A case for taxing charitable donations☆

Tomer Blumkin a,b, Efraim Sadka a,c,d,*

a Cesifo, Germany
b Department of Economics, Ben-Gurion University, Beer-Sheba 84105, Israel
c The Eitan Berglas School of Economics, Tel Aviv University, Tel-Aviv 69978, Israel
d IZA, Germany

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Abstract

We develop a model that allows for public goods and status signaling through charitable contributions. We use this setup to re-examine the conventional practice of rendering a favorable tax treatment to charitable contributions.

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1. Introduction

According to an annual survey, Giving USA, total charitable giving in America in 2004 amounted to $249 billion, over 2% of GDP. This outstanding figure reflects, in part, a response to what has been a consistent policy of US government since 1917 to grant favorable tax treatment to charitable contributions in order to promote philanthropy. Charitable contributions are accorded favorable tax treatment elsewhere too, taking a variety of forms, including tax deductions, tax credits, etc.

From a public economics point of view, a key reason for subsidizing charitable contributions derives from a Pigouvian motive. Looking at private charity as a voluntary mechanism for the provision of public goods, we note that individuals tend to overlook the positive externality their
contributions exert on the rest of the community. This will be the case even when individuals derive utility from the act of giving itself, which provides them with an extra incentive to donate ['warm glow’ approach as in Andreoni, 1989, 1990].

Following the work of Frank (1984a,b, 1985a,b) on the demand for status, there seems to be another motive for contributing; namely, the desire to signal status. Whereas there are other means to signal status, notably through conspicuous consumption of private goods, Glazer and Konrad (1996) explain that there are good reasons to believe that charitable donations may well stem from a signaling motive. They argue that conspicuous consumption, unlike charity, may be banned by social norms. They also point out that ownership of luxury goods may be difficult to observe reliably. In contrast, donations can prove very effective in conveying signals to individuals belonging to a peer group, who cannot observe the big house or the luxury car (such as the case of distant college roommates who read the alma mater’s alumni magazine and notice the recent contribution of their peers).

Glazer and Konrad (1996) cite empirical evidence in support of the hypothesis that donations are not purely driven by altruistic motives. One such evidence is that only a tiny fraction of donations is given anonymously. For instance, the fall 1991 Yale Law Report, sent to the alumni of the Yale Law School, indicates that only 4 out of 1950 donors were anonymous. Furthermore, when donations are reported in broad categories, rather than the exact amounts given, people tend to ‘converge’ to the lower limit of the specified category. For instance, the 1993–1994 report of the Harvard Law-School Fund indicates that contributions of exactly $500 constitute 93% of total amount raised in the category $500–$999.

Harbaugh (1998b) employs a theoretical model of the donor’s optimization problem developed in Harbaugh (1998a), and uses data on reported donations of a prestigious law school alumni from the same cohort, to identify the status effect associated with donations (“prestige motive”). His estimation results indicate that many donors would more than double their donations in response to the prestige motive.

The altruistic motive for charitable contributions per se calls for a Pigouvian subsidy. But the status-signaling motive has two opposite implications. First, on efficiency grounds, there is a case for taxing contributions as a means to internalize the negative externality associated with (relative) status acquisition. Second, there exists a case for taxing contributions on equity grounds, as the signaling motive renders them an extremely efficient ‘tagging device’ [as in Akerlof, 1978] of the rich who seek to signal their social status.

Status effects have been examined by the labor income tax literature. Boskin and Sheshinski (1978) is an early study that incorporates status in the design of the optimal income tax. They employ a model in which individuals care not only about their absolute income level but rather also about their relative income level. However, they analyze only the externality effect of status,

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1 Recently, Diamond (2006) provides a novel argument in favor of the conventional wisdom about subsidizing charitable contributions. He points out that subsidizing private donations may mitigate the incentive constraints associated with income taxation, thereby allowing the government to attain further redistribution.

2 Hirsch (1976) refers to those consumption goods used to signal status as ‘positional goods’.

3 Notably, a change in the category reporting plan of the university, which occurred during the period examined, resulted in a reduction in the number of donations at the omitted categories. This result is consistent with a prestige motive hypothesis.

