E C O N O M I C S B U L L E T I N

A Note on the Multi-Good Model of Altruistic Private Transfers

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Abstract

This paper extends a standard altruism model of private transfers to a multiple goods model. It has been pointed out that unlike the exchange-motivated transfers, altruistically motivated private transfers would mitigate income inequality in terms of quantity. However, taking the effect of multiple goods into account, it is shown that inequality-increasing transfers with purely altruistic motives can be apparently observed when market exchange is not available. This paper also introduces some concrete examples from the cases in a post-Soviet State.

Citation: Hiwatari, Masato, (2007) "A Note on the Multi-Good Model of Altruistic Private Transfers." *Economics Bulletin*, Vol. 9, No. 6 pp. 1-7
Submitted: January 31, 2007. **Accepted:** April 9, 2007.
URL: http://economicsbulletin.vanderbilt.edu/2007/volume9/EB-07I30001A.pdf

1. Introduction

Private income transfers are important for reallocating resources, particularly in developing countries. Private transfers often represent a significant fraction of the overall income of poor households and are likely to be essential in their daily struggles to make ends meet (e.g., Morduch 1999, Cox and Jimenez 1990, Ravallion and Dearden 1988).

Two motives for private transfers have been examined in the literature: altruism and self-interested exchange. The standard altruism model of private transfers makes a strong prediction about the signs and relative magnitudes of the effects of recipients' and donors' incomes on transfer amounts (e.g., Cox 1987, Cox, Eser, and Jimenez 1998; for details, see section 2 of this paper). Both the altruism and exchange hypotheses predict that the probability of transfer receipt is inversely related to the pre-transfer income. However, the two hypotheses contradict each other in predicting the marginal effects of the pre-transfer income on the transfer amounts. According to the altruism model, as the recipients' income increases, they would receive smaller amounts of transfers, whereas the exchange hypothesis states that transfers need not necessarily decline (Cox 1987).

This prediction of the altruism model has been well tested in a vast number of studies. For instance, in the U.S. (Cox 1987), Indonesia (Ravallion and Dearden 1988), the Philippines (Cox and Jimenez 1995), or Russia (Cox, Eser, and Jimenez 1995), the marginal effects of pre-transfer income on transfer amounts have been found to be negative. These results accord with the altruism model and confirm that private transfers mitigate income disparities. On the other hand, many evidences are inconsistent with the altruism hypothesis (e.g., Lucas and Stark 1985 for Botswana; Cox, Eser, Jimenez, and Jordan 1995 for Cote D'lvore; Cox, Eser, and Jimenez 1998 for Peru; Cox, Jimenez, and Jordan 1998 for Kyrgyzstan). According to the basic altruism model, these results against the hypothesis can be regarded as evidence that self-interested exchange motives are dominant in the transfers in these countries.

However, this paper suggests that taking the effects of multiple goods into account, it is possible that inequality-increasing transfers with purely altruistic motives could arise. In actuality, private transfers involve various types of goods, such as cash, foods items, textiles, durable goods, livestock, stocks, and bonds. However, the effects of such variety in private transfers have received little attention in the literature, whereas the market price of a total private transfer was usually utilized in the analyses. The assumption that each good involved in transfers can be converted into its cash equivalent with no barriers to exchange appears to be unrealistic, particularly in developing countries or post-Soviet states, where market institutions are insufficient and informal systems of barters for commodity goods or services play an active part in daily life. Considering the relevant

backgrounds of the multi-good model, this paper introduces additional concrete examples from the cases in a post-Soviet state in section 4.

The main purpose of this paper is to extend the basic altruism model to a model of multiple goods transfers and to show that it is possible for a positive relationship to exist between the amount of the recipient's resource *i* and that of transfer *i* recieved when market exchange is not available. This simple conclusion contains rich implications not only in theoretical or empirical terms but also for policy discussion in that it also indicates that the public subsidies to the poor will not always crowd out but will cause private transfers in a certain condition, as will be derived from the model.

