Donor Reliance on Accounting and its Consequences for the Charitable Distribution Channel

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Abstract

The organization of charitable distribution channels to ensure donor contributions reach beneficiaries in an efficient manner and the use of accounting metrics of such efficiency (whether provided directly or by charity rating groups) are oft-discussed issues in the nonprofit sector. The two issues are inextricably linked since reported efficiency measures influence subsequent donor giving. This paper develops a parsimonious model of a charity that must decide how best to employ its resources, either by acting as a direct service provider or as a grant provider to organizations that provide services to beneficiaries. We show that the desire to boost perceptions of efficiency vis-a-vis accounting reports leads an organization to rely more on others to provide services rather than being a direct service provider. This temptation to expand either the scope or length of the charity supply line is muted by a desire to avoid redundant costs and improve service delivery. The model's results have implications both for the role of nonprofit accounting and observed distribution strategies of nonprofits.

1. Introduction

Charities and their donors exhibit a delicate symbiotic relationship: donors seek to identify the most effective organizations to fund, while charities seek to maximize impact while also convincing donors that their resources are in good hands. As often noted, the charitable objectives of pleasing donors and maximizing impact may be at odds due to the fact that donors cannot observe the ultimate impact of their donations but rather must primarily rely on measures of financial propriety. These financial measures, in turn, may not paint a complete picture of an organization's efforts. In particular, a primary means by which donors evaluate charities is through reports on how much of the funds were directed toward the mission, termed "program" spending. With the rise of evaluation groups such as BBB Wise Giving Alliance, Charity Navigator, and Charity Watch, charities have noted that the pressure to demonstrate high program spending is immense.[1] Empirical evidence confirms that this perception is not an illusion – giving to an organization in a given year is notably sensitive to reported program spending from previous years (e.g., Tinkelman and Mankaney 2007; Gordon et al. 2009).

Of course, if reported program expenses are a perfect reflection of an organization's effectiveness, such pressure can help align priorities of benefactors and their recipient organizations. Deviations can arise, however, when accounting measures fall short of a perfect reflection of resource utilization. It is with this in mind that we consider a charity's preferred strategy for distributing funds to meet its mission goals in light of donor pressure to demonstrate financial efficiency. To elaborate, we consider a simple model of an organization that solicits funds from donors and distributes those funds to achieve its

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1 To be precise, the primary third-party charity evaluators rely on the functional classification of expenses included in Form 990 tax filings in assessing program spending. Though this reliance is on tax forms, it is worth noting that unlike with for-profit entities, accounting standards governing nonprofit tax filings largely mirror those established by the Financial Accounting Standards Board (FASB). As the calculation of functional classification of expenses for tax reports essentially follows FASB rules, this reliance by outsiders on tax forms reflects the uniform availability of tax filings rather than any substantive difference between the two reporting methods.

charitable goals. The model incorporates three salient features: (i) an organization can choose whether to be a direct service provider or a grant provider and, in the latter case, how widely to spread its reach; (ii) if an organization passes funds to another as a grant, it also passes some of the administrative burden of service provision; and (iii) all else equal, donors tend to give more to organizations that demonstrate high spending levels on programming.

With these three features in place, we consider how donor pressure to demonstrate high program spending can influence an organization's choice of how (and how widely) to distribute its spending. The analysis demonstrates that a charity faces two competing priorities. On the one hand, to engage services most efficiently, a charity will focus its efforts so as to avoid redundant administrative costs. After all, why engage an extensive supply line, since doing so necessitates more employees, accountants, lawyers, etc. along the way? In fact, we show that if donors do not care about reported accounting measures or were able to perfectly assess mission impact, a charity's preferred structure is to be a direct service provider and eliminate any "middle men" in the relationship.

On the other hand, to appear most efficient, a charity will want to spread its resources along a complicated web of grantees. Though this adds cost redundancies, it also shifts a portion of the administrative burden to other agencies, thus creating an appearance that the charity is more efficient. This latter feature reflects a key practical consideration with accounting measures: accounting for one organization's program spending only reflects how that organization spends its funds, not how any recipients of the organization's funds spend theirs. As a result, a donor's ability to "follow the paper trail" is restricted to single links in the chain. At the extreme, where a charity cares only about perceptions in order to boost donations and not on how best to employ the donations, the preferred distribution approach is tantamount to "daisy chaining", the practice of setting up a loop of organizations that cycle donations among them to create an outsized appearance of impact.

Though the Financial Accounting Standards Board (FASB) has been aware of the concern that passing along grants to other organizations may create an appearance of greater efficiency that can encourage "form-over-substance" transactions (Financial Accounting Standards Board 2012), the latest proposals from the FASB to reform nonprofit accounting do not notably change either the functional classification of expenses or rules governing treatment of pass-through transactions (Cohn 2015; Financial Accounting Standards Board 2015; Mittendorf 2015).

We demonstrate that the need to balance true efficiency and the appearance of efficiency in order to boost donations gives rise to a charity's preferred distribution method. The equilibrium distribution approach we identify reflects that the desire for short-run impact favors more direct service provision, whereas the desire to boost short-term perceptions, and thereby long-term donations and impact, favors a wider distribution channel. Importantly, these offsetting pressures arise not because a charity has an inherent desire to be large or appear large at the expense of its impact. Rather, it comes from a desire to maximize impact, realizing that appeasing donors is part of that equation since doing so helps the charity scale up.

A notable example of this tradeoff in practice is in the heavily scrutinized actions of the Red Cross. The Red Cross insists on being a direct service provision organization in order to meet acute needs rapidly. This choice comes despite the fact that it subjects the organization to more criticism of its finances than would be observed if it simply provided grants to others (see, e.g., Elliott et al. 2014). That said, the Red Cross has at times succumbed to the temptation to add layers to the supply line in order to improve efficiency measures, as has been reported about its recent efforts in Haiti. In that case, their heavy use of grant provision to local organizations permitted the Red Cross to report a non-program spending rate of only 9%, while also leading some familiar with circumstances on the ground to accuse it of creating a "cycle of overhead" by taking their own administrative cut and then "re-granting to another group which would take their cut" (Elliott and Sullivan 2015).

Consistent with the fundamental tradeoff we identify, comparative statics of the primary analysis reveal that both long-term mission and greater donor pressure favor an organization being a grant provider, providing grants across a larger spectrum of recipients. Thus, it may not be empire building, boredom, or experimentation that lead to organizations exhibiting outsized ambitions which leave their resources spread too thin but rather pressure from donors and ultimately a realistic desire to have a long term impact.

To further investigate how donor demands can influence an organization's chosen form of charity provision, we consider two extensions to the primary model. The first extension incorporates the fact that different charitable endeavors may exhibit varying levels of urgency – while acute public health needs necessitate quick impact, educational goals may instead require a long view. When mission urgency is taken into account, we not only show that the key results persist, but also demonstrate the comparative static that greater urgency favors a more focused distribution strategy. This leads to a prediction that urgent charitable matters such as disaster relief will exhibit a condensed supply line. Interestingly, this prediction arises not because a long supply line takes time, but rather because an organization focused on acute needs cares less about appearances to spur long-term donations and more about eliminating bureaucratic waste.

