Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence

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Models of giving have often been based on altruism. Examples include charity and intergenerational transfers. The literatures on both subjects have centered around neutrality hypotheses: charity is subject to complete crowding out, while intergenerational transfers are subject to Ricardian equivalence. This paper formally develops a model of giving in which altruism is not "pure." In particular, people are assumed to get a "warm glow" from giving. Contrary to the previous literature, this model generates identifiable comparative statics results that show that crowding out of charity is incomplete and that government debt will have Keynesian effects.

I. Introduction

The literatures on charitable giving and on Ricardian equivalence both center around a neutrality hypothesis. In the charity literature, government donations to a charity, financed by lump-sum taxes, will crowd out private giving dollar for dollar (Warr 1982; Roberts 1984). In the Ricardian equivalence literature, the consumption of parents and heirs is independent of the distribution of income among them (Barro 1974). A similar result is found in Becker's (1974) Rotten Kid theorem. While these neutrality results are discussed separately in the literature, their theoretical foundations are really the same. All concern public goods: in models of charity, the charity is assumed to be a

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public good, while in Ricardian models the benevolent parents care about their heir; hence the consumption of the heir acts as a public good within the family. Also, the demonstration of each is virtually identical. Once one has proved that lump-sum taxes completely crowd out private giving, then one can prove the neutrality of the income distribution by constructing all redistributions as mixes of a neutral tax cut to one person and a neutral tax increase to another. These two neutrality hypotheses, therefore, can be treated in tandem.

These hypotheses have many strong and well-known implications (see Roberts [1984, 1987] and Bergstrom, Blume, and Varian [1986] on charity and the survey by Bernheim [1987] on Ricardian equivalence). However, empirical evidence exists that contradicts neutrality.[1] In addition, many theoretical studies have demonstrated the limits of the neutrality hypothesis. These have included the consideration of corner solutions (Bergstrom et al. 1986), liquidity constraints (Hubbard and Judd 1986; Altig and Davis 1989), uncertain lifetimes (Blanchard 1985), imperfect capital markets (Feldstein 1988), strategic giving (Bernheim, Shleifer, and Summers 1985; Cox 1987), large economies (Andreoni 1988*a*), and myopia (Shefrin and Thaler 1985). Another natural hypothesis that has been suggested numerous times, beginning with Becker (1974), is that people have a taste for giving: perhaps they receive status or acclaim, or they simply experience a "warm glow" from having "done their bit." While it is fairly obvious that neutrality will be unlikely to hold with warm-glow giving, no tractable expression of this effect has been modeled and explored. Perhaps this is because it is less obvious what the comparative statics will be or that identifiable comparative statics results are even possible.[2]

This paper develops a general model of giving that includes a warm glow. In this model, individuals are assumed to contribute to a public good for two reasons. First, people simply demand more of the public good. This motive has become known in the literature as "altruism."[3] Second, people get some private goods benefit from their gift per se,

[1] On charity, see Clotfelter (1985) for a discussion of his and other results. See also Schiff (1985). On Ricardian neutrality, see Lucas and Stark (1985), Cox (1987), and the empirical summary by Bernheim (1987). In addition to these, there are experimental studies that demonstrate that the behavioral assumptions that are necessary for crowding out are contradicted in the laboratory (see Dawes and Thaler 1988; Andreoni 1988*b*).

[2] Earlier attempts at modeling this phenomenon have been based on Becker's (1974) original suggestion and have encountered precisely this difficulty. See Steinberg (1987) and the comment by McClelland (in press). As will be seen, this paper takes a different approach.

[3] The term was introduced by Barro (1974) and Becker (1974) and has been used most recently by Roberts (1987).

like a warm glow. Because of this second and seemingly selfish motive, this is called a model of "impure altruism." As will be seen, impure altruism is a simple yet powerful approach to giving and is consistent with empirical observations. With respect to charity, impure altruism indicates that progressive taxation may actually increase charitable giving rather than decrease it, as is commonly believed. The reason is that the general equilibrium effects of taxation depend only on the relative strengths of the warm-glow and altruism motives, not on income elasticities. With respect to Ricardian equivalence, this paper will show that if people "enjoy" making gifts or bequests, then the warm-glow effects will always dominate altruism, and debt will always have a Keynesian effect.

Section II develops the model of impure altruism. Section III discusses how the results apply to models of charitable giving, and Section IV discusses how they apply to Ricardian equivalence and the economics of the family. Section V presents a conclusion.

