

ARE PRIVATE TRANSFERS CROWDED OUT BY PUBLIC TRANSFERS? THE CASE OF NEPAL

SUNG JIN KANG

First version received October 2003; final version accepted November 2004.

Using household data from Nepal for 1995/96, this paper investigates the motives underlying private transfers and examines whether or not public transfers crowded out private transfers and the resultant effects on income inequality. The estimation results of Probit and Tobit models show that the private transfers received were altruistically motivated while public transfers exerted no crowding-out effect. Although the probability of receiving private transfers decreases with household size, having more children or more elderly members of the family increases the probability as well as the amount of transfers. By contrast, the age of the household head does not appear to be a significant factor. Furthermore, the study shows that public transfers did not contribute to a lowering of income inequalities among households. These findings suggest that the Government of Nepal should design its public transfer schemes in order to improve the effectiveness and efficiency of its social safety net programs.

I. INTRODUCTION

PRIVATE transfers among family, friends, and even neighbors are widespread throughout the world, especially in developing countries.¹ For example, parents frequently provide financial support to their children when they first leave home and children sometimes support their parents in old age. Understanding private transfer networks is important for designing policy interventions since, among other things, private transfers provide social and economic benefits informally, benefits that are similar to those of public programs such as unemployment insurance, pension provision, educational credit, and health insurance.

With the exception of recent studies of the Republic of Korea, most empirical findings on the motives underlying transfers support exchange. For example, Cox (1987), Cox and Rank (1990), Altonji, Hayashi, and Kotlikoff (1992, 1997), and Cox, Eser, and Jimenez (1998) argue in favor of exchange. However, studies on

I would like to thank two anonymous referees of the journal, Yasuyuki Sawada, and seminar participants at the University of Tsukuba, Japan, for their helpful comments. I am especially grateful to Dil Bahadur Rahut who allowed me access to the raw data.

¹ See Cox and Jimenez (1990) for a survey.

Korea before and during the financial crisis by Jimenez, Kang, and Sawada (2003) and Kang and Sawada (2003) strongly support altruism. The existing evidence on the extent and magnitude of the crowding-out effect of public transfers is mixed. Some studies find that public transfers have little effect on private ones (e.g., Cox and Jakubson 1995; Rosenzweig and Wolpin 1994) while others (e.g., Cox and Jimenez 1992, 1995; Cox, Eser, and Jimenez 1998; Jensen 2003; Jimenez, Kang, and Sawada 2003; Kang and Sawada 2003; Kang and Lee 2003) find that a crowding-out effect exists.

Building on the ideas outlined above, this paper investigates the transfer networks of Nepal. Nepal is one of the poorest countries in the world. In the 1990s, the per capita GDP of Nepal was about U.S.\$220 with an annual growth rate of about 2.2 percent. A rising debt and budget deficit ratio to GDP and a widening current account deficit are among the main economic problems. Furthermore, poverty in Nepal is widespread with about 42 and 38 percent of the population living below national and international poverty line of U.S.\$1 a day respectively (World Bank 2000).

The predominant objective of the development efforts of Nepal is poverty alleviation. An overriding concern for planned efforts for development has been explicitly stated as an objective only since the Sixth Poverty Reduction Strategy was introduced in 1980. The first attempt to formulate a separate plan with a long-term perspective for poverty alleviation was made during the Seventh Plan period (1992–97), and Nepal has continued along the same lines with the Tenth Plan (2002–7). Despite some achievements over the past decades, poverty incidence has remained high. A comparison of the 1984/85 data with those for 1995/96 shows that rural poverty increased while urban poverty declined, although neither of these changes was substantial (National Planning Commission 2002).

Using household data from Nepal for 1995/96, this paper investigates the role of public transfers as one of the main tools of social safety nets by testing the effect on the motives for public transfers and their crowding-out effect on private transfers. The Probit and Tobit estimation results indicate that Nepalese households are altruistically motivated for both transfers and net transfers received while there has been no crowding-out effect exerted by public transfers. This result is in contrast to the finding of Kang and Sawada (2003) who conclude that Korean households were altruistically motivated and public transfers had a significant crowding-out effect on private transfers before and during the financial crisis. Furthermore, there is an inconsistency with the literature discussed above, which suggests that there is a crowding-out effect under altruism.

The difference in the crowding-out effect might be related to the differences in institutional characteristics and/or the implementation of public transfer systems. There are some possible explanations even though they are quite tentative and remain to be substantiated by future research. Nepalese people might transfer be-

cause the very act of giving provides utility or because public transfers are not widespread in Nepal. Alternatively, it could be the case that the amount received from private transfers is not substantial, so that the amount is too small to be displaced.

In addition, the probability of receiving private transfers decreases with household size; but for a given household size, having more children or more elderly members of the family increases the probability as well as the amount of private transfers.

The paper is organized as follows. Section II provides some theoretical background from existing work on public and private transfers. Section III gives descriptive evidence and Section IV discusses the estimation model and the results. The final section offers a conclusion.

II. SAFETY NETS AND RELATED LITERATURE

Safety nets encompass various transfer programs designed to play both a redistributive and a risk reduction role in poverty alleviation. The redistributive role is intended to reduce the impact of poverty and the risk reduction role is intended to protect individuals, households, and communities against uninsured income and consumption risks.

The main types of safety nets include: (i) social insurance and cash transfers, (ii) in-kind transfers, (iii) income generation, (iv) training schemes, and (v) social funds. Social insurance and cash transfers include pensions, unemployment insurance, family and social assistance, and so on. In-kind transfers include food and nutrition programs, housing subsidies, and energy subsidies. Income generation implies public works and credit schemes.

The overall mix of programs within countries also differs substantially according to specific needs, political decisions, and historical conditions. Some countries may place much emphasis on training and public employment programs to address unemployment. Other countries may favor food programs to address malnutrition and to take advantage of donor contributions related to such assistance.²

Since this paper focuses on cash transfers in Nepal which include public transfers (pension and employee provident funds) and private transfers (inter-household transfers), this section reviews only the literature on cash transfers.

