Altruism and Donations

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by

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Abstract: We examine two types of altruism and their implications for voluntary giving. Philanthropists are altruists who wish to enhance the well-being of others, while individuals with merit-good preferences only wish to further the consumption of certain merit goods by others. Philanthropic donors prefer to make cash donations, while donors with merit-good preferences prefer to give in kind. The equilibrium of a donations-game with a philanthropic donor and recipients is efficient, while the equilibrium of a game with a single donor with merit-good preferences is not. Both equilibria are inefficient if there are multiple donors with strategic interaction amongst them.

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1. Introduction

Notwithstanding many economists' allegations that what comes as altruism is often egoism in disguise, charity and support of the needy, donations to promote what is conceived as socially beneficial, and valuable gifts, inter-vivos transfers and generous bequests suggest that unselfish altruism is pervasive even in individualistic societies. The motivation for giving can have various, not necessarily exclusive sources (Becker, 1974, Andreoni, 1988, and, for empirical evidence, Smith et al., 1995): People give because they feel good when doing so, because they are happy to make the recipients better off, because they find the person or the purpose to whom they address their donation deserving, because other people give etc. Regardless of their motivation, donors want to see their donations well-spent; it is not at all gratifying to them to find that their contributions are "wasted" or "abused". Such abuse can take various forms, ranging from charity organisations channelling their collections into the own pockets to recipients diverting the money for purposes not deemed worthwile by donors. Naturally, what is an "abuse" of a donation often lies in the eye of the donor or, to phrase it more technically, depends on the form of altruism the would-be donor is inclined to. Some people (A) might simply intend to make the recipients feel better while others (B) may be more paternalistic in wishing only to promote in recipients their own perception of what ought to be done or consumed. (Taking “arts-supporting“ as the donation motive, Fullerton distinguishes both types of altruistic donors in the same manner; see Fullerton 1992). In case (A), labelled "pure" altruism by Andreoni (1988) and "philanthropy" in Becker (1974) and here, it is the utility level of the recipients that enters into the preferences of the donors while in case (B) it is a specific "merit good" (or a bundle thereof) whose consumption by the recipients has the special interest of the donors. Often donors hold different views of how recipients should assess their consumption than the recipients themselves. As examples think of cultural or educational activities, sports or health goods of which many "benevolent" or "knowing" people believe that (some of) their contemporaries ought to consume more. As donors they then take action to correct for the -- in their eyes -- imperfect choices of recipients.

In this paper we discuss both forms of "altruism". In the first, philanthropic variant donors do not face any problem of their donations being abused by the recipients: Transferring purchasing power, goods or whatever has positive marginal utility for the recipient will make the recipient better off - to the full delight of the donors. Raising the recipient's utility is both in the interest of the recipient *and* of the donor. In the merit-good variant of altruism (B) things are more subtle since donors and recipients need not fully agree about the idea of what might be a "proper use" of the gift. Clearly, different forms of gifts entail different degrees of discretion for the recipient to (ab)use the gift. Here, we distinguish two kinds of transfers: (1) cash transfers (or, more generally, transfers of purchasing power) and (2) in-kind transfers with the assumption that it is impossible for the recipients to resell the gifts.

The main result of our discussion of philanthropy (Section 2) is that - in the single-donor case - voluntary cash transfers between the donor and the group of recipients lead to Pareto optimality. This property is not always shared by in-kind transfers of goods when resale is impossible -- which unsurprisingly corresponds to the standard result from consumer theory that the compensating variation of in-kind transfers is less than the cost of providing it. In the multi-donor case efficiency breaks down even in the case of cash transfers. The reason is that donors ignore their strategic interdependence. Typically and similar to equilibria of subscription games for public goods (Warr 1982; Bergstrom et al. 1986) there will be an undersupply of voluntary contributions or donations. Nonetheless, cash transfers are the (weakly) superior form of donations also in the multi-donor case. The efficiency result for the single-donor case bears some relation to Becker's Rotten-Kid-Theorem (Becker 1974), Barro's results on Ricardian equivalence (Barro 1974) and Bernheim's and Bagwell's neutrality theorems (Bernheim/Bagwell 1988): The assumption of philanthropy in the donor's preferences in fact ensures that the interaction of the donor and the recipients is equivalent to the behaviour of a single individual only hence.[1] Hence, the problem of an abuse of donations cannot occur.

In Section 3 we change the donors' preferences from pure altruism to the merit-good approach. Donors are now only willing to transfer resources to recipients when this increases their consumption of the merit good. The condition for this to happen (superiority of the good in question) is identical for cash and in-kind transfers. With cash transfers, however, recipients have full discretion how to use the gift and they might well be inclined to spend too great a

[1] It should be noted that Bernheim/Bagwell (1988) deal with neutrality rather than with efficiency (as in Barro, 1974, and Becker, 1974). In Bernheim/Bagwell (1988) the equilibrium may well be inefficient, yet redistributions contingent upon the actions chosen to lead to the equilibrium are ineffective.

portion of the transfer on purposes which the donor is not interested in and which he might thus consider as an "abuse". This danger does not exist for in-kind donations. We hence find that from the donors' view in-kind donations are the preferred type of transfers; recipients naturally see things different. Anyway, the decentralized donations game does not lead to efficiency, even not in the single-donor case. The reason is the strategic interaction between donors and recipients (formalized as a Stackelberg game) whose objectives do not fully overlap as in the philanthropy game. This strategic externality between donors and recipients adds to the one between donors alone and renders the Stackelberg equilibrium inefficient.

