

**Giving to Secular Causes by the Religious and Nonreligious:
An Experimental Test of the Responsiveness of Giving to Subsidies**

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Abstract

While evidence indicates that religious persons are more generous on average than nonreligious persons, little work has been done to determine if this greater generosity is a general pattern or specific to church-based institutions. Limited research addresses if, or how, religious and nonreligious givers respond to subsidies. This paper uses experimental data to examine differences in the amount and pattern of giving to secular charities in response to subsidies by self-identified religious and nonreligious subjects. The results indicate no significant difference in either the amount or pattern of giving or in the response to subsidies by religious and nonreligious subjects; however, giving by religious subjects is significantly more responsive to income changes than giving by nonreligious subjects.

JEL Classification: C91, D64, H24.

Key words: Charitable giving, Religion, Experiment, Subsidies.

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I. Introduction

Many religions call for their members to tithe a percentage of their incomes or wealth to the members' churches. Doing good is central to religious teaching.¹ The impact of these exhortations and teachings is that religion plays an important role in giving to charities and non-profit institutions. Churches and church-based institutions are the recipients of approximately two-thirds of all contributions (Hall, 1990). Evidence from the fundraising literature indicates that people active in religious organizations are more likely to give than those who are not. Flanagan (1991) reports that 80 percent of those who are active in religious organizations give, versus 55 percent of people who are not active. Barry (1996) reports that weekly attendees donate an average of 3.3 percent of their income versus 1.4 percent for monthly attendees and 1 percent for those who attended only once or twice a year.²

Another important factor in giving to charities is the implicit subsidy inherent in the Federal (and many state) income tax code. Under current tax law, a taxpayer who itemizes deductions and who is subject to a marginal tax rate of 28 percent will reduce taxes paid by \$0.28 for every dollar contributed to a charitable organization. In effect, the federal government rebates to the taxpayer \$0.28 for every dollar contributed, reducing the taxpayer's cost of making a \$1 donation from \$1 to \$0.72.

Many studies have found taxpayers to be very responsive to the tax subsidies for charitable contributions. For example, in a survey of empirical studies of the impact of the U.S. federal tax system on charitable giving, Clotfelter (1989; p. 208) cites -1.27 as a representative

estimate of the price elasticity of charitable contributions. This implies that a 1 percent reduction in the cost of giving (i.e., an increase in the marginal tax rate) increases the taxpayer's charitable giving by 1.27 percent. More recent analysis applying more sophisticated techniques have reported dramatically lower estimates for price elasticity. Barrett, et. al., (1997) estimates a long-run price elasticity of 0.47.³ An elasticity greater than one (in absolute value) means that the tax subsidy stimulates more in giving than it costs the Federal treasury in foregone tax revenue.

While it is clear that religious givers give more than nonreligious givers, there has been little work addressing the question of whether the greater generosity of religious givers is confined to churches and church-based institutions or if it also holds for giving to secular charities.⁴ There has also been little analysis of any differential in how religious and nonreligious givers respond to tax subsidies. A reason for the dearth of such work has been the inability to separate taxpayers by religious and nonreligious status.

If the primary reason religious givers make charitable contributions is the religious obligation to tithe, then differential responses to tax subsidies might be observed. If the obligation to tithe, defined broadly to mean giving for any charitable cause, is accepted as a strict requirement, then one might hypothesize that giving by religious persons would tend to be less responsive to tax subsidies than giving by nonreligious persons. Furthermore, this would also imply that the income elasticity of charitable giving (i.e., the responsiveness of one's charitable giving to changes in one's income) would be equal to one for religious givers but not necessarily equal to one for nonreligious givers.

In a previous study (Eckel and Grossman, forthcoming) the authors generated data on giving to secular charities under varying subsidy rates. This data were generated in controlled

laboratory experiments with significant financial stakes. Analysis of the experimental results indicates that subjects behaved in a manner consistent with real-world behavior, with elasticities similar to those generated by studies using tax data. As part of the data collection process, information on a subject's commitment to religion was collected. This variable allows the subject pool to be divided into "religious" and "nonreligious" subsets and for the contribution decisions to be compared, both with respect to their overall level of giving and to their different responses to the subsidies provided.