Previous studies on private transfers (Cox 1987, 1990) identify two motives: altruism (Becker 1974) and self-interested exchange (Bernheim, Shleifer, and Summers 1985). Households transfer resources out of feelings of altruism that implicitly determine the receiving household's consumption. Alternatively, donors give private transfers in order to receive something in exchange at times of need.

The distinction between the altruistic and the exchange models has an important policy implication (Cox 1987; Cox and Jimenez 1990). Becker (1974), in his altru-

² See Subbarao et al. (1997) and World Bank (2000) for a more comprehensive review.

istic model, argues that public transfer programs will have little effect on the distribution of economic welfare. Under altruism, public transfers reduce the pre-transfer marginal utility of the recipient's consumption. Hence, if government were to tax the donor and give the proceeds to the recipient, the donor's incentive to make the transfer would weaken and she or he might decide to give smaller private transfers. This cutting back of private transfers in response to public redistribution is called the "crowding-out" effect of public transfers. Thus, Becker's altruism model predicts that public transfers tend to displace private transfers.

Exchange-motivated transfers, by contrast, interact with public transfers in a different way. If transfers are motivated by an exchange in which the recipient compensates the donor by providing services of some kind, public transfers will have little effect on private transfers (Cox 1987). In contrast to the assumption of Becker's (1974) altruism model, the exchange model argues that crowding-out between private and public transfers does not necessarily occur. Moreover, under the exchange motive, public transfers may even increase the probability of receipts by providing an additional source of income to donors. In this case, an expansion of social insurance by government will increase the size of the risk-sharing pool and may act as an effective social safety net device for households.³

The existing evidence on the extent and magnitude of the crowding-out effect of public transfers is mixed. Under an altruistic motive, for instance, it is not always true that all public transfers leave household income unchanged. Such a program might give the dependent more than a household would have received privately. Also many households neither give nor receive private transfers and thus there are no private transfers to be displaced by public ones. Each of these considerations moderates the crowding-out effect of public transfers.

Some studies find that public transfers have little effect on private ones (e.g., Cox and Jakubson 1995; Rosenzweig and Wolpin 1994) while others (e.g., Cox and Jimenez 1992, 1995; Cox, Eser, and Jimenez 1998; Jensen 2003; Jimenez, Kang, and Sawada, 2003; Kang and Sawada 2003) indicate that the possibility for crowding-out occurring can be quite large. Cox and Jimenez (1995) estimate that if an unemployment insurance system were introduced in the Philippines, private transfers would fall so much that the intended beneficiaries of the program would scarcely be any better-off. In contrast, they find that the degree of crowding-out associated with pensions is much less significant.

As is the case in Korea, many households in East Asia are likely to be altruistically linked through a widespread and operative informal transfer network. Assuming that as public transfers increase, altruistically motivated private transfer donors may cutback their private transfer provisions, a government subsidy intended only

³ Rather than the strict dichotomy between altruism and exchange, Lucas and Stark (1985) favor an eclectic framework that recognizes each motive as tempered altruism or enlightened self-interest.

for those people in need may indirectly benefit donors who are often from the upper-income brackets and who are protected from exogenous shocks. Hence, a quantitative assessment of the altruistic model is very important. In addition, the crowding-out effect is proved to exist so that government is justified in introducing careful targeting schemes to ensure the effectiveness of its social safety net programs.

III. DATA AND DESCRIPTIVE EVIDENCE

The main data source of this study is the Nepal Living Standards Survey (NLSS) for 1995/96. This is a multi-topic survey which collects a comprehensive set of data on different aspects of household welfare. Based on a two-stage stratified random sampling procedure, the primary sampling unit is the ward. In the first stage of the sampling, wards were selected with probability proportional to size from each of the four ecological strata, using the number of households in the ward as the measure of size. In the second stage of the sampling, a fixed number of households were chosen with equal probabilities from each selected primary sampling unit. It should be noted that the figures and estimations employed in the study have been obtained for 3,310 households. Some 51 households were identified as outliers, as their nominal per capita income was outside a band defined as the median plus or minus five times the difference between the nominal per capita incomes of the 90th and the 5th percentiles (Central Bureau of Statistics 1996), and 15 households with negative total income were excluded from the analysis. In addition, the ethnicity, languages, religion, and occupation of the household head (excluding those of other household members) are defined as the household characteristics through the paper. The correlation coefficient matrix of the main variables used in the estimation is reported in Appendix Table.

The main income variables that are examined in the paper are private and public transfers. Private transfers are the total amount of remittances and transfer income sent or received. Public transfers are as reported, and include employee provident funds and pensions. The employee provident fund consists of 10 percent from the employee's monthly salary and 10 percent contributed by government or by the employer. Pensions apply only to government employees, and are calculated as the monthly salary at retirement multiplied by service years divided by 50. The Employees Provident Fund Cooperation (EPF) provides benefits to its members by means of the following: (i) upon request, a partial or full payment of the accumulated provident fund, (ii) a voluntary or compulsory retirement periodic pension of up to seven years based on the provident fund contribution period, (iii) funeral assistance in respect of the death of a provident fund member, and (iv) a work accident insurance payment in the case of permanent disability or death.⁴

⁴ See Upadhyaya (2001) for more details.

