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A Theory of Outsourced Fundraising: Why Dollars Turn into "Pennies for Charity"

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Abstract

Charities frequently rely on professional solicitors whose commissions exceed half of the solicited donations. To understand this practice, we propose a principal-agent model in which the charity optimally offers a higher commission to a more efficient solicitor, raising the price of giving significantly. Outsourcing is, therefore, profitable for the charity only if giving is very price-inelastic, which is not supported by empirical evidence. We show that outsourced fundraising can be optimal if: donors are unaware of this practice; the professional solicitor better activates donors' warm-glow feelings toward the cause; or there is a significant fixed cost of fundraising. We argue that informing the public of the mere existence of paid solicitations may be the most effective policy available.

Keywords: fundraising, solicitation, outsourcing, charitable giving
JEL Classification: H4, L3, L5

1 Introduction

Fundraising is essential to most charities – but it is costly. A 25-35% cost-to-donation ratio is considered reasonable by leading experts (Kelly, 1998) and watchdogs such as Charity Navigator. This benchmark is, however, significantly exceeded by those charities that rely on professional fundraisers.[1] According to the "Pennies for Charity" reports of New York

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[1] "Professional fundraiser" is a legislated term often used for a third-party whose services are contracted for. This term excludes employees of the charitable organization (Hopkins, 2009).

state, charities regularly paid more than half of the solicited donations to telemarketing companies; see Figure 1 based on the 2013 report.[2]

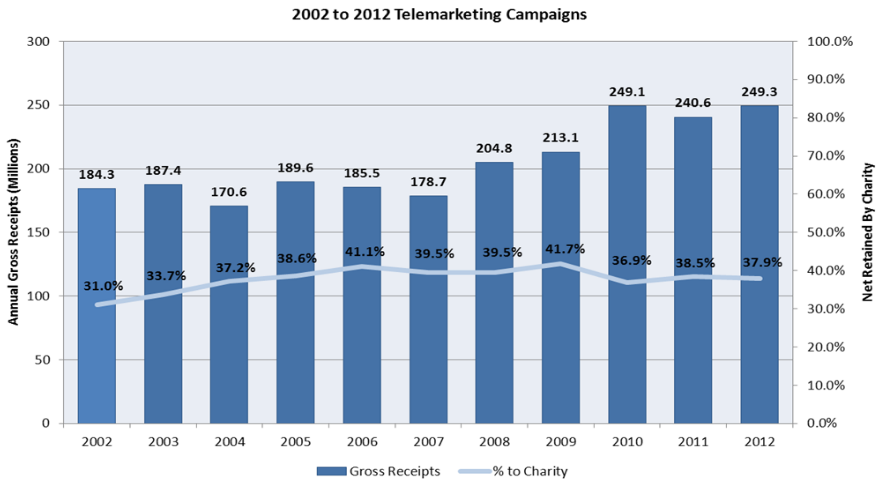

Figure 1. Charitable Telemarketing in New York

The cost of paid fundraisers raises legitimate concerns about the accountability of charitable organizations. As such, it has the potential to undermine public confidence in the entire nonprofit sector, which constitutes about 2% of GDP in the U.S (List, 2011). Complicating policy is the fact that regulation of fundraiser fees *and* their disclosure to donors is unconstitutional (Hopkins, 2009).[3] Therefore, the most state regulators can do are to compel paid solicitors to identify themselves to donors and to publish their campaign statistics (Fishman and Barrett, 2013).

This paper offers a first analysis of outsourced fundraising: why it exists despite being so expensive and what it implies about donor motives and policy.[4] Our base model features one charity, one professional fundraiser and many identical donors with standard, purely altruistic preferences. Each donor gives only if solicited.[5] The charity may conduct these (costly) solicitations on its own or outsource them to the professional by promising

[2]The *Pennies* reports are available at <www.charitiesnys.com>.

[3]Citing freedom of speech (about charitable causes), the U.S. Supreme Court ruled such regulation unconstitutional in three landmark cases: Village of Schaumburg v. Citizens for Better Environment, 444 U.S. 620 (1980); Secretary of State of Maryland v. Munson Co., 467 U.S. 947 (1984); and Riley v. National Federation of the Blind, 487 U.S. 781 (1988).

[4]Starting with Coase (1937), the issue of internal versus external operations of organizations has been extensively studied in the literature; see Williamson (2005) for a survey. Our paper differs in its focus on nonprofits.

[5]Directly asking donors is considered one of the most powerful fundraising techniques; see, e.g., Meer and Rosen (2011) and Edwards and List (2014) for recent evidence.

him a percentage of the donations collected. We find that it is hard to rationalize outsourcing in this standard setup if, as required by law, the professional reveals himself to donors. Intuitively, under outsourcing, the charity retains the paid solicitor as an agent whose unobserved effort is the number of solicitations (Holmstrom, 1979). To overcome the resulting incentive cost, the charity outsources only if the paid solicitor is sufficiently more "efficient" than itself. Consistent with agency theory, the charity must then optimally offer a high percentage of total receipts to such an efficient solicitor, implying a high price of giving for donors. Outsourcing is, therefore, profitable for the charity only if giving is very price-inelastic. That, however, is refuted by empirical evidence on elasticity (Clotfelter, 1985; Randolph, 1995; Auten et al. 2002; Eckel and Grossman, 2003; Bakija and Heim, 2011; and Huck and Rasul, 2011) as well as lab data on preferences for giving (Andreoni and Miller, 2002; Fisman et al. 2007).

In light of this (negative) finding, we offer three explanations for outsourcing. First, despite state disclosure laws, donors may still be unaware of paid solicitations and continue to give generously. This is consistent with the anecdotal evidence presented in media reports[6] as well as survey evidence indicating largely uninformed giving (Hope Consulting report, 2011) and the strong public confidence in the charitable sector (O'Neill, 2009; Edelman TrustBarometer, 2014). Second, the professional solicitor may be better trained in activating "warm-glow" feelings (Andreoni, 1989) toward the cause, making donors less sensitive to the increased price of giving. And third, the fundraising campaign may simply involve too high a fixed cost for the charity but not for the professional fundraiser.

As a by-product, our analysis reveals that a more efficient charity that raises greater (net) funds may also score a higher cost-to-donation ratio, which supports the critics of charity ratings based on this ratio (Steinberg, 1991; Karlan, 2011). In two extensions of our model, we further show that charities may view paid solicitations as an "investment" into acquiring new donors,[7] and that charities with additional revenue sources such as product sales, fees, government grants or repeat donors are less likely to use paid solicitors.

Apart from the papers mentioned above, our paper relates to a growing theoretical literature on strategic fund-raising by means of: coordinating donations (Andreoni, 1998; Marx and Matthews, 2000); facilitating informed giving (Vesterlund, 2003; Andreoni, 2006;

[6] See <www.bloomberg.com/news/2012-09-12/charities-deceive-donors-unaware-money-goes-to-a-telemarketer.html> and <www.tampabay.com/americas-worst-charities>.

[7] The *Pennies* reports indicate that about 10% of telemarketing campaigns result in a loss for charities.

Krasteva and Yildirim, 2013); and organizing lotteries (Morgan, 2000). These papers, however, do not model fundraising as an endogenous, costly undertaking. Fixing donor behavior, Rose-Ackerman (1982) provides a first model of costly fundraising as in our setting and shows that competitive fundraising can be "excessive". Andreoni and Payne (2003), Name-Correa and Yildirim (2013) and Perroni et al. (2014) endogenize both the charity's and donors' behaviors but essentially assume "in-house" fundraising; so outsourcing, which is at the heart of our investigation, is a nonissue. We should note that there is also an extensive empirical literature on charitable giving as ably reviewed by List (2011) and Andreoni and Payne (2013).

In the next section, we briefly overview the market for paid solicitors. In Section 3, we set up the base model with altruistic donors, followed by a characterization of in-house fundraising in Section 4. In Section 5, we determine an optimality condition for outsourcing and argue that it would contradict evidence. In Section 6, we advance three explanations for outsourcing. We discuss several extensions in Section 7 and conclude in Section 8. The proofs of all the formal results appear in the appendix.

2 Paid charitable solicitation

Paid charitable solicitation is widespread in the U.S.[8] As seen in Figure 1, telemarketing campaigns in New York state raised 249.3 million dollars in 2012. For the same period, California, Colorado, Massachusetts, and North Carolina, among others, reported 294.3, 317, 266.6, and 494 million dollars, respectively. Compared to total giving by individuals - 228.9 billion in 2012 - these amounts are not overly significant but paid solicitors are hired by small and large charities alike, including American Cancer Society, American Diabetes Association, American Heart Association and March of Dimes to name a few. Indeed, based on Pennsylvania data for the period 1991-1996, Greenlee and Gordon (1998) estimate that the average charity to use a professional solicitor is approximately six times larger than the average nonsolicitor charity. They also find that the charities using professionals are relatively more common in the advocacy, disease/disorder, environment, public safety and youth development subsectors. These findings are corroborated by Keating et al. (2003) who analyze 1994-2001 New York data.

According to Hopkins (2009, p.71), "in many instances, prior to a solicitation campaign,

[8]See Sandberg (2006) for the European experience.

a paid solicitor must file with the state a copy of his, her, or its contract with the charitable organization". Greenlee and Gordon (1998) find 63.3% of contracts to be pure percentage-based, 20.9% fixed-fee (paid to solicitor) and 15.8% the mix of the two. Keating et al. (2003) do not explicitly study contracts, but observe that "telemarketing arrangements are (explicitly or implicitly) structured with a heavy reliance on a (high) fixed commission rate". A two-part contract that involves a lump-sum transfer *to* the charity is not observed in the data nor would it be optimal: if a two-part contract were optimal, the charity would make the fundraiser a residual claimant of the solicitation campaign by requiring an up-front lump-sum payment, *but* this arrangement would discourage all donations and in turn be unacceptable to the fundraiser.[9]

3 Base model

The economy consists of one charity, one professional fundraiser, and many identical donors. Each donor participates in a voluntary contribution game only if solicited – perhaps, she is uninformed of the current fund-drive or simply procrastinates. For simplicity, each solicitation is assumed to reach the donor. The charity can perform these solicitations in-house or outsource them to the professional by offering him a percentage s of the donations collected.[10] Since it is not required by law, s is not disclosed to donors at the time of solicitation, though donors can hold rational expectations about it.[11] We assume that the fundraising technology is represented by a convex, iso-elastic cost function:

$$C(n;\alpha) = \frac{n^{1+1/\alpha}}{1+1/\alpha} \tag{1}$$

where $\alpha > 0$ is the "ability" parameter and n is the number of solicitations.[12] In particular, treating n as a continuous variable, the marginal cost is: $C_n(n;\alpha) = n^{1/\alpha}$, where subscripts

[9]Keeping the argument, donors who are unable to observe fundraising contracts at the point of solicitation would, therefore, not expect a lump-sum payment to the charity in equilibrium. This highlights the importance of donors in our principal-agent setting; see Steinberg (1990) for a similar point.

