<td>(11.55)</td>
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<tr>
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<td>0.97</td>
<td>-2.4</td>
<td>1.71</td>
</tr>
<tr>
<td></td>
<td>(9.83)</td>
<td>(9.50)</td>
<td>(14.22)</td>
</tr>
<tr>
<td>religion</td>
<td>-4.83</td>
<td>-3.28</td>
<td>-6.66</td>
</tr>
<tr>
<td></td>
<td>(4.41)</td>
<td>(3.69)</td>
<td>(6.11)</td>
</tr>
<tr>
<td>donated</td>
<td>1.35</td>
<td>-3.53</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>(2.71)</td>
<td>(2.98)</td>
<td>(4.35)</td>
</tr>
<tr>
<td>know_a</td>
<td>3.97</td>
<td>-0.61</td>
<td>2.36</td>
</tr>
<tr>
<td></td>
<td>(3.88)</td>
<td>(2.91)</td>
<td>(5.09)</td>
</tr>
<tr>
<td>know_h</td>
<td>0.34</td>
<td>4.27**</td>
<td>3.77</td>
</tr>
<tr>
<td></td>
<td>(2.08)</td>
<td>(1.86)</td>
<td>(2.77)</td>
</tr>
<tr>
<td>constant</td>
<td>-13.84***</td>
<td>-3.39</td>
<td>51.12*</td>
</tr>
<tr>
<td></td>
<td>(5.22)</td>
<td>(4.75)</td>
<td>(29.15)</td>
</tr>
<tr>
<td>Obs.</td>
<td>210</td>
<td>210</td>
<td>210</td>
</tr>
</tbody>
</table>

Note: * indicates statistical significance at the 10% level, ** significant at 5%, and *** at 1%. Robust standard errors are in parentheses.
Experiment 2: Two-Agent Case

In the two-agent case, we see similar results as in the one-agent case. Figure 6 shows average *individual* donations to the assigned animal and homeless person. Donations to the assigned animal significantly increases as the rebate rate increases from 0.3 to 0.5, 0.5 to 0.7 and 0.7 to 0.9 (all p-values are less than 0.05), while donations to the assigned homeless person decreases with the rebate rate. Similar to the one-agent case, stealing is not statistically significant at the 5% significance level for small rebate changes (i.e., none of the 20 point changes are significant, such as from 0.1 to 0.3 and 0.7 to 0.9.), but it is significant for larger rebate changes such as from 0.1 to 0.7 (p-value = 0.01).

![Figure 6. Average Donations in Experiment 2](image)

Figure 7 below as well as Table B.2 in Appendix B show that the total donations increase with the rebate rate (except from 0.1 to 0.3 where stealing cancels out the increased donations to the animal). Small rebate changes initially do not change total giving significantly, but change in total giving is statistically significant as the rebate rate changes from 0.7 to 0.9 (p-value = 0.03), as well as for larger rebate changes. Total giving function is again convex with respect to the rebate rate.
We repeat the Tobit analysis for Experiment 2 (Table 2). Results are extremely similar to Experiment 1. Giving to the assigned animal increases with the rebate rate and the rate of increase is larger at large rebate rates. Giving to the assigned homeless person decreases as the rebate rate for animal increases and the relationship is once again linear.\textsuperscript{21} The total giving is convex in the rebate rate and steeply increasing with higher rebate rates.

The results by demographics are a little different for Experiment 2. The variable \textit{age} has a negative effect as before, but this time it is only marginally significant and only for giving to the homeless person. Being a female is negatively correlated with giving, especially for total giving, which is significant at the 5\% level. Having an economics major has a positive effect, but again this is only marginally significant. Having a higher family income has a positive effect on giving to homeless and total giving. Interestingly, being either liberal or conservative relative to being moderate increases giving. Keeping other variables constant, more religious subjects donated to the homeless more and their total giving was higher. Higher donations in the past 12 months implied lower donations in our experiment. Finally, a better knowledge of homeless shelters in the Ann Arbor region implies less giving to the assigned animal and less giving in total.