The rest of the paper is organized as follows. Section 2 extracts the basic altruism model. Section 3 presents the multi-good model of altruistic private transfers. Section 4 describes some focused examples to explain the multi-good model, and section 5 provides some concluding remarks. Some calculations are provided in the Appendix.

2. A Basic Altruism Model of Private Transfers

In the standard altruism model (e.g., Cox 1987, Cox, Eser and Jimenez 1998), donors (say, parents) care about the well-being of recipients (children); they receive utility from their own consumption and from the utility of their recipients. The utility function of a donor is thus as follows.

$$U = U(c_p, V(c_k)), \tag{1}$$

where U denotes the donor's utility, c_p the donor's consumption, V the recipient's utility, and c_k the recipient's consumption. This is a single period model, and there is no saving. Thus, $c_p = I_p - T$ and $c_k = I_k + T$, where T denotes the net amount of private transfers from the donor to the recipient, I_p the donor's income and I_k the recipient's income. The donor's marginal utility of recipient's utility, $U_V \left(= \frac{\partial U}{\partial V}\right)$, is assumed to be positive; that is why this is called the altruism model. The donor chooses T to maximize his utility. Then, transfers are used to equate the donor's marginal utility of consumption, U_c, with the recipient's marginal utility of consumption from the parent's perspective, $U_V V_c$. The comparative statics of this basic model yield following testable predictions.

$$\frac{\partial T}{\partial I_k} < 0, \frac{\partial T}{\partial I_p} > 0, \tag{2}$$

$$\frac{\partial T}{\partial I_k} - \frac{\partial T}{\partial I_p} = -1, \tag{3}$$

First, a change in transfers with an increase in the recipient's income is negative, while that with an increase in the donor's income is positive. This result indicates that altruistic private transfers will always be averse to inequality. Second, if transfers are positive, an increase of one dollar in the recipient's income along with a decrease of one dollar in the donor's income will result in the decrease of one dollar in the transfer to the recipient. This result suggests that a public income-redistribution and private transfers will crowd out each other. This effect of crowding out has been the main cause of policy concern over private transfers (for details, see Cox and Jakubson 1995).

3. A Multi-Good Model of Altruistic Priavate Transfers

For simplicity, let us assume that two types of private transfers (good 1 vs. good 2) flow from a donor to a recipient, and each of them has a certain amount of each resource at the beginning and consumes each good in the single period model. Then, the utility of the donor is given by

$$U = U(c_{p1}, c_{p2}, V(c_{k1}, c_{k2})), \tag{4}$$

where c indexes consumption, p indexes the donor, k indexes the recipient, and 1 and 2 index two types of goods. We assume that there is a barrier to the market exchange and both the donor and recipient cannot exchange goods outside private transfers. In such economy, the donor's consumptions will equal the resources plus the transfers, and the recipient's consumptions will equal the resources minus the transfers. Thus, $c_{p1} = R_{p1} - T_1$, $c_{p2} = R_{p2} - T_2$, $c_{k1} = R_{k1} + T_1$, and $c_{k2} = R_{k2} + T_2$, where T_1 and T_2 are the transfer amounts [1]. The donor chooses T_1 and T_2 to maximize his utility in this model; that is, they solve

$$MaxU = U(R_{p1} - T_1, R_{p2} - T_2, V(R_{k1} + T_1, R_{k2} + T_2)), \tag{5}$$

$$s.t. T_1 \geq 0, T_2 \geq 0, R_{p1} - T_1 \geq 0, R_{p2} - T_2 \geq 0, R_{k1} + T_1 \geq 0, R_{k2} + T_2 \geq 0.$$

The results of the comparative statics (for details, see Appendix A.) are as follows:

$$\frac{\partial T_1}{\partial R_{k1}} \lesseqgtr 0, \frac{\partial T_1}{\partial R_{p1}} \lesseqgtr 0, \frac{\partial T_2}{\partial R_{k1}} \lesseqgtr 0, \frac{\partial T_2}{\partial R_{p1}} \lesseqgtr 0. \tag{6}$$

