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The Non-optimality of For-Profit Firms Acting as Philanthropic Agents

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Abstract

We present a model of the nonprofit organization that leads to an allocation in the economy that is Pareto Optimal. This is in contrast to the usual assumption that an economy in which individuals exhibit altruism will not lead to a Pareto Optimal outcome. The presence of nonprofit organizations that function according to this model leads to an outcome in the economy that is Pareto Optimal. The result of Pareto Optimality is based on several assumptions, including the assumption that nonprofit organizations believe that they will not be earning any profit that may be brought forward to the following year. This result suggests an additional reason for the tradition in the United States of absolving nonprofit organizations and donors to such organizations from paying income taxes on such donations. The nonprofit organizations, by acting according to this model, are performing an important economic role in the economy by restoring Pareto Optimality to the economy.

Keywords: nonprofit, philanthropic, altruism, Pareto Optimal

1. Introduction

An ice cream company sells special flavors that benefit charitable causes. A yogurt company donates money to breast cancer research from the sale of each product bought. And an oil change company donates a portion of each sale to brighten the days of sick children. In all three cases, for-profit firms are engaged in philanthropic activities. Where, then, does the for-profit end and the nonprofit begin? And if the line between for-profit firms and nonprofit organizations is blurring, then what determines whether an organization should be granted tax-exempt status? This paper proposes that there are clear matters of efficiency that distinguish for-profit firms from nonprofit organization.

We begin by presenting a model for a philanthropic organization and then embed it into a general equilibrium model of the economy. While we normally assume that Pareto Optimality, the standard used by economists to assess an economy, requires each agent to be self-interested, the presence of such organizations modeled here allow for altruism and mutual concern among members of the economy. We show that the presence of such organizations can restore Pareto Optimality to an economy in which members are altruistic. This result is dependent, however, on several assumptions. One of these is that such organizations make decisions expecting to experience a zero profit. If the expected value of profit deviates from zero, the result of Pareto Optimality is no longer found, and the economy is no longer efficient in face of altruistic members. Policy implications of this finding are discussed.

In Economics 101, one of the first things students learn is that the economy, left to itself, is efficient. That is, it functions in a way that leads to allocations in which no one may be made better off without someone else being made worse off. However, this is true, they soon learn, only if certain requirements are met. One of these requirements that must be met is the assumption of self-centeredness. It is the stipulation that each person’s utility is dependent on only that person’s own consumption of goods and leisure. The existence of altruism, while perhaps good for the soul, distracts the economy from a Pareto Optimal allocation.

Several weeks later in the same class, students learn a general model for the for-profit firm. Missing, however, is a generally agreed upon model of the nonprofit organization. We propose here a model of an organization that is involved in providing a philanthropic good. This organization may or may not be a nonprofit organization. We find that when it is a nonprofit, its presence allows the economy to operate under altruism while still remaining at a Pareto Optimal allocation. We imbed this model into a general equilibrium model of the economy and then compare the results under the model to those that are Pareto Optimal. We find that the allocation reached under the general equilibrium model is, in fact, Pareto Optimal, provided that several assumptions hold.

2. Literature Review

Although there is no definitive model of the nonprofit organization, economists have produced theoretical and empirical studies as to the performance and objective of nonprofit organizations and their altruist nature. The vast literature includes Schall (1972); Scott (1972); Collard (1978); Greenberg (1980); Kranich (1988); Bernhein and Stark (1988); Andreone (1990); Spiegel (1995) Rose-Ackerman (1996); Flores (2002). Some of these studies proposed some organizational objective function to be maximized under a variety of market and regulatory assumptions, and then implications are drawn from the outcomes (Steinberg 1986, 1987, 1993, War 1982). Powell and Steinberg (2006) provide an overview, discuss existing theories, and propose some minimal essentials for a general nonprofit framework. In this study we propose that perhaps the objective function of the nonprofit is one centered on researching and articulating utility functions of recipients of altruism in the economy. Such a role allows for Pareto Optimality in the face of altruism (Collard, 1978).

3. An Economic Model of the Nonprofit Organization

Assume that there are m philanthropic organizations indexed by j and n donors, indexed by i. Also assume there are recipients of the good being produced by the nonprofit, all with utility functions $\hat{U}(x_j)$ that depend on a good x_j, which is provided by some agency that may be a nonprofit organization.[1] Each organization provides the recipient with one good that the donor cares about. This good, x_j, such as housing or clothes, is the focus of the nonprofit organization. It is not concerned with the amount of other goods that the recipient receives. Each nonprofit then maximizes, to the best of their ability, the utility of the recipients of good x_j that they provide, taking the distribution of all other goods as given. It does this by using a budget consisting of donations, B_t to provide x_j. We assume that x_j is either purchased by the nonprofit at a price of p_j or produced using paid labor, N_j which is paid a wage of w'.

There are two options that the organization may face in working with a budget constraint. If the organization is a for-profit organization, it may earn profit in any time period, and any money left over from last period may be brought forward to the next period, as would any loss. If the for-profit is truly making decisions on the margin, it will not be using any excess revenue to subsidize the sale of other goods. As a for-profit, it would anticipate earning such profit, and that anticipated profit would therefore be taken into consideration as it solves its own optimization problem.