The paper's second extension examines the possibility that an organization can alter its approach over time. We show that the desire to influence donor perceptions leads young organizations to spread their resources widely, whereas older organizations (less reliant on the whims of donors) opt to focus their approach on how best to use resources. This comparative static suggests that as organizations mature they will engage in more direct service provision. This provides a more benign explanation for charities' tendency to build their own facilities and rely less on providing grants to outside parties as they grow as well as the same tendency often exhibited by organizations finding themselves less subject to donor whims. Examples of the former include the Susan G. Komen Foundation and the Clinton Foundation, each of which shifted toward direct programming as they matured; an example of the latter is the shift from grant provision to service provision at the Livestrong Foundation as scandal marked a compression of donations from the general public.

Broadly speaking, this study relates to two voluminous research streams, (i) the design and formation of supply chains (e.g., Beamon 1998; Tsay 2013) and (ii) how pressures to meet accounting targets can influence decision making (e.g., Healy and Wahlen 1999; Healy and Palepu 2001). More specifically, however, this paper brings these two considerations in play for nonprofit entities, an institutional circumstance with organizations facing unique pressures (Berenguer 2014 and Berenguer et al. 2014). To this end, the extant literature on supply chains of charitable organizations is much more limited. Notable exceptions include Privett (2012); Kretschmer et al. (2014); and the aforementioned Berenguer et al. (2014).

A distinguishing feature of our work is that it incorporates the role of accounting performance reporting in influencing donor behavior and how this, in turn, alters distribution and supply chain choices. Empirical evidence has consistently confirmed that accounting performance measures and, in particular, measures of program spending do in fact place pressures on charities due to the fact that donations (i.e., revenues) are sensitive to their reporting (e.g., Tinkelman and Mankaney 2007; Gordon et al. 2009). There is also notable empirical evidence that this pressure in turn leads nonprofits to engage in behavior to manage reported program spending levels (e.g., Baber et al. 2001; Krishnan et al. 2006; Keating et al. 2008; Tinkelman 2009). The present analysis considers how donor pressures influence a charity's decision of how best to employ and distribute funds to meet long-term objectives, and it does so presuming that decision-makers act not in self interest but instead are focused entirely on the mission.[2] Despite the mission focus, the pressures

2 Arya and Mittendorf (2015) consider how pressures from accounting performance measures can also influence effort and time allocation of nonprofit executives focused on maximizing their own career

placed by donors alone can alter decisions so as to balance short-run impact with long-term fundraising potential.

The remainder of this paper proceeds as follows. Section 2 presents the basic model of donor behavior and charitable distribution approaches. Section 3 identifies the preferred distribution strategy and considers its implications: 3.1. derives equilibrium giving behavior; 3.2. presents the equilibrium distribution strategy and its determinants; 3.3. considers the effect of mission urgency; and 3.4. examines the consequence of time-varying distribution approaches. Finally, section 4 concludes.

2. Model

A charity is formed that intends to solicit donations from the general public and make use of the funds to achieve its mission. The charity will operate over the course of T periods, $T \geq 2$. The charity establishes a distribution strategy in order to direct resources to the ultimate mission objective (beneficiary). The charity can establish itself as a direct service provider or be a grant provider, making use of additional organizations to provide the direct services. In particular, the charity can opt for a supply line of n, $n \geq 1$, organizations in reaching its objectives. With this formulation, $n = 1$ corresponds to the charity being a direct service provider, whereas $n > 1$ corresponds to the charity being a grant provider. Thus, higher values of n correspond to the charity making use of more organizations in its distribution approach. Figure 1 presents a graphical depiction of the distribution strategies for the cases of n = 1, 2, and 3.

potential; Bagnoli and Watts (2003) demonstrate that pressures to influence external perceptions of social responsibility can also impact strategic interplay of for-profit entities.

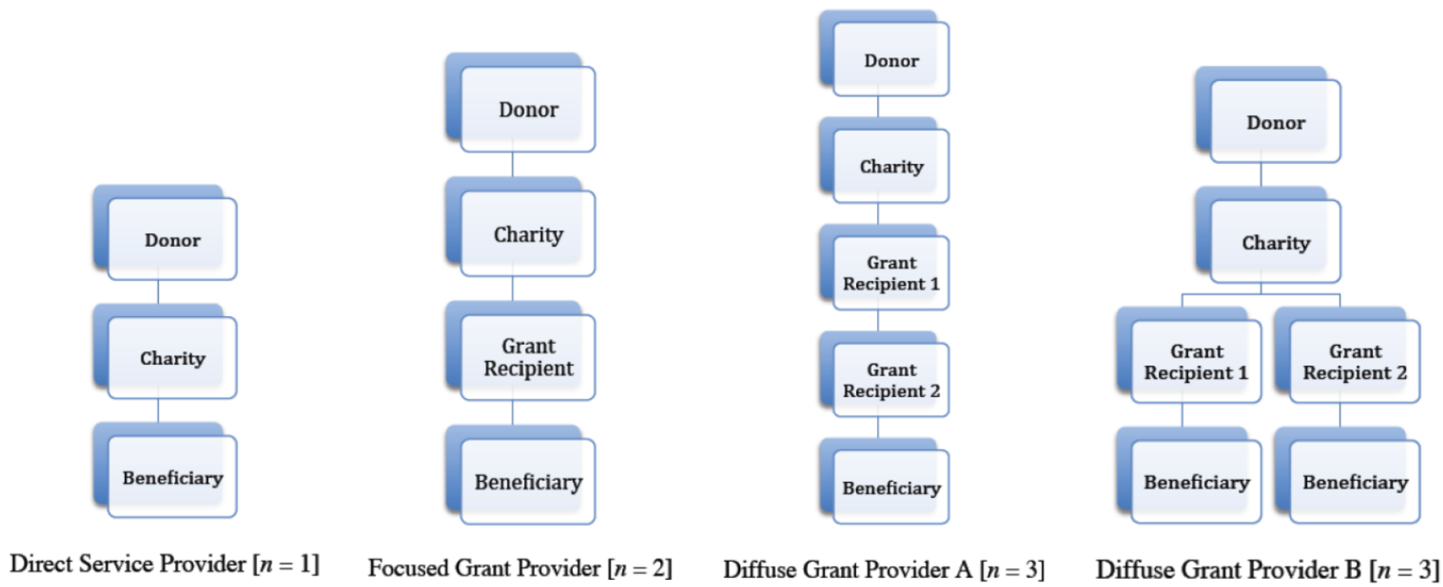

Figure 1: Charity Distribution Channels for n = 1, 2, and 3

Note from the figure that our focus is on the number of organizations that link the donor to the charitable beneficiary and encompasses multiple forms of the supply chain. In Case A for n = 3, for example, a (lead) charity provides a grant to an organization that itself is a grant provider to an eventual service provider. (We will discuss implementation issues for this case in section 3.2.) Equivalently, the charity may itself reach out to multiple service providers and support each with grants as in Case B.

