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Impure Prosocial Motivation in Charity Provision: Warm-Glow Charities and Implications for Public Funding

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ABSTRACT

We show that warm-glow motives in provision by competing suppliers can lead to inefficient charity selection. In these situations, discretionary donor choices can promote efficient charity selection even when provision outcomes are non-verifiable. Government funding arrangements, on the other hand, face verification constraints that make them less flexible relative to private donations. Switching from direct grants to government subsidies for private donations can thus produce a positive pro-competitive effect on charity selection, raising the value of charity provision per dollar of funding.

KEY WORDS: Private Provision of Public Goods, Warm Glow, Tax Incentives for Giving, Competition in the Nonprofit Sector

JEL CLASSIFICATION: H2, H3, H4, L3

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1 Introduction

What is a warm-glow charity? To the extent that charities (or the non-profit entrepreneurs who run them) are prosocially motivated, they care about what they provide. However, they also typically favour their own output relative to that of other providers – which is why, for example, they compete with charities similar to themselves for available funds. The reason why they favour their own output may be that the goods and services provided are different; but there is also ample anecdotal evidence that the preference stems from impure altruism, i.e. that non-profit entrepreneurs derive a direct benefit from being involved in non-profit provision even when what they provide is a homogeneous good.[1] So, a warm-glow charity is one that places a premium on own provision irrespectively of whether it is differentiated from that of other charities.

In this paper we show that, unlike donors' warm glow, which can promote private giving and offset incentives towards inefficiently low levels of collective good provision (Andreoni, 1988; 1990), warm-glow motives for providers can have adverse effects on allocative efficiency. If non-profit entrepreneurs are prosocially motivated, but impurely so (i.e. if they experience warm glow from their own provision), then they will face incentives to enter the non-profit sector and compete with other charities in situations where the technology they have access to is dominated by that of other charities. This gives rise to inefficient charity selection, with the result that total output is not maximized for the given resources that donors and government allocate to the non-profit sector.

In the for-profit sector, market competition in the provision of private goods and services is the standard mechanism through which positive selection of firms is promoted. This can be effective even in situations where information about technology is private to providers (which is typically the case), and even though the profit maximizing objectives of firms are in structural opposition to the utility maximizing objectives of consumers and objectives of other firms. Competition in the non-profit

[1] This is often reflected in charities' mission statements. To give an example, one of they key objectives in St. John Cymru Wales (a first aid charity operating in Wales) is to "establish St John Wales as the first choice for first aid throughout Wales".

sector is different, for the simple reason that pricing mechanisms can no longer be used as effective selection devices. Private information about technology combined with impure prosocial motivation on the part of providers can give rise to selection failure.

Nevertheless, discretionary donor choices in a repeated funding relationship can promote efficient charity selection. As we show, sequential donations conditioned on past performance can offset the selection bias arising from impure prosocial motivation on the part of providers, and improve ex-ante charity selection – and the more so the more charities are prosocially motivated. However, this requires the conditioning to be free from verification constraints. Since private donations are fully discretionary, private donors do not face any verification constraints and are therefore able to leverage on such incentives to the fullest.

Government, on the other hand, faces verification constraints that may reduce its ability to screen efficient charities in comparison with private donors: accountability requirements with respect to the use of public funds imply that the government must design an explicit mechanism based on *verifiable* signals (which may be imperfectly correlated to observed performance), whereas private donors do not face such constraints and can therefore condition donations directly on observed performance. These verification constraints can dominate any informational advantages the government may have relative to private donors in terms of its ability to observe charity performance, with the result that private donations will be superior to government funding as a way to promote efficiency in provision.

This result relates to the ongoing debate about why tax incentives for giving are used as a significant channel for delivering public support to charities instead of relying solely on direct government grants – a question that has provoked much debate, and still does, especially in light of the steadily increasing size and importance of the charitable sector and the corresponding increase in the level of government support directed to non-profit enterprises. In our analysis, we show how the presence of impure prosocial motivation on the part of providers can provide a supply-side based rationale for the use of tax incentives for private giving: relying on tax incentives as alternatives to direct government grants may improve charity selection and performance – an effect that would remain unmeasured in empirical estimates that focus on

effects on the *cost* of provision by charities as measured by their overall budgets (their inputs) rather than the provision itself (their output). This also implies that measuring the crowding effects of government grants in terms of their effects on the volume of funding may understate their true impact on the effective (productivity-adjusted) level of provision.

Whereas the donor's problem has received considerable attention in the literature, less is known about the way in which charities' affect public good provision. The theoretical literature on conduct and performance in the not-for-profit sector has mainly focused on the relative advantages of for-profit and non-for-profit organizational forms in terms of information and agency costs, differential regulatory and tax regimes, and implications of reliance on a prosocially motivated workforce (see Hansmann, 2012, for a recent survey). The line of questioning in this paper is related to that literature, but its specific focus is on the implications of impure prosocial motivation in provision on charity selection and output – an aspect that has so far not been examined by the literature. It is also closely related to the the literature on the relationship between donor choices in the presence of information constraints (Vesterlund, 2003; Potters *et al.*, 2005, 2007), and to the literature debating the effects of alternative modes of government funding on levels of donations (e.g. Andreoni and Payne, 2001; Feldstein and Clotfelter, 1976).

The rest of the paper is organized as follows. Section 2 formalizes the idea of positive charity selection from performance-based contributions. Section 3 focuses on the comparison between private contributions and government grants. Section 4 concludes.

2 Private philanthropy and competitive charity selection

In this section we develop a simple framework for modelling competition between non-commercial, not-for profit providers of a homogeneous collective good. The setting abstracts from a number of important aspects of real-world competition between charities (e.g., product differentiation, commercial activities, scale economies in provision, contracting problems within charities) in order to highlight the distinctive features of the mechanism through which non-commercial, not-for-profit firms

compete and are selected. The key features of this selection mechanism are: (i) charities can choose whether or not to participate in provision; (ii) charities are prosocially motivated but value their own provision more than that of other charities; (iii) charities differ in terms of their productive efficiency and funders are ex ante unable to observe a charity's productivity type; (iv) ex post, upon observing how the charity has performed, funders can choose to divert their funds towards another charity. In this framework, the selection of charity productivity types – and the resulting level of productivity of funds directed to them – is an equilibrium outcome, which can be affected by the mode of funding.

This section focuses on private contributions only. In the next section, we also discuss government grants and contrast them with private contributions in terms of their informational requirements and their implications for charity selection.

