Religion and Philanthropy

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Abstract

This paper uses a selection model and a Tobit model to investigate the effects of religion on the probability and amount of charitable donations. The main findings from the selection model are that being Catholic or Protestant make a family more likely to donate to charity than people who do not identify with a religion. Protestants, on average, donate more money to charity than people who do not identify with a religion. The Tobit model finds that Catholics, Jews, Protestants, and non-Christians give significantly more money to charity than non-religious people.

Part I

Introduction

This paper will investigate how religion affects whether an individual or family donates money to charity, how much money is donated, and to which organizations the money goes. This paper will also study how religion affects volunteerism. This paper will utilize a variety of econometric techniques to answer these questions, including a selection model, a Tobit model, and a probit model.

Previous researchers have explored the connection between religion and philanthropic

giving. Azzi and Ehrenberg (1975) presented the first attempt by economists to model religious behavior by individuals. Their main contribution was the idea of afterlife consumption. In economic models created before this paper, benefits from time allocation were assumed to terminate at the time of death.

Sullivan (1985) expanded on the results found in Azzi and Ehrenberg (1975). Sullivan adds tax effects to his model and eliminates the possibility of accruing after-death utility. Sullivan finds that religious contributions rise with income and that increased church attendance has no significant impact on the amount of money donated to the church.

Forbes and Zampelli (1997) considered factors that are important to religious giving and cross-denominational differences in giving. They found that Catholics contribute less in absolute dollars and less as a percentage of income compared to Protestants. They use both least squares and Tobit techniques. Their Tobit model found that income is a significant factor in giving for both groups and that the marginal impact of income is higher for Catholics than Protestants. This result contradicted the finding of earlier studies.

Gruber (2004) researched the economic arguments for subsidizing charitable donations through tax deductions. Gruber's goal is to determine whether charitable giving is a substitute for or complement to religious involvement. He finds that religious giving and attendance are substitutes and that larger subsidies lead to more giving and less church attendance.

Tao and Yeh (2007) study three categories of religions, one category that promises eternal life (Protestant and Catholic), one that promises a good next life (Buddhism), and one that has no promised reward (Taiwanese folk religions). They find that monetary donation frequency and volunteer frequency increase with the value of each religion's promise for the afterlife. They find they must take into account afterlife utility to capture behavior properly.

Meer (2011) looks at peer pressure in giving. He finds that social ties play a strong role in donation decisions and sizes of donation and that solicitations for donations are more effective when the solicitor shares a characteristic with the prospective donator. This result suggests that religious people would give more money to charity than non-religious people

Table 1: Summary Statistics for the Sample of Interest

	Observations	Mean	Standard Deviation	Minimum	Maximum
Age	8000	45.077	16.262	16	99
Male	8002	0.699	0.459	0	1
Children	8002	0.853	1.155	0	8
Stock Ownership	7960	0.183	0.387	0	1
Health	7964	2.491	1.094	1	5
College Degree	7984	0.254	0.435	0	1
Volunteer	3393	0.256	0.436	0	1
Income	8002	62175.56	103,441.4	-39000	5,500,000

because their social ties to the church.

The paper is organized as follows. Part II details the data, model, and methodology for this paper. Part III presents the results of the estimation of the model. Part IV concludes.

Part II

Data, Model, and Methodology

1 Data

The data for this study comes from the Panel Study of Income Dynamics (PSID). PSID, a nationally representative survey, began in 1968 with 5000 families that encompassed $18,000$ people in the United States. Summary statistics for demographic variables are found in Table 1. The main sample of interest includes heads of households in 2005. The year 2005 was chosen because it is the most recent year that includes detailed information about volunteering.