\textsuperscript{21} The third order polynomial is barely statistically significant at the 10\% significance level.
### Table 2. Tobit Regression Analysis for Experiment 2

<table>
<thead>
<tr>
<th>Dep. Ver.</th>
<th>Giving to Animal</th>
<th>Giving to Homeless</th>
<th>Total Giving</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rebate</td>
<td>62.52***</td>
<td>-34.81***</td>
<td>26.64***</td>
</tr>
<tr>
<td></td>
<td>(9.70)</td>
<td>(9.05)</td>
<td>(5.59)</td>
</tr>
<tr>
<td>rebate²</td>
<td>50.78***</td>
<td>-11.5</td>
<td>66.14***</td>
</tr>
<tr>
<td></td>
<td>(15.24)</td>
<td>(15.19)</td>
<td>(17.77)</td>
</tr>
<tr>
<td>age</td>
<td>0.03</td>
<td>-0.03</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>(0.55)</td>
<td>(0.55)</td>
<td>(0.55)</td>
</tr>
<tr>
<td>female</td>
<td>2.44</td>
<td>-14.00</td>
<td>-17.39**</td>
</tr>
<tr>
<td></td>
<td>(4.88)</td>
<td>(7.23)</td>
<td>(8.56)</td>
</tr>
<tr>
<td>econ</td>
<td>10.75*</td>
<td>6.66</td>
<td>13.18*</td>
</tr>
<tr>
<td></td>
<td>(6.02)</td>
<td>(7.50)</td>
<td>(7.73)</td>
</tr>
<tr>
<td>income</td>
<td>2.14</td>
<td>3.71**</td>
<td>5.15**</td>
</tr>
<tr>
<td></td>
<td>(1.39)</td>
<td>(1.72)</td>
<td>(2.10)</td>
</tr>
<tr>
<td>liberal</td>
<td>12.41**</td>
<td>18.15**</td>
<td>26.13**</td>
</tr>
<tr>
<td></td>
<td>(6.02)</td>
<td>(8.96)</td>
<td>(10.21)</td>
</tr>
<tr>
<td>conser.</td>
<td>18.42**</td>
<td>0.95</td>
<td>27.67**</td>
</tr>
<tr>
<td></td>
<td>(9.22)</td>
<td>(13.33)</td>
<td>(12.41)</td>
</tr>
<tr>
<td>religion</td>
<td>4.93</td>
<td>17.56***</td>
<td>18.24***</td>
</tr>
<tr>
<td></td>
<td>(3.12)</td>
<td>(5.01)</td>
<td>(4.64)</td>
</tr>
<tr>
<td>donated</td>
<td>-1.71</td>
<td>-8.11**</td>
<td>-10.46**</td>
</tr>
<tr>
<td></td>
<td>(1.95)</td>
<td>(3.24)</td>
<td>(3.10)</td>
</tr>
<tr>
<td>know_a</td>
<td>1.9</td>
<td>3.41</td>
<td>4.72</td>
</tr>
<tr>
<td></td>
<td>(2.63)</td>
<td>(2.31)</td>
<td>(3.51)</td>
</tr>
<tr>
<td>know_h</td>
<td>-3.16**</td>
<td>-1.8</td>
<td>-4.19*</td>
</tr>
<tr>
<td></td>
<td>(1.30)</td>
<td>(2.02)</td>
<td>(2.26)</td>
</tr>
<tr>
<td>constant</td>
<td>-12.44**</td>
<td>-3.3</td>
<td>31.98***</td>
</tr>
<tr>
<td></td>
<td>(5.20)</td>
<td>(4.93)</td>
<td>(6.41)</td>
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<td></td>
<td>37.13***</td>
<td>35.20***</td>
<td>43.31***</td>
</tr>
<tr>
<td></td>
<td>(6.64)</td>
<td>(6.55)</td>
<td>(6.24)</td>
</tr>
<tr>
<td></td>
<td>39.08**</td>
<td>37.29*</td>
<td>37.29*</td>
</tr>
<tr>
<td></td>
<td>(17.52)</td>
<td>(20.65)</td>
<td></td>
</tr>
<tr>
<td>Obs.</td>
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<td>200</td>
<td>200</td>
</tr>
</tbody>
</table>