TABLE I
PRIVATE AND PUBLIC TRANSFERS

	All Households	Net Transfer Recipients	Net Transfer Donors	Others
Pre-transfer income (Rs.)	7,687.3	6,713.7	11,753.4	7,553.1
Private transfers:				
Net transfers received (Rs.)	568.80	3,451.95	0.00	0.00
No. of households	3,309	702	0	0
Net Transfers given (Rs.)		0.00	2,239.93	0.00
No. of households		0	246	0
Gross transfers received (Rs.)	766.58	3,526.36	218.02	3.17
No. of households	746	701	42	3
Gross transfers given (Rs.)	200.78	74.41	2,457.95	3.17
No. of households	331	82	246	3
Public transfers:				
No. of households with positive public transfers	222 (6.7)	51 (7.3)	31 (12.6)	140 (5.9)
No. of households with no public transfers	3,088 (93.3)	652 (92.8)	215 (87.4)	2,221 (94.1)
Public transfer received (Rs.)	235.28	286.38	452.45	197.47
Public transfer received for positive public transfers receiver (Rs.)	3,522.88	4,020.74	3,590.42	3,330.12
No. of households	3,310 (100.0)	702 (21.2)	246 (7.4)	2,361 (71.3)

Note: Figures in parentheses indicate percentages.

Table I shows transfer status according to whether households were net recipients or net donors of private transfers, which include remittances and transfer income. The table shows that 28.6 percent of households were involved with transfers as donors or recipients. For all households, net transfer receipt amounts to 568.8 rupees (7 percent of pre-transfer income) while gross transfer receipt is 766.6 rupees (10 percent of pre-transfer income). It is thus clear that compared to other countries, transfers in Nepal are not widespread (Cox and Jimenez 1990). Far more households (702) were net recipients than donors (246). Also, the average per capita pre-transfer income of net transfer recipients was the lowest while that of donors was the highest. The average pre-transfer income of others (households whose net receipts are zero) was in between those of recipients and donors. It can therefore be inferred that transfers flowed from high- to low-income households.

As discussed above, the role of public transfers needs to be carefully investigated. This is because private transfers are likely to originate from high-income groups. Suppose a public income transfer is targeted at a low-income household

TABLE II
AVERAGE PER CAPITA PRIVATE AND PUBLIC TRANSFERS BY DECILE

Percentile	Private Transfers			Public Transfers		
	Received	Sent	Net	Employment Provident Fund	Pension	Total
Per capita pre-transfer income:						
10	652.16	12.30	639.86	14.67	203.41	218.08
20	606.53	15.46	591.07	18.79	196.35	215.14
30	434.12	69.16	364.96	2.52	127.11	129.63
40	639.96	79.40	560.56	4.17	237.43	241.60
50	405.80	63.00	342.81	9.91	123.24	133.15
60	1,019.82	81.20	938.63	7.39	193.07	200.46
70	452.86	48.76	404.10	15.96	172.45	188.41
80	863.99	103.13	760.87	33.86	86.85	120.71
90	1,115.81	382.41	733.40	64.16	300.05	364.21
100	1,476.87	1,155.83	321.04	36.76	505.63	542.38
Average	766.58	200.78	565.80	20.81	214.47	235.28

that depends in part on support coming from a high-income household. Suppose further that, in response to the public transfer program, the high-income households cut back some of their private support, demonstrating a crowding-out effect. Then the high-income household indirectly benefits from a program ostensibly targeted at the poor.

As Table I indicates, public transfers in Nepal are not widespread and were received by only 6.7 percent of households. So far as private transfers are concerned, net transfer donors received the highest amount of public transfers (452.5 rupees) while households with zero net transfers received the lowest amount. In particular, the average amount of public transfers of households with a positive amount of public transfers is the highest among net private transfer recipients (4,020.7 rupees).

These simple comparisons of income by type of transfer suggest that transfers might affect income distribution. One way of gauging the impact of transfers is to examine their significance for income distribution according to per capita income and compare pre- and post-transfer income distribution. Table II indicates the distribution of private and public transfers by pre-transfer income decile and Table III compares the change in income before and after private or public transfers.

Table II clearly shows that the lowest-income group did not necessarily receive the largest amount of private and public transfers. For example, the lowest 10 percent group received 639.9 rupees of net private transfers and 218.1 rupees of public transfers. However, the 60 percent decile group received the largest private trans-

fers, 938.6 rupees, while the richest 10 percent group received the largest amount of public transfers. In addition, the households in the 80 percentile received a relatively small amount of pension transfer (86.85 rupees). This might partially reflect the fact that those households receive relatively larger amount of private transfers (863.99 rupees).

In particular, the richest 20 percent group received the largest amount of pension transfers. It should be noted that pension payments account for a large portion of public transfers, although as explained above, only government employees benefit. Thus, pensions do not play a significant role in poverty alleviation because they target only a specific group. Moreover, since higher-income groups tend to receive more employees' funds, public transfers are not working as an effective tool for reducing poverty.

Table III shows the effect on income of private and public transfers. The incomes of the lowest 10 and 20 percent group increased by 51.9 and 24.8 percent respectively after private transfers and increased by 17.7 and 9.0 percent respectively after receiving public transfers. In general, the income of low-income groups tended to increase more after they received private and public transfers. Thus in terms of change in income, private and public transfers were targeted at low-income groups. As an alternative way of estimating the impact of private transfers, Gini coefficients of per capita income can be compared with those of pre-private- and/or pre-public-transfer incomes. The Gini coefficient for per capita income was 0.3270 and that of pre-transfer income was 0.3268 so that income distribution after the receipt of pri-

TABLE III
AVERAGE PER CAPITA INCOME BY DECILE

Percentile	(Rs.)				
	Pre-transfer Income	Post-Private-Transfer Income	Percentage Change (%)	Post-Public-Transfer Income	Percentage Change (%)
Per capita pre-transfer income:					
10	1,232.74	1,872.60	51.9	1,450.82	17.7
20	2,384.93	2,976.00	24.8	2,600.08	9.0
30	3,204.70	3,569.66	11.4	3,334.32	4.0
40	3,960.09	4,520.65	14.2	4,201.70	6.1
50	4,834.45	5,177.25	7.1	4,967.60	2.8
60	5,892.33	6,830.96	15.9	6,092.79	3.4
70	7,213.34	7,617.44	5.6	7,401.75	2.6
80	9,096.68	9,857.54	8.4	9,217.38	1.3
90	12,666.00	13,399.40	5.8	13,030.20	2.9
100	26,444.49	26,765.54	1.2	26,986.88	2.1
Average	7,687.31	8,253.11	7.4	7,922.59	3.1
Gini	0.3268	0.3266		0.3287	