[10]We assume a pure percentage-based contract for most of the analysis because, as discussed above, it is commonly observed in the data. We briefly compare it with a per-call based contract in Section 7. In practice, the contract negotiation between the parties can be complicated but assuming a more powerful professional would only strengthen our result about a high percentage offer.

[11]We assume that verifiably communicating fundraising contract at the point of solicitation, e.g., on the phone or at the door, is infeasible, nor would it be in the professional's best interest as we show in Proposition 3.

[12]With little loss of generality, fixed costs of fundraising are ignored in the main analysis but briefly discussed in Section 6.3.

refer to partial derivatives throughout. Note that marginal cost is decreasing in α, so we say that the fundraising technology is more efficient, the higher α is.[13,14]Donors cannot observe the choice of n and in case of outsourcing, neither can the charity.

On the donor side, we adopt the standard, purely altruistic model of giving (Bergstrom et al. 1986). Each contacted person allocates her income m between private good consumption $x_i \geq 0$ and a gift to the charity $g_i \geq 0$ without observing others. Units are normalized so that $x_i + g_i = m$. Let $G = \sum_i g_i$ be the total donation. Then, the charity's net revenue is $G - C$ for the in-house and $(1-s)G$ for the outsourced fundraising. The charity can provide the public good only if its net revenue is positive. In particular, the public good is provided at the levels: $\overline{G} = \max\{G - C, 0\}$ and $\overline{G} = (1-s)G$ for the in-house and outsourced fundraising, respectively. Person i's preferences are represented by an increasing, twice differentiable, and strictly quasi-concave utility function:

$$u_i = u(x_i, \overline{G}).$$

Let $f(m,p)$ be individual (Marshallian) demand for the public good whose relative price is p. We assume that both public and private goods are normal so that $0 < pf_m < 1$. Below, we will frequently refer to price and income elasticities of demand: $\varepsilon^p = \frac{p \times f_p}{f}$ and $\varepsilon^m = \frac{m \times f_m}{f}$.

To establish a benchmark, we begin our investigation by in-house fundraising and then turn to outsourcing.

4 In-house fundraising

Suppose that the charity fundraises itself and that this is commonly known by donors. Because donors do not observe the number of solicitations or the donations of others, a strategy for a donor is simply how much to give if solicited. Hence, in a (Nash) equilibrium, (i) the number of solicitations is optimal for the charity given the strategies of the donors, and (ii) the strategy of each donor is optimal given the number of solicitations

[13]From (1), note also that the marginal cost advantage of a more efficient fundraiser is increasing in the number of solicitations as we have both $C_{n\alpha} < 0$ and $C_{nn\alpha} < 0$. We believe that this is consistent with charity telemarketing: a telemarketer is more efficient not only because it is better trained in persuading a given donor but also because, having solicited for related charities, it is better at locating likely donors; see, e.g., <https://www.revealnews.org/article/one-donation-to-charity-telemarketer-spawns-more-solicitation-calls/>.

[14]The total cost $C(n;\alpha)$ is also decreasing in α if and only if $n > e^{\frac{\alpha}{1+\alpha}}$ (or if $n \geq 3$) which we assume to hold for consistency.

and the strategies of the other donors. Formally, conjecturing the equilibrium number of solicitations n^I, its cost $C^I = C(n^I; \alpha_I)$, and others' total contribution G^I_{-i}, donor i solves

$$\max_{x_i, g_i} u(x_i, g_i + G^I_{-i} - C^I)$$
$$\text{s. to } x_i + g_i = m.$$

Following Bergstrom et al. (1986) and letting $\overline{G}^I_{-i} \equiv G^I_{-i} - C^I$ and $\overline{G} = g_i + \overline{G}^I_{-i}$, i's program can be more conveniently written:

$$\max_{x_i, \overline{G}} u(x_i, \overline{G}) \tag{ID}$$
$$\text{s. to } x_i + \overline{G} = m + \overline{G}^I_{-i}$$
$$\overline{G} \geq \overline{G}^I_{-i}.$$

Ignoring the second (nonnegativity) constraint, which holds in equilibrium, the unique solution to (ID) is: $\overline{G}^I = f(m + \overline{G}^I_{-i})$, where, by slightly abusing notation, f denotes the demand for the public good under the relative price $p = 1$. This means that donor i's optimal gift is:

$$g^I_i = f(m + \overline{G}^I_{-i}) - \overline{G}^I_{-i}. \tag{2}$$

By normality, i.e., $0 < f_m < 1$, it readily follows that equilibrium gifts are equal: $g^I_i = g^I$.

Anticipating g^I from each solicitation, the charity chooses the number of solicitations to maximize its net revenues:[15]

$$\overline{G}^I = \max_n n g^I - C(n; \alpha_I). \tag{IF}$$

The first-order condition requires that $g^I = C_n(n^I; \alpha_I)$. That is, the optimal number of solicitations equates the marginal revenue, which is the last donation, to its marginal cost. Employing (1), this condition reduces to:

$$n^I = \left(g^I\right)^{\alpha_I}. \tag{3}$$

All else equal, the charity reaches out to more people, the larger the expected gift and/or the more efficient its technology is. Using (2), (3), and the fact that $g^I_i = g^I$, our first result

[15]In general, the evidence on charities' objectives is mixed but net revenue maximization is often adopted in theoretical studies; see Steinberg (1986) and Khanna et al. (1995) for empirical support.

characterizes the equilibrium for in-house fundraising.[16]

Proposition 1 *Under in-house fundraising, there is a unique and symmetric equilibrium. In equilibrium, as the fundraising technology becomes more efficient, namely as α_I gets larger, the number of solicitations, n^I; the total cost, C^I; the gross donations, G^I; and the net revenues, $\overline{G}^I$, all increase whereas the individual gift, g^I, decreases.*

As expected, a more efficient charity contacts more individuals and incurs a higher total cost as a result. Since free-riding intensifies in a larger population, each contacted individual gives less, but this reduction is not enough to diminish gross or net donations. The latter highlights a donor incentive to partially cover the fundraising cost.

The cost-to-donation ratio for the charity can also be readily determined. From (1) and (3), note that the equilibrium total donation is: $G^I = (1 + 1/\alpha_I)C^I$, which reveals

$$r^I \equiv \frac{C^I}{G^I} = \frac{\alpha_I}{1+\alpha_I}. \tag{4}$$

Evidently, r^I is increasing in α_I; that is, a more efficient charity, while raising more funds, scores a higher cost-to-donation ratio! The intuition is that an optimizing charity solicits until its cost-to-donation ratio for the last donor is 1. Since a more efficient charity has a flatter marginal cost curve, its (average) ratio ends up higher. Although this inverse relationship between efficiency and the cost-to-donation ratio does not generalize to any convex cost of solicitation,[17] it does have two important implications.

First, though simple and often utilized by leading watchdogs such as Charity Navigator, the cost-to-donation ratio is an unreliable measure for charity ratings. As such, our finding theoretically supports the critics of this measure (Steinberg, 1991; Karlan, 2011). Nevertheless, there is some evidence that donors care about such ratings and best practice

[16] Given our focus on a fundraising market, we rule out a trivial equilibrium in which it does not exist. Specifically, conjecturing the total solicitation cost $C^I > 0$, there can be a zero-contribution equilibrium among donors much like in Andreoni's (1998) non-convex public good provision; but it is never reached in our setting since C^I is endogenous to solicitations. That is, a fundraiser who anticipates a negative net revenue would not start the campaign in the first place.

[17] To see this, fix g and note that the cost-to-donation ratio is $r(\alpha) = \frac{AC(n,\alpha)}{g}$ where AC denotes average cost. From here,

$$r'(\alpha) = \frac{1}{g}[\underset{(+)}{AC_n} \times \underset{(+)}{n_\alpha} + \underset{(-)}{AC_\alpha}].$$

Consider, for instance, $C(n;\alpha) = \frac{n^2/2+n}{\alpha}$. From the charity maximization (IF), $n = \alpha g - 1$, yielding $r(\alpha) = \frac{1}{2} + \frac{1}{2\alpha g}$, which is decreasing in α.

standards promoted by industry experts and watchdogs (Gordon et al. 2009; Brown et al. 2014; Yoruk 2016). Thus, second, our finding might also explain why some charities fall short of maximizing net-revenues and instead behave as "satisficers" who set revenue goals (Khanna et al. 1995; Okten and Weisbrod, 2000; Andreoni and Payne, 2011; and Sieg and Zhang, 2012). The following corollary, which directly obtains from (4), shows that a goal-setting charity is likely to be more efficient.

Corollary 1 *Suppose that donors respond to watchdog ratings and that watchdogs consider the cost-to-donation ratio up to r^{wd} to be "acceptable". Then, a charity with $\alpha_I > \frac{r^{wd}}{1-r^{wd}}$ falls short of maximizing net revenues by soliciting too few donors whereas a charity with $\alpha_I \leq \frac{r^{wd}}{1-r^{wd}}$ maximizes net revenues.*

Corollary 1 predicts that more charities that are relatively efficient will turn satisficers as the "acceptable" rating grows more stringent. For a charity that is inefficient in fundraising, a viable alternative is to outsource it to a more experienced, better-equipped solicitor such as a telemarketing firm. Such efficiency-based outsourcing is, however, difficult to rationalize under altruistic donor preferences, as we formalize next.

5 Outsourced fundraising with aware donors: near impossibility

Suppose that the charity contracts out its fundraising to a professional solicitor whose efficiency parameter is α_o. Also suppose that the professional complies with the states' disclosure laws, and identifies himself as well as the sponsoring charity to the donors at the point of solicitation. The charity cannot directly monitor the number of solicitations conducted by the professional; to motivate, the charity offers him a percentage s of the funds raised. Donors observe neither the percentage nor the number of solicitations. Hence, the strategy of a donor is, again, how much to give if solicited. In equilibrium, (i) the strategy of each donor is optimal given the percentage, the number of solicitations and the strategies of other donors, (ii) the number of solicitations is optimal for the fundraiser given the percentage and the strategies of the donors, and (iii) the percentage offer is optimal for the charity given the fundraiser's participation and solicitation strategy.

