Crowding Out and Effectiveness of Government Grants to Charities*

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Abstract

Should we worry about the reduction in private donations collected by a non-profit in reaction to a government grant? We present a simple model of a nonprofit founded by a social entrepreneur that decides on the allocation of her time between leisure, fund-raising, production of the public good. If the funds and time are strongly complementary inputs in the production function of the nonprofit, an increase in the government grant has the following effects: the social entrepreneur reduces her time allocated for leisure, there is a large crowding out of private donations, and, if the charity was devoting a large fraction of its time budget to fund-raising before the increase in the grant, the effectiveness of the grant in terms of increasing the production of the charity’s service is very high. These findings call into question the desirability of using the extent of crowding out as an indication of low effectiveness of government grants to nonprofits.

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1 Introduction

In most economies, a large part of public goods are provided through private channels. The organizations that carry out these activities are called "charities", "voluntary organizations", "nonprofits", "non-governmental organizations", etc. At the aggregate level, the expenditures of the nonprofit sector (using the data from 1995) reach 6.8 percent of GDP in the United Kingdom, 7.5 percent in the United States, 12.7 percent in Israel, and 15.5 percent in the Netherlands (Andreoni 2006). The domains in which they operate are extremely wide: they include international development, local public service delivery, arts, sports, higher education, environment, etc.\(^1\)

In many cases, these organizations are founded by motivated individuals that work towards a particular mission. These organizations thus constitute a considerable resource in alleviating government’s task of providing public goods. However, the flip side of the coin is that these organizations have to finance themselves (at least in part) through private donations and these donations have to raised through fund-raising activities. In financial terms, fund-raising can take up from 5 to 25 per cent of the operational budget of non-profits (Andreoni 1998).

Another key source of income of non-profits are grants given directly by the government. Understanding the effectiveness of these grants is a key policy question. One of the main associated concerns is the so-called ’crowding out’ phenomenon: the funds devoted to the provision of the nonprofit’s service increase by the amount smaller than the grant given by the government. The economic research has initially concentrated on the private donors’ response to the grant, using the main hypothesis that private donors treat their voluntary contributions and involuntary contributions in the form of the government grant as perfect substitutes (the earliest paper is Roberts 1984, for a thorough review of the theoretical and empirical studies in this line see Andreoni 2006).

In a seminal contribution, Andreoni and Payne (2003) show, however, that the main channel behind the crowding out is the change in the fund-raising activities of nonprofits. In particular, using an original instrumental variable for the variation in government grants (aggregate government transfers to the individual in the state), they find that a nonprofit that receives an increase in the government grant strategically reduces its fund-raising expen-

\(^1\)See Bilodeau and Steinberg (2006) for an extensive survey of the economic research of the operations of the donative non-profit organizations.
ditures, which leads to the so-called "fund-raising crowding-out" phenomenon: the nonprofit reduces its fund-raising activities which implies that the funds of the nonprofit increase overall, but by a smaller amount than the government grant. Based on this finding, Andreoni and Payne (2003, 2008) suggest that the government should consider using matching grants (which do not provoke fund-raising crowding out) instead of direct grants.

However, this proposition and the view towards crowding out is based on the implicit assumption that the fund-raising effort saved by a charity (in response to the direct grant) goes to some unproductive activity (e.g., the leisure of the non-profit managers) and thus does not contribute to the provision of its service. This is perhaps an overly pessimistic view of the individuals working in the charitable sector. Precisely because these are motivated individuals, they are likely to use at least part of the time saved from fund-raising to working towards their mission, i.e. providing the services outlined by their mission.²

Moreover, what the government cares about in the end is not crowding out per se, but the effectiveness of the grants in increasing the provision of the public good services of the nonprofits. In this case, the evaluation of the effectiveness of the grants should be done in terms of the output of the charitable sector (and not merely in terms of funds collected by charities).