To deliver adequate services, any "charity supply chain" must incur administrative expenses including executive salaries, legal and compliance costs, information technology infrastructure, and training/assessment costs. As more links in the supply chain are added, some of these costs and responsibilities (e.g., training and information technology) are naturally shed to other layers of the chain. Realistically, however, redundancies are also introduced since some activities are required at each layer (e.g., legal and compliance fees and executive salaries). To most simply reflect these two realities, we assume (i) some administrative activities/costs are split between the n entities involved in administering the charitable activities; and (ii) some administrative activities/costs must be incurred by each of the entities involved. In particular, denote the per-period administrative cost incurred by each entity by $A/n+k$, $k \geq 0$ (resulting in a total administrative burden of $A+nk$).[3]

In addition to incurring its share of administrative costs, the lead charity must also incur costs associated with raising funds each period, denoted by $F \geq 0$.[4] Denoting its total resources available for use (the donations it collects) in period t by d_t, the charity recognizes spending on programs of $p_t = d_t - F - [A/n+k]$, as reported in the organization's accounting reports, i.e., we presume no profit carryover and the functional classification rules require spending to be split between program, fundraising, and administrative categories. The total funds eventually reaching the mission in period t are thus $m_t = p_t - [n-1][A/n+k]$, where the second term reflects administrative costs incurred by the remaining $n-1$ links in the charity supply chain. That is, if the charity is a direct service provider, then the reported program expenses reflect all funds ultimately spent on mission ($m_t = p_t$); as a grant provider, the amount ultimately reaching the mission is lowered due to the administrative costs incurred by the added $n-1$ links in the supply chain ($m_t < p_t$).

To reflect the practical consideration that donors rely on reported accounting measures of a charity's efficiency in determining their giving levels, denote the total donations raised by the charity in period t, $t = 1,\ldots,T$ by $d_t = \alpha + \beta p_{t-1}$: α, $\alpha > A+k+F$, reflects a baseline level of funding and β, $\beta \in [0,1)$, reflects the extent to which donors reward those charities with higher reported program spending in one period

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3 If the administrative costs are not borne equally but the lead charity instead incurs a disproportionate share of the costs, the results we find persist as long as some portion of the non-repeating costs are shed to other charities. In that case, as the paper's intuition will confirm, the greater the proportion of costs that is shed, the greater the benefit from adding additional layers to the supply chain.

4 For simplicity, we presume only the lead charity must incur a fundraising cost. The possibility of additional fundraising costs can readily be incorporated in the analysis. In fact, one can view k in the present formulation as representing the total additional administrative and/or fundraising costs introduced by each new layer of the supply chain.

by donating more in the subsequent period.[5] The lower bound on α is necessary and sufficient for the charity to at least have a positive impact if it is organized as a direct service provider, i.e., for $n = 1$, $\sum_{t=1}^{T} m_t > 0$.

With this basic model as a backdrop, we ask what is the charity's preferred distribution channel provided it wants to maximize the total resources devoted to the mission, i.e., the value of n that maximizes $\sum_{t=1}^{T} m_t$.

3. Results

To determine the charity's preferred distribution approach, we first need to examine how the distribution approach affects resources coming in to the organization (donations). This, in turn, naturally gives rise to consideration of the resources coming out of the organization and, eventually, to the mission.

3.1. Equilibrium Giving

It is often discussed that donor emphasis on reported program expenses puts charities in a bind – they must skimp on either administrative or fundraising infrastructure if they have any hope of generating funds from a skeptical public and this, in turn, facilitates a starvation cycle from which charities cannot fully recover (e.g., Gregory and Howard 2009). In this model, we revisit the question of donor emphasis on program expenses but instead hone in on how it affects distribution strategies. That is, even when fundraising and administrative requirements for the supply line are held fixed, the length of the supply line alone may affect giving which may thus affect the preferred design of the supply line.

Besides incorporating the natural tendency of donors to reward reported efficiencies (see, e.g., Tinkelman and Mankaney 2007; Gordon et al. 2009), this approach also

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5 A richer time-series process can also be used to model donations. For example, donations in period t may be tied to both program expenses in period t - 1 and period t - 2 with decaying effects. The current formulation maintains simplicity to provide intuition; in addition, it highlights how despite the one-period lag model, the repercussions of program spending in a given period last long term.

reflects the practical consideration that accounting measures of efficiency for one entity only report spending practices of that one entity even though it may rely on several others to carry out programming. That is, unless an organization has a very strong controlling and economic interest in another, accounting rules do not entail a consolidation of entities for reporting purposes.[6] As such, the accounting reflection of program expenses by one organization may largely reflect grants provided to another even if the recipient entity expends additional administrative costs spending only the residual on mission. The fact that program expenses of the charity can overstate eventual mission impact is commonly noted as a downside of relying on accounting metrics. Taken to the extreme, the potential for abuse is manifest in the creation of "daisy chains" of organizations that simply shuffle around funds to create an appearance of effectiveness even if no true efforts are undertaken.

Our setting reflects this practicality by noting that donors to the charity care about its reported program expenses (p_t) but cannot (or do not) rely on a measure of ultimate mission impact (m_t). The result is that donations in one period are sensitive to the level of program spending in the previous period. If an organization can boost donations, that, in turn, frees up funds for more programming. Thus, perceived efficiency has a self-fulfilling prophesy effect. Formally, in accordance with the functional classification of expenses, donations to a charity are utilized for programming, fundraising, and administration, that is, $d_{t-1} = p_{t-1} + F + [A/n + k]$. For a given n, an increase in d_{t-1} implies a higher p_{t-1} and, this boost in programming expenditures in turn means that the charity can garner more in donations in period t; this increase in d_t increases p_t, and so on. The next proposition summarizes this inter temporal connection among donations in the setting. (All proofs are provided in the Appendix.)

6 The level of control that must be in place to trigger a consolidation of financial statements is so strong that many national organizations report separately even from their local chapters that share the same name (e.g., United Way Worldwide).

Proposition 1. Donations in period t equal:

$$d_1 = \alpha \text{ and } d_t = d_{t-1} + \beta^{t-1}[\alpha - F - k - A / n] \text{ for } t > 1.$$

Note from the proposition that not only are donations across time inextricably linked (due to the fact that having more money makes it easier to devote money to programs), but they are also tied to the organization's distribution strategy (n). In particular, consistent with the expression in the proposition, donations can be written as:

$$d_t = \left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right]\left[\frac{1-\beta^{t-1}}{1-\beta}\right] + \alpha\beta^{t-1},\ t = 1,\ldots,T.$$

From the above, $\partial d_t / \partial n = \beta A[1-\beta^{t-1}] / [n^2(1-\beta)] > 0$, i.e., donations are increasing in n. This result reflects that the more widely the organization casts its net, the easier raising funds becomes. The reason for this is that by "passing the buck" to other organizations (increasing n), a charity can also pass on part of the administrative burden and, as a result, boost perceived efficiency. This occurs despite the fact that the total administrative burden is not actually reduced (actually it goes up by nk). The reason again goes back to the notion that donors to an organization only get to see where that organization's funds go, not necessarily how the ensuing recipients use the funds.

With an eye on this connection between distribution approaches and equilibrium donations, we next consider the organization's optimal distribution strategy.

3.2. Preferred Distribution Strategy

In effect, the charity faces a tradeoff in priorities in designing its distribution strategy. On the one hand, as seen above, maximizing donations entails boosting perceived efficiency, which favors a diffuse distribution approach (i.e., high n). On the other hand, reducing redundant costs and boosting ultimate mission impact of a given level of donations favors direct service provision (i.e., n = 1). To highlight this tradeoff, we next demonstrate two benchmark solutions that result in each extreme.

Proposition 2.

(i) If the charity is seeking to maximize total donations rather than mission impact, it prefers the most diffuse distribution strategy, i.e., $\sum_{t=1}^{T} d_t$ is increasing in n; and

(ii) If donations were tied to mission impact rather than program expenses, i.e., $d_t = \alpha + \beta m_{t-1}$, the charity prefers to be a direct service provider, i.e., $\sum_{t=1}^{T} m_t$ is decreasing in n.