II. Impure Altruism

A. *The Model*

Assume for simplicity that the economy has only one private good and one public good. The public good is assumed to be produced from the private good by a simple linear technology and thus can be measured in units of dollars. Individuals are endowed with wealth w_i that they allocate among their consumption of the private good x_i, gifts to the public good g_i, and payment of lump-sum taxes τ_i. All taxes raised are devoted directly to the public good. There are n total consumers.

Let $G = \Sigma_{i=1}^{n} g_i$ be the total private contributions to the public good, and let $T = \Sigma_{i=1}^{n} \tau_i$ be the total public contributions. The total supply of the public good is therefore $Y = G + T$. A standard model of altruism would then write preferences as $U_i = U_i(x_i, Y)$, so utility depends only on private consumption and the total supply of the public good. At the opposite extreme, we could imagine a person who cares nothing at all for the public good, but gives only for the warm glow: $U_i = U_i(x_i, g_i)$. The warm glow is an increasing function of what is given. We could call such preferences "egoistic." It is reasonable to expect, however, that preferences include a combination of both altruism and egoism: people care about the public good but receive a warm glow as well. Thus we can write the utility function as

$$U_i = U_i(x_i, Y, g_i), \quad i = 1, \ldots, n, \tag{1}$$

where U_i is assumed to be strictly quasi-concave and increasing in all its arguments. Note that this function contains both altruism and egoism as special cases. Note also that g_i enters the utility function twice: once as part of the public good and again as a private good.[4]

Let $G_{-i} = \Sigma_{j \neq i} g_j$ be the total private gifts of everyone but person i. Under the assumption of Nash conjectures, givers treat G_{-i} and τ as exogenous. Each individual solves the maximization problem

$$\max_{x_i, Y, g_i} U_i(x_i, Y, g_i)$$

$$\text{subject to } x_i + g_i = w_i - \tau_i,$$

$$G_{-i} + g_i + T = Y.$$

Let $y_i = g_i + \tau_i$ represent i's total contribution to the public good, including both the voluntary component g_i and the involuntary component τ_i. The budget constraint can be written as $x_i + y_i = w_i$. It also follows that $Y = \Sigma_{i=1}^{n} y_i$. Let $Y_{-i} = \Sigma_{j \neq i} y_j$ be the total gifts of everyone but i. Substitute $y_i = Y - Y_{-i}$ into the problem above and in turn substitute the budget constraint into the utility function. Then, by the Nash assumption, the maximization problem is equivalent to

$$\max_{Y} U_i(w_i + Y_{-i} - Y, Y, Y - Y_{-i} - \tau_i). \tag{2}$$

Differentiating (2) with respect to Y and setting it equal to zero, we can solve for the optimal level of Y for person i. We assume, except where stated, that the equilibrium is interior, that is, $g_i > 0$ for all i.[5] Hence, we can write the solution to (2) as a function of the exogenous components of the optimization problem,

$$Y = f_i(w_i + Y_{-i}, Y_{-i} + \tau_i),$$

or, equivalently, by subtracting Y_{-i} from both sides,

$$y_i = f_i(w_i + Y_{-i}, Y_{-i} + \tau_i) - Y_{-i} \tag{3}$$

The first argument of (3) comes from the altruism argument of the utility function, while the second argument of (3) comes from the egoism argument of the utility function. Therefore, under pure altruism, (3) would be a function of only its first argument: $y_i = f_i(w_i +$

[4] A model suggested by Becker (1974) in which utility is defined as $U_i = U_i(x_i, \Sigma_{j \neq i} g_j, g_i)$ is considered by Cornes and Sandler (1984) and Steinberg (1987). While the intent of the Cornes-Sandler and Steinberg model is similar to that of the warm-glow model, the two approaches supply remarkably different characterizations of the problem (see n. 2).

[5] An assumption that is sufficient to guarantee positive gifts is $\lim_{g \to 0} \partial U_i / \partial g_i = \infty$. While this particular condition will not be called on in succeeding analyses, it is important to note that an interior equilibrium under impure altruism can be guaranteed, while no such condition exists for the pure altruism extreme. As we shall see, including corner solutions is a simple and straightforward application of the results described by Bergstrom et al. (1986).