TABLE IV
MEANS FOR SELECTED VARIABLES BY PRIVATE TRANSFER STATUS

	All Households	Net Transfer Recipients	Net Transfer Donors	Others
Age (years)	44.7	45.5	45.6	44.3
Household size (no.)	5.57	5.04	5.74	5.72
Number of children	1.41	1.40	1.33	1.43
Number of elderly	0.35	0.45	0.38	0.32
Female	13.6	31.7	4.9	9.1
Male	88.4	68.3	95.1	90.9
Urban	20.5	16.8	27.6	20.9
Rural	79.5	83.2	72.4	79.1
Marital Status:				
Married	84.9	79.6	92.3	85.6
Divorced	0.5	1.0	0.8	0.4
Separated	0.8	0.4	4.9	0.9
Widow/widower	11.6	15.7	2.0	11.1
Never married	2.2	3.3	0.0	2.0
Religion:				
Hindu	87.2	87.7	89.7	86.9
Non-Hindu	12.8	12.3	10.3	13.1
Language:				
Nepali	75.0	77.3	71.7	74.6
Maithili	8.8	9.8	9.0	8.5
Others	16.2	12.9	19.4	16.9
Ethnicity:				
Chhetry and Brahmin	37.3	41.1	39.5	36.0
Matwali	29.2	22.5	21.9	31.9
Others	33.5	36.4	38.7	32.1
Education:				
Never attended	63.9	70.8	46.9	63.7
Primary	13.7	9.6	14.2	14.9
Secondary	19.1	15.1	32.5	18.8
Above college	3.2	4.0	6.1	2.6
Other	0.1	0.4	0.0	0.0
Occupation:				
Agriculture/fisheries	64.7	72.6	56.4	63.3
Professional and technical	5.9	6.1	9.5	5.4
Clerical	11.8	6.1	20.5	12.5
Production	10.2	6.0	7.7	11.6
Not working	7.5	9.3	6.0	7.2
No. of households	3,309	702	246	2,361

vate and public transfers was almost the same as that of pre-transfer income. The separate effect of private and public transfers can also be measured. The Gini coefficients for post-private- and post-public-transfer incomes were 0.3266 and 0.3287, respectively. Thus the inclusion of public transfers increases income inequalities across households.

Table IV provides a list of household characteristics according to private transfer status. The average age of the household head was about 45 years old regardless of transfer status. Household size was 5.0 and 5.7 for net transfer recipients and donors, respectively, which implies that the household size of net donors was relatively larger. In terms of ethnicity, 41.1 percent of Chhetry and Brahmin and 22.5 percent of Matwali households received net transfers.⁵ The proportion of female-headed and rural households, and the households whose heads are in agriculture and fisheries and whose language is Nepali, are higher among net recipients than among net donors. Further, transfer recipients have less education than net donors.

IV. ESTIMATION

A. Model Specification

Following Cox (1990) and Cox and Jappelli (1990), let us consider a simple two-period model with two individuals, a parent (p) and a child (k). Assuming that the parent cares about the child's well-being, the parent's objective function is then

$$U = U_1[C_{p1}, V_1(C_{k1})] + \frac{U_2[C_{p2}, V_2(C_{k2})]}{1 + \rho}, \quad (1)$$

where U_t and V_t represent the parent's and the child's utility in period $t = 1$ and 2, respectively; C_{jt} implies the consumption of person j in period t for $j = p$ and k and $t = 1$ and 2; and ρ is the subjective rate of time discount. The function U is increasing and concave in each argument, and for simplicity, the subjective rate of time preference is assumed equal for parent and child.

The parent has access to capital markets, but the child does not, so that

$$\begin{aligned} C_{p1} + \frac{C_{p2}}{1 + r} + T_1 + \frac{T_2}{1 + r} &= E_{p1} + \frac{E_{p2}}{1 + r_1}, \\ C_{k1} &= E_{k1} + T_1, \end{aligned} \quad (2)$$

where E_{jt} and T_t represent the earnings of person j in period t and transfers from parent to child in period t and r is the market interest rate. For purposes of considering the role of public transfers, it is assumed that the earnings include public transfers received as well as given.

⁵ Matwali households include Magar, Tharu, Newar, Tamang, Rai, Gurung, and Limbu. Others include Kami, Yadav/Ahir, Muslim, and Sarki.

The final constraint is that the child does not incur a reduction in wellbeing from being linked to the parent:

$$V_1(E_{k1} + T_1) + \frac{V_2(E_{k2} + T_2)}{1 + \rho} \geq V^0, \quad (3)$$

where $V^0 = V_1^0(E_{k1}) + \frac{V_2^0(E_{k2})}{1 + \rho}$ denotes the child's threat-point utility.

Finally, we allow for the possibility that first-period transfers can be intergenerational loans, which the child repays with negative second-period transfers. We assume that the interest rate on such loans is at most equal to the market interest rate. This implies the nonnegativity constraint:

$$T_1 + \frac{T_2}{1 + r} \geq 0. \quad (4)$$

When equation (4) binds, transfers function as a private loan. Otherwise, they are a consumption subsidy for the child.

Interior solutions for transfers allow the child to pursue a nonliquidity-constrained consumption path. Consider first the altruism case, in which condition (3) is non-binding, so that parental transfers boost child utility. Parental access to capital markets implies proportionality between marginal utility of consumption in periods 1 and 2 (i.e., Euler equation). Meanwhile operative and altruistic transfers generate proportionality between parent and child marginal utility of consumption in each period. If the parent's weighting of child utility is time-invariant, the Euler condition holds for the child as well:

$$\frac{\partial V_1(E_{k1} + T_1)}{\partial C_{k1}} = \frac{1 + r}{1 + \rho} \frac{\partial V_2(E_{k2} + T_2)}{\partial C_{k2}}. \quad (5)$$

Now suppose that equation (3) is binding, implying an exchange regime. Though the parent cares about the child, the initial condition is such that he does not want to increase the child's wellbeing. The parent would still be willing to make a consumption loan with above-market interest. The loan, which is repaid in the second period, lets the child follow a consumption path given by equation (5). So in either regime the Euler equation is obtained for the child.