The signs of all the above expressions are ambiguous. In particular, the results related to the recipient's resource predict that unlike the basic altruism model,

[1] In case we assume that there is no barriers to exchange of two goods with fixed prices, the model will be equivalent to a single-good case by using so-called Hicks' composite commodity theorem which states that any group of commodities whose relative prices remain unchanged can be treated as a single commodity (Hicks 1946, 312).

the transfers of the goods i need not necessarily decline with the increase in the recipient's resource of the goods i. This is because in this two-good model, an exogenous increase in R_{ki} gives rise to two kinds of effects on T_i: the direct (negative) effect and the cross (ambiguous) effect through the change in T_j.

Illustrations of the effects of an increase in R_{k1} are given in fig.1. $U_{c1}/U_{c2}\left(=\frac{\partial U}{\partial c_{p1}}/\frac{\partial U}{\partial c_{p2}}\right)$ is a donor's subjective value of good 1 relative to that of good 2. Thus, the curve S can be regarded as the donor's supply curve of T_1. $V_{c1}/V_{c2}\left(=\frac{\partial V}{\partial c_{k1}}/\frac{\partial V}{\partial c_{k2}}\right)$ is the recipient's subjective value of good 1 relative to that of good 2. Thus, the curve D can be regarded as the recipient's demand curve of T_1. The optimum amount of T_1 is chosen at an intersection, E. In the first place, an increase in R_{k1} causes a decrease in the recipient's marginal utility of the good 1's consumption. This effect causes the demand curve of T_1 to shift downward and to the left, which will make E shift to E'and the amount of T_1 to decrease. In the multi-good model, however, we must note that an increase in R_{k1} also causes an increase in the recipient's marginal utility of the good 2's consumption. This effect can make the recipient's demand of T_2 to rise and the amount of T_2 to increase. If the effect of the increase in T_2 is sufficiently strong, subsequently, the donor's marginal utility of good 1 will fall and recipient's marginal utility of good 1 will rise. As a result, the supply curve of T_1 will shift downward and to the right, and the demand curve upward and to the right. Then, it is possible that the optimum point E" can exceed E horizontally, implying that $\frac{\partial T_1}{\partial R_{k1}}$ can have a positive sign.

To see the condition under which the sign of the expression is determined, consider the case in which the donor and recipient have constant elasticity of substitution (CES):

$$U = [\alpha {C_{p1}}^{-p} + (1-\alpha){C_{p2}}^{-p}]^{-1/p} + \delta[\beta {C_{k1}}^{-q} + (1-\beta){C_{k2}}^{-q}]^{-1/q}, \qquad (7)$$

where their elasticities of substitution are $\sigma = \frac{1}{p+1}$ and $\epsilon = \frac{1}{q+1}$, respectively. In this case, we obtain the following condition:

$$\frac{\partial T_1}{\partial R_{k1}} > 0, \frac{\partial T_2}{\partial R_{k1}} > 0, \frac{\partial T_1}{\partial R_{p1}} > 0, \frac{\partial T_2}{\partial R_{p1}} > 0, \quad if \ \frac{c_{p1}}{c_{p2}} < \frac{c_{k1}}{c_{k2}}, \qquad (8)$$

$$\frac{\partial T_1}{\partial R_{k1}} < 0, \frac{\partial T_2}{\partial R_{k1}} < 0, \frac{\partial T_1}{\partial R_{p1}} < 0, \frac{\partial T_2}{\partial R_{p1}} < 0, \quad if \ \frac{c_{p1}}{c_{p2}} > \frac{c_{k1}}{c_{k2}}.$$

Thus, $\frac{\partial T_i}{\partial R_{ki}}$ will have a positive sign, when we deal with goods for which the ratio of the donor's optimum consumption is lower than that of recipient's. In this case, the cross effect through the other goods' transfer must be sufficiently strong to overcome the direct effect on the transfer of the original goods.