Proposition 2(i) shows that if the charity has no concern for ultimate mission impact but instead only cares about what donors think about its efficiency, then the natural temptation is to spread the administrative burden across as many organizations as possible. In other words, for the extreme case of an organization that only cares about generating funds and is unconcerned about the degree to which those fund reach beneficiaries, the worst fears of uncontrolled daisy chaining are confirmed.

At the other extreme, if an organization cares about its mission impact, and donors too are able to assess said mission impact, there is no incentive to spread out distributions so as to spread administrative burden (Proposition 2(ii)). Rather, if donors' behavior fully reflects an appreciation of and care for ultimate impact, the organization's optimal approach is to be a direct service provider and thereby avoid any redundant administrative costs along the chain.

Our main setup reflects the co-existence of these two extremes. In particular, we presume that the motives of organizations are to maximize mission impact (not just to maximize donations), while at the same time incorporating the fact that donors can only rely on measures of program spending to assess an organization's efficiency. The melding of these two considerations means that even an organization solely focused on impact may nonetheless seek to be a grant provider since doing so can help boost donations enough to justify the added inefficiencies that come along with it. This result is confirmed in the next proposition.

Proposition 3.

(i) The charity opts to be a direct service provider ($n = 1$) if $\frac{\beta[T(1-\beta)-(1-\beta^T)]}{T[1-\beta]^2} \leq \frac{k}{A}$; and

(ii) The charity opts to be a grant provider ($n > 1$) if $\frac{\beta[T(1-\beta)-(1-\beta^T)]}{T[1-\beta]^2} > \frac{k}{A}$.

From Proposition 3, being a grant provider is more attractive the more the administrative cost that can be shared from doing so (A), the more donors pay attention to reported program expenses (β) and/or the longer such a boost can persist (T), whereas it is less attractive if it introduces more inefficiency (k). Further, for an organization that benefits from expanding its reach as a grant provider, these same forces help determine how wide that reach should be, i.e., how many links in the chain the organization should employ.

Proposition 4. For $\frac{\beta[T(1-\beta)-(1-\beta^T)]}{T[1-\beta]^2} > \frac{k}{A}$, the charity's preferred grant provision strategy entails $n = n^* = \sqrt{\frac{A\beta[T(1-\beta)-(1-\beta^T)]}{T[1-\beta]^2 k}}$.

Proposition 4 presents the optimal supply formulation when the lead charity opts to be a grant provider. In cases where it opts to incorporate multiple grantees (i.e., n >2), this could take the form of providing grants to other grant providers (case A of Figure 1) or diversifying among several direct service providers (case B of Figure 1). The former case represents a delicate implementation exercise. After all, as mentioned previously, if the charity gives funds as grants to another and stipulates precisely where and how the funds will be distributed (leaving no discretion to the recipient), this triggers pass-through accounting recognition by the recipient that could permit financial statement readers and charity evaluators to bypass the "middleman" and more easily follow the paper trail. Realistically, however, most grant providers do not go this far but rather retain a measure of control while also leaving some discretion to grantees. This control arises either explicitly by putting use restrictions on funds (e.g., they must be paid as grants to others for a particular purpose without stipulating precisely who receives the grants) or implicitly by requiring performance requirements be met for grants (e.g., setting minimum spending ratios for a grantee which would, in turn, incentivize the grantee to itself pay grants in order to pass along some of the administrative burden). In either circumstance, the grant provider maintains enough control to have substantial say on the ultimate disposition of funds. Further, it is worth stressing that in case B of Figure 1, the absence of added layers of grant provision means that the issue of how grant recipients will act in distributing funds to other parties is a non-issue. All that said, even in the event that outsiders could "see through" and account for administrative costs incurred by other parties, our results broadly apply as long is there is not complete see through – the key to our result is that accounting metrics are not so rich that they permit perfect revelation of resources to their ultimate disposition for the mission (else, in effect, Proposition 2(ii) applies).

Figure 2 provides a graphical depiction of the key results thus far for the case of $k = 1/20$; $\alpha = 1/2$; $A = 1/4$; $F = 0$; $\beta = 3/4$; and $T = 5$. The left-panel shows that total donations are increasing in n – the greater the number of organizations involved in the distribution channel the lower is the lead charity's share of the administrative costs, with this improvement in efficiency being rewarded by a boost in donor giving. Of course, the administrative costs of the distribution channel ($A + nk$) are increasing in n, and the right-panel reflects this trade-off. The total mission impact is concave in n with an interior maximum showing the optimal distribution design entails the lead charity serving as a grant provider.

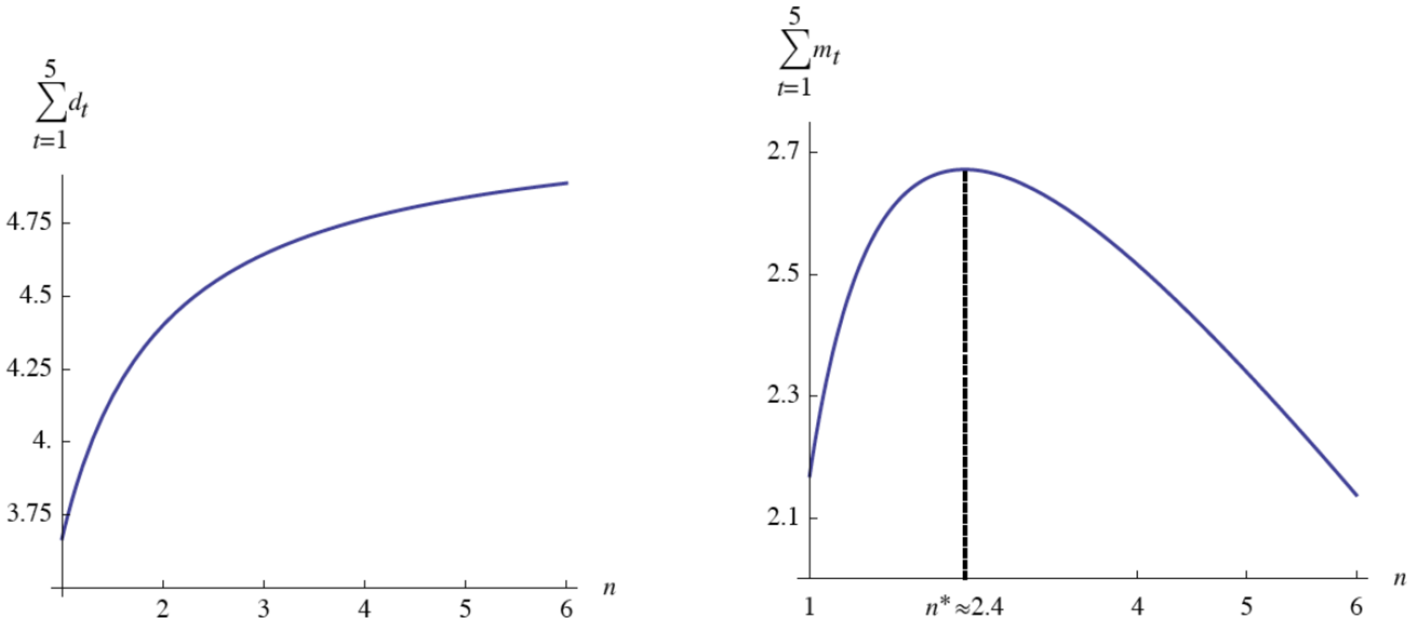


Figure 2: Effects of Distribution Strategy

From Propositions 3 and 4 together, not only can the desire to influence donor perceptions compel an organization to make use of grant provision rather than focusing on direct services, but it also influences the extent of the organization's reach. As noted previously, the primary driver for expanding an organization's reach is to spread out the administrative burden and thereby boost the reported program expenses of the charity. This, in turn, serves to increase giving to the organization due to the perceived improvements in efficiency. These incentives give rise to the following corollary.

