

**The Responsiveness of Household's Charitable Donations to Income Changes  
Across Religious Groups**

Mitch Grenier

The College of the Holy Cross

Advisor: Professor Miller

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## Introduction

The topic of Charitable Donations has attracted a great deal of attention over the years in both economic and sociological literature. While the motivations for donating have been studied at length, many studies have looked at whether certain groups are more or less charitable than others. These groups have been defined in many ways, such as education level, higher income groups, living in an urban area, and even race. One of the most commonly studied groups in the literature surrounding charitable donations are religious groups. Religious people have been observed to be more charitable even when controlling for income. Despite this, the motivations behind these donations are unknown. Some authors have argued that religious people are more altruistic while others have argued that their calculated benefit from a donation includes not only the altruistic benefit, feeling good about donating, but also a benefit in the eyes of their god or their church.

This study aims to shed some light on the motivations behind the higher level of charitable donations by the religious by measuring the income elasticity of charitable donations separately for different religious groups and different charitable causes, such as religious organizations, organizations serving the needy or combined purpose organizations. This study finds that there are not statistically significant differences in the ways that different religious groups' charitable donations change as their income changes. Furthermore, these changes are not obviously different from charitable cause to charitable cause.

The overall economic research on charitable donations falls largely into three groups. The first of these groups discusses the possible motivations behind charitable donations. Various papers have tried to show the existence of altruism in these donations whereas others have shown that people might donate with their own self-interest in mind. Understanding these motivations is

essential for drawing any conclusions about donative behavior as well as for guiding potential research. The second group of papers on charitable donations contains research on the effects of income and income shocks on donations. While it has been observed by many studies that a household's income is a significant predictor of donative behavior, this does not answer the question of whether higher income people are more altruistic or whether households that earn more donate more for other reasons, such as being viewed favorably by their peers. Despite the observed significance of income, income alone is limited in explaining donative behavior by itself since studies that control for income still find other significant variables. The third category of papers on charitable donations involves looking at different non-income groups, such as religion and race, to see if or how they behave differently. This paper aims to combine these categories to find out what can be learned about how religious groups, while controlling for other factors that have been observed to be significant, behave when faced with income or wealth shocks, and what this might tell us about these groups' motivations for donating.

Economic literature has put forth various potential motivations for charitable donations. These include altruism (Cheng and Wagener 2001), religious benefit (Showers, Showers, Beggs and Cox, Jr. 2011), or even benefit from being viewed favorably by peers or some other personal benefit (Alpizar and Martinsson 2013, Yen, Boxall, and Adamowicz 2013). With these basic motivations understood, or at least identified, studies have moved towards attempting to uncover characteristics that are associated with donations and are therefore potentially associated with altruism (Butera and Houser 2018). As previously mentioned, one of the many characteristics that have been studied at great length is religion. Of course, the amount of money that a person has influences how much of it they are willing to give away, but characteristics such as religion and education have been found to be significant even when controlling for income. Factors that

influence income are also worth observing when aiming to learn about donations as they have been shown to influence donations beyond their influence on income. Tax incentives, age, education, and the Great Recession have all been studied as factors that influence donations even beyond their impacts on income (Liu and Zhang (2008), Olsen, Smith, and Wunnava (1989) Hood, Martin, and Osberg (1977), Marx and Carter (2014) and Meer, Miller, and Wulfsberg (2016)). In this study, I use a holistic approach and control for all of the variables that have been previously found to be significant.

The question remains, what does estimating the income elasticities of different types of charitable donations by religious and non-religious people reveal about the motivations behind the charitable donations? If religious people exhibit lower elasticities, meaning that donations are less responsive to changes in income, only when donating to non-religious causes then this might show that they are motivated by religious beliefs that require them to donate money to their place of worship, such as tithing. If religious people are more altruistic than non-religious people, then they might have lower elasticities with respect to all causes and not only to religious organizations. It is not possible, however, to say that donating to religious causes is motivated less by altruism, and so this paper focuses on examining consistency of donations with respect to income changes and has less to say about the types of altruism that are often looked at in other papers.

### **Question**

This study aims to discover how different demographic groups react to changes to income. Specifically, it asks, “How different religious groups within the United States behave when faced with income changes, and what might that tell us about these groups’ motivations for

donating?” Additionally, it asks if the observed patterns are consistent when controlling for the type of organization that is being donated to.

By observing how the income elasticities of donations for these religious groups vary when faced with the same changes, it can be observed which groups will donate with the greatest consistency. A finding of an elasticity less than one would show that a given religious group's donations change at a rate that is slower than its income changes. Such a group donates consistently and could be counted on to donate in times where donations might decrease. Such a discovery could be used to advise charities who receive donations on how to maintain consistent funding during periods of time where incomes are widely down, such as a recession. Similarly, if the elasticities of specific religious groups are increasing over time, charitable organizations should be aware that members of that religious group view donations as less of a necessity than they had in the past. Additionally, this information could be used to inform the US government's policies towards charities receiving these donations. If demographic trends show that the religious groups with the lower elasticities are shrinking, it might be advisable for the government, if it values the contributions of these charities, to increase its contributions to charitable causes since donations would be less consistent in this case. In this way, both charitable organizations and the US government could learn from the findings in this study.