Warm-glow charities and private donors

Consider an economy where there are charities and private contributors. Suppose that there is a continuum of different charity types, with a constant mass of charities for each type. Charities use resources from private contributions to provide a collective good, and differ from each other only with respect to the probability that the provision they carry out will succeed in its aims. A charity of type π ($0 \leq \pi \leq 1$) that uses a given amount of resources to provide a collective good will be successful in provision with probability π and unsuccessful (i.e. no provision follows from the resources used) with probability $1 - \pi$. Assuming, without loss of generality, that the unit cost of provision is equal to unity, then expected provision per unit of expenditure for the charity is thus π. Charities of different types are uniformly distributed in $(0, \overline{\pi}]$, $\overline{\pi} \leq 1$.[2] Throughout the rest of this section, we assume that output is perfectly

[2]The probability of success, π, plays an analogous role here as provision quality does in other frameworks (e.g., Glaeser and Schleifer, 2001). The main advantage of modelling performance in this way is that – as shown later – this specification yields a simple and convenient representation of informational asymmetries. The zero-one (failure-success) formulation is without loss of generality – our analysis and results would carry through to a formulation where a low output/low quality outcome does not entail complete failure (zero output).

observable; this will be relaxed in the following section. Without loss of generality, and to simplify the presentation, we assume $\overline{\pi} = 1$.

Private contributors value expected provision – and thus favour more successful charities over less successful ones – but otherwise view provision by one charity as a perfect substitute for provision by another charity (the extreme case of perfect substitution is a convenient benchmark). The overall level of expected provision from the point of view of an individual, i, contributing an amount c_i is thus

$$e_i c_i + G_{-i}, \tag{1}$$

where G_{-i} is expected provision through contributions by individuals other than i, and e_i is the expected provision per unit value of i's contribution.

Charities, on the other hand, derive warm glow from their own provision relative to that of other charities, in the sense that they value the overall provision of the public good or service but also derive an additional benefit from their own contribution to the provision. As Andreoni (1989) puts it, this additional benefit stems from a feeling of having "done one's bit" – an effect that his original contribution invokes with reference to donors' motives but which can equally apply to the motives of charities' managers. It may well be that the premium that charities attach to own provision is due to the presence of 'ego rents' for managers or trustees or from pecuniary motives of managers that relate to the size of the organization (for example, managers can draw a salary from their activities even if the activity itself is not for profit) – and indeed others have characterized charities' objective as being revenue maximization (e.g. Hansmann, 1981) or a mixture of pure prosocial and revenue maximization motives (e.g. Philipson and Posner, 2009); but from a modelling perspective, as well as in observational terms, this alternative interpretation is fully equivalent to the more benign characterization of charities' motives being shaped by warm-glow effects.[3,4]

[3]Additionally, managers can move between the for-profit and non-profit sectors, and often do so, but managerial salaries in the third sector are typically lower than they are in the for-profit sector for comparable qualifications ("Wages in the nonprofit sector: Management, professional, and administrative support occupations" Amy Butler, Bureau of Labor Statistics, 2009), suggesting that managers are indeed themselves prosocially motivated.

[4]Both "true" warm-glow motives or pecuniary motives relate to impure altruism, but it may also

The expected payoff to a charity j of type π_j using funds w_j to provide the collective good is thus equal to

$$(1+\mu)\pi_j w_j + G_{-j}, \tag{2}$$

where G_{-j} is expected provision by all charities other than j, and $\mu > 0$ is the premium on own provision.

The following discussion focuses on scenarios that involve two time periods, 1 and 2. The sequence of choices is as follows: (i) at the outset, i.e. before provision occurs (time 0), charities make once-and-for all entry decisions; (ii) at the beginning of period 1, donors each select a charity and make contributions to it, after which period 1 provision then takes place; (iii) at the beginning of period 2, donors again select a charity – either the same one or a new one – and make contributions to it, after which period 2 provision takes place. For simplicity, it is assumed that there is no discounting, and that provision in the first period and provision in the second period are perfect substitutes in payoffs – both for charities and for contributors.[5]

Charity choice and private contributions

Private contributors' payoffs in each of the two periods (stages (ii) and (iii)) depend positively upon the expected marginal productivity of their own contribution. In turn, this depends upon the number of successful charities. As donors are identical, the focus is on the choices of a representative donor, contributing an amount c in each of the two periods (the same in both periods). For the time being, and in order to isolate the selection mechanism at work, assume c to be exogenously given (the case where the level of donations is endogenous is examined in Section 3).

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be that non-profits view own provision as an imperfect substitute for that of other charities. This interpretation, however, does not alter our arguments, as long as charities' preferences diverge from those of donors and managers as a group represent a negligible fraction of the total population of donors and managers.

[5]Linearity of costs and payoffs implies that the structure of the problem is independent of whether a charity is receiving donations from multiple donors, or of whether different donors are giving to different charities.

If the contributor can identify, ex ante, each charity's probability of success, she will only give to a charity of type $\overline{\pi} = 1$ in both periods – this delivers the highest expected level of provision per unit value of funding.

If the contributor cannot observe charity types ex ante, then she cannot identify which charities are the most effective type and so she will have to make a random selection. Suppose that the contributor believes that the set of active charities is $P \subset (0, 1]$ – a belief that will be consistent with charities' behaviour in equilibrium.[6] If, after having selected a charity in the first period, the contributor experiences failure, she will unilaterally choose to switch to another charity in the second period since the expected output, $E_{\pi \in P}[\pi] \equiv E_P[\pi]$, from a new random selection always weakly exceeds that from renewing a contribution to a charity that has failed.[7,8]

Competition and selection

Given their probability of success, charities choose to be active in providing the collective good only if the expected payoff from doing so exceeds the expected payoff from not participating. This entry choice (stage (i)) is made by charities once-and-for-all, at the outset.[9]

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[6]For the purposes of defining a charity's incentives, the set P need not be assumed to be an interval; however, as will be shown, P is an interval in equilibrium.

[7]If a new charity is picked at random, its expected type (and expected level of output) is $E_P[\pi]$. The expected type of a charity that has been picked at random *and* has been observed to fail (using Bayes' Rule and after taking expectations) is $E_{\pi' \in P}\big((1-\pi')\pi' / E_{\pi \in P}[1-\pi]\big)$. This can be expanded as $E_P[(1-\pi)\pi] / E_P[1-\pi]$, which is equal to $\big(E_P[\pi] - E_P[\pi^2]\big) / \big(1 - E_P[\pi]\big)\big)$; this is less than or equal to $\big(E_P[\pi] - E_P[\pi]^2\big) / \big(1 - E_P[\pi]\big) = E_P[\pi]$ – since $E_P[\pi^2] \leq E_P[\pi]^2$ (given $0 \leq \pi \leq 1$) – implying that the contributor is made no worse off by switching. If P consists of the single point $\pi = 1$, the above updating rule is formally degenerate, but no Bayesian updating following failure will occur in equilibrium.