$Y_{-i}) - Y_{-i}$. Notice that this formulation implies that pure altruists treat giving by others, Y_{-i}, as a perfect substitute for personal wealth, w_i. This is why Becker (1974) calls $w_i + Y_{-i}$ "social wealth." Also, this expression implies that only *total* giving y_i is important, implying that involuntary giving τ_i is a perfect substitute for voluntary giving g_i. This perfect substitutability is at the heart of the neutrality hypothesis. Since a person is indifferent about the source of the donations to the public good, any constellation of taxes, transfers, and contributions that leaves (x_i, Y) unchanged (from some equilibrium) for all i can be supported as an equilibrium; and, in general, there are infinitely many such constellations.

Next, we can ask how the optimum changes with the introduction of warm-glow giving. Notice that the warm-glow argument in (3), $Y_{-i} + \tau_i$, is the part of Y that i treats as exogenous. Hence, if altruism is not pure, then giving by others is no longer a perfect substitute for wealth, and giving through taxes is no longer a perfect substitute for giving voluntarily. As can be verified by (2), when i compares constellations that leave (x_i, Y) unchanged, i always prefers the one with the most warm glow, that is, the highest g_i. As a result, impure altruists will be reluctant to swap g_i for either τ_i or Y_{-i}. This unwillingness to substitute perfectly across sources of giving will be crucial to the analysis of warm-glow giving.

To understand this, we must first examine the derivative properties of $f_i(w_i + Y_{-i}, Y_{-i} + \tau_i)$. Call the derivative with respect to this first argument f_{ia}, where the a refers to the altruism component of utility. If both charity and the private good are normal, then $0 < f_{ia} < 1$. We can call the derivative with respect to the second argument f_{ie} since it is derived from the egoistic component of the utility function. The sign of f_{ie} is most easily seen by comparing (3) with the extreme cases. For pure altruists, $\partial f_i/\partial w_i = \partial f_i/\partial Y_{-i}$: if we trade a dollar of w_i for an extra dollar of Y_{-i}, then the person would substitute perfectly by reducing g_i by a dollar. On the other hand, if the person is impurely altruistic, then g_i and Y_{-i} are imperfect substitutes: if we trade a dollar of w_i for an extra dollar of Y_{-i}, then the person would be unwilling to substitute perfectly by reducing g_i by a dollar. Instead, g_i will fall by less than a dollar. This implies that $\partial f_i/\partial w_i \leq \partial f_i/\partial Y_{-i}$. Since $\partial f_i/\partial Y_{-i} = f_{ia} + f_{ie}$, this implies $f_{ie} \geq 0$. This can also be seen to hold at the pure egoism extreme. If $U_i = U_i(x_i, g_i)$, then an individual's total gift y_i will be independent of the gifts of others. So $\partial f_i/\partial Y_{-i} = 1$, which means $f_{ia} + f_{ie} = 1$. Given the normality assumption, this implies that, for pure egoists, $0 < 1 - f_{ia} = f_{ie} < 1$.

We can now discuss the interaction between altruism and warm-glow giving. One way to see this is to ask the following question: If we were to decrease w_i by one dollar, by how much would we have to increase Y_{-i} in order to maintain neutrality, that is, to keep Y constant? If we have pure altruism, the answer is one dollar. Since people are indifferent about the source of the contribution, if we decrease w_i by a dollar and increase Y_{-i} by a dollar, then the person will simply reduce g_i by a dollar and restore the original equilibrium. Suppose instead that a person is impurely altruistic. Then there will be some stickiness in g_i. Since g_i and Y_{-i} are no longer perfect substitutes, if w_i and Y_{-i} are altered to keep $w_i + Y_{-i}$ constant, then the person is no longer willing to substitute perfectly away from g_i. This implies that if w_i rises by one dollar, then Y_{-i} needs to rise by *less than* a dollar to keep Y constant. Indeed, at the pure egoism extreme, person i will simply decrease g_i by f_{ia}; hence Y_{-i} need only increase by this amount.