The first issue is on the amount of private transfers. Under an altruism regime, since transfers allow the child to smooth her/his consumption, an increase in E_{k1} raises desired first-period consumption less than dollar-to-dollar, which prompts a reduction in first-period transfers. An increase in E_{k2} also raises desired first-period consumption. With E_{k1} held constant, this implies an increase in first-period transfers. The general pattern is that transfer amounts are inversely related to contemporaneous earnings and positively related to other-period earnings. The exchange regime can produce a different pattern. Given an interior solution, it can be shown

that the first-period transfer need not be inversely related to E_{k1} . An increase in E_{k1} raises the child's threat-point utility, making borrowing terms more favorable. This can produce a positive relationship between current earnings and transfer amounts.⁶

The second issue is on the decision. The child's marginal utility with no transfers is $\partial V_t(E_{kt})/\partial E_{kt}$. The latent variable is defined as

$$d_T = \frac{\partial V_t(Y_{2t})}{\partial Y_{2t}} - \frac{1+r}{1+\rho} \frac{\partial V_{t+1}(Y_{2t+1})}{\partial Y_{2t+1}}. \tag{6}$$

Transfer will occur if the latent variable is positive. From the concavity of the utility function, $\partial d_T/\partial Y_{2t} < 0$, $\partial d_T/\partial Y_{2t+1} > 0$, suggests that the latent variable d_T , which determines whether a transfer is inversely related to contemporaneous earnings and positively related to future earnings.⁷ An alternative way of expressing the predictions of the model is to contrast the transfer effects of current earnings versus permanent income. Recasting the model in terms of permanent income and E_{k1} , as opposed to E_{k2} and E_{k1} , produces comparative statistics results that are qualitatively the same as those reported above. Transfers are targeted at those with low current income and high permanent income.

B. Estimation Equation

In order to identify the motives of private transfers quantitatively, we employ an empirical model of Cox (1987) and Cox, Eser, and Jimenez (1998). For the decision concerning whether a transfer occurs, the following stochastic model of the latent variable that determines private transfer receipts of household i at time t is used:

$$PRT_{it} = \alpha_1 y_{it} + \alpha_2 PUT_{it} + X_{it}\beta + \varepsilon_{it}, \tag{7}$$

where PRT is a latent variable of private transfers, observed only when positive. Pre-transfer income and public transfers are represented by y and PUT_{it} , respectively. The matrix, X , includes various household characteristics.⁸ The last term, ε , represents the well-behaved stochastic error term.

Since the dependent variable of equation (7) is a latent variable which can be observed only when positive, we estimate the binary transfer functions by defining the following binary variables:

$$\begin{aligned} \delta^{PRT_{it}} &= 1 && \text{if } PRT_{it} > 0, \\ &= 0 && \text{otherwise.} \end{aligned} \tag{8}$$

⁶ This result is obtained in the Nash bargaining context as well. The connection between transfer amounts and earnings is explored in a different context in Cox (1987).

⁷ If transfers are motivated solely by parental altruism (i.e., no lending) and utility is time-separable, the transfer decision is determined solely by contemporaneous parent and child endowment-point marginal utilities of consumption and the child's future income would not affect the latent variable for current transfers.

⁸ The other control variables can be interpreted as the determinants of future permanent income.

We estimate a maximum-likelihood Probit model of private transfers by assuming that the error term, ε , in equation (7) is independent and uncorrelated with PUT and X .

It should be noted that pre-transfer income is included as an independent variable. The key to identifying transfer motives is the sign on the pre-transfer income coefficient in the decision versus the amount equation. The comparative statistics results for the transfer decision are the same whether transfers are motivated by altruistic or exchange considerations (Cox 1987). This finding is important because it implies that information on transfer decisions alone is insufficient for making inferences about transfer motives. Thus the estimated coefficient for pre-transfer income in equation (7) is not enough to identify transfer motives.

In addition, through estimation of the transfer amount equation, we can identify the transfer motives since the exchange motive predicts a positive coefficient while the altruistic motive predicts a negative sign for recipient pre-transfer income (Cox 1987; Cox and Rank 1992). Hence, we also estimate the transfer amount equation by using the following:

$$PRT_{it} = \beta_1 y_{it} + \beta_2 PUT_{it} + X_{it} \gamma + \varepsilon_{it}, \text{ if } PRT_{it} > 0. \quad (9)$$

In estimating equation (9), we use a Tobit model, treating the household specific term, u_i , as a stochastic variable. The likelihood function to estimate random effect Tobit model involves integration over the household random effects, u_i . We utilized an approximation of the likelihood with Gauss-Hermite quadrature. The sign hypothesis for β_1 is positive under exchange and negative under altruism. If the estimated coefficient on public transfers, β_2 , is negative, it indicates the magnitude of the crowding-out effect of public transfers.

In equations (7) and (9), the matrix of other control variables, X , includes the household head's characteristics such as age, education level, and occupation, and the household's demographic characteristics.

First, we include age variables of household head because, as Cox (1990) emphasized, the timing of transfers over the life cycle is important especially for households facing liquidity constraints. If households are subject to binding borrowing constraints, the transfer receipts will be concentrated at an early age when current resources are low. Although even developing countries have public pensions, most of them apply only to urban workers in the formal sector (World Bank 1998). Thus, old family members are likely to be dependent on informal support from young family members.