In this paper, we build a simple model of a nonprofit organization (charity) founded by a "social entrepreneur" who can allocate her time between production of the charity’s services, fund-raising, and leisure. The production function of the charity has time and funds as complementary inputs. We study how the social entrepreneur reacts to the direct government grant. In particular, we are interested in the following questions. Is crowding out mainly driven by the social entrepreneur devoting more time to leisure or by the reallocation of the time resource away from fund-raising and towards production? Does larger crowding out mean lower effectiveness of the government grants?

We show that if the effectiveness of government grants are measured in terms of charity’s output, the presence (and the extent) of fund-raising crowding out is a misleading indicator of the grant effectiveness: even with high fund-raising crowding out, government grants can be highly effective. In fact, the crucial parameter is the degree of the complementarity of time and funds in the production function of the charity. If this complementarity is sufficiently

²Notably, Andreoni and Payne (2008) acknowledge this possibility: "Charity managers ... may see fund-raising as a 'necessary evil' and, given the chance, might prefer to divert fund-raising resources to their charitable activities" (p. 1). However, the authors do not investigate this idea further and do not consider the possibility that the time of nonprofit managers also constitutes such a resource.
strong, an increase in the government grant has the following effects. First, because a larger grant implies more funds for the output of the charity’s services, the opportunity cost of the leisure time increases; this leads to a reduction in the leisure time of the social entrepreneur (thus increasing the time budget of the charity). Second, the opportunity cost of fund-raising time also increases sharply, and this leads to a large (financial) crowding out. Finally, if the charity was devoting a large fraction of its time budget to fund-raising before the increase in the grant, low marginal productivity of funds (and the corresponding high marginal productivity of time) implies that the effectiveness of the grant in terms of increasing the production of the charity’s service is very high.

Our model does not indicate that substituting direct grants with matching grants is always a bad idea. However, it indicates that simply the theoretical possibility that the crowding out can make the case in favor of the direct grant calls for a more detailed analysis of this phenomenon, before making further policy propositions.

2 Model

2.1 Setup

Consider a non-profit organization (hereafter, charity) founded by a ‘social entrepreneur’ with 1 unit of time endowment. The charity provides a public good (hereafter, a project) using the following production function:

$$Q = Q(F, \tau),$$

where $F$ is the amount of funds devoted to the project and $\tau$ is the amount of time the founder of the charity devotes to the project. The production function (1) has diminishing marginal returns in both inputs and the two inputs are complementary (i.e. the marginal product of one input increases in the quantity of the other input):

$$Q_F > 0 > Q_{FF}, \quad Q_\tau > 0 > Q_\tau, \quad Q_{F\tau} \geq 0.$$

We allow for the non-profit entrepreneur to be partially altruistic, i.e. her utility function $U^c$ includes the part depending on output of her charity and the part that depends on leisure:

$$U^c = \alpha Q + (1 - \alpha)v(t),$$
where $\alpha$ is the weight the social entrepreneur gives to the output of her charity as compared to leisure (i.e. the measure of her altruism), $t$ is the amount of time she devotes to leisure, and $v$ is a concave function.

Funds that she collects come from fund-raising activities, which take time (denoted with $y$). Thus, behind the picture there are private donors that donate to the charity when solicited through fund-raising activities. We do not model this process explicitly in this section; instead, we keep a general fund-raising function $D(y)$. Charity entrepreneur’s time budget constraint is then

$$1 = \tau + y + t.$$  

Given the non-profit status of the charity, its budget has to satisfy the non-distribution constraint (see Weisbrod 1988):

$$D(y) + G = F + cD(y),$$  

with the left-hand side corresponding to the revenues and the right-hand side to expenditures. Here, $D$ stands for private donations the charity, $G \geq 0$ is the government grant, and $c$ is the financial cost of collecting a unit of private donation. We assume this cost to be constant.

