

# Essays on the Market for Professional Fundraising

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Dissertation submitted in partial fulfillment of the requirements for the degree of  
Doctor of Philosophy in the Department of Economics  
in the Graduate School of Duke University  
2016

ABSTRACT

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# Abstract

This dissertation contributes to the economic literature on the market for professional fundraising with two theoretical and one empirical essays. The second chapter rationalizes the decision of charities to outsource fundraising. The third chapter shows theoretically how liquidity considerations affect the contractual choices and campaign results between charities and professional solicitors. The fourth chapter tests the empirical implications of the theory, using a unique dataset I collected from the North Carolina Secretary of State website.

# Contents

Abstract	iv
List of Tables	vii
List of Figures	viii
Acknowledgements	ix
<b>1 Introduction</b>	<b>1</b>
<b>2 A Theory of Outsourced Fundraising: Why Dollars Turn into “Pennies for Charity”</b>	<b>3</b>
2.1 Introduction . . . . .	3
2.2 Base model . . . . .	8
2.3 In-house fundraising . . . . .	9
2.4 Outsourcing with aware donors: near impossibility . . . . .	12
2.5 Why do charities outsource fundraising? . . . . .	18
2.5.1 Unaware donors . . . . .	18
2.5.2 Aware warm-glow donors . . . . .	21
2.5.3 Improving watchdog ratings . . . . .	24
2.6 Extensions . . . . .	25
2.6.1 Professional fundraising as an investment . . . . .	26
2.6.2 Government grants and repeat donors . . . . .	27
2.6.3 Heterogenous donors . . . . .	28
2.6.4 Percentage vs. per-call contracts . . . . .	29

2.7	Discussion and conclusion . . . . .	30
<b>3</b>	<b>Theory of the Contractual Choices between Charities and Professional Solicitors</b>	<b>32</b>
3.1	Introduction . . . . .	32
3.2	The model . . . . .	34
3.3	Contract Choice under Charity’s Offer . . . . .	35
3.4	Contract Choice under Fundraiser’s Offer . . . . .	43
3.5	Conclusion . . . . .	46
<b>4</b>	<b>Empirical Tests on the Contractual Choices between Charities and Professional Solicitors</b>	<b>48</b>
4.1	Introduction . . . . .	48
4.2	The Data . . . . .	49
4.3	Empirical Specifications . . . . .	51
4.4	Results . . . . .	54
4.5	Conclusion . . . . .	58
<b>A</b>	<b>Appendix to Chapter 2</b>	<b>59</b>
	<b>Bibliography</b>	<b>71</b>
	<b>Biography</b>	<b>75</b>

# List of Tables

4.1	Summary Statistics . . . . .	50
4.2	Contract Choice . . . . .	55
4.3	Retained Share . . . . .	55
4.4	Gross Amount Raised . . . . .	56
4.5	Net Amount Raised . . . . .	57
4.6	Ratio of Outsourcing to Total Revenue . . . . .	58

# List of Figures

2.1 Telemarketing in New York (Source: 2013 Pennies for Charity) . . . 4



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# 1

## Introduction

In the second chapter of this dissertation, Huseyin Yildirim and I rationalize the charities' decision to outsource fund-raising to a professional solicitor. 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. This, however, clashes with empirical evidence. We show that paid solicitations can benefit the charity if: (1) donors are unaware; (2) donors have intense "warm-glow" preferences; or (3) the charity worries mostly about watchdog ratings. We argue that informing the public of the mere existence of paid solicitations may be the most effective policy available.

In the third chapter I explore theoretically the contractual choices between charities and the professionals. Three contract types are most prevalent in practice - percentage based, where the solicitor receives a fixed share of donations; per call based, where the solicitor is paid for each phone call made; and per call with a minimum guarantee based, where the charity is not liable for any potential loss from an unsuccessful campaign. I offer a liquidity explanation for the choice of contract type.

I show that when charities are liquidity constrained, outsourcing is more likely to be done on either a percentage or per call with a minimum guarantee basis. Moreover, less liquidity constrained charities can afford to offer a higher powered incentive to the solicitor and therefore expect to raise more funds.

In the fourth chapter of this dissertation I test the model implications using a unique dataset that I collected from the North Carolina Secretary of State website. The empirical results confirm the suggestions of the model. Unfortunately, it turns out that the charities that most need funds are the ones that have the hardest time raising them.

# A Theory of Outsourced Fundraising: Why Dollars Turn into “Pennies for Charity”

## 2.1 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); Greenfield (2002)) and watchdog groups such as Charity Navigator and CharityWatch. This benchmark is, however, significantly exceeded by those charities that rely on professional fundraisers.<sup>1</sup> According to the “Pennies for Charity” report of the New York Attorney General, charities regularly paid more than half of the solicited donations to telemarketing companies; see Figure 2.1.<sup>2</sup>

From 2002 to 2012, around 580 telemarketing campaigns were run on behalf of 438 charities annually.<sup>3</sup>

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<sup>1</sup> “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)).

<sup>2</sup> The Pennies reports are available at [www.charitiesnys.com](http://www.charitiesnys.com).

<sup>3</sup> Similar statistics have been documented by other states including California, Colorado, Connecticut, Massachusetts, North Carolina, Ohio, Pennsylvania, Tennessee, and Vermont. For instance, the California Attorney General reported that of the \$294.3 million that the public donated through telemarketers in 2012, only 36% was distributed to charities. The same

## 2002-2011 Comparison of Telemarketing Campaigns

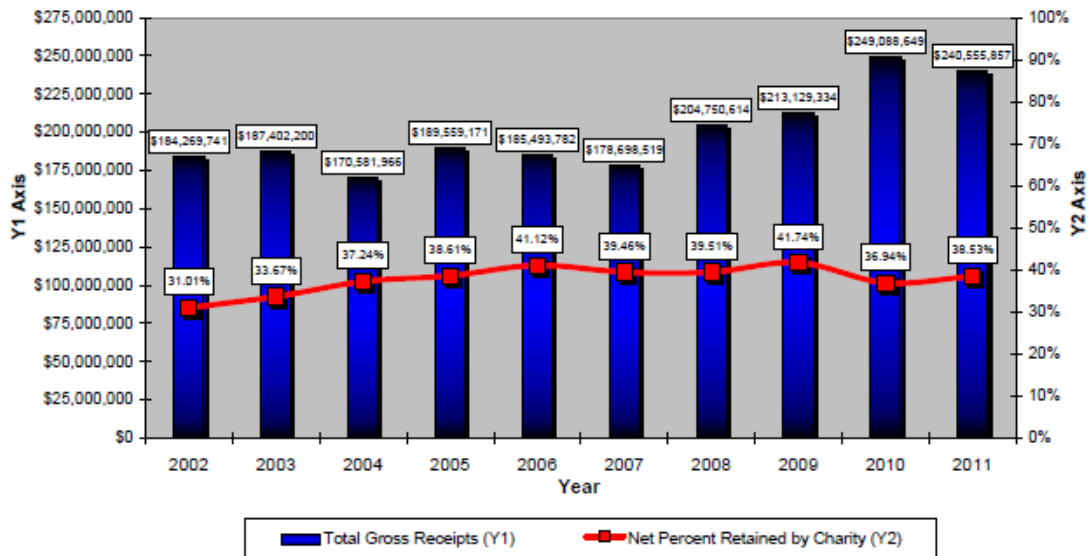


FIGURE 2.1: Telemarketing in New York (Source: 2013 Pennies for Charity)

Paid solicitors have also attracted media scrutiny. A 2012 story by the Bloomberg Markets magazine revealed that from 2007 to 2010, a major telemarketing company kept 52% of \$424.5 million raised on behalf of 30 nonprofits, including American Cancer Society and March of Dimes - two of the largest in the U.S.<sup>4</sup> A 2013 investigation by the Tampa Bay Times ranked nearly 6000 American charities based on money paid to solicitors over the past decade. The top 50 totalled \$970.6 million while allocating less than 4% of collected donations in direct cash aid to their intended causes.<sup>5</sup>

The high cost of paid fundraisers raises legitimate concerns about the accountability of charitable organizations. As such, it has the potential to severely undermine year, \$494 million was raised in nationwide campaigns including North Carolina residents but only 46% reached the nonprofits; see <http://oag.ca.gov/charities/publications> and <https://www.secretary.state.nc.us/csl/>.

<sup>4</sup> See [www.bloomberg.com/news/2012-09-12/charities-deceive-donors-unaware-money-goes-to-a-telemarketer.html](http://www.bloomberg.com/news/2012-09-12/charities-deceive-donors-unaware-money-goes-to-a-telemarketer.html).

<sup>5</sup> See [www.tampabay.com/americas-worst-charities](http://www.tampabay.com/americas-worst-charities).

public confidence in the nonprofit sector, which constitutes about 2% of GDP in the U.S (Giving USA (2013)). Nevertheless, before introducing any policy, it is important to understand the market for professional fundraising: why it exists despite being so expensive; what it implies about donor motives; whether it is consistent with informed donors (as intended by state regulators); and how it should be intervened by authorities, if necessary. Complicating policy interventions is the fact that a direct regulation of fundraising contracts is prohibited by freedom of speech (Hopkins (2009)).<sup>6</sup> Regulators in 41 U.S. states including California and New York do, however, have disclosure laws that compel paid solicitors to identify themselves to donors (Fisman and Barrett (2013)).<sup>7</sup>

This paper proposes a first model of outsourced fundraising, featuring one charity, one professional fundraiser and many potential donors. Each donor considers giving only if solicited.<sup>8</sup> The charity may conduct these (costly) solicitations on its own or outsource them to the professional by promising him a percentage of the donations collected.<sup>9</sup> We find that the charity would be unlikely to outsource if, as required

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<sup>6</sup> The U.S. Supreme Court consistently overturned state laws that limited fundraiser fees. In 1980, the *Schaumburg case* (444 U.S. 620) overturned a city ordinance prohibiting door-to-door or on-street solicitation of contributions by charitable organizations that do not use at least 75% of their receipts for charitable purposes. In 1984, the *Munson case* (467 U.S. 947) invalidated a Maryland statute that similarly prohibited paying fundraisers more than 25% of the amount raised. In 1988, the *Riley case* (487 U.S. 781) invalidated a North Carolina law that denied licenses to professional fundraisers whose commissions exceeded 20%. The *Riley case* also dismissed the law's requirement that a professional fundraiser must disclose to potential donors the average percentage of gross receipts actually turned over to charities in the preceeding year.

<sup>7</sup> As per the Supreme Court ruling on the *Riley case*, these laws cannot mandate the disclosure of fundraising contracts to donors.

<sup>8</sup> Directly asking donors is considered one of the most powerful fundraising techniques; see Yoruk (2009), Andreoni and Rao (2011), Meer and Rosen (2011), and Edwards and List (2014) for evidence.

<sup>9</sup> Prior to solicitation campaigns, professional fundraisers must often file with the state their contracts with charities. Greenley and Gordon (1998) found 63.3% of such contracts between 1991 and 1996 in Pennsylvania were percentage-based. Based on the Pennies report, Keating et al. (2003) similarly concluded "telemarketing arrangements are (explicitly or implicitly) structured with a heavy reliance on a (high) fixed commission rate." Our own inspection of New York and North Carolina data confirm these findings.

by law, the professional revealed 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 its fundraising only if the paid solicitor is sufficiently more “efficient” than itself. Indeed, charities often justify the use of paid solicitors by being unequipped to undertake complex, large-scale campaigns as well as their need to focus on core missions. Consistent with agency theory, the charity optimally offers a higher percentage of total receipts to a more efficient solicitor, implying a higher price of giving. Thus, outsourcing is profitable for the charity only if giving is very price-inelastic. That, however, is strongly 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 observation, we advance three explanations for the prevalent use of professional fundraisers. First, despite disclosure laws, donors may still be unaware of paid solicitors and continue to give generously. This is consistent with the anecdotal evidence presented in media reports 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 Trust Barometer (2014)). Second, donors may have intense “warm-glow” preference for giving (Andreoni (1989)) and thus be less sensitive to the increased price of giving. And third, in order to improve their watchdog ratings, charities may retain paid fundraisers and shift their campaign fixed costs onto them.

A dynamic extension of our model can further explain why charities are willing to lose on some fundraising campaigns.<sup>10</sup> We show that as in practice, charities may view paid solicitations as an investment into acquiring new donors who can then

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<sup>10</sup> The *Pennies* report reveals that about 10% of campaigns results in a loss for charities.

be re-solicited. In another extension, we demonstrate that charities with additional funds from government grants and/or repeat donors are less likely to use paid solicitors – though not because additional funds are less valuable to charity but because motivating a paid solicitor is costlier in this case. Together, these extensions suggest that charities are less likely to hire paid solicitors for their established programs but the same charities can afford to become aggressive in establishing new ones.

Apart from the papers mentioned above, our paper relates to a growing theoretical literature on strategic fund-raising by means of: providing prestige and status to donors (Glazer and Konrad (1996); Harbaugh (1998); Romano and Yildirim (2001); Barbieri and Malueg (2014)); coordinating donations (Andreoni (1998); Marx and Matthews (2000)); facilitating informed giving (Vesterlund (2003); Andreoni (2006); 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 a means of informing donors of the charitable cause as in our setting. She shows that fundraising can be “excessive”. Andreoni and Payne (2003) and Name-Correa and Yildirim (2013) endogenize both the charity and donors’ behaviors, but they essentially assume “in-house” fundraising; so outsourcing, which is at the heart of our investigation, is 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).

The remainder of the paper is organized as follows. In the next section, we set up the base model. In Section 3, we characterize the benchmark of in-house fundraising. In Section 4, we determine an optimality condition for outsourced fundraising and argue that it would contradict evidence if donors were aware of this practice. In Section 5, we advance three explanations for outsourcing, followed by extensions to dynamic fundraising, additional revenue sources from government grants/ repeat



donors, and per-call based contracts in Section 6. Section 7 discusses policy and concludes. The proofs of all the formal results appear in the appendix.