However, if the organization is a nonprofit organization, it will approach its optimization problem as if there will be no surplus at the end of a time period. While it is possible that such surplus could arise, any surplus would not be anticipated and would then be put back into producing the philanthropic good the following year. This reflects the non-distribution constraint that is the hallmark of the nonprofit organization in the United States, since in the U.S., any profit earned may not be distributed to shareholders or other stakeholders. The nonprofit therefore faces a “lifetime” budget constraint that is carried over from year to year[2]. The maximization problem of the organization is therefore:

$$\text{Max } \hat{U}(x^{G'}(nM) \quad x_j(N^e)) + \quad \lambda[(B_{jt} \;\; + p_j x_j - w'N_t \quad) \quad + \sum_{t=0}^{t=t-1} (B_t \;\; - p_{jt}x_{jt} - w'N_t)]$$

Looking at the last term in this maximization problem, can let

$$\pi_t = \sum_{t=0}^{t=t-1} (B_t + p_{jt}\, x_{jt} - w'N_t) .$$

This is the extra income or loss brought forward from previous time periods, and acts as lump sum income for the organization. In each time period, t, the organization solves its optimization problem at that time to find the FOCs[3]:

N_j: $\hat{U}'(\cdot)x_N(\cdot) - \lambda w' = 0$

x_j: $\hat{U}'(\cdot) \quad - \lambda p_j = 0$

λ: $(B_{jt} - p_{jt}x_{jt} - w'N_t \quad) + \pi_t = 0$

In the case when the organization is a nonprofit organization, The term π_t in the above first order conditions then drops out, since any profit is not anticipated nor included in the optimization problem. This leads to a first order condition equal to

$$B_{jt} - p_{jt}x_{jt} - w'N_t = 0$$

as, in the long run, the nonprofit will treat any expected profit as zero.

Looking at the shadow price implied by the first order condition, and letting the portion of each dollar received in donations that is used to provide the good be equal to c, we see that, in equilibrium, it will be true that:

$$\lambda = \frac{1}{c}$$

as each dollar of b_j purchases $\frac{1}{c}$ units of good x_j. It must therefore be true that, in equilibrium, c is the price of purchasing a unit of x_j, or.

$$c =$$

$$p_j^e.$$

Further, the derivative of x_j with respect to N is equal to the marginal product of paid labor[4].

$$x_N = \varphi_N$$

To study the implications of this model of the philanthropic organization on efficiency in the economy, we embed the model into a general equilibrium model of an economy that explicitly models a philanthropic sector using several simultaneous optimization problems. Since our focus is the philanthropic sector, we do not describe the for-profit and government sectors in great detail, but note that the model could easily be expanded to observe the effects of these sectors in more detail. While it is possible for a for-profit firm to be participating in philanthropic activities, the portion of their endeavors that involve philanthropy are actually part of the nonprofit sector, and are modeled as such.

The first of these simultaneous optimization problems being solved is that of the donor. We assume that the donor receives utility from the increased well-being of the recipient, and can work in the for-profit sector or choose to assist the recipient by giving money to the philanthropic agent or by working, possibly for a reduced wage, for the nonprofit sector. In addition to the nonprofit sector, we include a for-profit sector as well as a government sector. The general equilibrium model is completed with market clearing conditions and a rational expectations assumption.

3.1 Donor

Assume that there are n donors indexed by "i". Each donor cares about others in the economy, and the utility functions of these other people enter the donor's utility function as an argument over which the donor maximizes utility. These donors also "purchases" leisure, $£_i$, and a vector of goods, $\mathbf{x}_i$[5]

Each donor cares about the welfare of others with utility functions $\hat{U}(x_j)$, but is concerned about the recipient's consumption of only a subset of the possible j goods. For example, I care if my neighbor has housing and food, but not if they have a new, flat-screen TV.

The total amount of time available to a donor is equal to T, from which they must choose the amount of time spent in leisure ($£_i$), the amount of time spent working for pay for the for-profit sector(h_i) and amount of time spent working for pay in the nonprofit sector(N_i). We assume that, to produce goods similar to $\mathbf{x}_j$, the government collects a tax (τ). This tax requires that the donor work a specified amount of time (M_i) at the market wage in order to pay that tax. We therefore define leisure, $£_i$ as a residual.

$$£_i = T - N_i - h_i - M_i\,, \tag{1}$$

In addition to offering money and time donations, the donor also purchases goods in the for-profit marketplace. The value of the goods they may purchase (with a vector of prices $\mathbf{p}_i$) is equal to the sum of the donor's income from all sources (h_i, N_i, and M_i), minus any taxes paid (τ) or cash donations offered (b_i). Note that $\mathbf{x}_i$ is a vector of goods, such as housing, food and transportation.

$$\mathbf{p_i}\, \mathbf{x}_i = \omega\, h_i + w' N_i + \omega\, M_i - \tau - b_i \tag{2}$$

The wage paid in the nonprofit sector (w' for labor N_i) is not necessarily equal to the wage paid in the for-profit and government sectors (w for labor h_i and M_i). With a production function of φ, assume that the marginal product of N is equal to φ_N, and that the marginal product of labor in the for-profit sector is equal to ω. A donation of one dollar to the nonprofit organization has a marginal product of $\frac{1}{c}$ units of x_j.