[8]There is evidence of significant switching in private giving, though this may be due to reasons other than perceived performance (The Urban Institute, 2011); but there is also direct evidence that perceived quality is a factor (Sargeant and Woodliffe, 2007).

[9]In this setting, a single collective good is provided. This implies that a charity that chooses not to enter is fully inactive. In a less abstract setting where multiple forms of collective provision are

Consider a charity of type π'' facing the choice of whether or not it should join the pool of active charities, P. If it chooses to enter, then there is a realization of the state of the world in which it is selected to receive funding in the first period. If this occurs, it will receive a payoff of $(1+\mu)\pi''c$ in the first period, and, in the second period, it will be selected again with probability π'', and so will obtain a further expected payoff of $(1+\mu)\pi''c$, but will not selected again with probability $1-\pi''$, in which case another charity will be selected instead by the donor, resulting in a further expected payoff equal to c times $E_P[\pi]$ – the expected level of provision per unit of funding of a random selection from the set of participating charities. If the charity chooses not to enter, then, for the same realization of the state of the world in which it would have been selected, an alternative charity is selected from P at random at the the beginning of the first period.

If $\mu > 0$, a non-empty, continuous interval of charity types that will choose to be active in provision can then be identified:

Proposition 1 *When information about charity types is private, the range of charity types that choose to participate in collective provision consists of an interval, $[\widetilde{\pi}, 1]$, that includes the most productive charity type and some less productive types.*

PROOF: The sequence of actions is as follows: (i) each charity decides whether or not to enter, given its beliefs about the entry/exit choices of other charities; (ii) a charity is selected at random and receives funding, c, in the first period; (iii) the realization of first-period provision is observed by the donor, who can renew funding to the same charity, or fund another charity newly selected at random; (iv) the realization of second-period provision is observed.

The expected payoff at (ii) to a charity of type π'' that has chosen to enter and is selected at (ii) is $c\big((1+\mu)(\pi''+(\pi'')^2)+(1-\pi'')E_{\pi\in P}[\pi]\big)$. If the charity chooses to be inactive, it always faces an expected payoff of $E_{\pi'\in P}\big[(\pi'+(\pi')^2)+(1-\pi')E_{\pi\in P}[\pi]\big]c \equiv \Phi(P)c$. To compare expectations at (i), both expressions must be multiplied by the ex-ante probability of a given charity being selected – a zero-measure probability event in itself (but *not* a zero-probability event) – which however has no effect on the comparison. Consider then a charity

present (e.g. social services, support to arts and culture, education), a charity may be engaged in multiple activities and may choose to enter certain areas and not others depending on its comparative productivity in each of those areas.

type, $\widetilde{\pi}$, that is indifferent between entry and non-entry, i.e. such that

$$(1+\mu)(\widetilde{\pi}+\widetilde{\pi}^2)+(1-\widetilde{\pi})E_P[\pi]-\Phi(P)\equiv\Gamma(\widetilde{\pi},\Phi(P))=0. \tag{3}$$

The derivative $\partial\Gamma(\pi,\Phi(P))/\partial\pi=(1+\mu)(1+2\pi)-E_P[\pi]$ is strictly positive for all π since $E_P[\pi]<1$. This implies that $\Gamma(\pi,\Phi(P))\geq 0$ for all $\pi\geq\widetilde{\pi}$, and $\Gamma(\pi,\Phi(P))<0$ for all $\pi<\widetilde{\pi}$. Thus, if a charity of type $\widetilde{\pi}$ is indifferent between participating or not, all charities of type $\pi\in(\widetilde{\pi},1]$ will choose to participate. In turn, this means that P, if non-empty, must consist of the interval $[\widetilde{\pi},1]$.

Next, it can be shown that for $\mu>0$, the set P is non-empty, i.e. $\widetilde{\pi}<1$. First note that the mean charity type in the interval $[\widetilde{\pi},1]$ is

$$m(\widetilde{\pi})=E_{[\widetilde{\pi},1]}[\pi]=(1+\widetilde{\pi})/2, \tag{4}$$

and that, for $P\equiv[\widetilde{\pi},1]$, the expression $\Phi(P)$ equals

$$E_P\big[(\pi+\pi^2)+(1-\pi)m(\widetilde{\pi})\big]=\frac{1}{1-\widetilde{\pi}}\int_{\widetilde{\pi}}^{1}\big((x+x^2)+(1-x)m(\widetilde{\pi})\big)dx\equiv\widetilde{\Phi}(\widetilde{\pi}). \tag{5}$$

Now, let

$$\widetilde{\Omega}(\pi)\equiv(1+\mu)(\pi+\pi^2)+(1-\pi)m(\pi)-\widetilde{\Phi}(\pi). \tag{6}$$

Since $\widetilde{\Omega}(0)=-7/12<0$, $\lim_{\pi\to 1}\widetilde{\Omega}(\pi)=2\mu>0$, and $\partial\widetilde{\Omega}/\partial\pi=(5/6)\pi+\mu(1+2\pi)+1/6>0$, then by continuity, for $\mu>0$, a value $\widetilde{\pi}\in(0,1)$ for which $\widetilde{\Omega}(\widetilde{\pi})=0$ will exist. This identifies an interval $[\widetilde{\pi},1]$ of charity types that will choose to participate. □

Note that the resulting level of expected provision per unit of contribution is increasing in $\widetilde{\pi}$. Thus, from the point of view of contributors, charity selection is better the larger is the interval, $(0,\widetilde{\pi}]$, of low-productivity charity types that choose not to enter. That is, charity selection is better the higher is $\widetilde{\pi}$; and it can be shown that the stronger the warm-glow motives of charities are, the worse is charity selection (the lower is $\widetilde{\pi}$):

Proposition 2 *When information about charity types is private, the mean productivity type of participating charities is decreasing in the intensity of charities' warm-glow motives, and converges to unity as warm-glow motives vanish.*

PROOF: Totally differentiating $\widetilde{\Omega}(\widetilde{\pi}) = 0$ with respect to μ and $\widetilde{\pi}$, we obtain

$$\frac{\mathrm{d}\widetilde{\pi}}{\mathrm{d}\mu} = -\frac{\partial\widetilde{\Omega}/\partial\mu}{\partial\widetilde{\Omega}/\partial\widetilde{\pi}} = -\frac{\widetilde{\pi}+\widetilde{\pi}^2}{(5/6)\widetilde{\pi}+\mu(1+2\widetilde{\pi})+1/6} < 0. \tag{7}$$

For $\mu = 0$, $\widetilde{\Omega}(\pi)$ equals $-\big((5/6)\widetilde{\pi}+7/6\big)(1-\widetilde{\pi})/2$, whose only positive root is $\widetilde{\pi} = 1$. □