## 2.2 Base model

The economy consists of one charity, one professional fundraiser and many identical donors. Each donor considers giving and participates in a voluntary contribution game only if solicited – perhaps she is uninformed of the current fund-drive or simply procrastinates.<sup>11</sup> The charity can fundraise in-house or outsource its fundraising to the professional by offering him a percentage  $s$  of the donations collected.<sup>12</sup> 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. We assume that the fundraising technology is represented by a convex, iso-elastic cost function:

$$C(n; \alpha) = \frac{n^{1+1/\alpha}}{1 + 1/\alpha}, \quad (2.1)$$

where  $\alpha > 0$  is the “ability” parameter and  $n$  is the number of solicitations.<sup>13</sup> In particular, treating  $n$  as a continuous variable, the marginal cost is  $C_n(n; \alpha) = n^{1/\alpha}$ , where subscripts refer to partial derivatives throughout. Note that marginal cost is decreasing in  $\alpha$ ; so we say that the fundraising technology is more efficient, the

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<sup>11</sup> Our model easily accommodates repeat donors who do not need soliciting or cost little to solicit; see Section 6.2. Also, as previously indicated in Footnote 8, there is ample evidence on the power of asking in fundraising.

<sup>12</sup> For the prevalent use of percentage contracts in paid fundraising, see Footnote 9. We discuss other contract types in Section 6.4. In practice, the contract negotiation between the charity and the professional can be complicated but assuming a more powerful professional will only strengthen our results. Moreover, the exemption of nonprofits from the Do-Not-Call registry seems to have increased telemarketer competition for nonprofits.

<sup>13</sup> For simplicity, each solicitation is assumed to reach the donor. Moreover, with little loss of generality, fixed costs of fundraising are ignored in the main analysis but briefly discussed in Section 5.3.

higher  $\alpha$  is.<sup>14</sup> Donors cannot monitor the choice of  $n$  and in case of outsourcing, neither can the charity.

On the donor side, we adopt the standard model of giving (Bergstrom et al. (1986)). Each contacted person allocates her income  $m$  between a 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:  $\bar{G} = \max\{G - C, 0\}$  and  $\bar{G} = (1 - s)G$  for the in-house and outsourced fundraising, respectively. Person  $i$ 's preferences are represented by an increasing and quasi-concave utility function:

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

Let  $f(m, p)$  be individual 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.

### 2.3 In-house fundraising

Suppose that the charity fundraises itself and that this is commonly known by donors. Anticipating a (unique) equilibrium gift  $g^I$  from each solicitation,<sup>15</sup> the

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

<sup>15</sup> Since donors do not observe the number of solicitations, their gifts are fixed from the charity's perspective. Moreover, in the proof of Proposition 1, we show that equilibrium gifts must be the same.

charity chooses the number of solicitations to maximize net revenues:

$$\bar{G}^I = \max_n [ng^I - C(n; \alpha_I)]. \quad (\text{IF})$$

The first-order condition requires that  $g^I = C_n(n; \alpha_I)$ . That is, the optimal number of solicitations equates the marginal revenue, which is the last donation, to its marginal cost. Employing Eq.(3.1), this condition reduces to:

$$n = (g^I)^{\alpha_I}. \quad (2.2)$$

All else equal, the charity reaches out to more people, the larger the expected gift and/or the more efficient its technology is. In equilibrium, both the donors and the charity correctly conjecture strategies; hence  $n = n^I$  and  $g^I = g(n^I)$ . Our first result characterizes in-house fundraising.

**Proposition 1.** *Under in-house fundraising, there is a unique and symmetric equilibrium. In equilibrium, as the fundraising technology becomes more efficient, namely  $\alpha_I$  gets larger, the number of solicitations,  $n^I$ ; the total cost,  $C^I$ ; the gross donations,  $G^I$ ; and the net revenues,  $\bar{G}^I$  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.<sup>16</sup>

The cost-to-donation ratio for the charity can also be readily determined. From Eqs. (3.1) and (2.2), note that the equilibrium total donation is:  $G^I = (1 + 1/\alpha_I)C^I$ , which reveals

$$r^I \equiv \frac{C^I}{G^I} = \frac{\alpha_I}{1 + \alpha_I}. \quad (2.3)$$

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<sup>16</sup> Given the total cost  $C > 0$ , there can be a zero-contribution equilibrium among donors much like in Andreoni (1998); but it is never reached in our setting since  $C$  is endogenous to fundraising.

Evidently,  $r^I$  is increasing in  $\alpha_I$ . That is, a more efficient charity, while raising more funds, has a higher cost-to-donation ratio! Most starkly, the ratio is close to 1 for the most efficient charity. 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. This finding has two important implications.

First, though simple and often utilized by leading watchdogs such as Charity Navigator and CharityWatch, the cost-to-donation ratio is an unreliable measure for ranking charities. As such, our finding theoretically supports the critics of this measure (Steinberg (1991); Karlan (2011)). Nevertheless, there is some evidence that donors care about cost-to-donation ratios and best practice standards promoted by industry experts and watchdogs (Cnaan et al. (2011); 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); and Andreoni and Payne (2011)). The following corollary, which directly obtains from Eq.(2.3), shows that a goal-setting charity is likely to be more efficient.

**Corollary 2.** *Suppose that donors respond to watchdog ratings and that watchdogs consider the cost-to-donation ratio  $r^I \leq r^{wd}$  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 if donors are made aware of the practice, as we

formalize next.

## 2.4 Outsourcing with aware donors: near impossibility

Suppose that the charity contracts out its fundraising to a professional solicitor whose efficiency parameter is  $\alpha_o$ . 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. This means that from the fundraiser's perspective, donations are fixed and determined in equilibrium.

Upon accepting the contract and expecting a (unique) equilibrium gift  $g^o$  from each solicitation,<sup>17</sup> the professional solicits  $n$  donors to maximize his profit:

$$n \in \arg \max_{\hat{n}} [s\hat{n}g^o - C(\hat{n}; \alpha_o)]. \quad (\text{IC})$$

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

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

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

$$\bar{G}^o = \max_{s,n} (1-s)ng^o \quad (\text{OF})$$

s.to (IC) and (IR).

Note that the (IR) constraint is trivially satisfied because the professional can ensure a zero profit by soliciting no one. Thus, in equilibrium the professional must

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<sup>17</sup> As with the in-house benchmark, it is readily verified that equilibrium gifts are equal.

receive a positive profit, namely  $\Pi^o > 0$ . This is an “incentive cost” to the charity. The first-order condition from (IC) requires that  $sg^o = C_n(n; \alpha_o)$ . As with in-house fundraising, the professional solicits until his marginal revenue, which is the agreed percentage of the last donation, equals his marginal cost. Using Eq.(3.1), the professional’s strategy simplifies to:

$$n = (sg^o)^{\alpha_o}. \quad (2.4)$$

Not surprisingly, the solicitation effort intensifies with a higher percentage retained and a larger expected gift. Inserting Eq.(2.4) into (OF), the charity’s objective becomes

$$\bar{G}^o = \max_s (1 - s) (sg^o)^{\alpha_o} g^o, \quad (2.5)$$

whose unique solution is:

$$s^o = \frac{\alpha_o}{1 + \alpha_o}. \quad (2.6)$$

Three properties of the optimal (percentage) contract,  $s^o$  are worth noting. First,  $s^o$  is increasing in  $\alpha_o$ : a more efficient solicitor is offered a larger share of the donations. The trade-off is easily seen from (3.2): a larger share reduces the charity’s return but motivates the solicitor; and motivating a more efficient solicitor is less costly.<sup>18</sup> Second, the share offered to the professional can be quite high. For instance, the solicitor with a quadratic cost,  $\alpha_o = 1$ , is paid half of the total donation. This observation may rationalize the empirical evidence that telemarketing companies specializing in fundraising often retain more than half of the donations and the charities agree to it. This does not, however, mean that the charity receives little. From Eqs.(3.1) and (2.4), it is readily found that  $\bar{G}^o = (1 + 1/\alpha_o) \times \Pi^o$ ; that is, the

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<sup>18</sup> 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)).

charity's net revenues actually exceed the fundraiser's profit by a fraction of  $1/\alpha_o$ . Third, because donors cannot observe or verify the fundraising contract at the time of solicitation and adjust their gifts, the contract depends only on the solicitor's technology – not on donors' preferences. This dichotomy 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 mentioned above. In particular, the charity's net revenue must grow with the fundraiser's efficiency; that is, for outsourcing to be profitable for the charity, it is necessary that  $\frac{d}{d\alpha_o}\bar{G}^o > 0$ . 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  $\varepsilon^p$  denotes the price elasticity of demand for the public good.

**Proposition 3.** *Under outsourcing, there is a unique and symmetric equilibrium. In equilibrium, the charity's net revenue is increasing in fundraiser efficiency, i.e.,  $\frac{d}{d\alpha_o}\bar{G}^o > 0$ , if and only if  $|\varepsilon^p| < pf_m \times (1 + \frac{\ln n}{\alpha_o n})$ , where  $p = p^o$  and  $n = n^o$ .*

To understand Proposition 2, note that the ratio  $\frac{\ln n}{n}$  is likely to be negligible for mass solicitations.<sup>19</sup> Given this, the condition in Proposition 2 reduces to:  $|\varepsilon^p| \leq$

<sup>19</sup> In particular,  $\frac{\ln n}{n}$  converges to 0 at the rate of  $\frac{1}{n}$ . For instance,  $\frac{\ln n}{n} = .046, .012, .006$  for

$pf_m$ . Since  $pf_m < 1$  by normality, this means that outsourcing based on fundraiser efficiency can be justified only if giving is sufficiently price-inelastic, as the intuition suggested. In our two-good economy, this is equivalent to the private good being a gross complement to the public good.<sup>20</sup> 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 empirical consensus that charitable giving is price-elastic, namely  $|\varepsilon^p| > 1$ .<sup>21</sup> Second, notice the term  $pf_m$  can be written:  $\frac{pf}{m} \times \varepsilon^m$ , where  $\frac{pf}{m}$  is the fraction of income spent on charity and  $\varepsilon^m$  is the income elasticity of donation. The fraction of personal income allocated to charity hovers around 2% in the U.S. (Giving USA (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,  $|\varepsilon^p|$ .<sup>22</sup>

Additional and equally strong 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. To see what this

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$n = 100, 500, 1000$ . Moreover, recall from Eq.(2.6), a solicitor who receives at least half of donations must have efficiency  $\alpha_o \geq 1$ .

<sup>20</sup> This conclusion directly follows from the donor's budget constraint:  $x(m, p) + pf(m, p) = m$ . Differentiating with respect to  $p$ , we obtain

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

<sup>21</sup> 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.

<sup>22</sup> 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.



implies in our context, consider first Leontief preferences:  $u_i = \min\{x_i, \overline{G}\}$ , for which demand for the public good is:  $f(m, p) = \frac{m}{1+p}$ , implying that  $|\varepsilon^p| = pf_m = \frac{p}{1+p}$ . Thus, with Leontief, efficiency-based outsourcing can indeed be rationalized – but barely. That is, our outsourcing criterion in Proposition 2 is unlikely to hold for less than perfect complements observed in lab data, as we demonstrate next.

**Example 4** (CES utility). *Suppose*

$$u_i = (ax_i^\rho + (1-a)\overline{G}^\rho)^{\frac{1}{\rho}},$$

where  $\rho \in (-\infty, 1)$ . Letting  $r = \frac{\rho}{\rho-1}$  and  $A = (a/(1-a))^{1-r}$ , demand for the public good is:  $f(m; p) = \frac{1}{Ap^{1-r}+p}m$ ; hence

$$pf_m = \frac{p^r}{A+p^r} \text{ and } |\varepsilon^p| = 1 - r \frac{A}{A+p^r}.$$

Since  $\frac{\ln n}{n} \leq \frac{1}{e}$ , Proposition 2 reveals that

$$\frac{d}{d\alpha_o} \overline{G}^o < 0 \text{ if } |\varepsilon^p| \geq pf_m \times \left(1 + \frac{1}{e \times \alpha_o}\right).$$

Setting  $p = 1 + \alpha_o$ , it follows that  $\frac{d}{d\alpha_o} \overline{G}^o < 0$  if  $eA(1-r)\alpha_o - (1+\alpha_o)^r \geq 0$ , or equivalently if

$$e(a/(1-a))^{1/(1-\rho)}\alpha_o - (1-\rho)(1+\alpha_o)^{-\rho/(1-\rho)} \geq 0.$$

The left-hand side of this inequality is increasing in  $\alpha_o$ ; and it becomes negative for  $\alpha_o \rightarrow 0$  and positive for  $\alpha_o \rightarrow \infty$ . Thus, there is a unique threshold  $\underline{\alpha}(\rho, a) > 0$  such that  $\frac{d}{d\alpha_o} \overline{G}^o < 0$  if  $\alpha_o \geq \underline{\alpha}(\rho, a)$ . Moreover,  $\underline{\alpha}(\rho, a)$  is decreasing in both  $\rho$  and  $a$ , with  $\underline{\alpha}(\rho, .5) = .03, .32, .37, .42$ , and  $.96$  for  $\rho = .9, .1, 0, -.1$ , and  $-.9$ , respectively.

Example 1 says that an outsourcing charity actually becomes worse off by hiring a more efficient fundraiser if individual preferences display enough selfishness (i.e., a

high  $a$ ) and/or enough substitution between private good and charity. This makes sense because, as alluded to above, a more efficient fundraiser is promised a greater percentage of donations, raising the price of giving. With enough selfishness and/or substitution, this causes donors to significantly cutback on their gifts, diminishing net revenue for the charity. Estimating CES preferences, Andreoni and Miller (2002) report that only 25 out of 173 subjects exhibit Leontief preferences, namely  $\rho = -\infty$ , while the rest (86%) have  $a \geq .5$  and  $\rho \geq -.36$ . Using a similar method, Fisman et al. (2007) uncover that only 2 out of 65 subjects can be rationalized by Leontief preferences while the remaining (97%) have  $a \geq .5$  and  $\rho \geq -.9$ . Example 1 thus implies that for most individuals in these two experiments,  $\underline{\alpha}(\rho, a) \leq .96$ . Since a professional solicitor who keeps at least half of donations (as suggested by the telemarketing evidence) corresponds to  $\alpha_o \geq 1$  by Eq.(2.6), Example 1 also implies that the charity's net revenue is decreasing in fundraiser efficiency, making outsourcing unprofitable.

