



The number but not the variety of nonprofit organizations affects donations: evidence from an experiment

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Abstract

We provide experimental evidence on the total and the per-capita amount of collected donations at the increase of the number and variety of organizations available for donations. We vary the number of organizations, their type (nonprofit associations and community foundations) and their charitable purposes (to help people with economic difficulties or disabilities). We show that the number, but not the variety, of nonprofit organizations positively affects the total collected donations. Moreover, we find that, when the number of organizations increases, the inelasticity of total donations to the increase in the number of organizations leads to a reduction in the average amount of collected donations.

Keywords Donations · Associations · Economic behavior · Non-profit organizations

JEL Classification C91 · D64 · L31

1 Introduction

A crucial issue for the nonprofit sector is the effect of the increase in the number of organizations involved in fundraising activity on the total and per-capita amount of collected donations.

At the theoretical level, the increase in the number of organizations may result in the growth of the *total* donations as a consequence of the amplification of the

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exposure of potential donors to charitable activities, which may have positive impacts on their sensitivity and their willingness to donate (Guo and Brown 2006; Graddy and Wang 2009). In addition, the increase in the number of organizations might be associated with the increase in their variety, both in terms of their types and in terms of their charitable purposes, which may positively affect the coverage of the spectrum of potential donors' "ideologies" (Rose-Ackerman 1982), leading to an increase in the total amount donated.¹

Organizations could also be perceived by donors as coordinating to satisfy the needs connected to the provision of social welfare goods and services (Eckel et al. 2020). In this perspective, the number of organizations available for donations may generate in donors the perception of a certain level of need for donations, irrespectively from the charitable purposes of the organizations. If the organizations operate within the same sector, subjects may assume that they coordinate to satisfy a certain demand for social goods and services in that sector. If the same number of organizations operate with different charitable purposes, donors may assume that they coordinate to satisfy the same total need, but articulated in different social sectors.

Per-capita collected donations may increase or decrease when the number of organizations increase, depending on the elasticity of donations to the number of organizations which, in turn, is affected by the magnitude of the effects on total donations described above.

The existing empirical and experimental evidence on the effect of the number and variety of nonprofit organizations involved in fundraising activities on collected donations, surveyed in the next section, is mixed and may depend on a variety of conditions, such as the type of organization and how donation requests reach potential donors.

Our study contributes to this strand of literature by providing an experimental analysis of how total and per-capita donations are affected both by the number of organizations and by their variety in terms of the type of organization and charitable purposes.

Our results provide empirical support for a positive effect of the number of organizations on *total* donations. However, the increase in donations is less than proportional to the increase in the number of organizations that compete for gifts, resulting in a decrease in *per-capita* collected donations. Moreover, we do not observe any effect of variety on donations, either considering the types of organizations or the charitable purposes.

The remainder of the article is organized as follows. Section 2 reviews the related literature and highlights the main contribution provided by our paper to the existing literature. Section 3 describes the experimental design and provides some descriptive statistics on the sample of participants in the study. Section 4 illustrates the main theoretical hypotheses and experimental results. Section 5 concludes.

¹ This is in line with the evidence that shows that nonprofits tend to differentiate themselves as a strategic response to market congestion (Barman 2002).

2 Related literature

The empirical literature on the effect of the number of organizations on fund-raising provides evidence both on total and per-capita collected donations. Guo and Brown (2006) find that organizational density, which is measured as the ratio of the community foundations in a state to the Gross State Product, positively affects fiscal efficiency measured as the foundation's total revenues divided by their total expenses, minus any grants that were allocated in the last fiscal year and negatively affects grant-making performance measured as the ratio between total grants and total assets. Focusing on the same type of organizations, Graddy and Wang (2009) do not find a positive effect of the number of foundations in a county on the ratio between the total donations that are received by foundations and the county's population. Moreover, they do not find detrimental effects on the amount of donations received by foundations of the donations that are collected by other types of charitable organizations, therefore corroborating the idea of a positive effect of variety on total gifts. By considering labor unions, Hanna and Freeman (1987) show that the relation between density, in terms of the number of organizations competing for donations, and funding rates is curvilinear with an inverted U-shape. The increase in the number of organizations generates an initial positive effect on the willingness to donate; however, the effect tends to vanish as the number exceeds a threshold. Thornton (2006) shows that an increase in the number of nonprofit organizations may result in a reduction in the per-capita fund-raising expenditures. The author shows that, collectively, nonprofits organizations may devote an inefficiently high share of their revenues to fundraising. Reinstein (2011) provides empirical evidence on substitution between charitable donations, showing that a shock that positively affects individual's donation to one cause tends to reduce individual's donations to other charitable aims. Choudhury, Omura and Forster (2014) find a positive, but decreasing, effect of nonprofit organizations' total fundraising expenditures on total donations. Moreover, they conclude that nonprofit organizations that compete for donations generate a negative effect on the donations that are collected by other organizations having similar functions. By using data from an online platform which allows foundations and corporations to provide matching grants for projects asking for funds, Meer (2017) shows that the presence of more organizations does not reduce giving.