The total amount of the philanthropic good x_j produced in the economy is equal to the sum of the amount produced by the government, $x_j^G(nM_i)$, and that produced by the nonprofit sector, $x_j(N^e)$.

$$x_j = x_j^G(nM_i) + x_j(N^e) \tag{3}$$

The donor may give money, b_i directly to a philanthropic organizations in the form of cash. This then becomes part of the organization's budget. Donations to nonprofit, b_i , are assumed to have a marginal product per dollar of $\frac{1}{c}$.

Perceptions on the part of the donor are important, as perfect information may or may not exist in this economy. The perception by donor i of the amount of philanthropic good x_j is equal to Ψ_i. This depends on the total amount of this good produced by other private organizations (χ^P), the government (x^G, using nM_i) as well as the sum of the marginal product of the donor's donations of b_i, and of N_i.

$$\Psi_i = \chi^P + x^{G'}(nM_i) + \frac{b_i}{c} + \varphi_N N_i \tag{4}$$

The donor maximizes a utility function that is a function of the utility of other agents in the economy, of market goods, $\mathbf{x}_i$ and of leisure, $£_i$. That is, the donor solves a maximization problem of

$$\text{Max } U(\hat{U}(\cdot), \mathbf{x_i}, £_i)$$

Substituting equations 1,2 and 3 into the maximization problem above yields

$$\text{Max } U = (\hat{U}(\chi^P + x^{G'}(nM_i) + \frac{b_i}{c} + \varphi_N N_i), \omega h_i + w'N_i + \omega M - \tau - b_i, T\text{-}N_i - h_i - M)$$

This leads to first order conditions of:

$$N_i\text{: } U_1(\cdot)\hat{U}'(\cdot)\varphi_N + U_2(\cdot)w' - U_3(\cdot) = 0 \tag{5}$$

$$h_i\text{: } U_2(\cdot)w - U_3(\cdot) = 0 \tag{6}$$

$$b_i\text{: } U_1(\cdot)\hat{U}'(\cdot)\frac{1}{c} - U_2(\cdot) = 0 \tag{7}$$

3.2 The Government

It is assumed that the amount of taxes paid to the government is equal to the total value of the time spent working to pay for them. The government then uses this M_i labor to produce a good that is a substitute for x_j, denoted x^G.[7]

$$n\tau - \omega n M_i = 0 \tag{8}$$

3.3 The Philanthropic Organization

We now repeat the first order conditions for the philanthropic organization, as outlined above.

$$N_j\text{: } \hat{U}'(\cdot)x_N - \lambda w' = 0 \tag{9}$$

$$x_t\text{: } \hat{U}'(\cdot) - \lambda p_j = 0 \tag{10}$$

$$\lambda\text{: } B_j + p_j x_j - w' N_{it} + \pi_t = 0 \tag{11}$$

which become

$$\lambda\text{: } B_j + p_j x_j - w' N_{it} = 0 \tag{11}$$

when the organization is a nonprofit organization performing this maximization problem assuming it will have expected profit equal to zero.

As noted before, in equilibrium, it will be true that:

$$\lambda = \frac{1}{c} \tag{12}$$

$$x_N = \varphi_N \tag{13}$$

3.4 The For-Profit Sector

Labor in the for-profit sector is paid a wage of ω, with a marginal product of w. Each of the n individuals offers h_i hours in this sector, for a total amount of paid labor in the economy of H. The amount of the vector **x** produced, $\mathbf{x}^s$ is therefore

$$\omega = w \tag{14}$$

$$\mathbf{x}^S = \omega n h_i \tag{15}$$

3.5 Market Clearing

We assume that markets clear in this economy. This includes the market for paid labor in the for-profit sector,

$$H = n h_i \tag{16}$$

the supply of the vector of goods, **x**, which are used by both individuals as $\mathbf{x}_i$ and nonprofit organizations, as $\mathbf{x}_j$,

$$\mathbf{x}^S = n\mathbf{x}_i + m\mathbf{x}_j \tag{17}$$

Prices in the market for goods clear, and c is found to be the shadow price of the philanthropic good.

$$p_i = p^e \tag{18}$$

$$p_j = p^e \tag{19}$$

$$c = p^e \tag{20}$$

the market for paid labor to the nonprofit sector clears, from both a supply and demand side,

$$nN_i = N^e \tag{21}$$

$$mN_j = N^e \tag{22}$$

The total amount of donations given by n donors equals the total amount received by the m organizations.

$$nb_j = mB_j \tag{23}$$

3.6 Rational Expectations

We assume that the nonprofit organizations and donors correctly observe and interpret the amount of the philanthropic good being produced by the government and other nonprofits as well as the marginal benefit of any donations of money or time to the nonprofit organization . In addition, philanthropic organizations correctly interpret the utility functions of the recipients of the philanthropic good. Indeed, correctly interpreting the utility function of the recipient may be seen as the role of such organizations in an economy with altruism, where individual donors may not have access to such information.

$$\Psi_i = \Psi = \chi^P + \quad x^{G'}(nM_i) + \frac{b_i}{c} + \varphi_N N_i \tag{24}$$

These 24 equations may be reduced to four equations in three unknowns**,** in the variables N_i, h_i, and b_i as well as the given parameters, T, τ, n, m, φ_N, and. This is done in detail in the appendix to this paper.