Second, in order to capture the effect of transfer network of an extended family, we enter variables representing residential area, gender of household head, family size, and the number of children and elderly as a household's characteristics. In particular, the number of children will be an important determinant of public transfers as regards the old-age insurance motives for having many children. In addition,

TABLE V
ESTIMATION RESULTS FOR NET TRANSFERS RECEIVED

	Probit		Tobit	
	Coefficient	Robust z-ratio	Coefficient	z-ratio
Pre-transfer income / 10 ⁴	-0.042	(3.48)**	-1,083.7	(3.43)**
= 1 if public transfer recipients	0.206	(1.80)	7,376.7	(2.15)*
Age	-0.022	(1.91)	-631.9	(1.79)
Age squared / 10 ²	0.026	(2.09)*	724.9	(1.91)
= 1 for Hindus	0.055	(0.62)	-1,464.6	(0.53)
= 1 for Nepali	0.049	(0.68)	2,689.1	(1.15)
= 1 for Chhetry or Brahmin	-0.132	(1.81)	-3,001.1	(1.26)
= 1 for Matwali	-0.221	(3.14)**	-5,286.2	(2.29)*
= 1 for urban households	-0.051	(0.59)	1,704.8	(0.62)
= 1 for female household head	1.031	(12.48)**	29,647.1	(11.63)**
Household size	-0.045	(2.63)**	-446.73	(0.87)
= 1 if married	-0.072	(2.42)**	-1,146.93	(1.35)
= 1 if never attended school	-0.663	(3.42)**	-30,260.1	(5.20)**
= 1 if primary graduate	-0.677	(3.33)**	-30,611.2	(5.05)**
= 1 if secondary graduate	-0.518	(2.80)**	-23,537.4	(4.19)**
Number of children aged 9 or less	0.088	(3.27)**	2,245.9	(2.49)*
Number of elderly above 60	0.211	(3.63)**	6,914.7	(3.79)**
= 1 if professional workers	-0.006	(0.04)	-4,164.9	(0.97)
= 1 if clerical workers	-0.401	(3.58)**	-15,867.2	(4.26)**
= 1 if production workers	-0.300	(2.85)**	-8,606.3	(2.53)**
= 1 if students or unemployed	-0.146	(1.24)	-1,338.5	(0.38)
Constant	0.368	(1.13)	10,228.1	(1.01)
Observations (no.)	3,120		3,120	

- Notes: 1. In Probit analysis, the dependent variable is net transfer receipt where net transfer receipt = 1 if transfer received, 0 otherwise.
2. Absolute value of z-statistics in parentheses.
3. * significant at 5 percent; ** significant at 1 percent.

larger households are likely to obtain a larger amount of public transfers since they have more members to support.

C. Estimation Results

Tables V and VI report the Probit and Tobit estimation results. In order to examine the impact of different transfer status, two different dependent variables are used. Table V uses net transfers received while Table VI uses transfers received. Since main implications of estimation results for those different dependent variables are not significantly different, we focus on the results of Table V.⁹

⁹ Considering a sample selection bias, the estimation results of Heckman's (1979) generalized Tobit model show that a selection bias and the coefficients for pre-transfer income and public transfers are not shown to be significant.

TABLE VI
ESTIMATION RESULTS FOR TRANSFERS RECEIVED

	Probit		Tobit	
	Coefficiency	Robust z-ratio	Coefficiency	z-ratio
Pre-transfer income / 10 ⁴	-0.025	(2.38)*	-635.2	(2.27)*
= 1 if public transfer recipients	0.178	(1.58)	6,337.7	(1.93)
Age	-0.023	(2.04)*	-625.0	(1.85)
Age squared / 10 ²	0.026	(2.13)*	699.4	(1.93)
= 1 for Hindus	0.070	(0.80)	-1,416.1	(0.53)
= 1 for Nepali	0.002	(0.04)	1,707.0	(0.77)
= 1 for Chhetry or Brahmin	-0.135	(1.89)	-2,742.1	(1.20)
= 1 for Matwali	-0.252	(3.65)**	-5,855.9	(2.65)**
= 1 for urban households	-0.042	(0.50)	1,502.5	(0.58)
= 1 for female household head	1.039	(12.63)**	29,424.5	(11.98)**
Household size	-0.046	(2.81)**	-479.4	(0.98)
= 1 if married	-0.081	(2.75)**	-1,387.3	(1.69)
= 1 if never attended school	-0.655	(3.51)**	-29,840.1	(5.45)**
= 1 if primary graduate	-0.639	(3.29)**	-29,317.5	(5.15)**
= 1 if secondary graduate	-0.498	(2.78)**	-22,804.8	(4.34)**
Number of children aged 9 or less	0.084	(3.13)**	2,033.4	(2.37)*
Number of elderly above 60	0.237	(4.20)**	7,194.4	(4.14)**
= 1 if professional workers	-0.026	(0.19)	-3,287.3	(0.81)
= 1 if clerical workers	-0.321	(3.04)**	-13,197.6	(3.86)**
= 1 if production workers	-0.333	(3.20)**	-9,114.3	(2.78)**
= 1 if students or unemployed	-0.168	(1.44)	-1,788.1	(0.52)
Constant	0.500	(1.54)	12,174.5	(1.26)
Observations (no.)	3,120		3,120	

- Notes: 1. In Probit analysis, the dependent variable is net transfer receipt where net transfer receipt = 1 if transfer received, 0 otherwise.
 2. Absolute value of z-statistics in parentheses.
 3. * Significant at 5 percent; ** Significant at 1 percent.

We turn our attention first to the effects of pre-transfer income on transfer decision and amount, respectively. From columns 1 and 2 of Table V, transfer decision and amount appear to be negatively and significantly related with pre-transfer income. Thus, the estimation results by the Probit and Tobit models support altruistic motive of private transfers.