Our merit-good form of altruism requires some further comment: The notion of merit goods was first suggested by Musgrave (1959, pp. 13f) who uses it to characterize a variety of *state interventions* (sumptuary excises on tobacco or alcohol, regulations applied to education, cultural activities, drug consumption etc.) which appear to lie beyond the scope of the consumer-sovereignty principle. Welfarists often criticize the merit-good approach as violating the "everyone knows best for himself"-paradigm which anyone with minimally liberal sentiments is inclined to believe that it has some validity (see Besley 1988 for a discussion). To our framework such criticism does not apply. Here it is, unlike in Musgrave (1959) and many follow-ups, not the government that sees necessity to correct the individual preferences or the implications thereof, but it is a different subgroup of the population (called "the donors") that wants their fellow-citizens to consume more of a certain good than they otherwise would do. Since the donors do not have the power or the right to directly regulate the behaviour of other people or to tax their consumption of other, "unwarranted" goods, they can only use transfers and donations to see their merit-good preferences set into effect. Clearly, this involves a good deal of paternalism and a desire of social control by donors towards recipients. It should be noted, however, that the recipients will never reject the donor's activity since it always implies that their utility increases relative to a no-donations situation. Further, in our notion of Pareto optimality we strictly stick to the welfarist paradigm since only the true rather than any "corrected" preferences of individuals enter into the social planner's problem. (In approaches where the government's and its citizens' preferences do not coincide typically the goverment's preferences are used to determine "social optimality"; see e.g. Besley 1988; Racionero 2000).

The structure of this paper is as follows: Section 2 discusses the case of donations under the assumption of philanthropy in a simple static economy with two types of agents. In Section 3 we use the same framework to study the case of merit-good preferences -- and, in a brief digression, the case of demerit-good preferences. Section 4 concludes.

2 Philanthropic Donors

2.1 Model

We consider a simple two-good economy with two groups of agents. Members of the first group (which we will call donors) make transfers to the members of the second group (called recipients). There are $n \geq 1$ donors and $m \geq 1$ recipients. Within each group all individuals are identical. The two goods we consider are a normal consumption good *Y* and a merit good *X*.

Recipients are purely selfish: They derive utility (only) from their own consumption of the two goods. Labelling variables related to recipients by sub- or superscript *r*, we represent the preferences of a (representative) recipient by

$$U^r = U^r(X_r, Y_r)\,. \tag{1}$$

We assume that U^r has the standard properties of positive, but decreasing marginal utility: $U^r_{X_r}$, $U^r_{Y_r} > 0$ and $U^r_{X_r X_r}$, $U^r_{Y_r Y_r} < 0$.[2]

Donors are altruistic, they know exactly the preference of the recipients. In this section we assume that they are - apart from their own consumption of goods *X* and *Y* - also interested in the well-being of the recipients.[3] To distinguish this type of altruism from another one (to be introduced in Section 3), we call it philanthropy. The utility function of a donor is:

$$U^d = U^d(X_d, Y_d, U^r)\,. \tag{2}$$

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2 Subscripts at multivariate functions denote partial derivatives.

3 This follows Fullerton (1992). We thus do not consider any mutual interaction between the two groups. This is done in Becker (1974) where each agent has the utility level of the other agent(s) as an argument in his utility function: $U_i = U_i(\bullet,\ U_j)$ for all *i*, *j*.

We assume that U^d is increasing in all of its arguments and concave. The function U^d thus has the same standard properties with respect to X and Y as U^r, namely: $U^d_{X_d}$, $U^d_{Y_d} > 0$, and $U^d_{X_d X_d}$, $U^d_{Y_d Y_d} < 0$. Altruism means that $U^d_{U^r} > 0$. It is assumed that altruism decreases at the margin: $U^d_{U^r U^r} < 0$. The model is completed by the convex production possibility set:

$$F(X,Y) \le 0, \tag{3}$$

where $X = nX_d + mX_r$ and $Y = nY_d + mY_r$ denote the total consumptions of goods X and Y, respectively. We assume that the production possibility frontier $F(X,Y) = 0$ is concave.

Under the (innocuous) assumption that individuals within each of the two groups are treated alike, an allocation of this economy can be represented by a vector (X_d, Y_d, X_r, Y_r).

2.2 Pareto Efficiency

Given that all functions involved are concave we get the equivalence that an allocation (X_d, Y_d, X_r, Y_r) is Pareto efficient if and only if there exists $\overline{\lambda} \ge 0$ such that (X_d, Y_d, X_r, Y_r) maximizes

$$nU^d(X_d, Y_d, U^r(X_r, Y_r)) + m\overline{\lambda} U^r(X_r, Y_r), \tag{4}$$

subject to the feasibility constraint $F(X,Y) \le 0$ (see Takayama (1985, pp. 90ff)). An efficient allocation of this economy must satisfy:

$$\frac{U^d_{X_d}(X_d, Y_d, \overline{U}^r)}{U^d_{Y_d}(X_d, Y_d, \overline{U}^r)} = \frac{U^r_{X_r}(X_r, Y_r)}{U^r_{Y_r}(X_r, Y_r)} = \frac{F_X}{F_Y}. \tag{5}$$

and

$$U^d_X(X_d, Y_d, \overline{U}^r) = \frac{n}{m} U^r_X(X_r, Y_r) \cdot U^d_U(X_d, Y_d, \overline{U}^r) + \overline{\lambda} U^r_X(X_r, Y_r) \tag{6}$$

where $\overline{U}^r = U^r(X_r, Y_r)$.

