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Testing for indirect reciprocity in charitable activities

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Abstract

We propose a test of indirect reciprocity using US data on charitable activities in terms of both time and money. We find that expecting help from friends or relatives in the future positively affects the probability and the amount of charitable activities performed.

1. Introduction

In 2011, $298 billion was donated to charity and 64.3 million (26%) Americans volunteered for an organization.[1] The literature has outlined several motivations behind the act of giving. Altruism posits that individuals may care about other's well-being (Becker, 1974) while the warm glow motive states that individuals may get satisfaction from the act of giving (Andreoni, 1989).

In this paper, we explore the indirect reciprocity motive. Indirect reciprocity occurs when a beneficial act is repaid from someone other than the act's recipient. This motivation has been previously studied in the context of family transfers as the demonstration effect motive where parents look after their elderly parents and in turn receive old age support from their children in the future (Arrondel and Masson, 2002; Cox and Stark, 2005; Mitrut and Wolff, 2009). Thus, people with children are expected to provide higher transfers to their elderly parents compared to people without children.

We test for indirect reciprocity in charitable activities using data on charity donations and volunteer work from the Health and Retirement Study which is a representative dataset of the US population aged above 50. If people give because they expect to receive benefits from a third party, expectations about future benefits should affect one's donations. We find that expecting to receive help from friends or relatives in the future increases both the probability and the amount of charitable activities performed.

In Section 2, we present a simple theory adapted from Cox and Stark (2005) demonstration effect model and applied to charitable donations. In Section 3, we present our data, empirical strategy, and results. We conclude in Section 4.

2. Theory and Testable Implication

For simplicity, suppose that individuals live for two periods and that they value both periods equally. In the first period, individuals have income m and choose the amount of charitable donations x while in the second period, individuals get a return with exogenous probability π and get nothing with probability $(1 - \pi)$. Expected utility is given by

$$EU(x, \pi) = u(m - x) + \pi u(x) + (1 - \pi)u(0).$$

Suppose that utility is increasing in net income $u_1 > 0$. Charitable donations decrease the net income[2] of individuals in period 1 but potentially increase net income in period 2. Individuals therefore choose the amount of charitable donations x that maximize their expected utility.

The first order condition with respect to x gives us $EU_1 = 0$. Totally differentiating the first order condition and rearranging, we get

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[1] *Sources*: US Department of the Interior http://www.nps.gov/partnerships/fundraising_individuals_statistics.htm and Bureau of Labor Statistics http://www.bls.gov/news.release/volun.nr0.htm.
[2] Note that the model can also apply to time transfers where in this case x could be interpreted as the value of time measured in terms of wages, i.e., the opportunity cost of volunteering instead of working.

$$\frac{\partial x}{\partial \pi} = -\frac{EU_{12}}{EU_{11}}.$$

Differentiating expected utility with respect to x and then with respect to π, we get $EU_{12} = u_1 > 0$. Moreover, sufficiency condition for maximization posits that $EU_{11} < 0$. Thus, it must be that a higher probability of receiving a return (π) in period 2 leads to higher charitable donations (x) in period 1: $\frac{\partial x}{\partial \pi} > 0$.

In the empirical section, we interpret the probability of receiving a return as the expectations of receiving help in the future. The testable implication of the model is that charitable activities should increase when one expects to receive help in the future. Moreover, it is a test of indirect reciprocity when the expected future help arises from parties other than the charities benefiting from the donations. This motive implies that when one expects to receive from others in the future, one would give more today.

3. Empirical Analysis

3.1. Data and Empirical Strategy

We use data from the Health and Retirement Study (HRS) which is a biennial longitudinal dataset of older respondents. From 1996 onwards, we observe whether the respondent donated to charity and the amount donated in the HRS questionnaire: "In (last calendar year), did you … donate money, property, or possessions totaling $500 or more to religious or other charitable organizations?" and "About how much money did that amount to?" We also observe whether the respondent volunteered and the number of hours volunteered: "Have you spent any time in the past 12 months doing volunteer work for religious, educational, health-related or other charitable organizations?" and "Altogether, how many hours did you spend in the past 12 months doing volunteer work for such organizations?"