To characterize the equilibrium, note that upon accepting the contract and expecting a (unique) equilibrium gift g^o from each solicitation, the professional solicits n donors to maximize his profit:

$$n \in \arg\max_{\widehat{n}} s\widehat{n}g^o - C(\widehat{n}; \alpha_o). \tag{IC}$$

The professional accepts the contract if it yields a nonnegative profit:

$$\Pi = sng^o - C(n; \alpha_o) \geq 0. \tag{IR}$$

Taking these incentive compatibility and individual rationality constraints into account, the charity sets the percentage s to maximize its net proceeds:

$$\overline{G}^o = \max_{s,n}(1-s)ng^o \tag{OF}$$
$$\text{s.to (IC) and (IR).}$$

Note that (IR) is trivially satisfied because the professional can ensure a zero profit by soliciting no one. Thus, in equilibrium the professional must receive a positive profit, namely $\Pi^o > 0$.[18] This is an "incentive cost" to the charity. The first-order condition from (IC) requires that $sg^o = C_n(n; \alpha_o)$, which, using (1), simplifies to:

$$n = (sg^o)^{\alpha_o}. \tag{5}$$

Not surprisingly, the fundraiser's solicitation effort intensifies with a higher percentage retained and a larger expected gift. Inserting (5) into (OF), the charity's objective becomes

$$\overline{G}^o = \max_{s}(1-s)\,(sg^o)^{\alpha_o}\,g^o \tag{6}$$

whose unique solution is

$$s^o = \frac{\alpha_o}{1+\alpha_o}. \tag{7}$$

Three properties of the optimal (percentage) contract, s^o are worth noting. First, s^o is increasing in α_o: a more efficient solicitor is offered a larger share of the donations. The trade-off is easily seen from (6): a larger share reduces the charity's return but motivates the solicitor; and motivating a more efficient solicitor is less costly.[19] Second, for a sufficiently efficient solicitor, $\alpha_o \geq 1$, the share offered to him exceeds half of the donations, rationalizing the empirical evidence alluded to in the Introduction. Third, because donors

[18] It is tempting to conjecture that the charity could tax away the fundraiser's profit by requiring a fixed fee in the contract. As argued in Section 2 (and Footnote 9), however, a two-part contract with a positive fee *to* the charity cannot be part of an equilibrium nor is it observed in the data.

[19] This comparative static is consistent with that for a standard principal-agent relationship: the agent is promised a larger fraction of the profit as his effort cost becomes less convex (Holmstrom, 1979).

cannot observe the fundraising contract at the time of solicitation and adjust their gifts, g^o, the contract depends only on the solicitor's technology – not on donors' preferences. This dichotomy, which clearly depends on our cost specification in (1), will prove useful when we discuss voluntary contract disclosure in Proposition 3.

For the charity to outsource, the professional must be significantly more efficient than the charity itself to overcome the incentive cost. In particular, the charity's net revenue must grow with the fundraiser's efficiency; that is, it is necessary that $\frac{d}{d\alpha_o}\overline{G}^o > 0$. There is, however, a price effect countering such revenue growth. Note that the (relative) price of giving under outsourcing is

$$p^o \equiv \frac{1}{1-s^o} = 1 + \alpha_o,$$

which exceeds the price of 1 under in-house fundraising, and rises with the professional's efficiency owing to a larger percentage paid to him. Intuitively, if giving is very price-inelastic, then donations should be affected little from outsourcing and as a result, the charity may benefit from hiring a professional. By the same token, if giving is very price-elastic, then the charity is unlikely to gain from outsourcing. The following result confirms this intuition. In its statement, recall that ε^p denotes the price elasticity of demand for the public good.

Proposition 2 *Under outsourcing, there is a unique and symmetric equilibrium. In equilibrium, the charity's net revenue is increasing in fundraiser efficiency – i.e.,* $\frac{d}{d\alpha_o}\overline{G}^o > 0$, *if and only if* $|\varepsilon^p| < pf_m \times (1 + \frac{\ln n}{\alpha_o n})$, *where* $p = p^o$ *and* $n = n^o$.

Note that for mass solicitations (as in telemarketing campaigns), the ratio $\frac{\ln n}{n}$ is negligible, which reduces the outsourcing condition to: $|\varepsilon^p| \leq pf_m$. Since $pf_m < 1$ by normality, this means that outsourcing can be justified only if giving is sufficiently price-inelastic, as the intuition suggested. In our two-good economy, this is also equivalent to the private good being a gross complement to the public good.[20] Thus, for an efficiency-based outsourcing, some complementarity between the goods is also necessary.

The evidence, however, does not support outsourcing. For one, there is a wide empir-

[20]This equivalence is easily seen from the donor's budget constraint: $x(m,p) + pf(m,p) = m$. Differentiating with respect to p, we obtain

$$\frac{\partial}{\partial p} x(.) =^{sign} |\varepsilon^p| - 1.$$

ical consensus that charitable giving is price-elastic, namely $|\varepsilon^p| > 1$.[21] Second, notice the term pf_m can be written as: $\frac{pf}{m} \times \varepsilon^m$, where $\frac{pf}{m}$ is the fraction of income spent on charity and ε^m is the income elasticity of donation. The fraction of personal income allocated to charity hovers around 2% in the U.S. (Andreoni and Payne, 2013). Furthermore, most studies estimate the income elasticity to be less than 1 – around .7 (Auten et al. 2002; Bakija and Heim, 2011). Hence, a reasonable estimate for pf_m is roughly .014, which is far below the price elasticity, $|\varepsilon^p|$.[22]

Additional evidence against outsourcing comes from lab data on individual preferences for giving. Both Andreoni and Miller (2002) and Fisman et al. (2007) experimentally find that most subjects exhibit a much higher degree of substitution between giving self and giving to others than Leontief. Note that for Leontief preferences, $u_i = \min\{x_i, \overline{G}\}$, demand for the public good is $f(m,p) = \frac{m}{1+p}$, implying that $|\varepsilon^p| = pf_m = \frac{p}{1+p}$. Thus, our outsourcing criterion in Proposition 2 is unlikely to hold for less than perfect complements observed in lab data.

In sum, based on rich data on charitable giving, we cannot rationalize outsourced fundraising in the base model. The apparent reluctance of professional solicitors to inform donors of their fundraising contracts at the point of solicitation reinforces this conclusion.[23] To see how, suppose that giving is price-elastic as suggested by the data. If the fundraising contract were to be disclosed to donors, then the charity would optimally lower the fundraiser's percentage to both control the price effect and (implicitly) commit to the number of solicitations. While, compared to nondisclosure, a lower percentage would benefit the charity, it would hurt the fundraiser. We formalize this intuition in,

Proposition 3 *Suppose that the charity outsources and the fundraiser verifiably discloses its contract to donors at the point of solicitation. If giving is price-elastic, $|\varepsilon^p| \geq 1$, then the fundraiser receives a lower percentage and is worse off than under nondisclosure. The charity is, on the other hand, better off under contract disclosure. Formally, $s^{o,d} < s^o$, $\Pi^{o,d} < \Pi^o$, and $\overline{G}^{o,d} > \overline{G}^o$.*

[21] See, for instance, Clotfelter (1985), Randolph (1995), Auten et al. (2002), Eckel and Grossman (2003), Bakija and Heim (2011), and Huck and Rasul (2011). Andreoni and Payne (2013) briefly summarizes the literature.

[22] To be sure, recent empirical studies have distinguished between transitory and persistent elasticities of giving depending on the periods of tax laws. It seems natural to assume that the effects of outsourcing are temporary. In this respect, Randolph (1995) estimates $|\varepsilon^p| = 1.55$ and $\varepsilon^m = .58$ whereas Auten et al. (2002) estimate $|\varepsilon^p| = .4$ and $\varepsilon^m = .29$. Despite the mixed evidence, our outsourcing condition is violated.

[23] In Riley v. National Federation of the Blind (1988), a coalition of professional fundraisers *and* charitable organizations opposed to North Carolina law that mandated the disclosure of fundraising commissions to donors. The Supreme Court held that such disclosure might unduly impair nonprofits' ability to raise funds.

Proposition 3 confirms our modeling assumption that the fundraiser does not voluntarily disclose his contract to donors. It also explains states' efforts to inform donors of percentages retained by professional fundraisers. Note that Proposition 3 holds even when $|\varepsilon^p| = 1$; hence, by continuity, it also holds for $|\varepsilon^p|$ less than but close to 1 – consistent with experimental data that shows some complementarity between public and private goods. The reason is that even if the price effect is not too severe, the charity would still want to lower the fundraiser's percentage to discourage excessive solicitations. The obvious question, however, remains:

6 Why do charities outsource fundraising?

We offer three possible answers in this section. First, donors are simply unaware of professional solicitations. Second, donors are aware, but professional appeals make them less sensitive to the price of giving by activating their warm-glow feelings toward the cause. And third, fundraising campaigns may involve significant fixed costs that the professional has already incurred.

6.1 Unaware donors

Common to the media accounts of paid solicitations is the fact that the interviewed donors often did not know this practice or high percentages retained by the solicitors. For instance, in the 2012 Bloomberg story,[24] upon learning that all of the proceeds from a $5.3 million campaign conducted on behalf of the American Cancer Society went to the telemarketing company, a 30-year veteran fundraiser of New York University reportedly said:

> "I didn't know about it. It's deceitful...And I am in the field. So how can you expect donors to know that?"

When asked about their losing campaigns, a senior manager at the Cancer Society responded:

> "If we came into it and said, 'Geez, I'm not going to make a dime on this,' do you think we would have anyone who would give us money?"

[24] <www.bloomberg.com/news/2012-09-12/charities-deceive-donors-unaware-money-goes-to-a-telemarketer.html>

These accounts are consistent with states' efforts to inform donors about telemarketing activities as well as survey evidence pointing to uninformed giving (Hope Consulting, 2011) and strong public confidence in the charitable sector (O'Neill, 2009; Edelman Trust-Barometer, 2014).[25] Proposition 4 shows that unlike with aware donors, the charity might optimally hire a paid solicitor if donors are unaware.

Proposition 4 *Suppose that donors are unaware of paid solicitations and continue to make their in-house gifts, namely $g^I = g^o = g$. Then, a charity with technology α_I hires a paid solicitor with technology α_o if and only if $\alpha_o > \underline{\alpha}(g, \alpha_I)$ where $\underline{\alpha}(.) > \alpha_I$ is a unique cutoff. Moreover, $\underline{\alpha}(.)$ is decreasing in g and increasing in α_I; that is, the charity is more likely to outsource its fundraising (1) the higher its expected in-house gift, or (2) the less efficient its own solicitation technology is.*

The intuition behind outsourcing is that unaware donors do not respond to the increase in the price of giving due to outsourcing. This is reminiscent of the tax salience literature where consumers are found to react less to nonsalient price changes (Chetty et al., 2009; Finkelstein, 2009). Interestingly, the charity is more likely to outsource its fundraising when donors are more generous toward its cause. While a more generous gift raises the charity's net revenues regardless of the mode of fundraising, it further raises net revenues from outsourcing by motivating the solicitor (see (5)) and in turn lowering the incentive cost for the charity. The same logic explains why a more efficient charity is less likely to outsource: by soliciting a larger set of donors, a more efficient charity receives a less generous (in-house) gift from each donor, which de-motivates the solicitor and raises the incentive cost for the charity. It is worth noting that by outsourcing, the charity realizes a higher cost-to-donation ratio: the ratio under outsourcing is the percentage offered to the fundraiser, s^o, which given $\alpha_o > \alpha_I$, exceeds that in-house, r^I.