4 A recent survey of Philanthropy by The Economist (February, 2006) cites a study by Schervish of Boston College, showing that American Families with a net worth of 1 million dollars or more, accounted for 4.9% of the total number of donations to charitable organizations in 1997, but as much as 42% of the value.
as individuals do not engage in signaling in their model. More recently, Ireland (1998, 2001) employs a model in which individuals signal their social status through consumption choices. He focuses on the design of the income tax schedule and rules out the possibility of direct taxing of the consumption signals.\(^5\)

In the present study we develop a model that allows for both public good provision and status signaling through charitable contributions. We use this setup to re-examine the conventional practice of rendering a favorable tax treatment to charitable contributions.

The organization of the paper is as follows. Section 2 introduces the basic framework. In Section 3 we characterize the equilibrium. The succeeding section examines the optimal tax treatment of charitable contributions. Section 5 concludes.

2. The model

Consider an economy with a continuum of individuals (whose number is normalized to one), producing a single consumption-good. Following Mirrlees (1971), we assume that individuals differ in their innate ability denoted by \(w\) (which also denotes the hourly wage rate in the competitive labor market). The production-technology employs labor only and exhibits constant returns to scale and perfect substitutability among various skill levels. We further assume that the innate ability is distributed according to some cumulative distribution function \(F(w)\) with the support \([-w, \bar{w}]\).

As in Mirrlees (1971), all individuals share the same preferences, which are represented by the following utility function:

\[
U(c, l, z, g) = p(z) \cdot b + u(c) + h(l) + v(z) + r(g),
\]

where \(c\) denotes consumption, \(l\) denotes leisure, \(z\) denotes charitable contribution and \(g\) denotes public good provision; the functions \(u\), \(h\), \(v\) and \(r\) are assumed to be strictly concave and strictly increasing; and \(b > 0\).

The utility specification given in Eq. (1) is quite general and captures the two aforementioned contribution motives. The altruistic motive is captured by the function \(v\) which measures the joy of giving (‘warm glow’ effect). This motive has been already discussed in the literature [see, for instance, Kaplow, 1995]. Due to the external economies involved it calls for subsidizing charitable donations. This policy implication has been recently challenged by Blumkin and Sadka (2007) on equity grounds, showing that the case for subsidizing donations crucially depends on the exact specification of the utility function. In this paper we ignore the altruistic motive and focus on the signaling motive. Formally, we henceforth set \(v(z) = 0\) for all \(z\).

The strategic motive to signal ability and thereby gain social status was first investigated by Glazer and Konrad (1996).\(^6\) In our framework it is captured by the term \(p(z) \cdot b\). For analytical tractability we assume a two (status) class society, but with a continuum of abilities. In such a society individuals gain social status if they credibly signal that their ability, unobserved directly by other individuals, exceeds a certain threshold, denoted by \(\hat{w}\).\(^7\) We emphasize that this threshold is exogenously given. Denoting by \(\tilde{w}\) the perceived ability of an individual by all other

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\(^5\) See Ireland (2001) for discussion of the difficulty of directly taxing consumption signals.

\(^6\) Glazer and Konrad (1996) did not consider the issue of signaling in the context of the design of a tax-transfer system, as we do, and hence assumed fixed labor supply.

\(^7\) Note that while there are only two status classes, there is nevertheless a continuum of abilities. Thus, our model is not restrictive for redistribution purposes. Note further that it is assumed that consumption and leisure choices of an individual are not observed (nor can be verified) by other individuals. Thus, charitable contribution is the only signal observed.
individuals, we let \( p(z) \) denote the probability that the individual’s perceived ability exceeds the threshold \( \hat{w} \), conditional on the fact that the individual has contributed \( z \). Formally,

\[
p(z) = \Pr[\hat{w} \geq \hat{w}|z].
\]

In the absence of any signaling, all individuals share the same belief, namely \( 1 - F(\hat{w}) \), that any given individual belongs to the high class (that is, she has an innate ability exceeding the threshold \( \hat{w} \)). If an individual signals by contributing an amount of \( z \), all individuals update their common belief about her belonging to the high class to \( p(z) \). Denoting by \( b \), the utility equivalent of the gain from status, the product \( p(z) \cdot b \) measures the expected gain from status.\(^8\) We naturally assume that individuals are rational in their beliefs in the sense that the probability assigned to all individuals to be of high status is indeed given by \( 1 - F(\hat{w}) \):

\[
\int_0^\infty p(z) d\theta(z) = 1 - F(\hat{w}),
\]

where \( \theta(z) \) denotes the number of individuals donating an amount not exceeding \( z \). Note crucially that the status-signaling activity per se (that is, apart from its direct contribution to public good provision) is wasteful, because, in view of Eq. (3), total status is fixed at the level of \( b \cdot [1 - F(\hat{w})] \).