Note: * indicates statistical significance at the 10% level, ** significant at 5%, and *** at 1%.

Robust standard errors are in parentheses.
Comparison of Experiments 1 and 2: Warm-Glow versus Altruism Motives

While Experiment 2 was mainly conducted in order to check for robustness of our results, we can provide important insights for comparing altruism and warm-glow motive. Andreoni (1989, 1990) introduced warm-glow motives for non-selfish behavior. One interesting aspect of our design is that we can actually compare two treatments to see which motive, warm-glow or altruism, is more prevalent for the charities used in the experiment.

The altruism model would predict that individuals give less when they are in groups of 2 versus when they are the solo giver. Therefore, individual giving in Experiment 2 should be lower than in Experiment 1. However, the warm-glow model in isolation suggests that it does not matter if someone else is also contributing to the same cause, so we would expect similar giving across experiments.

Comparing Tables B.1 and B.2, individual giving levels seem slightly higher in Experiment 2 at any given rebate rate. However, according to Mann-Whitney tests, the differences are not statistically significant (p-values range between 0.27 and 0.73). In addition, the result is the same if we perform a Tobit regression analysis and add a dummy variable for Experiment 1 (p-values range between 0.48 and 0.83). Therefore, our data suggest that for the charities used in our experiment the warm-glow model better explains our data since under warm-glow, single and multiple agent cases are identical.

Is rebate wasteful?

We investigate whether rebates are effective fundraising strategies by comparing (opportunity) costs and benefits of such a campaign. In this section, we acknowledge that the third party could have used those funds towards the cause instead of fundraising purposes. Therefore, we now treat refunds as a cost, and we are interested in the amount of donations net of paid refunds.

---

22 We can also study the effect of increasing group size on the public goods provision in a multiple charity environment. Isaac and Walker (1988), Isaac et al. (1994) and Nosenzo et al. (2015) study the effect of group size on the public goods provision in a single public good environment.
Since giving is similar across the two experiments, we pool them together in this section. Given that donations to the assigned homeless person are refunded at a rate of 50%, we find that the animal shelter would have an incentive to use rebates. Table 3 shows mean donations to the assigned animal net of rebates paid. Table 3 suggests that the animal shelter should have a rebate rate in the range of 0.5 and 0.7, but the rebate rate should not be too aggressive since the net benefit would be lower. On the other hand, donations to the assigned homeless person net of rebates are decreasing with the rebate rate for the assigned animal, which is expected. The surprising result is that total donations net of total rebates are decreasing with the rebate rate for the assigned animal. Therefore, if the rebates are provided by the same source\textsuperscript{23} and the aim is to maximize the total net giving rather than the net giving to a certain cause, minimal rebate rates seem to work better.

It is important to highlight that our conclusion relies on the assumption that crowding out either would not happen or would be limited when the third party donates the funds to the charities instead of offering them as rebates. This assumption would be valid only if individuals have warm-glow preferences. As we show in the previous section, our data are consistent with warm-glow preferences. However, one needs to be careful generalizing this result to other contexts where individuals might mainly be driven by altruistic preferences, implying crowding-out. In such environments, one may expect rebate campaigns to improve net total donations.