In sum, based on rich data on charitable giving, we cannot rationalize outsourced fundraising if donors are aware of this practice – not necessarily of the actual percentage. The apparent reluctance of professional solicitors to inform donors of their fundraising contracts at the point of solicitation reinforces this conclusion.<sup>23</sup> To see why, 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,

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<sup>23</sup> In the 1988 *Riley case* alluded to in the introduction, a coalition of professional fundraisers and charitable organizations opposed to a 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. For an interesting discussion of nonprofit disclosure laws in the U.S. and Europe, see Sandberg (2006).

**Proposition 5.** *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  $\bar{G}^{o,d} > \bar{G}^o$ .*

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:

## 2.5 Why do charities outsource fundraising?

We offer three possible answers in this section. First, donors are simply unaware of professional solicitations. Second, donors are also “warm-glow” or joy givers and therefore less sensitive, though not insensitive, to the price of giving. And third, for fundraising campaigns that involve significant fixed costs, charities have an incentive to shift these costs onto fundraisers in order to improve their watchdog ratings.

### 2.5.1 Unaware donors

Common to the media accounts alluded to in the Introduction is the fact that the interviewed donors often did not know about paid solicitations or high percentages retained by the solicitors. For instance, in the Bloomberg story, 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 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 such 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?”

These accounts are consistent with states’ efforts to inform donors about telemarketing activities as well as survey evidence pointing to uninformed giving (Hope Consulting Report (2011)) and strong public confidence in the charitable sector (O’Neill (2009); Edelman Trust Barometer (2014)).<sup>24</sup> Proposition 4 shows that unlike with aware donors, the charity might optimally hire a paid solicitor if donors are unaware.

**Proposition 6.** *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  $\alpha_I$  hires a paid solicitor with technology  $\alpha_o$  if and only if  $\alpha_o > \underline{\alpha}(g, \alpha_I)$  where  $\underline{\alpha}(\cdot) > \alpha_I$  is a unique cutoff. Moreover,  $\underline{\alpha}(\cdot)$  is decreasing in  $g$  and increasing in  $\alpha_I$ ; that is, the charity is more likely to outsource its fundraising (1) the higher its expected in-house gift is 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

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<sup>24</sup> In these studies, survey evidence shows that people trust nonprofits more than they trust the government or businesses to address pressing social problems.

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 Eq.(2.4)) 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.

Proposition 4 implies that with unaware donors, charitable motives that increase gifts should also increase the likelihood of outsourcing. Most significantly, Proposition 4 predicts that charitable causes that carry intense warm-glow preference should be the prime candidates for paid solicitations. This prediction appears compatible with a leading telemarketing firm’s strategy:

“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.” (Bloomberg Markets, 2012)<sup>25</sup>

To fully understand this business strategy, and thus the charity’s incentive to outsource, we also need to understand whether outsourcing would continue to be profitable for the charity if, as required by law, warm-glow donors were made aware of paid solicitations. As we show next, this is the case if donors are primarily warm-glow givers.

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<sup>25</sup> Small et al. (2007) experimentally supports this fundraising strategy: people give more to the causes they identify with, than to the ones they reason about.

### 2.5.2 Aware warm-glow donors

As in Section 4, suppose that the charity outsources its fundraising to a professional with efficiency  $\alpha_o$  and that the professional discloses this fact to donors at the point of solicitation. Donors, however, now possess an added motive of warm-glow à la Andreoni (1989). Specifically, when the fundraiser retains a percentage  $s$  of the funds collected, donor  $i$ 's utility is given by:

$$u_i = u(x_i, \bar{G}, \bar{g}_i), \quad (2.7)$$

where  $\bar{G} = (1 - s)G$  and  $\bar{g}_i = (1 - s)g_i$ . As before the donor receives utility from private consumption  $x_i$  and public good production  $\bar{G}$ , but he now also receives a warm-glow utility from the fraction of his donation that goes toward the public good,  $\bar{g}_i$ .<sup>26</sup>

Conjecturing  $s$  and others' total contribution  $G_{-i}$ , donor  $i$  maximizes his utility in (2.7) subject to budget constraint:  $x_i + g_i = m$ . Denoting by  $p = \frac{1}{1-s}$  the price of giving and  $\bar{G}_{-i} = (1 - s)G_{-i}$  others' net contribution,  $i$ 's program can be re-stated:

$$\max_{x_i, \bar{G}} u(x_i, \bar{G}, \bar{G} - \bar{G}_{-i}) \quad (\text{WG})$$

$$\text{s.to } x_i + p\bar{G} = M$$

$$\bar{G} \geq \bar{G}_{-i},$$

where  $M \equiv m + p\bar{G}_{-i}$  is the "social income". This formulation reduces to Andreoni's for  $s = 0$ . Ignoring the second constraint (which holds in equilibrium), let  $\bar{G} = \bar{f}(m + p\bar{G}_{-i}, \bar{G}_{-i}; p)$  be the solution to (WG) where  $\bar{f}$  is donor  $i$ 's Nash supply. Also let  $\bar{f}_m$ ,  $\bar{f}_w$ , and  $\bar{f}_p$  be the respective partial derivatives, signifying propensity to give due to altruism, warm-glow, and price increase. Normality of the goods implies that  $0 < p\bar{f}_m < 1$ ;  $\bar{f}_w \geq 0$ ; and  $\bar{f}_p < 0$ . Note that  $\bar{f}_w = 0$  refers to a purely

<sup>26</sup> Hence, we implicitly assume that donors do not obtain warm-glow from simply paying for the fundraising cost. Results would only be stronger if they did.

altruistic donor, who cares only about the charitable output, as in the base model, whereas  $p\bar{f}_m + \bar{f}_w = 1$  refers to a pure warm-glow giver who is unresponsive to others' contributions. To capture both motives for giving here, we assume  $0 < p\bar{f}_m + \bar{f}_w \leq 1$ .

From the fundraiser's perspective, gifts are fixed in equilibrium; so the optimal contract and the price of giving stay the same as in pure altruism in Section 4. The following result extends Proposition 2 and derives the condition under which the charity's net revenue is increasing in fundraiser's efficiency – a necessary condition for outsourcing. In its statement,  $\bar{\varepsilon}^p = \frac{p\bar{f}_p}{\bar{f}}$  represents the price elasticity of Nash supply.

**Proposition 7.** *Consider warm-glow giving described in this subsection and suppose that donors are aware of paid solicitations. Then, there is a unique and symmetric equilibrium. In equilibrium, the charity's net revenue is increasing in fundraiser efficiency, i.e.,  $\frac{d}{d\alpha_o} \bar{G}^o > 0$ , if and only if  $|\bar{\varepsilon}^p| < p\bar{f}_m \times (1 + \frac{\ln n}{\alpha_o n}) + \bar{f}_w \times (\frac{1}{n} + \frac{\ln n}{\alpha_o n})$ , where  $p = 1 + \alpha_o$  and  $n = n^o$ .*

Clearly, by setting  $\bar{f} = f$  and  $\bar{f}_w = 0$ , the outsourcing condition coincides with that found in Proposition 2. To discern the role of warm-glow, note that for mass solicitations, i.e., large  $n$ , the condition in Proposition 5 approximately becomes:  $|\bar{\varepsilon}^p| \leq p\bar{f}_m$ . Since  $p\bar{f}_m < 1$  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. It is intuitive that with an added warm-glow motive, giving should be less price sensitive; that is, it should be that  $|\bar{\varepsilon}^p| \leq |\varepsilon^p|$ . 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, we expect that  $pf_m \leq p\bar{f}_m$ . Taken together, the warm-glow motive is likely to relax the outsourcing condition. To determine if it is satisfied, however, we examine a CES example – extending Example 1.

**Example 8** (CES with warm-glow). *Suppose*

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

where  $\rho \in (-\infty, 1)$  and  $\omega \in [0, 1]$ . Again, letting  $r = \frac{\rho}{\rho-1}$  and  $A = (a/(1-a))^{1-r}$ , we find  $\bar{f}(M; \bar{G}_{-i}; p) = \frac{1}{Ap^{1-r}+p}M + \frac{\omega A}{A+p^r}\bar{G}_{-i}$ , which yields

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

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 found in Example 1. Proposition 5 implies that

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

For  $n \rightarrow \infty$ ,  $\bar{G}^o$  is increasing in  $\alpha_o$  if and only if  $\omega \rightarrow 1$  or  $\rho \rightarrow -\infty$ . For  $\omega = 1$ ,  $\bar{G}^o$  is increasing in  $\alpha_o$  if  $\rho \leq 0$ ; and it is decreasing if  $\rho \rightarrow 1$ .

Evidently, a higher  $\omega$  implies a stronger warm-glow preference, with  $\omega = 1$  representing a pure warm-glow giver. Example 2 reveals that in addition to unaware donors, the charity may outsource its mass solicitations to a professional if warm-glow is the sole charitable motive. It also reveals that mass solicitations are optimal for aware pure warm-glow givers if warm-glow and private good are complements, or else substitution between them is not too high so that the negative price effect is not pronounced. This is consistent with the literature on charitable motives: in general, donors are found to have both altruistic and warm-glow preferences for giving but the latter is likely to dominate in a large economy (Ribar and Wilhelm (2002); Yildirim



(2014)). More interestingly, the observation from Example 2 is also consistent with the telemarketing strategy alluded to above, in which the fundraiser promises to make donors act solely on their emotions such as “sympathy, fear, anger, guilt, etc.”. While we are unaware of any direct evidence on which charitable causes arouse such emotions, Keating et al. (2003) observe that about one-third of telemarketing campaigns in New York’s Pennies reports from 1994 to 2001 were police-related and another one-third were conducted on behalf of activist or advocacy organizations, civic clubs, groups that support the military, and illness-related associations. In a comparable study that exploited Pennsylvania data from 1991 to 1996, Greenley and Gordon (1998) find that charities in the advocacy, disease/disorder, youth development and public safety subsectors were more likely to hire paid solicitors. 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.

### *2.5.3 Improving watchdog ratings*

Our analysis suggests that a charity which is net-revenue maximizing but unequipped to run complex, large-scale campaigns hires a professional solicitor only if the professional is significantly more efficient. While net-revenue maximization is a reasonable objective,<sup>27</sup> some charities might be more concerned about their cost-to-donation ratios in order to receive better watchdog ratings and more donations as a result

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<sup>27</sup> As previously discussed in Section 3, the evidence on charities’ objectives is mixed. The net-revenue maximization is, however, often adopted in theoretical studies.

(Gordon et al. (2009); Cnaan et al. (2011); Brown et al. (2014); Yoruk (2016)). When a fundraising campaign involves a significant fixed cost due, for instance, to its planning and staff training, outsourcing may indeed help lower the ratio. To see this formally, let  $K > 0$  be the fixed cost of fundraising, which we have ignored so far. Then, the in-house ratio in Eq.(2.3) is modified to be:

$$r^{I,K} \equiv \frac{C^I + K}{G^I} = \frac{\alpha_I}{1 + \alpha_I} + \frac{K}{G^I}. \quad (2.8)$$

Under outsourcing, recall that absent the fixed cost, the professional earns a positive profit, namely  $\Pi^o > 0$ . Thus, the professional is willing to absorb the additional cost as long as  $K \leq \Pi^o$ , leaving the charity's cost-to-donation ratio under outsourcing intact:<sup>28</sup>

$$r^{o,K} \equiv s^o = \frac{\alpha_o}{1 + \alpha_o}. \quad (2.9)$$

Comparing Eqs.(2.8) and (2.9), it is evident that  $r^{o,K} < r^{I,K}$  for  $\alpha_I = \alpha_o = \alpha$ . In words, the charity will attain a lower cost-to-donation ratio under outsourcing even if the fundraiser is no more efficient solicitor than itself. The reason is evident: by shifting the fixed cost onto the fundraiser, the charity improves its cost-to-donation ratio.

## 2.6 Extensions

To further understand the market for professional fundraising, we extend our model to dynamic fundraising in which paid solicitations are considered as an investment into donor acquisition. We then examine how additional funding sources as well as heterogenous donors affect the outsourcing decision. Finally, we compare percentage and per-call based contracts – two of the most used in practice.

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<sup>28</sup> The same conclusion also holds for  $K > \Pi^o$ , though less trivially since the fundraiser's (IR) – not (IC) – constraint would bind in this case.

### 2.6.1 Professional fundraising as an investment

It is not uncommon that charities may actually 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 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  $\delta$  but, for simplicity, we assume that donors are short-sighted.<sup>29</sup>

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

$$\bar{G}^t = (1 - s + \delta + \dots + \delta^{T-1})ng. \quad (2.10)$$

Since the fundraiser is hired only in period 1, the number of solicitations again is dictated by Eq.(2.4); that is,  $n = (sg)^{\alpha_o}$ . Inserting this into Eq.(2.10) and maximizing it with respect to  $s$ , we find the optimal contract:

$$s^{o,T} = \left( \frac{1 - \delta^T}{1 - \delta} \right) \frac{\alpha_o}{1 + \alpha_o}. \quad (2.11)$$

Clearly,  $s^{o,T}$  is increasing in  $T$  and  $\delta$ . 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

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<sup>29</sup>  $\delta$  can also be interpreted as the probability of losing donors each period.

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  $\delta$ ,  $T$ , and  $\alpha_o$  as expected.

It is worth noting that investing into new donors can be a viable strategy only for large charities that have additional resources to pay for it. Our analysis predicts that it is such large charities that are also likely to promise a significantly high percentage to professional fundraisers on new campaigns. This seems consistent with the 2012 Bloomberg report in which the featured telemarketing company had several of the America's biggest charities as its clients. This is also confirmed by Greenley and Gordon (1998) who empirically found professional solicitor charities to be significantly larger than nonsolicitor charities.