The public transfer in the Tobit estimation appears to be positive and significant which implies that there is significant crowding-in effect on private transfers. The result is in contrast to the finding of Kang and Sawada (2003) who show that Korean households are altruistically motivated and thus public transfers crowded out private transfers. This might be because public transfers in Nepal are not widespread while those in Korea are nationwide (national pensions, financial support

from the government or social organization, and unemployment insurance). In Nepal, only 6.7 percent of households receive public transfers (see Table I). Another interpretation might be that the amount received by way of private transfers is not very large and that the amount is therefore too small to be displaced.

Households whose heads are less educated tend to receive smaller private transfers where the reference is assistance at college, or aid above the graduate level.¹⁰ This pattern is consistent with the responsiveness of transfers to liquidity constraints. Education raises permanent income, which in turn raises desired consumption.¹¹ With current income constant and no access to capital markets, these households rely on loans and subsidies from other households to fill the gap between desired consumption and current income.

The larger households tend to have a lower probability of receiving private transfers but as regards these households, there is no significant relationship between family size and amount received. Nevertheless, for a given household size, having more children or more elderly family members increases the probability as well as the amount of transfers. Urban households do not show a significant relationship with private transfers while the Matwali tend to receive less as regards both probability and amount.

As for the effects of occupational characteristics, households whose heads are clerical (clerical workers and operators and sales workers) and production workers tend to receive smaller transfers relative to other households, workers in agriculture being taken as a reference. The significant and positive coefficient for female-headed households indicates that female-headed households are more likely to receive larger amounts of transfers than male-headed households—a consistent pattern across countries (Lucas and Stark 1985; Kaufman and Lindauer 1986; Cox 1987; Cox and Jimenez 1989; Kang and Sawada 2002). We should note that this result is not due to the poverty of female-headed households, since even after holding current income constant—comparing transfer amounts across households with similar income levels—the same pattern persists. One possible reason for this finding is simply that females tend to live longer than males and may receive a greater quantity of old-age

¹⁰ Instead of dummies for education variables, the total years of education of the household head as an alternative specification is used. The coefficients for this variable are shown to be positive and significant which is consistent with the result when the education dummies are used. The estimated coefficients for Table V specification are 0.027 ($z = 3.17$) and 1,237.4 ($t = 4.66$) for Probit and Tobit estimation, respectively. In addition, those for Table VI specification are 0.029 ($z = 3.57$) and 1,303.2 ($t = 5.17$), respectively. Note that the coefficient shows a positive sign while the coefficients for education dummies are negative because the estimation with the education dummies uses college graduate as a reference level.

¹¹ In other words, it can be concluded that the households with less well-educated head might receive less because he/she is currently attending school and thus has no enough savings. The empirical test will be possible if we can identify the members who received private transfers and their individual characteristics. We leave this part as a topic for future research.

transfers through an altruistically linked informal network and formal channels. Another reason may be that private transfers compensate females for wage discrimination in the formal labor market.

Other household characteristics such as age, religion (Hinduism), and language (Nepali) are found to be not significant in explaining the decisions and amounts of private transfers.

V. CONCLUSION

By way of Probit and Tobit estimation with household-level cross-section data for 1995/96 in Nepal, this paper shows that the transfer behavior of Nepalese households is altruistically motivated. In addition, the study has found that public transfers do not exert crowding-out effects on private transfers. The probability of receiving transfers decreases with household size. However, for a given household size, having more children or more elderly family members increases the probability as well as the amount of transfers. Residential cleavage by rural and urban area of residence does not affect the probability of receiving private transfers while the Matwali tend to have a lower probability of receiving transfers and receive smaller amounts.

In general, we conclude that the motives for making private transfers need to be carefully tested and the Government of Nepal needs to design public transfer schemes to at least improve income distribution. Thus the evidence suggests that the government should have designed its targeting schemes carefully in order to improve the effectiveness and efficiency of its social safety net programs.

REFERENCES

- Altonji, Joseph G.; Fumio Hayashi; and Laurence J. Kotlikoff. 1992. "Is the Extended Family Altruistically Linked? Direct Tests Using Micro Data." *American Economic Review* 82, no. 5: 1177-98.
- . 1997. "Parental Altruism and Invervivos Transfers: Theory and Evidence." *Journal of Political Economy* 105, no. 6: 1121-66.
- Becker, Gary S. 1974. "A Theory of Social Interactions." *Journal of Political Economy* 82, no. 6: 1063-93.
- Bernheim, B. Douglas; Andrei Shleifer; and Lawrence H. Summers. 1985. "The Strategic Bequest Motive." *Journal of Political Economy* 93, no. 4: 1045-76.
- Central Bureau of Statistics. 1996. *Nepal Living Standards Survey 1995-96: Statistical Report*. Kathmandu: National Planning Commission Secretariat, Government of Nepal.
- Cox, Donald. 1987. "Motives for Private Income Transfers." *Journal of Political Economy* 95, 3: 508-46.
- . 1990. "Intergenerational Transfers and Liquidity Constraints." *Quarterly Journal of Economics* 105, no. 1: 187-215.
- Cox, Donald; Z. Eser; and Emmanuel Jimenez. 1998. "Motives for Private Transfers over