Proposition 4 implies that with unaware donors, charitable motives that increase gifts should also increase the likelihood of outsourcing. Thus, charitable causes that carry intense warm-glow feelings should be the prime candidates for paid solicitations even if donors are made aware of this practice, as we examine next.

[25] In these studies, survey evidence shows that people trust nonprofits more than they trust the government or businesses to address pressing social problems.

6.2 Aware warm-glow donors

Suppose that as in Section 5, the charity outsources its fundraising to a professional with efficiency α_o and that the professional *discloses* this fact to donors at the point of solicitation. Thanks to the professional's trained appeals, however, donors now possess an added motive of warm-glow à la Andreoni (1989). Indeed, as reported in the 2012 Bloomberg story mentioned above, a leading telemarketing firm has adopted the following fundraising strategy consistent with generating warm-glow giving:[26]

> "Telephone purchases and donations are made on impulse. These are dictated not by reason or logic but by feelings of emotion. We are very familiar with the emotions of fundraising: sympathy, fear, anger, guilt, etc."

To understand if such emotional appeals to donors can also rationalize outsourcing, we extend our base model so that when the fundraiser retains a percentage s of the funds collected, donor i's utility is given by:

$$u_i = u(x_i, \overline{G}, \overline{g}_i) \tag{8}$$

where $\overline{g}_i = (1-s)g_i$, $\overline{G} = (1-s)G$, and u_i is an increasing, twice differentiable, and strictly quasi-concave function. In particular, the donor now receives an extra utility from his own (net) contribution, and as expected, (8) reduces to Andreoni's specification when $s = 0$.

In equilibrium, conjecturing s and others' total contribution G_{-i}, donor i maximizes her utility in (8) subject to budget constraint: $x_i + g_i = m$. Denoting by $p = \frac{1}{1-s}$ the price of giving and $\overline{G}_{-i} = (1-s)G_{-i}$ others' net contribution, i's program can be re-stated:

$$\begin{aligned} \max_{x_i, \overline{G}} \; & u(x_i, \overline{G}, \overline{G} - \overline{G}_{-i}) \\ \text{s.to } & x_i + p\overline{G} = M \\ & \overline{G} \geq \overline{G}_{-i} \end{aligned} \tag{WG}$$

where $M \equiv m + p\overline{G}_{-i}$ is the "social income". Ignoring the second constraint (which holds in equilibrium), let $\overline{G} = \overline{f}(M, \overline{G}_{-i}; p)$ be the solution to (WG) where $\overline{f}$ is donor i's Nash supply. Also let $\overline{f}_m$, $\overline{f}_w$, and $\overline{f}_p$ be the partial derivatives with respect to M, $\overline{G}_{-i}$ and p, signifying propensity to give due to altruism, warm-glow, and price increase. Normality

[26] For a similar account, see also <https://www.revealnews.org/article/one-donation-to-charity-telemarketer-spawns-more-solicitation-calls>.

of the goods implies that $0 < p\overline{f}_m < 1$, $\overline{f}_w \geq 0$, and $\overline{f}_p < 0$. Clearly, $\overline{f}_w = 0$ refers to a purely altruistic donor (as in the base model) whereas $p\overline{f}_m + \overline{f}_w = 1$ refers to a pure warm-glow giver who is unresponsive to others' contributions.[27] To capture both motives, we assume $0 < p\overline{f}_m + \overline{f}_w \leq 1$. Note that since gifts are fixed in equilibrium from the fundraiser's perspective, the optimal contract and the price of giving stay the same as in Section 5. Given this, the following result extends Proposition 2, where $\overline{\varepsilon}^p = \frac{p \times \overline{f}_p}{\overline{f}}$ denotes the price elasticity of Nash supply.

Proposition 5 *Consider warm-glow giving described in this subsection. Under outsourcing, there is a unique and symmetric equilibrium. In equilibrium, the charity's net revenue is increasing in fundraiser efficiency, i.e.,* $\frac{d}{d\alpha_o}\overline{G}^o > 0$, *if and only if* $|\overline{\varepsilon}^p| < p\overline{f}_m \times (1 + \frac{\ln n}{\alpha_o n}) + \overline{f}_w \times (\frac{1}{n} + \frac{\ln n}{\alpha_o n})$, *where* $p = 1 + \alpha_o$ *and* $n = n^o$.

For mass solicitations – i.e., a large n, the condition in Proposition 5 approximately becomes $|\overline{\varepsilon}^p| \leq p\overline{f}_m$. Since $p\overline{f}_m < 1$ by normality, as with no warm-glow, the Nash supply must be sufficiently price-inelastic, implying that private good must be a gross complement to the public good.[28] It is intuitive that with an added warm-glow motive, giving should be less price sensitive; that is, $|\overline{\varepsilon}^p| \leq |\varepsilon^p|$. Moreover, all else equal, we expect a warm-glow donor to give a larger fraction of her marginal dollar than a pure altruist; that is, $pf_m \leq p\overline{f}_m$. Taken together, the warm-glow motive is likely to relax the outsourcing condition found in Proposition 2. To see if it is satisfied, however, we solve a CES example.

Example 1 (CES utility) *Suppose*

$$u_i = \left[ax_i^\rho + (1-a)\left((1-\omega)\overline{G} + \omega\overline{g}_i\right)^\rho\right]^{\frac{1}{\rho}}$$

where $\rho < 1$, $a \in [0,1]$ *and* $\omega \in [0,1]$. *Letting* $r = \frac{\rho}{\rho-1}(< 1)$ *and* $A = (a/(1-a))^{1-r}$, *we find* $\overline{f}(M, \overline{G}_{-i}; p) = \frac{1}{Ap^{1-r}+p}M + \frac{\omega A}{A+p^r}\overline{G}_{-i}$, *where* $p = 1 + \alpha_o$. *From here,*

$$p\overline{f}_m = \frac{p^r}{A+p^r} \text{ and } \overline{f}_w = \frac{\omega A}{A+p^r}$$

[27] To see the latter, note that donor i's (net) contribution is: $\overline{g}_i = \overline{f}(m + p\overline{G}_{-i}, \overline{G}_{-i}; p) - \overline{G}_{-i}$, implying that $\partial\overline{g}_i/\partial\overline{G}_{-i} = p\overline{f}_m + \overline{f}_w - 1$. Hence, $\partial\overline{g}_i/\partial\overline{G}_{-i} = 0$ if and only if $p\overline{f}_m + \overline{f}_w = 1$.

[28] In light of the evidence on price elasticity of giving (see Section 5), our search here for sufficiently price-inelastic giving may seem puzzling. Note, however, that most giving statistics are aggregate, and as argued in Section 2, giving through professional solicitors, while pursued by many charities, is still a small fraction of the total.

and

$$|\bar{\varepsilon}^p| = |\varepsilon^p| - \frac{\omega(1-r)A}{A+p^r}\left(\frac{n-1}{n}\right)$$

where $|\varepsilon^p| = 1 - r\frac{A}{A+p^r}$ *is the price elasticity without warm-glow. Proposition 5 implies that*

$$\frac{d}{d\alpha_o}\overline{G}^o > 0 \iff \Delta(n^o;\omega) \equiv (p^r + \omega A)\frac{\ln n^o}{\alpha_o n^o} + \frac{r\omega A}{n^o} - (1-r)(1-\omega)A > 0.$$

Clearly, $\Delta(n^o;\omega) > 0$ *if* $\omega = 1$. *Moreover,* $d\Delta(n^o;\omega)/d\omega > 0$ *if* n^o *is large.*[29]

Evidently, a higher ω implies a stronger warm-glow preference, with $\omega = 1$ representing a pure warm-glow giver. Example 1 reveals that when donors are informed of professional solicitations, the charity is more likely to use them if they increase warm-glow giving.[30] While we are unaware of any direct evidence on which charitable causes may arouse more warm-glow feelings, both Greenlee and Gordon (1998) and Keating et al. (2003) estimate that telemarketing campaigns in Pennsylvania and New York are relatively more common in the advocacy, disease/disorder, environment, public safety and youth development subsectors. Andreoni and Payne (2011) support these findings. Across a wide range of social welfare and community-based charities, they measure about 75% crowding out but attribute almost all of it to reduced fundraising and little to donor response, implying strong warm-glow for these charities. For international relief and development organizations, Ribar and Wilhelm (2002) also present compelling evidence of warm-glow giving; so these organizations may be prone to using professional fundraisers – at least for their new projects with no prior donor list.[31]

6.3 Fixed costs

Up to now, we have ignored fixed costs of running a fundraising campaign such as renting an office, buying phones, and hiring attorneys to comply with states' charity laws (Pallotta,

[29] It can be verified that

$$\begin{aligned} d\Delta(n^o;\omega)/d\omega &= \Delta_n(.) \times n^o_\omega + \Delta_\omega(.) \\ &\approx (1-r)A \text{ for a large } n^o. \end{aligned}$$

[30] With a large number of solicitations, the potential dominance of the warm-glow motive over altruism is also consistent with the literature (Ribar and Wilhelm, 2002; Yildirim, 2014).

[31] It is worth remarking that even with warm-glow donors, a two-part contract mentioned in Section 2 would not arise in equilibrium. As we argued, the charity would otherwise ask the fundraiser a lump-sum payment and make him the residual claimant of the donations. But anticipating such an arrangement, the donor would receive no warm-glow from her donation since it would all go to the fundraiser – and none to the cause.

2015). Serving multiple charities, however, such costs are likely to be sunk for the professional fundraiser when dealing with a new client. It is, therefore, intuitive that despite the agency cost, the charity may contract out its fundraising activities to a professional if fixed costs are significant. More specifically, given the fixed cost of fundraising K_c, the charity would use a professional whenever $K_c > \overline{G}^I - \overline{G}^o$. Clearly, $\overline{G}^I - \overline{G}^o > 0$ for $\alpha_I = \alpha_o$. Hence, in the presence of significant fixed costs, even a charity with a lower marginal cost of solicitation than the professional may outsource its fundraising. Interestingly, in some cases, such outsourcing may also improve the charity's watchdog ratings. To see this, note from (4) that with the fixed cost, the charity's in-house cost-to-donation ratio would be

$$r^{I,K} \equiv \frac{C^I + K}{G^I} = \frac{\alpha_I}{1+\alpha_I} + \frac{K}{G^I}$$

whereas, from (7), its ratio under outsourcing would be

$$r^{o,K} \equiv s^o = \frac{\alpha_o}{1+\alpha_o}.$$

Evidently, $r^{o,K} < r^{I,K}$ so long as α_I is not too far below α_o. It is worth noting that for each fundraising campaign, the professional may also incur a fixed cost, K_f, such as preparing a new donor list from its database and training employees for new solicitations. But since the professional earns a positive profit, $\Pi^o > 0$, he would be willing to absorb the additional cost if it is not too high, i.e., $K_f \leq \Pi^o$, leaving s^o intact.[32]

7 Extensions

In this section, we briefly discuss several extensions to better understand the charity's outsourcing and contract decisions.

