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Private Household Transfers and Poverty Alleviation in Rural India: 1998–99

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A transfer function for private household transfers in rural India is estimated from the National Council of Applied Economic Research's (NCAER's) ARIS-REDS survey for 1998–99. It is found that till a threshold, income (close to the rural poverty line) transfers are altruistically motivated. There is partial 'crowding out' of private transfers by public transfers of Rs 0.56 for every rupee of public transfer. About 10 per cent of rural households participate in the rural private 'transfer economy', with transfers going to relatively well-educated, pensionless, aged destitutes who have a number of adults to support.

Keywords: *Private Household Transfer Function; Crowding Out; Rural India*
JEL Classification: *D13, H31, I38, O15*

1. Introduction

In their 25-country comparative study, the *Political Economy of Poverty, Equity and Growth*, Lal and Myint (1996), following Ilife (1987), had distinguished between three types of poverty. The first, structural poverty, can only be alleviated through economic growth. The second, conjunctural poverty, requires temporary transfers when the individual or household falls below the poverty line. The third, destitution, occurs when the individual or household has no way of making a living. Its alleviation requires permanent transfers. These transfers can be either public or private. Before the emergence of welfare states in the West, private transfers either through charitable and religious institutions, or more importantly from other households, were the major means to alleviate conjunctural poverty and destitution. With the rise of Western welfare states,

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public transfers replaced these private transfers. But, in developing countries, private household transfers continue to play a major role in alleviating conjunctural poverty and destitution.

The motivation for private transfers is of importance, as it will determine whether public transfers supplementing private transfers will be efficacious in alleviating poverty. Thus, if these transfers are based purely on altruism, then as Becker (1974)—with his 'rotten kid' theorem—and Barro (1974)—with his Ricardian equivalence theorem—showed, public transfers would 'crowd out' private transfers, which falls in line with Warr (1983) and Bernheim and Bagwell (1988), deriving even stronger neutrality results, namely that 'no government transfer has any real effect…the distributional role [of government] is entirely eliminated' (Bernheim and Bagwell 1988: 309). For the altruism motivation behind private transfers, they would be negatively related to household income. It should also be noted that, in mutual co-insurance arrangements within a village, where the participants can be seen to be playing a repeated Prisoner's Dilemma game, the 'reciprocal altruism' thereby generated could also lead to outcomes indistinguishable from pure altruism (see Coate and Ravallion 1993).

Alternatively, if private transfers are part of an exchange process involving an implicit mutually beneficial contract between households, then the crowding out effects of public on private transfers need not hold (Bernheim et al. 1985; Cox 1987; Kotlikoff and Spivak 1981). In this case, when transfers are payments in exchange, they could be either positively or negatively related to household income.

Intermediate models in which both altruism and self-interested exchange are motives for transfers have been developed by Lucas and Stark (1985) and Cox, Hansen and Jiminez (2004). In these models there is 'crowding out' of private by public transfers, up to some threshold income level where the altruism motive is operative, and then at higher incomes the exchange motive takes over and public transfers supplement private transfers. Cox, Hansen and Jiminez (2004) have applied such a model to the Philippines, and showed how the shape of the 'transfer function'—which shows how private transfers respond to household income—determines the efficacy of public transfers in alleviating poverty and is highly non-linear. They found that up to a threshold income (close to the national poverty line), private transfers fell as household income increased, and thereafter the relationship between pre-transfer household income and private transfers became roughly linear.

Till recently, there was no national data set available to determine such a transfer function for private household transfers in India. Information on private inter-household transfers was not collected in the many national household surveys carried out over the years in India. The first survey which collected this data, was a national rural sample survey (the ARIS–REDS survey) conducted by NCAER in 1998–99. This had a separate schedule seeking detailed information on private transfers received and given by the surveyed household.

In this paper we have used this survey data to analyse inter-household private transfers in rural India: their extent, nature, and effects on poverty alleviation. As the literature on private transfers has been concerned with the issue of 'crowding out' of these private transfers by public transfers and the consequent effects on poverty alleviation, we will also be estimating the private transfer function, and using it to assess the effects of a hypothetical public poverty alleviation programme which gives everyone below the official poverty line a cash entitlement to bring them up to poverty-level income.