Proof of (5) and (6): Denote the multiplier associated with the resource constraint in the Lagrangian for maximizing (4) subject that constraint by λ_e. The FOCs are:

$$U^d_X = \lambda_e F_X,$$

$$U^d_Y = \lambda_e F_Y,$$

$$[nU^d_U + \overline{\lambda} m] U^r_X = m\lambda_e F_X,$$

$$[nU^d_U + \overline{\lambda} m] U^r_Y = m\lambda_e F_Y.$$

Dividing the first by the second equation and the third by the fourth yields (5), while plugging the first into the third one yields (6).

According to (5), in a Pareto optimum the marginal rates of substitution (*MRS*) between the two consumption goods *X* and *Y* have to be equal accross agents and must be identical to the marginal rate of transformation (*MRT*) which is given by F_X / F_Y.

Condition (6) is a bit more complicated to interpret. Since $\overline{\lambda}$ is non-negative, (6) implies that:

$$\frac{1}{n} U_X^d(X_d, Y_d, \overline{U}^r) \geq \frac{1}{m} U_X^r(X_r, Y_r) \cdot U_U^d(X_d, Y_d, \overline{U}^r), \tag{7}$$

which states that the last unit of good *X* must generate at least as much additional utility to the donors if they themselves consume as it would do when recipients consume it. If the unit of good X is shared by the donors, each of them gets additional utility of U_X^d / n. If it is divided among the recipients it raises their utility by U_X^r / m which is worth $U_U^d U_X^r / m$ to a (single) donor. Suppose that (7) did not hold. Then shifting some of good *X* from the donor to the recipient group would unambiguously constitute a Pareto improvement: It would increase donors' utilities (since (7) did not hold) *and* recipients' utilities U^r (which is increasing in X_r). In eq. (6) the term $\overline{\lambda} U_X^r$ accounts for this increase in U^r due to a reallocation of *X* towards the group of recipients. The marginal social benefit of such a utility increase is captured in the welfare weight $\overline{\lambda}$. At this moment we should already hint at the fact that $\overline{\lambda}$ may well be zero - in which case (7) will hold with equality.

2.3 The Decentralized Economy

We now investigate into the properties of the equilibrium in a decentralized economy. We will discuss and compare two different kinds of donations. First we assume that the donors make cash transfers to the group of recipients (Section 2.3.1), while we will present the case of in-kind transfers (or, as Becker 1974 calls "earmark transfers") in Section 2.3.2. Both in the cash transfer and in the in-kind transfer regimes we suppose that the two consumption goods will be produced by profit maximizing competitive firms which adapt their production plans as to equate the *MRT* between the two goods to their price ratio in the markets[4]:

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4 Peltzman (1973) treats both the price and cost as varibles in the cash and in-kind transfers in his model of government subsidies.

$$\frac{F_X}{F_Y} = \frac{P_X}{P_Y}. \tag{8}$$

We assume that (8) will hold in all decentralized settings we are discussing below (including Section 3).

The decentralized settings below have the structure that the donors act as Stackelberg leaders vis-à-vis the recipients: Donors decide on their transfers (and their consumption) such as to maximize their utility, taking into account that recipients will possibly react on the transfers they get. While as a whole being Stackelberg leaders twoards recipients, the donors are assumed to act according to the Nash conjecture within their own group: They simultaneously decide how much to transfer to the recipients, thereby each of them taking the transfers of all others as given.

2.3.1 Cash Transfers

Suppose that the donor makes a cash transfer to the recipients hoping that this will further their well-being. Let S_d be the cash transfer of a (representative) donor. All transfers are collected and redistributed to the recipients on a per-capita basis. Each recipient thus obtains a transfer of $S := \frac{1}{m}(S_d + S_{-d})$ where we write $S_{-d} := \sum_{j \neq d} S_j$ to denote the transfers of all donors other than the one we are currently talking about. Recipients, of course, retain discretion about their consumption of *X* and *Y*. Their optimization problem

$$\max_{X_r, Y_r} U^r(X_r, Y_r) \text{ s.t. } S + E_r \geq P_X X_r + P_Y Y_r \tag{9}$$

has the following FOC:

$$\frac{U_X^r}{P_X} = \lambda_r = \frac{U_Y^r}{P_Y}. \tag{10}$$

The Lagrangian multiplier λ_r is the marginal utility of income:

$$\lambda_r = \frac{d\,V^r}{d\,E_r} = \frac{d\,V^r}{d\,S}, \tag{11}$$

where $V^r = V^r(S + E_r)$ is the recipients' indirect utility function (the value function of (9)). We suppress all other arguments for notational convenience.

When considering his transfer, each donor presumes that his co-donors will not react upon his choice (Nash assumption). The donor maximizes $U^d(X_d, Y_d, V^r(S+E_r))$ with respect to X_d, Y_d and S_d, obeying his budget constraint $E_d \geq S_d + P_X X_d + P_Y Y_d$ and the fact that $S = \frac{1}{m}(S_d + S_{-d})$. The FOCs read:

$$\frac{U_X^d}{P_X} = \lambda_d = \frac{U_Y^d}{P_Y}, \tag{12}$$

$$\lambda_d = \frac{1}{m} U_{U^r}^d \frac{d\,V^r}{d\,E_r} = \frac{1}{m} U_{U^r}^d \lambda_r . \tag{13}$$