This concept can be expressed formally by totally differentiating (2) and setting it equal to zero: $dY = f_{ia}(dw_i + dY_{-i}) + f_{ie}dY_{-i} = 0$. Let α_i be the ratio that solves this. Then by rearranging we see that

$$\alpha_i = -\left.\frac{dY_{-i}}{dw_i}\right|_Y = \frac{f_{ia}}{f_{ia} + f_{ie}}.$$

We can see that α_i has all the properties described above. If we have pure altruism, then $f_{ie} = 0$, so $\alpha_i = 1$. For pure egoists, $f_{ia} + f_{ie} = 1$, so that $\alpha_i = f_{ia}$. Impure altruists are in the middle: $f_{ia} \le \alpha_i \le 1$. Hence, α_i serves to index altruism: the higher α_i, the more willing the person is to substitute g_i for other sources of giving. Thus if $\alpha_i > \alpha_j$, we shall say that i is more altruistic than j.

B. *Neutrality*

Consider first an increase in lump-sum taxes that are donated to the public good. Following this, we can generalize the result to redistributions of income.

Without loss of generality, let the taxes be changed on person 1. Totally differentiating the donation function of person 1 yields

$$\begin{aligned} dy_1 &= f_{1a}dY_{-1} + f_{1e}(dY_{-1} + d\tau_1) - dY_{-1} \\ &= (f_{1a} + f_{1e} - 1)dY_{-1} + f_{1e}d\tau_1. \end{aligned}$$

Substituting $dY_{-1} = dY - dy_1$ and rearranging, we see that

$$dy_1 = \frac{f_{1a} + f_{1e} - 1}{f_{1a} + f_{1e}}dY + (1 - \alpha_1)d\tau_1. \tag{4}$$

Totally differentiating the remaining $j = 2, \ldots, n$ equations, holding $d\tau_j = 0$, and rearranging, we get

$$dy_j = \frac{f_{ja} + f_{je} - 1}{f_{ja} + f_{je}}dY, \quad j = 2, \ldots, n. \tag{5}$$

Solve for the general equilibrium comparative statics result by adding equation (4) and the $n - 1$ equations of (5). We then find that

$$\begin{aligned} dY &= \sum_{i=1}^{n} \frac{f_{ia} + f_{ie} - 1}{f_{ia} + f_{ie}} dY + (1 - \alpha_1) d\tau_1 \\ &= c(1 - \alpha_1) d\tau_1, \end{aligned} \tag{6}$$

where

$$c = \left(1 + \sum_{i=1}^{n} \frac{1 - f_{ia} - f_{ie}}{f_{ia} + f_{ie}}\right)^{-1}.$$

If we assume that preferences are normal with respect to "social wealth,"[6] then $0 < f_{ia} + f_{ie} \leq 1$. This implies that $0 < c \leq 1$. Since $0 < \alpha_1 \leq 1$, it follows that $0 \leq dY/d\tau_1 \leq 1$. But notice it can never be that $dY/d\tau_1 = 1$ since $c = 1$ would imply that $\alpha_1 = f_{1a} < 1$. Thus it follows that $0 \leq dY/d\tau_1 < 1$.

This demonstrates that lump-sum taxes will, in general, only incompletely crowd out private giving. In fact, as can easily be seen above, pure altruism ($\alpha_i = 1$) is both necessary and sufficient for neutrality. Note also that the coefficient c in equation (6) is the same regardless of who is taxed. Hence, equation (6) implies that the relative degree of crowding depends only on the degree of altruism of the person whose taxes change. In particular, crowding is independent of income, income elasticity, or income effects per se. Only the degree of substitutability, α_i, matters.[7] This illustrates the general force of the theory: there will be less crowding out if the government levies taxes on the less altruistic members of society, regardless of income, income elasticities, or original gifts.

We can understand this result intuitively by noting that if i is purely altruistic, then i will neutralize a tax all by himself. If τ_i goes up by a dollar, then i can reduce g_i by a dollar and restore the original optimum; everyone else's gifts (both voluntary and exogenous) remain unchanged. However, if i is impurely altruistic, then if τ_i goes up by a dollar, i will be unwilling to substitute perfectly out of g_i; hence g_i will fall by less than a dollar. As a result, there will be a net infusion of social wealth economywide. This "income effect" will cause an increased demand for the public good.

[6] This assumption is necessary and sufficient to show that a Nash equilibrium exists and, moreover, is sufficient to show that the Nash equilibrium is unique and stable (see Andreoni 1987).

[7] To see this more precisely, suppose that at the initial equilibrium $f_{1a} = f_{2a}$, $w_1 = w_2$, and $y_1 = y_2$, so that income, income effects, and income elasticities are identical. However, suppose that $f_{1e} > f_{2e} = 0$. Then $\alpha_1 < \alpha_2 = 1$, and a tax on person 1 would increase the public good while a tax on person 2 would be neutral.