\textsuperscript{23} In our experiments, the experimenter was financing rebates for both charities. In applications, it might be the government or the same foundation (e.g. the Gates foundation) campaigning for multiple charities.
Table 3. Analyzing the Effectiveness of Refunds as a Fundraising Strategy

<table>
<thead>
<tr>
<th>Rebate rate for animal</th>
<th>Net benefit to animal</th>
<th>Net benefit to homeless</th>
<th>Net total donation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.1</td>
<td>5.93</td>
<td>15.66</td>
<td>21.59</td>
</tr>
<tr>
<td></td>
<td>(0.85)</td>
<td>(1.58)</td>
<td>(1.90)</td>
</tr>
<tr>
<td>0.3</td>
<td>6.22</td>
<td>14.17</td>
<td>20.39</td>
</tr>
<tr>
<td></td>
<td>(0.74)</td>
<td>(1.49)</td>
<td>(1.77)</td>
</tr>
<tr>
<td>0.5</td>
<td>8.77</td>
<td>11.46</td>
<td>20.24</td>
</tr>
<tr>
<td></td>
<td>(0.80)</td>
<td>(1.21)</td>
<td>(1.74)</td>
</tr>
<tr>
<td>0.7</td>
<td>8.86</td>
<td>8.26</td>
<td>17.11</td>
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<tr>
<td></td>
<td>(0.80)</td>
<td>(1.06)</td>
<td>(1.33)</td>
</tr>
<tr>
<td>0.9</td>
<td>4.75</td>
<td>7.09</td>
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</tr>
<tr>
<td></td>
<td>(0.38)</td>
<td>(0.98)</td>
<td>(0.95)</td>
</tr>
</tbody>
</table>

Standard errors in parentheses.

**Individual Analysis**

Figures B.1 and B.2 (in Appendix B) show donations to the assigned animal and homeless person for each individual for Experiments 1 and 2, respectively, as well as the fitted linear regression lines. One thing is clear: there is quite a bit of heterogeneity in individual preferences. While some individuals are sensitive to the rebate rates, some do not change their contributions with changes in the rebate at all.

Table 4 provides a classification of subjects into a few important categories. Note that the results for E1 and E2 are very similar, and therefore we also pool both treatments in the following analysis. In the pooled data, we see that 11% of the subjects never donate to their assigned animal, about 15% never donate to their assigned homeless person, and about 7% never donate to either charitable cause. By conducting OLS regressions separately for each individual and for the three different cases, we find that approximately 67% of the subjects increase their donations for their assigned animal with the rebate, while only about 37% decrease donations to their assigned homeless person as the rebate for their assigned animal increases. While there is no case of total giving
decreasing as the rebate for assigned animal increases, we see that 39% of the subjects increase their total giving with the rebate rate and about 54% do not change their total giving.

<table>
<thead>
<tr>
<th>% of subjects who</th>
<th>E1</th>
<th>E2</th>
<th>Pooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>never donate to animal</td>
<td>11.9</td>
<td>10.0</td>
<td>11.0</td>
</tr>
<tr>
<td>increase donations to animal with rebate</td>
<td>64.3</td>
<td>70.0</td>
<td>67.1</td>
</tr>
<tr>
<td>don’t change don. to animal with rebate</td>
<td>23.8</td>
<td>20.0</td>
<td>22.0</td>
</tr>
<tr>
<td>never donate to homeless</td>
<td>16.7</td>
<td>12.5</td>
<td>14.6</td>
</tr>
<tr>
<td>decrease don. to homeless with rebate</td>
<td>35.7</td>
<td>37.5</td>
<td>36.6</td>
</tr>
<tr>
<td>don’t change donate to homeless with rebate</td>
<td>47.6</td>
<td>47.5</td>
<td>47.6</td>
</tr>
<tr>
<td>never donate</td>
<td>7.1</td>
<td>7.5</td>
<td>7.3</td>
</tr>
<tr>
<td>increase total giving with rebate</td>
<td>38.1</td>
<td>40.0</td>
<td>39.0</td>
</tr>
<tr>
<td>don’t change total giving with rebate</td>
<td>54.8</td>
<td>52.5</td>
<td>53.7</td>
</tr>
</tbody>
</table>

Note that the categories listed here do not overlap. In other words, “% of subjects that never donates” category is not included in the “% of subject who don’t change their donations” category.