4. Examining the General Equilibrium Model

This model presented here leads us to several conclusions about an economy which contains nonprofit organizations as modeled here.

4.1 Reduced Wage in the Nonprofit Sector

The first conclusion that may be drawn is that the wage in the nonprofit sector will be less than the wage in the for-profit sector. This has been shown to hold in previous empirical literature dealing with the nonprofit labor market, and is shown to be taken to an extreme level in the model presented here (Preston 1988, 1989; Leete 1994). Notice that this model assumes that all the donors must choose to give both time at a reduced wage and money donations, and cannot choose a corner solution of donations of zero in either case. These severe assumptions, dictated by the donor's problem, dictate a relationship between the wages in the for-profit sector and those in the nonprofit sector that are of the ratio 2:1, assuming that all donations are used directly for the provision of the philanthropic good by the organization. That is, under the assumptions we make here and later in this model, wages in the for-profit sector are double that of wages in the nonprofit sector. This may be shown by examining a subset of the original equations from the model presented here. Combining the equations presented earlier

$$U_1(\cdot)\hat{U}'(\cdot)\varphi_N + U_2(\cdot)w' - U_3(\cdot) = 0 \tag{6}$$

$$U_2(\cdot)w - U_3(\cdot) = 0 \tag{7}$$

$$U_1(\cdot)\hat{U}'(\cdot)\frac{1}{c} - U_2(\cdot) = 0 \tag{8}$$

$$x_N(\cdot) - \lambda w' = 0 \tag{9}$$

$$\lambda = \frac{1}{c} \tag{12}$$

$$\varphi_N = x_N \tag{13}$$

gives the result

$$U_2(\cdot)(c\,w' + w' - \omega) = 0.$$

That is, either $U_2(\cdot) = 0$ and the donor is at a point of satiation for income and goods[8], or in equilibrium the donor will choose to work in the nonprofit sector for a reduced wage of $w' = w - c\,w'$.

Making the common assumption that the donor is not a point of satiation for income and goods, we conclude that $w' = \omega - cw'$. In the case where $c = 1$, where all donations are used to provide the philanthropic good, this implies that $2w' = \omega$, or that the wage in the nonprofit sector is equal to half of the wage in the for-profit sector. Note that if $c<1$, the ratio of w'/w increases, as is probably the case in the actual nonprofit labor market. Indeed, in such a model as is presented here, the proportion of donations that are used to provide a philanthropic good would be predicted to be positively related to the differential between the nonprofit and for-profit wages[9].

4.2 Crowding Out

Previous research has been done on the concept of "crowding out" in an economy that contains both philanthropic donors and a government sector that both provide a public good (Andreoni, 1987; Brown 1997; Warr (1982); Roberts (1984); and Bergstrom, Blume and Varian (1986); and Day and Devlin (1996).) It is theorized that donors will decrease donations to that public good as the government increases provision of that good, as they will see their tax dollars and donations as perfect substitutes for each other, with both being used to provide the philanthropic good. In the extreme case, crowding may be perfect, and any increase in taxes spent on a public good also produced by the nonprofit sector will cause donations to fall, one-for-one. An alternative is found when donors are impurely altruistic. In this case, they value not only the provision of the public good, but also their act of contributing to it, as such contributions bring them utility directly (Andreioni 1989, 1990). In such a case, donations will not decline one-for-one as taxes used to finance a public good increase.

An additional issue with for-profit firms acting as philanthropic agents might be found in what is sometimes called "corporate crowding out." When people are encouraged to act altruistically as part of their relationships with for-profit firms (as, for example, when that firm promises to donate a fraction of their receipts to a worthy cause), this may discourage donors from giving on their own, as they believe that they have already contributed to the worthy cause. Thus, the philanthropic activities of for-profit firms cannot be seen as perfect substitutes to those of nonprofits.[11]

The model of the donor presented here is one of pure altruism. The donor does not value their donations as separate from the utility they bring to the recipient. Therefore, we could expect crowding out to be complete. Indeed, this is the case if $x^{G'}$ is equal to x_N[10] in the partial equilibrium context, when only the donor's utility function is studied. However, such results are partial equilibrium results, and may not hold in a general equilibrium framework. Thus, despite the perfect crowding out suggested by this perfectly altruistic model, crowding out will be less than complete as other changes in the economy are taken into effect. For example, how does the change in taxes affect donations of time vs. donations of cash? Such differences will depend on how the donor's desire for income reacts to changes in taxes. In general, we will not expect crowding out to be complete in a general equilibrium framework[12]

5. Pareto Optimality when Organization Optimizes Treating E(π) = 0

Recall that one of the characteristics of altruism in a competitive economy arises from the assumption that such an interconnectedness of utility functions will lead to outcomes that are not necessarily Pareto Optimal. We now compare the results found in this general equilibrium model to those that would be chosen by a social planner attempting to allocate resources in a manner that is Pareto Optimal. When a philanthropic organization functions in such a way as to treat the expected value of their profit equal to zero, that organization may be seen as a traditional nonprofit organziation. This removes the π_t from the equations presented above, and lets us reduce the 24 equations given above into four equations in three unknowns.