Combining (10) through (13) we get that the Stackelberg equilibrium of the decentralized economy is characterized by

$$\frac{U_X^r}{U_Y^r} = \frac{U_X^d}{U_Y^d} = \frac{P_X}{P_Y}. \tag{14}$$

$$U_X^d = \frac{1}{m} U_{U^r}^d U_X^r . \tag{15}$$

Condition (14) states that in a Stackelberg equilibrium goods *X* and *Y* are allocated such that the *MRS* of all agents are equal to the *MRT* - as is required by (5) for a Pareto efficient situation. Condition (15) then states that the equilibrium allocation is such that *each donor* is indifferent between consuming the last unit of good *X* by himself (which generates additional utility of U_X^d) or giving it away to the group of recipients. Each recipient will obtain $1/m$ units of X which increases his utility by U_X^r. The donor assesses this by U_U^d. Comparing (15) and (6) we see that the Stackelberg equilibrium is inefficient for $n > 1$ since

$$U_X^d = \frac{1}{m} U_{U^r}^d U_X^r < \frac{n}{m} U_{U^r}^d U_X^r + \overline{\lambda} U_X^r$$

for all $\overline{\lambda} \geq 0$ (All functions are evaluated in the [unique] Stackelberg equilibrium). For the single-donor case $n = 1$ we obtain, however, that the Stackelberg equilibrium is Pareto efficient as (15) and (6) coincide for $\overline{\lambda} = 0$.

The reason why the Stackelberg equilibrium is inefficient for $n > 1$ is the strategic externality inherent in the Nash conjecture of the donors' game. Each of them, when assessing the benefits of increasing his donation, only accounts for his benefits from the recipients' utility increase; they are given by $U_U^d U_X^r / m$. He ignores, however, that an increase in his donation also is to the benefit of all other donors. The marginal benefit of donating to the group of donors is given by $nU_U^d U_X^r / m$. Note that the RHS of (15) is a decreasing function of the donation S_d:

$$\frac{\partial}{\partial S_d}\left(U_U^d U_X^r\right) = \frac{1}{P_X}\frac{\partial}{\partial S_d}\left(\frac{dV^r}{dS}U_U^d\right) = \frac{1}{mP_X}\left(\frac{d^2V^r}{dS^2}U_U^d + \left(\frac{dV^r}{dS}\right)^2 U_{UU}^d\right) < 0 .$$

Hence, under the assumption that cross-partial effects are non-existing, have the "correct" signs or at least do not overcompensate the direct effects, donations will be too low in the Stackelberg equilibrium for the case of $n > 1$ donors. This could be expected from the outset since the externality among donors is a positive one.

Things are different for the single-donor case $n = 1$. Here the Stackelberg equilibrium is efficient as eqs. (15) and (6) coincide for $\overline{\lambda} = 0$. Clearly, in the case of a single donor only, externalities among donors cannot occur. However, this alone is not enough to explain that the Stackelberg equilibrium is efficient here. The "true" reason for efficiency is that the objectives of the philanthropic donor and the social planner can, for the single-donor case, be fully brought to coincidence - namely, by setting $\overline{\lambda} = 0$ in (4).

2.3.2 In-kind Donations

We now analyse the case that the donors make an in-kind rather than a cash transfer to the recipients. I.e., each donor purchases a certain amount of X (concert or museum tickets, books for the library) in order to hand them over to the recipients, while the in-kind transfers are not refundable. Denote this amount by X_d^S. Donations are again distributed on a per-capita basis among recipients, such that each of them receives $X^s = \frac{1}{m}(X_d^s + X_{-d}^s)$. (Notation is analog to the previous section.) A recipient´s optimisation problem can then be written in terms of the following Lagrangian:

$$L^r = U^r[(X^S + X^B), Y_r] + \lambda_r(E_r - P_X X^B - P_Y Y_r) , \tag{16}$$

where X^B is the amount of merit good the recipient purchase at his own expenses. His total consumption is then given by $X_r = X^S + X^B$. The Kuhn-Tucker conditions for (16) read:

$$U_X^r - \lambda_r P_X \leq 0; \quad X^B(U_X^r - \lambda_r P_X) = 0 ,$$

$$U_Y^r - \lambda_r P_Y \leq 0; \quad Y_r(U_Y^r - \lambda_r P_Y) = 0 ,$$

plus the budget constraint. We assume that good Y is always purchased in positive amounts (the Inada assumption that $U_Y^r(X,0) \to \infty$ for all X would be sufficient for this). With respect to good X it may, however, well happen that the recipient does not make any purchase of the good by himself, but solely relies on the donor´s gift.

This will happen if and only if

$$\frac{U_X^r(X^S, E_r / P_Y)}{U_Y^r(X^S, E_r / P_Y)} \leq \frac{P_X}{P_Y}. \tag{17}$$

If one assumes that $U_{XY}^r \geq 0$ (or $U_{XY}^r < 0$, but small in absolute terms) then the *MRS* for U^r will be decreasing in X and (17) thus will prevail if the gift X^S is too large.

The donors' optimization procedure is captured in:

$$L^d = U^d \{X_d,\ Y_d,\ \tilde{V}^r[\frac{1}{m}(X_d^S + X_{-d}^S)]\} \ +\ \lambda_d[E_d - P_X(X_d^S + X_d) - P_Y Y_d], \tag{18}$$

where $\tilde{V}^r(X^S) = \tilde{V}^r\left(\frac{1}{m}(X_d^S + X_{-d}^S)\right)$ is the value function of the recipient's optimization problem. Its derivative is given by $\tilde{V}_{X^S}^r = U_X^r(X_r, Y_r)$ (regardless of whether the recipient chooses a corner solution or not). The FOCs for (18) are

$$\frac{U_X^d}{P_X} = \lambda_d = \frac{U_Y^d}{P_Y} \quad \text{and} \quad P_X \lambda_d = \frac{1}{m} U_{U^r}^d \frac{\partial \tilde{V}^r}{\partial X^S} = \frac{1}{m} U_{U^r}^d U_X^r. \tag{19}$$

If the recipient does not choose a corner solution we thus get

$$\frac{U_X^r}{U_Y^r} = \frac{U_X^d}{U_Y^d} = \frac{P_X}{P_Y} \quad \text{and} \quad U_X^d = \frac{1}{m} U_{U^r}^d U_X^r,$$

which is identical to the case of cash donation.