This paper examines data from those laboratory experiments for differences in both the level of giving and the responsiveness to subsidies of giving by religious and nonreligious individuals. This study will test the following hypotheses:

1. Is the greater generosity of religious givers confined to churches and church-based institutions or does this greater generosity extend to secular charities?
2. Does the obligation to tithe result in religious givers being less responsive to price subsidies than nonreligious givers?
3. Does the obligation to tithe result in religious givers' income elasticity differing significantly from that of nonreligious givers?⁵

II. Data

The data were generated at the University of Texas – Arlington in laboratory experiments in which the subject made a series of allocation decisions that divided endowments between himself and his chosen charity. Allocation decisions varied according to 1) the level of the endowment, 2) the net price of giving \$1 to the charity, and 3) whether giving was subsidized in the form of a rebate, a match, or not at all (see Table 1). As part of the data collection process,

socioeconomic information, including an indicator of the subjects' commitment to their religion, was collected after all allocation decisions are made. This variable allows the subject pool to be divided into "religious" and "nonreligious" subsets. We can then compare the contribution decisions, both with respect to the overall level of giving and to subjects' responses to the subsidies provided.⁶

In total, 168 subjects made complete, useable decisions.⁷ There were four monitors for the classroom sessions and two for the recruited sessions. The average age of subjects was 23 (the University of Texas at Arlington is primarily a commuter college with a high percentage of part-time, mature-aged students). Men comprised 57 percent of the sample. One-eighth of the subjects were married and one-tenth have children. Sixty percent of the subjects listed their major as either economics or business, and approximately 80 percent had completed two or fewer economics courses. Just over a third of the subjects (65) indicated that they attended religious services regularly.

Table 1 shows the gross contributions to the charity by the "religious" – i.e., subjects who indicated that they attend religious services regularly – and nonreligious subjects. The first three columns contain the treatment parameters: endowment level, net price of giving, and subsidy type. Column 4 reports the mean charitable contribution by religious and nonreligious subjects. In column 5 we report the t-statistics and *p*-values for the means test for equivalence of contributions. In no case did religious subjects contribute significantly more than nonreligious subjects.

We do find, however, some slight evidence that the distribution of contributions differed. Column 6 reports the $\chi^2(4)$ statistic and *p*-value for the Epps-Singleton test of whether the contributions by religious and nonreligious subjects are drawn from the same distribution.⁸ For

three of the twelve endowment/price/subsidy cases, there were significant differences in the distributions; two match and one rebate. Closer examination of the data reveals some hint of a pattern. In the \$4/\$0.80/rebate case, contributions by religious givers are distributed relatively uniformly across the full range (\$0 - \$4), while contributions by nonreligious subjects are clustered at \$0, \$2, and \$4. In the \$7.50/\$0.50/rebate and \$7.50/\$0.75/rebate cases, contributions by religious subjects were skewed slightly to the lower contribution range (\$0 - \$15 and \$0 - \$10, respectively), while contributions by nonreligious subjects were more uniformly distributed across the full range but with some clustering at the \$4 and \$10 levels and the \$5 and \$15 levels, respectively

While the data reported in Table 1 suggest at most a weak difference in giving between religious and nonreligious subjects in the aggregate, it is possible that differences will emerge at the level of the individual charities, both in the amount contributed and in the number of contributors. These issues are addressed in Table 2. Comparing mean contributions for religious and nonreligious subjects across charities, we find no significant differences in giving for nine of the ten charities. Nonreligious subjects were significantly more generous in their giving to the AIDS Outreach Center than were religious subjects (\$4.70 vs. \$1.77: $t\text{-stat} = 4.90$, $p\text{-value} < 0.001$). This charity might be different from the others because of the large asymmetry in the number of givers: only two religious subjects (3.1%) chose this charity as opposed to 11 nonreligious subjects (10.7%). This is confirmed by examining the distribution of contributors across the ten charities, where only AIDS Outreach Services and Feed the Children appear to stand out. However, applying a χ^2 contingency table test, we cannot reject the null hypothesis of independence in the choice of charity by religious and nonreligious subjects ($\chi^2(9) = 13.60$, $p\text{-value} < 0.14$).