As for experimental evidence, Lange and Stocking (2012) carry out a field experiment involving more than 288,000 individuals and two charities having different objectives concerning environmental issues. The authors provide evidence for complementarities between the two charities. In fact, the members of a charity who also became members of the second one, and who are solicited for donations from the latter, tend to donate more time and money to both as a whole and to the original charity to which they belong. Cairns and Slonim (2011) examine substitution effects across charitable donations by considering the effect generated by a second collections on first collections at Catholic Masses. While the second collections increase total donations by 17.8%, it reduces first collections by 4.3%. Filiz-Ozbay and Uler (2018) find experimental evidence of a positive effect on

donations of subsidies in the form of rebates. However, when they consider charities having similar objectives, the positive effect of rebates is at the expense of the other charities, that receive lower donations. Conversely, when charities with complementary causes are considered, donations to both charities increase when one of them increases its rebate rate. Finally, when the opportunity costs of rebate campaigns are considered, the total donations minus the rebate costs decrease as the rebate rate that is offered by one of the charities increases.

In a laboratory experiment, Bernasconi et al. (2009) consider a benchmark treatment in which subjects are involved in a standard public goods game and a treatment in which subjects have to choose how much to contribute to each of two identical public goods. The authors show that unpacking generates an increase in total contributions and conclude suggesting that NGOs might increase collected donations by asking donors to decide simultaneously on a variety of contribution opportunities. This study supports the evidence that the “part–whole bias” (Bateman et al. 1997) may have a role also in the context of donations to charities. This bias implies that “if the component parts of a whole are evaluated separately, the sum of those valuations tends to exceed the valuation placed on the whole” (Bateman et al. 1997, p. 322). This effect has been highlighted within the literature on the contingent evaluation method (Diamond and Hausman 1994) and has been found to occur also in experimental contexts concerning private goods (Bateman et al. 1997). Corazzini et al. (2015) adopt threshold public goods representing projects for funding and analyze overall contributions and the probability of project success by comparing different treatments: one where subjects contribute to a single good; others where donors may contribute to four goods. The analysis shows that having four identical donation options instead of one increases difficulty in coordination by decreasing both total contributions and the expected number of successful projects. Results change when one of the four goods stands out with respect to the alternatives because it provides higher potential payments or because it is being featured on the experimental computer screen when donors make their choice. The authors clearly show that salience can help overcome coordination problems and lead to greater efficiency in contributions when more charities compete for donations. Harwell et al. (2015) provide subjects with a menu of charities to which they can make donations. By using a within-subjects design, the authors find that showing a video which promotes one of the five charities increases donations for that charity, but does not affect overall contributions. In the experiment by Eckel et al. (2020), subjects make real donations to charities. The authors conduct many treatments which are based on a main distinction: subjects may receive information on charities simultaneously—coordinated fundraising—or sequentially—independent fundraising. The authors show that the coordinated fundraising outperforms the independent fundraising, also when subjects are given the ex-post opportunity to revise their donation choices. The result is crucially determined by information conditions: the difference in total donations collected in the simultaneous and in the sequential setting disappears when full information concerning the number and identities of the charities is provided before the sequential arrival of any requests.

3 The experiment

3.1 Experimental design and procedures

The experiment was conducted at one of the library of the University of Parma, Italy, and it consisted of four treatments: *Single association*, *Two associations*, *Association and disability fund*, and *Association and poverty fund*.

The participants were recruited using the same text² through announcements in classrooms at the University of Parma and in the newsletters and mailing lists of a second-level association based in Parma (second-level associations are voluntary associations of associations with the institutional goals of supporting their members in their activities, such as by providing training courses). Participants were randomly assigned to the different treatments.

At the beginning of the experiment, the participants were welcomed to the room and were asked to take a place in the room. All the stations were equipped with boxes that served as separators and allowed decisions to be made in complete privacy. The instructions were handed to participants in written form before being read aloud by the experimenter.

Participants were paid a show-up fee of €5. Then, they received fifteen cards with the inscription “€1” on each, an envelope with the inscription “Personal,” and two or three copies (depending on the treatment) of a randomly generated personal code. At this point, they were asked to make a decision regarding the distribution of their “€1” cards.

In the *Single association* treatment, in addition to the “Personal” envelope, they received another envelope with the title “Association” and the following text written on it.

Text on the “Association” envelope:

ASSOCIATION

The association to which you give using this envelope is a nonprofit association that is based and operating in the province of Parma. The nonprofit association is a body under private law that is prohibited from distributing profits. The nonprofit association collects resources that are to be allocated to socially important projects and initiatives in the reference community.

² The description of the research in the recruiting text used neutral language. “We make decisions all the time in our lives. Sometimes they are simple and quick decisions to make; sometimes they are decisions that require time and reflection, sometimes they are decisions that affect only us, and sometimes they affect others as well. The aim of the research is to study economic decisions in different contexts of choice. Participation is established as the opportunity to receive a cash payment, as explained below. If you decide to participate, you will be asked to make simple decisions. To make these decisions, each participant will be given a sum of money that can be used in different ways. Your final gain will depend on your decisions. In any case, a minimum show-up fee of €5 is guaranteed. You will also be asked to fill in a questionnaire about your opinions about today’s society. The choices and answers you provide will remain anonymous, and the data will be analysed and presented in aggregate form, so it will not be possible to associate choices and answers to individuals. The results of the research will be presented in a meeting for which you will receive an invitation to participate.”