Otherwise, if the recipient choose a corner solution, we obtain:

$$\frac{U_X^r}{U_Y^r} \leq \frac{P_X}{P_Y} = \frac{U_X^d}{U_Y^d} \quad \text{and} \quad U_X^d = \frac{1}{m} U_{U^r}^d U_X^r,$$

where the *MRS* between X and Y are not equalized across the two groups of donors and recipients.

Clearly, the equilibrium of the in-kind game is always inefficient in the multi-donor case. Unlike in the case of cash donations, it need not be Pareto efficient in the single-donor case either. As corner solutions for the recipients' program cannot be excluded, condition (5) might be violated in the Stackelberg equilibrium for $n = 1$. For an interior solution of the recipient's problem, the results of Section 2.3.1 can be transferred *mutatis mutandis*: The Stackelberg equilibrium is inefficient for $n > 1$ and efficient else. In an inefficient equilibrium, donations are too low.

2.3.3 Comparison of Cash- and In-Kind Donation

It is obvious that for case ii) there exists a cash-donation of equal value as the in-kind donation that makes the recipients and thus the donors better off. This is most easily illustrated by means of Figure 1, where the in-kind case with a border solution is P_K, while P_C is the equilibrium for a cash-donation of equal value.

-- Figure 1 goes here --

The comparison between cash and in-kind donations is therefore clear-cut: Either cash and in-kind donations are equivalent (case (i) above) or there exists a cash-donation of equal value that makes both groups better off (case (ii)). Hence, cash donations are the (weakly) preferable form of donation.

3. Donor with Merit-Good Preferences

In this section we discuss the implications of a different form of altruism. Instead of deriving utility from the well-being U^r of the recipients, donors are now assumed to derive utility from the merit goods consumption X_r of the recipients. One might be reluctant to call this an altruistic attitude and might wish to label it paternalistic (as, e.g., in Solow, 1994). We call it merit-good preferences. Each donors' utility function is now given by

$$U^d = U^d(X_d, Y_d, X_r) \tag{20}$$

and is assumed to possess standard properties with respect to all its variables. In particular, $U^d_{X_r} > 0$ and $U^d_{X_r X_r} < 0$. Apart from the donors' utility function, the model is identical to that in the previous section.

3.1 Pareto Optimum

Pareto optimal allocations (X_d, Y_d, X_r, Y_r) of this economy maximize the Lagrangian:

$$L = nU^d(X_d, Y_d, X_r) + m\lambda_u[U^r(X_r, Y_r) - \overline{U}^r] - \lambda_e F(X, Y).$$

They thus satisfy the following set of FOCs:

$$\frac{U^d_{X_d}}{U^d_{Y_d}} = \frac{F_X}{F_Y}, \tag{21}$$

$$m\frac{U^r_{X_r}}{U^r_{Y_r}} + n\frac{U^d_{X_r}}{U^d_{Y_d}} = m\frac{F_X}{F_Y}. \tag{22}$$

According to (21), the donors' *MRS* for the two goods *X* and *Y* has to be equal to the *MRT* F_X / F_Y. Eq. (22) then accounts for the fact that X_r enters both the donors' and the recipients' preferences. Thus, one-unit increase of the consumption of X_r for all recipients (which costs society mF_X / F_Y in terms of *Y*) benefits the *m* recipients (measured, in terms of *Y*, by their *MRS*) *and* the *n* donors. Eq. (22) resembles the Samuelson-condition, but is not identical to it. X_r is not a public good: Each unit of X_r can only be consumed by one recipient (but nevertheless enters the utility function of *all* donors.)

3.2 Cash Donation

As above we will distinguish between cash and in-kind donations. Let us start with the cash case. Donors with merit-good preferences consider to make cash transfers to the recipients, hoping that these will devote their higher income to engage in more merit good.

The recipients' problem is identical to that in Section 2.3.1 and its FOC are given by (10) and the budget constraint. We are now interested in how the recipient changes his consumption of the cultural goods when his income increases. Ignoring all other parameters we write the recipients' demand function for *X* as $X_r(S)$. Differentiating the FOCs we obtain:

$$\frac{\partial X_r}{\partial S} = \frac{P_Y(U^r_{XY}P_X P_Y - \frac{P_X}{P_Y}U^r_{YY})}{P_X P_Y(2U^r_{XY} - \frac{P_X}{P_Y}U^r_{YY} - \frac{P_Y}{P_X}U^r_{XX})} = \frac{1}{P_X}\frac{U^r_{XY} - \frac{U^r_X}{U^r_Y}U^r_{YY}}{2U^r_{XY} - \frac{U^r_X}{U^r_Y}U^r_{YY} - \frac{U^r_Y}{U^r_X}U^r_{XX}}. \tag{23}$$

The denominator in (23) is always positive in a household optimum. Hence, *X* is superior in the recipient's preferences ($\partial X_r / \partial S$ > 0) if and only if

$$U^r_{XY} > \frac{U^r_X}{U^r_Y}U^r_{YY}.$$

The donors (ceteris paribus) feel better if the recipients use their cash transfer to consume more of the merit good. They solve the optimization problem:

$$L^d = U^d\left\{X_d, Y_d, X_r[(S_d + S_{-d})/m]\right\} + \lambda_r(E_d - S_d - P_X X_d - P_Y Y_d) \qquad (24)$$