PSID added questions about philanthropic giving and volunteer time in 2001 and has continued asking questions about philanthropy since. PSID is the only panel survey that collects data on religious attendance, charitable giving, and volunteering. Data on charitable giving describe are at the family level. Data on volunteering are available for the family head

Table 2: Summary Statistics for Charitable Donations

	Observations	Mean	Standard Deviation	Minimum	Maximum
Donate	7803	0.627	0.484	0	1
(Positive) Donation Amount	4742	1951.222	3854.195	1	82,700

Donate is a binary variable, equal to one if the family has donated to charity in the past year and zero otherwise. The donation amount variable only takes into account families with positive donation amounts.

and spouse. This study utilizes the data about the head only. PSID includes information about whether the family donated at least $25 to charity in a given year. For the purposes of this study, families who gave less than $25 are considered not to have given. Summary statistics are available in Table 2. PSID breaks down the recipients of charitable giving into several categories: religious, combination (like the United Way), those that help the needy, health, education, youth or family services, arts and culture, neighborhood improvement, environment, international aid and world peace, and other.

Because the focus of this study is how religion affects philanthropic behavior, it is necessary to have data about the head of household's religion. PSID allows for the following categories for religion: Catholic, Jewish, Protestant, other non-Christian (Muslim, Buddhist), (Greek, Russian, or Eastern) Orthodox, other, and none. Table 3 shows summary statistics for each religion. It would have been preferable if PSID had more detail about religion or broke down Protestants and other non-Christians into more specific categories. Table 4 shows summary statistics for the mean donation amount and the donation probability between religious and non-religious people. t-tests for the equality of mean donation amounts (conditional on a positive donation) and donation probabilities show that the means for the two groups are significantly different.

2 Model

This paper will estimate a selection model, using the ideas developed in Heckman (1979). The selection model involves two equations. The first equation will estimate the probability

Table 3: Summary Statistics for Whether a Family Donates by Religion

Donate	Observations	Mean	Standard Deviation
None	975	0.487	0.500
Catholic	1439	0.677	0.468
Jewish	146	0.890	0.313
Protestant	4829	0.638	0.481
Non-Christian	101	0.594	0.493
Orthodox	15	0.733	0.458
Other	28	0.429	0.504

Table 4: Summary Statistics for Donation and Donation Amount

	Religious	Not Religious
Observations	6229	940
Donation Probability	0.651	0.487
Standard Error	(0.006)	(0.016)
Mean Donation Amount	1351.716	665.708
Standard Error	(42.784)	(62.674)

Table 4 shows means for the donation probability and amounts based on whether the donor identifies with a religion or with no religion (or atheism).

that a household has donated at least $25 to charity in the past year. The second equation will estimate the amount of the donation. The selection equation for whether the family has donated at least $25 is

$$D_i^* = Z_i'\gamma + \epsilon_{1i} \tag{1}$$

where D_i^* is a latent variable. Only an indicator variable for a positive amount of debt, $D = 1$ if $D_i^* > 0$ and $D = 0$ otherwise, is observed. The identifying restriction for equation (1) is described in Section 3. The regression model for if $D = 1$ (the respondent has given a donation) is

$$P_i = X_i'\beta + \epsilon_{2i}, \tag{2}$$

where P denotes the dollar amount (or logarithm of the dollar amount) of philanthropic donations a family has given. We assume $E(\epsilon_{1i}) = E(\epsilon_{2i}) = 0$, $E(\epsilon_{1i}\epsilon_{2i}) = \sigma_{12}$, and ϵ_{1i} and ϵ_{2i} are follow a jointly normal distribution. The selection-corrected equation is

$$P_i = X_i'\beta + \sigma_{12}\frac{\phi(Z_i'\gamma)}{\Phi(Z_i'\gamma)}. \tag{3}$$

This model can be estimated using the procedure discussed in Heckman (1979). Estimate equation (1) with a probit. Use the predicted probabilities to estimate the inverse Mills ratio, $\frac{\phi(Z_i'\gamma)}{\Phi(Z_i'\gamma)}$. Next, use the estimated inverse Mills ratio as a regressor in estimation of equation (2), which is equivalent to estimating equation (3).

For the sake of comparison, a Tobit model will also be estimated. The Tobit model, developed in Tobin (1958), is equivalent to the Heckman selection model if we assume $\epsilon_1 = \epsilon_2$, $X_i = Z_i$, and $\beta = \gamma$. In other words, a variable that increases the probability of a donation (Z_i in equation (1)) must also increase the mean of the positive donation amounts (X_i in equation (2)). As noted in Lin and Schmidt (1984), the Tobit model is only a special case of the Heckman model when the level of donations is the dependent variable (as opposed to the logarithm of donations). One may also estimate a Cragg model as in Cragg (1971) to avoid the above drawbacks of the Tobit model. The Tobit model and the Cragg model are commonly used when there is a large proportion of observations with value zero (donation amounts, for example), while Heckman's model is often used when some donation amounts are unobserved.