### *2.6.2 Government grants and repeat donors*

Up to now, we have assumed that the single source of revenue for the charity is new donors – perhaps the charitable program itself is new. However, for an established program, the charity may also have repeat donors who cost little to solicit. Moreover, many charities receive government grants. As the following result shows, outsourced fundraising becomes less pronounced in both cases.

**Proposition 9.** *Let  $R \geq 0$  and  $n_0 \geq 0$  be the government grant and the number of repeat donors, respectively. Suppose  $f(m + R) > R$  and that donors are unaware of professional solicitations. Then, a charity with technology  $\alpha_I$  uses a professional solicitor with technology  $\alpha_o$  if and only if  $\alpha_o > \hat{\alpha}(R, n_0)$  where  $\hat{\alpha}(\cdot)$  exceeds  $\alpha_I$  and it is increasing in  $R$  and  $n_0$ .*

Proposition 6 says that the charity is less likely to outsource if it has a larger base of repeat donors and/or obtains a more generous grant. The reason is not that the marginal return of each dollar falls for the charity (as the production of the public good is linear in funds) but that with additional funds, each donor gives less,

which makes it costlier for the charity to motivate the professional fundraiser. In fact, if, contrary to our assumption, the government grant were high enough so that  $f(m + R) \leq R$ , then donors would give nothing and outsourcing would trivially be suboptimal. Combining with the previous extension, Proposition 6 suggests that the charity is less likely to outsource its solicitations for an established program with a repeat donor base but the same charity can also afford to invest aggressively into establishing a new program.

### 2.6.3 Heterogenous donors

Up to now, we have also maintained that donors are identical. Besides facilitating the analysis, this assumption appears reasonable for settings where the charity has sufficient information about donors to divide them into homogenous groups that can be assigned to different fundraisers. Here, we consider the setting where the charity lacks such information and aims to motivate the professional for solicitations among heterogenous donors.

Let  $N_\tau$  and  $n_\tau$  denote the size of group  $\tau$  and the number of solicitations by the professional from that group where  $\tau = 1, \dots, k$ . Without loss of generality, let equilibrium gifts be ordered such that  $g_1 \geq g_2 \geq \dots \geq g_k$ . It is intuitive that the professional will follow this ascending order. If he stops soliciting with group  $\tau$ , then the charity retains

$$\bar{G}_\tau = (1 - s) \left( \sum_{j=1}^{\tau-1} N_j g_j + n_\tau g_\tau \right). \quad (2.12)$$

Modifying (2.4), the optimal  $n_\tau$  is determined by:

$$\sum_{j=1}^{\tau-1} N_j + n_\tau = (s g_\tau)^{\alpha_o}. \quad (2.13)$$

Inserting (2.13) into (2.12), the percentage  $s_\tau$  maximizes

$$\bar{G}_\tau = (1 - s) \left( \sum_{j=1}^{\tau-1} N_j (g_j - g_\tau) + (s g_\tau)^{\alpha_o} g_\tau \right). \quad (2.14)$$

Note that for a homogenous population, namely  $g_j = g$ , we have  $s_\tau = \frac{\alpha_o}{1+\alpha_o}$  as in (2.6). In general,  $s_\tau$  is decreasing in  $\tau$ . Due to rising marginal cost and diminishing donations, the professional is provided with fewer incentives to solicit from one more group.<sup>30</sup> Hence, we predict that the charity whose donor base is more heterogenous is expected to offer a lower percentage to the fundraiser.

#### 2.6.4 Percentage vs. per-call contracts

Besides a percentage contract, another commonly used contract in professional fundraising is per-call based under which the professional is paid a fixed amount  $c > 0$  per solicitation. Note that a per-call contract insures the fundraiser against losses whereas a percentage contract insures the charity. This difference would, however, matter only if (1) donations admit exogenous uncertainty so losses are possible in equilibrium and (2) at least one party is risk averse. The former requirement is not satisfied in our base model: following the standard models of giving (Bergstrom et al. (1986); Andreoni (1989)), donations are perfectly predictable in equilibrium. To this end, suppose that individuals are pure warm-glow givers and from the charity and fundraiser's perspective, their gifts are uncertain; perhaps the fundraiser has limited information about donors' preferences and/or incomes. For convenience, suppose that individual gift  $g_i$  is an independent draw from a normal distribution,  $N(\mu, \sigma^2)$ , and when risk-averse, the charity and fundraiser possess CARA utilities.<sup>31</sup>

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<sup>30</sup> In order for the professional to stop soliciting with group  $\tau$ , his FOC must satisfy  $s_\tau g_{\tau+1} - \left( \sum_{j=1}^{\tau} N_j \right)^{\frac{1}{\alpha_o}} < 0$ ; in turn, the FOC for (2.14) must satisfy  $\frac{d}{ds} \bar{G}_\tau|_s = \left( \sum_{j=1}^{\tau} N_j \right)^{\frac{1}{\alpha_o}} / g_{\tau+1} < 0$ . Simplifying the latter condition we find  $g_{\tau+1}^2 < \left( \sum_{j=1}^{\tau} N_j \right)^{\frac{1}{\alpha_o}} \left( g_{\tau+1} + \frac{\sum_{j=1}^{\tau} N_j g_j}{\alpha_o \sum_{j=1}^{\tau} N_j} \right)$ .

<sup>31</sup> The CARA-Normal setting is widely used in agency problems.

**Proposition 10.** *(a) With risk-averse charity and risk-neutral fundraiser, both parties are better off under percentage based contract; (b) with risk-neutral charity and risk-averse fundraiser, both parties are better off under per-call based contract; and (c) With risk-neutral charity and risk-neutral fundraiser, percentage and per-call based contracts are payoff equivalent;*

The intuition behind Proposition 7 is familiar from principal-agent problems: a contract performs better than another to the extent that it allocates risk toward the party who can tolerate it. This is achieved by a percentage contract in part (a) since the charity is the risk-averse party, and by a per-call contract in part (b) since the fundraiser is the risk-averse. By the same logic, the equivalence is obtained in part (c).

## 2.7 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; (2) donors are purely warm-glow givers; or (3) the charity worries primarily about its watchdog rating.

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 reputational concerns. In this sense, the existing 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.<sup>32</sup> Given this, we believe that attorneys general can better serve donors by raising awareness about professional solicitations 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.<sup>33</sup> Our results also suggest that if people give purely for self-interest or 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.

In conclusion, our paper is a first attempt to address the “boundaries” of a non-profit organization: when charitable activities are undertaken in-house or outsourced. Future work should open the organizational “black-box” of a nonprofit itself so its key decisions on services and fundraising are better understood.

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<sup>32</sup> 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).

<sup>33</sup> If asked, fundraisers need to truthfully identify themselves.



## Theory of the Contractual Choices between Charities and Professional Solicitors

### 3.1 Introduction

Professional fundraising is a significant industry in the United States. Each year more than 115,000 nonprofit organizations utilize the services of fundraising staff and consultants (Kelly (1998)). Outsourced multi-state charitable fundraising campaigns active in North Carolina collected \$578,782,531 from July 01, 2011 to June, 30 2012. Of this amount only 43% actually wound up in the hands of the charities, the balance being retained by the professional fundraisers.<sup>1</sup>

The charitable organizations who employ professionals range from small, local non-profits to large household names such as the March of Dimes, the American Diabetes Association, the American Heart Association and the Leukemia and Lymphoma Society (see Pennies for Charity reports at [www.charitiesnys.com](http://www.charitiesnys.com)). Given this heterogeneity, it is easy to imagine that one type of fundraising contract may not be suitable for every charity. In fact, using data I collected on charities active

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<sup>1</sup> See the 2011-2012 Charitable Solicitation Licensing Division Annual Report at <http://www.secretary.state.nc.us/csl/download.aspx>

in North Carolina during 2011, I find that there are three types of fundraising contract widely utilized: per call, per call with a minimum guarantee and percentage based. The research questions at the heart of this paper concern the choice among these three types of contract made by charities and professional fundraisers and the concomitant welfare implications.

First, – building on Paskalev and Yildirim (2014), – I propose a theoretical model that rationalizes the contractual choices between the charities and the professionals. Both models assume that a charity retains the fundraiser as an agent offering him a share of donations as per Holmstrom (1979). In the current model, however, there is no game among donors whose contributions are assumed to be random from an outsider’s perspective. This assumption is consistent with the finding that in a large economy most giving appears to be motivated by purely “warm glow” preferences as per Andreoni (1989), while donors may also view their contributions as a source of prestige and status as per Harbaugh (1998) and Romano and Yildirim (2001). Hence donors are unlikely to adjust their contributions to the charitable cause due to altruistic motives consistent with the standard model of giving (Bergstrom et al. (1986)). In the current model I introduce liquidity constraints and offer a risk sharing explanation for the choice of contract between charities and professional fundraisers.

The paper is organized as follows. In Section 2 I introduce the theoretical model. In Section 3 I derive the model implications under the base case when the charity makes the contract offer and proposes the incentive scheme. In Section 4 I explore the case where the fundraiser is the one offering the contract. Section 5 concludes.

## 3.2 The model

The economy consists of one charity, one professional solicitor and many donors. Each donor considers giving only if solicited.<sup>2</sup> Let  $g \geq 0$  denote individual donation. I assume that  $g$  is independently and identically distributed (from an outsider's perspective) under a cumulative distribution function  $F(g)$  with mean  $\mu$  and support  $[0, \infty)$ . The professional contacts the charity in order to fundraise on its behalf. Under the base case scenario, the latter chooses the contract type as well as the incentive scheme to offer to the professional.<sup>3</sup> As mentioned earlier, the contract can be one of three types - percentage based, where the telemarketer is offered a fixed share  $s$  of donations, per call based where the telemarketer is offered a flat rate of  $c$  per conducted phone call and per call with a minimum guarantee based, under which the charity is insured against covering a potential loss from an unsuccessful campaign. Both the charity and the fundraiser have liquidity constraints of  $L_c$  and  $L_f$  respectively. Neither party can afford a loss that is greater than its respective constraint and is assumed infinitely risk averse beyond that point: if they get under, they get shut down. The fundraising technology is represented by a convex, iso-elastic cost function:<sup>4</sup>

$$C(n; \alpha; \gamma) = \gamma \frac{n^{1+1/\alpha}}{1 + 1/\alpha}, \quad (3.1)$$

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<sup>2</sup> Directly asking donors is considered one of the most powerful fundraising techniques; see Yoruk (2009), Andreoni and Rao (2011), Meer and Rosen (2011), and Edwards and List (2014) for evidence.

<sup>3</sup> As per my conversations with charity professionals who outsource fundraising, the funds from the solicitations may go to an independent caging house that redistributes the proceeds to the charity and the telemarketer or directly to a bank account in the name of the charity (as evident in some contracts) who pays the telemarketer after that. The professional never has custody over the proceeds.

<sup>4</sup> One justification for convexity is that it becomes harder to find willing donors.

where  $\alpha > 0$ ,  $\gamma > 0$  and  $n$  is the number of (successful) solicitations.<sup>5</sup> Treating  $n$  as a continuous variable, the marginal cost is  $C_n(n; \alpha; \gamma) = \gamma n^{1/\alpha}$  with subscripts referring to partial derivatives. Marginal cost is decreasing in  $\alpha$ ; so that more efficient technology corresponds to higher  $\alpha$ . Moral hazard is present given that the charity cannot contract directly on the number of solicitations  $n$ . The latter are verified ex-post.<sup>6</sup>

### 3.3 Contract Choice under Charity's Offer

Suppose that the charity is sufficiently less efficient than the fundraiser for the specific campaign and contracts out its fundraising activities. As per Paskalev and Yildirim (2015) that will be the case when the charity's own technology ( $\alpha_C$ ) is sufficiently less efficient than the fundraiser's ( $\alpha_F$ ) - i.e.  $\alpha_C \ll \alpha_F$ . I begin my analysis with the case, where, conditional on outsourcing, the liquidity constraints of both the charity and the fundraiser are greater than the costs in the worst case scenario of no contributions. Under percentage based contract the charity employs the fundraiser as an agent, offering him a fixed share  $s \in [0, 1]$  of donations. (See Section 4 for the case where the fundraiser offers the contract.) The sum of individual donations is denoted by  $\tilde{G} = \sum_i \tilde{g}_i$ . The fundraiser chooses the number of solicitations  $n$  in order to maximize his expected profit:

$$n \in \arg \max_{\hat{n}} [s\mathbb{E}[\tilde{G}] - C(\hat{n}; \alpha; \gamma)] = [s\hat{n}\mu - C(\hat{n}; \alpha; \gamma)], \quad (IC)$$

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<sup>5</sup> For simplicity, each solicitation is assumed successful in that it convinces, but doesn't pressure the donor to give. The fixed costs of fundraising are ignored in the analysis.