We make a ‘large economy assumption’ by letting the amount of public good provision, \( g \), be a fixed parameter from the point of view of the individual (not depending on that individual’s \( z \)).\(^9\) For most people this would reflect reality, whereas for the very rich individuals this might be violated. However, this assumption may reflect also the fact that contributors often gain very little from the projects financed by their own donations.\(^10\)

We assume that a linear labor income tax system is in place, where the marginal tax rate is denoted by \( t \), and the uniform lump-sum transfer (possibly negative) is given by \( T \). We further assume that a tax \( (s) \) on charitable contributions (possibly negative, that is a subsidy) may be levied. Note that allowing individuals to deduct their charitable contributions from their taxable incomes, or, granting them tax credits, amounts to such a subsidy.\(^11\) We turn next to characterize the equilibrium for the signaling game.

### 3. Equilibrium

Given the function \( p(z) \), each individual has to decide on the levels of consumption, leisure and charitable contribution, so as to maximize utility, subject to the budget constraint:

\[
(1-t) \cdot w \cdot (1-l) + T \geq c + (1+s) \cdot z.
\]

We turn next to study the solution for the consumer optimization problem. Denote it by \( c^*(w) \), \( l^*(w) \) and \( z^*(w) \) where the tax parameters are henceforth omitted to abbreviate the notation. Similarly, we denote by \( V^*(w) \) the maximized level of utility. For tractability, we

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\(^8\) In our framework both \( \hat{w} \) and \( b \) are exogenous. Naturally, one would expect the status gain \( (b) \) to rise as the size of the high-class shrinks [that is, \( \hat{w} \) rises and hence \( 1 - F(\hat{w}) \) diminishes].

\(^9\) This assumption is sometimes referred to in the literature as “parametric externality”.

\(^10\) Relaxing this assumption will not alter the gist of our analysis. An alternative assumption concerning the provision of public good is that each individual has a positive (that is, non-atomistic) mass; see, for instance, Green and Laffont (1979) and Bergstrom, Blume and Varian (1986). The latter assumption may be particularly relevant in the context of local public goods.

\(^11\) Note that with a linear income tax there is equivalence between tax deduction and tax credit.
follow Glazer and Konrad (1996) and Ireland (1994, 2001) in restricting attention to the fully-revealing equilibrium, which in our framework implies that all individuals (and only those) with ability exceeding or equaling the threshold $\hat{w}$ signal their ability and enjoy the respective social status. This equilibrium is defined by a threshold level of contributions, $z > 0$, and a probability function $p(z)$, such that:

(i) $p(z) = \begin{cases} 0 & \text{for } z < \hat{z} \\ 1 & \text{for } z \geq \hat{z} \end{cases}$

(ii) All individuals whose innate ability exceeds (or equals) $\hat{w}$ choose to contribute an amount $z \geq \hat{z}$, whereas all other individuals optimally set their contribution at a level $z < \hat{z}$.

We emphasize that $\hat{z}$ is *endogenously* determined (in equilibrium), so that individuals with innate ability $w \geq \hat{w}$ (and only these individuals) choose to donate an amount of at least $\hat{z}$. Note that in the absence of altruism, no one will choose to donate an amount in excess of $\hat{z}$. Thus, in our fully-revealing equilibrium all individuals with $w \geq \hat{w}$ choose to donate exactly the amount $\hat{z}$. Similarly, all other individuals will donate nothing. That is:

$$z^*(w) = \begin{cases} 0 & \text{for } w < \hat{w} \\ \hat{z} & \text{for } w \geq \hat{w} \end{cases}$$  \hspace{1cm} (5)