Professional fundraising as an investment: It is not uncommon that charities may incur a loss on some telemarketing campaigns. For instance, the "Pennies for Charity" report reveals that 91 out of 589 telemarketing campaigns in 2012 yielded a loss to the charity. One explanation for this phenomenon is that the professional fundraiser solicits a "cold" list of donors, with an understanding that the list is then turned over to the charity for

[32]Such cost absorption by the fundraiser appears common in practice: "Small charities serving poor communities or narrower causes don't have access to wealthy donors the way universities, hospitals, or broader charities may. They rely on telemarketing because it doesn't have heavy up-front costs. In many cases telemarketers will carry the up-front costs, only getting paid when donations come in. This form of carrying debt is not really any different than banks holding notes on charities for financing their buildings and vans." (Pallotta, 2015)

future solicitations. In particular, professional fundraising is viewed as an investment into acquiring new donors. To formalize, consider a multi-period extension of our base model with unaware donors so outsourcing is possible. In period 1, the fundraiser (successfully) solicits n new donors in return for a share s of donations. In the remaining $T-1$ periods, the charity re-solicits the same donors at no additional cost. The charity discounts future revenues by δ but, for simplicity, we assume that donors are short-sighted.[33]

Let g be the (equilibrium) gift from each solicitation. Then, the charity's discounted net revenue is

$$\overline{G}^T = (1 - s + \delta + ... + \delta^{T-1})ng. \tag{9}$$

Since the fundraiser is hired only in period 1, the number of solicitations again is dictated by (5); that is, $n = (sg)^{\alpha_o}$. Inserting this into (9) and maximizing it with respect to s, we find the optimal contract:

$$s^{o,T} = \left(\frac{1-\delta^T}{1-\delta}\right)\frac{\alpha_o}{1+\alpha_o}. \tag{10}$$

Clearly, $s^{o,T}$ is increasing in T and δ. That is, as the charity cares more about future returns, it motivates the fundraiser to solicit a longer list of new donors by offering him a larger percentage. In fact, it is now possible that the percentage exceeds 1, implying a loss for the charity for the initial $t = \ln\left(\frac{1+\alpha_o\delta^T}{1+\alpha_o}\right) / \ln\delta$ periods, where t is increasing in δ, T, and α_o as expected.

Note that investing into new donors can be a viable strategy only for large charities that have additional resources to pay for it. Our analysis, therefore, predicts that it is such large charities that are also likely to promise a significantly high percentage to professional fundraisers on new campaigns. As highlighted in Section 2, this prediction is confirmed by Greenlee and Gordon (1998) who empirically found professional solicitor charities to be significantly larger than nonsolicitor charities.

Additional revenue sources: We have assumed that the single revenue source for the charity is new donations – perhaps the charitable program itself is new. For an established program or a program that offers goods and services, the charity may also generate revenues from repeat donations, sales, fees, external grants, etc. Outsourcing is less likely for such charities, as we formalize in Proposition A1 in the appendix. The reason is that with additional funds, each donor gives less, which makes it costlier for the charity to motivate the professional fundraiser. This observation may explain why nonprofits such as operas,

[33] δ can also be interpreted as the probability of losing donors each period.

orchestras, museums, and universities rely primarily on in-house fundraising. Moreover, combining with the previous extension, it predicts that a charity is less likely to use paid solicitors for its established program that has repeat donors but the same charity can afford to invest aggressively into establishing a new program.

Heterogenous donors: We have also assumed identical donors in the main analysis. This assumption is reasonable for settings where the charity has enough information about donors to segment them into (relatively) homogenous groups, perhaps based on their zip codes, alumni status, donation history, etc., that can be assigned to different fundraisers. Suppose that the charity lacks such information about donors but has access to a single fundraiser who does not. Keeping with the base model (and the extant literature), suppose also that the fundraiser and donors have complete information, and contributions are made simultaneously.

Let N_τ and n_τ denote the size of group τ and the number of solicitations from that group where $\tau = 1, ..., k$. Without loss of generality, let equilibrium gifts be ordered such that $g_1 \geq g_2 \geq ... \geq g_k$. It is intuitive that the fundraiser will optimally solicit in this ascending order. In addition, for a homogenous population, namely $g_\tau = g$ for all τ, we have $s_\tau = \frac{\alpha_o}{1+\alpha_o}$, as found in (7). In general, it can be shown that s_τ is decreasing in τ.[34] Due to rising marginal cost and diminishing donations, the professional is provided with fewer incentives to solicit from one more group. Hence, we predict that the charity whose donor base is more heterogenous is expected to offer a lower percentage to the fundraiser.

Mixed fundraising. While some small charitable organizations rely exclusively on professional fundraisers, unlike in our model, many large organizations such as American Cancer Society and March of Dimes use a mix of in-house and outsourced fundraising. It is often argued that an in-house fundraising campaign involves soliciting from previous donors whereas an outsourced campaign is intended for discovering and identifying new donors, which is a costlier endeavor because only a small fraction of such solicitations result in donations. Our investigation suggests several reasons as to why a large charity

[34] Note that if the fundraiser stops soliciting with group τ, then the charity retains: $\overline{G}_\tau = (1 - s)\left(\sum_{j=1}^{\tau-1} N_j g_j + n_\tau g_\tau\right)$ while the fundraiser receives the profit: $\Pi = s\left(\sum_{j=1}^{\tau-1} N_j g_j + n_\tau g_\tau\right) - C(\sum_{j=1}^{\tau-1} N_j + n_\tau; \alpha_o)$. Modifying (5), the professional's first-order condition implies that $(s g_\tau)^{\alpha_o} = \sum_{j=1}^{\tau-1} N_j + n_\tau$. Inserting this into $\overline{G}_\tau$ and simplying terms, the percentage s_τ maximizes

$$\overline{G}_\tau = (1-s)\left(\sum_{j=1}^{\tau-1} N_j(g_j - g_\tau) + (s g_\tau)^{\alpha_o} g_\tau\right).$$

might hire a professional fundraiser for the latter type of campaigns. First, serving related charities, the professional may have access to a more promising list of prospective donors and, therefore, he may be more efficient in reaching out to them. Second, the professional may have already incurred fixed costs of running a larger, better-equipped call center with better-trained employees. And third, the charity may simply view recruiting new donors as a long-term investment into sustaining its program.

Last, but not least, the charity may also outsource part of its fundraising campaign due to its increasing marginal cost in-house. To see this, consider the extension to heterogenous donors above and suppose that $\alpha_I = \alpha_o = \alpha$ and there are no fixed costs. Suppose also that it is optimal for the charity to solicit all the donors in groups $\tau = 1, ..., \tau_I$.[35] Clearly, without a (significant) technological advantage, the charity would not hire the professional for these – more generous – groups, but due to increasing marginal cost, it would do so for the remaining groups to receive an additional, windfall revenue. Put differently, the charity would collect the "low-hanging fruits" itself while leaving the more "barren areas" to the professional.

Percentage vs. per-call based contracts: Besides percentage-based, another commonly observed contract in professional fundraising is per-call based under which the professional is paid a fixed fee per solicitation.[36] Intuitively, a per-call contract insures the fundraiser against losses whereas a percentage contract insures the charity. This difference would, however, matter only if donations are uncertain so that losses are possible in equilibrium, and at least one party is risk-averse. None of these requirements is satisfied in our base model: following the standard model of giving (Bergstrom et al. 1986), donations are perfectly predictable in equilibrium and both the charity and the fundraiser are risk-neutral. To this end, suppose that individuals are pure warm-glow givers and from the charity and fundraiser's perspectives, their gifts are uncertain. For convenience, suppose that the random individual gift is $g_i = \mu_c + \varepsilon_i$, where μ_c and ε_i represent charity- and individual-specific shocks, respectively. We assume that μ_c and ε_i are independently

[35] A necessary and sufficient condition to do so is: $g^{\alpha}_{\tau_I+1} \leq \sum_{j=1}^{\tau_I} N_j \leq g^{\alpha}_{\tau_I}$.

[36] As mentioned in Section 2, "in many instances, prior to a solicitation campaign, a paid solicitor must file with the state a copy of his, her, or its contract with the charitable organization." (Hopkins 2009, p.71). Inspecting North Carolina data (www.sosnc.gov/forms/csl), Paskalev (2016) uncovers that 180 out of 273 telemarketing campaigns in 2011 were per-call based. For instance, ActionAid USA, Child Fund International USA, and March of Dimes paid between $2.50 and $4.25 per completed call. Such calls are heavily scripted and subject to monitoring by the charity.

and normally distributed and that the risk-averse party has CARA utility.[37] Proposition A2 in the appendix shows that a risk-averse charity prefers a percentage contract with a risk-neutral fundraiser whereas a risk-neutral charity prefers a per-call contract with a risk-averse fundraiser. This makes sense because, as is well-known from principal-agent problems, a contract performs better than another to the extent that it allocates risk toward the party who can tolerate it more.

8 Discussion and conclusion

Despite being generous, few people give without being solicited. Charities often turn to high-priced professional solicitors, claiming to be unequipped for running large-scale fundraising campaigns. Professional solicitors explain their expensive services by the onerous task of prospecting and retaining donors. State attorneys general, however, argue that donors are uninformed about the high costs of paid solicitations and would give little otherwise.

To rationalize these viewpoints, we have proposed a model of outsourced fundraising, in which the charity optimally retains a professional solicitor who is significantly more efficient in fundraising and motivates him by offering a high percentage of the gross receipts. This implies that donors who are merely informed of paid solicitations would anticipate a high price of giving and become much less generous, rendering this practice unprofitable for the charity. The charity is found to benefit from professional solicitors if: (1) donors are uninformed of their presence; (2) donors are informed but become intense warm-glow givers by professional appeals; or (3) the fundraising campaign simply involves significant fixed costs for the charity.