Corollary 1.

(i) A long-term mission favors a larger distribution channel, i.e., $\partial n^* / \partial T \geq 0$; and

(ii) Donor emphasis on efficiency favors a larger distribution channel, i.e., $\partial n^* / \partial \beta \geq 0$.

From the corollary, our model predicts that an organization seeking to balance donor demands and a desire to reduce administrative redundancies along its supply line will find its distribution strategy vary predictably with both the time frame of the organization's mission and the degree to which donors pay attention to reported costs. Corollary 1(i) demonstrates that an organization intending to reach its objectives over a long time horizon will opt to spread its resources out over a variety of recipient organizations. Importantly, this comparative static arises not from a desire to diversify risks or to maximize the potential for an extreme breakthrough, but rather a desire to leverage high initial reported program expenses to garner greater donations over the long run, even if doing so introduces inefficiencies in the short run. That is, the longer the charity's horizon, the greater the gains from linking and boosting donations over the many periods. It is worth noting, however, that this temptation to expand reach as horizon expands has a limit. In particular, taking Propositions 3 and 4 together reveals that the maximum optimal reach is $Max\left\{1, \lim_{T\to\infty} n^* = \sqrt{\frac{A\beta}{[1-\beta]k}}\right\}$.

In a similar vein, Corollary 1(ii) notes that the more attention donors pay to accounting measures of efficiency, the greater the incentive to spread resources (and, as a result, administrative burden) across more grant recipients. It is notable that it is the desire to boost perceptions of efficiency to boost long-run giving that creates incentives to be more inefficient in the short run. In other words, this comparative static gives credence to those criticizing donors and charity evaluators for relying heavily on accounting measures of efficiency to gauge effectiveness. The desire to please these evaluators results in form over substance in that it requires some inefficiencies to generate adequate donations. It is concern over such myopic behavior that gave rise to the "overhead myth" movement in the nonprofit sector, which seeks less reliance on accounting metrics in evaluating efficiency.

The two panels in Figure 3, plotted for the parameters of our running example, show results in line with the comparative statics in the Corollary. As expected, the n^*

value in the right panel of Figure 2 matches the n^*-value corresponding to $T = 5$ and $\beta = 0.75$ in the two panels in Figure 3.

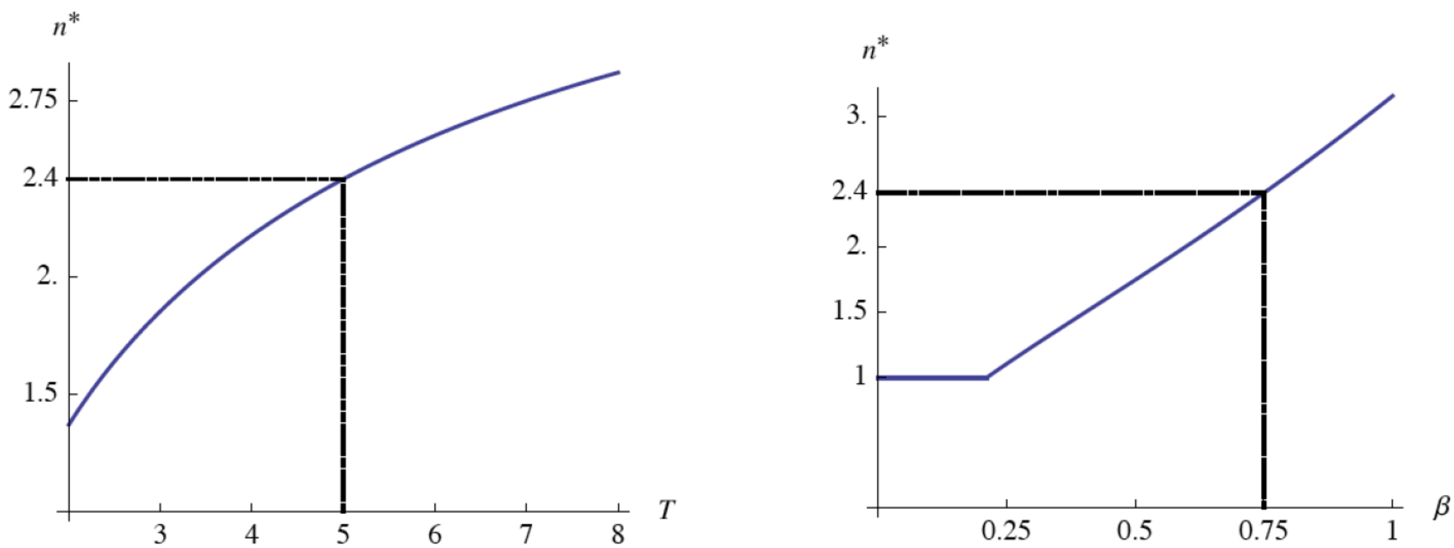


Figure 3: Distribution Strategy and Key Comparative Statics

With the primary results in tow, we now consider two key extensions to the analysis. First, we derive the impact on the distribution channel as the degree of urgency in the organization's mission increases. Second, we consider the design of the distribution channel when the charity can change its approach across time, i.e., it may shift between grant and direct service provision as it ages. As we will see, these extensions confirm and even underscore the key forces present in the baseline analysis while also providing additional practical insights.

3.3. Mission Urgency

The preferred form of charitable distribution entails a tradeoff between minimizing inefficiencies in the short run (favoring a concentrated distribution approach) and maximizing donor loyalty to boost resources available in the long run (favoring casting a wider distribution net to boost reported program expenses). This tradeoff suggests that an organization facing a particularly urgent need will seek to focus on the short-run ramifications of its strategy. To examine this conjecture, we append the analysis to consider a charity whose goal is to maximize the present value of mission impact, $\sum_{t=1}^{T}\lambda^{t-1}m_t$, where the discount factor λ, $0<\lambda<1$, reflects the degree of urgency to the mission (the limiting case of $\lambda=1$ corresponds to the primary analysis).

As confirmed in the next proposition, consideration of mission urgency complicates the equilibrium derivation but the end result is nonetheless intuitive.

Proposition 5.

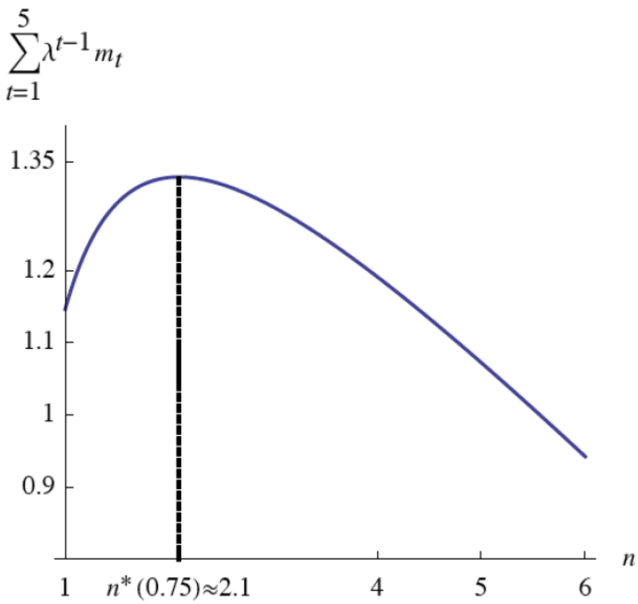
(i) In the presence of mission urgency, the charity's preferred distribution strategy is

$$n=n^*(\lambda)=Max\left\{1,\sqrt{\frac{A\beta[\lambda-\lambda^T+(\lambda\beta)^T(1-\lambda)-\lambda\beta(1-\lambda^T)]}{[1-\beta][1-\lambda\beta][1-\lambda^T]k}}\right\}.$$

(ii) Greater mission urgency leads to a more concentrated distribution strategy, i.e., $\partial n^*(\lambda)/\partial\lambda\geq 0$.