In Table 3 we estimate the demand for charitable giving, using the commonly applied log-linear specification.⁹ The unrestricted equation estimated is:

$$\begin{aligned} \ln(\text{CONTRIBUTIONS})_{ij} = & a_0 + a_1 \ln(\text{ENDOWMENT})_{ij} + a_2 \ln(\text{RELIGIOUS} \times \text{ENDOWMENT})_{ij} \\ & + a_3 \ln(\text{REBATE})_{ij} + a_4 \ln(\text{RELIGIOUS} \times \text{REBATE})_{ij} + a_5 \ln(\text{MATCH})_{ij} + a_6 \ln(\text{RELIGIOUS} \times \\ & \text{MATCH})_{ij} + \varepsilon_{ij} \quad (1) \end{aligned}$$

where $i = 1, \dots, 168$ (an index of subjects) and $j = 1, \dots, 12$ (an index of allocation problems) and:

CONTRIBUTIONS = dollar value of contribution received by the charity + \$0.10;¹⁰

ENDOWMENT = dollar value of tokens in the endowment (\$4, \$6, \$7.50, or \$10);

RELIGIOUS = dummy variable equal to 1 if the subject attends religious services regularly, 0 otherwise);

RELIGIOUS x ENDOWMENT = interaction of endowment with religious dummy variable

REBATE = rebate price of giving \$1 to the charity (\$0.50, \$0.75, \$0.80, or \$1.00);

RELIGIOUS X REBATE = interaction of rebate price with religious dummy variable;

MATCH = match price of giving \$1 to the charity (\$0.50, \$0.75, \$0.80, or \$1.00).;

RELIGIOUS X MATCH = interaction of match price with religious dummy variable.

We estimate (1) using random effects, tobit maximum likelihood to account for the panel nature of the data (168 subjects each making twelve decisions) and for the censoring of the subjects' choices from both below and above (i.e., $\ln(0.1) \leq \ln(\text{CONTRIBUTIONS}) \leq \ln(\text{maximum possible CONTRIBUTIONS})$).¹¹ Several versions of the model are estimated and results are reported in Table 3.

We first test whether religious subjects have different income and price elasticities than do nonreligious subjects. Column 1 reports results for the unrestricted model, while columns 2

and 3 impose common rebate and match price elasticities and common income elasticities, respectively. Comparing columns 1 and 2, a likelihood ratio test of the joint null hypothesis of no difference in the rebate price and match price coefficients across religious and nonreligious subjects could not be rejected ($\chi^2(2) = 1.02, p\text{-value} < 0.61$). This finding suggests that religious and non religious subjects do not have different price elasticities for charitable giving.

Comparing columns 1 and 3, a likelihood ratio test of the joint null hypothesis of no difference in the endowment coefficients across religious and nonreligious subjects is rejected ($\chi^2(1) = 7.57, p\text{-value} < 0.006$). These findings suggest that religious and nonreligious subjects do have different income elasticities for charitable giving. The marginal effects of ENDOWMENT and RELIGIOUS x ENDOWMENT can be interpreted as the income elasticity of charitable giving. The income elasticity for nonreligious subjects is estimated to be 0.744, significantly lower than the 0.90 estimated for religious subjects. For religious subjects, the income elasticity closely approximates what one would expect from the religious obligation to tithe (i.e., giving as a constant percent of income, resulting in an elasticity equal to one).

Finally we consider the difference between our two subject groups in their desire for recognition of their contribution. Although the experiment was conducted under double-blind conditions, subjects were given the option of relinquishing their anonymity and receiving a letter of acknowledgement from their charity of choice. Approximately 21 percent (36) of our subjects so chose. Of the sixty-five religious subjects, 17 (26.2 percent) requested acknowledgement of their contributions, as opposed to 19 (18.4 percent) of the 103 nonreligious subjects. This is not a significant difference (t-statistic = 1.15, $p\text{-value} < 0.25$). We also find that those seeking acknowledgement were statistically neither more nor less generous in their giving regardless of

endowment, price, subsidy type, or whether or not they were religious or not (data not reported).¹²

III. Conclusion

This paper uses experimental data to examine differences in the amount and pattern of giving to secular charities in response to subsidies by self-identified religious and nonreligious subjects. Subjects participated in a laboratory experiment with substantial financial stakes in which they made a series of allocation decisions that divided endowments between themselves and chosen charities. Allocation decisions varied according to 1) the level of the endowment, 2) the net price of giving \$1 to the charity, and 3) the form of subsidy. Subjects self-identified as either religious or nonreligious.