Note that in this fully revealing equilibrium, we have:

$$\theta(z) = \begin{cases} F(\hat{w}) & \text{for } 0 \leq z < \hat{z} \\ 1 & \text{for } z \geq \hat{z} \end{cases}$$  \hspace{1cm} (6)

so that there are $1 - F(\hat{w})$ individuals who donate exactly $\hat{z}$. Formally, $\hat{z}$ is determined in this equilibrium so as to make the individual with the threshold ability, $\hat{w}$, just indifferent between donating an amount $\hat{z}$ and gaining social status or donating nothing and having no social status.\(^{12}\)

The determination of the individual’s choice of $c$, $l$ and $z$ can be simply described as follows. First consider $z$ as exogenously given and solve the consumer maximization problem [that is, the maximization of (1), subject to (4)] to obtain the optimal levels of consumption and leisure, $\bar{c}(w, z)$ and $\bar{l}(w, z)$, respectively, and the indirect utility function $V(w, z)$. Clearly, an $w$-individual will prefer to contribute $\hat{z}$ than nothing if-and-only-if $V(w, \hat{z}) > V(w, 0)$. Given the assumed concavity of $u$ and $h$, it is straightforward to show that $[V(w, \hat{z}) - V(w, 0)]$ is strictly increasing in $w$. Thus, the cutoff donation ($\hat{z}$) in the fully-revealing equilibrium is determined by the equality\(^{13}\):

$$V(\hat{w}, 0) = V(\hat{w}, \hat{z}).$$  \hspace{1cm} (7)

\(^{12}\) Note that there may well be other equilibria. For instance, $p(z)$ could be a strictly increasing function of $z$. This equilibrium is less than fully revealing. Another possibility is a pooling equilibrium in which $p(z)$ is constant, equaling $1 - F(\hat{w})$. That is, all individuals, irrespective of their donations, are believed to belong to the high class with the same probability [namely, $1 - F(\hat{w})$]. In this case, each individual has the same expected gain from status given by $[1 - F(\hat{w})]h$. Naturally, no one will make any donation in this equilibrium. In general, the more revealing the equilibrium is (that is, the more distinct the high-status group is), the higher is the expected benefit gained by this distinct group.

\(^{13}\) Mild parametric restrictions on the utility function in Eq. (1) guarantee that the equality in Eq. (7) is indeed satisfied. For example, when the functions $u$ and $h$ are logarithmic, it is straightforward to verify that the equality in Eq. (7) is satisfied.
The functions $c^*(w)$, $l^*(w)$ and $V^*(w)$ are determined by\textsuperscript{14}:

$$c^*(w) = \begin{cases} \overline{c}(w, 0) & \text{for } w < \hat{w}, \\ \overline{c}(w, \hat{z}) & \text{for } w \geq \hat{w}, \end{cases}$$

(8)

$$l^*(w) = \begin{cases} \overline{l}(w, 0) & \text{for } w < \hat{w}, \\ \overline{l}(w, \hat{z}) & \text{for } w \geq \hat{w}, \end{cases}$$

(9)

$$V^*(w) = \begin{cases} \overline{V}(w, 0) & \text{for } w < \hat{w}, \\ \overline{V}(w, \hat{z}) & \text{for } w \geq \hat{w}. \end{cases}$$

(10)

4. The tax-treatment of contributions

The government is seeking to maximize some egalitarian social welfare function by choosing the fiscal instruments $t, T, s$ and $g$, subject to a revenue constraint, taking into account the optimal choices of the individuals and the response of the threshold donation, $\hat{z}$, to its fiscal instruments [through Eq. (7)]. We assume an egalitarian social welfare function, given by:

$$W = \int_{\hat{w}}^{\bar{w}} \overline{W}(\overline{V^*(w)})dF(w),$$

(11)

where $W' > 0$ and $W'' < 0$. Note that we kept the status component in the individual utility also in the social welfare function. One may question whether the individual component should have any standing in the social calculus. Nevertheless, dropping this component does not affect the qualitative results of the paper [see also footnote 16 below]. Naturally, the social welfare function is maximized subject to the government revenue constraint,

$$t \cdot \int_{\hat{w}}^{\bar{w}} w[1-l^*(w)]dF(w) + (1 + s) \cdot \hat{z} \cdot [1-F(\hat{w})] - g - T \geq 0.$$  

(12)