The paper is in three parts. The first part sets out the model to estimate the private transfer function for India. The second provides a summary description of the data, and our estimates of the transfer function in rural India from the ARIS—REDS survey. The third provides our general conclusions about the nature of private transfers in rural India from our estimated transfer function.

2. The Model

Following Cox, Hansen and Jiminez (2004), assume that the donor's utility is given by:

$$Ud = U(Cd, s, V(Cr,s)) \tag{1}$$

Where V = the recipient's welfare;
Ci, i = d, r are donor and recipient's consumption;
s = 'services' provided by the recipient to the donor.

These services cover everything from the recipient's providing help with home production to changing behaviour in line with the wishes of the donor. The transfer T could also be a loan with s then being the discounted present value of the repayments.

The budget constraints for the donor and recipient are:

$$\left.\begin{aligned} Cd &= Id - T \\ Cr &= Ir + t \end{aligned}\right\} \qquad (2)$$

Where, T-transfers
Id-is the income of the donor before making a transfer
Ir-is the pre-transfer income of the recipient.

It is assumed that in (1), $Ud/\delta V > 0$, which implies that the donor cares about the welfare of the recipient.

It is also assumed that the recipient must be compensated for any services provided, so

$$V/s < 0.$$

The partial derivatives of the other arguments in (1) are positive.

Further it is assumed that the donor and recipient are in a bilateral monopoly with no market substitutes for either the transfers (T) or services (s). If the donor dominates the bargaining with the services received exactly compensating for the transfers given, the exchange model would be nested in the Becker-Barro altruism model in a more general model featuring both altruism and exchange.

Suppose the recipient cuts off relations with the donor. The recipient then receives no transfers (T) and provides no services (s). The recipient's utility then is

$$Vo = V\ (Ir, 0)$$

which leads to a 'participation constraint' for the donor

$$V = Vo.$$

Transfers will be exchange-related if it is binding, with transfers exactly compensating for services provided. If it is not, transfers will be altruistic as they increase the welfare of the recipient.

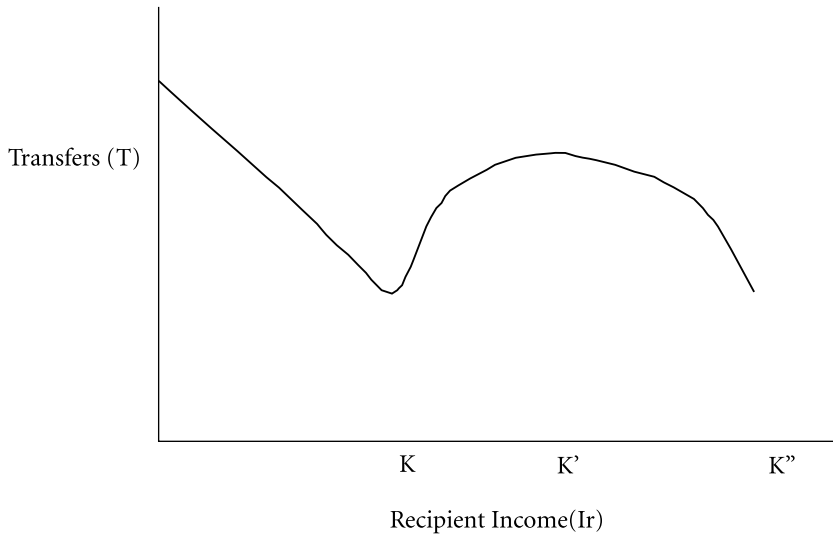
With transfers being altruistic, $\delta T/Ir < 0$, as recipients with higher pre-transfer income need smaller transfers to reach the desired post-transfer

income from the donor's viewpoint. As the recipient's pre-transfer income rises, transfers will fall.

If the transfers are due to the exchange motive, then transfers can be thought of as equalling an implicit price (p) multiplied by the services (s) provided by the recipient. Then, depending upon whether the price effect dominates the quantity effect, transfers can rise or fall (Cox 1987). They are likely to first rise and then fall, implying an inverted-U shape with respect to the recipient's pre-transfer income.