If $\sigma = \epsilon$, this condition will become simple by using the condition $U_{c1}/U_{c2} = V_{c1}/V_{c2}$ at an optimum.

$$\frac{\partial T_1}{\partial R_{k1}} > 0, \frac{\partial T_2}{\partial R_{k1}} > 0, \frac{\partial T_1}{\partial R_{p1}} > 0, \frac{\partial T_2}{\partial R_{p1}} > 0, \quad if\ \alpha < \beta, \tag{9}$$
$$\frac{\partial T_1}{\partial R_{k1}} < 0, \frac{\partial T_2}{\partial R_{k1}} < 0, \frac{\partial T_1}{\partial R_{p1}} < 0, \frac{\partial T_2}{\partial R_{p1}} < 0, \quad if\ \alpha > \beta.$$

In addition, this multi-good model obtains the following expression:

$$\frac{\partial T_i}{\partial R_{ki}} - \frac{\partial T_i}{\partial R_{pi}} = -1, \tag{10}$$

where $i = 1, 2, i \neq j$. This expression suggests that an increase of one unit in the recipient's resource *i* coupled with the decrease of one unit in the donor's resource *i*, will result in the decrease of one unit in the transfer *i*. It follows that in this model, private transfers of good *i* will ultimately be neutralized by the effect of the exogenous redistribution of good *i*. However, in this multi-good model of the constant elasticity, this prediction can hold under the condition where the signs of the two derivatives on the left of the expression are the same, although in the basic altruism model, $\frac{\partial T}{\partial I_k} < 0$ and $\frac{\partial T}{\partial I_p} > 0$ necessarily hold. Thus, in this multi-good model, one of two public policies subsidies to the poor or taxes to the rich will increase private transfers, whereas the other will decrease them.

4. Examples for the Multi-Good Model of Altruistic Private Transfers

This section provides some relevant examples to explain the background conditions of the multi-good model and considers their implications by introducing the actual cases in Uzbekistan, a post-Soviet country where the author has conducted the field research for several years [2].

(a) In the regions of the Ferghana valley in this country, which is famous for being a major producer of cotton, the byproduct materials from cotton refinement, such as *kunjara* (oilcake) or *shulha* (cottonseed meal) have been widely utilized not only as fuel but also as animal feed mainly for cattle. In the socialist era, it was a widespread practice for livestock-breeding households in these regions, who had to feed their cattle through the winter season, to receive *kunjara* or *shulha* without any payment from acquaintances who have access to these goods, rather than to purchase them in the bazaars [3]. In most cases, the workers or the guardsmen in cotton warehouses or cotton-oil extraction factories, who had greater access to

[2] A detailed discussion of the private economy and traditions in Uzbekistan is available in my PhD dissertation (Hiwatari 2006).

[3] As has been pointed out in the literature, limited access to the scarce goods and services in the former U.S.S.R. had led to the mobilization of a range of informal mechanisms that have been

these goods, would voluntarily hand them over to their relatives or neighbors.

These voluntary transfers of *kunjara* or *shulha*, however, would not be necessarily distributed to households with fewer resources; recipient households usually had a certain amount of resources, such as cattle or at least adequate space to store feed. In this respect, these transfers had a tendency to increase the inequality, but do they indeed constitute an evidence for their non-altruistic motives? In light of the foregoing considerations, the livestock owned by the households appears to induce voluntary transfers of animal feed to them, since this type of transfers of complementary goods could more effectively augment the altruistically formed utility. In this case, the livestock should be considered as good 1 and the feedstuff as good 2 in fig.1. Moreover, according to the multi-good model, if the increase in feedstuff transfers is sufficiently strong, it will subsequently lead to the transfers of livestock as well. Although the last point lacks strong proof, it may be likely that the households who could once establish a steady access to feedstuff tended to receive more gifts in the form of livestock.