To compare these results to that achieved under Pareto Optimal conditions, we solve the "social planner's" problem, in which a social planner seeks to maximize total welfare in the economy. To do this, the social planner maximizes the social welfare function consisting of the total utility in the economy of n identical donors[13].

$$\text{Max } W = nU\left(\hat{U}\left(mx_k + \frac{n}{m}\, x_j(N_i)\right) + x^G(nM_i) + \frac{b_i}{c},\ wh + w'N_i + wM_i - \tau - b_i,\ T - N_i - h_i - M_i\right)$$

Maximizing over the variables N_i, h_i,, M and b_i the first order conditions for the social planner are:

$$N_i\text{: } n[U_1(\cdot)\hat{U}'(\cdot)(\tfrac{n}{m})x_N + U_2(\cdot)w' - U_3(\cdot)] = 0 \qquad \text{(a)}$$

$$h_i\text{: } n[U_2(\cdot)w - U_3(\cdot)] = 0 \qquad \text{(b)}$$

$$M_i\text{: } n[nU_1(\cdot)\hat{U}'(\cdot)\, x^{G'} + U_2(\cdot)w - U_3(\cdot)] = 0 \qquad \text{(c)}$$

$$b_i\text{: } n[U_1(\cdot)\hat{U}'(\cdot)\tfrac{1}{c} - U_2(\cdot)] = 0 \qquad \text{(d)}$$

We now compare these results to the reduced general equilibrium model in which π = 0 presented above, and ask whether the general equilibrium model implies the Pareto Optimal conditions. The general equilibrium model may be reduced to the following equations, as shown in the appendix.

$$U_2(\cdot)w - U_3(\cdot) = 0 \tag{i}$$

$$U_1(\cdot)\hat{U}'(\cdot) - U_2(\cdot) = 0 \tag{ii}$$

$$\hat{U}'(\cdot)x_N - (w') = 0 \tag{iii}$$

$$\hat{U}'(\cdot) - \frac{1}{c} = 0 \tag{iv}$$

We now show the relationship between the Social Planner's problem and the reduced equations from the general equilibrium model. We find that the conditions from the general equilibrium model imply those resulting from the Social Planner's problem when the firm is a nonprofit organization, and expects to earn zero profit to bring forward into the future. We begin by comparing condition (a) from the social planner's problem to those arrived at from the general equilibrium model. To prove condition (a) using the reduced equations from the general equilibrium model, note that equation iii says that

$$\hat{U}'(\cdot)x_N = w'$$

Noting the relationship between w and w' found earlier under our current assumptions, we substitute in to find

$$\hat{U}'(\cdot)x_N = w - w'$$

or

$$\hat{U}'(\cdot)x_N \quad + w' - w = 0,$$

Which can be shown, using the other equations presented here and the assumption that $x_N = w'$ implied by equations 13 and 14 of the general equilibrium model, to be equal to condition (a)

Condition (b) is implied by equation i from the general equilibrium model.

Condition (c), when combined with condition (b), says that $U_1(\cdot)\hat{U}'(\cdot)\, x^{G'} = 0$. This may be true for at least one of three reasons; $U_1 = 0$, $\hat{U}'(\cdot) = 0$ or $x^{G'} = 0$. If either of the first two reasons hold, then a contradiction to the usual assumption of nonsatiation of income and goods must occur, for either the donor or the recipient. Rather than have the nonsatiation assumption violated, we find, therefore, it must be the case that $x^{G'} = 0$. This is implied by the model of the government presented here, as there is seen to be no cost to asking for more M from each member of the economy, as all M is directly paid for by taxes, τ. Under such a condition, the government would choose to produce x^G until the first derivative of the production function for x^G is equal to zero. Thus, condition c is implied by our simple general equilibrium model.

Condition (d) is implied by equation (ii) whenever c = 1. This is implied by the general equilibrium model presented here in which each dollar donated to the nonprofit sector is used to produce or purchase philanthropic goods. That is, a donation of $1 is experienced as an increase of $1 in the budget of the philanthropic organizations that receive donations. The equivalence of these two sets of equations implies that the current public policy that grants special tax status to nonprofit organizations not shared by for-profit firms is economically correct. It is not simply the philanthropic work that leads to an optimal outcome in the presence of altruism, but the nonprofit status of the organization itself. Such a status is not duplicated by for-profit firms, regardless of any charitable causes they may espouse.

Note that, for the general equilibrium model to be Pareto Optimal, several specific assumptions were made. They were:

1) The philanthropic organization acts as a true nonprofit organization, with expected profit being equal to zero.
2) All income received from donors is used for the provision of the philanthropic good.
3) The government has no cost in producing a good similar to the philanthropic good.

6. Discussion and Conclusion

The model of a nonprofit organization presented here leads to an allocation in the economy that is Pareto Optimal. This is in contrast to the usual assumption that an economy in which individuals exhibit altruism will not lead to a Pareto Optimal outcome. The presence of nonprofit organizations that function according to this model leads to an outcome in the economy that is Pareto Optimal. The result of Pareto Optimality is based on several assumptions, including the assumption that nonprofit organizations believe that they will not be earning any profit that may be brought forward to the following year.