Importantly, we observe expectations about receiving future help from friends or relatives should the need arise: "Suppose in the future, you needed help with basic personal care activities like eating or dressing. Do you have relatives or friends (besides your [husband/wife/partner]) who would be willing and able to help you over a long period of time?" We construct a dummy variable taking value 1 if the answer is "yes" and 0 if the answer is "no".

We use four waves of the data: 1996, 1998, 2000, and 2002, and limit our sample to the original HRS cohort of respondents born between 1931 and 1941 and to the War Babies Cohort born between 1942 and 1947. After dropping missing values (approximately 5% of the sample) this leaves us with an unbalanced panel of 35,090 observations. Summary statistics for our sample are reported in Table 1.

Since our dependent variables are either discrete (whether gave to charity, whether volunteered) or censored (amount donated, number of hours volunteered), we use random effects probit and random effects tobit models respectively. Our key variable of interest is whether the respondent expects to receive help from friends or relatives in the future should the need arise. We also control for children, demographic characteristics, wealth, and religion.

Table 1 Summary Statistics

Variable	Mean	s.d.	Variable	Mean	s.d.
Gave to charity	0.47	0.50	Female	0.57	0.50
Amount donated ($1k)	5.62	19.09	Married	0.75	0.43
Volunteered	0.36	0.48	Black	0.15	0.36
Tens of hours volunteered	15.8	34.02	Good health	0.77	0.42
Expect to receive future help	0.61	0.49	Years of schooling	12.4	3.12
Has a child	0.95	0.22	Wealth ($100k)	4.37	11.1
No. of children	3.64	2.45	Owns a house	0.82	0.39
Average age of children	31.9	9.94	Christian	0.92	0.27
Age	60.9	4.81	No. of observations	35,090	

Note: Amount of charity donated (in thousands) and number of hours volunteered (in tens) reported conditional on positive amounts in one year. All dollar amounts were converted to 2010 dollars using the Bureau of Labor Statistics CPI calculator.

3.2. Results

Marginal effects from our random effects maximum likelihood estimation are reported in Table 2. As can be seen from the table, we find that expecting future help from friends or relatives increases both the probability and the amount of charitable activities performed. The probability of making a monetary donation increases by 3.2% and the amount donated increases by $312 conditional on donating. Similarly, the probability of volunteering increases by 5.5% while the number of hours volunteered increase by 9.2 hours All effects are statistically significant at the 1% level.

Our results are consistent with the indirect reciprocity motive where respondents who expect to receive future help from friends or relatives perform higher charitable activities in terms of both time and money. We also note the additional interesting result that having a child increases the amount of charitable activities performed as well. This seems to be consistent with a demonstration effect motive which may arise due to one's desire to demonstrate to children how to be generous towards others. Other interesting results are that women are more willing to donate time while wealthier people and Christians tend to perform higher charitable activities in terms of both time and money.

One potential issue is that people who enjoy giving or who are altruistic may also expect others to have similar inclinations. We may therefore get a positive correlation between charitable activities and expectations of receiving future help due to the fact that generous people tend to give more to charity and also have higher expectations of receiving help from others should the need arise. To control for this potential bias, we take advantage of the panel feature of our dataset and estimate the model using fixed effects regressions. We therefore allow for a potential correlation between our expectations variable and the error term in our charitable

activities equations. With fixed effects regressions, the fixed effect (generosity parameter) is differenced out. [3]

Results from our fixed effects OLS regressions are reported in panel (b) of Table 3 and are qualitative similar to our reported results from random effects maximum likelihood estimation with some quantitative differences. Expectations of receiving future help increased both the probability of volunteering by 2.6% significant at the 1% level, and the number of hours volunteered by 7 hours significant at the 5% level. The probability of making a charity donation increased by 0.5% not statistically significant at the 10% level while amount of donations increased by $356 significant at the 10% level.

Similarly, results from conditional logit models for our discrete outcomes in panel (c) of Table 3, suggest that expecting to receive future help increased the probability of volunteering by 6.2% significant at the 1% level and the probability of giving to charity by 1.3% although the effect is not statistically significant at the 10% level. Those results suggest that controlling for fixed effects may be important especially in the case of monetary transfers. Nevertheless, our results are still consistent with the indirect reciprocity motive where respondents who expect to receive future help performed higher charitable activities, especially in terms of time transfers. One potential explanation could be that time transfers are more visible and individuals therefore are more willing to volunteer in order to demonstrate their indirect reciprocity.