From the viewpoint of policy implications, this example suggests that public subsidy in the form of livestock could be complementary to private transfers and could increase voluntary transfers of *kunjara* or *shulha*, while a subsidy in the form of feedstuff might crowd out these voluntary transfers [4]. In reality, it is often observed that the councils of the neighborhood communities (*mahalla*s) in these areas provide cattle to the poor households free of cost as a form of social assistance, even at present; this may perhaps vitalize voluntary transfers of animal feed [5].

(b) In the second example, construction materials are considered as good 1, and labor forces as good 2. In Uzbekistan, there has been a well-known traditional concept of mutual assistance known as "*khashar*", which refers to a voluntary aid in the form of labor (Arifkhanova 2000, 13). Since the participation in *khashar*

called the "second," "parallel," or "unofficial," economy (e.g., Grossman 1997, Lubin 1984). In Uzbekistan, for example, private subsidiary agriculture, farming activities, or barters of privately produced goods were so widespread that these private activities would satisfy the primary needs of the rural population for vegetables or animal products (e.g., Lubin 1984, 182). In cotton-growing regions in particular, the majority of the population, who would in fact work in the public production system for only a part of the year, such as in cotton-picking, tended to devote more time to private subsidiary activities, such as petty commodity production or livestock-breeding on their private plots (e.g., Poliakov 1982, 44).

[4] As shown in the multi-good model, the relative consumption ratio determines which good increases private transfers. Additional focused observation and empirical tests regarding this aspect remain to be examined.

[5] For instance, in 2006, the council of the neighborhood community (*mahalla*) researched by the author, which had a size of 500 households, located in the Andijan region, decided to provide cattle to each of the 18 poor households.

has been regarded as a good deed (*sovob ish*), indigenous Uzbek people have actively cooperated in the name of *khashar* in accomplishing various kinds of construction work, such as building teahouses (*chaikhona*), repairing mosques, and digging and cleaning irrigation canals. The typical *khashar* can be observed when privately owned houses are constructed in the traditional communities. In most cases, the owners of the new houses collect necessary construction materials and then invite as many neighbors and relatives as possible, who get together two or three times for a construction work (Arifkhanova 2000, 13).

With regard to the custom of *khashar*, the benevolent aspects, such as helping the poor, have often been emphasized. However, it does not imply that it is always targeted toward poorer households. Instead, it does have a latent possibility that the poor, who could not even prepare for the construction materials, could find less opportunities to announce and organize *khashar*. This can explain that a greater amount of construction materials (good 1) lead to a greater flow of voluntary labor (good 2). Considering that once the *khashar* begins, they are likely to find more opportunities to receive assistance from participants for prividing materials that run short in the construction process, it will be possible that even the inequality-increasing transfer of a specific good (good 1) could occur, as predicted by the model.

In this case, the policy implication would be that merely providing construction materials as a form of social assistance might be a complementary policy and encourage more voluntary labor, rather than trying to mobilize residents' labor forces arbitrarily [6].

5. Concluding Remarks

It has been pointed out that altruistically motivated private transfers would mitigate income inequality in terms of quantity. However, we found that a positive relationship could exist between the amount of recipient's resource i and that of transfer i even if the motive for the transfer is purely altruistic, when the market exchange of transfer goods is difficult. This implication is remarkable considering that private transfers are particularly significant as an important source of income in developing countries. Focusing on this finding might be helpful for empirical implications and policy consideration in such areas.

[6] In the recent efforts toward community development in Central Asia, which has been promoted by Western donors, one of major topics concerned how local traditions such as *khashar* could be incorporated into community development projects (e.g., Earle 2005). However, the mobilization of residents for their projects by utilizing traditional systems has turned out to be unexpectedly difficult (e.g., Earle 2005, Stevens 2005). The viewpoint from the multi-good model might be helpful in reconsidering these experiences.