<sup>6</sup> The flat rate to be paid to fundraisers is usually specified in the contracts as a rate per phone call made. The number of phone calls is verifiable as the charities can receive a summary of the calls made by the telemarketers. Contracting on the number of solicitations directly is not observed in practice, a possible explanation being that the fundraiser often keeps the donor list.

where  $\mathbb{E}[\cdot]$  denotes the expectation. The professional accepts the contract only if it yields non-negative payoff in expectation:

$$\mathbb{E}[\Pi_F] = [s\hat{n}\mu - C(\hat{n}; \alpha; \gamma)] \geq 0. \quad (IR)$$

The charity chooses  $s$  in order to maximize its expected profit:

$$\mathbb{E}[\Pi_C] = \mathbb{E}[(1-s)\tilde{G}] = (1-s)n\mathbb{E}[g] = (1-s)n\mu \quad (3.2)$$

subject to the fundraiser's individual rationality (*IR*) and incentive compatibility (*IC*) constraints. The (*IR*) is trivially satisfied since he can insure himself 0 profit by soliciting no one. Hence he should receive a positive profit  $\mathbb{E}[\Pi_F] > 0$ . The first-order condition from the (*IC*) constraint shows that the fundraiser solicits till his expected marginal revenue equals his marginal cost or  $s\mu = \gamma n^{\frac{1}{\alpha}} = C_n(n; \alpha; \gamma)$ . Therefore, the fundraiser's strategy is to solicit:

$$n = \left(\frac{s\mu}{\gamma}\right)^\alpha. \quad (3.3)$$

All else equal,  $n$  is increasing in the size of the expected gift ( $\mu$ ), the fundraiser's efficiency ( $\alpha$ ) and the incentive ( $s$ ). Upon substitution into Eq.(3.2), the charity's objective becomes:

$$\max_s (1-s) \left(\frac{s\mu}{\gamma}\right)^\alpha \mu, \quad (3.4)$$

whose unique maximizer is:

$$s^* = \frac{\alpha}{1+\alpha}. \quad (3.5)$$

Hence the expected profits of the charity and the fundraiser are given by:

$$\mathbb{E}[\Pi_C] = \frac{1}{1+\alpha} \left(\frac{\alpha}{1+\alpha}\right)^\alpha \frac{\mu^{1+\alpha}}{\gamma^\alpha} \text{ and } \mathbb{E}[\Pi_F] = \frac{\alpha}{1+\alpha} \mathbb{E}[\Pi_C]. \quad (3.6)$$

Both increase with respect to the fundraiser's technology  $\alpha$  and the expected size of the equilibrium gift  $\mu$ , and decrease with respect to the cost parameter  $\gamma$ . The

optimal number of solicitations can also be pinned down from Eq.(3.3) to be:

$$n^* = \left(\frac{\alpha}{1 + \alpha} \frac{\mu}{\gamma}\right)^\alpha. \quad (3.7)$$

In the case of an unsuccessful campaign with zero donations, the fundraiser needs to have sufficient funds to cover the entire cost, which upon substitution for  $n^*$  is equal to:

$$\begin{aligned} C(n^*; \alpha; \gamma) &= \left(\frac{\alpha}{1 + \alpha}\right)^{2+\alpha} \frac{\mu^{1+\alpha}}{\gamma^\alpha} \\ &= \underline{L}_f(\alpha; \mu; \gamma). \end{aligned}$$

Hence, the fundraiser's liquidity constraint is non-binding if and only if  $L_f \geq \underline{L}_f(\alpha; \mu; \gamma)$ .

Under per call contract, the charity offers the fundraiser a flat rate  $c$  per phone call made. The fundraiser faces  $(IC)$  and  $(IR)$  constraints of the form:

$$n \in \arg \max_{\hat{n}} [\hat{n}c - C(\hat{n}; \alpha; \gamma)] \quad (IC_c)$$

$$\mathbb{E}[\Pi_F] = [\hat{n}c - C(\hat{n}; \alpha; \gamma)] \geq 0. \quad (IR_c)$$

Once again  $(IR_c)$  constraint is trivially satisfied, while the FOC from the  $(IC_c)$  constraint implies that the fundraiser will solicit till his marginal revenue  $c$  equals his marginal cost  $\gamma n^{\frac{1}{\alpha}}$ . Hence:

$$n = \left(\frac{c}{\gamma}\right)^\alpha. \quad (3.8)$$

The charity's objective function is:

$$\max_c \mathbb{E}[\tilde{G}] - nc = \max_c n(\mu - c). \quad (3.9)$$

Substituting for  $n$ , the charity's objective becomes:

$$\max_c \frac{c^\alpha}{\gamma^\alpha} \mu - \frac{c^{1+\alpha}}{\gamma^\alpha}. \quad (3.10)$$

The unique solution is:

$$c^* = \frac{\alpha}{1 + \alpha} \mu. \quad (3.11)$$

Note that in expectation, the professional is provided the same incentive as under percentage based contract, equal to a share  $s^* = \frac{\alpha}{1 + \alpha}$  of the expected equilibrium donation  $\mu$ . As a result the number of solicitations, the charity's and the fundraiser's profits are identical to the ones under percentage based contract. The only difference is that the professional receives a certain amount and is guaranteed to cover his cost and insure his profit. The charity, however, absorbs the entire risk and needs to be able to pay for the phone calls. To do that it needs to have access to cash of at least:

$$\begin{aligned} n^* c &= \left( \frac{\alpha}{1 + \alpha} \right)^{1 + \alpha} \frac{\mu^{1 + \alpha}}{\gamma^\alpha} \\ &= \underline{L}_c(\alpha; \mu; \gamma). \end{aligned}$$

Hence the charity's liquidity constraint is non-binding if and only if  $L_c \geq \underline{L}_c(\alpha; \mu; \gamma)$ .

The difference between the above scenario and one under per call with a minimum guarantee based contract lies in the fact that under the latter, the charity is not liable to pay the fundraiser more than the gross amount raised in a campaign. As a result the charity cannot incur a loss. The fundraiser is the one who bears the risk and faces an identical worst case scenario as the one under percentage based contract. To do that, he needs to have sufficient cash access to cover the solicitation cost  $\underline{L}_f(\alpha; \mu; \gamma)$ . If liquidity is a non-issue the expected profits of the charity and the professional are the same as under the other two contract types. The following proposition summarizes this observation.

**Proposition 11.** *Suppose that liquidity constraints are non-binding for both the charity and the fundraiser, i.e.  $L_c \geq \underline{L}_c(\alpha; \mu; \gamma)$  and  $L_f \geq \underline{L}_f(\alpha; \mu; \gamma)$ . Then all three contract types: percentage, per call and per call with a minimum guarantee are*

equivalent for both the charity and the fundraiser in terms of expected profit and the number of solicitations.

Proposition 1 is intuitive given that the incentive under all three contract types is equivalent ex-ante and both parties are risk neutral when unconstrained by the lack of liquidity. It is important to note that the profit function of the charity is single-peaked with respect to the incentive provided (the share  $s$  or the per call rate  $c$ ). Moreover, the number of solicitations (and the overall solicitation cost as a result) is strictly increasing in the latter. It follows that both the profit of the charity and the costs grow with the number of solicitations  $n$ , when those are less than the optimal number  $n^*$ .

I proceed with the cases where at least one party is liquidity constrained. Under percentage and per call with a minimum guarantee based contracts, the professional bears the risk and needs to be able to cover the entire solicitation cost. Therefore, if his access to cash  $L_f$  is less than  $\underline{L}_f(\alpha; \mu; \gamma)$ , the charity will offer him the steepest possible incentive until his cash constraint binds; that is:

$$C(n; \alpha; \gamma) = L_f. \quad (3.12)$$

From Eq.(3.12) it follows that  $n = \left(\frac{1+\alpha}{\gamma} L_f\right)^{\frac{\alpha}{1+\alpha}}$ ,  $s = \frac{(\frac{1+\alpha}{\alpha} L_f)^{\frac{1}{1+\alpha}} \gamma^{\frac{\alpha}{1+\alpha}}}{\mu}$  and  $c = \left(\frac{1+\alpha}{\alpha} L_f\right)^{\frac{1}{1+\alpha}} \gamma^{\frac{\alpha}{1+\alpha}}$  from Eq.(3.3) and Eq.(3.8) respectively. The incentives under both contract types are once again the same, i.e.  $s\mu = c$ . This is intuitive given that the charity induces the same  $n$  under the binding liquidity constraint. The respective expected profits of the charity and the fundraiser become:

$$\mathbb{E}[\Pi_C] = \mu \left(\frac{1+\alpha}{\gamma} L_f\right)^{\frac{\alpha}{1+\alpha}} - \left(\frac{1+\alpha}{\alpha}\right) L_f \text{ and } \mathbb{E}[\Pi_F] = \frac{L_f}{\alpha}. \quad (3.13)$$

The case under per call contract is similar. Now, however, the charity is obliged to pay the telemarketer irregardless of campaign results. As a result if it doesn't



have sufficient access to cash to cover  $\underline{L}_c(\alpha; \mu; \gamma)$ , it will induce the highest possible number of solicitations, resulting in:

$$\frac{1 + \alpha}{\alpha} C(n; \alpha; \gamma) = L_c \Rightarrow C(n; \alpha; \gamma) = \frac{\alpha}{1 + \alpha} L_c. \quad (3.14)$$

A direct comparison between Eq.(3.12) and Eq.(3.14) reveals that when the charity bears the risk, it needs relatively more cash than the fundraiser in order to be able to cover the same campaign costs. This is because the professional incurs the solicitation costs directly, while the charity pays for both the telemarketer's profit and the solicitation costs. Under this scenario  $n = (\frac{L_c}{\gamma})^{\frac{\alpha}{1+\alpha}}$  and  $c = \gamma^{\frac{\alpha}{1+\alpha}} L_c^{\frac{1}{1+\alpha}}$ . The charity's and the fundraiser's profits are respectively:

$$\mathbb{E}[\Pi_C] = \mu \left( \frac{L_c}{\gamma} \right)^{\frac{\alpha}{1+\alpha}} - L_c \text{ and } \Pi_F = \frac{L_c}{1 + \alpha}. \quad (3.15)$$

A direct observation shows that if we substitute  $\frac{1+\alpha}{\alpha} L_f$  with  $L_c$  in Eq.(3.13), both the charity's and the telemarketer's profits become identical to the ones under Eq.(3.15). It is not surprising given that under per call contract the charity needs  $\frac{1+\alpha}{\alpha}$  more cash than the professional does under percentage/per call with a minimum guarantee based contracts, in order to induce the same number of solicitations. Remembering that the charity's profit is strictly increasing in  $n$  for  $n < n^*$ , the following proposition follows:

**Proposition 12.** *Suppose that both the charity and the fundraiser are liquidity constrained, i.e.  $L_c < \underline{L}_c(\alpha, \mu, \gamma)$  and  $L_f < \underline{L}_f(\alpha, \mu, \gamma)$ . If  $(\frac{1+\alpha}{\alpha})L_f < L_c$  then both the charity and the fundraiser are better off under per call contract than under percentage or per call with minimum guarantee based contracts. If  $(\frac{1+\alpha}{\alpha})L_f > L_c$  then the opposite is true with the charity and the fundraiser being indifferent between percentage and per call with a minimum guarantee based contracts.*

Proposition 2 shows that the implemented contract type, when both the charity and the fundraiser are liquidity constrained, will be the one that will lead to a higher solicitation effort. In the same line of thought it follows that, when only one party faces a binding liquidity constraint, the other one will bear the risk, resulting in the optimal number of solicitations  $n^*$ . The next proposition summarizes this implication:

**Proposition 13.** *Suppose that the charity has sufficient access to cash, i.e.  $L_c \geq \underline{L}_c(\alpha, \mu, \gamma)$ , but the fundraiser is liquidity constrained  $L_f < \underline{L}_f(\alpha, \mu, \gamma)$ . Then both the charity and the fundraiser are better off under per call based contract versus percentage or per call with a minimum guarantee based contracts. If, however,  $L_c < \underline{L}_c(\alpha, \mu, \gamma)$ , while  $L_f \geq \underline{L}_f(\alpha, \mu, \gamma)$ , then the opposite is true: the charity and the fundraiser being better off under percentage and per call with a minimum guarantee based contracts versus per call contract.*

The results from Proposition 1-3 are intuitive given that the charity cannot do better under binding than under non-binding liquidity constraints. As a result, it will always choose the contract type that induces the highest number of solicitations. The model suggests that all else equal, the more cash constrained the charity is, the more likely it is to outsource on a percentage/ per call with a minimum guarantee basis. Moreover, under per call contract the provided incentive and the expected profits of both parties will be increasing in the charity's access to cash. Under percentage/per call with a minimum guarantee based contracts the incentive and the expected profits will increase with the telemarketer's access to cash. The next proposition formally states those results:

**Proposition 14.** *Under per call based contract when  $L_c < \underline{L}_c(\alpha, \mu, \gamma)$ , the expected share retained by the charity is decreasing in  $L_c$ , while the expected gross amount raised and the expected profits for both the charity and the fundraiser are increasing*

in  $L_c$ . Under percentage and per call with a minimum guarantee based contracts when  $L_f < \underline{L}_f(\alpha, \mu, \gamma)$ , the expected share retained by the charity is decreasing in  $L_f$ , while the expected gross amount raised and the expected profits of both the charity and the fundraiser are increasing in  $L_f$ .

**Proof:** Let the charity contract on a per call basis and  $L_c < \underline{L}_c(\alpha, \mu, \gamma)$ . Then the expected share retained by the charity is equal to:

$$\mathbb{E}[(1 - s)] = \mathbb{E}\left[\frac{\Pi_C}{G}\right] = \mathbb{E}\left[\frac{ng - nc}{ng}\right] = \mathbb{E}\left[1 - \frac{c}{g}\right] = 1 - c\mathbb{E}\left[\frac{1}{g}\right] = 1 - \mathbb{E}\left[\frac{1}{g}\right]\gamma^{\frac{\alpha}{1+\alpha}}L_c^{\frac{1}{1+\alpha}}$$

The first derivative is equal to:

$$\frac{\partial \mathbb{E}[(1 - s)]}{\partial L_c} = -\mathbb{E}\left[\frac{1}{g}\right]\frac{1}{1 + \alpha}\left(\frac{\gamma}{L_c}\right)^{\frac{\alpha}{1+\alpha}} < 0.$$

Hence the expected share retained by the charity is decreasing in  $L_c$ .

$$\begin{aligned}\frac{\partial \mathbb{E}[\Pi_C]}{\partial L_c} &= \frac{\alpha\mu}{(1 + \alpha)}\frac{1}{L_c^{\frac{1}{1+\alpha}}\gamma^{\frac{\alpha}{1+\alpha}}} - 1 > \frac{\alpha\mu}{(1 + \alpha)}\frac{1}{\underline{L}_c(\alpha, \mu, \gamma)^{\frac{1}{1+\alpha}}\gamma^{\frac{\alpha}{1+\alpha}}} - 1 = 0 \\ \frac{\partial \Pi_F}{\partial L_c} &= \frac{1}{1 + \alpha} > 0\end{aligned}$$

As a result both the expected profit of the charity and the profit of the fundraiser are increasing in the charity's access to cash under a per call contract. Given that the expected gross amount raised ( $\mathbb{E}[\tilde{G}] = n\mu$ ) is strictly increasing in  $n$  and  $n$  increases with  $L_c$ , the expected gross amount raised also increases with  $L_c$ .