Next, we can apply this to redistributions of income. Since any k-person redistribution can be reconstructed as a series of two-person redistributions, it is sufficient to state the result in terms of a two-person transfer. Consider a redistribution that works through the tax system. Without loss of generality, let $d\tau_1 = d\tau = -d\tau_2$. (The same result can easily be shown to hold for direct redistributions, i.e., through dw rather than $d\tau$.) Then implementing this redistribution is equivalent to implementing first the tax increase $d\tau_1$ and second the tax cut $d\tau_2$. From our last result, the combined effect is

$$\begin{aligned} dY &= \frac{dY}{d\tau_1} d\tau - \frac{dY}{d\tau_2} d\tau \\ &= [c(1 - \alpha_1) - c(1 - \alpha_2)]d\tau \\ &= c(\alpha_2 - \alpha_1)d\tau. \end{aligned}$$

Hence, a redistribution of income will increase the total supply of the public good if and only if the person receiving the transfer is more altruistic than the person losing income. Again, if all preferences are purely altruistic, then the redistribution will be neutral.[8] Note, too, that neither initial wealth, initial gifts, nor income elasticities have any direct bearing on the predicted outcome: only relative degrees of altruism matter.

Curiously, pure altruism is only a sufficient condition for redistributions to have a neutral effect on Y since Y will also be unchanged if $\alpha_1 = \alpha_2$. However, pure altruism *is* a necessary condition for the redistribution to have a neutral effect on *all* consumption, including x_i. To see this, note that in equilibrium the total derivative of person 1's donation function would be

$$\begin{aligned} dy_1 &= \frac{f_{1a} + f_{1e} - 1}{f_{1a} + f_{1e}} dY + (1 - \alpha_1)d\tau_1 \\ &= (1 - \alpha_1)d\tau_1. \end{aligned}$$

Since $dx_1 = -dy_1$, then $dx_1 = 0$ if and only if $\alpha_1 = 1$. A similar result holds for person 2.

The intuition for this result follows that for crowding out. If the person receiving the tax cut is more willing to adjust her g to offset the tax (i.e., is more altruistic) than the person receiving the tax increase,

[8] If people were assumed also to gain utility from paying taxes, then utility would have the form $U_i = U_i(x_i, Y, g_i + \tau_i)$. It can easily be shown that lump-sum taxes will completely crowd out private giving and that redistributions through the tax system will also be neutral, but that redistributions outside of the tax system will not be neutral.

then there will be a net positive infusion of social wealth economy-wide. The aggregate effect will be to increase the demand for the public good.

III. Implications for Charitable Giving

It is immediate that impure altruism is capable of explaining the empirical regularities that the pure altruism model fails to explain. In particular, free riding is not pervasive and crowding out is not complete. Moreover, the model suggests that many of the natural indices used for policy analysis, such as relative donations, wealth, or income elasticities, as well as much of the intuition gleaned from pure altruism models, may be inappropriate. For instance, Bergstrom et al. (1986) show that only if the government taxes nongivers will the policy increase private giving. Therefore, if giving is a normal good, this implies that making the tax schedule less progressive would not hurt charity markets and would be likely to help them. Under impure altruism, however, this is not necessarily the case: neither wealth, generosity, nor relative income elasticities have a direct bearing. If those with lower income are more altruistic, regardless of income elasticities, then more progressive taxation may promote rather than discourage giving.[9]

This analysis has, of course, ignored the possibility that many people may be at corner solutions with respect to the public good, that is, $g_i = 0$. Therefore, suppose that the government raises taxes on a nongiver, say person $n + 1$. Then $dy_{n+1} = d\tau_{n+1}$. Since $f_{n+1,a} = 0$, then $\alpha_{n+1} = 0$, and it follows from the analysis above that the general equilibrium effect will be $dY = cd\tau_{n+1}$. Comparing this with (6), we see that the two expressions differ by a proportion $1 - \alpha$. Thus if we believe that givers are motivated largely by altruism, then the difference between taxing a giver and taxing a nongiver may be substantial. However, if we believe that people are motivated largely by warm glow, then the relative difference may be quite small. As a point of reference, if we assume that people are motivated only by warm glow, then $\alpha_i = f_{ia}$. Using an estimate of this by Reece and Zieschang (1985) (similar results are obtained with other studies), we see that $\alpha = .023$, which implies that the increase in Y generated by a tax on a giver would be roughly 98 percent of the increase generated by a tax on a nongiver. Curiously, this 2 percent prediction of crowding out is similar to Clotfelter's (1985) estimate of 5 percent.