One interpretation of our results is that transparency about fundraising methods is irrelevant or even undesirable because both the charity and the donors ultimately prefer greater net funds raised. An alternative interpretation, however, is that such transparency is important to keep the high public confidence in the charitable sector. Intuitively, additional funds received from uninformed donors in the short term may well be outweighed by the reduced giving due to damaged reputation. While this intuition can only be formalized within a fully dynamic model, efforts by state attorneys to inform donors about professional solicitations point to such reputation concerns. In this sense, the existing

[37]The CARA-Normal setting is widely used in agency problems.

disclosure laws that require paid solicitors to reveal themselves to donors also appears well-founded. The weakness of these laws may, however, be in their enforcement since communications between the solicitor and donors seem hard to verify. In fact, even if they are verified, it is the exclusive power of the attorney general to sue charities and their fiduciaries.[38] Given this, we believe that attorneys general can serve donors better by raising awareness about professional solicitations, especially during holiday seasons, than by publishing detailed reports that few donors might read. That is, simply educating the public to inquire whether solicitors are paid or not may suffice to regulate the market for professional fundraising.[39] Our results also suggest that if people give primarily for warm-glow, then charities should explore more cost-effective ways of fundraising to increase their warm-glow. For instance, Castillo et al. (2014) report that the advent of social media offers a promising peer-to-peer fundraising platform.

More broadly, our paper is a first attempt to address the "boundaries" of a nonprofit organization: when charitable activities are undertaken in-house or outsourced – a much studied issue for its for-profit counterpart since Coase (1937). Future research can shed new light on how nonprofit boundaries are shaped by competitive pressure, donor heterogeneity, employee-volunteer composition, and the type of charitable cause, among other factors.

[38]In particular, members of the general public are precluded from suing charitable fiduciaries or bring suit to force an attorney general to sue a charity or its fiduciaries; see Hopkins (2009).

[39]If asked, fundraisers need to truthfully identify themselves.

A Appendix

Proof of Proposition 1. To ease notation, we drop the superscript "I" in this proof. Note first that in equilibrium, $n > 0$ if and only if $G - C > 0$. Clearly, if $G - C > 0$, it must follow that $n > 0$ to have $G > 0$. Now suppose $n > 0$ but $G - C \leq 0$. Then, by definition no public good would be provided. In particular, a solicited donor would be strictly better off contributing nothing to the public good. Given this, the charity would find it optimal not to solicit any donor, contradicting $n > 0$.

Next recall a solicited donor's program (ID).

$$\begin{aligned} &\max_{x_i,\overline{G}} u(x_i, \overline{G}) \\ \text{s. to } &x_i + \overline{G} = m + \overline{G}_{-i} \\ &\overline{G} \geq \overline{G}_{-i}. \end{aligned}$$

Since $u(.)$ is strictly quasi-concave in its arguments, there is a unique solution to this program: $\overline{G} = \max\{f(m + \overline{G}_{-i}), \overline{G}_{-i}\}$, where, as stated in the text, f is the demand for the public good under the relative price $p = 1$ and $0 < f_m < 1$ by normality. In equilibrium, individual contributions must be equal. To prove this, suppose otherwise. Then, $g_k > g_l$ for some donors k and l, which would mean $g_k > 0$ and thus $\overline{G} = f(m + \overline{G}_{-k})$. It would also mean that $\overline{G} \geq f(m + \overline{G}_{-l})$. Together we must have $f(m + \overline{G}_{-k}) \geq f(m + \overline{G}_{-l})$ or equivalently, $g_k \leq g_l$ since $f_m > 0$, yielding a contradiction. Hence, in equilibrium, $g_i = g$ for all solicited donors. Moreover, since $G - C > 0$ as argued above, it must be that $g > \frac{C}{n} > 0$, which implies $\overline{G} = f(m + \overline{G}_{-i})$ or equivalently

$$\overline{G} = f(m + \overline{G} - g). \tag{A-1}$$

On the charity side, (3) and (1) reveal that

$$G = (1 + 1/\alpha)C \text{ and } \overline{G} = C/\alpha. \tag{A-2}$$

Together with the facts that $n = [(1 + 1/\alpha)C]^{\frac{\alpha}{1+\alpha}}$ from (1) and $g = \frac{G}{n}$ by symmetry, (A-1) and (A-2) thus require that

$$\begin{aligned} C/\alpha &= f\left(m + C/\alpha - \frac{(1+1/\alpha)C}{[(1+1/\alpha)C]^{\frac{\alpha}{1+\alpha}}}\right) \\ &= f\left(m + C/\alpha - (1+1/\alpha)^{\frac{1}{1+\alpha}} C^{\frac{1}{1+\alpha}}\right). \end{aligned}$$

Define

$$\Phi(C) = C/\alpha - f(m + C/\alpha - (1+1/\alpha)^{\frac{1}{1+\alpha}} C^{\frac{1}{1+\alpha}}).$$

Evidently, $\Phi(0) = -f(m) < 0$ and $\Phi(\frac{m^{1+\alpha}}{1+1/\alpha}) = \frac{m^{1+\alpha}}{1+\alpha} - f(\frac{m^{1+\alpha}}{1+\alpha}) > 0$ by normality. Thus, there is a solution to $\Phi(C) = 0$ such that $C \in (0, \frac{m^{1+\alpha}}{1+1/\alpha})$. Moreover, since $\Phi'(C) = \frac{1}{\alpha}[1 - f_m(.) \times (1 - 1/n)] > 0$, the solution is unique, proving the existence of a unique equilibrium.

To prove comparative statics with respect to α, first differentiate (A-1):

$$\overline{G}' = f_m \times (\overline{G}' - g'),$$

which implies that $(1 - f_m) \times \overline{G}' = -f_m \times g'$. Since $0 < f_m < 1$,

$$\overline{G}' =^{sign} -g'. \tag{A-3}$$

Next, since $\overline{G} = \frac{C}{\alpha}$ from (A-2) and $g = n^{\frac{1}{\alpha}}$ from (3), using (1), we respectively write: $\ln(\overline{G}) = -\ln(1+\alpha) + (1 + \frac{1}{\alpha}) \ln n$ and $\ln g = \frac{1}{\alpha} \ln n$. Differentiating both with respect to α yields

$$\frac{\overline{G}'}{\overline{G}} = -\frac{1}{1+\alpha} - \frac{\ln n}{\alpha^2} + (1 + \frac{1}{\alpha})\frac{n'}{n} \tag{A-4}$$

$$\frac{g'}{g} = -\frac{\ln n}{\alpha^2} + \frac{1}{\alpha}\frac{n'}{n}. \tag{A-5}$$

Suppose $g' \geq 0$. Then $\overline{G}' \leq 0$ by (A-3), which, from (A-4), implies that $-\frac{1}{1+\alpha} + \frac{n'}{n} \leq 0$. Moreover, $-\frac{\ln n}{\alpha^2} + \frac{1}{\alpha}\frac{n'}{n} \geq 0$ by (A-5). Together we have

$$\frac{\ln n}{\alpha} \leq \frac{n'}{n} \leq \frac{1}{1+\alpha},$$

which requires that $n \leq e^{\frac{\alpha}{1+\alpha}}$, contradicting our assumption that $n > e^{\frac{\alpha}{1+\alpha}}$. Hence, $g' < 0$ and in turn $\overline{G}' > 0$ and $n' > 0$. Furthermore, the fact that $\overline{G}' > 0$ implies from (A-2) that $C' > 0$ and $G' > 0$. ■

Proof of Proposition 2. To ease notation, we drop the superscript "o" in this proof. Conjecturing n, s and G_{-i}, donor i solves

$$\max_{x_i, g_i} u(x_i, (1-s)G)$$
$$\text{s. to } x_i + g_i = m.$$

By definition, $g_i = G - G_{-i} = \frac{1-s}{1-s}G - \frac{1-s}{1-s}G_{-i}$. Defining $p = \frac{1}{1-s}$, $g_i = p\overline{G} - p\overline{G}_{-i}$ where $\overline{G} \equiv (1-s)G$ and $\overline{G}_{-i} \equiv (1-s)G_{-i}$. Thus, i's program can be written:

$$\begin{aligned} &\max_{x_i, \overline{G}} u(x_i, \overline{G}) \\ \text{s. to } & x_i + p\overline{G} = m + p\overline{G}_{-i} \\ & \overline{G} \geq \overline{G}_{-i}. \end{aligned}$$

The unique solution to this program is $\overline{G} = \max\{f(m + p\overline{G}_{-i}; p), \overline{G}_{-i}\}$ where $f(m, p)$ is the demand for the public good. As in the previous proof, it is straightforward to argue that in equilibrium, gifts must be symmetric and positive. Hence, in equilibrium

$$\overline{G} = f(m + p\overline{G} - g; p). \tag{A-6}$$

On the charity side, from (5) and (7), it must be that

$$G = (1 + \frac{1}{\alpha})^2 C \text{ and } \overline{G} = (1 + \frac{1}{\alpha})\frac{1}{\alpha}C. \tag{A-7}$$

Together with the fact that $n = [(1 + \frac{1}{\alpha})C]^{\frac{\alpha}{1+\alpha}}$ from (1) and $g = \frac{G}{n}$ by symmetry, (A-6) and (A-7) thus require that

$$\begin{aligned} (1 + \frac{1}{\alpha})\frac{C}{\alpha} &= f\left(m + (1 + \frac{1}{\alpha})^2 C - \frac{(1 + \frac{1}{\alpha})^2 C}{[(1 + \frac{1}{\alpha})C]^{\frac{\alpha}{1+\alpha}}}; p\right) \\ &= f\left(m + (1 + \frac{1}{\alpha})^2 C - (1 + \frac{1}{\alpha})^{\frac{2+\alpha}{1+\alpha}} C^{\frac{1}{1+\alpha}}; p\right). \end{aligned}$$

Define

$$\Psi(C) = (1 + \frac{1}{\alpha})\frac{C}{\alpha} - f\left(m + (1 + \frac{1}{\alpha})^2 C - (1 + \frac{1}{\alpha})^{\frac{2+\alpha}{1+\alpha}} C^{\frac{1}{1+\alpha}}; p\right).$$

Clearly, $\Psi(0) = -f(m; p) < 0$ and $\Psi(\frac{m^{1+\alpha}}{(1+\frac{1}{\alpha})^{2+\alpha}}) = \frac{1}{1+\alpha}\left[\frac{m^{1+\alpha}}{(1+\frac{1}{\alpha})^{\alpha}} - (1+\alpha)f\left(\frac{m^{1+\alpha}}{(1+\frac{1}{\alpha})^{\alpha}}; p\right)\right] > 0$. The latter follows because $p = 1 + \alpha$ and $M - pf(M; p) > 0$ from the budget line. Thus, there is a solution to $\Psi(C) = 0$ such that $C \in (0, m^{1+\alpha}/(1 + \frac{1}{\alpha})^{2+\alpha})$. Moreover, since $0 < pf_m < 1$ by normality, $\Psi'(C) = (1 + \frac{1}{\alpha})\frac{1}{\alpha}\left(1 - pf_m + \frac{f_m}{n}\right) > 0$, implying a unique solution C and in turn, the existence of a unique equilibrium.