To put the above mechanism in perspective, compare the non-profit scenario above with one that features for-profit firms that only differ from one another in terms of the quality of their output – represented in terms of the probability with which the goods they produce deliver actual "consumption services" to buyers.[10] Even if the success rate of a firm's output is unobservable to consumers, if the outcome of first-period purchases is observable before second-period purchases are made, fully efficient selection of firms can result from competitive bidding via the price mechanism, as long as some of the costs of second-period provision are incurred in the first period:[11] if, after observing failure in the first period, a consumer switches to a different provider, then expected revenues (and thus profits) will be comparatively lower for less effective firms. For-profit competition between firms for profits will then bid down the price of the good until only the most effective firms remain and break even.[12]

In the case of competition between charities, the absence of price competition means that switching to an alternative charity after perceived failure cannot produce the same degree of selection – a less effective charity can still choose to enter even if it faces a lower probability of raising funds in the second period. Fully mimicking the selection effects of competition in markets for private goods would require charities to run a surplus of which they are interested residual claimants. This, how-

[10]If success is interpreted as quality, then in this setting quality would only observed after a private purchase is made.

[11]Investment costs have been abstracted from in the model because, given the other assumptions, the presence of such costs is inconsequential for the case of competition between charities.

[12]Clearly, managers of for-profit firms can also be driven in part by purely or impurely prosocial motives; however, the presence of a for-profit motive will reduce the comparative weight of other motives – which is all that is required for our comparative characterization of the equilibrium selection of charities relative to that of for-profit firms.

ever, would mean departing from a not-for-profit objective (in the absence of a profit motive, any potential surplus is devoted to provision, and therefore cannot give rise to price competition), which in the context of collective goods can give rise to moral hazard in provision.

Thus discretionary choices by private donors can promote efficient selection in the provision of collective goods and services, but not as effectively as consumer choices can do with respect to private goods and services.[13]

3 Government grants and incentives for private giving

In this section we contrast private contributions and government grants with respect to their comparative effectiveness at promoting positive selection of charities. We then draw implications for the selection effects of changes in the composition of public financial support for charitable activities. As we noted in the introduction, the crucial difference between private contributions and direct government grants is that the latter face verification constraints that the former do not face.

Governments in developed countries support charitable activities either through direct government grants or by channeling funding through tax incentives (subsidies) for private giving. The question of why governments rely on tax incentives has provoked much debate, and still does.[14] Since tax relief lowers the price of giving for donors, there is a presumption that the rationale of tax incentives is to encourage private giving and boost charity funding – compared to direct government grants, tax incentives may result in a higher overall level of charity funding for the same amount of public funds. The main challenge to this interpretation comes from avail-

[13]It can be shown that the above selection mechanism can be strengthened if, instead of making an unconditional contribution in both periods, contributors offer charities a contribution pledge that also conditions the amount contributed *to any charity* in the second period on the first period outcome. This further leverages on the prosocial motivation of charities to lower entry incentives for inefficient charities. However, such a mechanism relies on a potentially empty threat by contributions, i.e. it is not renegotiation-proof.

[14]Research that has focused attention on this question includes that of Feldstein and Clotfelter (1977), Warr (1982), Roberts (1987), Scharf (2000), and Horstmann *et al.* (2007).

able evidence on donor responses. Empirical evidence suggests less-than-full crowding out of donations by direct government grants: Andreoni and Payne (2001) estimate crowding out of fundraising by direct grants to be around 25 percent.[15] When combining this with available estimates of the price elasticity of giving, it would seem that there is *not* a strong *prima facie* case for tax incentives over direct grants as a way of supporting charities, i.e. that one dollar of public funds will raise provision more if channelled through subsidies than if given as a direct grant.[16]

As we show below, when charities' entry decisions are shaped by impure prosocial motivation, donation subsidies can dominate direct government grants even when they make no difference to the overall level of funding available to charities.

Information and verification constraints

For-profit businesses typically produce goods and services that are provided to and are consumed by their paying customers. In contrast, charities' activities often involve provision of services to third parties, which makes observing performance and quality more difficult. Nevertheless, one could argue argue that, if private contributors are also end users of the collective goods provided by charities, they may be

[15]When changes in fundraising costs are taken into account this estimate has been shown to be even higher (up to 60 percent in Andreoni and Payne, 2011).

[16]To see this, consider the case of a charity receiving $1,000 in total funding, some of it from private donations and some of it from direct government grants. If we take a $-.5$ estimate for the price elasticity of giving, and a .25 estimate for the crowding-out effect of fundraising by direct grants, then a back-of-the-envelope calculation suggests that diverting $1 of direct grants to fund subsidies to private contributions, starting from zero subsidies, would generate a net decrease of approximately 25 cents in total funding. Assume that the combined effect of an increase in subsidies and a reduction in grants can be assessed as the combination of the effects from separate changes in subsidies and grant reductions; then the $1 decrease in direct grants would be offset by a $.25 increase in donations stemming from a reduction in the direct crowding-out effects of grants, and by an increase of $.50 in gross donations stemming from the subsidy that could be funded by $1. One could arrive at a positive net effect by taking upper-range estimates of crowding out and giving elasticities, but this effect remains quite small. Also, on the basis of the aforementioned elasticity estimates, incorporating second-best optimal tax considerations in the presence of endogenous labour supply decisions (Saez, 2004; Diamond, 2006) does not substantially affect conclusions.

in a better position to observe performance than government is. But one can also think of many situations where government would have an informational advantage over private donors and would be in a better position to monitor how funds are used than private contributors are – for example, in the case of cross-border charitable activities.[17] Ultimately, whether it is government or private donors that are in a better position to observe performance is an empirical matter, and is likely to vary by charity type.

However, the design and enforcement of incentive structures does not only depend on the respective parties' ability to observe informative signals of performance. What matters is whether funding can be conditioned on those signals. In this respect, an essential feature of private contributions is that they do not give rise to bilaterally binding and enforceable arrangements. They are unilateral undertakings on the part of donors, and as such they impose minimal verification requirements on them. Private contributions are fully discretionary, and private contributors are therefore free to condition their contributions on perceived performance without facing any legal/contractual constraints. There is thus nothing preventing private contributors from increasing or reducing their contribution according to any signal they choose to use for this purpose; and once the signal is chosen, private contributors unilaterally assess its realization, and this determination cannot be questioned by the charity.

This is not the case for government, which is accountable to other public bodies and voters. Any conditional granting arrangement on the part of the government thus needs to specify explicit performance criteria and include a formal assessment process involving objective indicators of performance that must be verifiable by others.[18] Performance-related, direct funding arrangements involving government are thus more akin to actual bilateral contracts, involving bilateral obligations and bilaterally binding verification criteria; and so, even if the government may be able to

[17] This is evidenced by the recurring calls for governments to monitor international aid programmes in response to allegations of scandals and corruption in such programmes.