One of the tools of the nonprofit association is donations from individual donors that are used to support certain activities.

The association to which you give using this envelope has the main purpose of helping people who are not self-sufficient and have disabilities.

Note that the name of the association was not revealed until the end of the experiment (see below).³

The *Two Associations* treatment was the same as the *Single association* one, but now participants received two “Association” envelopes with the same text as that above, but with two different headings: “Association 1” and “Association 2.” They were informed that even if the description on the two envelopes was the same, the two envelopes would have been used to collect donations for two separate associations.

In the *Association and disability fund* treatment, participants received one “Association” envelope that was identical to the one that was used in the *Single association* treatment and one “Fund” envelope with a description of a community foundation’s fund that provided the same services in the same province of the “Association.”

Text on the “Fund” envelope in the *Association and disability fund* treatment:

FUND

The fund to which you give using this envelope is a community foundation fund-based and operating in the province of Parma.

The community foundation is a nonprofit organization under private law that is prohibited from distributing profits.

The funds are instruments of community foundations that are created and desired by the promoters who started the fund using an initial donation. The funds are aimed at supporting the specific projects that are chosen from time to time by the promoters of the fund. The funds can be used to finance the projects of nonprofit bodies and associations or socially important individual projects and initiatives in the reference community.

The Fund to which you give using this envelope has the main purpose of helping people who are not self-sufficient and have disabilities.

Finally, in the *Association and poverty fund* treatment, in addition to the same “Association” envelope that is used in the other treatments, the participants received a “Fund” envelope describing a community foundation’s fund which provides financial assistance to poor families in the same province of the “Association.”

Text on the “Fund” envelope in the *Association and poverty fund* treatment:

FUND

The fund to which you give using this envelope is a community foundation fund-based and operating in the province of Parma.

The community foundation is a nonprofit organization under private law that is prohibited from distributing profits.

³ We decided not to reveal in advance the name of the association to prevent participants to condition their choice on the knowledge of the specific association.

The funds are instruments of community foundations that are created and desired by the promoters who started the fund using an initial donation. The funds are aimed at supporting the specific projects that are chosen from time to time by the promoters of the fund. The funds can be used to finance the projects of nonprofit bodies and associations or socially important individual projects and initiatives in the reference community.

The fund to which you give using this envelope has the main purpose of helping people and families in financial difficulties.

In each treatment, participants' decision consisted of distributing the fifteen "1€" cards in the envelopes. They must determine the amounts of money to keep and to donate, attach the personal codes to each envelope and place the envelopes in a box.⁴

Participants were informed that at the end of the experiment, the amounts that were collected for each association or fund would be donated by means of an online bank transfer and that they would have the opportunity to assist in the transfer and know the names of the associations and of the community foundation funds.

3.2 Descriptive statistics and nonparametric tests on the experimental sample

As a whole, 179 subjects took part in the experiment; the great majority of participants were students (132), mainly enrolled in Bachelor programs in Economics or Political science. The sample is almost equally divided in terms of gender with 85 female subjects (see Table 4 in the Appendix for descriptive statistics of all variables considered in the empirical analysis). 46 subjects were involved in the *Single association* treatment, 39 in the *Two associations* treatment, 49 in the *Association and disability fund* treatment and 45 in the *Association and poverty fund*.

A series of nonparametric tests (Table 1) reveal some statistically significant differences (5% significance level) between the characteristics of the subjects that were involved in the different treatments. In particular, we find differences in terms of age (between the subjects that were involved in the *Two associations* treatment and those in the *Single association*, *Association and poverty fund* and *Association and disability fund*), and gender (between the subjects that were involved in the *Two associations* treatment and those in the *Association and disability fund*). No differences emerge with respect to the presence of students in the various treatments, while weakly significant differences (10% level) characterize the subjects that were

⁴ In addition, after having concluded this first decision, consisting in distributing the 15€ among the different envelopes as described with reference to the different treatments, the participants were asked to make another decision in which they have been provided with a "Personal" envelope and a single "Fund" envelope. In this second decision, we did not change the number of organizations in competition for donations, but we manipulated the description of the fund, ranging from a minimal to a more detailed description of it. The participants were informed that only one of the two decisions would be randomly selected by tossing a coin and that they would receive 1€ for each card that remained in their "Personal" envelope in the randomly selected decision. Apart from the inconclusive results that emerge from the analysis of this second decision concerning the "Personal" envelope and single "Fund" envelopes, the rationale of this decision is not to investigate the effect of competition on collected donations. Therefore, this part of the experiment is not considered.