Appendix A

$$\frac{\partial U}{\partial T_1}\left(=\frac{\partial U}{\partial c_{p1}}\frac{\partial c_{p1}}{\partial T_1}+\frac{\partial U}{\partial V}\frac{\partial V}{\partial c_{k1}}\frac{\partial c_{k1}}{\partial T_1}\right)=-U_{c1}+U_V V_{c1}=0,$$

$$\frac{\partial U}{\partial T_2}\left(=\frac{\partial U}{\partial c_{p2}}\frac{\partial c_{p2}}{\partial T_2}+\frac{\partial U}{\partial V}\frac{\partial V}{\partial c_{k2}}\frac{\partial c_{k2}}{\partial T_2}\right)=-U_{c2}+U_V V_{c2}=0,$$

Assuming that functions U and V are additively separable, differentiating these two equations yields

$$\begin{pmatrix}A & B\\ C & D\end{pmatrix}\begin{pmatrix}dT_1\\ dT_2\end{pmatrix}=\begin{pmatrix}E\\ F\end{pmatrix}\leftrightarrow\begin{pmatrix}dT_1\\ dT_2\end{pmatrix}=\frac{1}{|G|}\begin{pmatrix}D & -B\\ -C & A\end{pmatrix}\begin{pmatrix}E\\ F\end{pmatrix},$$

where
$A = U_{c1c1} + U_V V_{c1c1} < 0$, $B = U_{c1c2} + U_V V_{c1c2} > 0$,
$C = U_{c1c2} + U_V V_{c1c2} > 0$, $D = U_{c2c2} + U_V V_{c2c2} < 0$,
$E = U_{c1c1}dR_{p1} - U_V V_{c1c1}dR_{k1} + U_{c1c2}dR_{p2} - U_V V_{c1c2}dR_{k2}$,
$F = U_{c1c2}dR_{p1} - U_V V_{c1c2}dR_{k1} + U_{c2c2}dR_{p2} - U_V V_{c2c2}dR_{k2}$,
The second order conditions correspond to $A < 0$, $D < 0$ and the Jacobian determinant $|G| = AD - BC > 0$. This system implies the following comparative statics results:

$$\frac{\partial T_1}{\partial R_{k1}} = \frac{1}{|G|}\{-U_V(DV_{c1c1} - BV_{c1c2})\} \lesseqgtr 0, \frac{\partial T_1}{\partial R_{p1}} = \frac{1}{|G|}\{(DU_{c1c1} - BU_{c1c2})\} \lesseqgtr 0,$$

$$\frac{\partial T_2}{\partial R_{k1}} = \frac{1}{|G|}\{U_V(CV_{c1c1} - AV_{c1c2})\} \lesseqgtr 0, \frac{\partial T_2}{\partial R_{p1}} = \frac{1}{|G|}\{(-CU_{c1c1} + AU_{c1c2})\} \lesseqgtr 0,$$

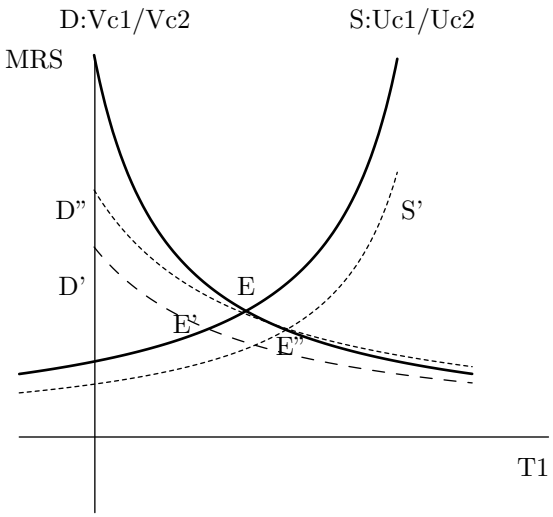

Fig.1. Effects of an increase in Rk1

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