[9] Andreoni (1987) cites evidence that suggests that this is true.

IV. Implications for Ricardian Equivalence and the Rotten Kid Theorem

The results above naturally apply to public goods within the family. First, consider the model of bequests. Parents are taken as altruistic: they care about their own consumption, x_p, and the consumption of their heir, x_h. Since the heir also cares about x_h, it is a public good. In Barro's (1974) proof, voluntary bequests act to "undo" involuntary intergenerational redistributions generated by government debt, as in the pure altruism case above. Suppose, however, that parents feel an obligation to future generations. Family heirlooms, custom, or social status may all compel parents to leave bequests, or they may simply use their wealth to (strategically) exert control or influence over their heirs (Bernheim et al. 1985; Cox 1987). In each case the utility of parents also depends on the size of their bequest: $U_p = U_p(x_p, x_h, b)$. The utility of heirs, on the other hand, depends only on their own consumption: $U_h = U_h(x_h)$. We are now back in the realm of impure altruism. Parents are impurely altruistic with respect to their gifts to heirs, while the heirs can be thought of as "purely altruistic" with respect to their own consumption. As such, redistributions from children (more altruistic) to parents (less altruistic) will reduce the private supply of the public good (the consumption of the heir). Parents will be unwilling to perfectly substitute bequests for debt; hence they will keep some of their new "wealth" for themselves.

Suppose instead that the young are making gifts to the old. Now the consumption of the old is a public good. If the young get a warm glow from giving, then the old are more altruistic with respect to their own consumption. A redistribution from the young (less altruistic) to the old (more altruistic) will increase the supply of the public good (consumption of the old). Children will reduce their gifts, but not by the full amount of the transfer. With this simple modification, we see that debt is not neutral. Regardless of whether there are gifts or bequests, a debt will have a Keynesian effect: consumption will increase in the period the debt is incurred. Note also that this model will allow for both gifts and bequests to occur simultaneously. However, debt will affect both the gift and bequest relationships similarly; hence Keynesian effects will still hold.

A similar result holds if we modify Becker's (1974, 1981) model of the family. His Rotten Kid theorem states that a rotten kid who seeks to maximize his own income is also working in the best interests of the family. The reason is that the selfish acts of a rotten kid are simple redistributions of income: when a rotten kid tries to secure more for himself, the head of the household will neutralize this by adjusting the allocations earmarked for the rotten kid. Alternatively, we could assume that the head of the household is a "soft touch": he enjoys giving to his kids, rotten or not. Since kids care only about their own allocations, they are more "altruistic" than their parents. If a rotten kid takes actions that reallocate household income to himself, then his actions will not be fully neutralized. Hence, if parents enjoy giving to their kids, then rotten kids can increase their own consumption by behaving in a rotten manner. In other words, it is not sufficient for kids simply to be rotten: they must be *spoiled* rotten.

V. Conclusion

That publicness generates neutrality in models of giving has been a subject of great interest and concern in recent years. Researchers have considered generalizations ranging from market failure to myopia in order to explore the limits of neutrality. This paper considers perhaps the most natural generalization: that people derive some utility from the act of giving. When we consider the effects of such warm-glow giving, we find that neutrality breaks down in an intuitive and predictable way: government contributions to charity will incompletely crowd out private gifts, and intergenerational transfers via debt will always have Keynesian effects. The reason is that the warm glow makes private gifts *imperfect* substitutes for gifts from other sources. As a result, people are unwilling to swap a dollar of g_i for a dollar of τ_i or Y_{-i}, which is necessary for neutrality.

This work can be easily extended to subsidies to giving. Bernheim (1986) and Bernheim and Bagwell (1988) have shown that even "distortionary" taxes may have neutral effects when preferences are altruistic. However, Andreoni (1987) shows that this too breaks down when altruism is impure. Again, this is because the warm glow makes the government's contribution, including the subsidy, an imperfect substitute for gifts made directly. Hence subsidies, as indicated by econometric studies, will increase net giving. Finally, this work also suggests a dynamic study of the family to explore how impure altruism may affect savings rates and economic growth in the presence of debt.