4 Concluding Comments

Charitable organizations provide goods and services that many people value. These organizations rely on charitable donations to be active. However, according to the National Center for Charitable Statistics, there are over one and a half million charities just in the United States that compete for donations. It is extremely important to understand how this competition affects donations to charities and the overall charitable pot.

We have several important contributions to the literature. The biggest fear after a successful campaign for one cause is possible lower funding for other charities, which we also establish in our study. More funding for the animal shelter leads to less funding for the homeless shelter. Next, we look at whether this is a simple shift of donations from one charity to another without increasing the charitable pie. The good news is that the animal shelter generates additional money by increasing rebates, i.e., total giving increases when the rebate rate increases. It is important to note that the change in total giving is not constant, which sheds light into contradictory findings in the literature. We
also show that charities have individual incentives to use rebates as fundraising campaigns even when opportunity costs of such campaigns are taken into account; however, this may hurt the charitable sector as a whole.

We studied a well-established and tractable theoretical model to provide a benchmark for our experiments. The theory provides sufficient conditions for stealing as well as the effect of rebate on total giving. The theory also has testable implications for altruism versus warm-glow motives. Our theoretical results are not limited to rebates but can also be applied to matching strategies since these are mathematically equivalent. However, behaviorally, we expect matching strategies to generate more giving compared to rebate strategies (among others, see Eckel and Grossman, 2003; 2006a; 2006b; 2008). Nevertheless, we conjecture that our qualitative results would continue to hold under matching.24

Our paper has important policy implications for practitioners who use refunds/matches as fundraising strategies as well as for policy makers who propose tax incentives for giving to certain charities, which would imply a price change for giving to some charities while keeping the price the same for others. Our results show that by using price incentives, total charitable giving might be increased. This contrasts with the somewhat common view that levels of charitable giving in the United States is stuck at two percent of GDP. However, we also argue that if the aim is not only to increase charitable donations of a particular charity, but instead to increase donations for the overall charitable sector, (high) rebates/matches may not be that cost effective. The true success of such a policy would depend on choosing the rebate/match rate carefully as well as the degree of donation crowding out if the rebates/matches were instead used to fund the public goods directly.

24 Qualitative equivalence may not hold if giving is not very sensitive to the match rate as suggested by Karlan and List (2007). However, Eckel and Grossman (2003, 2006 and 2008) find large price elasticities in the lab. Future research could demonstrate whether our results could be generalized to different set-ups such as matching strategies.
5 References


Appendix A
Instructions for Experiment 2

(Instructions for Experiment 1 are available from the authors upon request)

This experiment deals with the economics of decision making. Your participation in this experiment is voluntary. You will be compensated for your participation.

The experimental instructions are presented below. After you complete the experiment, you will be asked to fill out a questionnaire on demographics while you wait to be paid.

During the experiment, your earnings will be calculated in Tokens. At the end of the experiment the total amount of Tokens you have earned will be converted to US Dollars at the following rate:

\[10 \text{ Tokens} = 1.00 \text{ US Dollars}\]

In addition, upon completion of the experiment, you will receive a show-up reward of $5. This is yours to keep regardless of the decisions you make in the experiment.

Your computer has been assigned an ID number that you will be informed of. Your decisions and payoffs from the experiment will be recorded with that ID number. At no time your name will be linked to that ID number. At the end of the experiment, you will be paid in private. Your decisions and payoff will not be revealed to anyone during or after the experiment.

Please do not communicate with the other participants during the experiments. Should you have any questions, please raise your hand.