This result suggests an additional reason for the tradition in the United States of absolving nonprofit organizations and donors to such organizations from paying income taxes on such donations. The nonprofit organizations, by acting according to this model, are performing an important economic role in the economy by restoring Pareto Optimality to the economy. This result is not necessarily found, however, whenever for-profit firms participate in philanthropic activities, as the expected value of their profit is not equal to zero. Indeed, they probably participate in such activities in an attempt to increase profit.

As for-profit firms would be expected to experience positive profits, no matter how many admirable causes they may espouse, there is good reason not to exempt them from income taxes. The differences in the underlying attitudes towards profit distinguishes the for-profit firm from the nonprofit organization, and provides reasons for granting such tax exempt status to nonprofits alone.

The results of this analysis bring up several questions for future investigation. In each case, the expansion of a general equilibrium model and the application of a model of the nonprofit organization as an organization seeking to maximize utility of some members of the economy might be applied to questions that remain about the workings of this sector of the economy.

Since nonprofit organizations receive tax protection for their work, and for-profit firms do not, it would be interesting to explicitly imbed a tax on the for-profit firm in this analysis. Is such asymmetric treatment justified by a general equilibrium model involving both sectors? A true general equilibrium model including taxation of for-profit firms might shed light on the necessary conditions for such treatment to be optimal.

In addition, it may be interesting to expand upon donations by including other types of donations. In particular, it might be interesting to change the model to include a two-sided market for volunteer labor, as such a model has been proposed in some previous research (Simmons and Emanuele, 2010, Emanuele, 1996).

Finally, it would be interesting to explicitly study the issue of "crowding out" of donations when the government assumes responsibility for the supply of public goods also offered by the public sector. How does crowding out affect the amounts consumers are willing to purchase from for-profit firms that are attempting to assume the role of philanthropic agents? Are such results similar to those found with donations to nonprofit organizations?

There are many unanswered questions about the workings of the philanthropic sector with this model of a nonprofit organization in a general equilibrium setting. This paper presents only a beginning of a line of inquiry that may help illuminate the theoretical framework behind what is often called the "third sector" of the economy.

Appendix

In this appendix, we reduce the 24 equation presented in the text to a more manageable four equations in three unknowns. As we do this, we make several assumptions, including the assumption that the variable π is equal to zero. Recall that π represents profit brought forward from previous years, and, for a nonprofit organization, is assumed to have an expected value of zero.

We begin with 24 equations in 23 unknowns: $₤_i$, N_i ,h_i **,**M_i ,ω, w', $\mathbf{x}_i$, b_i, x_j, p_i, p_j, p^e, x_j^G, Ψ_i , χ^P, x_N, c, λ, $\mathbf{x}^S$, H, N_j, N^e, B_j, given the parameters T, τ , n, m, φ_N and w.

$$₤_i = T - N_i - h_i - M_i \tag{1}$$

$$p_i x_i = \omega h_i + w'N_i + \omega M - \tau - b_i \tag{2}$$

$$x_j = x_j^G(M_i) + x_j(N^e) \tag{3}$$

$$\Psi_i = \chi^P + x^{G'}(nM_i) + \frac{b_i}{c} + \varphi_N N_i \tag{4}$$

$$U_1(\cdot)\hat{U}'(\cdot)\varphi_N + U_2(\cdot)w' - U_3(\cdot) = 0 \tag{5}$$

$$U_2(\cdot)\omega - U_3(\cdot) = 0 \tag{6}$$

$$U_1(\cdot)\hat{U}'(\cdot)\frac{1}{c} - U_2(\cdot) = 0 \tag{7}$$

$$n\tau - \omega n M_i = 0 \tag{8}$$

$$\hat{U}'(\cdot)x_N(\cdot) - \lambda w' = 0 \tag{9}$$

$$\hat{U}'(\cdot) - \lambda p_j = 0 \tag{10}$$

$$B_j + \pi - p_j x_j - w'N \tag{11}$$

$$\lambda = \frac{1}{c} \tag{12}$$

$$x_N = \varphi_j \tag{13}$$

$$\omega = w \tag{14}$$

$$x^S = wnh_i \tag{15}$$

$$H = nh_i \tag{16}$$

$$\mathbf{x}^S = n\mathbf{x}_i + m\mathbf{x}_j \tag{17}$$

$$p_i = p^e \tag{18}$$
$$P_j = p^e \tag{19}$$
$$c = p^e \tag{20}$$
$$nN_i = N^e \tag{21}$$
$$mN_j = N^e \tag{22}$$
$$nb_i = mB_j \tag{23}$$
$$\Psi_i = \Psi = \chi^P + x^{G'}(nM_i) + \frac{b_i}{c} + \varphi_N N_i \tag{24}$$