This implies that in the more general model, where transfers can be both altruistically and exchange motivated, the relationship between pre-transfer income and transfers would be as in Figure 1. Till the threshold income point of K of pre-transfer income (where the altruistic motive is operative), transfers rise as the pre-transfer income of recipient's falls. After K, as the transfers are motivated by exchange, they have the inverted U shape with respect to pre-transfer income. Whilst after the recipient's income becomes greater than K", private transfers cease completely.

Figure 1 Income before Transfers



3. Estimate of the Transfer Function for Rural India

Next, we estimate the transfer function for India from the NCAER's ARIS—REDS survey.

3.1 Characteristics of the Sample

The data were collected for 7,500 rural households spread across 250 villages of 16 states in 1998–99. The survey had three parts. The first part (the 'listing sheet') contained information on household income and a few demographic variables. The second contained information on village-level characteristics such as agricultural production and land use, irrigation facilities, selected prices and agricultural wage rates, access to markets, political structure, land tenure systems and the level of development (including infrastructure, distance from markets presence of schools and medical centres, etc.).

The third part was the 'household questionnaire' which collected data on a range of variables relating to household behaviour. The listing sheets were used to select the households to be surveyed. They contain information of several household characteristics such as age, gender and occupation of the head of the household, household income, family size and number of earners.

Tables 1 and 2 provide selected characteristics of rural households by private transfer status. From this it can be seen that 7 per cent of households are recipients of transfers and 2 per cent are donors, which implies that less than 10 per cent of rural Indian households in 1998–99 were involved in the 'private transfer economy'.

This is a much smaller proportion of those participating in transfers as compared to the rural Phillipines where nearly 90 per cent of households are involved in receiving or giving transfers (Cox et al. 2004), whilst in urban Peru in 1985–86, 25 per cent of households received transfers. Even for India, Behrman and Deolalikar (1987) found that in their rural South Indian sample for 1975–83, 93 per cent of households received private transfers. In rural Java in Indonesia, Ravallion and Dearden (1988) found that nearly 70 per cent of households gave transfers to the 30 per cent of households receiving transfers.

The Planning Commission's all-India poverty line for 1998–99 was Rs 4,537.80 per capita per annum. As the average size of households in our sample is 6, it yields a poverty-level income of Rs 27,226 per household per annum for our sample. It implies that 55 per cent of sampled households were below the poverty line. Of these, 8 per cent received private transfers, suggesting they were amongst the poorest of the poor. Of those receiving transfers, over 30 per cent were above the poverty line. Surprisingly, 21 per cent of the donors were also below the poverty line, which suggests that some of the transfers could be based on the mutual co-insurance motive rather than pure altruism.

The recipients of transfers tended to be older, less well-educated and with more unemployed heads than donor households, and with a larger proportion of female-headed households than non-recipients of transfers. The net transfers

Table 1 Selected Characteristics of Indian Rural Households by Private-Transfer Status

Variable	*Net Transfer Recipients*	*Net Transfer Donors*	*Others**	*All Households*
Income				
Total income before transfers	25,502.314	1,10,041.860	33586.340	34,381.510
Proportion with retirement income	0.017	0.007	0.000	0.001
Retirement income	489.504	9.023	0.000	392.237
Total income after transfer	49,928.040	98,555.560	33586.340	35,946.180
Education				
Some primary or none	0.380	0.304	0.483	0.472
Primary	0.083	0.104	0.105	0.103
Some secondary	0.063	0.081	0.086	0.085
Secondary	0.070	0.119	0.067	0.068
Some university	0.245	0.237	0.153	0.162
University graduate	0.096	0.089	0.042	0.046
Other Characteristics				
Age of household head	60.937	51.807	48.277	49.264
Married	0.972	1.000	0.972	0.973
Female-headed households	0.190	0.081	0.056	0.066
Husband and wife both work	0.994	1.000	0.997	0.997
Head not employed	0.244	0.148	0.103	0.114
No. of children aged 1 or less	0.181	0.104	0.172	0.171
No. of children aged 1 to 7	0.725	0.652	0.870	0.855
No. of children aged 8 to 15	0.749	0.941	1.114	1.084
No. of adults	4.081	4.230	3.889	3.909

(*Table 1 continued*)

(*Table 1 continued*)