There is another constraint, which requires that the government cannot confiscate the charitable contributions and direct them to its general needs (redistribution purposes in our case). Put differently, the level of public good provision should (weakly) exceed the total amount of contributions:

$$g - \hat{z} \cdot [1-F(\hat{w})] \geq 0.$$  

(13)

We address the question of the desirability of levying a tax on charitable contributions, as a supplement to the optimal linear labor–income tax system. Note crucially that the status-signaling activity per se (that is, apart from its direct contribution to the amount of the public good) is purely wasteful. In the absence of signaling, all individuals would obtain the same (high) status (which is worth $b$), with the same probability [namely, $1 - F(\tilde{w})$], whereas with signaling $1 - F(\tilde{w})$ individuals gain high status and all the other gain no status, leaving the aggregate level of status exactly at the same level as without signaling. We emphasize that the aggregate amount of status is exogenously given, at the level of $[1 - F(\tilde{w})] \cdot b$. Thus, status signaling can only affect the distribution of this aggregate level of status.

\textsuperscript{14} The function $z^*(w)$ is given by Eq. (5).
The Lagrangean for the government optimization problem is:

\[
L = \int w W[V^*(w)] dF(w) + \mu_1 \left\{ t \left[ \int w [1-t^*(w)] dF(w) \right] + (1+s) \cdot z [1-F(\hat{\omega})] \cdot g - T \right\} + \mu_2 [g - z [1-F(\hat{\omega})]] + \mu_3 [V(\hat{\omega}, \hat{z}) - V(\hat{\omega}, 0)],
\]

where \( \mu_i, i=1, 2, 3 \) denote the Lagrange multipliers, associated, respectively, with the revenue constraint (12), the public good provision constraint in (13) and the fully-revealing equilibrium condition (7).

Starting from an optimal linear tax system with zero tax on contributions \((s=0)\), we examine the effect of a small tax on contributions. We seek to sign the following derivative:

\[
\begin{align*}
\frac{\partial L}{\partial s} \bigg|_{s=0, t^*, g^*} & = -\hat{z} \cdot \int w W[V^*(w)] \cdot \lambda^*(w) dF(w) - \mu_1 \cdot t \int w W[V^*(w)] dF(w) \\
& + \mu_1 \cdot \hat{z} \cdot [1-F(\hat{\omega})] - \mu_3 \cdot \lambda^*(\hat{\omega}) \cdot \hat{z},
\end{align*}
\]

where \( \lambda^*(w) \) denotes the marginal utility of income of an \( w \)-individual.

Employing the first-order conditions for the optimal tax problem (see the Appendix for details), we can re-write Eq. (15) as follows:

\[
\begin{align*}
\frac{\partial L}{\partial s} \bigg|_{s=0, t^*, g^*} & = \mu_1 \cdot \hat{z} \cdot [1-F(\hat{\omega})] - \int w W[V^*(w)] \cdot \lambda^*(w) dF(w) \\
& + \hat{z} \cdot \int w W[V^*(w)] dF(w) \\
& + \left(-\mu_1 + \mu_2\right) \cdot \hat{z} \cdot [1-F(\hat{\omega})].
\end{align*}
\]

Eq. (16) decomposes the effect of a small tax on contributions into three terms. The first term on the right-hand side of Eq. (16) captures the redistributive effect of a unit increase in the tax on charitable contributions. To see this, note that the term \( \hat{z} \cdot [1-F(\hat{\omega})] \) is the additional amount of revenues raised by a unit increase in the tax on contributions (at \( s=0 \)). Multiplying it by \( \mu_1 \), the marginal social benefit of a unit increase in the transfer \((T)\), yields the effect of the extra revenues on social welfare. As the burden of this unit increase on each status-signaling individual (that is, each individual with innate ability exceeding \( \hat{\omega} \)) is \( \hat{z} \), then, indeed, the first term on the right-hand side of Eq. (16) captures the redistributive effect of a tax on contributions. This effect is positive and works in the direction of taxing contributions, when the social welfare function exhibits a sufficiently large degree of inequality aversion.\(^{15}\)

The second term, which also works in the direction of levying a tax on contributions, captures the corrective effect of taxing contributions on the wasteful pure status-signaling donations.