We proposed to test three hypotheses:

1. Is the greater generosity of religious givers confined to churches and church-based institutions or does this greater generosity extend to secular charities?

Our results are consistent with the conclusion that while religious givers are more generous than nonreligious givers, their greater generosity is confined to churches and church-based institutions and does not extend to secular charities.

2. Does the obligation to tithe result in religious givers' being less responsive to price subsidies than nonreligious givers?

We also failed to find a significant difference in the response to price subsidies by religious and nonreligious subjects. This result suggests that rebate and matching subsidies will be equally effective at increasing contributions across the two groups.

3. Does the obligation to tithe result in religious givers' income elasticity differing significantly from that of nonreligious givers?

The obligation to tithe does appear to result in different income elasticities for religious and nonreligious subjects. Giving by religious subjects is significantly more responsive to income changes than is giving by nonreligious subjects, and the elasticity estimate for religious givers is close to one, consistent with a tithing rule.

Table 1: Dollar Contribution To Charities

Endowment	Price of Giving \$1 to Charity	Subsidy Type	Contribution to Charities (Std. Dev.)		Nonreligious vs. Religious Means Test t-statistic (<i>p</i> -value)*	Epps-Singleton Test $\chi^2(4)$ -statistic (<i>p</i> -value)
			Religious	Nonreligious		
\$4.00	\$0.50	Rebate	\$2.30 (1.11)	\$2.16 (1.18)	0.78 (0.22)	3.36 (0.50)
		Match	\$4.02 (2.56)	\$4.15 (2.55)	0.78 (0.22)	0.24 (0.99)
	\$0.80	Rebate	\$2.12 (1.28)	\$1.96 (1.33)	0.82 (0.21)	9.85 (0.04)
		Match	\$2.69 (1.60)	\$2.61 (1.69)	0.31 (0.38)	4.98 (0.29)
\$6.00	\$0.75	Rebate	\$3.23 (1.85)	\$2.93 (1.80)	1.02 (0.15)	2.87 (0.58)
		Match	\$3.82 (2.49)	\$3.72 (2.54)	0.25 (0.40)	4.35 (0.36)
	\$1.00	No Subsidy	\$2.88 (1.99)	\$2.81 (1.96)	0.20 (0.42)	3.91 (0.42)
\$7.50	\$0.50	Rebate	\$4.03 (2.34)	\$3.86 (2.25)	0.49 (0.31)	2.61 (0.63)
		Match	\$7.80 (4.61)	\$7.66 (4.82)	0.19 (0.42)	10.87 (0.03)
	\$0.75	Rebate	\$3.96 (2.36)	\$3.84 (2.30)	0.34 (0.37)	6.28 (0.18)
		Match	\$4.44 (3.16)	\$4.88 (3.08)	0.88 (0.19)	10.14 (0.04)
\$10.00	\$1.00	No Subsidy	\$5.10 (3.24)	\$4.73 (3.22)	0.73 (0.23)	3.03 (0.55)

* - One-tailed test and assuming unequal variances.