Variable	*Net Transfer Recipients*	*Net Transfer Donors*	*Others**	*All Households*
Household size	5.736	5.926	6.045	6.020
Transfers				
Proportion giving net transfers	0.000	1.000	0.000	0.018
Net transfers given (amount)	0.000	11,486.300	0.000	207.473
Proportion receiving net transfers	1.000	0.000	0.000	0.073
Net transfers received (amount)	24,425.726	0.000	0.000	1,771.306
Proportion giving gross transfers	0.063	1.000	0.000	0.023
Gross transfers given (amount)	172.694	12,115.930	0.000	231.369
Proportion receiving gross transfers	0.994	0.193	0.000	0.076
Gross transfers received (amount)	24,598.420	629.630	0.000	1,795.202
Proportion receiving from abroad	0.120	0.007	0.000	0.009
Transfers received from abroad (amount)	4,803.142	37.037	0.000	348.984
Number of cases	542	135	6,797	7,474

Source: Authors' calculations.
Note: *Neither a net-transfer recipient nor a net-transfer donor.

Table 2 Selected Characteristics of Indian Rural Households by Private Transfer Status

	Net Transfer Recipients		*Net Transfer Donors*		*Others**		*All Households*	
Variable	*Below Poverty Line*	*Above Poverty Line*	*Below Poverty Line*	*Above Poverty Line*	*Below Poverty Line*	*Above Poverty Line*	*Below Poverty Line*	*Above Poverty Line*
Income								
Total income before transfers	1212.027	64812.700	19958.930	133615.000	15065.990	56518.620	13973.040	59494.480
Proportion with retirement income	600.000	268.116	0.000	11.215	0.000	0.000	48.775	16.910
Retirement income	618.462	278.895	0.000	11.429			569.405	186.513
Total income after transfer	28698.510	84285.020	17107.140	119869.200	15065.990	56518.620	16188.060	60258.880
Education								
Some primary or none	0.388	0.367	0.393	0.280	0.544	0.407	0.530	0.400
Primary	0.087	0.077	0.214	0.075	0.109	0.100	0.107	0.098
Some secondary	0.060	0.068	0.071	0.084	0.089	0.084	0.086	0.083
Secondary	0.069	0.072	0.143	0.112	0.061	0.074	0.063	0.075
Some university	0.257	0.227	0.071	0.280	0.113	0.203	0.124	0.207
University graduate	0.084	0.116	0.000	0.112	0.019	0.069	0.025	0.073
Other Characteristics								
Age of household head	59.922	62.603	51.250	51.953	47.407	49.358	48.459	50.257
Married	0.991	0.942	1.000	1.000	0.980	0.963	0.981	0.963

(*Table 2 continued*)

(*Table 2 continued*)

Variable	*Net Transfer Recipients*		*Net Transfer Donors*		*Others**		*All Households*	
	Below Poverty Line	*Above Poverty Line*	*Below Poverty Line*	*Above Poverty Line*	*Below Poverty Line*	*Above Poverty Line*	*Below Poverty Line*	*Above Poverty Line*
Female-headed households	0.176	0.213	0.071	0.084	0.047	0.066	0.058	0.076
Husband and wife both work	1.000	0.986	1.000	1.000	0.998	0.996	0.998	0.996
Head not employed	0.245	0.242	0.179	0.140	0.095	0.113	0.108	0.122
No. of children aged 1 or less	0.221	0.116	0.143	0.093	0.206	0.129	0.207	0.127
No. of children aged 1 to 7	0.803	0.599	0.643	0.654	1.051	0.646	1.028	0.643
No. of children aged 8 to 15	0.845	0.594	0.929	0.944	1.290	0.896	1.252	0.879
No. of adults	4.313	3.705	4.607	4.131	4.061	3.677	4.085	3.693
Household size	6.182	5.014	6.321	5.822	6.609	5.347	6.572	5.342
Transfers								
Proportion giving net transfers	0.000	0.000	1.000	1.000	0.000	0.000	0.007	0.032
Net transfers given (amount)	0.000	0.000	2851.786	13745.790	0.000	0.000	19.376	438.652