Table 1 Characteristics of subjects involved in the different treatments

	$H_0: T 1 = T 2$	$H_0: T 1 = T 3$	$H_0: T 1 = T 4$	$H_0: T 2 = T 3$	$H_0: T 2 = T 4$	$H_0: T 3 = T 4$
Gender	Pearson $\chi^2(1) = 2.8964$ Pr = 0.089	Pearson $\chi^2(1) = 0.1263$ Pr = 0.722	Pearson $\chi^2(1) = 0.0448$ Pr = 0.832	Pearson $\chi^2(1) = 4.2737$ Pr = 0.039	Pearson $\chi^2(1) = 2.2573$ Pr = 0.133	Pearson $\chi^2(1) = 0.3265$ Pr = 0.568
Age	Test = - 3.440 Prob > z = 0.0006	Test = 1.410 Prob > z = 0.1586	Test = 1.207 Prob > z = 0.3042	Test = -4.655 Prob > z = 0.0000	Test = - 4.380 Prob > z = 0.0000	Test = 0.306 Prob > z = 0.7596
Student	Pearson $\chi^2(1) = 0.3645$ Pr = 0.546	Pearson $\chi^2(1) = 0.2388$ Pr = 0.625	Pearson $\chi^2(1) = 0.0039$ Pr = 0.950	Pearson $\chi^2(1) = 1.1473$ Pr = 0.284	Pearson $\chi^2(1) = 0.4362$ Pr = 0.509	Pearson $\chi^2(1) = 0.1784$ Pr = 0.673
Income	Pearson $\chi^2(4) = 8.4899$ Pr = 0.075	Pearson $\chi^2(4) = 3.0793$ Pr = 0.545	Pearson $\chi^2(4) = 1.7455$ Pr = 0.782	Pearson $\chi^2(4) = 4.4018$ Pr = 0.354	Pearson $\chi^2(4) = 5.0899$ Pr = 0.278	Pearson $\chi^2(4) = 1.0013$ Pr = 0.910

Single association treatment = T 1, Two association treatment = T 2, Association and disability fund treatment = T 3, and Association and poverty fund treatment = T 4

Gender: dummy = 1 if the subject is a female; Age: subjects' age in year; Student: dummy = 1 if the subject is a student; and Income: level of income of the subject's household, which is measured on a 5-level scale between 1 (less than 15,000€) and 5 (more than 75,000€). Chi-square tests have been run for Gender, Student and Income and Wilcoxon–Mann–Whitney tests for Age.

involved in the *Two associations* treatment vs. those in the *Single association* in terms of income and gender.⁵

To control for these differences, in the next section, we apply also a multivariate approach.⁶

4 Theoretical hypotheses and empirical analysis

4.1 Theoretical hypotheses

Given the contributions surveyed in Sect. 2, we put forward the following two main hypotheses.

H1 *The number of organizations positively affects the total donations.* Considering the effect of the “part–whole bias” detected also with respect to the provision of public goods (Bernasconi et al. 2009), we expect that duplicating the donation opportunity increases the total amount donated by subjects.⁷ Moreover, we argue that in our experimental setting this effect may be strengthened by two main motivational drivers. First, the presence of more nonprofit organizations could positively influence the sensitivity of donors to charitable activities (Guo and Brown 2006; Graddy and Wang 2009). More organizations available for donations may induce subjects to think that more is needed to satisfy the requests of the local community in terms of social welfare goods and services provided by nonprofit organizations. Second, increasing the amount donated by contributing to both the envelopes when two organizations are available for donations instead of one may allow subjects to obtain more pleasure from warm-glow (Andreoni 1989, 1990).⁸

⁵ Even though we take into account in our empirical analysis individual characteristics of donors, such as the income level and the religious orientation, our experiment was specifically designed to investigate the role of the number and variety of organization available to donors on collected donations and not to provide evidence on other determinants of donations. In particular, we do not focus on the relationship between the costs of fundraising activities and the amount of collected donations. With this respect, in a seminal contribution, Rose-Ackerman (1982) showed that, in the absence of barriers to entry, the competition for donations is socially wasteful (see also Aldashev and Verdier 2010) because it “reduces the level of service provision relative to funds raised for all charities” (Rose-Ackerman 1982, p. 205). For a comprehensive review of the main drivers of charitable giving see Bekkers and Wiepking (2011); on the determinants of donations and pro-social behaviors see also: Andreoni (1990), Bruni et al. (2008) and Lainer-Vos (2014).

⁶ We have also estimated the average treatment effect using inverse probability of treatment weighting (IPW) and predicting the treatment status using the variables *Gender*, *Student*, *Income* and *Parma*. The results confirm the difference between treatments reported in the next section. The variable *Age* was not included in this analysis because of limited overlap in the propensity score distributions between treatment groups. To provide a further robustness check, we performed our estimate by dropping from the sample subjects older than 26, i.e., the maximum age in the *Two associations treatment*. Results presented in the next section—Table 2—are virtually unchanged.

⁷ In the empirical section, we also consider data on subjects’ decision to donate positive amounts across treatments. However, since in Lab experiment participation rates are pretty high compared, for example, to field experiment, we focus our analysis on subjects’ average donations.

⁸ We would like to thank an anonymous referee for suggesting this interpretation.