The key implication of accounting for mission urgency is that the more pressing an organization's mission, the more concentrated its distribution approach. In other words, for organizations less focused on long-term growth and more focused on short-term results, the optimal approach will be to forget concerns about donor perceptions of "overhead" but rather hone in on delivering services. Besides providing justification for the use of direct aid in response to many natural disasters, it also mirrors the justification provided by the Wounded Warrior Project which consciously decided to ignore ratings groups after determining that the changes necessary to improve ratings would "diminish its ability to care for veterans" (O'Neil 2014).

The next figure revisits the numerical example to demonstrate how mission urgency (i.e., lower λ) alters the preferred distribution approach.



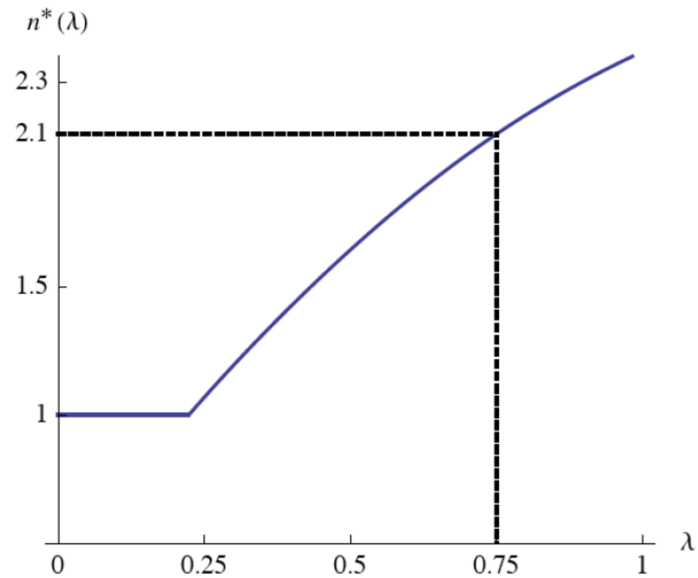


Figure 4: Effects of Mission Urgency on Distribution Strategy

Besides generalizing the distribution strategy results of Propositions 3 and 4, the results in Proposition 5 also demonstrate a key comparative static of mission urgency. The more urgent the mission, the more the charity opts to focus its efforts, with sufficiently strong urgency favoring direct service provision. Note that this preference for a focused distribution approach arises because the organization wants to avoid duplicate administrative costs in its supply chain and favors the approach despite the fact it appears less efficient to donors. This is consistent with anecdotal evidence that organizations addressing acute public health and disaster relief needs (e.g., Red Cross; Doctors Without Borders) are also organizations with a notably condensed supply line.

With this intuition in mind, we next consider how distribution strategy can change over the life of a charity.

3.4. Altering Distribution Strategy over Time

Thus far, we have presumed that a charity's distribution approach is stable across time, reflecting a singular approach. That said, charities often have flexibility in their approach, by either focusing on grant provision or direct service provision in one year, switching emphasis in a subsequent year. To reflect this possibility, we now append the primary analysis to permit a different distribution strategy each period. Denote the distribution approach in period t by n_t. In this case, n_t is chosen to maximize $\sum_{i=t}^{T} m_i$.[7] The next proposition characterizes the preferred distribution approach.

Proposition 6. When distribution strategy can be altered each period,

(i) The optimal distribution strategy is $n_t = n_t^* = Max\left\{1, \sqrt{\frac{A\beta[1-\beta^{T-t}]}{[1-\beta]k}}\right\}$; and

(ii) As an organization ages, the optimal distribution strategy becomes more concentrated, i.e., $\partial n_t^* / \partial t \leq 0$.

As confirmed in Proposition 6(ii), as an organization ages it shifts to a more focused distribution strategy. As can be seen in Proposition 6(i), this is driven not by knowledge gained from years that have passed (t), but rather an increased focus on the limited years remaining ($T-t$). As such, for organizations best viewed as infinitely-lived ($T \to \infty$), it is readily confirmed that the optimal distribution strategy is time invariant and precisely the one examined in the primary setup. That is, $\underset{T\to\infty}{Lim}\, n_t^* = Max\left\{1, \sqrt{\frac{A\beta}{[1-\beta]k}}\right\}$.

The next figure provides a graphical depiction of the proposition for the continuing numerical example.

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7 The solution is unchanged if n_t is chosen upfront to maximize $\sum_{i=1}^{T} m_i$. This is because n_t impacts administrative costs only in period t, and its effects on donations arise only from period $t+1$ onwards.

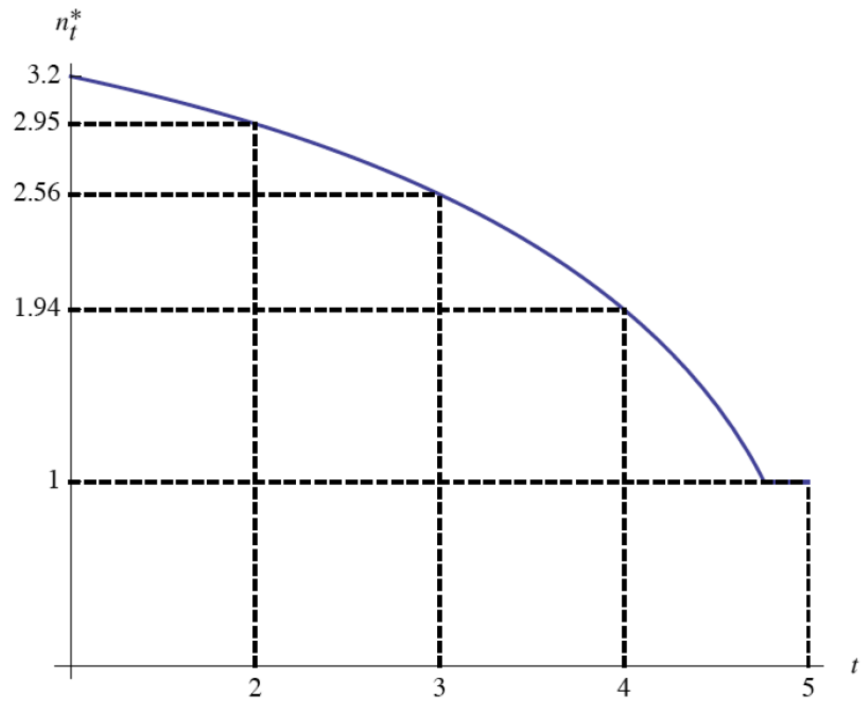

Figure 5: Preferred Time-Varying Distribution Strategy

A comparison of Proposition 6 to Propositions 3 and 4 confirms that the key underlying forces of the analysis persist in the case of time-varying distribution strategies. The proposition also provides a key comparative static of how distribution approaches change over the life of a charity. In an organization's early stages, its optimal approach is to streamline its administrative burden by distributing funds diffusely, gradually focusing its efforts over time. While the organization may appear to be too ambitious and "spread too thin" in early years, such an appearance of ambition turns out to be self-enforcing. Importantly, this gradual focusing of resources is not an exercise of experimentation in trying to find the best outlets, narrowing down to the best across time. Instead, the gradual narrowing of distribution outlets over time is a reflection of an organization focused less on how donor perceptions will affect future donation streams and focused more on making immediate impact by avoiding cost redundancies. Also, note that our prediction provides an offsetting force to the notion of organizational "mission creep" over time – here, as organizations age, they winnow down, not expand, their initiatives.

