

## Altruism or Exchange?

### An Experimental Evidence on the Motives behind Private Transfer in Sri Lanka

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#### Abstract

This study develops a new approach to the classical question whether private transfer is motivated by altruism or exchange. By combining artefactual field experiment and standard household survey data, we can directly measure the degree of altruism and trust (i.e., exchange) and analyze their impact on the co-movement of consumption. We find that higher altruism toward lower income partners and their income difference reduce the difference in consumption, which supports the altruism hypothesis of a motive of private transfers.

**Keywords:** Private transfer, altruism, exchange, artefactual field experiment, dyadic data

**JEL Classification:** O15, D64, C93

#### 1. Introduction

Consumption smoothing by mutual private transfers is an important issue especially in developing countries where formal institutions are weak. However, there are two competing hypothesis on the motives behind private transfers: altruism or exchange (e.g., Cox 1987). In the case of altruism-motivated private transfers, people give transfers because their partner's utility is included in their utility function (Becker 1974). In contrast, exchange-driven private transfers are given because people expect positive reciprocity (Bernheim et al. 1985). Distinguishing these two motives is important because each model leads different policy implications on whether public transfer crowds out private transfer or not.

Whether the motive behind private transfer is altruism or exchange has been analyzed by a number of existing studies (e.g., Lucas and Stark 1985; Cox 1987; Cox and Rank 1992; Cox et al. 1994; Cox et al. 1998; Cox and Jimenez 1998). These studies compare the altruism and exchange

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models by testing the predicted implications, but the results are rather mixed. Recently, several studies started analyzing this issue by using economic experiments. For example, Ligon and Schechter (2012) use variants of dictator game, finding that the variation in sharing across individuals depends on the incentive-related motives. Lin et al. (2014) find that altruism motivates private transfer and affects the crowding-out effect of formal insurance on informal income transfer. Another related literature employs dyadic data to investigate the determinants of risk sharing network formation. Fafchamps and Gubert (2007) develop dyadic regression approach, finding that social and geographical proximity plays an important role in gift and loan receipt. Schechter and Yuskavage (2011) show that the formation of social network, especially unreciprocated network, is not based on altruism.

We combine these literatures and provide a new approach to analyze the motive behind private income transfers. Using standard artefactual field experiments of dictator and trust games, we measure the degree of altruism and trust (i.e., foreseeing positive reciprocity). By combining these experimental results with actual consumption and income data, we can directly test the altruism and exchange hypotheses of private transfers. Another important feature of our study is to analyze the co-movement of consumption using dyadic data to utilize the pairwise structure of the dictator and trust games.

The remainder of this paper is organized as follows. First, we describe the dataset and our empirical strategy. Then we discuss the estimation results on the motives of private transfer. The final section offers a summary and concluding remarks.

## **2. Data**

This study uses a dataset collected by JICA/JBIC under the project “Impact Assessment of Infrastructure Development on Poverty Alleviation in Sri Lanka” (JBIC 2007). The study site is Walawe Left Bank (WLB) located in southern part of Sri Lanka. In this area, the government started to construct irrigation canal in 1997, using Japanese ODA loans. The construction started from the northern part and gradually extended to the southern part. This area is divided into six blocks: Sevenagala Irrigated, Sevanagala Rainfed, Sooriyawewa, Kiriibanwewa, Mayurapura, and Tissapura. Each block has some distribution canals (D-canal) to draw irrigation water from the main canal to each farm plot, and each D-canal is managed by the farmers belonging to it.

As a part of the project, we conducted artefactual field experiments in March 2009. The experiments comprised dictator game, trust game, and risk game.<sup>1</sup> In both dictator game and trust

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<sup>1</sup> See Aoyagi et al. (2014) for detail.

game, the initial endowment was Rs. 500, and the players were asked to fill in the amount  $x \in \{0, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500\}$  to send to four types of partners: three non-anonymous players in the same D-canal, an anonymous player in the same D-canal, an anonymous player in the same block, and an anonymous player in a different block. In the trust game, the amount sent to the partner was tripled and he/she had an option to send back to the first mover. Note that the Nash equilibrium of both games is to send nothing, and the deviation from this equilibrium is interpreted as altruism and trust, respectively (e.g., Levitt and List 2007). We utilize the results of three non-anonymous cases to elicit altruism and trust directed to specific partners. Since the results of trust game are known to be confounded with altruism and risk preference (e.g., Cox 2004; Schechter 2007), we need to control for these effects to elicit the degree of foreseeing positive reciprocity, which is equivalent to the exchange motive in the previous literature.

In order to elicit risk preference, we also conducted a risk game based on Schechter (2007). The initial endowment was also Rs. 500 and each player could choose how much of this money he/she wanted to invest in a dice game. The final payoff is determined by the results of rolling a die with six different faces, each of which corresponds to the payoff  $\{0, 0.5x, x, 1.5x, 2x, 2.5x\}$  where  $x$  is the invested amount.