3 Methodology

Estimating Heckman selection model involves estimating a probit for whether the family has donated to charity in 2005. The independent variables in the selection equation are age of the family head, marital status, number of children, dummies for marital statuses, stock ownership, dummies for health status, whether the family head has a college degree, dummies for religion, whether the family head has volunteered in the past year, how many times the family has attended church services in the past year, and family income. Stock ownership is a binary variable that captures whether the family owns stock. It does not capture the dollar

value of the stock. The dummies for marital status are married, never married, widowed, divorced, and separated. The dummies for health status are excellent, very good, good, fair, and poor. The donation amount equation's dependent variable is the logarithm of the donation amount. The independent variables are the same in the donation equation as in the selection equation except for church attendance, which is excluded. Intuitively, this exclusion restriction means that attending church more frequently increases the probability of giving to charity, but it does not increase the average amount of the donation, given that the family gives a positive amount. The linear regression for the donation amount includes a term to correct for selection by unobservables into positive levels of charitable giving. A Tobit model is also estimated using the same independent variables as in the donation equation in the Heckman selection model.

Several probit models with differing dependent variables will answer whether religion is a significant determinant of which charity receives a family's donation. Each probit will use the same independent variables: age, gender, number of children, dummies for martial status, stock ownership, health dummies, religion dummies, volunteerism, church attendance and income. The dependent variables are binary variables for whether the family gave to a religious organization, combination organization, organization for the needy, health organization, educational organization, youth organization, cultural organization, community organization, peace organization, or another type of organization.

Part III

Results

Estimation results for the Heckman selection model are presented in Table 5 and Table 6. Table 5 presents the results from the probit for donating a positive amount of money to charity in 2005. Age, number of children, stock ownership, dummies for fair and poor

Table 5: Estimates of Heckman Selection Model: Participation Equation

Donation in 2005	Coefficient	Standard Error
Age	0.013	(0.002)
Male	−0.053	(0.056)
Children	−0.073	(0.025)
Stock	0.602	(0.087)
College Degree	0.534	(0.065)
Volunteer	0.785	(0.059)
Church Attendance	0.006	(0.003)
Income	3.08×10^{-7}	(1.92×10^{-7})
Catholic	0.382	(0.095)
Jewish	0.125	(0.234)
Protestant	0.306	(0.075)
Non-Christian	0.100	(0.250)
Orthodox	0.128	(0.128)
Other Religion	−0.104	(0.356)

Table 5 shows the coefficient on each continuous or binary variable, along with the associated standard error. There were 3105 observations used to estimate this probit model.

health, college degree, volunteering, and church attendance are significant in the probit. In addition, the dummies for being Catholic and on being Protestant are significant. The sign on age is positive, so older individuals are more likely to donate. The sign on children is negative, so having more children makes families less likely to donate. Owning stock makes a family more likely to donate. People who volunteer are more likely to donate. Also, people in fair or poor health are significantly less likely to donate than people in excellent health. It is interesting to note that the coefficient on income is not significantly different from zero, so wealthier families are not more likely to give on average. Only two religions are significant in the participation equation: Catholic and Protestant. Being Catholic or Protestant makes a family significantly more likely to donate.