4. Conclusion

This paper considers a simple model of charitable distribution strategies in light of donor reliance on accounting measures. The model incorporates the practical feature that donors often rely on reported program spending to determine efficiency of charitable organizations. This reflects the fact that donors can only realistically observe how the organization uses its funds, not how any subsequent grant recipients use theirs. As a result, a charity appears more efficient if it employs a strategy of providing grants to a variety of parties, since those sources in turn take on more of the administrative burden. Thus, even a charity whose sole intent is to maximize mission impact adds extra layers between itself and eventual beneficiaries. This desire to spread grants widely is offset by a desire to help the mission by reducing redundant fixed costs. The results demonstrate key determinants of the equilibrium distribution strategy in light of donor reliance on accounting metrics of efficiency for non-profit organizations. The results also suggest that development and refinement of impact measures and/or additional rules requiring consolidated financial reporting can reduce bureaucratic layers in charity supply chains, instead favoring more direct provision of services.

APPENDIX

PROOF OF PROPOSITION 1. The program expenses in period t are given by:

$$p_t = d_t - F - k - \frac{A}{n},\ t = 1,\ldots,T, \text{ and } p_0 = 0. \tag{1}$$

The donations received in period t are:

$$d_t = \alpha + \beta p_{t-1},\ t = 1,\ldots,T. \tag{2}$$

Using p_{t-1} from (1) in (2) yields:

$$d_t = \alpha + \beta\left[d_{t-1} - F - k - \frac{A}{n}\right] = \left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right] + \beta d_{t-1}. \tag{3}$$

Using (3), d_{t-1} can be expressed as a function of d_{t-2}, and making this substitution in the right-hand-side of (3), d_t can be expressed as a function of d_{t-2}. Using similar iterative substitutions d_t in (3) can be written as:

$$d_t = \left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right]\left[1 + \beta + \beta^2 + \ldots + \beta^{i-1}\right] + \beta^i d_{t-i},$$

$$= \left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right]\left[\frac{1-\beta^i}{1-\beta}\right] + \beta^i d_{t-i},\quad i = 0,1,\ldots,t-1;\ t = 1,\ldots,T. \tag{4}$$

With $p_0 = 0$, from (2), $d_1 = \alpha$. This, when combined with $i = t-1$ in (4), yields:

$$d_t = \left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right]\left[\frac{1-\beta^{t-1}}{1-\beta}\right] + \alpha\beta^{t-1},\ t = 1,\ldots,T. \tag{5}$$

Using (5),

$$\begin{aligned} d_t - d_{t-1} &= \left(\left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right]\left[\frac{1-\beta^{t-1}}{1-\beta}\right] + \alpha\beta^{t-1}\right) - \\ &\quad \left(\left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right]\left[\frac{1-\beta^{t-2}}{1-\beta}\right] + \alpha\beta^{t-2}\right) \\ &= \left[\alpha - \beta\left(F + k + \frac{A}{n}\right)\right]\beta^{t-2} - \alpha\beta^{t-2}[1-\beta] \\ &= -\left(F + k + \frac{A}{n}\right)\beta^{t-1} + \alpha\beta^{t-1} = \beta^{t-1}\left[\alpha - F - k - \frac{A}{n}\right],\quad t = 2,\ldots,T. \end{aligned} \tag{6}$$

From (6), $d_t = d_{t-1} + \beta^{t-1}[\alpha - F - k - A/n]$. This completes the proof of Proposition 1. ■

PROOF OF PROPOSITION 2. Using d_t from (5):

$$\sum_{t=1}^{T} d_t = \left[\frac{\alpha - \beta(F + k + A/n)}{1-\beta}\right]\left[T - \frac{1-\beta^T}{1-\beta}\right] + \alpha\left[\frac{1-\beta^T}{1-\beta}\right]. \tag{7}$$

Taking the derivative of (7) with respect to n yields:

$$\frac{\partial \sum_{t=1}^{T} d_t}{\partial n} = \frac{A\beta[T(1-\beta) - (1-\beta^T)]}{[1-\beta]^2 n^2}. \tag{8}$$

The term $[T(1-\beta) - (1-\beta^T)]$ in the numerator of the right-side-hand of (8) is decreasing in β and, at $\beta = 1$, its value is 0. Hence, $[T(1-\beta) - (1-\beta^T)] > 0$ for $0 \le \beta < 1$, and the derivative in (8) is non-negative. Turning to part (ii), when donations are tied to mission impact, (1) and (2) are replaced by the two equations in (9):

$$m_t = d_t - F - nk - A, \text{ and } m_0 = 0, \text{ and}$$

$$d_t = \alpha + \beta m_{t-1},\ t = 1,\ldots,T. \tag{9}$$

Again using the iterative substitution process employed in the proof of Proposition 1, the analog to (5) is:

$$d_t = \left[\alpha - \beta(F + nk + A)\right]\left[\frac{1-\beta^{t-1}}{1-\beta}\right] + \alpha\beta^{t-1},\ t = 1,\ldots,T. \tag{10}$$

Using (9) and (10):

$$\sum_{t=1}^{T} m_t = \left[\frac{\alpha - \beta(F + nk + A)}{1-\beta}\right]\left[T - \frac{1-\beta^T}{1-\beta}\right] + \alpha\left[\frac{1-\beta^T}{1-\beta}\right] - T[F + nk + A]. \tag{11}$$

From (11), and $[T(1-\beta) - \beta(1-\beta^T)] > 0$, it follows that:

$$\frac{\partial \sum_{t=1}^{T} m_t}{\partial n} = -\frac{k[T(1-\beta) - \beta(1-\beta^T)]}{[1-\beta]^2} < 0. \tag{12}$$

This completes the proof of Proposition 2. ■

PROOF OF PROPOSITION 3. Using total donations from (7), the total mission impact equals:

$$\sum_{t=1}^{T} m_t = \left[\frac{\alpha - \beta(F + k + A/n)}{1-\beta}\right]\left[T - \frac{1-\beta^T}{1-\beta}\right] + \alpha\left[\frac{1-\beta^T}{1-\beta}\right] - T[F + nk + A]. \tag{13}$$

Using (13),

$$\frac{\partial^2 \sum_{t=1}^{T} m_t}{\partial n^2} = -\frac{2A\beta[T(1-\beta) - (1-\beta^T)]}{[1-\beta]^2 n^3} < 0. \tag{14}$$

Given concavity noted in (14), it follows that the charity chooses to be a direct service provider if $\partial \sum_{t=1}^{T} m_t / \partial n \leq 0$ when evaluated at $n = 1$; else, it chooses to set $n > 1$. Using (13),

$$\frac{\partial \sum_{t=1}^{T} m_t}{\partial n} = \frac{A\beta[T(1-\beta) - (1-\beta^T)]}{[1-\beta]^2 n^2} - kT. \tag{15}$$