4. Conclusion

The indirect reciprocity motive posits that people may give to charity because they expect to receive a benefit from a third party in the future. We proposed a new test of that motive by using Health and Retirement Study data on expectations of future help from friends or relatives. We find that respondents who expect to receive future help performed higher charitable activities, which is consistent with the indirect reciprocity motive.

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[3] Among the four survey years in our sample period, approximately 27% of respondents changed their answer once to the question on whether they expect to receive help in the future should they need it. 19% changed their answer twice, and 3% changed it every year. This variation allows us to still test our hypothesis using fixed effects regressions. We also performed two tailed t-tests on the differences in means of observable characteristics between the group of respondents who never changed their answer and the group of respondents who changed their answer at least once. We found no statistically significant differences in the means of amount of charity donations, number of hours volunteered, marital status, gender, wealth, ethnicity, and religion across the two groups. We note that the group that changed their answers are slightly in worse health that the group that did not change their answers. There is a positive correlation of 0.05 significant at the 1% level between respondents whose health changed for the worse and who also did not expect to receive help anymore suggesting that respondents potentially updated their expectations after receiving an actual bad health shock. We controlled for health status in all of our regressions.

Table 2 Impact of Future Help Expectations on Charitable Activities

	Charity Donations		Volunteer Work	
	1 = yes 0 = no	Thousands donated	1 = yes 0 = no	Tens of hours
Expect to receive future help	0.032**	0.312**	0.055**	0.915**
	(0.010)	(0.074)	(0.009)	(0.154)
Has a child	0.157*	0.812**	0.180**	3.026**
	(0.061)	(0.396)	(0.026)	(0.773)
No. of children	-0.016**	-0.083**	-0.001	-0.001
	(0.004)	(0.023)	(0.003)	(0.046)
Average age of children	-0.002	-0.014	-0.007**	-0.082**
	(0.002)	(0.011)	(0.001)	(0.023)
Age	0.007**	0.036*	0.010**	0.148**
	(0.003)	(0.015)	(0.002)	(0.029)
Female	-0.002	-0.002	0.041**	0.404*
	(0.018)	(0.108)	(0.012)	(0.203)
Married	-0.637**	-4.074**	-0.639**	-11.451**
	(0.072)	(0.888)	(0.064)	(2.220)
Black	0.088**	0.508*	0.115**	1.990**
	(0.030)	(0.229)	(0.032)	(0.446)
Good health	0.106**	0.942**	0.084**	1.626**
	(0.015)	(0.091)	(0.009)	(0.218)
Years of schooling	0.077**	0.401**	0.043**	0.702**
	(0.004)	(0.023)	(0.002)	(0.057)
Wealth ($100k)	0.008**	0.041**	0.001	0.021**
	(0.002)	(0.007)	(0.001)	(0.006)
Owns a house	0.207**	1.436**	0.040**	0.432
	(0.017)	(0.127)	(0.011)	(0.280)
Christian	0.191**	0.977**	0.119**	1.981**
	(0.026)	(0.135)	(0.018)	(0.277)
Log likelihood	-16,738	-76,930	-17,552	-68,221
No. of observations	35,090			

Note: Marginal effects reported from maximum likelihood estimation with random effects. Standard errors (in parentheses) block bootstrapped. All regressions include a full set of time and census division dummies and controls for spouse demographic characteristics. **significant at 1%, *significant at 5%, and †significant at 10%.

Table 3 Sensitivity Analysis: Impact of Future Help Expectations

	Charity Donations		Volunteer Work	
	1 = yes 0 = no	Thousands donated	1 = yes 0 = no	Tens of hours
(a) OLS	0.019**	0.303*	0.039**	0.891**
	(0.006)	(0.142)	(0.006)	(0.237)
(b) OLS with fixed effects	0.005	0.356†	0.026**	0.728*
	(0.005)	(0.198)	(0.006)	(0.285)
(c) Conditional logit	0.013	-	0.062**	-
	(0.013)	-	(0.013)	-

Note: Marginal effects reported. Standard errors (in parentheses) clustered at respondent level. **significant at 1%, *significant at 5%, and †significant at 10%.

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