In addition to these artefactual field experiments, we conducted standard household survey in May 2009. The survey data includes four (retrospective) seasonal income and consumption data: 2007 Yala (dry season), 2007-08 Maha (wet season), 2008 Yala, 2008-09 Maha. Thus we can construct a seasonal panel data for our purpose. By combining this data with the experimental game results, we can directly analyze the impacts of altruism and exchange motives.

### 3. Empirical Strategy

We utilize the pairwise structure of the dictator and trust games and the seasonal panel income and consumption data. Since income transfer occurs from the richer one to the poorer partner, altruism or exchange motive of the richer one matters. Specifically, if higher altruism or trust toward lower income partners facilitates income transfer, the difference in consumption should shrink. In order to test this hypothesis, we estimate the following model:

$$|c_{it} - c_{jt}| = \beta_1 \text{altruism}_{ijt} |y_{it} - y_{jt}| + \beta_2 \text{trust}_{ijt} |y_{it} - y_{jt}| + \beta_3 |y_{it} - y_{jt}| + \gamma_1 \text{altruism}_{ijt} + \gamma_2 \text{trust}_{ijt} + \gamma_3 \text{risk}_{ijt} + \delta |x_i - x_j| + \tau_t + \eta_{ij} + \epsilon_{ijt},$$

where  $c_{it}$  and  $y_{it}$  are consumption and income of household  $i$  at time  $t$ , respectively, and  $x_i$  is a set

of  $i$ 's other control variables.<sup>2</sup>  $\tau_t$  is time-specific fixed effect and  $\eta_{ij}$  is group or individual fixed effect which controls for time-invariant heterogeneities.<sup>3</sup> In order to elicit the degree of altruism, trust, and risk preference of the richer partners, we define these variables as follows:  $altruism_{ijt} = I(y_{it} > y_{jt}) \cdot dictator_{ij} + I(y_{it} < y_{jt}) \cdot dictator_{ji}$ ,  $trust_{ijt} = I(y_{it} > y_{jt}) \cdot trust_{ij} + I(y_{it} < y_{jt}) \cdot trust_{ji}$ , and  $risk_{ijt} = I(y_{it} > y_{jt}) \cdot risk_i + I(y_{it} < y_{jt}) \cdot risk_j$ . Since observations of the pair  $(i, j)$  and  $(j, i)$  are the same within the same time period, standard errors are corrected based on Fafchamps and Gubert (2007)<sup>4</sup>.

If higher altruism or trust toward lower income partner facilitates income transfer so that the difference in consumption shrinks,  $\beta_1$  and  $\beta_2$  should be negative. Thus, by testing these coefficients, we can directly ask which of altruism or exchange motive facilitates private transfers.

#### 4. Results

Table 1 shows the main estimation results. Most notably, the cross term of altruism toward the lower income partner and their income difference has negative impact on consumption difference, implying that altruism facilitates income transfer from the richer to the poorer within a pair. In contrast to these significant results, the cross term of trust and income difference is not significant statistically. Hence, our estimation results support the hypothesis that altruism is the main motive of private transfers. Another important finding is that the difference in income itself explains only 23-31% of the difference in consumption. This suggests that idiosyncratic income shocks affect consumption only partially, which is consistent with the literature of partial risk sharing within a network (e.g., Townsend 1994; Ligon, 2008).

#### 5. Concluding Remarks

This study provides a new approach to the classical question whether private transfer is motivated by altruism or exchange. By combining artefactual field experiment and standard household survey data, we directly elicit the degree of altruism and trust (i.e., exchange) and analyze their impact on the co-movement of consumption. We find that higher altruism toward lower income partners and their income difference reduce the difference in consumption, which supports the altruism hypothesis of a motive of private transfers.

<sup>2</sup> Consumption and income are adjusted for the price index based on 2002 Sri Lanka Rupees.

<sup>3</sup> We use the following three types of fixed effects: block, D-canal, and individual fixed effect. Pair fixed effect is not used because there is little variation in  $I(y_{it} > y_{jt})$  or  $I(y_{it} < y_{jt})$ , which means that the effect of altruism or trust cannot be correctly estimated.

<sup>4</sup> Our setting is equivalent to the unidirectional case in Fafchamps and Gubert (2007).