Proportion receiving net transfers	1.000	1.000	0.000	0.000	0.000	0.000	0.081	0.062
Net transfers received (amount)	27486.480	19472.320	0.000	0.000	0.000	0.000	2234.402	1202.139
Proportion giving gross transfers	0.057	0.072	1.000	1.000	0.000	0.000	0.011	0.036
Gross transfers given (amount)	106.269	280.193	3173.214	14456.070	0.000	0.000	30.199	478.616
Proportion receiving gross transfers	0.997	0.990	0.179	0.196	0.000	0.000	0.082	0.067
Gross transfers received (amount)	27592.750	19752.520	321.429	710.280	0.000	0.000	2245.225	1242.103
Proportion receiving from abroad	0.107	0.140	0.000	0.009	0.000	0.000	0.009	0.009
Transfers received from abroad (amount)	5963.149	2925.836	0.000	46.729	0.000	0.000	484.750	182.120
Number of cases	335	207	28	107	3758	3039	4121	3353

Source: Authors' calculations.
Note: *Neither a net-transfer recipient nor a net-transfer donor.

received were 96 per cent of income before transfers, and this put those recipients who were below the poverty line, just above it. This brought down the rural poverty rate in the sample to 47 per cent. A modest proportion (12 per cent) of recipients received transfers from abroad, but none of the other households. Taken together, this suggests that the transfer recipients below the poverty line were largely destitute or suffering from conjunctural poverty. The motive for transfers to this group could be altruism, as well as mutual co-insurance provided by other households below the poverty line (whose pre-transfer household income at Rs 19,958 per annum was just below the poverty line, compared with the below-poverty-line recipients, whose pre-transfer household income was only Rs 1,212 per annum).

The above-poverty-line recipients of transfers also had a larger proportion of female-headed households than the non-transfer households. As their pre-transfer income of Rs 68,813 per annum was nearly 2.5 times the poverty level income, it is likely that the motive for transfers to this group is based on exchange.

3.2 Estimates of the Transfer Function

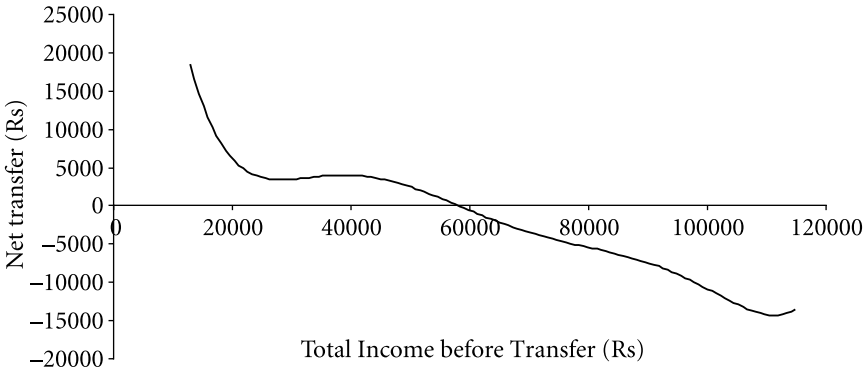
As the knot K is unknown, it has to be estimated along with other regression parameters by NLLS.

In estimating the non-linear transfer function for rural Indian households, we found the best fit was with a ninth-order polynomial in income I to the household data.[1] Table 2 provides our estimates and Figure 2 charts the estimated transfer function.

The knot K at which the altruism motive is replaced by the exchange motive occurs at a pre-transfer household income of Rs 22,500. The Planning Commission's poverty line for 1998–99 translates into Rs 27,226 per household. It would seem that private transfers based on altruism (or mutual co-insurance) are a potent poverty alleviation measure for some of those below the poverty line. The gradient of the transfer function for pre-transfer income I below the poverty line is –0.56.

[1] We could not follow Cox and Jiminez in fitting a continuous linear spline with a single knot K, or the threshold income at which transfer behaviour switches from being altruistic to non-altruistic, because we were not able to translate the GAUSS programme in which their empirical work was conducted into STATA. So *faut meiux* we have used the 'polynomial route' to estimate the non-linear transfer function.

Figure 2 Income before Transfers



$$Y = 22112.75 + (-3.058117)X + (0.001663)X^2 + (-1.94\text{E}-07)X^3 + (-2.33\text{E}-11)X^4 + (3.70\text{E}-15)X^5 + (1.27\text{E}-19)X^6 + (-2.11\text{E}-23)X^7 + (-2.33\text{E}-28)X^8 + (3.78\text{E}-32)X^9$$

Where: Y = Total income before transfer and X = Net transfer.