### 2.2 Charity’s Optimal Choice

The charity’s input of funds into the production of its service is:

$$F(y, G) = (1 - c)D(y) + G.$$  

The problem of the ’social entrepreneur’ is

$$\max_{y,t} U^c(y, t; \alpha, G) = \alpha Q[F(y, G), 1 - y - t] + (1 - \alpha)v(t).$$  

The first-order conditions of this problem are

$$\frac{\partial U^c}{\partial y} = Q_F \frac{\partial F}{\partial y} - Q_\tau = 0,$$  

$$\frac{\partial U^c}{\partial t} = -\alpha Q_\tau + (1 - \alpha)\frac{dv}{dt} = 0.$$  

We can rewrite (5)-(6) as

$$Q_F(F(y, G), \tau)(1 - c)D_y = Q_\tau(F(y, G), \tau)$$  

$$(1 - \alpha)\frac{dv}{dt} = \alpha Q_\tau(F(y, G), \tau)$$
The intuition for these expressions is as follows. Consider first (7), the equation that pins down the choice of the charity in terms of the time devoted for fund-raising versus the time devoted for production. The left-hand side represents the marginal benefit of an additional unit of time spent raising funds, in terms of project output. The net financial returns on this unit of fund-raising time is \((1 - c)D_y\), and each additional dollar raised yields its marginal product, measured by the marginal productivity of funds in terms of output, \(Q_F\). The right-hand side represents the marginal cost of fund-raising: out of the total time budget that the entrepreneur devotes generally to the charity, one extra minute raising funds means one minute less producing the public good. The opportunity cost in terms of charity’s output is the marginal productivity of time, \(Q_r\).

Consider now (8), the equation that describes the choice of the social entrepreneur in terms of the time devoted to the charity versus leisure. The left-hand side stands for the marginal benefit of leisure time (in terms of entrepreneur’s utility). The right-hand side describes the marginal cost of leisure: one extra minute of leisure means one minute less devoted to the project (given that the fund-raising/production allocation in terms of time is optimal, as described by (7)). This opportunity cost is measured by \(\alpha Q_r\): the marginal productivity of time in terms of output multiplied by the weight the entrepreneur gives to the output in her utility function.

### 2.3 Impact of the Government Grant

Let’s now analyze how the social entrepreneur reacts to an increase in government grant. Suppose the government marginally increases \(G\). Consider first the allocation of leisure time. From (8), we see that the grant does not affect the marginal benefit of leisure, but influences its marginal cost. An increase in the grant means higher amount of funds that can be devoted to the project. Given the complementarity between time and funds, this means that the marginal returns on time devoted to production increases. Thus, if the fund-raising/production allocation is unchanged, an increase in the grant would increase the marginal cost of leisure and the entrepreneur would increase the amount of time she devotes to the charity.

The fund-raising/production allocation would, however, change. From (7), we can see that a higher grant affects both the marginal benefit and the marginal cost of fund-raising. The marginal benefit of fund-raising decreases, because given the diminishing marginal prod-
uct of funds, higher grant means more funds put to the project. An extra minute of time spent raising funds now gives a lower return in terms of project output. The larger is the extent of the diminishing marginal product of funds, the bigger is the fall in the marginal benefit of fund-raising.

On the contrary, the marginal cost of fund-raising increases: given the complementarity between funds and time, more funds imply higher marginal product of time devoted to producing the public good. Thus, the opportunity cost of fund-raising time increases. The stronger is the complementarity of inputs, the sharper is the increase in the marginal cost of fund-raising.

Summing up, since the marginal benefit of fund-raising falls while its marginal cost increases, the charity allocates more of its time budget to production.\footnote{Note that contrarily to the model of Andreoni and Payne (2003), this result does not require that the charity is competing with another charity for private donations. Interestingly, their empirical findings concerning ‘strategic’ crowding out do not rely on the reaction of rival charities and are fully consistent with our theoretical model.}

Let’s now look again to the allocation of leisure time (8). Given that the charity allocates more time to production, we now observe that a higher grant affects the marginal cost of leisure in two ways. On the one hand, as described above, it increases the marginal cost by increasing the marginal productivity of time devoted to production. On the other hand, given that the charity re-allocates its time away from fund-raising and towards production, because of the diminishing marginal productivity, a higher grant reduces the marginal cost of leisure. The first (cost-increasing) effect dominates if

\[ Q_{F} > |Q_{T}| \]

Proposition 1 If the complementarity between the two inputs is sufficiently strong or if the marginal productivity of time does not decrease too quickly, an increase in the government grant reduces the amount of time that the social entrepreneur devotes to leisure.