Differentiating both sides of (A-6) with respect to α, we have

$$\overline{G}' = f_m \times (p'\overline{G} + p\overline{G}' - g') + f_p p'$$

or since $p = 1+\alpha$, $\overline{G} = f$ and $\varepsilon^p = \frac{pf_p}{f}$,

$$(1 - pf_m)\overline{G}' = \frac{\overline{G}}{p}(pf_m - |\varepsilon^p|) - f_m g'. \tag{A-8}$$

Next, since $\overline{G} = (1+\frac{1}{\alpha})\frac{C}{\alpha} = \frac{n^{1+\frac{1}{\alpha}}}{\alpha}$ and $sg = n^{\frac{1}{\alpha}}$, we have $\ln \overline{G} = -\ln\alpha + (1+\frac{1}{\alpha})\ln n$ and $\ln g + \ln(\frac{\alpha}{1+\alpha}) = \frac{1}{\alpha}\ln n$. Thus

$$\frac{g'}{g} = -\frac{1}{\alpha(1+\alpha)} - \frac{1}{\alpha^2}\ln n + \frac{1}{\alpha}\frac{n'}{n}$$

and

$$\frac{\overline{G}'}{\overline{G}} = -\frac{1}{\alpha} + (1+\frac{1}{\alpha})\frac{n'}{n} - \frac{1}{\alpha^2}\ln n.$$

From here, it follows that

$$\frac{\overline{G}'}{\overline{G}} = (1+\alpha)\frac{g'}{g} + \frac{1}{\alpha}\ln n. \tag{A-9}$$

Substituting for g' into (A-8), we obtain:

$$(1 - pf_m)\overline{G}' = \frac{\overline{G}}{p}\,(pf_m - |\varepsilon^p|) - f_m \times \left(\frac{g\overline{G}'}{p\overline{G}} - \frac{g\ln n}{\alpha(1+\alpha)}\right).$$

Given that $p\overline{G} = G$ and $\frac{G}{g} = n$, it follows that

$$\begin{aligned}
(1 - pf_m + \frac{f_m}{n})\overline{G}' &= \frac{\overline{G}}{p}\,(pf_m - |\varepsilon^p|) + f_m\frac{g\ln n}{\alpha p} \\
&= \frac{\overline{G}}{p}\,(pf_m - |\varepsilon^p|) + f_m\frac{G\ln n}{\alpha n p} \\
&= \frac{\overline{G}}{p}\,(pf_m - |\varepsilon^p|) + f_m\frac{\overline{G}\ln n}{\alpha n} \\
&= \frac{\overline{G}}{p}\,(pf_m - |\varepsilon^p|) + \frac{\overline{G}}{p}pf_m\frac{\ln n}{\alpha n}. \\
&= \frac{\overline{G}}{p}\left[pf_m \times (1 + \frac{\ln n}{\alpha n}) - |\varepsilon^p|\right].
\end{aligned}$$

Since $pf_m < 1$ and $f_m > 0$, $\overline{G}' > 0$ if and only if $|\varepsilon^p| < pf_m \times (1 + \frac{\ln n}{\alpha n})$, as desired. ■

Proof of Proposition 3. Suppose that the charity outsources but unlike in the base model, the fundraiser verifiably discloses s to donors. Let $n(s)$ be the equilibrium number of solicitations and $\overline{g}(s) \equiv g(s, n(s))$. Given s, the fundraiser solves

$$\Pi^o(s) = \max_n [ns\overline{g}(s) - C(n;\alpha)].$$

The FOC for the fundraiser is: $s\overline{g}(s) = n^{\frac{1}{\alpha}}$. Setting $n = n(s)$ and differentiating with respect to s, we obtain

$$\frac{1}{\alpha}\frac{n_s}{n} = \frac{1}{s} + \frac{d\overline{g}(s)/ds}{\overline{g}(s)}. \tag{A-10}$$

On the donor side, recalling $p = 1/(1-s)$, $\overline{G} = G/p$ and $G = ng$, we re-write (A-6):

$$n(s)\overline{g}(s) = pf\left(m + (n(s)-1)\overline{g}(s); p\right).$$

Differentiating with respect to s yields

$$(1 - pf_m)n_s\overline{g}(s) + (n - (n-1)pf_m) \times d\overline{g}(s)/ds = \frac{1}{(1-s)^2}f(.) \times (1 - |\varepsilon^p|). \tag{A-11}$$

Finally, subject to $n = n(s)$, the charity's program reduces to:

$$\max_s \overline{G}(s) \equiv (1-s)s^{\alpha}\left(\overline{g}(s)\right)^{1+\alpha}$$

which is equivalent to (6) except that g^o is replaced with $\overline{g}(s)$.

$$\text{FOC: } \frac{d\overline{G}(s)/ds}{\overline{G}(s)} \equiv -\frac{s(1+\alpha)-\alpha}{s(1-s)} + (1+\alpha)\frac{d\overline{g}(s)/ds}{\overline{g}(s)} = 0$$

which, given $s^o = \frac{\alpha}{1+\alpha}$, results in:

$$\frac{d\overline{g}(s)/ds}{\overline{g}(s)} = \frac{s - s^o}{s(1-s)}. \tag{A-12}$$

From here, we find the optimal disclosure contract, $s^{o,d}$. (A-10) and (A-12) reveal that $n_s = \alpha n \frac{1-s^o}{s(1-s)} > 0$. Since $pf_m < 1$ by normality and $|\varepsilon^p| \geq 1$ by hypothesis, this implies that $d\overline{g}(s)/ds < 0$ from (A-11) and thus $s^{o,d} < s^o$ from (A-12).

By the Envelope Theorem, note that $d\Pi^o(s)/ds > 0$ if and only if $d(s\overline{g}(s))/ds > 0$. Note also that

$$\begin{aligned} d(s\overline{g}(s))/ds &= \overline{g}(s)\left[1 + sd\overline{g}(s)/ds\right] \\ &= \overline{g}(s)\frac{1-s^o}{1-s} \text{ at } s = s^{o,d} \\ &> 0 \text{ at } s = s^{o,d}. \end{aligned}$$

Thus, $d\Pi^o(s)/ds > 0$ at $s = s^{o,d}$. Since $s^{o,d} < s^o$, this implies that $\Pi^o(s^{o,d}) < \Pi^o(s^o)$; that is, the fundraiser is worse off under disclosure than under nondisclosure. The charity is, however, better off under disclosure because it sets $s^{o,d} \neq s^o$. ■

Proof of Proposition 4. Let $g^I = g^o = g$. Then $\overline{G}^I(\alpha, g) = \frac{g^{1+\alpha}}{1+\alpha}$ and $\overline{G}^o(\alpha, g) = \frac{g^{1+\alpha}}{\alpha(1+1/\alpha)^{1+\alpha}}$. Clearly, $\overline{G}^o(\alpha_I, g) < \overline{G}^I(\alpha_I, g)$. Moreover, since $g > 1 + 1/\alpha_o$ from (5), we have $\frac{\partial \overline{G}^o(\alpha_o, g)}{\partial \alpha_o} > 0$ and $\lim_{\alpha_o \to \infty} \overline{G}^o(\alpha_o, g) = \infty$. Hence, there is a unique and finite $\underline{\alpha}(g, \alpha_I) > \alpha_I$ such that

$$\overline{G}^I(\alpha_I, g) = \overline{G}^o(\underline{\alpha}(g, \alpha_I), g) \tag{A-13}$$

and $\overline{G}^o(\alpha_o, g) > \overline{G}^I(\alpha_I, g)$ for $\alpha_o > \underline{\alpha}(g, \alpha_I)$. Next differentiating both sides of (A-13), we obtain

$$\frac{\partial \underline{\alpha}}{\partial g} =^{sign} \frac{\partial \overline{G}^I(\alpha_I, g)}{\partial g} - \frac{\partial \overline{G}^o(\underline{\alpha}, g)}{\partial g}.$$

Note that $\frac{\partial \overline{G}^I(\alpha_I, g)}{\partial g} = (1 + \alpha_I)\frac{\overline{G}^I(\alpha_I, g)}{g}$ and $\frac{\partial \overline{G}^o(\underline{\alpha}, g)}{\partial g} = (1 + \underline{\alpha})\frac{\overline{G}^o(\underline{\alpha}, g)}{g}$. Together with the facts that $\overline{G}^o(\underline{\alpha}, g) = \overline{G}^I(\alpha_I, g)$ and $\underline{\alpha} > \alpha_I$, we have

$$\frac{\partial \underline{\alpha}}{\partial g} =^{sign} (\alpha_I - \underline{\alpha})\frac{\overline{G}^I(\alpha_I, g)}{g} < 0.$$

Moreover,

$$\frac{\partial \underline{\alpha}}{\partial \alpha_I} = \frac{\partial \overline{G}^I(\alpha_I, g)/\partial \alpha_I}{\partial \overline{G}^o(\alpha_o, g)/\partial \alpha_o} > 0. \blacksquare$$

Proof of Proposition 5. Using a similar argument to the proof of Proposition 1, it is easily argued that a unique equilibrium exists and equilibrium gifts must be symmetric and positive. Hence, on the donor side, the equilibrium condition reduces to:

$$\overline{G} = \overline{f}(m + p\overline{G} - g; \overline{G} - \frac{g}{p}; p), \tag{A-14}$$

where $\overline{G}_{-i} = \overline{G} - \overline{g} = \overline{G} - \frac{g}{p}$. Differentiating (A-14) with respect to α:

$$\overline{G}' = \overline{f}_m \times (p'\overline{G} + p\overline{G}' - g') + \overline{f}_w \times \left(\overline{G}' - \frac{pg' - p'g}{p^2}\right) + \overline{f}_p p'$$

Recalling that $p = 1 + \alpha$ and $\overline{G} = \overline{f}$ from (A-14), it follows

$$(1 - p\overline{f}_m - \overline{f}_w)\overline{G}' = \frac{\overline{G}}{p}\left(p\overline{f}_m - |\bar{\varepsilon}^p|\right) - \frac{1}{p}\left(\left(p\overline{f}_m + \overline{f}_w\right)g' - \frac{\overline{f}_w ng}{np}\right)$$

where $\bar{\varepsilon}^p = \frac{p\overline{f}_p}{\overline{f}}$. Using (A-9) from the proof of Proposition 2, we know that: $\frac{g'}{g} = \frac{1}{1+\alpha}\frac{\overline{G}'}{\overline{G}} - \frac{1}{\alpha}\frac{\ln n}{(1+\alpha)}$. Hence upon substituting for g',

$$(1 - p\overline{f}_m - \overline{f}_w)\overline{G}' = \frac{\overline{G}}{p}\left(p\overline{f}_m - |\bar{\varepsilon}^p|\right) - \frac{1}{p}\left[\left(\frac{1}{(1+\alpha)}\frac{\overline{G}'g}{\overline{G}} - \frac{1}{\alpha}\frac{(\ln n)ng}{(1+\alpha)n}\right)\left(p\overline{f}_m + \overline{f}_w\right) - \frac{\overline{f}_w ng}{np}\right].$$