Table 2 The effect of the density and variety of nonprofit organizations on total donations

	(1)
Dependent variable	<i>Total amount donated</i>
Method	OLS
Two associations	1.622** (0.798)
Association and disability fund	1.943*** (0.723)
Association and poverty fund	2.146*** (0.751)
Age	0.032 (0.047)
Female	1.787*** (0.571)
Believer	0.090 (0.540)
Maiden/single	-0.576 (1.152)
Student	-1.769** (0.832)
Bachelor's degree	-1.473* (0.838)
Income	0.372 (0.261)
Stranger	0.452 (0.840)
Parma	1.080 (0.697)
Risk	-0.014 (0.122)
Knowledge_found	2.348* (1.393)
Knowledge_ass	-0.367 (0.610)
Constant	6.722** (2.606)
Observations	165
Adj R-squared	0.1996
<i>t</i> -test of the equality of the coefficients for the Association and disability fund- Association and poverty fund	-0.203 (0.720)
<i>t</i> -test of the equality of the coefficients for the Two associations-Association and disability fund	-0.321 (0.799)
<i>t</i> -test of the equality of the coefficients for the Two associations-Association and poverty fund	-0.525 (0.813)

* $p < .1$, ** $p < .05$ and *** $p < .01$

H2 *An increase in the variety of organizations positively affects the total donations*
This hypothesis stems from the consideration that a greater variety of organizations allows them to cover more of the donors' ideological spectrum (Rose-Ackerman 1982). Therefore, one may observe an increase in the level of donations as the variety of organizations available for donations increases (in terms of the types of organizations and the purposes of beneficial activities).

Finally, the existing theoretical arguments do not allow us to elaborate hypotheses with regard to the effect of the number and variety of organizations on the amount of donations that are collected by single organizations. In fact, individual collection depends on the elasticity of the aggregate amount of donations to the number and variety of organizations, which in turn depends on the magnitude of their effects on the emergence of the "part-whole bias," on the donors' sensitivity and on the coverage of the ideological spectrum; and on the effects of the latter on donations. These effects have not been clearly theoretically identified or empirically measured.

However, since the endowment of participants does not change across treatment, we put forward the following conjecture:

Conjecture 1 *An increase in the number of organizations triggers a decrease in the per-capita amount collected.*

4.2 Empirical analysis

4.2.1 Number of organizations and total donations

To provide empirical evidence on H1, we compare the *Single association* and the *Two associations* treatments.

The average donation of subjects in the *Single association* treatment is €7.78 (std. dev. 3.67). 8.70% donated all their endowments and the modal value is €5, that was donated by 28.26% of the subjects. In the *Two associations* treatment, the average donation is €9.46 (std. dev. 3.98), 10.26% donated €15 and the modal value is €10, that was donated by 17.95% of subjects. Figure 1 illustrates the percentages of subjects' who donated the different possible amounts across the treatments. When considering the percentage of subjects who donated a positive amount, we find that this is almost the same in the two treatments, with percentages equal to 96.65% in the *Single association* treatment and to 94.87% in the *Two associations* treatment (Pearson $\chi^2(1) = 0.0287$, $Pr = 0.866$). In both the treatments, only two subjects decided not to donate anything. In the *Two associations* treatment, there was only a subject who donated nothing to one of the two associations and a positive amount to the other one. What we observe in this treatment is that subjects tend to donate positive amounts to both the associations, with the average amount donated to each of the two associations which is almost exactly the same (€4.65 vs. €4.81). This behavior results in a higher amount donated as a whole in the *Two associations* treatment than in the *Single*

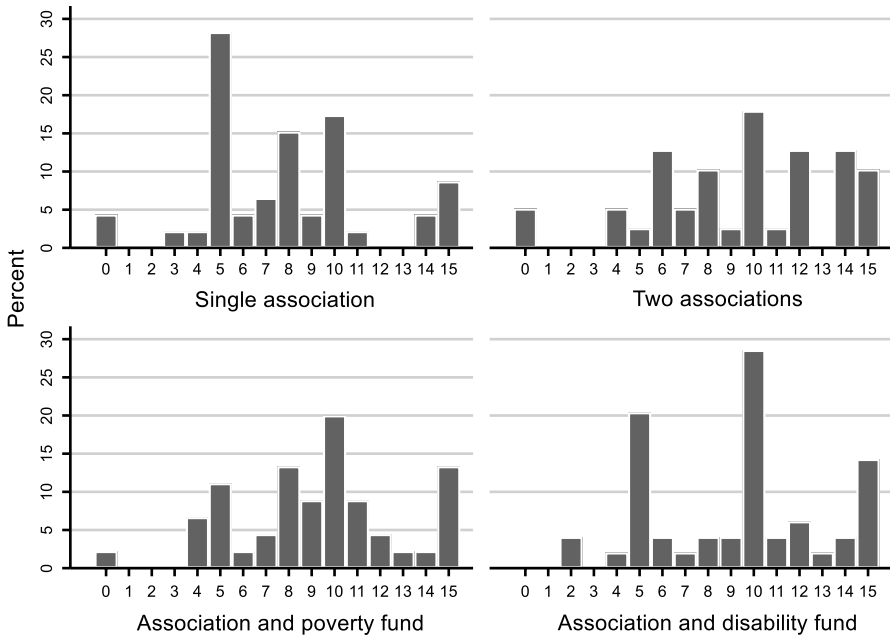


Fig. 1 Donations across treatments (€)

association treatment. Donations in the *Two associations* treatment are greater than those in the *Single association* treatment (Wilcoxon rank-sum (Mann–Whitney) test = 2.230 Prob >|z|= 0.0258).