As above, we assume an interior solution for X_d and Y_d. The Kuhn-Tucker condition for the optimal choice of S_d reads:

$$U^d_{X_r}\frac{1}{m}\frac{\partial X_r}{\partial S} - \lambda_d \le 0 \text{ and } S\cdot\left(U^d_{X_r}\frac{1}{m}\frac{\partial X_r}{\partial S} - \lambda_d\right) = 0\,.$$

Hence there are two cases to be distinguished:

i) $S > 0$: If the donor actually makes a donation the FOC of (21) and (23) can be combined to:

$$U^d_{X_r}\frac{1}{m}\frac{\partial X_r}{\partial S} = \frac{U^d_{X_d}}{P_X} = \frac{U^d_{Y_d}}{P_Y} \qquad (25)$$

ii) $S = 0$: In case the donor does not provide any cash to the recipients, we get:

$$U^d_{X_r}\frac{1}{m}\frac{\partial X_r}{\partial S} < \frac{U^d_{X_d}}{P_X} = \frac{U^d_{Y_d}}{P_Y}\,. \qquad (26)$$

Eq. (25) states that the donor spends his income from donations for good X and good Y such that marginal utility is equalized in all these directions: Using the last unit of income for the purchase of X or Y yields additional utility of U^d_X / P_X or U^d_Y / P_Y, respectively. If the last unit of income is given away as a donation, the recipients will change their consumption of the merit good by $(1/m)\,\partial X_r / \partial S$ which donors assess by $U^d_{X_d}(1/m)\,\partial X_r / \partial S$. Clearly, (25) can only be satisfied - and thus a positive transfer $S > 0$ will only occur - if $\partial X_r / \partial S > 0$, i.e., if good X is superior in the recipients' preferences. Otherweise a cash-transfer would harm donors twice: first, by narrowing his own consumption possibilities for X and Y and, second, by a reduction in the recipients consumption of X. Only if the cash transfer augments the recipient´s consumption of X_r, will the money be well spent from the donor´s perspective.

3.3 In-Kind Donations

We now turn to the case that the donor makes in-kind transfer to the recipients rather than cash transfers. The recipient's optimization problem and the associated Kuhn-Tucker conditions are identical to those in Section 2.3.2. The recipients's own purchases of good X are a function of the amount of X that he gets as a gift: $X^B = X^B(X^S)$. Hence, his total consumption X_r is given by $X_r = X^S + X^B(X^S)$. The properties of the demand function $X^B(X^S)$ will prove to be important in the following analysis. In particular, it will be of interest whether the donation X^S (or an increase thereof) induces the recipient to increase his total consumption X_r of the merit good, i.e. whether

$$X^S + X^B(X^S) > \hat{X}^S + X^B(\hat{X}^S), \tag{27}$$

for some (or all) $X^S > \hat{X}^S \geq 0$. Clearly, condition (27) is (locally) violated if the recipient chooses a corner solution $X^B = 0$. Presupposing local differentiability of $X^B(X^S)$, (27) can be rewritten as

$$\frac{d\ X^B}{d\ X^S} > -1\,.$$

For the case of an interior solution we differentiate (16a) and (16b) to obtain:

$$U^r_{XX}(d\ X^S + d\ X^B) + U^r_{XY} d\ Y = \frac{P_X}{P_Y}\left[U^r_{XX} d\ Y + U^r_{XY}(d\ X^S + d\ X^B)\right] \tag{28}$$

$$d\ Y = -\frac{P_X}{P_Y} d\ X^B \tag{29}$$

Upon substituting the *MRS* for the price ratio it follows that

$$\frac{d\ X^B}{d\ X^S} = -\frac{U^r_{XX} - \frac{P_X}{P_Y}U^r_{XY}}{U^r_{XX} - 2\frac{P_X}{P_Y}U^r_{XY} + (\frac{P_X}{P_Y})^2 U^r_{YY}} > -1 \;\; \Leftrightarrow \;\; U^r_{XY} > \frac{U^r_X}{U^r_Y}U^r_{YY}\,, \tag{30}$$

i.e., if and only if the merit good X is superior (cf. (23a)). To obtain the equivalence in (30) we used the fact that the denominator in the large fraction on the LHS is negative from the second-order conditions of the recipient's optimization problem.

The donors solve the optimization problem

$$L^d = U^d[X_d, Y_d, X^S + X^B(X^S)] + \lambda_d[E_d - P_X(X^S_d + X_d) - P_Y Y_d] \tag{31}$$

where $X^S = \frac{1}{m}(X_d^S + X_{-d}^S)$. Assuming that goods X and Y are both consumed in positive amounts by the donors, it must be true that

$$\frac{U_X^d}{P_X} = \lambda_d = \frac{U_Y^d}{P_Y}.$$

Since it is not a priori clear whether donors really make non-zero gift we use the Kuhn-Tucker condition for X_d^S:

$$U_{X_r}^d \frac{1}{m}\frac{\partial X_r}{\partial X^S} - \lambda_d P_X \leq 0; \quad X^S(U_{X_r}^d \frac{1}{m}\frac{\partial X_r}{\partial X^S} - \lambda_d P_X) = 0$$

Hence there are two cases to be discussed:

i) $X^S \geq 0$: If the donor gives an in-kind donation to the recipients, the FOCs can be combined to yield

$$\frac{1}{m}\frac{\partial X_r}{\partial X^S}\frac{U_{X_r}^d}{P_X} = \frac{U_{X_r}^d}{P_X} = \frac{U_{Y_r}^d}{P_Y}. \tag{32}$$

ii) $X^S = 0$: If the donor does not donate anything of good X to the recipients, the FOCs imply:

$$\frac{1}{m}\frac{\partial X_r}{\partial X^S}\frac{U_{X_r}^d}{P_X} < \frac{U_{X_d}^d}{P_X} = \frac{U_{Y_r}^d}{P_Y}. \tag{33}$$

Condition (32) states that in case of a positive donation the donor will distribute his income on purchases of X_d, X_r and Y_d such that the last unit generates equal marginal utility in all three directions. Spending the last euro for X allows a purchase of $1/P_X$ units each of which augments utility by $U_{X_r}^d$ if consumed by the donor himself and by $(1/m)\,U_{X_r}^d(d\,X_r / d\,X^S)$ if given away to recipients. In the latter term it is taken into account that recipients react upon donations with changes in their own purchases of X.