[18] There are many examples of this relating to the funding of both private and public organizations. For example, public funding of educational institutions is conditioned on measured performance, and involves formal verification through testing, monitoring, and inspection, all of which must be carried out according to certain well-specified procedures.

observe the same signals of performance that contributors can, these signals may be too difficult or too costly to verify for government.

A case in point is given by medium-term government funding arrangements for charities. These typically take the form of multi-period awards with intermediate verification requirements (e.g. progress reports) that tie the recipient to specific, measurable targets but also prevent arbitrary termination. In the U.S., for example, the relationship between government and grant holders is governed by federal provisions (Office of Management and Budget Circular A-110, Revised 11/19/93, as Further Amended 9/30/99, on the Administrative Requirements for Grants and Agreements With Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations) that set specific rules for the monitoring and reporting of program performance (par. 51) and for the termination of grants and the enforcement of granting conditions (pars. 61 and 62), explicitly giving grant recipients a right to hearings and appeals.

In relation to our model, this means that in any funding arrangement involving government, second-period funding can only be conditioned on *verifiable* (rather than just observable) signals. Thus, even if government has a monitoring advantage over private donors, the intrinsically tighter verification constraints government funding arrangements face can make channelling funds through private contributors more effective at promoting efficient charity selection than direct government grants.

This idea can be modelled as follows. Suppose that government and private donors receive distinct, informative signals about first-period provision outcomes, denoted with $\sigma_D \in \{0,1\}$, $D \in \{Z,C\}$, where Z stands for government and C for private contributors.[19] Such signals are positively correlated with success in provision: a signal $\sigma_D = 1$ is sent with probability one if output is positive, but it can also be sent "by mistake" when output is zero, in which case a signal $\sigma_D = 1$ is sent (and received) with probability $1 - \eta_D$, $\eta_D \geq 0$, $D \in \{Z,C\}$ and a signal $\sigma_D = 0$ is sent (and received) with probability η_D. Thus, a signal $\sigma_D = 1$ is sent by a charity of type

[19]The idea that donors are not necessarily aware of the quality/productivity of non-profit organizations and use imprecise signals to condition their donations has been examined elsewhere (Vesterlund 2003, Potters *et al.* 2005, 2007), but not with reference to the efficient selection of warm-glow charities.

π with probability $\pi + (1-\pi)(1-\eta_D) \equiv \rho_D(\pi) > \pi$.

Furthermore, assume that, conditional on actual realized performance, the signal received by government and that received by private contributors are statistically independent – i.e. although the signals are positively correlated with performance (and hence are correlated with one another), the noise component attached to each signal is uncorrelated across signals.

Next, suppose that the signals σ_D, $D \in \{Z, C\}$, are imperfectly verifiable by third parties. Namely, the mapping from the observable signals to a verifiable signal $\varphi_D \in \{0,1\}$, $D \in \{Z, C\}$, involves further noise: if $\sigma_D = 1$, the verifiable signal is $\varphi_D = 1$ with probability one; if $\sigma_D = 0$, the verifiable signal is also $\varphi_D = 0$ with probability $1 - \xi$, but it is $\varphi_D = 1$ with probability ξ (in other words, there will be situations where the funder perceives failure but cannot prove it to a third party). A verifiable signal $\varphi_D = 1$ is thus sent (and received) by a charity of type π with probability $\pi + (1-\pi)(1-\beta_D) \equiv \gamma_D(\pi)$, where $\beta_D \equiv (1-\xi)\eta_D < \eta_D$.

Since performance-related private donations are fully discretionary, and are made as part of an *implicit* contract that is unenforceable by a third party, private donors can condition their repeated funding directly on σ_C. Government, on the other hand, can only condition repeated funding on the verifiable signal, φ_Z. Thus, even if government has an informational advantage in its ability to observe performance ($\eta_Z > \eta_C$), if the verification constraints government faces are significant enough (ξ is large enough), the observable signal that private donors can rely on to condition their funding may be more informative than the verifiable signal that government can rely upon, i.e. it can be the case that $\beta_Z < \eta_C$ even if $\eta_Z > \eta_C$.

Direct government grants and contribution incentives

If, owing to verification constraints, government is less flexible than private donors in conditioning funding on observed performance, then a shift of funding from government grants towards subsidies to private donors can increase the overall conditional element of funding, which improves selection and raises the level of expected provision per unit of funding.

This possibility can be highlighted by focusing on a two-period scenario where charities receive a combination of private contributions, C, and government grants, Z.

Suppose that private contributions are C in each period and that, in each period, the government can dispose of some funds, F, to be used for supporting provision by a charity. If it engages in direct funding, it can supplement the total private contribution C with direct grants to the charity, $Z = F$. Alternatively, it can use a fraction, $F - Z$, of the funds to subsidize private contributions at a rate $s = (F - Z)/C$ per unit value of contribution,[20] dispersing the remaining funds as direct grants.

Then, if $\beta_Z < \eta_C$, a shift of funding from government grants towards subsidies to private donors results in an increase in the overall conditional element of funding, which improves selection and raises the level of expected provision per unit of funding:

Proposition 3 *When the* non-verifiable *signal of performance that is received by private contributors is more informative than the corresponding* verifiable *signal received by government, an increase in direct government funding of charities widens the range of participating charity types, whereas an increase in gross private contributions lowers it.*

PROOF: Consider a situation where, if a charity is selected at the outset, it receives both private and government funding. For each, renewal of funding in the second period is conditioned on a signal of performance – an unverifiable signal σ_C for private donations and a verifiable signal φ_Z for government grants. Since the probabilities $\rho_C(\pi)$ and $\gamma_Z(\pi)$ (as previously defined) of receiving a positive signal are each increasing in π, such conditioning is individually rational for funders – the expected type of a provider who sends a positive signal is greater than that of a provider selected at random from the set of participating providers.

Suppose first that the charity only receives private funding at level $C = 1$. The expected payoff of a charity of type π'' that has chosen to be active and has been selected can be expressed as

$$(1+\mu)\pi''\left(1+\rho_C(\pi'')\right) + E_P[\pi]\left(1-\rho_C(\pi'')\right). \tag{8}$$

If the charity chooses not to participate, the corresponding payoff is

$$E_P\Big[\pi\left(1+\rho_C(\pi)\right) + E_P[\pi]\left(1-\rho_C(\pi)\right)\Big]. \tag{9}$$

[20]This is how tax relief is implemented in the UK: private contributions are augmented by government funding at a matching rate that corresponds to the basic rate of income taxation. Irrespectively of how it is implemented, tax relief can always be equivalently modelled as a contribution subsidy.