Since $p\overline{G} = G$ and $\frac{G}{g} = n$, we have

$$(1 - p\overline{f}_m - \overline{f}_w)\overline{G}' = \frac{\overline{G}}{p}\left(p\overline{f}_m - |\overline{\varepsilon}^p|\right) - \frac{1}{p}\left[\left(\frac{\overline{G}'}{n} - \frac{\ln n}{\alpha n}\overline{G}\right)\left(p\overline{f}_m + \overline{f}_w\right) - \frac{\overline{f}_w\overline{G}}{n}\right].$$

Furthermore,

$$\begin{aligned}\left[1 - (p\overline{f}_m + \overline{f}_w) + \frac{1}{np}(p\overline{f}_m + \overline{f}_w)\right]\overline{G}' &= \frac{\overline{G}}{p}\left[p\overline{f}_m + \frac{\ln n}{\alpha n}\left(p\overline{f}_m + \overline{f}_w\right) + \frac{\overline{f}_w}{n} - |\overline{\varepsilon}^p|\right] \\ &= \frac{\overline{G}}{p}\left[p\overline{f}_m \times (1 + \frac{\ln n}{\alpha n}) + \overline{f}_w \times (\frac{1}{n} + \frac{\ln n}{\alpha n}) - |\overline{\varepsilon}^p|\right].\end{aligned}$$

Since $0 < p\overline{f}_m + \overline{f}_w \leq 1$, $\overline{G}' > 0$ if and only if $|\overline{\varepsilon}^p| < p\overline{f}_m \times (1 + \frac{1}{\alpha}\frac{\ln n}{n}) + \overline{f}_w \times (\frac{1}{n} + \frac{1}{\alpha}\frac{\ln n}{n})$, as claimed. ■

Proposition A1. *Suppose that the charity receives an external revenue $R \geq 0$ such that $f(m + R) > R$. Suppose also that donors are unaware of professional solicitations and continue to give their in-house amounts. Then, the charity with technology α_I uses a professional solicitor with technology α_o if and only if $\alpha_o > \widehat{\alpha}(R)$ where $\widehat{\alpha}(R)$ exceeds α_I, and it is increasing in R.*

Proof. As in the proof of Proposition 1, it is readily argued that there is a unique equilibrium in-house gift g, resulting in total contribution: $G = ng$, and total net contribution: $\overline{G} = G - C$. In particular, in the presence of R, a modified (A-1) holds in equilibrium:

$$\overline{G} + R = f(m + \overline{G} + R - g). \tag{A-15}$$

From the charity's optimization, we again have $n = g^{\alpha}$, which, since $n = [(1 + 1/\alpha)C]^{\frac{\alpha}{1+\alpha}}$ from (1), reveals that $g = [(1 + 1/\alpha)C]^{\frac{1}{1+\alpha}}$,

$$G = (1 + 1/\alpha)C \text{ and } \overline{G} = C/\alpha.$$

Inserting these into (A-15), we obtain

$$C/\alpha + R = f(m + R + C/\alpha - [(1 + 1/\alpha)C]^{\frac{1}{1+\alpha}}).$$

Define

$$\widehat{\Phi}(C; R) = C/\alpha + R - f(m + R + C/\alpha - [(1 + 1/\alpha)C]^{\frac{1}{1+\alpha}}).$$

Clearly, $\widehat{\Phi}(0; R) = R - f(m + R) < 0$ by assumption and $\widehat{\Phi}(\frac{m^{1+\alpha}}{1+1/\alpha}; R) = \frac{m^{1+\alpha}}{1+\alpha} + R - f(\frac{m^{1+\alpha}}{1+\alpha} + R) > 0$ by normality. Thus, $\widehat{\Phi}(C^*; R) = 0$ for some $C^* \in (0, \frac{m^{1+\alpha}}{1+1/\alpha})$. Moreover, since $\widehat{\Phi}_C(C; R) = \frac{1}{\alpha}[1 - f_m(.) \times (1 - \frac{1}{n})] > 0$, the solution C^* is unique, proving the existence of a unique equilibrium in this extension.

The existence of a unique cutoff $\widehat{\alpha}(R)$ follows the same line of arguments as in Proposition 4. In light of Proposition 4, it also suffices to show for the rest of Proposition A1 that equilibrium g is decreasing in R. Note that

$$\widehat{\Phi}_R(.) = 1 - f_m(.) > 0.$$

Hence, C^* is decreasing in R; and so does g because $g = [(1+1/\alpha)C]^{\frac{1}{1+\alpha}}$. ■

Remark A1. *The point that outsourcing is less likely for a charity that receives external funds R can also be made with aware warm-glow donors. In particular, it can be verified that the outsourcing condition in Example 1 becomes*

$$\frac{d}{d\alpha_o}\overline{G}^o > 0 \Longleftrightarrow (p^r + \omega A)\frac{\ln n}{\alpha_o n} + \frac{r\omega A}{n} - (1-r)(1-\omega)A\left(1 + \frac{pR}{ng}\right) > 0.$$

Percent vs. per-call contracts: Let $g_i = \mu_c + \varepsilon_i$ be donor i's gift, where μ_c and ε_i are the charity- and individual-specific shocks. Assume that μ_c and ε_i are independent and normally distributed: $\varepsilon_i \sim^{iid} N(0, \sigma_\varepsilon^2)$ and $\mu_c \sim N(\mu_0, \sigma_\mu^2)$. If n donors are solicited, then the total contribution is given by:

$$\begin{aligned} G_n &= g_1 + g_2 + ... + g_n \\ &= n\mu_c + (\varepsilon_1 + ... + \varepsilon_n). \end{aligned}$$

Hence,

$$G_n \sim N(n\mu_0, n^2\sigma_\mu^2 + n\sigma_\varepsilon^2),$$

which implies that

$$\frac{G_n}{n} \sim N(\mu_0, \sigma_\mu^2 + \frac{\sigma_\varepsilon^2}{n}).$$

Clearly, $\frac{G_n}{n} \rightarrow^d N(\mu_0, \sigma_\mu^2)$ as $n \rightarrow \infty$. That is, even with a large number of solicitations, some aggregate uncertainty about the average donation remains due to the charity-specific shock. For the proof of the following proposition, recall that in the CARA-Normal model, for $X \sim N(\mu, \sigma^2)$

$$E[-e^{-RX}] = -e^{-R[\mu - \frac{R}{2}\sigma^2]},$$

resulting in the certainty equivalent: $CE = \mu - \frac{R}{2}\sigma^2$.

Proposition A2. *Let $G_n \sim N(n\mu_0, n^2\sigma_\mu^2 + n\sigma_\varepsilon^2)$ and the risk-averse player have a CARA utility. Then, between the percentage and per-call based contracts, **(a)** a risk-averse charity prefers the percentage contract with a risk-neutral fundraiser; **(b)** a risk-neutral charity prefers a per-call* *based contract with a risk-averse fundraiser; and* **(c)** *a risk-neutral charity is indifferent between the two contract types if the fundraiser is also risk-neutral.*

Proof. Since the proofs of parts (b) and (c) are similar, we only prove part (a) here. Under a percentage contract, a risk-averse charity that faces a risk-neutral fundraiser solves

$$\max_{s,n} E[-e^{-R(1-s)G_n}]$$

$$\text{s.to } sn\mu_0 - C(n;\alpha) \geq 0 \tag{A-16}$$

$$n \in \arg\max_{\hat{n}} s\hat{n}\mu_0 - C(\hat{n};\alpha). \tag{A-17}$$

Note that as in the text, (A-16) is satisfied trivially since it holds for $n = 0$. Moreover, from (A-17), we have that $n = (s\mu_0)^\alpha$. Inserting this into the charity's certainty equivalent, the charity's program reduces to

$$\max_{s\in[0,1]} \Pi_C^{\%}(s) = (1-s)(s\mu_0)^\alpha \left[\mu_0 - \frac{R}{2}(1-s)((s\mu_0)^\alpha\sigma_\mu^2 + \sigma_\varepsilon^2)\right],$$

where we use the fact that $(1-s)G_n \sim N(n(1-s)\mu_0, (1-s)^2(n^2\sigma_\mu^2 + n\sigma_\varepsilon^2))$.

On the other hand, under a per-call contract, the charity pays $k \geq 0$ per call and solves

$$\max_{s,n} E[-e^{-R(G_n - nk)}]$$

$$\text{s.to } nk - C(n;\alpha) \geq 0 \tag{A-18}$$

$$n \in \arg\max_{\hat{n}} \hat{n}k - C(\hat{n};\alpha) \tag{A-19}$$

Since, from (A-19), $n = k^\alpha$, the charity's program reduces to

$$\max_k \Pi_C^{call}(k) = k^\alpha \left(\mu_0 - k - \frac{R}{2}\left(k^\alpha\sigma_\mu^2 + \sigma_\varepsilon^2\right)\right).$$

The first-order condition reveals that $k^* \leq \frac{\alpha}{1+\alpha}\mu_0$. Hence, $\frac{k^*}{\mu_0} \in [0,1]$ and we have that

$$\begin{aligned}
\Pi_C^{\%}(s^*) &\geq \Pi_C^{\%}(\frac{k^*}{\mu_0}) = (1-\frac{k^*}{\mu_0})\,(k^*)^\alpha \left[\mu_0 - \frac{R}{2}(1-\frac{k^*}{\mu_0})((k^*)^\alpha\,\sigma_\mu^2 + \sigma_\varepsilon^2)\right] \\
&= (k^*)^\alpha \left[\mu_0 - k^* - \frac{R}{2}(1-\frac{k^*}{\mu_0})^2((k^*)^\alpha\,\sigma_\mu^2 + \sigma_\varepsilon^2)\right] \\
&\geq (k^*)^\alpha \left[\mu_0 - k^* - \frac{R}{2}((k^*)^\alpha\,\sigma_\mu^2 + \sigma_\varepsilon^2)\right] = \Pi_C^{call}(k^*),
\end{aligned}$$

which implies that $\Pi_C^{\%}(s^*) \geq \Pi_C^{call}(k^*)$, with a strict inequality whenever $k^* > 0$. ■

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