Donations to Charities:

In this experiment, you will be given 5 different situations in which you will make decisions regarding donations to two charitable organizations. At the end, one of the situations will be chosen at random. This chosen situation will determine your payoff. Each situation has an equal chance of being chosen; hence, you should make your decision in each situation as if it will be the chosen one. You will be notified of your earnings at the end of the experiment.
At the beginning of the experiment you will be randomly and anonymously paired with another participant from this room to form a group. In every situation, you and your paired participant will be asked to decide how much to donate to two non-profit organizations in the Ann Arbor region. One is an Animal Rescue Organization and the other one is a Homeless Shelter in Ann Arbor. Each group is randomly assigned to one rescued animal in an Animal Rescue Organization and one homeless person who is a resident of a Homeless Shelter in Ann Arbor. **No two groups are giving to the same animal or the same homeless person. Thus, your group’s donation will be the only donation that your group’s assigned animal and homeless person will receive as a result of this experiment.** Your group’s donated amounts will be delivered to your group’s assigned homeless person and/or animal in the form of equal-value food or other supplies (such as hygiene products, clothing, etc.).

In each of the 5 situations, you will start with an endowment of 100 tokens and you will decide how many tokens to donate to your group’s assigned animal in the Animal Rescue Organization, how many tokens to donate to your group’s assigned homeless person at the Shelter, and how many tokens to keep for yourself. Similarly, for each situation, your paired participant also starts with an endowment of 100 tokens and decides how many tokens to donate to your group’s assigned animal and homeless person, and how many tokens to keep for himself/herself. **You and your paired participant will make donations simultaneously and will not know each other’s donations until the end of the experiment.** In addition to the tokens you keep for yourself, you will receive rebates from the experimenters for donations that you make. The rebate levels will change for each situation and will be explained in detail in the next section.

As mentioned above, at the end of the experiment, one of the 5 situations will be picked at random for your group and the decisions from that situation will be implemented. The donations that your group makes in that situation will be sent out to your group’s assigned animal and homeless person within 6-8 weeks to ensure that the whole research study is completed. The amount that you keep for yourself (converted into dollars) will be paid out to you in addition to the rebates that you receive from your donations (as well as the show-up reward of $5).
Rebates:

The rebate rate is the percentage of your donation that will be refunded to you. For example, if you give $X$ tokens to your assigned homeless person in the shelter and the rebate rate is 50%, the experimenters will pay you a rebate of $0.50 \times X$ tokens at the end of the experiment, and a donation with a value of $X$ tokens together with the donation of your paired participant will be sent to the shelter to be spent specifically for the homeless person. In this experiment, the rebate rate for the Homeless Shelter is always the same at 50%.

The rebate rate for the Animal Rescue Organization varies from 0% to 90%. The following example shows how your earnings and donations are calculated. At the end of the experiment, one situation out of the 5 will be randomly picked for each subject. Suppose in that situation, the rebate rate for the Animal Rescue Organization is 30%, and the rebate rate for the Homeless Shelter is 50%. Suppose you gave $X_1$ tokens for your group’s assigned animal and $Y_1$ tokens for your group’s assigned homeless person, and your paired participant gave $X_2$ tokens and $Y_2$ tokens, respectively. Then:

**Your group’s assigned animal at the Animal Rescue Organization receives:** $X_1 + X_2$

**Your group’s assigned homeless person at the Homeless Shelter receives:** $Y_1 + Y_2$

**You receive:**

$$(100 - X_1 - Y_1) + (0.30 \times X_1) + (0.50 \times Y_1)$$

Note that the donations of your paired participant do not affect your payoff from this experiment, only your decisions do. However, your paired participant’s donations affect how much your group’s assigned animal and homeless person receives.