Thus, if the condition (9) holds, a higher grant actually "crowds in" the social entrepreneur’s time towards the charity. However, as we have seen above, within the time budget devoted to the charity, a higher grant leads to a crowding out from fund-raising towards production. We study this effect more in detail in the next section.

One should also note that under the condition (9), there are two channels that lead to a higher amount of time devoted to production. First, the social entrepreneur increases the
time budget devoted to the charity (which thus would increase the amount of time devoted to production even if no reallocation within charity time budget would occur). Second, she reallocates her "charity time" away from fund-raising and towards production.

2.4 Is Crowding Out Bad?

We now turn to the main question of our analysis: is (financial) crowding out bad for the production of the public good by the charity? This question has important policy consequences. If crowding out hurts the production of the public good by charities, then direct government grants should be replaced by matching grants, as Andreoni and Payne (2003, 2008) suggest. If, contrarily, the presence of financial crowding out does not influence negatively the production of charities’ services, then the idea of scrapping direct grants can be counter-productive.

Denoting with an asterisk the optimal choices of the charity, we can define the measure of financial crowding out as

\[
\eta = 1 - \frac{dF^*}{dG} = -(1 - c)D_y(y^*) \frac{dy^*}{dG}.
\] (10)

Clearly, if the charity does not change its fund-raising behavior in response to the grant, \(\frac{dy^*}{dG} = 0\), and there is no crowding out. If the charity reduces its fund-raising effort in response to the increase in government grant sufficiently strongly (i.e., \(\frac{dy^*}{dG} < 0\) and \(\left|\frac{dy^*}{dG}\right|\) is sufficiently large), we can have \(\frac{dF^*}{dG} = 0\), which would imply full crowding-out. Andreoni and Payne (2008) estimate, using the data on more than 3000 U.S. non-profits, that the crowding out is about 56 per cent (of which about two-thirds comes from "strategic" crowding out, i.e. the reduction of fund-raising expenditures by the charity in response to the grant).

Observing (10), we note that the size of crowding out depends positively on the reduction in fund-raising effort by the charity, \(\left|\frac{dy^*}{dG}\right|\), and on the net financial returns on fund-raising, \((1 - c)D_y(y^*)\). Above, we have discussed the reduction in fund-raising effort by the charity in reaction to an increase in the grant. We can thus state the following

**Proposition 2** Crowding out increases with the complementarity of inputs in the production function of the charity, the extent of the diminishing marginal product of funds, and the net marginal financial returns to fund-raising.

The intuition is simple: strong complementarity of inputs and/or large diminishing marginal product of funds imply that the net marginal benefit of fund-raising falls stronger in
reaction to an increase in the grant. This implies a stronger reduction in fund-raising effort by charity, which, ceteris paribus, implies a larger crowding out. For a given reduction in fund-raising effort, larger net marginal financial returns to fund-raising imply a stronger fall in funds collected, which translates into a larger crowding out.

Andreoni and Payne (2008) find that the marginal returns to fundraising are relatively high: 4.3 dollars per dollar of fundraising expenditures. This high figure indicates that nonprofits do not try to maximize financial revenue (as also noted by Okten and Weisbrod 2000). And even though this is not a measure of net returns on fund-raising effort, it might still indicate that nonprofits do not, on average, feel strongly constrained by their funds - as they could have easily increased them by spending a little more on fundraising. Our explanation is that fundraising does not require just financial resources, but also - and more importantly - time. Many fundraising campaigns - e.g. door-to-door solicitation, organizing fundraising dinners, etc. - are time-intensive activities. Therefore, the main reason we observe large crowding out (found by Andreoni and Payone (2008) to be around 56 percent) might be that even small reductions in time devoted to fundraising lead to large reductions in private donations collected.

What government really cares about (or, at least, should care about) is not the crowding out per se, but the effect of the grant on charity’s output. Of course, if all crowding out comes from higher slack in the behavior of the social entrepreneur, then crowding out is clearly bad. However, this increase in slack is not at all guaranteed.