- the Life Cycle: An Analytical Framework and Evidence for Peru." *Journal of Development Economics* 55, no. 1: 57–80.
- Cox, Donald, and George Jakobson. 1995. "The Connection between Public Transfers and Private Interfamily Transfers." *Journal of Public Economics* 57, no. 1: 129–67.
- Cox, Donald, and G. Jappelli. 1990. "Credit Rationing and Private Transfers: Evidence from Survey Data." *Review of Economics and Statistics* 72, no. 3: 445–54.
- Cox, Donald, and Emmanuel Jimenez. 1990. "Achieving Social Objectives through Private Transfers: A Review." *World Bank Economic Review* 5, no. 2: 205–18.
- . 1992. "Social Security and Private Transfers in Developing Countries: The Case of Peru." *World Bank Economic Review* 6, no. 1: 155–69.
- . 1995. "Private Transfers and the Effectiveness of Public Income Redistribution in the Philippines." In *Public Spending and the Poor: Theory and Evidence*, ed. Dominique van de Walle and Kimberly Nead. Baltimore, Md.: John Hopkins University Press.
- Cox, Donald, and Mark R. Rank. 1992. "Inter-vivos Transfers and Intergenerational Exchange." *Review of Economics and Statistics* 74, no. 2: 305–14.
- Heckman, J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47, no. 1: 153–61.
- Jensen, Robert T. 2003. "Do Private Transfers 'Displace' the Benefits of Public Transfers? Evidence from South Africa." *Journal of Public Economics* 88, nos. 1–2: 89–112.
- Jimenez, Emmanuel; Sung Jin Kang; and Yasuyuki Sawada. 2003. "Did Public Transfers Crowd Out Private Transfers in Korea during the Financial Crisis?" Tsukuba, Japan: University of Tsukuba. Mimeographed.
- Kang, Sung Jin, and M. Lee. 2003. "Analysis of Private Transfers with Panel Fixed Effect Censored Model Estimator." *Economics Letters* 80, no. 2: 233–37.
- Kang, Sung Jin, and Yasuyuki Sawada. 2003. "Are Private Transfers Altruistically Motivated? The Case of the Republic of Korea before and during the Financial Crisis." *Developing Economics* 41, no. 4: 484–501.
- Kaufman, Daniel, and David L. Lindauer. 1986. "A Model of Income Transfers for the Urban Poor." *Journal of Development Economics* 22, no. 2: 337–50.
- Lucas, Robert E. B., and Oded Stark. 1985. "Motivation to Remit: Evidence from Botswana." *Journal of Political Economy* 93, no. 5: 901–18.
- National Planning Commission. 2002. *Concept Paper on PRSP/10th Plan*. Kathmandu: Government of Nepal.
- Rosenzweig, Mark R., and Kenneth I. Wolpin, 1994, "Parental and Public Transfers to Young Women and Their Children." *American Economic Review* 84, no. 5: 1195–212.
- Subbarao, K.; A. Bonnerjee; K. Ezemerari; J. Braithwaite; C. Graham; S. Carvalho; and A. Thomson. 1997. *Safety Net Programs and Poverty Reduction: Lessons from Cross-Country Experience*. Washington, D.C.: World Bank.
- Upadhyaya, Umsh. 2001. "Social Protection in Nepal at a Glance." http://www.labournepal.org/issues/social_security/social_protection.htm (accessed November 1, 2004).
- World Bank. 1998. "Nepal: Poverty in Nepal at the Turn of the Twenty-first Century." Sector Report no. 18639-NEP. Washington, D.C.: World Bank.
- . 2000. *World Development Report, 2000/2001: Attacking Poverty*. Oxford: Oxford University Press for the World Bank.

APPENDIX TABLE
THE CORRELATION COEFFICIENTS MATRIX OF SELECTED VARIABLES

	Pre-transfer Income	Public Transfer	Age	= 1 If Hindus	= 1 If Nepali	Ethnic- ity 1	Ethnic- ity 2	= 1 If Urban	= 1 If Female
Pre-transfer income	1.00								
Public transfer	0.06	1.00							
Age	0.06	0.11	1.00						
= 1 if Hindus	0.02	-0.06	-0.08	1.00					
= 1 if Nepali	-0.03	0.03	-0.01	0.22	1.00				
Ethnicity 1	0.06	-0.02	0.00	0.27	0.42	1.00			
Ethnicity 2	0.06	0.11	0.03	-0.23	-0.10	-0.51	1.00		
= 1 if urban	0.25	0.15	-0.00	-0.08	-0.05	0.00	0.13	1.00	
= 1 if female	-0.14	-0.03	-0.00	-0.01	0.07	0.07	-0.01	0.02	1.00
Household size	0.26	0.01	0.11	-0.00	-0.02	-0.05	0.01	-0.06	-0.26
Education 1	-0.24	-0.09	0.33	-0.08	-0.10	-0.12	0.01	-0.25	0.19
Education 2	-0.00	-0.01	-0.16	0.03	0.05	-0.01	0.02	-0.02	-0.12
Education 3	0.18	0.10	-0.24	0.07	0.07	0.11	-0.03	0.22	-0.12
Occupation 1	0.14	0.01	-0.08	0.05	0.05	0.10	-0.04	0.15	-0.05
Occupation 2	0.09	0.00	-0.07	-0.03	-0.05	-0.01	0.05	0.31	-0.07
Occupation 3	-0.05	-0.03	-0.10	0.01	0.01	-0.11	-0.01	0.09	-0.10
Occupation 4	-0.05	0.16	0.28	-0.06	0.01	-0.00	0.06	0.18	0.15

	Household size	Educa- tion 1	Educa- tion 2	Educa- tion 3	Occupation 1	Occupation 2	Occupation 3	Occupation 4
Pre-transfer income								
Public transfer								
Age								
= 1 if Hindus								
= 1 if Nepali								
Ethnicity 1								
Ethnicity 2								
= 1 if urban								
= 1 if female								
Household size	1.00							
Education 1	-0.01	1.00						
Education 2	0.05	-0.54	1.00					
Education 3	-0.01	-0.65	-0.19	1.00				
Occupation 1	-0.03	-0.19	-0.03	0.12	1.00			
Occupation 2	-0.01	-0.21	0.02	0.22	-0.88	1.00		
Occupation 3	-0.00	-0.06	0.09	0.01	-0.08	-0.11	1.00	
Occupation 4	-0.03	0.05	-0.05	-0.02	-0.06	-0.09	-0.09	1.00

Note: Ethnicity 1 and 2 indicate Chhetry/Brahmin and Matwali, respectively; Education 1, 2, and 3 represent never attended school, primary graduate, and secondary graduate, respectively; and Occupation 1, 2, 3, and 4 indicate professional workers, clerical workers, production workers, and students or unemployed, respectively.