The regression analysis confirms that the subjects involved in the *Two associations* treatment tended to donate more than those involved in the *Single association* treatment. We run an OLS estimate including all subjects who participated in the experiment. The dependent variable is the total amount that was donated by subjects. We included dummy variables identifying the subjects involved in the different treatments (*Two association*; *Association and poverty fund*; *Association and disability fund*). The residual category is the subjects that were involved in the *Single association* treatment (Table 2).

The control variables considered are described in the Appendix—Table 4. They include the subject’s age; the income level of the subject’s household; a risk aversion measure; dummy variables taking the value of 1 for the following subject characteristics: female, religious believer, maiden/single, has a university degree or higher, student, non-Italian-born and born in the province of Parma where the research has been carried out; two dummy variables that, respectively, control for the knowledge of nonprofit associations and community foundations operating in the province of Parma. The main results reported in Table 2 are virtually unchanged if ordered logit estimates instead of OLS are performed. The estimates clearly show that the amount of gifts increases as the number of organizations available for donations increases when the two associations do not differ from the single one in any respect.

We then put forward the following result:

Result 1 Moving from one association to two associations of the same type and with same charitable purpose increases the total donations.

This result provides empirical support for H1.

4.2.2 Variety of organizations and total donations

To investigate the effect of variety on donations, we compare the *Two associations* treatment with the *Association and disability fund* treatment and the *Association and poverty fund* treatment. In the first case, the variety increases exclusively in terms of the types of organizations available for donations. In fact, in the *Association and disability fund* treatment, subjects can donate to two different types of organizations, an association and a community foundation fund, that have the same charitable goal. When considering the *Association and poverty fund* treatment, the variety increases both in terms of the type of organizations competing for donations and in terms of the charitable purpose.

The average donation of the subjects that were involved in the *Two associations* treatment (mean €9.46 and std. dev. 3.98) does not seem to be different from those in the *Association and disability fund* treatment (mean €9.29 and std. dev. 3.74) and in the *Association and poverty fund* treatment (mean €9.24 and std. dev. 3.56). The modal value concerning the donated amount is the same in the three distributions and is equal to €10 (Fig. 1). Non parametric tests reveal that the distribution of the donations in the *Two associations* treatment is not significantly different from those in the other two treatments (*Two associations* vs. *Association and disability fund*: Wilcoxon rank-sum (Mann–Whitney) test=0.373 and Prob>|z|= 0.7089; and *Two associations* vs. *Association and poverty fund*: Wilcoxon rank-sum (Mann–Whitney) test=0.393 and Prob>|z|= 0.6946).

All subjects involved in the *Association and disability fund treatment* donated positive amounts. However, six subjects (12.24%)—three per each organization—donated nothing to one of the two organizations available for donation while opted for donating a positive amount to the other organization. In the *Association and poverty fund* treatment, the 97.78% of subjects donated a positive amount. A subject donated nothing to the association and a positive amount to the poverty fund. In both these treatments, the participation rate to donation is higher than in the *Two associations* treatment (96.65%), but the differences are not statistically significant (*Two associations* vs. *Association and disability fund*: Pearson $\chi^2(1)=2.5713$, Pr=0.109; *Two associations* vs. *Association and poverty fund*: Pearson $\chi^2(1)=0.5123$, Pr=0.474; *Association and poverty fund* vs. *Association and disability fund*: Pearson $\chi^2(1)=1.1006$, Pr=0.294). The relatively lower number of subjects deciding not to donate in the treatment characterized by more variety in the organizations asking for donation is not enough to generate differences in the average amount donated. However, it seems to provide room for a possible effect of variety on donors' behavior.

The last two lines of Table 2 report the *t*-test results that are useful for comparing subjects' behavior in the *Two associations* treatment vs. the *Association and disability fund* treatment and the *Association and poverty fund* treatment, respectively. They

confirm that no statistically significant differences emerge with respect to the total amounts that are donated by subjects in these treatments.

We put forward our second result:

Result 2 The total amount of donations collected is not affected either by the variation of the type of organizations, or the variation of both the type and the purpose of the organizations.

This result seems not to support the role of variety in positively affecting donations because of a greater coverage of the donors' ideological spectrum. Obviously, we cannot maintain that Result 2 is robust to all possible changes in the types of organizations available for donations or in their charitable purposes. However, assuming that the organizational types and/or the charitable purposes considered in our experiment increase the coverage of the donors' ideological spectrum, it may be argued that H2 (an increase in the variety of organizations positively affects the total donations) is not supported by our empirical. An explanation of our result 2 may be based on the possibility that donors perceive organizations asking for donations as coordinating to satisfy a general level of needs. If this is the case, the effect of variety of organizations on the total collected donations would not emerge.