By the same arguments presented in the proof of Proposition 1, the set of participating charities will consist of an interval, $[\widehat{\pi}, 1]$. And, as in the Proof of Proposition 1, we define

$$\widehat{\Omega}_C(\pi) = (1+\mu)\pi\left(1+\rho_C(\pi)\right) + \frac{1+\pi}{2}\left(1-\rho_C(\pi)\right) - \frac{1}{1-\pi}\int_{\pi}^{1}\left(x\left(1+\rho_C(x)\right) + \frac{1+\pi}{2}\left(1-\rho_C(x)\right)\right)dx. \tag{10}$$

The borderline type $\widehat{\pi}_C$ is then identified by $\widehat{\Omega}_C(\pi) = 0$, which gives

$$\widehat{\pi}_C = \frac{(5/6)\eta_C - (1+\mu(2-\eta_C)) + (1/3)\Big(12\mu(3-\eta_C) + 9(1+\mu^2(2-\eta_C)^2)\Big)^{1/2}}{(5/6)\eta_C + 2\mu\eta_C}. \tag{11}$$

Differentiating this with respect to η_C, and using using (11) to simplify the resulting expression, we can write

$$\frac{d\widehat{\pi}_C}{d\eta_C} = (1-\widehat{\pi}_C)\,\frac{-\big(1+\mu(2-\eta_C)\big) + (1/3)\Big(12\mu(3-\eta_C) + 9\big(1+\mu^2(2-\eta_C)^2\big)\Big)^{1/2}}{2\eta_C\big(1-(5/6)\eta_C(1-\widehat{\pi}_C) + \mu(2-\eta_C) + 2\mu\eta_C\widehat{\pi}_C\big)}. \tag{12}$$

The denominator is positive – as $(5/6)\eta_C(1-\widehat{\pi}_C) < 1$ – and the expression in the numerator is positive – noting that $\Big(12\mu(3-\eta_C) + 9\big(1+\mu^2(2-\eta_C)^2\big)\Big)^{1/2} > \Big(9\big(1+\mu^2(2-\eta_C)^2\big)\Big)^{1/2} > 3\big(1+\mu(2-\eta_C)\big)$ – and so $d\widehat{\pi}_C/d\eta_C > 0$: a higher η_C (a more informative signal) translates into tighter selection.

Analogously, with reference to government grants, also considered in isolation from private funding, we can define

$$\widehat{\Omega}_Z(\pi) = (1+\mu)\pi\left(1+\gamma_Z(\pi)\right) + \frac{1+\pi}{2}\left(1-\gamma_Z(\pi)\right) - \frac{1}{1-\pi}\int_{\pi}^{1}\left(x\left(1+\gamma_Z(x)\right) + \frac{1+\pi}{2}\left(1-\gamma_Z(x)\right)\right)dx. \tag{13}$$

The borderline type $\widehat{\pi}_Z$ is then identified by $\widehat{\Omega}_Z(\pi) = 0$. As for private funding, this is increasing in β_Z. In turn, this means that in a scenario with $\beta_Z < \eta_C$ we must have $\widehat{\pi}_Z < \widehat{\pi}_C$.

Now consider a mix of funding from private donors, at level C, and from government, at level Z. We define

$$\widehat{\Omega}(\pi) = T\Big(\theta_Z\widehat{\Omega}_Z(\pi) + (1-\theta_Z)\widehat{\Omega}_C(\pi)\Big); \tag{14}$$

where $T = Z + C$ is total expected funding and $\theta_Z = Z/T$ is the share of direct government funding in total expected funding. Since $\widehat{\Omega}(\pi)$ is a convex combination of $\widehat{\Omega}_C(\pi)$ and $\widehat{\Omega}_Z(\pi)$,

by the monotonicity results we have just established, the borderline type $\widehat{\pi}$ for which $\widehat{\Omega}(\pi) = 0$ will be such that $\widehat{\pi}_Z < \widehat{\pi} < \widehat{\pi}_C$; this in turn implies $\widehat{\Omega}_C(\widehat{\pi}) < 0 < \widehat{\Omega}_Z(\widehat{\pi})$. Then,

$$\frac{\partial \widehat{\Omega}(\widehat{\pi})}{\partial \theta_Z} = T\big(\widehat{\Omega}_Z(\widehat{\pi}) - \widehat{\Omega}_C(\widehat{\pi})\big) > 0, \tag{15}$$

implying

$$\frac{d\widehat{\pi}}{d\theta_Z} = -\frac{\partial \widehat{\Omega}/\partial \theta_Z}{\partial \widehat{\Omega}/\partial \pi} < 0. \tag{16}$$

Since private donations are exogenously given, government subsidies to private donations will have no effect on net donations (the case where they do is discussed in the next section). Thus, for a given level of (expected) net private funding C and a given level of total government funding, a redirection of one dollar from direct government funding towards subsidies to private contributions lowers Z by an amount S and increases expected gross private funding by S, and thus has exactly the same effect as that shown in (16). □

Then, to the extent that private contributions can be conditioned on performance more easily than government grants can – because they do not face verification constraints – channeling funding through private contributions, by granting them tax relief, could promote positive selection and thus raise expected provision and welfare even when net contributions are unaffected.[21] If the level of net private contributions, C, is taken as exogenous, then the two alternatives would result in the same level of total *funding*. However, subsidies to private contributors may be superior at promoting positive selection and thus result in a higher level of *expected provision* (as opposed to funding).[22]

[21] We have assumed that contributors cannot pool the signals that they individually receive. To the extent that such information pooling is possible, donors will be able to condition their switching choices more accurately, thus leading to even more efficient selection.

[22] Government funding arrangements that are formally direct grants but are awarded to charities only if they are able to attract private funds (matching grants) could be viewed as being similar to subsidies in their effects on selection. Upon closer scrutiny, however, there is still a significant gap between the structure of matching grants and that of contribution subsidies. Even when a government grant is awarded to match private funds that are initially secured by a charity, the flow of funds paid over time following a successful award is often not conditioned on subsequent fluctuations in private

On the other hand, there are situations where government is in a better position to monitor how funds are used than private contributors are – e.g., as previously mentioned, in the case of cross-border charitable activities. If this monitoring advantage is large enough to offset the intrinsically tighter verification constraints government grants face (if $\beta_Z > \eta_C$), then channelling funds through direct government grants could be more effective than channelling them through private contributors (the signs of (15) and (16) are reversed).[23] Broadly speaking, one would expect this to be more likely to apply to situations where a charity's activities involve delivery of goods or services to a third party (implying that funders have limited scope for directly observing performance).

In recent years, there has been a growing interest in the policy and literature debates on the measurement of performance in the provision of collective goods, both with respect to government and third sector providers (Atkinson, 2005). Our results here point to the need for refocusing this debate to account for the implications of funding modes for competition and market structure in the third sector.