A similar calculation shows that under percentage and per call with a minimum guarantee based contracts the share and the expected share respectively, retained by the charity, are decreasing in  $L_f$ , while  $\mathbb{E}[\tilde{G}]$ ,  $\mathbb{E}[\Pi_C]$  and  $\mathbb{E}[\Pi_F]$  are increasing. ■

### 3.4 Contract Choice under Fundraiser's Offer

In practice it is not clear from the data whether the charity or the fundraiser is the one who makes the offer of the contract and/or chooses the incentive. Therefore, I complement my previous analysis with the case where the fundraiser picks the contract type. In this section, I show that the qualitative implications carry through. Most importantly the rule for choosing the preferred contract type remains the same. The thresholds, beyond which the liquidity constraints won't bind, however, are higher. Moreover, both the incentive and the gross amount raised per campaign increase with the charity's or the fundraiser's access to cash (depending on the implemented contract type). I begin by formulating the fundraiser's problem under percentage based contract. In that case, the professional chooses both the share  $s$  and the number of solicitations  $n$ , so that he solves:

$$\max_{s,n} s\mathbb{E}[\tilde{G}] - C(n; \alpha; \gamma). \quad (3.16)$$

Subject to the charity's (*IR*) constraint:

$$\Pi_C = (1 - s)\mathbb{E}[\tilde{G}] = (1 - s)n\mu \geq \Pi_O, \quad (IR)$$

where  $\Pi_O$  is the charity's outside option. For a given  $s$ , the fundraiser's first order condition reduces to  $s\mu = \gamma n^{\frac{1}{\alpha}}$ . Substituting for  $n$ , the fundraiser's problem becomes:

$$\max_s \frac{1}{1 + \alpha} \frac{(s\mu)^{1+\alpha}}{\gamma^\alpha}. \quad (3.17)$$

$$\text{Subject to: } (1 - s) \frac{s^\alpha}{\gamma^\alpha} \mu^{1+\alpha} \geq \Pi_O. \quad (IR)$$

The objective function is increasing in  $s$ . Therefore the fundraiser will contract on as high a share as possible until the charity's profit is reduced to its outside option  $\Pi_O$ . Under per call and per call with a minimum guarantee based contracts the fundraiser's problem is the following:

$$\max_{c,n} cn - C(n; \alpha; \gamma). \quad (3.18)$$

Subject to the charity's (*IR*) constraint:

$$\Pi_C = \mathbb{E}[\tilde{G}] - nc = n(\mu - c) \geq \Pi_O. \quad (IR_c)$$

For a given  $c$  the fundraiser's FOC is  $(\frac{c}{\gamma})^\alpha = n$ . Substituting for  $n$ , the objective function becomes:

$$\max_c \frac{1}{1 + \alpha} \frac{c^{1+\alpha}}{\gamma^\alpha}. \quad (3.19)$$

Subject to:

$$\left(\frac{c}{\gamma}\right)^\alpha (\mu - c) \geq \Pi_O. \quad (IR_c)$$

Given that  $c \leq \mu$ , choosing the per call rate  $c$  is equivalent to choosing a share  $s \in [0, 1]$  times the expected equilibrium donation  $\mu$ . Upon substitution of  $s\mu$  for  $c$  in Eq.(3.19) and the charity's (*IR<sub>c</sub>*) constraint, it is straightforward to verify that the problem of the fundraiser is identical to the one under percentage based contract. Therefore, when there are no liquidity considerations, the fundraiser will be indifferent between the three contract choices (per call and per call with minimum guarantee are the same ex-ante in such a case). He will request the highest possible incentive that reduces the charity's payoff to its outside option  $\Pi_O$ . Since the charity's profit function is single-peaked with respect to the implemented incentive (the fixed percentage  $s$  or the per call rate  $c$ ) and  $\Pi_O$  is less than the optimal unrestricted payoff from Section 3, it follows that the incentive will be higher under fundraiser's offer. Moreover, the number of solicitations and the incurred costs will also be greater as a result. Therefore, the thresholds, beyond which the liquidity constraints will no longer bind, will also be higher. I will denote the latter by  $L_c(\Pi_O)$  and  $L_f(\Pi_O)$  respectively as their magnitude depends on the charity's outside option. Denoting

by  $n^*$ , the maximal number of solicitations when  $(IR)$  and  $(IR_c)$  are binding, it is straightforward to verify that:

$$\frac{1+\alpha}{\alpha}C(n^*; \alpha; \gamma) = L_c(\Pi_O) \text{ and } C(n^*; \alpha; \gamma) = L_f(\Pi_O).$$

Provided one or both party's liquidity constraints bind, the fundraiser will choose the contract that provides him with the highest possible incentive. Given that the incentives under all three contract types are equivalent ex-ante, this will also be the contract that leads to the highest number of solicitations.

Under per call contract the charity needs to pay an amount equal to  $nc$  to the professional. Substituting for  $c = \gamma n^{\frac{1}{\alpha}}$ , the charity needs sufficient access to cash to cover  $\frac{1+\alpha}{\alpha}C(n; \alpha; \gamma)$ . Hence, if the charity's liquidity constraint binds:

$$\frac{1+\alpha}{\alpha}C(n; \alpha; \gamma) = L_c \Rightarrow C(n; \alpha; \gamma) = \frac{\alpha}{1+\alpha}L_c. \quad (3.20)$$

Under percentage and per call with a minimum based contracts the telemarketer needs to pay for the solicitation costs. Therefore, if his liquidity constraint binds:

$$C(n; \alpha; \gamma) = L_f. \quad (3.21)$$

When both the charity's and the fundraiser's liquidity constraints bind, the professional will choose the contract type, under which he will receive a higher incentive and solicit more as a result. Once again, as in Section 3, the charity needs  $\frac{1+\alpha}{\alpha}$  times more cash than the professional to cover the same cost, being obliged to pay for his profit as well. Hence, the following proposition follows:

**Proposition 15.** *Suppose that both the charity and the fundraiser are liquidity constrained so that  $L_c < \underline{L}_c(\Pi_O)$  and  $L_f < \underline{L}_f(\Pi_O)$  for some access to cash  $L_c$  and  $L_f$  respectively. If  $(\frac{1+\alpha}{\alpha})L_f < L_c$  the fundraiser will offer per call contract. If  $(\frac{1+\alpha}{\alpha})L_f > L_c$  the fundraiser will offer percentage or per call with a minimum guarantee based contract.*

If only one counterparty has insufficient access to cash, the fundraiser will choose the contract type, under which there are no liquidity considerations. Therefore, the rule for choosing the implemented contract is the same as in Section 3. Once again, the incentive, and as a result the gross amount raised  $n\mu$ , will be increasing in the charity's or the professional's access to cash (contract dependent). The relationship between the net amount raised and the access to cash, however, differs. In fact, under fundraiser's offer when there is sufficient access to cash, the charity's profit will be at its lowest ( $\Pi_O$ ) rather than its highest. In view of the model implications from Sections 3 and 4, in my future work I plan to test the following hypotheses:

**Hypothesis 1:** Less liquidity constrained charities are more likely to outsource on a per call basis.

**Hypothesis 2:** Under per call contract, less liquidity constrained charities get smaller yield from outsourcing. The yield eventually plateaus.

**Hypothesis 3:** Under per call contract, less liquidity constrained charities raise more in gross terms per outsourced campaign. The amount eventually plateaus.

**Hypothesis 4:** Under per call contract, less liquidity constrained charities net more per outsourced campaign. The amount eventually plateaus.

### 3.5 Conclusion

In this paper I introduce a model that rationalizes the contractual choices between charities and paid solicitors. I show that the three contractual schemes: per call, per call with a minimum guarantee and percentage, are virtually identical when both the non-profit and the fundraiser have no liquidity considerations. When either or both parties faces a binding liquidity constraint the contractual choice comes down to choosing between per call and percentage/per call with a minimum guarantee based contracts. The latter two can be grouped in one category as there is no difference between those in terms of expected profit for both the charity and the fundraiser. It

turns out that if the fundraiser is relatively more liquidity constrained, the charity bears all the risk and per call contract is implemented. When the opposite holds true, the fundraiser bears the risk and percentage/ per call with a minimum guarantee based contract is implemented. Moreover, a less liquidity constrained charity can afford to offer a steeper incentive to the professional and as a result expects to raise a higher amount in both net and gross terms.



## Empirical Tests on the Contractual Choices between Charities and Professional Solicitors

### 4.1 Introduction

In this chapter I test the implications of the theory I presented in Chapter 3 using a unique dataset that I collected from the North Carolina Secretary of State website. The empirical findings are consistent with the risk-sharing explanation for the contractual choice between charities and professionals that I hypothesize. Small, cash-constrained charities are more likely to insure themselves against potential losses and hence outsource on a percentage/ per call with a minimum guarantee bases.<sup>1</sup> I further test how those charities fare versus their larger counterparts. The data confirms the model's implications that smaller, liquidity constrained charities cannot afford to offer higher powered incentives to the professional solicitors and raise fewer funds as a result. That in turn suggests the question of who gets a higher share of their overall contributions from outsourcing. Therefore, I perform further empirical

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<sup>1</sup> Under percentage based contract the charity is assured a percentage of the gross receipts, while under per call with a minimum guarantee based contract the charity is not liable to pay for losses in case campaign receipts are less than campaign costs.

analysis and find that it is the small charities who are more reliant on funds raised from outsourced campaigns.

The paper is organized as follows. In Section 2 I describe the data. In Section 3 I propose the empirical specifications to be tested. In Section 4 I discuss the results. Section 5 concludes.

## 4.2 The Data

In order to test the predictions of the model and its implications for the charitable sector as a whole I collected a unique dataset from the North Carolina Secretary of State website.<sup>2</sup> The dataset consists of all the nationwide campaigns that included citizens of North Carolina that were done on behalf of charitable organizations by professional fundraisers for the 2011 calendar year. For each campaign I recorded the gross amount raised, the net amount received by the charity and the type of the campaign. The campaigns ranged from telemarketing campaigns to mail solicitations, door-to-door campaigns, internet solicitations, entertainment events, sale of products and other. There were 534 outsourced campaigns including North Carolina State citizens altogether with contract data available for 521. The campaigns including telemarketing, which will be the primary focus of this paper, constituted approximately 80% of the latter or 385 out of 521.

In order to supplement my analysis I also used a dataset from the Urban Institute for IRS 501(c) organizations that contains data with basic information, classification and financial information for those organizations. 501(c) organizations are tax-exempt non-profit organizations in the United States. The major part of those fall under 501(c)(3) categorization that includes organizations with religious, charitable, educational, scientific, public safety testing, prevention of cruelty to children or animals and amateur sports competition fostering purposes. Data is not available

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<sup>2</sup> <http://www.secretary.state.nc.us/search/index/csl>

for organizations that have had less than 25000 USD of gross receipts for 2011. To proceed with my analysis I merged the two datasets by the tax identification number of the 501(c) organizations. Upon disregarding the campaigns that could not be matched or didn't include telemarketing services, data was available for 273 campaigns. From those 45 contracts were percentage based, 180 were per call based, 36 were per call based with a minimum guarantee and 12 were classified as other. The contracts classified as other used a different form of compensation and are ignored in my analysis - hence I am left with a sample of 261 campaigns done on behalf of 180 charities. Each non-profit organization fell into one of 22 broad categories as classified by the National Center for Charitable Statistics.<sup>3</sup> The other variables of interest for the non-profits are the total assets as well as the total revenues for 2011. For the summary statistics please refer to Table 4.1. It is interesting to note that

Table 4.1: Summary Statistics

	Mean	Standard Deviation	25th percentile	Median	75th percentile
Gross Amount per Campaign	\$941,970	\$3,101,372	\$47,105	\$174,122	\$701,077
Net Amount per Campaign	\$478,263	\$2,835,686	\$2,170	\$38,426	\$178,839
Total Revenues (2011)	\$96.2 <i>mil.</i>	\$200 <i>mil.</i>	\$7 <i>mil.</i>	\$24.9 <i>mil.</i>	\$97.1 <i>mil.</i>
Total Assets (2011)	\$137.6 <i>mil.</i>	\$501 <i>mil.</i>	\$2.49 <i>mil.</i>	\$18.2 <i>mil.</i>	\$116.4 <i>mil.</i>

for many charities total revenues are higher than their size (total assets) as both the 25th percentile and the median for the former variable are bigger than those for the latter one. This observation suggests that those charities are indeed donation

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<sup>3</sup> The 22 categories are: Arts, Culture and Humanities, Education, Environment, Animal-Related, Health Care, Mental Health and Crisis Intervention, Diseases, Disorders and Medical Disciplines, Medical Research, Crime and Legal-Related, Food, Agriculture and Nutrition, Housing and Shelter, Public Safety, Disaster Preparedness and Relief, Recreation and Sports, Youth Development, Human Services, International, Foreign Affairs and National Security, Civil Rights, Social Action and Advocacy, Philanthropy, Voluntarism and Grantmaking Foundations, Science and Technology, Social Science, Public and Societal Benefit, Religion-Related.

dependent and cannot afford to loose on their programs. In lieu of that fact it is noteworthy that approximately 21% or 57 out of the 273 outsourced telemarketing campaigns resulted in an actual loss for the respective charities, turning out to be a liability rather than an asset.

### 4.3 Empirical Specifications

As mentioned in Chapter 3, the theoretical model suggests the following hypothesis:

**Hypothesis 1:** Less liquidity constrained charities are more likely to outsource on a per call basis.

**Hypothesis 2:** Under per call contract, less liquidity constrained charities get smaller yield from outsourcing. The yield eventually plateaus.