To facilitate your decisions, we will provide a "calculator" (see table below) when the experiment starts. You may use the calculator to see your payoff for any potential donation plans you have in mind before actually making the donation decision. To use the calculator, first enter the rebate rate for donations to the animal for the specific situation where you are currently making decision, and then enter the possible donation amounts for your group’s assigned animal and your group’s assigned homeless person. The calculator will then provide you with a table that gives information on the number of tokens you decided to keep for yourself ($100 - \text{donations to the animal} - \text{donations to the homeless}$).
homeless person), tokens you will receive from rebates from your donations, and the total tokens after rebates. You can use the calculator as many times as you like.

**Calculator**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebate rate for donations to the animal (%)</td>
<td>30</td>
</tr>
<tr>
<td>Rebate rate for donations to the homeless person (%)</td>
<td>50</td>
</tr>
<tr>
<td>Your donation to the animal (tokens)</td>
<td>15</td>
</tr>
<tr>
<td>Your donation to the homeless person (tokens)</td>
<td>30</td>
</tr>
<tr>
<td>Tokens kept for yourself</td>
<td>55</td>
</tr>
<tr>
<td>Rebate you received from your donation to the animal</td>
<td>4.5</td>
</tr>
<tr>
<td>Rebate you received from your donation to the homeless person</td>
<td>15</td>
</tr>
<tr>
<td>Total Tokens you have after Rebates</td>
<td>74.5</td>
</tr>
</tbody>
</table>

**Decision Screen:**

Your decision screen consists of two parts: the left part will have the “calculator” and the right part will have 5 different situations from which you need to make donation decisions. You may use the calculator as explained above before making your final decision in each situation.

To summarize, you and your paired participant will make decisions for 5 situations, simultaneously. In each situation, the two organizations that you can donate are kept fixed but the rebate rates change from one situation to another. For each situation, you need to decide how much to donate to your group’s assigned animal at the Animal Rescue Organization and to your group’s assigned homeless person at the Homeless Shelter. At the end of the experiment, one of the situations will be selected at random where each situation has an equal chance of being selected. The tokens donated to the animal and to the homeless person by your group will be donated to these charities by the experimenters. The amount that you do not donate will be paid out to you, as well as the rebates that you receive from the experimenters for your donations. **Note that the experimenter - not the charitable organization - pays the rebates.**
After you enter your donation amounts at the decision screen, please press the “confirm” button to confirm your decisions. Once you confirm all your five decisions, changes cannot be made.

Exercise: Let’s check our understanding!

Suppose the rebate rate for the Animal Rescue Organization is 10%, and the rebate rate for the Homeless Shelter is 50%. Let’s consider a situation where the subject’s donation to her group’s assigned animal is 20 tokens and her donation to her group’s assigned homeless person is 40 tokens. Suppose her paired participant donates 15 tokens to the group’s assigned animal and 15 tokens to the group’s assigned homeless person. Please fill the table below for this specific situation:

<table>
<thead>
<tr>
<th>How much does her group’s assigned <strong>animal receive (tokens)</strong>?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>How much does her group’s assigned <strong>homeless person receive (tokens)</strong>?</td>
<td></td>
</tr>
<tr>
<td>Tokens kept for herself</td>
<td></td>
</tr>
<tr>
<td>Rebate she received from her donation to the <strong>animal</strong></td>
<td></td>
</tr>
<tr>
<td>Rebate she received from her donation to the <strong>homeless person</strong></td>
<td></td>
</tr>
<tr>
<td>Total Tokens she has after Rebates</td>
<td></td>
</tr>
</tbody>
</table>

Suppose the rebate rate for the Animal Rescue Organization is 10%, and the rebate rate for the Homeless Shelter is 50%. Let’s consider a situation where the subject’s donation to her group’s assigned animal is 40 tokens and her donation to her group’s assigned homeless person is 20 tokens. Suppose her paired participant donates 15 tokens to the group’s assigned animal and 15 tokens to the group’s assigned homeless person. Please fill the table below for this specific situation:

<table>
<thead>
<tr>
<th>How much does her group’s assigned <strong>animal receive (tokens)</strong>?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>How much does her group’s assigned <strong>homeless person receive (tokens)</strong>?</td>
<td></td>
</tr>
<tr>
<td>Tokens kept for herself</td>
<td></td>
</tr>
<tr>
<td>Rebate she received from her donation to the <strong>animal</strong></td>
<td></td>
</tr>
<tr>
<td>Rebate she received from her donation to the <strong>homeless person</strong></td>
<td></td>
</tr>
<tr>
<td>Total Tokens she has after Rebates</td>
<td></td>
</tr>
</tbody>
</table>
Questionnaire

1. Age:
2. Gender:
3. Major:
4. Family income:
   a) less than 50,000
   b) between 50,000 and 75,000
   c) between 75,000 and 100,000
   d) between 100,000 and 150,000
   e) between 150,000 and 200,000
   f) more than 200,000
5. What is your political view:
   a) conservative
   b) moderate
   c) liberal
6. How important is religion in your life:
   a) very important
   b) important
   c) somewhat important
   d) not important
7. During the past 12 months how much money have you donated for charitable causes:
   a) Less than $5
   b) Between $5-$10
   c) Between $10-$20
   d) More than $20
8. How well do you know the Animal Rescue Organizations in Ann Arbor, please rate it on a 0 to 10 scale where 0 indicates no prior information at all and 10 indicates a perfect knowledge about these organizations:
9. How well do you know the Homeless Shelters in Ann Arbor, please rate it on a 0 to 10 scale where 0 indicates no prior information at all and 10 indicates a perfect knowledge about these organizations:
Appendix B

Table B.1. Summary Statistics for Experiment 1

<table>
<thead>
<tr>
<th>Animal Rebate Rate</th>
<th>Donations to Animal</th>
<th>Donations to Homeless</th>
<th>Total Giving</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>6.17 (1.38)</td>
<td>27.74 (3.85)</td>
<td>33.90 (4.51)</td>
</tr>
<tr>
<td>0.3</td>
<td>8.76 (1.58)</td>
<td>25.67 (3.69)</td>
<td>34.43 (4.57)</td>
</tr>
<tr>
<td>0.5</td>
<td>17.05 (2.46)</td>
<td>21.67 (3.03)</td>
<td>38.71 (5.08)</td>
</tr>
<tr>
<td>0.7</td>
<td>27.86 (3.74)</td>
<td>16.24 (2.85)</td>
<td>44.10 (4.95)</td>
</tr>
<tr>
<td>0.9</td>
<td>46.71 (5.46)</td>
<td>13.76 (2.56)</td>
<td>60.48 (5.50)</td>
</tr>
</tbody>
</table>

Total observations per cell are 42. Standard errors are in parentheses.

Table B.2. Summary Statistics for Experiment 2

<table>
<thead>
<tr>
<th>Animal Rebate Rate</th>
<th>Donations to Animal</th>
<th>Donations to Homeless</th>
<th>Total Giving</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>7.03 (1.31)</td>
<td>35.08 (5.02)</td>
<td>42.10 (5.15)</td>
</tr>
<tr>
<td>0.3</td>
<td>9.03 (1.42)</td>
<td>31.15 (4.75)</td>
<td>40.18 (4.84)</td>
</tr>
<tr>
<td>0.5</td>
<td>18.08 (2.09)</td>
<td>24.25 (3.82)</td>
<td>42.33 (4.76)</td>
</tr>
<tr>
<td>0.7</td>
<td>31.28 (3.88)</td>
<td>16.80 (3.16)</td>
<td>48.08 (4.71)</td>
</tr>
<tr>
<td>0.9</td>
<td>48.25 (5.38)</td>
<td>14.63 (3.03)</td>
<td>62.88 (5.21)</td>
</tr>
</tbody>
</table>

Total observations per cell are 40. Standard errors are in parentheses.
Figure B.1. Individual donations from Experiment 1
Figure B.2. Individual donations from Experiment 2