Variable contributions

The discussion so far has assumed expected private contributions to be constant. Here the previous setup and results are generalized to the case where contributions vary endogenously, and may thus be sensitive to changes in the price of giving. For

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funding – indeed, one of the main attractions of government grants from the point of view of charities is that they can be relied upon to cover long-run "core" costs, which private donors are reluctant to fund (Scott, 2003). We do observe arrangements where continuation of government funding *is* conditioned on continued private fundraising; but given that government cannot commit indefinitely to match private funds, such arrangements can never be as "open-ended" as can an implicit contract with a private funder. In addition, unlike subsidies, matching government grants affect the price of giving faced by private contributors only to the extent that there is a firm ex-ante commitment on the part of government to provide a match and that this commitment is widely advertised to potential contributors before private contributions are made. Finally, despite the increasing reliance on matching grants, a significant fraction of government funding remains unlinked to private donations.

[23]Our analysis also abstracts from any costs associated with charities' fundraising efforts. Taking these into account would push the balance in favour of direct grants.

simplicity, in what follows we focus on the extreme case where $\beta_Z = 0$ and $\eta_C = 1$, i.e. where direct government grants are unconditional and private donors can perfectly observe provision outcomes – although the same conclusions would carry over to a more general setting where $\beta_Z < \eta_C$.

Consider a representative contributor with income y in both periods and making an individual contribution c, constrained to be the same in both periods; and assume the following general specification of preferences for cumulative expected private consumption, $x = y - c$, and cumulative expected collective provision, G over the two periods:

$$U(y - c, G), \tag{17}$$

where U is quasiconcave.[24] The following abstracts from any additional warm-glow motives on the giving side of the funding relationship, which may need to be invoked to rationalize any non-negligible level of giving in large groups. All of the arguments can nevertheless be readily generalized to a specification incorporating warm glow.

Let p represent the unit price of expected provision from the point of view of a donor – corresponding to the price of giving in a setting without uncertainty. This depends on the expected unit cost of expected provision, which in turn is a decreasing function, $q(\widehat{\pi})$, of the charity type cutoff point, $\widehat{\pi}$, and of the subsidy, s:

$$p \equiv q(\widehat{\pi})/(1+s). \tag{18}$$

The expected gross unit cost of expected provision, $q(\widehat{\pi})$, is the average ratio of contributions to the corresponding expected provision; i.e.,

$$q(\widehat{\pi}) = \frac{2}{E_{[\widehat{\pi},1]}[\pi] + E_{[\widehat{\pi},1]}[\pi^2] + \big(1 - E_{[\widehat{\pi},1]}[\pi]\big)m(\widehat{\pi})} \tag{19}$$

$$= \frac{13 - 3\widehat{\pi} - 9(\widehat{\pi})^2 - (\widehat{\pi})^2}{12}. \tag{20}$$

[24] Although U is assumed to be quasi-concave, the fact that cumulative expected provision, G, and cumulative expected consumption $y - c$ enter U directly as one of its argument implies risk neutrality and an perfect intertemporal substitution within the flows that are associated with each argument. Allowing for risk aversion and less than perfect intertemporal substitution complicates the analysis but does not undermine the general arguments.

A symmetric Nash equilibrium in contributions, given entry choices by charities, is characterized by

$$\frac{\partial U/\partial G}{\partial U/\partial(y-c)} = p, \tag{21}$$

with $G = \big(Z + nc(1+s)\big)/q(\widehat{\pi}) = \big(Z(1+s) + nc\big)/p$. An overall equilibrium in private contributions and entry decisions by charities is then identified by (21) and by the equilibrium selection condition, $\Omega(\widehat{\pi}) = 0$.

Even when $q(\widehat{\pi})$ is constant, an increase in s has an ambiguous sign on c. This follows from general principles, and is a standard theoretical prediction in the literature. Nevertheless, the preceding analysis directly yields the following result:

Proposition 4 *When private donations are sensitive to changes in the price of giving, private donors can perfectly observe provision outcomes, and direct government grants are unconditional, an increase in the subsidy combined with a corresponding budget-neutral decrease in direct grants can raise expected provision even when it leaves net contributions unchanged.*

PROOF: The government budget constraint is $Z + ncs - \bar{B} \equiv \Upsilon(Z,s) = 0$, where $\bar{B}$ is the overall budget. A budget-neutral increase in s then requires $(\partial\Upsilon/\partial s)ds + (\partial\Upsilon/\partial Z)dZ = 0$, i.e.

$$\frac{dZ}{ds} = \frac{n\,(c + s\,dc/ds)}{1 - ns\,dc/dZ}. \tag{22}$$

The effect $d\widehat{\pi}/ds$ of an increase in s on $\widehat{\pi}$, is found by totally differentiating the two equilibrium conditions (21) and $\Omega(\widehat{\pi}) = 0$. The total effect on net contributions is then

$$\frac{dc}{dp}\frac{dp}{ds} + \frac{dc}{dZ}\frac{dZ}{ds} = \frac{dc}{dp}\left(\frac{q'(d\widehat{\pi}/ds)}{1+s} - \frac{q}{(1+s)^2}\right) + \frac{dc}{dZ}\frac{dZ}{ds}. \tag{23}$$

The first term measures the change in contributions stemming from the change in the subsidy, and includes a direct price effect of the subsidy change (the expression $q/(1+s)^2$) as well as an indirect effect that stems from induced changes in charity selection (the expression $q'(d\widehat{\pi}/ds)/(1+s)$). The second term accounts for the crowding-in effect of a reduction in Z that makes the corresponding increase in the subsidy budget neutral (dZ/ds is defined as in (22)).

Consider then a scenario where the overall effect on c, as measured by (23), is zero. In this case, the total amount of funding available to charities $Z + nc(1+s)$ remains unchanged. Nevertheless, the effect on $\widehat{\pi}$ is just as described earlier (Proposition 3), and so an increase in s

combined with a decrease in Z that leaves both the government budget and the total funding of charities unchanged, lowers $q(\widehat{\pi})$ and raises G. □

Induced effects on selection will affect contribution levels and will thus be included in empirical measurements of responsiveness of contributions with respect to tax incentives. There will also be, however, an unmeasured effect on the efficiency of provision – the level of expected provision per unit of funding. Thus, even when the total measured effect on net contributions is zero, effective provision will rise by more than the value of the tax relief received. Therefore, there can be a rationale for offering tax relief to private giving even when a switch from direct grants to tax incentives produces no measurable effect on total funding.