\(^{15}\) For instance, when the social planner is Rawlsian, the second expression in the first set of brackets disappears and, clearly the re-distributive term is positive. Notably, in such a case, also the signaling correction term vanishes, as the contributors obtain zero weight in the social welfare measure.
see this, totally differentiate the fully-revealing equilibrium condition in Eq. (7) with respect to \( s \) at \( s = 0 \), fixing the other tax parameters, \( t \) and \( T \), to obtain \( \frac{d \hat{z}}{ds} \bigg|_{s=0} = -\hat{z} \) [that is, the term \( \hat{z} \cdot (1 + s) \) remains constant]. Thus, a unit tax levied on contributions reduces the amount of contributions (per a unit of \( s \)), entailed by signaling, by \( \hat{z} \), thereby raising the utility derived by the individuals who engage in signaling, and consequently social welfare, by the corresponding expression in Eq. (16).

The last term captures the *Pigouvian* motive for subsidizing contributions. To see this, note first that the first-order condition for the optimal provision of the public good implies that:

\[
(\mu_1 - \mu_2) = r'(g) \cdot \int_{\hat{w}}^W W[V^*(w)]dF(w) > 0. \tag{17}
\]

Because \(-\hat{z} \cdot [1 - F(\hat{w})]\) is the effect of a unit tax on contributions on the total contributions to the public good, it follows that the third term measures indeed the loss in social welfare associated with the decrease in public good provision, generated by a unit tax imposed on contributions. The third term is negative and works in the direction of granting a subsidy to contributions.

Re-arranging terms, Eq. (16) reduces to:

\[
\frac{\partial L}{\partial s} \bigg|_{s=0, r, T, g, \hat{z}} = \mu_2 \cdot \hat{z} \cdot [1 - F(\hat{w})] \geq 0. \tag{18}
\]

Thus, we establish the following result:

**Proposition.** The optimal tax on contributions is non-negative.

Note that when the constraint (13), which states that the government may not confiscate contributions and direct them towards its general budget, is binding, we may plausibly assume that the corresponding *Lagrange* multiplier (\( \mu_2 \)) is strictly positive. In this case, it is optimal to levy a positive tax on contributions. Naturally, this will be the case when the demand for the public good is sufficiently small (that is, when \( r' \) is sufficiently small). In contrast, when the demand for the public good is high enough (that is, when \( r' \) is large enough), constraint (13) will not be binding. Hence, \( \mu_2 = 0 \), and it becomes optimal to set \( s = 0 \). That is, it is not optimal for the government to directly affect contributions by either taxing or subsidizing them (through deduction or credits).

The rationale for these results is straightforward. It follows from the fully-revealing equilibrium condition in Eq. (7) that the term \( \hat{z} \cdot (1 + s) \) does not change when the government changes the tax on contributions (\( s \)), while leaving the other tax instruments (namely, \( t \) and \( T \)) intact.\(^{16}\) In such a case, the only effect of increasing the tax on contributions is to reduce the total amount of contributions. That is, the tax shifts resources from public good provision to redistribution (through \( t \) and \( T \)). When constraint (13) is binding (\( \mu_2 > 0 \)), there is an excess provision of the public good, and, consequently, under-provision of redistribution. In such a case, a tax on contributions enhances social welfare.\(^{17}\) In contrast, when constraint (13) is not binding (\( \mu_2 = 0 \)), then the government is indifferent, at the margin, between redistribution and public good provision. Therefore, there is no social gain or cost generated by a tax on contributions.

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16 This is true regardless of whether the individual gain from status is part of the social calculus (as we assume) or not.
17 In contrast, in Glazer and Konrad (1996), where the focus is only on the provision of public good, there is no role for the government to play in either taxing or subsidizing contributions.
5. Conclusions

The conventional practice with respect to the tax treatment of charitable contributions is to render them a favorable treatment, either through deductions or credits. The literature focuses, by and large, on the altruistic motive for charitable contributions, and establishes an economic rationale for this practice, which is essentially Pigouvian: contributions for the financing of public goods generate a positive externality.18 In this paper, we point out that contributions may be also driven by a status-signaling motive. Therefore, as a pure signal, contributions generate also a negative externality. Moreover, contributions may be employed by the government in order to sort out the wealthy, and enhance redistribution. Both considerations challenge the conventional practice.