## References

- Aoyagi, Keitaro, Yasuyuki Sawada, and Masahiro Shoji (2014) "Does infrastructure facilitate social capital accumulation? Evidence from natural and artefactual field experiments in Sri Lanka." *JICA-RI Working Paper*, No.65.
- Becker, Gary S. (1974) "A Theory of Social Interactions," *Journal of Political Economy* 82, pp.1063-93.
- Bernheim, B. Douglas, Andrei Shleifer, and Lawrence H. Summers (1985) "The Strategic Bequest Motive," *Journal of Political Economy* 93, pp.1045-76.
- Cox, Donald (1987) "Motives for Private Income Transfers," *Journal of Political Economy*, Vol. 95, No. 3, pp. 508-546.
- Cox, Donald and Emmanuel Jimenez (1998) "Risk Sharing and Private Transfers: What about Urban Households?," *Economic Development and Cultural Change*, Vol. 46, No. 3, pp. 621-637.
- Cox, Donald and Mark R. Rank "Inter-Vivos Transfers and Intergenerational Exchange," *Review of Economics and Statistics*, Vol. 74, No. 2, pp. 305-314.
- Cox, Donald, Bruce E. Hansen, and Emmanuel Jimenez (2004) "How responsive are private transfers to income? Evidence from a laissez-faire economy," *Journal of Public Economics* 88, pp.2193–2219.
- Cox, Donald, Zekeriya Eser, and Emmanuel Jimenez (1998) "Motives for private transfers over the life cycle: An analytical framework and evidence for Peru," *Journal of Development Economics* Vol. 55, pp.57–80.
- Cox, James C. (2004) "How to identify trust and reciprocity," *Games and Economic Behavior* 46, pp.260–281.
- Fafchamps, Marcel and Flore Gubert (2007) "The formation of risk sharing networks," *Journal of Development Economics* 83, pp.326–350.
- JBIC Institute (2007) "Impact of irrigation infrastructure development on dynamics of incomes and poverty: Econometric evidence using panels data from Sri Lanka." *JBICI Research Paper* No. 32, JBIC Institute, Japan.
- Levitt, Steven D. and John A. List (2007) "What Do Laboratory Experiments Measuring Social Preferences Reveal about the Real World?," *Journal of Economic Perspectives*, Vol. 21, No. 2, pp. 153-174.
- Ligon, E. (2008). Risk Sharing. In S. N. Durlauf, & L. E. Blume (Eds), *The New Palgrave Dictionary of Economics*, Second Edition. Palgrave Macmillan.
- Ligon, Ethan and Laura Schechter (2012) "Motives for sharing in social networks," *Journal of Development Economics* 99, pp.13–26.
- Lin, Wanchuan, Yiming Liu, and Juanjuan Meng (2014) "The crowding-out effect of formal insurance on informal risk sharing: An experimental study," *Games and Economic Behavior* 86, pp.184–211.
- Lucas, Robert E. B. and Oded Stark (1985) "Motivations to Remit: Evidence from Botswana," *Journal of Political Economy* 93, pp.901-18.
- Schechter, Laura (2007) "Traditional trust measurement and the risk confound: An experiment in rural Paraguay," *Journal of Economic Behavior & Organization* Vol. 62, pp.272–292.
- Schechter, Laura and Alex Yuskavage (2011) "Inequality, reciprocity, and credit in social networks," *American Journal of Agricultural Economics* 94(2): pp.402–410.
- Townsend, Robert. M. (1994) "Risk and Insurance in Village India." *Econometrica* 62, pp. 539–91.

**Table1: Estimation Results**

VARIABLES	(1)	(2)	(3)	(4)
Altruism × income difference	-0.385*** (0.133)	-0.400*** (0.130)	-0.415*** (0.129)	-0.221** (0.0974)
Trust × income difference	0.111 (0.131)	0.114 (0.130)	0.0817 (0.129)	-0.0253 (0.0970)
Altruism	1,644* (862.3)	1,599* (843.6)	954.5 (1,028)	1,423 (915.2)
Trust	-970.7 (716.3)	-840.7 (710.1)	-134.9 (750.8)	-326.3 (738.8)
Risk preference	4,351*** (1,070)	4,457*** (1,080)	3,247*** (779.1)	528.9 (1,096)
Income difference	0.278*** (0.0544)	0.282*** (0.0542)	0.311*** (0.0548)	0.235*** (0.0395)
Age difference	85.94*** (11.50)	85.93*** (11.55)	74.23*** (12.51)	95.20*** (24.61)
Education level difference	53.92 (46.19)	49.13 (47.28)	34.49 (49.72)	13.19 (61.15)
Sex difference	830.8*** (280.4)	884.3*** (274.1)	880.8*** (269.5)	-3,024*** (548.0)
Constant	-222.5 (615.9)	-36.01 (860.4)	760.2 (595.2)	4,781*** (847.9)
Season fixed effect	YES	YES	YES	YES
Additional fixed effect type		Block	D-canal	Individual
Observations	2,768	2,768	2,768	2,768

Dyadic standard errors based on Fafchamps and Gubert (2007) in parentheses. \*\*\* p<0.01, \*\* p<0.05,

\* p<0.1. Dependent variable is the difference in consumption of each pair.