**Hypothesis 3:** Under per call contract, less liquidity constrained charities raise more in gross terms per outsourced campaign. The amount eventually plateaus.

**Hypothesis 4:** Under per call contract, less liquidity constrained charities net more per outsourced campaign. The amount eventually plateaus.

All else equal, the more cash constrained a charity is, the more likely it is to outsource on a percentage/per call with a minimum guarantee basis. However, as a charity becomes sufficiently big in terms of its total assets, it will no longer have any liquidity considerations and will simply contract with the most efficient fundraiser available in order to raise as much as possible. At the same time a charity that faces stringent liquidity considerations, will almost certainly outsource on a percentage/per call with a minimum guarantee basis with a sufficiently big fundraiser. Therefore, I expect the probability of outsourcing on a per call basis to initially increase steeply with the charity size and to plateau eventually as the charity gets sufficiently large (Hypothesis 1). In order to test the implication of the model in the data, I use

the following Probit specification:

$$Prob(Per\_Call_i = 1|Outsrc.) = \Phi(\beta_0 + \beta_1 Size_i + \beta_2 Size_i^2 + \beta_3 Size_i^3 + \beta_4 Mail_i + \sum_{j=2}^{22} \sigma_j T_{ij} + u_i).$$

$Per\_Call_i$  is a dummy for the contract type used in campaign  $i$ .  $Per\_Call_i$  is 1 if per call contract is used and 0 if percentage or per call with a minimum guarantee contract is used as the latter two are equivalent for both the charity and the fundraiser in lieu of my model.  $Size_i$  is the total assets of the charity (in millions) conducting campaign  $i$  at the end of 2010 and  $T_{ij}$  is a dummy variable indicating that the charity conducting campaign  $i$  is of type  $j$ .  $Mail_i$  is a dummy equal to 1 if the campaign used direct mail solicitation as well. In the following analysis as per Bernanke et al. (1994) and Chevalier and Scharfstein (1995) I will use total assets as a proxy for the charities' liquidity constraints given that the bigger the charity is the more access to cash it has.

As per Hypothesis 2, the next testable implication of the model is that - all else equal - the expected share retained by the charity is decreasing in its liquidity constraint under per call contract. This is a direct consequence of Proposition 4 under charity's offer. The result as highlighted in Section 4 holds even if the fundraiser makes the offer. Moreover, younger charities may view the outsourcing as an investment in new donors and offer the fundraiser an even greater incentive, retaining very small share of the campaign proceeds as a result. Hence, I estimate the following model:

$$Yield_i = \zeta_0 + \zeta_1 Size_i + \zeta_2 Age + \zeta_3 Mail_i + \sum_{j=2}^{20} v_j T_{ij} + \sum_{s=2}^{21} \nu_s Sol_{is} + \epsilon_i,$$

where  $Yield_i$  is the percentage of funds received by the charity in campaign  $i$ ,  $Age_i$  is the age of the charity in years and  $Sol_{is}$  is a dummy equal to 1 if solicitor  $s$  is

conducting campaign  $i$ . The remaining variables are as defined in the previous model specification.<sup>4</sup>

Next, I propose the following regression in order to test Hypothesis 3 that the gross amount raised per campaign is increasing in the charity's access to cash:

$$G_i = \rho_0 + \rho_1 Size_i + \rho_2 Size_i^2 + \rho_3 Size_i^3 + \rho_4 Mail_i + \sum_{j=2}^{20} \delta_j T_{ij} + \sum_{s=2}^{21} \omega_s Sol_{is} + \epsilon_i,$$

where  $G_i$  stands for gross amount raised in campaign  $i$ . The control for the charity type is included in order to account for the fact that different charity types may have different expected donations ( $\mu$ ), while the control for the fundraiser absorbs the heterogeneity in the technology parameter ( $\alpha$ ). I use a cubic specification with respect to the charity's size since I expect the gross amount raised to eventually flatten up when the charity is sufficiently large.

The fourth important question that arises with respect to my analysis is whether liquidity constrained charities are indeed likely to net less on average (this implication is only relevant for the base case when the charity makes the offer). As per Hypothesis 4, the model suggests that this should be the case when the charities' liquidity constraints are binding under per call contract. As liquidity considerations become a non-issue I expect net revenues to plateau. Therefore, I test the following specification:

$$\bar{G}_i = \theta_0 + \theta_1 Size_i + \theta_2 Size_i^2 + \theta_3 Size_i^3 + \theta_4 Mail_i + \sum_{j=2}^{20} \kappa_j T_{ij} + \sum_{s=2}^{21} \phi_s Sol_{is} + \epsilon_i,$$

where  $\bar{G}_i$  is the net amount raised in campaign  $i$ . I once again include controls for charity type and fundraiser.

The last important question that I address is whether liquidity constrained char-

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<sup>4</sup> I also tested a cubic specification in  $Size$  to account for the fact that the yield may plateau, however, despite the fact that the coefficients do have the expected signs, the magnitudes are statistically insignificant.

ities do need the money from outsourcing more. In order to test that, I propose the following model:

$$\frac{OR_i}{TR_i} = a_0 + a_1 \log(Size_i) + \sum_{j=2}^{22} b_j \bar{T}_{ij} + \epsilon_i,$$

where  $OR_i$  stands for net proceeds from outsourcing for charity  $i$ ,  $TR_i$  denotes the total revenues for charity  $i$  and  $\bar{T}_{ij}$  is a dummy indicating whether or not charity  $i$  is of type  $j$ . Unfortunately, due to data restrictions I cannot account for fundraising expenses and overheads. Those, if anything, are more likely to constitute a higher percentage of total revenues for smaller charities that don't have large donor bases on their own and face no economies of scale. Therefore, I expect that, provided there is a positive difference between the ratios of net proceeds from outsourcing to total revenues for small, liquidity constrained charities versus their larger counterparts, this difference will understate the difference between the two groups with respect to the ratio of net proceeds from outsourcing to total net revenues.

#### 4.4 Results

The results I obtain upon estimating the first specification are presented in Table 4.2. The coefficients of  $Size$  and  $Size^3$  are highly significant and positive, while the coefficient of  $Size^2$  is significant and negative. The results are in line with the model implications that the larger the charity, i.e. the less liquidity constrained it is, the more likely it is to outsource on a per call basis with the probability eventually plateauing up. The coefficient on  $Mail$  is also positive and significant indicating that charities prefer to contract on a per call basis when their campaigns are to include mailings. For the sake of brevity the coefficients on the charity type dummies have been omitted from the table. It is worth noting, however, that five of those organization types perfectly predict the contract type and 24 observations have been

Table 4.2: Contract Choice

Obs.	=	237
Wald Chi2(20)	=	74.66
Prob > Chi2	=	0.0000
Pseudo R2	=	0.3696

CT	Coef.	Robust SE	z	P>  z
Size	.0428***	(.0143)	2.99	0.003
Size <sup>2</sup>	-.0004**	(.00018)	-2.31	0.021
Size <sup>3</sup>	$1.28e^{-06}$ **	( $6.25e^{-07}$ )	2.05	0.041
Mail	.551***	(.21)	2.62	0.009
cons	.1904	(.7178)	0.27	0.791

omitted from my analysis as a result.

Next, I proceed with testing Hypothesis 2. The estimated coefficients are presented in Table 4.3. The coefficient on *Size* is negative and significant indicating that

Table 4.3: Retained Share

Obs.	=	180
F(35, 137)	=	-
Prob > F	=	-
R-squared	=	0.3909
Root MSE	=	1.5795

<i>Yield</i>	Coef.	Robust SE	t	P>  t
Size	-.00014*	(.000071)	-1.96	0.052
Age	.0084	(.0052)	1.61	0.11
Mail	-.6927	(.5644)	-1.23	0.222
cons	-1.295***	(.3741)	-3.46	0.001

larger charities retain a lower share of donations. This is consistent with the model implications under both cases of the charity and the fundraiser offering the contract. The coefficient on *Age* although insignificant has the expected sign as younger charities may want to further incentivize the professional in order to acquire new



donors. *Mail* has no bearing with respect to the yield. The charity type dummies are insignificant, while the solicitor dummies are highly statistically significant.

Hypothesis 3 states that larger charities expect to raise more gross donations on average. The empirical results that follow strongly support that implication as seen in Table 4.4. The coefficients of *Size* and *Size*<sup>3</sup> are significant and positive, while

Table 4.4: Gross Amount Raised

Obs.	=	180
F(36, 136)	=	–
Prob > F	=	–
R-squared	=	0.3493
Root MSE	=	3.3e <sup>+06</sup>

<i>G</i>	Coef.	Robust SE	t	P >  t
Size	4833.066***	(1853.1)	2.61	0.010
Size <sup>2</sup>	–2.2951**	(.9763)	–2.35	0.020
Size <sup>3</sup>	.00026**	(.00011)	2.22	0.028
Mail	617075	(886460)	0.70	0.488
cons	–1244529**	(500060)	–2.49	0.014

the coefficient of *Size*<sup>2</sup> is negative indicating that the gross amount raised is indeed increasing with respect to the charity’s access to cash and eventually plateaus as liquidity becomes a non-issue. Direct mail has no bearing on the total amount raised. The dummies for both the charity types and the solicitors are highly significant. That is not surprising given that solicitors differ in terms of efficiency ( $\alpha$ ), while charity types differ with respect to expected donations ( $\mu$ ). Both  $\alpha$  and  $\mu$  are determinants of the net amount raised in view of my model.

Hypothesis 4 suggests that larger charities also expect to net more per outsourced campaign. The empirical results confirm the model’s implication as per Table 4.5. The coefficients of *Size* is positive and significant, the coefficient of *Size*<sup>3</sup> is positive and borderline insignificant, while the coefficient of *Size*<sup>2</sup> is negative and significant indicating that the charity’s net revenues are indeed increasing in the charity’s size

Table 4.5: Net Amount Raised

Obs.	=	180
F(35, 137)	=	–
Prob > F	=	–
R-squared	=	0.2094
Root MSE	=	$3.4e^{+06}$

$\bar{G}$	Coef.	Robust SE	t	P >  t
Size	3264.066**	(1611.895)	2.02	0.045
Size <sup>2</sup>	–1.5805*	(0.9022)	–1.75	0.082
Size <sup>3</sup>	.00017	(.00011)	1.58	0.117
Mail	471070	(716075)	0.66	0.512
cons	–1009543**	(390566)	–2.58	0.011

and eventually flatten up when the latter becomes big enough. The coefficient on *Mail* is insignificant indicating that there is no direct association between the net amount raised and the use of additional mail-solicitation. The charity type and solicitor dummies are once again highly statistically significant.

The above analysis suggests that larger charities are able to offer higher incentive to the professional and expect to raise more in absolute terms. A natural question that arises is whether it is the large or small charities who are relatively more dependent on the outsourced campaigns. In order to answer that question I create a new variable that is the ratio of the net amount raised from outsourcing for charity  $i$  over the total revenues of the non-profit (overheads data is unfortunately not available). The results I obtain upon estimating the mode are summarized in Table 4.6. The coefficient of  $\log(Size)$  is negative and significant indicating that all else equal the fraction of total revenues received from outsourcing is higher for the charities that are liquidity constrained. The magnitude of  $-.0034$  per 100% increase in size is highly significant in economic terms given that the average ratio for a charity is equal to  $.021$  and the median is even lower at  $.0027$ . Therefore the funds received from outsourcing will be more important for a charity that is perfectly cash constrained

Table 4.6: Ratio of Outsourcing to Total Revenue

Obs.	=	176
F(19,153)	=	—
Prob > F	=	—
R-squared	=	0.2567
Root MSE	=	0.0487

$\frac{OR}{TR}$	Coef.	Robust SE	z	P>  z
log(Size)	−0.0034***	(.0012)	−2.77	0.006
cons	.0173***	(.0058)	2.99	0.003

versus a charity that has no liquidity limitations. Moreover, as mentioned earlier, that ratio is likely to understate the actual difference between the ratios of the net amount raised from outsourcing over the total net revenues received by the charities.

#### 4.5 Conclusion

In this paper I test my theoretical model implications for the contractual choices and campaign results between charities and professional solicitors. The data confirms my model results, suggesting that the larger the charity in terms of its size, i.e. the less liquidity concerns it has, the more likely it is to outsource on a per call basis. Moreover, I find out that conditional on outsourcing under per call basis, larger, less liquidity constrained charities, are able to provide the fundraiser with a more powered incentive and raise more as a result (both in terms of gross and net amount). Unfortunately, the smaller cash constrained charities not only raise less, but the funds from outsourcing contribute a higher share to their total revenues. Therefore, they are relatively more reliant on outsourcing campaigns in order to serve their missions.