Table 6 shows the results of the second equation in the selection model, a linear regression for log of donation amount, given that the donation amount is positive. In this equation, age, Protestantism, volunteerism, and income are significant. Older families donate more money, Protestants donate more money, and people with higher incomes donate more money. It is interesting that the results from the probit show that Catholics are more likely to donate

Table 6: Estimates of Heckman Selection Model: Donation Equation

Log Donation Amount in 2005	Coefficient	Standard Error
Age	0.011	(0.004)
Male	−0.125	(0.078)
Children	−0.047	(0.041)
Stock	0.516	(0.147)
College Degree	0.258	(0.138)
Volunteer	0.353	(0.183)
Income	8.98×10^{-6}	(8.72×10^{-7})
Catholic	−0.097	(0.164)
Jewish	0.465	(0.283)
Protestant	0.265	(0.136)
Non-Christian	0.477	(0.323)
Orthodox	−0.894	(0.658)
Other Religion	0.121	(0.533)
Selection (Inverse Mills Ratio)	−0.501	(0.412)

Table 6 shows the coefficient on each continuous or binary variable, along with the associated standard error. There are 1505 observations used to estimate this regression.

to charity than non-religious people, but conditional on giving, they do not give more on average.

The independent variables used in estimation of the Tobit model are the same as those used in the donation equation in the Heckman selection model. The results of the estimation are presented in Table 7. Age, stock ownership, very good, fair, and poor health, college degree, and volunteering are significant in the Tobit model. Catholicism, Judaism, Protestantism, and Non-Christian religion are also significant. Older people and people who own stock give more money on average to charity. People in very good health give more to charity on average than people in excellent health. Perhaps this surprising result occurs because younger people are more likely to have excellent health and younger people give less to charity. People in fair and poor health give less on average than those in excellent health. People who volunteer give on average $1849.86 more to charity than people who do not. Increased income also leads to increased average giving.

The effects of religion on giving are stronger in the Tobit model than in the Heckman selection model. On average, Catholics give $523.00 more than people with no religious

Table 7: Estimates of Tobit Model

Donation Amount in 2005	Coefficient	Standard Error
Age	26.206	(5.477)
Male	−10.720	(143.120)
Children	−86.297	(65.319)
Stock	1221.153	(189.618)
College Degree	1226.162	(0.138)
Volunteer	1849.858	(138.973)
Income	0.002	(0.001)
Church Attendance	4.525	(7.100)
Catholic	522.998	(244.708)
Jewish	2679.667	(535.809)
Protestant	736.840	(199.691)
Non-Christian	1425.969	(578.769)
Orthodox	−280.237	(1336.878)
Other Religion	−554.468	(962.179)

Table 7 shows the coefficient on each continuous or binary variable, along with the associated standard error. There are 1496 left-censored observations and 1620 uncensored observations used to estimate this regression.

preference, Jews give $2679.67 more, Protestants give $199.69 more, and non-Christian give $1425.97 more. In the Heckman model, being Jewish or Catholic was not a significant determinant of the level of charitable giving.

Table 8 shows how belonging to each religious group impacts the probability of giving to each category of charity. Religion only has a significant effect on the probability of giving to religious organizations, combination organizations, education organizations, cultural organizations, and environmental organizations. It is not surprising that being Protestant or Catholic makes a family more likely to donate to a religious organization than a non-religious person.

Table 8: Probit Model Estimates for Donation by Organization Type

	Catholic	Jewish	Protestant	Other Non-Christian	Orthodox	Other
Religious	+	0	+	0	0	0
Combination	+	+	+	0	0	0
Needy	0	0	0	0	0	0
Health	0	0	0	0	0	0
Education	0	+	0	0	0	0
Youth	0	0	0	0	0	0
Cultural	0	+	-	0	0	0
Community	0	0	0	0	0	0
Environment	0	0	-	+	0	0
Peace	0	0	0	0	0	0
Other	0	0	0	0	0	0

Table 8 shows the sign of the marginal effect of belonging to a religion on the probability of donating to each type of organization (compared to having no religion). A + represents a significantly positive effect, a - a significantly negative effect, and 0 an insignificant effect.

Part IV

Conclusion

On average, religious people donate more money and more often to charity than non-religious people. In the Heckman selection model, Catholics and Protestants are significantly more likely to donate to charity than non-religious people. Protestants donate more money on average than non-religious people. In the Tobit model, Catholics, Jewish people, Protestants, and non-Christians give significantly more money to charity than non-religious people.

This study puts forth a few questions for future study. Future researchers could investigate whether the effect on donations of religion changes based on frequency of church attendance. Another avenue for research would be to analyze income effects on donation to look for the effects of tax incentives on charitable donation.

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