From (15),

$$\left.\frac{d \sum_{t=1}^{T} m_t}{dn}\right|_{n=1} \leq 0 \quad \Leftrightarrow \quad \frac{\beta[T(1-\beta) - (1-\beta^T)]}{T[1-\beta]^2} \leq \frac{k}{A}.$$

This completes the proof of Proposition 3. ■

PROOF OF PROPOSITION 4. n^* is the n-value that maximizes $\sum_{t=1}^{T} m_t$ in (13). Given the condition in part (ii) of Proposition 3 is satisfied and, from (14), the concavity condition holds, it follows that the solution is interior and obtained by solving the first-order-condition to the problem, i.e., setting $\frac{\partial \sum_{t=1}^{T} m_t}{\partial n}$ in (15) equal to 0. This yields:

$$n^* = \sqrt{\frac{A\beta[T(1-\beta) - (1-\beta^T)]}{T[1-\beta]^2 k}}. \tag{16}$$

This completes the proof of Proposition 4. ■

PROOF OF THE COROLLARY. Using (16), $T \geq 2$, and $0 \leq \beta < 1$, it follows that:

$$\frac{\partial n^*}{\partial T} = \frac{A\beta[1-\beta^T(1-T\ln\beta)]}{2n^*[1-\beta]^2 kT^2} \geq 0 \text{ and}$$

$$\frac{\partial n^*}{\partial \beta} = \frac{A[T(1-\beta)-(1-\beta^T)+\beta^T(\beta+T(1-\beta))-\beta]}{2n^*[1-\beta]^3 kT} > 0.$$

This completes the proof of the Corollary. ■

PROOF OF PROPOSITION 5. Given $m_t = d_t - F - nk - A$ with d_t in (5), the discounted mission impact equals:

$$\sum_{t=1}^{T}\lambda^{t-1}m_t = \left[\frac{\alpha-\beta(F+k+A/n)}{1-\beta}\right]\left[\sum_{t=1}^{T}\lambda^{t-1} - \sum_{t=1}^{T}(\lambda\beta)^{t-1}\right] + \alpha\sum_{t=1}^{T}(\lambda\beta)^{t-1} - [F+nk+A]\sum_{t=1}^{T}\lambda^{t-1}$$

$$= \left[\frac{\alpha-\beta(F+k+A/n)}{1-\beta}\right]\left[\frac{1-\lambda^T}{1-\lambda} - \frac{1-(\lambda\beta)^T}{1-\lambda\beta}\right] +$$

$$\alpha\left[\frac{1-(\lambda\beta)^T}{1-\lambda\beta}\right] - [F+nk+A]\left[\frac{1-\lambda^T}{1-\lambda}\right]. \tag{17}$$

From (17), it follows that $\sum_{t=1}^{T}\lambda^{t-1}m_t$ is concave in n:

$$\frac{\partial^2 \sum_{t=1}^{T}\lambda^{t-1}m_t}{\partial n^2} = -\frac{2A\beta}{[1-\beta]n^3}\left[\frac{1-\lambda^T}{1-\lambda} - \frac{1-(\lambda\beta)^T}{1-\lambda\beta}\right] < 0. \tag{18}$$

From (18), the charity's preferred distribution strategy is the larger of the boundary value ($n = 1$) or the interior value that solves $\partial \sum_{t=1}^{T}\lambda^{t-1}m_t / \partial n = 0$. Using (17),

$$\frac{\partial \sum_{t=1}^{T}\lambda^{t-1}m_t}{\partial n} = \left[\frac{A\beta}{(1-\beta)n^2}\right]\left[\frac{1-\lambda^T}{1-\lambda} - \frac{1-(\lambda\beta)^T}{1-\lambda\beta}\right] - k\left[\frac{1-\lambda^T}{1-\lambda}\right]. \tag{19}$$

Setting $\partial \sum_{t=1}^{T}\lambda^{t-1}m_t / \partial n$ in (19) equal to 0, and accounting for the boundary value of $n = 1$, yields:

$$n^*(\lambda) = Max\left\{1, \sqrt{\frac{A\beta[\lambda - \lambda^T + (\lambda\beta)^T(1-\lambda) - \lambda\beta(1-\lambda^T)]}{[1-\beta][1-\lambda\beta][1-\lambda^T]k}}\right\}. \tag{20}$$

Part (ii) follows by noting that, when $n^*(\lambda)$ is interior in (20), its derivative with respect to λ equals:

$$\frac{\partial n^*(\lambda)}{\partial \lambda} = \frac{A\beta[\lambda(1-\lambda^T)(1-\beta)(1-(\lambda\beta)^T) - T\lambda^T(1-\lambda)(1-\lambda\beta)(1-\beta^T)]}{2\lambda n^*(\lambda)[1-\beta][1-\lambda\beta]^2[1-\lambda^T]^2 k} \geq 0. \tag{21}$$

This completes the proof of Proposition 5. ■

PROOF OF PROPOSITION 6. Let n_t denote the distribution approach in period t. In this case, using the same iterative process as used in the proof of Proposition 1, the analog to (5), i.e., donations in period t, can be written as:

$$d_t = [\alpha - \beta(F+k)]\left[\frac{1-\beta^{t-1}}{1-\beta}\right] - \beta A \sum_{i=1}^{t-1}\left[\frac{\beta^{i-1}}{n_{t-i}}\right] + \alpha\beta^{t-1},\ t = 1,\ldots,T. \tag{22}$$

Thus, at time t, the remaining mission impact equals:

$$\begin{aligned}\sum_{j=t}^{T} m_j = \left[\frac{\alpha - \beta(F+k)}{1-\beta}\right]\left[(T-t+1) - \frac{\beta^{t-1} - \beta^T}{1-\beta}\right] - \beta A \sum_{j=t}^{T}\sum_{i=1}^{j-1}\left[\frac{\beta^{i-1}}{n_{j-i}}\right] + \\ \alpha\left[\frac{\beta^{t-1} - \beta^T}{1-\beta}\right] - (T-t+1)[F+A] - k\sum_{j=t}^{T} n_j.\end{aligned} \tag{23}$$

The charity chooses n_t to maximize (23). From (23), it follows that $\sum_{j=t}^{T} m_j$ is concave in n_t. As a result, the charity's preferred distribution strategy is again the larger of the boundary value ($n_t = 1$) or the interior value that solves $\partial \sum_{j=t}^{T} m_j / \partial n_t = 0$. From (23),

$$\frac{\partial \sum_{j=t}^{T} m_j}{\partial n_t} = -k + \frac{A\beta}{n_t^2}\sum_{i=1}^{T-t}\beta^{i-1}. \tag{24}$$

Setting $\partial \sum_{j=t}^{T} m_j / \partial n_t$ in (24) equal to 0, and accounting for the boundary value of $n = 1$, yields:

$$n_t^* = Max\left\{1, \sqrt{\frac{A\beta[1-\beta^{T-t}]}{[1-\beta]k}}\right\}. \tag{25}$$

Part (ii) follows by noting that, when n_t^* is interior in (25), its derivative with respect to t equals:

$$\frac{\partial n_t^*}{\partial t} = \frac{A\beta^{T-t+1}\ln\beta}{2n_t^*[1-\beta]k} \leq 0.$$

This completes the proof of Proposition 6. ■

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