References

Altig, David, and Davis, Steve J. "Government Debt, Redistributive Fiscal Policies, and the Interaction between Borrowing Constraints and Intergenerational Altruism." *J. Monetary Econ.* (1989), in press.

Andreoni, James. "Impure Altruism and Donations to Public Goods: A Theory of 'Warm-Glow' Giving." Manuscript. Madison: Univ. Wisconsin, 1987.

———. "Privately Provided Public Goods in a Large Economy: The Limits of Altruism." *J. Public Econ.* 35 (February 1988): 57–73. (*a*)

———. "Why Ride Free? Strategies and Learning in Public Goods Experiments." *J. Public Econ.* 37 (December 1988): 291–304. (*b*)

Barro, Robert J. "Are Government Bonds Net Wealth?" *J.P.E.* 82 (November/December 1974): 1095–1117.

Becker, Gary S. "A Theory of Social Interactions." *J.P.E.* 82 (November/December 1974): 1063–93.

———. *A Treatise on the Family.* Cambridge, Mass.: Harvard Univ. Press, 1981.

Bergstrom, Theodore C.; Blume, Lawrence; and Varian, Hal. "On the Private Provision of Public Goods." *J. Public Econ.* 29 (February 1986): 25–50.

Bernheim, B. Douglas. "On the Voluntary and Involuntary Provision of Public Goods." *A.E.R.* 76 (September 1986): 789–93.

———. "Ricardian Equivalence: An Evaluation of Theory and Evidence." In *NBER Macroeconomics Annual,* vol. 2, edited by Stanley Fischer. Cambridge, Mass.: MIT Press, 1987.

Bernheim, B. Douglas, and Bagwell, Kyle. "Is Everything Neutral?" *J.P.E.* 96 (April 1988): 308–38.

Bernheim, B. Douglas; Shleifer, Andrei; and Summers, Lawrence H. "The Strategic Bequest Motive." *J.P.E.* 93 (December 1985): 1045–76.

Blanchard, Olivier J. "Debts, Deficits, and Finite Horizons." *J.P.E.* 93 (April 1985): 223–47.

Clotfelter, Charles T. *Federal Tax Policy and Charitable Giving.* Chicago: Univ. Chicago Press (for NBER), 1985.

Cornes, Richard, and Sandler, Todd. "Easy Riders, Joint Production, and Public Goods." *Econ. J.* 94 (September 1984): 580–98.

Cox, Donald. "Motives for Private Income Transfers." *J.P.E.* 95 (June 1987): 508–46.

Dawes, Robyn, and Thaler, Richard H. "Anomalies: Cooperation." *J. Econ. Perspectives* 2 (Summer 1988): 187–98.

Feldstein, Martin. "The Effects of Fiscal Policies When Incomes Are Uncertain: A Contradiction to Ricardian Equivalence." *A.E.R.* 78 (March 1988): 14–23.

Hubbard, R. Glenn, and Judd, Kenneth L. "Liquidity Constraints, Fiscal Policy, and Consumption." *Brookings Papers Econ. Activity,* no. 1 (1986), pp. 1–50.

Lucas, Robert E. B., and Stark, Oded. "Motivations to Remit: Evidence from Botswana." *J.P.E.* 93 (October 1985): 901–18.

McClelland, Robert. "Voluntary Donations and Public Expenditures in a Federalist System: A Comment." *A.E.R.* (in press).

Reece, William S., and Zieschang, Kimberly D. "Consistent Estimation of the Impact of Tax Deductibility on the Level of Charitable Contributions." *Econometrica* 53 (March 1985): 271–93.

Roberts, Russell D. "A Positive Model of Private Charity and Public Transfers." *J.P.E.* 92 (February 1984): 136–48.

———. "Financing Public Goods." *J.P.E.* 95 (April 1987): 420–37.

Schiff, Jerald. "Does Government Spending Crowd Out Charitable Contributions?" *Nat. Tax J.* 38 (December 1985): 535–46.

Shefrin, H. M., and Thaler, Richard H. "Life Cycle versus Self-Control Theories of Savings." Working paper. 1985.

Steinberg, Richard. "Voluntary Donations and Public Expenditures in a Federalist System." *A.E.R.* 77 (March 1987): 24–36.

Warr, Peter G. "Pareto Optimal Redistribution and Private Charity." *J. Public Econ.* 19 (October 1982): 131–38.