The distinction between the conflicting tax implications of the two contributions motives raises the possibility of designing a system of differential tax treatment of contributions depending on whether they are anonymous or not. When contributions are anonymous, they indicate that they are driven by altruism. Therefore, a favorable tax treatment may be targeted toward the latter. Note further that the ability to signal status via contributions hinges crucially on the assumption whether they are anonymous or not. When contributions are anonymous, they indicate that they are driven by altruism. Therefore, a favorable tax treatment may be targeted toward the latter. Note further that the ability to signal status via contributions hinges crucially on the assumption that such contributions are indeed observable. The role of status-signaling in enhancing contributions for public good provision, thereby mitigating the free-rider problem, may call for policy measures aimed at facilitating the dissemination of such information and rendering it more observable; see the related discussion of Cooter and Broughman (2005), suggesting a donation registry of the IRS via the Internet.

Appendix A. Derivation of Eq. (16)

We first re-formulate Eq. (15) in the main text for convenience.

\[
\frac{\partial L}{\partial s}_{|s=0,T^*,g^*,z^*} = -\hat{z} \int_\mathcal{W} [W[V^*(w)] \cdot \hat{\lambda}^*(w)] dF(w) - \mu_1 \cdot t \int_\mathcal{W} \left[w \cdot \frac{\partial l^*(w)}{\partial s}\right] dF(w) + \mu_1 \cdot z \cdot [1-F(\hat{w})]\cdot \mu_3 \cdot \hat{\lambda}^*(\hat{w}) \cdot \hat{z},
\]

(A1)

Differentiation of the \textit{Lagrangean} in Eq. (14) with respect to \(\hat{z}\) yields the following first-order condition:

\[
\frac{\partial L}{\partial z}_{|s=0,T^*,g^*,z^*} = -\int_\mathcal{W} [W[V^*(w)] \cdot \hat{\lambda}^*(w)] dF(w) - \mu_1 \cdot t \int_\mathcal{W} \left[w \cdot \frac{\partial l^*(w)}{\partial z}\right] dF(w) + (\mu_1 - \mu_2) \cdot [1-F(\hat{w})] - \mu_3 \cdot \hat{\lambda}^*(\hat{w}) = 0.
\]

(A2)

Substituting for the term \(\mu_3 \cdot \hat{\lambda}^*(\hat{w})\) from Eq. (A2) into Eq. (A1) yields:

\[
\frac{\partial L}{\partial s}_{|s=0,T^*,g^*,z^*} = \mu_1 \cdot \hat{z} \cdot [1-F(\hat{w})] - \hat{z} \cdot \int_\mathcal{W} [W[V^*(w)] \cdot \hat{\lambda}^*(w)] dF(w) - \mu_1 \cdot t \int_\mathcal{W} \left[w \cdot \frac{\partial l^*(w)}{\partial s}\right] dF(w) + \mu_1 \cdot \hat{z} \cdot \int_\mathcal{W} \left[w \cdot \frac{\partial l^*(w)}{\partial z}\right] dF(w) + \hat{z} \cdot \int_\mathcal{W} [W[V^*(w)] \cdot \hat{\lambda}^*(w)] dF(w) - (\mu_1 - \mu_2) \cdot \hat{z} \cdot [1-F(\hat{w})],
\]

(A3)

18 This rationale has been recently challenged by Blumkin and Sadka (2007) who point out that charitable contributions can be employed as a ‘tagging’ device by the government in order to enhance redistribution (by taxing them).
Re-formulating the budget constraint faced by an individual who engages in signaling yields:

\[ J(l, c, t, T, s, \hat{z}) = (1-t) \cdot w \cdot (1-l) + T - c - (1 + s) \cdot \hat{z} = 0. \]  
(A4)

Differentiation of the expression in Eq. (A4) yields:

\[ \hat{z} \cdot \frac{\partial J}{\partial z} \bigg|_{s=0} - \frac{\partial J}{\partial s} \bigg|_{s=0} = 0. \]  
(A5)

Thus, for any ability level \( w \), the following holds:

\[ \hat{z} \cdot \frac{\partial l^*}{\partial z} \bigg|_{s=0} - \frac{\partial l^*}{\partial s} \bigg|_{s=0} = 0. \]  
(A6)

Substituting into Eq. (A3) yields Eq. (16) in the main text. This completes the derivation.

**References**