4 Concluding remarks

This paper has examined the role of impure prosocial motivation in entry decisions by non-profit providers, providing a novel, supply-side related argument for why donor discretion can promote efficient charity selection. Impure altruism in charitable organizations essentially diverts funds away from more efficient charities that could provide a greater quantity of the public good. Donor discretion lowers entry incentives by less efficient charities and thus improves selection.

Our specification does not hinge on heterogeneity in preferences across contributors with respect to the form of provision that is carried out by charities – donors here are only concerned with differences in the level of expected provision delivered by different charities. Nevertheless, the argument would carry over to a setup that incorporates product differentiation, i.e. where different donors view the services provided by different charities as being imperfect substitutes, when productivity differentials are also present.[25] Although we have derived results for the case of

[25]Melitz (2003) provides the for-profit analogous of such a setup. In this kind of scenario, there would be an optimal tradeoff between preferences for variety and the costs associated with supplying multiple varieties, and the mechanism described in the simpler setup would result in too much entry (too many varieties) relative to the optimum.

a uniform distribution, the mechanism described only hinges on monotonicity of the cumulative distribution, which applies more generally.

We have also shown that, as a direct result of this mechanism, channelling government funding through subsidies to private donations may be preferable to using direct government grants: private donors face weaker verification constraints and can therefore engage in implicit funding contracts with charities that offer stronger positive selection incentives. Our analysis thus predicts that an exogenous increase in the proportion of funds that originate from private donors (either as net donations or as tax relief attached to net donations) should improve efficiency in provision through a pro-competitive selection mechanism.

This is, in principle, a testable prediction. Direct evidence on this positive selection effect on performance, however, is difficult to obtain – not least because of the problems that are inherent to the measurement of collective output in both the public and third sectors (Atkinson, 2005). Deriving indirect evidence is also challenging. One could attempt inference from evidence on market structure, but the mapping between selection and market structure is not a priori clear: selection can manifest itself not just as charities ceasing to operate, but also as a rationalization of charities' activities, i.e. charities choosing to abandon or reduce their involvement in activities where they are comparatively ineffective in order to concentrate on activities where they are comparatively more effective.[26] Thus, depending on the distribution of providers' characteristics, selection could translate into higher market concentration – if it induces exit by smaller, less effective charities – or into lower market concentration – if it induces larger charities to vacate areas of activities to accommodate entry by smaller, more effective charities. To analyze these mechanisms, future research will need to develop models of non-profit competition and entry choices with heteroge-

[26]Exit rates for charities are indeed quite low: once charities are set up, it is rare for them to formally exit. For example, Canadian panel data on charitable organizations suggests that very few charities formally terminate, wind-up or dissolve operations. In 1997 the number of active registered organizations was 63,764 with only 536 of these formally terminating, winding up or dissolving their operations. Since then, even smaller proportions of charities have chosen to formally cease their operations – over the period 1997 to 2007, there were a total of 756,429 registered active charities and only 4,817 of these became inactive, about 0.6 percent of the total.

neous provider characteristics, and combine them with data sets at the charity level that provide sufficient information to allow for structural estimation of the model's parameters.

References

Andreoni, J., 1988. "Privately provided public goods in a large economy: The limits of altruism." *Journal of Public Economics* 35, 57-73.

Andreoni, J., 1989. "Giving with impure altruism: Applications to charity and Ricardian Equivalence." *Journal of Political Economy* 97, 1447-1458.

Andreoni, J., 1990. "Impure altruism and donations to public goods: A theory of warm-glow giving." *The Economic Journal* 100, 464-77.

Andreoni, J., and A. Payne, 2001. "Do government grants to private charities crowd out giving or fundraising?" *American Economic Review* 93, 792-812.

Andreoni, J., 2007. "Charitable giving." In the *New Palgrave Dictionary of Economics, 2nd Edition*.

Andreoni, J., and A. Payne, 2011. "Is crowding out due entirely to fundraising? Evidence from a panel of charities." *Journal of Public Economics* 95, 334-343.

Atkinson, T., 2005. *Atkinson review: final report – Measurement of government output and productivity for the national accounts*. London: Palgrave.

Clotfelter, C., 1985. *Federal tax policy and charitable giving*. Chicago: University of Chicago Press.

Diamond, P., 2006. "Optimal tax treatment of private contributions for public goods with and without warm-glow preferences." *Journal of Public Economics* 90, 897-919.

Feldstein, M., and C. Clotfelter, 1976. "Tax incentives and charitable contributions in the United States: A microeconometric analysis." *Journal of Public Economics* 5, 1-26.

Glaeser, E., and A. Schleifer, 2001. "Not-for-profit entrepreneurs." *Journal of Public Economics* 81, 99-115.

Hansmann, H., 1981. "Nonprofit enterprise in the performing arts." *Bell Journal of Economics* 12, 341-361.

Hansmann, H., 2012. "Firm ownership and organizational form," in *The Handbook of Organizational Economics*, R. Gibbons and J. Roberts, eds., Princeton: Princeton University Press.

Horstmann, I., K. Scharf, and A. Slivinski, 2007. "Can private giving promote economic segregation?" *Journal of Public Economics* 91, 1095-1118.

Melitz, 2003. "The impact of trade on intra-industry reallocations and aggregate industry productivity." *Econometrica* 71, 1695-1725.

Philipson, T., and R. Posner, 2009. "Antitrust in the not-for-profit sector," *Journal of Law and Economics* 52, 1-18.

Potters, J., M. Sefton, and L. Vesterlund, 2005. "After you – Endogenous sequencing in voluntary contribution games." *Journal of Public Economics* 89, 1399-1419.

Potters, J., M. Sefton, and L. Vesterlund, 2007. "Leading-by-example and signaling in voluntary contribution games: An experimental study." *Economic Theory* 33, 169-182.

Roberts, R., 1987. "Financing public goods." *Journal of Political Economy* 95, 420-37.

Saez, E., 2004. "The optimal treatment of tax expenditures." *Journal of Public Economics* 88, 2657-84.

Sargeant, A., and L. Woodliffe, 2007. "Building donor loyalty: The antecedents and role of commitment in the context of charity giving." *Journal of Nonprofit and Public Sector Marketing* 18, 47-68.

Scharf, K., 2000. "Why are tax expenditures for giving embodied in fiscal constitutions?" *Journal of Public Economics* 75, 365-87.

Scott, K., 2003. *Funding matters: The impact of Canada's new funding regime on nonprofit and voluntary organizations*. Ottawa: Canadian Council on Social Development.

The Urban Institute, 2011. *Fundraising Effectiveness Project, 2011 FEP Donor Retention Supplement.* November 17.

Vesterlund, L., 2003. "Informational value of sequential fundraising." *Journal of Public Economics]/* 87, 627-657.

Warr, P., 1982. "Pareto optimal redistribution and private charity." *Journal of Public Economics* 19, 131-38.