4.2.3 Number, variety of organizations and per capita donations

Table 3 shows the average donations that are collected by each organization in the four treatments. The second line of Table 3 reports the tests that analyze if the distributions of the donations to each organization in the three treatments (*Two associations*, *Association and disability fund*, and *Association and poverty fund*) are significantly different from the distribution of donations to the single association in the *Single association* treatment. The tests clearly show that the average amounts that are collected by each organization decreases as the number of organization available for donation increases.

This leads to our third result, which is in line with our *Conjecture 1*:

Result 3 Total donations are inelastic to the increase in the number of organizations available for donations, even when it is associated with a greater variety in terms of the types of organizations and charitable purposes.

Finally, we do not find any difference when we examine the amount that is donated to each single organization that is considered in the different treatments. In fact, no difference emerges between the amounts that are donated to the two associations that are involved in the *Two associations* treatment or between the funds and the associations in the *Association and disability fund* treatment and the *Association and poverty fund* treatment (Table 3—last line).

Table 3 The effects of density and variety of nonprofit organizations on per capita donations

Treatment Organization Type	Single associations		Two associations		Association and disability fund		Association and poverty fund	
	Association	Found	Association	Found	Association	Found	Association	Found
Average donation (SD)	7.78 (3.67)		4.65 (2.12)	5	4.29 (2.14)		4.56 (2.05)	4.69 (1.87)
Wilcoxon rank- sum (Mann- Whitney)			Test = -4.312 Prob > z =0.000	Test = -3.962 Prob > z =0.000	Test = -5.133 Prob > z =0.000		Test = -4.808 Prob > z =0.000	Test = -4.590 Prob > z =0.000
			Test = 0.303 Prob > z =0.7616	Test = 1.101 Prob > z =0.2711	Test = 1.101 Prob > z =0.2711		Test = 0.460 Prob > z =0.6452	

The second line analyzes if the distributions of the donations to each organization in the three treatments (*Two associations*, *Association and disability fund*, and *Association and poverty fund*) are significantly different from the distribution of donations to the single association in the *Single association* treatment. The last line analyzes if differences emerge between the amounts that are donated to the two associations that are involved in the *Two associations* treatment or between the funds and the associations in the *Association and disability fund* treatment and the *Association and poverty fund* treatment

5 Conclusions

The theoretical analyses of the competition for donations among nonprofit organizations suggest that both the number and the variety of organizations should have positive impacts on the total collected donations. However, the empirical results for these connections are mixed, also depending on the variable that is used to measure fundraising performance. With this work, we make a step forward with respect to the existing literature by providing an experimental analysis in which we vary the number and the type of nonprofit organizations available for donations.

Our data show that the number of organizations, but not their variety, positively affects donations. Moreover, we show that the total collected donations are inelastic to the increase in the number of organizations available for donations. This implies that when the number of organizations competing for donations increases, the per capita donations decrease.

Two main shortcomings characterize our experimental design. The first one concerns the maximum number of organizations available for donations. Future research may analyze if there is a threshold with respect to the effect of this variable on the total collected donations. The second one is the absence of costs associated with fundraising activities, which does not allow us to analyze the effect of competition on collected donations net of the fundraising costs that may increase with competition. This aspect seems to be particularly difficult to be implemented in Lab experiments and should be analyzed by considering data from organizations operating in different competitive contexts.

Finally, in our experiment, we analyze two types of organizations and two charitable purposes characterizing their activity and we do not explore the effects on donations of all the possible combinations of these variables. Future research may investigate if our results hold when different types, purposes and combinations are considered.

Appendix

See Table 4.

Table 4 Variable legend and descriptive statistics

	Variable description	Obs	Mean	SD	Min	Max
Total amount donated	Total amount donated by subjects	179	8.927	3.760	0	15
Two associations	Dummy Variable (DV) taking the value of one (= 1) for subjects involved in the <i>Two association treatment</i>	179	0.218	0.414	0	1
Association and disability fund	DV = 1 for subjects involved in the <i>Association and disability fund treatment</i>	179	0.274	0.447	0	1
Association and poverty fund	DV = 1 for subjects involved in the <i>Association and poverty fund treatment</i>	179	0.251	0.435	0	1
Age	Subject's age in years	178	25.596	10.492	19	73
Female	DV = 1 if the respondent is a female	177	0.480	0.501	0	1
Believer	DV = 1 if the respondent is a religious believer	178	0.584	0.494	0	1
Maiden/single	DV = 1 if the respondent is maiden/single	174	0.851	0.358	0	1
Student	DV = 1 if the respondent is a student	179	0.737	0.441	0	1
Bachelor's degree	DV = 1 if the respondent has a university degree or higher	179	0.173	0.379	0	1
Income	Income level of the subject's household measured on a 5-level scale between 1 (less than 15,000€) and 5 (more than 75,000€)*	176	2.472	1.111	1	5
Stranger	DV = 1 if the respondent was not born in Italy	178	0.135	0.343	0	1
Parma	DV = 1 if the respondent was born in the province of Parma, where the research has been carried out	179	0.298	0.459	0	1
Risk	Risk aversion measure based on the question "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please tick a box on the scale, where the value 0 means 'unwilling to take risks' and 10 means 'fully prepared to take risk,' which proved to be a good measure of risk aversion (see Dohmen et al. 2011)	179	6.324	2.228	0	10
Knowledge found	DV = 0 if the respondent declares in the post-experimental survey that s/he does not know of a nonprofit association operating in Parma	176	0.057	0.232	0	1
Knowledge ass	DV = 0 if the respondent declares in the post-experimental survey that s/he does not know of a community foundation operating in Parma	179	0.570	0.496	0	1