It is obvious from (32) that a positive gift $X^S > 0$ will be made only when $\partial X_r / \partial X^S > 0$ (otherwise, (32) can never be satisfied). We know from (30) that this is equivalent to X being superior in the recipient´s preferences. Hence for the in-kind case we get the same necessary condition for positive donation as for the case of cash donations: X_r must be superior.

Again, the logic behind this is clear: If X_r is inferior, an in-kind donation to the recipient harm the donor twice: first, by the expenditures which reduce his own consumption possibilities of goods *X* and *Y* and, second, by a utility reduction due to a lower consumption of good *X* by the recipient.

3.4 Comparing Cash and In-Kind Donations

From section 2 we know that when the recipient´s utilities U^r enter into the donor´s preferences, cash donations are superior to in-kind donations both from an overall perspective and from the donor´s point of view. These in-kind donations bear the risk of inducing a corner solution in the recipient´s utility maximization problem - which always implies an avoidable loss of utility. It is exactly the possibility of inducing corner solutions which for the actual case - where X_r rather than U^r enters into U^d - can make in-kind gifts preferable to cash donations from the donor´s perspective. To see this consider Figure 1 again. The initial situation - without donations of any kind - is characterized by the recipient´s optimum P_O. Let the Stackelberg equilibrium of the cash-game lead to an optimum P_C (with higher consumption of *X* than in P_O). An in-kind donation of the same value will induce the boundary situation P_K - which is prefered to P_C by the donor: Expenditures for the gift are the same in P_C and P_K, but the recipient´s consumption of good *X* is higher in P_K. Hence, the donor´s utility is higher.

One can easily see that from the donor´s perspective an in-kind donation will be preferred to cash when the latter is such that the recipient´s consumption of good *Y* with the donation exceeds his consumption *possibilities* of that good in the initial situation (indicated by $\overline{Y}_O$ above). Then, too much of the donation is diverted into good *Y*, which is worthless from the donor´s point of view. With an in-kind donation, such an ”abuse” of the gift is precluded - which makes them the first choice from the donor's perspective.

In all situations other than the one just discussed, cash and in-kind donations are equivalent: If X_r is inferior, neither of them will ever be made. If X_r is superior and the optimal cash donation does not induce a consumption of *Y* higher than $\overline{Y}_O$, an equilibrium of the cash-game can be obtained as an equilibrium of the in-kind-game where the donation are of equal value.

Formally, this can be seen from comparing the FOC for the donor in the two games. We replicate them here:

- cash: $U^d_{X_r}\frac{1}{m}\frac{\partial X_r}{\partial S}=\frac{U^d_{X_d}}{P_X}$.

- in-kind: $U^d_{X_r}\frac{1}{m}\frac{\partial X_r}{\partial X^S}=U^d_{X_d}$.

Check from (23) and (30) that: $\frac{\partial X_r}{\partial X^S}=\frac{\partial X_r}{\partial S}P_X$ for the case that the recipient´s optimum is an interior one (which is the relevant case here).

To sum up, we get that in-kind donations are preferred to cash donations from the donor´s perspective. This does not hold in an overall perspective since in the case of Figure 2 the outcome P_K is worse than P_O from the recipient´s point of view. Hence, cash and in-kind donations are generally Pareto non-comparable.

Yet, the equilibria of both the in-kind and the cash donations game are typically inefficient - as can be easily seen from comparing the FOCs (recall that we assume $F_X / F_Y = P_X / P_Y$ throughout) with the conditions for Pareto optimality. Typically, the Stackelberg equilibrium entails too low a consumption of X_r. To see this, recall that in a Pareto optimum we must have from (22) that:

$$\frac{U^r_{X_r}}{U^r_{Y_r}}<\frac{F_X}{F_Y}. \tag{34}$$

In an interior solution of the donations game we have, however,

$$\frac{U^r_{X_r}}{U^r_{Y_r}}=\frac{F_X}{F_Y}. \tag{35}$$

Assuming that the *MRS* on the LHS is a decreasing function of X_r, we get that an increase in the consumption of X_r will bring (35) closer to (34) and thus towards optimality. The condition that the *MRS* be decreasing is, however, equivalent to good Y_r being superior.

It is important to note that for the donor with merit-good preferences the inefficiency of the Stackelberg equilibrium also prevails in the single-donor case. Unlike in the case of a (single) philanthropic donor (cf. previous Section), the objectives of donors and recipients do not coincide: the donors with merit-good preferences are interested in a high consumption of good *X* by recipients, while recipients are interested in their utility.

A Digression to Demerit Goods - or: Should Non-Smokers Give Cigarettes to Smokers?