Step 1: We first note that one of these variables occurs only once and can therefore be eliminated. We therefore begin by eliminating $\pounds_i$ (eliminating equation 1). We also substitute out for x^S(using equations 15 and 17 to form a new equation, 11'), p_i and p_j (using equations 18, 19 and 20 to form a new equation, 12'), N^e (using equations 21 and 22 to form a new equation, 13'), as well as λ (using equation 12), x_N (using equation 13), ω (using equation 14), H(using equation 16) and B_j (using equation 23). We have eliminated ten variables and ten equations. We are left with fourteen equations and thirteen variables, N_i ,h_i M_i, w', $\mathbf{x}_i$, b_i , x_j p^e, x_j^G, Ψ_i , χ^P, c, and N_j given the parameters w, T, τ, m, n and φ_N.

$$\mathbf{x}_i = \omega h_i + w'N_i + M_i - \tau - b_i \tag{1'}$$
$$\mathbf{x}_j = x_j^G + x_j^N(mN_j) \tag{2'}$$
$$\Psi_i = x^G(nM) + \chi^P + \frac{b_i}{c} + x_N(mNj) \tag{3'}$$
$$U_1(\cdot)\hat{U}'(\cdot)\varphi_j + U_2(\cdot)w' - U_3(\cdot) = 0 \tag{4'}$$
$$U_2(\cdot)w - U_3(\cdot) = 0 \tag{5'}$$
$$U_1(\cdot)\hat{U}'(\cdot)\frac{1}{c} - U_2(\cdot) = 0 \tag{6'}$$
$$n\tau - wnM = 0 \tag{7'}$$
$$\hat{U}'(\cdot)\varphi_j - \frac{1}{c}w' = 0 \tag{8'}$$
$$\hat{U}'(\cdot) - \frac{1}{c} = 0 \tag{9'}$$
$$\frac{n}{m}b_i + \pi - w'N_j - p^e x_j = 0 \tag{10'}$$
$$wnh_i = n\mathbf{x}_i + m\mathbf{x}_j \tag{11'}$$
$$p^e = c \tag{12'}$$
$$nN_i = mN_j \tag{13'}$$
$$\Psi_i = mx_j + x^G(nM) + xj^P(N^e) \tag{14'}$$

Step 2: We notice that equations 1' and 11' imply that, when $\pi = 0$, that $\frac{n}{n}x_j + w'N_i - b_i + wM_i - \tau = 0$.

At the same time, we make the assumptions that c=1, that all income received by the nonprofit is used for the production of the philanthropic good, and that $\pi_t = 0$. These assumptions lead to the fact that the result implied by equations 1' and 11' is also implied by equations 7', 10' and 13'[14].

Making these assumptions, we may therefore eliminate equations 1' and 11', since they are redundant, as well as the variable $\mathbf{x}_i$. Note that by assuming that c=1 we have also eliminated the variable c, and, by equation 12', have normalized the equilibrium price of the philanthropic good to equal one, thus eliminating the variable p^e along with equation 12'. This leaves us with a system of 11 equations in the 10 variables; N_i, h_i M_i, w', b_i, x_j, x_j^G, Ψ_i , χ^P, and N_j as well as the given parameters.

$$x_j = x_j^G + x_j^N(mN_j) \tag{1''}$$
$$\Psi_i = x^G(nM) + \chi^P + b_i + \varphi_N N_i \tag{2''}$$
$$U_1(\cdot)\hat{U}'(\cdot)\varphi_j + U_2(\cdot)w' - U_3(\cdot) = 0 \tag{3''}$$
$$U_2(\cdot)\omega - U_3(\cdot) = 0 \tag{4''}$$
$$U_1(\cdot)\hat{U}'(\cdot) - U_2(\cdot) = 0 \tag{5''}$$
$$n\tau - \omega nM = 0 \tag{6''}$$
$$\hat{U}'(\cdot)\varphi_N - w' = 0 \tag{7''}$$
$$U_1(\cdot) - 1 = 0 \tag{8''}$$
$$\frac{n}{m}b_i - w'N_j - x_j = 0 \tag{9''}$$

$$nN_i = mN_j \quad (10'')$$

$$\Psi_i = mx_j + x^G(nM) + x_j(N^e) \quad (11'')$$

Step three:

Substitute the terms for Ψ_i and χ^P (eliminating equation 2" and 11") into the donor's utility function. At this time, also substitute in for x_j^G and x_j (eliminating equation 1") into the utility functions. Also substitute out for b_i (using equation 9") and N_j (using equation 10") and M_i (using equation 6".) We also note that, since φ_N is equal to w' in equailibrium under the givnen assumptions, equations 7" and 8" are redundant, and we can therefore eliminate equation 7". This gives us four equations in three unknowns, N_i, h_i and b_i as well as the given parameters.

$$U_1(\hat{U}'(x^G(nM_i) + \chi^P + w'N_i + x_j + \varphi_N \frac{n}{m} N_i + U_2(\cdot)w' - U_3(\cdot) = 0 \quad (1''')$$

$$U_2(\cdot)w - U_3(\cdot) = 0 \quad (2''')$$

$$U_1(\cdot)\hat{U}'(\cdot) - U_2(\cdot) = 0 \quad (3''')$$

$$\hat{U}'(\cdot) - 1 = 0 \quad (6''')$$

Step four:

Substitute in for the variable $w' = \frac{w}{2}$ as is found in the text, whenever c = 1. Recall that, as found earlier in this reduction, $w' = \varphi_N$. These assumptions eliminate another variable, w', and leave us with four equations and three variables, h_i and N_i and b_i.