# Appendix A

## Appendix to Chapter 2

**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  $\bar{G} > 0$ , or equivalently  $G - C > 0$ . 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, i.e.,  $\bar{G} = 0$ . 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 consider a solicited donor’s problem. Conjecturing  $n$ , its cost  $C$ , and others’ total contribution  $G_{-i}$ , donor  $i$  solves

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

By definition,  $g_i = (G - C) - (G_{-i} - C)$ , or equivalently  $g_i = \bar{G} - \bar{G}_{-i}$  where  $\bar{G} \equiv G - C$

and  $\bar{G}_{-i} \equiv G_{-i} - C$ . Thus,  $i$ 's program can be written:

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

Let  $\bar{G} = \max\{f(m + \bar{G}_{-i}), \bar{G}_{-i}\}$  be the solution to this program, where  $f$  is the demand for the public good as in the text. In equilibrium, individual contributions must be equal. To prove, suppose this is not the case. Then, we would have  $g_k > g_l$  for some donors  $k$  and  $l$ , which would mean  $g_k > 0$  and thus  $\bar{G} = f(m + \bar{G}_{-k})$ . It would also mean that  $\bar{G} \geq f(m + \bar{G}_{-l})$ . Together we must have  $f(m + \bar{G}_{-k}) \geq f(m + \bar{G}_{-l})$  or equivalently  $g_k \leq g_l$ , yielding a contradiction. Hence, in a fundraising equilibrium,  $g_i = g$  for all solicited donors. Moreover,  $G - C > 0$  as argued above, it must be that  $g > \frac{C}{n} > 0$ , which implies  $\bar{G} = f(m + \bar{G}_{-i})$  or equivalently

$$\bar{G} = f(m + \bar{G} - g). \quad (\text{A.1})$$

On the charity side, Eqs. (2.2) and (3.1) reveal that

$$G = (1 + 1/\alpha)C \text{ and } \bar{G} = C/\alpha. \quad (\text{A.2})$$

Together with the facts that  $n = [(1 + 1/\alpha)C]^{\frac{\alpha}{1+\alpha}}$  from Eq.(3.1) and  $g = \frac{C}{n}$  by symmetry, Eqs.(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

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

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

To prove comparative statics with respect to  $\alpha$ , first differentiate (A.1):

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

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

$$\bar{G}' =^{sign} -g'. \quad (\text{A.3})$$

Next, since  $\bar{G} = \frac{C}{\alpha}$  from Eq.(A.2) and  $g = n^{\frac{1}{\alpha}}$  from Eq.(2.2), using Eq.(3.1), we respectively write:  $\ln(\bar{G}) = -\ln(1+\alpha) + (1 + \frac{1}{\alpha}) \ln n$  and  $\ln g = \frac{1}{\alpha} \ln n$ . Differentiating both with respect to  $\alpha$  yields,

$$\frac{\bar{G}'}{\bar{G}} = -\frac{1}{1+\alpha} - \frac{\ln n}{\alpha^2} + (1 + \frac{1}{\alpha}) \frac{n'}{n} \quad (\text{A.4})$$

$$\frac{g'}{g} = -\frac{\ln n}{\alpha^2} + \frac{1}{\alpha} \frac{n'}{n}. \quad (\text{A.5})$$

Suppose  $g' \geq 0$ . Then,  $\bar{G}' \leq 0$  by Eq.(A.3), which, from Eq.(A.4), implies that  $-\frac{1}{1+\alpha} + \frac{n'}{n} \leq 0$ . Moreover, since  $g' \geq 0$  by hypothesis,  $-\frac{\ln n}{\alpha^2} + \frac{1}{\alpha} \frac{n'}{n} \geq 0$  by Eq.(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  $\bar{G}' > 0$  and  $n' > 0$ . Furthermore, the fact that  $\bar{G}' > 0$  implies from Eq.(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

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

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

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

The solution to this program is  $\bar{G} = \max\{f(m + p\bar{G}_{-i}; p), \bar{G}_{-i}\}$  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

$$\bar{G} = f(m + p\bar{G} - g; p). \quad (\text{A.6})$$

On the charity side, from Eqs. (2.4) and (2.6), it must be that

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

Together with the fact that  $n = [(1 + \frac{1}{\alpha})C]^{\frac{\alpha}{1+\alpha}}$  from Eq.(3.1) and  $g = \frac{G}{n}$  by symmetry, Eqs.(A.6) and (A.7) thus require that

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

Define

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

Clearly,  $\Psi(0) = -f(m; p) < 0$  and  $\Psi(\frac{m^{1+\alpha}}{(1+\frac{1}{\alpha})^{2+\alpha}}) = \frac{1}{1+\alpha} \left[ \frac{m^{1+\alpha}}{(1+\frac{1}{\alpha})^\alpha} - (1+\alpha)f(\frac{m^{1+\alpha}}{(1+\frac{1}{\alpha})^\alpha}; p) \right] > 0$ . 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  $pf_m < 1$  and  $f_m > 0$ ,  $\Psi'(C) = (1 + \frac{1}{\alpha})\frac{1}{\alpha}[1 - pf_m + \frac{f_m}{n}] > 0$ , the solution is unique, which proves the existence of a unique fundraising equilibrium.

Differentiating (A.6) with respect to  $\alpha$  and recalling that  $p = 1 + \alpha$ ,

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

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

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

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

$$\begin{aligned} \frac{g'}{g} &= -\frac{1}{\alpha(1+\alpha)} - \frac{1}{\alpha^2} \ln n + \frac{1}{\alpha} \frac{n'}{n}, \\ \frac{\bar{G}'}{\bar{G}} &= -\frac{1}{\alpha} + (1 + \frac{1}{\alpha})\frac{n'}{n} - \frac{1}{\alpha^2} \ln n. \end{aligned}$$

From the above it follows that

$$\frac{\bar{G}'}{\bar{G}} = (1 + \alpha)\frac{g'}{g} + \frac{1}{\alpha} \ln n. \quad (\text{A.9})$$

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

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



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

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

Since  $pf_m < 1$  and  $f_m > 0$ ,  $\bar{G}' > 0$  if and only if  $|\varepsilon^p| < pf_m(1 + \frac{\ln n}{\alpha n})$ , 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  $\bar{g}(s) \equiv g(s, n(s))$ . Given  $s$ , the fundraiser solves

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

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

$$\frac{1}{\alpha} \frac{n_s}{n} = \frac{1}{s} + \frac{d\bar{g}(s)/ds}{\bar{g}(s)}. \quad (\text{A.10})$$

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

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

Differentiating with respect to  $s$  yields

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

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

$$\max_s \bar{G}(s) \equiv (1-s)s^\alpha (\bar{g}(s))^{1+\alpha},$$

which is equivalent to Eq.(3.2) except that  $g^o$  is replaced with  $\bar{g}(s)$ .

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

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

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

From here, we find the optimal disclosure contract,  $s^{o,d}$ . Eqs.(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  $d\bar{g}(s)/ds < 0$  from Eq.(A.11) and thus  $s^{o,d} < s^o$  from Eq.(A.12).

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

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

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  $s$ ;  $s = s^o$  is feasible and  $s^{o,d} \neq s^o$ . ■

**Proof of Proposition 4.** Fix  $\alpha_I$  and let  $g = g^I$ . Then,  $\bar{G}^I(\alpha, g) = \frac{1}{1+\alpha} g^{1+\alpha}$  and  $\bar{G}^o(\alpha, g) = \frac{1}{\alpha(1+1/\alpha)^{1+\alpha}} g^{1+\alpha}$ . It is straightforward to verify that  $\bar{G}^o(\alpha_I, g) < \bar{G}^I(\alpha_I, g)$ .

Moreover, since  $g > 1 + 1/\alpha_o$  from Eq.(2.4),  $\bar{G}^o(\alpha_o, g)$  is strictly increasing in  $\alpha_o$  and  $\lim_{\alpha_o \rightarrow \infty} \bar{G}^o(\alpha_o, g) = \infty$ . Hence, there is a unique and finite  $\underline{\alpha}(g, \alpha_I) > \alpha_I$  such that

$$\bar{G}^I(\alpha_I, g) = \bar{G}^o(\underline{\alpha}(g, \alpha_I), g) \quad (\text{A.13})$$

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

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

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

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

proving the first comparative static. To prove the one with respect to  $\alpha_I$ , we again differentiate both sides of Eq.(A.13) by recalling that  $g = g^I$ :

$$\frac{\partial \underline{\alpha}}{\partial \alpha_I} = \frac{\frac{d\bar{G}^I}{d\alpha_I} - \frac{\partial \bar{G}^o(\alpha_o, g^I)}{\partial g} \times \frac{\partial g^I}{\partial \alpha_I}}{\frac{\partial \bar{G}^o(\alpha_o, g^I)}{\partial \alpha_o}} > 0,$$

because  $\frac{d\bar{G}^I}{d\alpha_I} > 0$  and  $\frac{\partial g^I}{\partial \alpha_I} < 0$  by Proposition 1 and  $\frac{\partial \bar{G}^o(\alpha_o, g^I)}{\partial g} > 0$  and  $\frac{\partial \bar{G}^o(\alpha_o, g^I)}{\partial \alpha_o} > 0$  follow from above. ■

**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:

$$\bar{G} = \bar{f}(m + p\bar{G} - g; \bar{G} - \frac{g}{p}; p), \quad (\text{A.14})$$

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

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

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

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

where  $\bar{\varepsilon}^p = \frac{p\bar{f}_p}{\bar{f}}$ . Using Eq.(A.9) from the proof of Proposition 2, we know that:

$\frac{g'}{g} = \frac{1}{1+\alpha} \frac{\bar{G}'}{\bar{G}} - \frac{1}{\alpha} \frac{\ln n}{(1+\alpha)}$ . Hence upon substituting for  $g'$ ,

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

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

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

Furthermore,

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

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

**Proof of Proposition 6.** Let  $R \geq 0$  and  $n_0 \geq 0$  be the government grant and the number of repeat donors, respectively. As in the proof of Proposition 1, it

is readily argued that given  $n_0 + n$ , there is a unique equilibrium gift  $g$ , resulting in total contribution:  $G = (n_0 + n)g$ , and total net contribution:  $\bar{G} = G - C$ . In particular, in the presence of  $R$ , a modified Eq.(A.1) holds in equilibrium:

$$\bar{G} + R = f(m + \bar{G} + R - g). \quad (\text{A.15})$$

From the charity's optimization, we have  $n = g^\alpha$ , which, since  $n = [(1 + 1/\alpha)C]^{1/\alpha}$  from Eq.(3.1), reveals that  $g = [(1 + 1/\alpha)C]^{1/(1+\alpha)}$ ,

$$G = (1 + 1/\alpha)C + n_0[(1 + 1/\alpha)C]^{1/(1+\alpha)} \text{ and } \bar{G} = C/\alpha + n_0[(1 + 1/\alpha)C]^{1/(1+\alpha)}.$$

Inserting these into Eq.(A.15), we obtain

$$C/\alpha + n_0[(1 + 1/\alpha)C]^{1/(1+\alpha)} + R = f(m + R + C/\alpha + (n_0 - 1)[(1 + 1/\alpha)C]^{1/(1+\alpha)}).$$

Define

$$\hat{\Phi}(C; n_0, R) = C/\alpha + n_0[(1 + 1/\alpha)C]^{1/(1+\alpha)} + R - f(m + R + C/\alpha + (n_0 - 1)[(1 + 1/\alpha)C]^{1/(1+\alpha)}).$$

Clearly,  $\hat{\Phi}(0; n_0, R) = R - f(m + R) < 0$  by assumption and  $\hat{\Phi}(\frac{m^{1+\alpha}}{1+1/\alpha}; n_0, R) = \frac{m^{1+\alpha}}{1+\alpha} + n_0m + R - f(\frac{m^{1+\alpha}}{1+\alpha} + n_0m + R) > 0$  by normality. Thus,  $\hat{\Phi}(C^*; n_0, R) = 0$  for some  $C^* \in (0, \frac{m^{1+\alpha}}{1+1/\alpha})$ . Moreover, since  $\hat{\Phi}_C(C; n_0, R) = \frac{1}{\alpha}[1 + \frac{n_0}{n} - f_m(\cdot) \times (1 + \frac{n_0}{n} - \frac{1}{n})] > 0$ , the solution  $C^*$  is unique, proving the existence of a unique fundraising equilibrium in this extension.

The existence of a unique cutoff  $\hat{\alpha}(R, n_0)$  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 6 that equilibrium  $g$  is decreasing in  $R$  and  $n_0$ . Note that

$$\hat{\Phi}_{n_0}(\cdot) = [(1 + 1/\alpha)C]^{1/(1+\alpha)}(1 - f_m(\cdot)) > 0 \text{ and } \hat{\Phi}_R(\cdot) = 1 - f_m(\cdot) > 0.$$

Hence,  $C^*$  is decreasing in  $n_0$  and  $R$ ; and so does  $g$  because  $g = [(1 + 1/\alpha)C]^{1/(1+\alpha)}$ . ■

**Proof of Proposition 7.** Since the proofs of parts (b) and (c) are similar, we only prove part (a) here. Let  $\tilde{G}_n$  denote the total donations if  $n$  donors are solicited. Then, by the normal assumption,  $\tilde{G}_n \sim N(n\mu, n\sigma^2)$ . Under a percentage contract, the charity solves

$$\begin{aligned} \max_{s,n} E[-e^{-R_c(1-s)\tilde{G}_n}] \\ \text{s.to } sE[\tilde{G}_n] - C(n; \alpha) \geq 0 \end{aligned} \quad (\text{A.16})$$

$$n \in \arg \max_{\hat{n}} sE[\tilde{G}_{\hat{n}}] - C(\hat{n}; \alpha). \quad (\text{A.17})$$

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

$$\Pi_C^{\%,*} = \max_s (1-s)(s\mu)^\alpha \left[ \mu - (1-s)\frac{R_c\sigma^2}{2} \right].$$

It can be shown that  $s^* > \frac{\alpha}{1+\alpha}$ . On the other hand, under a per-call contract, the charity solves:

$$\begin{aligned} \max_{s,n} E[-e^{-R_c(\tilde{G}_n - nc)}] \\ \text{s.to } nc - C(n; \alpha) \geq 0 \end{aligned} \quad (\text{A.18})$$

$$n \in \arg \max_{\hat{n}} \hat{n}c - C(\hat{n}; \alpha) \quad (\text{A.19})$$

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

$$\Pi_C^{c,*} = \max_c c^\alpha \left( \mu - c - \frac{R_c\sigma^2}{2} \right)$$

The FOC reveals that  $c^* = \frac{\alpha}{1+\alpha} \left( \mu - \frac{R_c\sigma^2}{2} \right)$ . Using this, simple algebra shows

$$\Pi_C^{\%,*} \geq \Pi_C^{\%}(s = \frac{\alpha}{1+\alpha}) > \Pi_C^{c,*}.$$

Moreover, on the fundraiser side, we observe

$$\Pi_F^{\%,*} > \Pi_F^{\%}(s = \frac{\alpha}{1 + \alpha}) > \Pi_F^{c,*} . \blacksquare$$

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