From the previous sections we know that a necessary condition for donors with merit-good preferences for X_r to make a positive in-kind donation is:

$$U^d_{X_r} \frac{1}{m} \frac{\partial X_r}{\partial X^S} > 0\,; \tag{36}$$

an equivalent condition applies to cash donations. Given that $U^d_{X_r} > 0$, good X_r must be superior in the recipient's preferences to allow this condition to hold. Of course, there is nothing in the formal analysis that prevents us from assuming that donors disapprove the recipients' consumption of good *X* while the recipients themselves enjoy it:

$$U^d_{X_r} < 0 < U^r_{X_r}\,. \tag{37}$$

As examples for such demerit consumption think of smoking, drinking alcohol, or - to use Sen's famous example (Sen, 1970, pp. 80ff) - reading *Lady Chatterly's Lover* and other scandalous literature. Assumption (37) does not require any modifications in the formal analysis.[5] Condition (36) tells us that donor's will find it worthwile to make a positive donation of good *X* to the recipients in order to *discourage* their consumption of X_r when this good is inferior in the recipients' preferences: $\frac{\partial X_r}{\partial X^S} < 0$. Ie., we have the seemingly paradox result that donors give cigarettes, alcohol or indecent literature to smokers, drinkers or otherwise lascivious people in order to make them *reduce* their total consumption of such goods. Suppose, e.g., that the donor-group consists of non-smokers who feel embarrassed by other people's smoking (again, there is nothing to prevent us to assume that the own

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[5] This at least holds as long as we speak about interior solutions for both individual and the social planner's problem. We also assume that the second-order conditions for optima are always satisfied.

consumption of good X does not show up in the donor's preferences and that they only care about their consumption of good Y and the recipients' consumption of X: $U^d_{Y_d} > 0 = U^d_{X_d} > U^d_{X_r}$). If X_r is inferior, then these non-smokers might seriously consider to give cigarettes to smokers. -which is certainly at odds with conventional wisdom.

Even more funnily, an equilibrium of a corresponding donations game entails too small such donations. The argument is identical to that of the previous section: A Pareto-optimum still requires (22) to hold (in an interior solution, assuming that the disgust of donors for X is not too large) which now implies, however, that $U^r_{X_r} / U^r_{Y_r} > F_X / F_Y$. In the Stackelberg equilibrium of donations game we still have $U^r_{X_r} / U^r_{Y_r} = F_X / F_Y$. Assuming that the *MRS* on the LHS is a decreasing function of X_r, we get that a decrease in the consumption of X_r will bring the latter condition closer to the former. This can be achieved, e.g., by higher transfers and larger gifts of X.

Clearly, all "results" in this section crucially hinge upon the assumption that X_r is an inferior good. So, a donor who considers to employ the mechanism presented here to reduce the consumption of demerit goods by his fellow citizens is strongly recommended to engage in some empirical investigation of the incriminated good´s effect.

4. Concluding Remarks

Social interactions related to taking and giving involve several externality-like features: First, at a conceptual level, externalities may constitute the primary reason for giving at all: People are affected by and feel concerned with the well-being of others (altruism) or their consumption of certain (merit) goods. Second, strategic externalities may prevail among those who give (cf. e.g. Bergstrom et al., 1986, or Section 3) or among those who receive (as, e.g., in the *rotten-kids* example by Becker, 1974). Externalities typically entail the danger that decentralized interaction fails to achive Pareto optimality. However, this general observation needs some qualifications:

First, consider the intra-group externalities among donors or recipients. With respect to donors it is a standard result (confirmed in Section 3) that their strategic interaction fails to be efficient since, given Nash conjectures, donors are inclined to ignore the positive externality their donations create for other donors (this holds independently of the donors' type of preferences). Strategic interaction among recipients, which is not discussed in this paper, need, however, not fail efficiency; again see Becker's rotten-kid theorem.

More important for our paper, consider the externalities that motiviate giving: If it is philanthropy (pure altruism), the positive externality between recipients and a single donor is extreme in the sense that their objectives fully coincide (one might be even reluctant to speak of an externality here). Decentralization is efficient then -- *de facto* there is no co-ordination problem to be solved. Things are different with merit-good preferences or, more generally, with only partial coincidence of the donor's and the recipient's preferences. Here, we typically encounter inefficiencies in the decentralized equilibrium. Moreover, coincidence or differences of donors' and recipients' preferences also have implications for the "optimal" form of donations: A philanthropic donor's first choice will be cash transfers: They are most efficient in raising the recipients' utility by providing the recipient with full discretion for their use. Exactly this feature may render them second choices when the donor's interest is not in the recipient's well-being, but only in special components thereof such as the consumption of merit goods.

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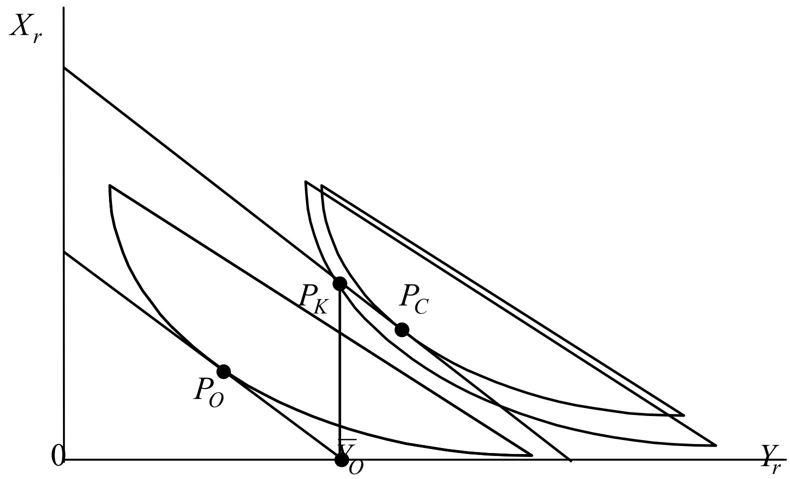

Figure 1