$$U_1(\hat{U}'(x^G(nM) + \chi^P + \frac{b_i}{c} + \varphi_N \frac{n}{m}N_i) + U_2(\cdot)\frac{w}{2} - U_3(\cdot) = 0 \quad (1''')$$

$$U_2(\cdot)\frac{w}{2} - U_3(\cdot) = 0 \quad (2''')$$

$$U_1(\cdot)\hat{U}'(\cdot) - U_2(\cdot) = 0 \quad (3''')$$

$$\hat{U}'(\cdot) - 1 = 0 \quad (6''')$$

Equations 2"' and 3"' imply equation 1"'. Further, this implies that, in equilibrium, the donor equates marginal utilities across the various uses of his or her time and money, as they are concerned with only one good that the recipient consumes. These results tell us that equation 1"" is implied by equations 2"' and 3"', when we incorporate the result found earlier that w' = w/2. We therefore eliminate equation 1"'. This leaves us with a system of four equations and three unknowns, in N_i, h_i and b_i.

$$U_2(\cdot)\frac{w}{2} - U_3(\cdot) = 0 \quad (i)$$

$$U_1(\cdot)\hat{U}'(\cdot) - U_2(\cdot) = 0 \quad (ii)$$

$$\hat{U}'(\cdot)(\frac{w}{2}) - (\frac{w}{2}) = 0 \quad (iv)$$

$$\hat{U}'(\cdot) - 1 = 0 \quad (v)$$

$$U_2(\cdot)w - U_3(\cdot) = 0 \quad (i)$$

$$U_1(\cdot)\hat{U}'(\cdot) - U_2(\cdot) = 0 \quad (ii)$$

$$\hat{U}'(\cdot)x_N - \frac{w}{2} = 0 \quad (iii)$$

$$\hat{U}'(\cdot) - \frac{1}{c} = 0 \quad (iv)$$

These four equations may be compared to those from the Social Planner's problem in the text. It is found that, under the specified assumptions, the social planner's problem is equivalent to the general equilibrium model presented here. That is, under the assumptions made, nonprofit organizations help restore Pareto Optimality to an economy that includes altruism in a way that for-profit firms do not.

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Endnotes

[1] It is interesting to note that the donors of one good may, in fact, be recipients of another good, as when, for example, middle class donors receive the services of adoption agencies which themselves depend on donations.

[2] In this model, we assume that there is no cost to gathering information about the utility function of the recipient. This, however, might lead to an interesting avenue of research.

[3] Note that the first two conditions lead to the traditional Pareto Optimal condition. The ratio of the prices is equal to the ratio of the marginal products, in this case, of the use of paid labor (with a price of w' and MP = x_N) to produce x vs. the purchase of x directly (with a price of p and a MP=1, as it is purchased directly).

[4] An additional expansion of this model could include a model of a two-sided market for volunteer labor, where the cost of using such labor is explicitly taken into account.

[5] For the purposes of this model, we are assuming that volunteer labor is actually truly free to the nonprofit and that it is viewed as a subset of leisure activity, £, by the donor. A more complex model, in which there is an impurely altruistic market for volunteer labor (Emanuele, 1996) is a possible expansion of this model, but is left for future research.

[6] Throughout this paper, we will use the notation of U_1 to denote the partial derivative of U(·) with respect to the philanthropic good, U_2 to denote the partial derivative of U(·) with respect to goods purchased, and U_3 to denote the partial derivative of U(·) with respect to leisure. Û'(·) will denote the first derivative of Û(·) with respect to x_j.

[7] Note that we do not impose a cost to the government in producing x^G, beyond that of using M and paying that labor ω per unit labor. Relaxing this assumption is area that might yield interesting future research.

[8] In maximization problems, we assume complementary slackness. That is, either the individual is at a point of satiation for that good, and the constraint does not hold, or the individual faces a constraint that does hold and is therefore not at a point of satiation. As we substituted equation (2) into the utility function, we are assuming that this income constraint holds and the donor is not at a point of satiation for income and goods.

[9] This might lead to an interesting area for future investigation.

[10] To find the degree of crowding out, compute the comparative static derivative for $\frac{dbi}{d\tau}$. In this case, that is equal to $-\frac{x_N}{x^{G\prime}}$.

[11] There is also concern that the growing popular practice of for-profit corporations providing opportunity for customers to "do good" by buying the companies product are actually causing harm if these customers then view this as their contribution to "giving back" rather than doing what they might otherwise do to give back. A 2011 article in the Chronicle of Higher Education noted that the "trend of corporate social responsibility, such as Whole Foods' donating money to charity each time shoppers bring a reusable bag, may in the long run make people less active in civic forums or charitable activities and undermines political passions and actions by making consumer choices seem like political acts."

[12] Further research might want to investigate the conditions under which it is complete.

[13] The utility of the recipients are maximized by the nonprofit, and this maximized utility plays a role in maximizing the utility of each donor. We therefore do not consider the utility of the recipients directly.

[14] Note that this assumption, reflecting the definition of nonprofit organizations, is critical at this point. If π does not equal zero, then this step cannot be taken and the remainder of the reduction will not follow.