To verify this, let’s consider the effectiveness of the government grant, i.e. the effect of the grant on charity’s output. In our case, it is

\[
\frac{dQ^*}{dG} = Q^*_F \frac{dF^*}{dG} + Q^*_\tau \frac{d\tau^*}{dG}. \tag{11}
\]

It consists of two components. The first is the increase in output caused by higher amount of funds devoted to the production of the public good, while the second is the increase in output driven by the fact that a higher grant induces the charity to re-allocate its time budget from fund-raising to production.

The discussion of the crowding out made above implies that a larger crowding out reduces the first component: the stronger is the financial crowding out, the smaller is the increase in funds in reaction to the increase in the grant, \( \frac{dF^*}{dG} \). However, the associated large increase in the amount of time devoted to the project strongly enhances the second component. The first effect is likely to be small (and the second is likely to be big) if the charity is devoting
a large fraction of its time budget to fund-raising before the increase in the grant. In that case, given the diminishing marginal product of both inputs, \( Q^r_F \) is relatively small and \( Q^r_r \) is relatively big. Moreover, we also know that the stronger is the complementarity of inputs, the larger is the re-allocation of time towards production. At the same time, from Proposition 1, the stronger is the complementarity of inputs, the larger is the crowding out. We can thus formulate the following

**Proposition 3** *If the charity is devoting a large fraction of its time budget to fund-raising before the increase in the grant and the production function exhibits strong complementarity of inputs, large financial crowding out is associated with high effectiveness of the grant.*

This proposition describes the particular case when the presence of a large crowding out actually indicates that the government grant is highly effective. In this case, the extent of the crowding out should lead the government to favor the direct grant. This is exactly opposite to the suggestion by Andreoni and Payne (2003, 2008). Of course, we do not claim that all or even most charities fall into this case. However, simply the theoretical possibility that the crowding out can make the case in favor of the direct grant calls for a more detailed analysis of this phenomenon, before making further policy propositions.

### 3 Conclusion

We have presented a simple model of a nonprofit founded by a social entrepreneur that decides on the allocation of her time between, on the one hand, leisure and her charity, and on the other hand, within the charity time budget, between time for fund-raising and time for production. If the funds and time are complementary inputs in the production function of the nonprofit, the results of the earlier literature on the desirability of reducing crowding out of government grants do not hold. We have shows that if the degree of the complementarity is sufficiently strong, an increase in the government grant has the following effects: the social entrepreneur reduces her time allocated for leisure (thus increasing the time budget of the charity), there is a large (financial) crowding out of the government grant, and, finally, if the charity was devoting a large fraction of its time budget to fund-raising before the increase in the grant, the effectiveness of the grant in terms of increasing the production of the charity’s service is very high.
Our paper has two limitations. We have not considered the possibility that time (and not just money) can be donated. In fact, Andreoni (2006) reports that 44% of respondents in a recent U.S. survey claim to have contributed volunteer time to a nonprofit during the prior year. Moreover, as Freeman (1997) shows, donations in time and donations in money are (at least partially) substitutes: richer people donate more in money and less in time. Exploring how the effectiveness of the government grant correlates with crowding out in the presence of donations also in time is a natural extension of the research line presented here.

Second, we have not considered one of the main instruments of government concerning nonprofits: tax deductibility of private donations. To do so, we would need to explicitly model private giving (so far hidden behind the function $D(y)$). An interesting question is what happens when the government finances an increase in the grant by reducing the tax deductions applied to giving to the nonprofit: in that case $D(y)$ function would also be altered and the results derived above might have to be qualified.

More generally, our theoretical findings call for the empirical analysis of the way in which funds and nonprofit workers' time are combined in producing nonprofits' services. The post-tsunami events in 2005-2006 indicate that from the NGOs' point of view, funds were not the scarce resource but time (or hands) was. This implies that at least in that context time and funds were highly complementary. The degree of complementarity might, however, depend crucially on the industry (or service) characteristics and collecting and analyzing more data on this issue is an important next step in this research agenda.

References