Dependent Variable–Total Income before Transfers

Variable	*Coefficient*	*Standard Error*
X^9	3.78E-32*	(1.49E-32)
X^8	–2.33E-28	(1.83E-28)
X^7	–2.11E-23*	(8.28E-24)
X^6	1.27E-19	(8.38E-20)
X^5	3.70E-15**	(1.58E-15)
X^4	–2.33E-11***	(1.23E-11)
X^3	–1.94E-07***	(1.14E-07)
X^2	0.001*	(0.000626)
X	–3.0581	(2.404688)
Constant	22112.750*	(6394.354)
R-squared	0.128	
Log likelihood	–4607.537	
F-statistic	5.955	
Probability (F-statistic)	0.000	
Akaike info criterion	24.825	
Schwarz criterion	24.930	
Hannan-Quinn criterion	24.867	
Durbin-Watson statistics	2.7008	

Source: Authors' calculations.

Notes: *denotes 1 per cent of level of significance; **denotes 5 per cent of level of significance and ***denotes 10 per cent of level of significance.

4. Effects of Public Programmes for Poverty Alleviation

The estimated gradient of the transfer function of –0.56 gives us an estimate of the 'crowding out' of private transfers that would follow the introduction of a public transfer programme. Every public rupee paid to a household below the poverty line receiving private transfers would lead to a reduction in private transfers of Rs 0.56.

The net effect would be that there would be no change in the numbers of poor receiving transfers, only an implicit transfer of Rs 0.56 to current donors. But as there is not complete crowding out of private transfers by public ones, the net income of the poor would rise by Rs 0.46 for every rupee of public transfers.

4.1 Characteristics Affecting Transfers

As per Table 3, from the coefficients of the education variables in the transfer function, it can be seen that transfers increase with the level of education. This suggests that transfers to those below the threshold income level K motivated by altruism, are likely to be dealing with a form of 'conjunctural' poverty. If the recipients future income is expected to rise above current income, then as Cox (1990) shows, desired consumption based on permanent income will be higher than current income-based consumption, and if households are subject to liquidity and borrowing constraints, then (within the altruistic model) transfers could fill the gap between desired consumption and current income.

Transfers also rise with age. But, the negative sign on the variable 'has retirement income' suggests that transfers provide support to the aged without any pension

Marital status and female-headed households do not seem to affect transfers, nor does the number of children in the household. The number of adults in the household does raise transfers, but not unemployment of the head, whilst if both husband and wife are working, there is a large significant negative effect on transfers.

All in all, our results suggest that private transfers in rural India are by and large flowing to the aged destitute who are relatively well–educated, without pensions, and who have a number of adults to support.

Table 3 Transfer Function, Dependent Variable–Net-Transfers Received*

Variable	*Coefficient*	*Standard Error*
Income		
Income threshold (K)	23753.01**	(3830.918)
Income below K	–0.575**	(0.011)
Income above K	–0.0008	(0.002)
Retirement income	2.195**	(0.117)
Has retirement income	–10597.15***	(5412.606)
Education		
Primary graduate	1175.674**	(329.701)
Some secondary	1515.732**	(360.481)
Secondary graduate	2139.465**	(395.672)
Some university	4250.023**	(280.282)
University graduate	5975.779**	(471.582)
Other characteristics		
Age of household head	101.882**	(7.674)
Female-headed households	3376.477	(3660.839)
Married	–660.941	(780.630)
Married and female-headed	–449.942	(3683.157)
No. of children aged 1 or less	37.060	(246.079)
No. of children aged 1 to 7	274.489**	(91.749)
No. of children aged 8 to 15	125.626	(78.159)
No. of adults	177.824**	(52.717)
Husband and wife both work	–32803.330**	(3739.248)
Head not employed	234.342	(373.933)
Observations	7397	
R-squared	0.363	

Source: Authors' calculations.

Notes: *Dependent variable is gross transfers received minus gross transfers given; **denotes 1 per cent of level of significance and ***denotes 10 per cent of level of significance.

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