*Our main results do not virtually change if we replace this variable with a variable measuring the answers to the question "How well would you say that you are doing financially these days?" For this question, 1 represents "Living in a comfortable way," 2 represents "Living in an acceptable way," 3 represents "Barely getting by," and 4 represents "It goes really badly." In fact, the only difference in the statistical significance of our dummy variables of interest is for the *Association and poverty fund* that becomes significant at less than 1% ($p = 0.014$)

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Declaration

Conflict of interest The authors declare that they have no conflict of interest.

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References

- Aldashev G, Verdier T (2010) Goodwill bazaar: NGO competition and giving to development. *J Dev Econ* 91(1):48–63
- Andreoni J (1989) Giving with impure altruism: applications to charity and Ricardian equivalence. *J Polit Econ* 97(6):1447–1458
- Andreoni J (1990) Impure altruism and donations to public goods: a theory of warm-glow giving. *Econ J* 100(401):464–477
- Barman EA (2002) Asserting difference: the strategic response of nonprofit organizations to competition. *Soc Forces* 80(4):1191–1222
- Bateman I, Munro A, Rhodes B, Starmer C, Sugden R (1997) Does part-whole bias exist? *Exp Investig Econ J* 107(441):322–332
- Bernasconi M, Corazzini L, Kube S, Maréchal MA (2009) Two are better than one!: individuals' contributions to "unpacked" public goods. *Economics Lett* 104(1):31–33
- Bekkers R, Wiepking P (2011) A literature review of empirical studies of philanthropy: eight mechanisms that drive charitable giving. *Nonprofit Volunt Sect Quart* 40(5):924–973
- Bruni L, Gilli M, Pelligra V (2008) Reciprocity: theory and facts. *Int Rev Econ* 55(1–2):1–11
- Cairns J, Slonim R (2011) Substitution effects across charitable donations. *Econ Lett* 111(2):173–175
- Choudhury MA, Omura T, Forster J (2014) Competition for donations and the sustainability of not-for-profit organisations. *Humanomics* 30(3):255–274
- Corazzini L, Cotton C, Valbonesi P (2015) Donor coordination in project funding: evidence from a threshold public goods experiment. *J Pub Econ* 128:16–29
- Diamond PA, Hausman JA (1994) Contingent valuation: is some number better than no number? *J Econ Perspect* 8(4):45–64
- Dohmen T, Falk A, Huffman D, Sunde U, Schupp J, Wagner GG (2011) Individual risk attitudes: measurement, determinants and behavioural consequences. *J Eur Econ Assoc* 9(3):522–550

- Eckel C, Guney B, Uler N (2020) Independent vs. coordinated fundraising: understanding the role of information. *Eur Econ Rev* 127:103476
- Filiz-Ozbay E, Uler N (2018) Demand for giving to multiple charities: an experimental study. *J Eur Econ Assoc* 17(3):725–753
- Graddy E, Wang L (2009) Community foundation development and social capital. *Nonprofit Volunt Sect Quart* 38(3):392–412
- Guo C, Brown WA (2006) Community foundation performance: Bridging community resources and needs. *Nonprofit Volunt Sect Quart* 35(2):267–287
- Hannan MT, Freeman J (1987) The ecology of organizational founding: American labor unions, 1836–1975. *Am J Sociol* 92(4):910–943
- Harwell H., Meneses D, Mocerri C, Rauckhorst M, Zindler A, Eckel C. (2015) Did the Ice Bucket Challenge Drain the Philanthropic Reservoir?. Economic Research Laboratory, Texas A&M University, Working Paper
- Lange A, Stocking A (2012) The complementarities of competition in charitable fundraising. Congressional Budget Office Washington, DC Working Paper 32
- Dan L-V (2014) Brothers' keepers: gift giving networks and the organization of Jewish American diaspora nationalism. *Socio-Econ Rev* 12(3):463–488
- Meer J (2017) Does fundraising create new giving? *J Pub Econ* 145:82–93
- Reinstein DA (2011) Does one charitable contribution come at the expense of another? *BE J Econ Anal Policy*. <https://doi.org/10.2202/1935-1682.2487>
- Rose-Ackerman S (1982) Charitable giving and "excessive" fundraising. *Q J Econ* 97(2):193–212
- Thornton J (2006) Nonprofit fund-raising in competitive donor markets. *Nonprofit Volunt Sect Quart* 35(2):204–224

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