Table 2: Number of Contributors and Mean Contribution by Charity

Charity	Number of Contributors (% of Total)		Mean Contribution (Std. Dev.)		Means Test* t-statistic (p-value)
	Religious (n = 65)	Nonreligious (n = 103)	Religious	Nonreligious	
American Red Cross, Tarrant County Branch	5 (7.7)	8 (7.8)	\$3.30 (1.41)	\$3.22 (2.29)	0.07 (0.94)
Earth Share of Texas	2 (3.1)	3 (2.9)	\$2.51 (0.25)	\$1.87 (0.67)	1.50 (0.23)
Doctors Without Borders USA	4 (6.2)	13 (12.6)	\$5.87 (2.75)	\$4.70 (1.82)	0.79 (0.47)
Cancer Care Services	12 (18.5)	20 (19.4)	\$3.13 (2.01)	\$3.42 (1.87)	0.40 (0.70)
AIDS Outreach Center	2 (3.1)	11 (10.7)	\$1.77 (0.12)	\$4.32 (1.71)	4.90 (0.001)
YMCA of Arlington	3 (4.6)	9 (8.7)	\$3.32 (0.75)	\$3.09 (2.31)	0.26 (0.80)
African Christian Relief	7 (10.8)	5 (4.9)	\$5.06 (2.44)	\$3.66 (3.51)	0.77 (0.47)
Feed The Children	20 (30.8)	16 (15.5)	\$3.48 (1.72)	\$3.94 (1.99)	0.72 (0.47)
Women's Haven of Tarrant County	3 (4.6)	10 (9.7)	\$6.15 (1.22)	\$4.31 (2.22)	1.84 (0.12)
I Have A Dream Foundation	7 (10.8)	8 (7.8)	\$4.53 (2.28)	\$3.50 (1.74)	0.97 (0.35)

* - two-tailed test.

Table 3: Regression Results: Random Effects Tobit Maximum Likelihood

Dependent Variable = ln(dollars contributed to the charity + \$0.10)			
	(1)	(2)	(3)
Variable	Coefficient (<i>t-stat.</i>) Elasticity	Coefficient (<i>t-stat.</i>) Elasticity	Coefficient (<i>t-stat.</i>) Elasticity
Constant	-0.967* (7.16)	-0.970* (7.19)	-1.094* (8.20)
Endowment	0.814* (12.20) 0.742	0.815* (12.33) 0.744	0.888* (13.34) 0.826
Religious x Endowment	0.178* (5.88) 0.162	0.174* (7.68) 0.159	
Rebate Price	-0.383* (3.40) -0.349	-0.403* (4.69) -0.368	-0.406* (3.91) -0.379
Religious x Rebate Price	-0.051 (0.34) 0.047		0.012 (0.09) 0.011
Match Price	-01.20* (11.88) -1.095	-1.152* (14.06) -1.052	-01.228 (13.42) -1.143
Religious x Match Price	0.122 (0.81) 0.111		0.191 (1.59) 0.179
L.L.F.	-2395	-2395	-2399
<i>N</i>	2016	2016	2016

* - significant at the 5% level, one-tailed test.

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FOOTNOTES

¹ Doing good includes volunteering one's time and services. Judeo-Christian teachings call for both acts beneficial to mankind in general as well as acts beneficial to specific needy individuals (Cnaan, et. al., 1993).

² Hodgkinson, et. al. (1990) cite evidence of a similar relationship between volunteering and religion; the likelihood of volunteering increased with frequency of church attendance. Cnaan, et. al. (1993) offer contradictory evidence.

³ Barrett, et. al., (1997) cites a number of other studies that report similar price elasticity estimates.

⁴ What work there is often is from self-reported survey data (see for example, Donahue (1994) and Hodgkinson, et. al., 1990).

⁵ We recognize that the observance of the tithing obligation can and may across religions, but our data is not detailed enough to allow us to control for any variations. For evidence of variations in giving across religions see Regnerus, et. al. (1998) and Donahue (1994).

⁶ See Eckel and Grossman (forthcoming) for a complete description of the experiment's procedures.

⁷ An additional seven subjects were dropped for failure to complete all allocation decisions, failure to understand instructions received, or failure to answer all the required questions on the survey form.

⁸ The Epps-Singleton test is a nonparametric test designed to distinguish between different distributions (see Epps and Singleton, 1986), and is especially useful for discrete data such as ours.

⁹ See, for example, Clotfelter (1980 and 1990).

¹⁰ Because the logarithm of zero is not defined, it is customary in studies of the effect of the tax system on charitable giving to add a small amount (\$10 is common) to the contribution, thereby allowing the dependent variable to be expressed as a logarithm. We have added only \$0.10 rather than \$10 to adjust for the fact that in our study the subjects' endowments are quite small, rather than being their after-tax net income.

¹¹ We did not include separate religious and nonreligious intercept terms since the means tests reported in Table 1 offered no evidence that one group was, other things equal, more generous than the other.

¹² Means test results are available upon request of the authors.