### **Religious Studies and this Study's modifications**

Since this study is focused primarily on the donative behaviors of different religious groups, it is necessary to talk about studies that have looked at religion and charitable behavior in the past. Eagles, Keister and Read (2018) showed that higher levels of religious participation, higher levels of attendance at religious services for example, were associated with higher levels of charitable giving. This shows that religious people donate more, but it does not show that they

donate more consistently, which is how this study differs from Eagles, Keister, and Read (2018). Showers, Showers, Beggs, and Cox, Jr. (2011) is the study that is closest to this one, as it aims to measure whether or not religious donations were more or less responsive to changes in income and wealth than non-religious donations. They found that religious donations have an elasticity of less than one, showing that religious donations are viewed as a necessity whereas non-religious donations are viewed as a luxury (elasticity greater than 1). This study looks to add to Showers, Showers, Beggs, and Cox, Jr. (2011), and others, by using the Panel Study of Income Dynamics to evaluate how different religious groups' donative behavior changed when faced with shocks to income and wealth, as well as if the changes are consistent for all charitable causes.

There are some key differences in this study and the one done by Showers (2011). Showers (2011) looks at donations to religious causes and donations to non-religious causes as they are related to income in a given year. Showers (2011) uses household consumption to measure what they call perceived income and then estimates the elasticity of donations with that income. This study uses the change in income over-time to estimate the elasticity of religious and non-religious donations as opposed to using the income and donation levels from each year. Additionally, this study introduces a new dataset to this question of donations. By observing these patterns, this paper learns about the charitable behaviors of these different religious groups. This will allow us to see whether or not the observed elasticities hold true when looking at religious people, as opposed to donations, and whether or not they are constant for different causes.

## **Data**

Data is from the 2003-2017 Panel Study of Income Dynamics (PSID). This longitudinal survey of American households began in 1966 to research the dynamics of income and poverty in the United States and has been used in countless peer-reviewed studies as a source of data. While its form has changed over the years, the PSID has surveyed households every other year since 1997. Many of the questions in a given year ask about the previous year. Income, for example, reported in the 2003 survey is actually income from 2002. So, while this study uses data from the 2003-2017 surveys, the data is actually from 2002 to 2016. The PSID oversamples certain groups, such as low-income households. This is done so that the data can be better used to study income dynamics. The PSID provides survey weights to account for the sampling scheme and attrition.

The PSID includes data on both religious and charitable donations at the household level. These questions are of particular interest to this study as, in conjunction with the income variables, they form the main relationship that this study aims to understand between income, religion and charitable donations. Questions on religion have been included in the study since its inception, however the available responses have changed overtime. This is not an issue for this study since these changes are not significant during the time period analyzed here. For the purpose of this study, I identify households with a religion using the question on the head of household's religious preference.<sup>1</sup> In 2003, a question was added to the survey which asked respondents to include both whether they donated to a specific charitable cause as well as the

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<sup>1</sup> The PSID records both the "head of household's" religious preference and "spouse's" religious preference. This study uses the "head of household's" religious preference for simplicity, though there is surely much to be learned from looking at either how this study's findings might change if the "spouse's" religious preference was introduced as well, or whether religious differences within the household affect giving.

amount that they donated. This self-reported charitable donations data forms the basis of this analysis.

Some of the questions asked in this section do not apply to an entire household. For example, questions on religion ask about the “head of household’s” religious preference and “spouse’s” religious preference rather than for a general household religious preference. This study uses the “head of household’s” religious preference for simplicity, though there is surely much to be learned from looking at how this study’s findings might change if the “spouse’s” religious preference was introduced as well. Each model is estimated with a broad sample: A household is included in a particular analysis if that household responded to the specific donation question being evaluated. Since not every household answers each donation question, there are some households included in one model but not another. While it might be more consistent to build one data set that includes only households that responded to each donation question, this method makes use of as much of the available data as possible. I do not remove outliers, but I do exclude households with non-exact answers such as a “Don’t Know” or “\$99,997 or more” responses in addition to households with missing data. The PSID does not allow for members of the household other than the head of household to respond to questions about donations, As the survey is often completed by people other than the head of household, this removes a number of responses from the dataset. The resulting sample sizes vary from 20,000~30,000 households, depending on the model.

### **Model & Methodology**

In order to evaluate the elasticity of households’ donative behavior it is necessary to first set up a regression using a response variable that uses a measure of income and predictor variables. A model that uses charitable donations to organizations serving a specific cause as a

response variable and a first predictor variable of income is the starting point. Since we are interested in the elasticities of donations, we want to look at how donations change when income changes, which requires our income and donation variables to be the difference in income and donation amounts for two separate years in the survey. There are two ways that this can be done. One would be to look at year over year changes, and the other would be to look at the changes over a longer period of time in the data set. This study elects to look at the change in donations over the entire period of time where questions are asked about charitable donations in the survey (2002-2016) for a few reasons. One is that looking at year over year changes may lead to smaller changes in income on average which will be more difficult to evaluate. Another is that using year over year changes introduces a great amount of noise. For example, if a household has a windfall of cash in one year, they may decide to donate a chunk of it. On the other hand, a household may suffer a medical emergency that greatly lowers their disposable income, leading to lower donations in a given year. This study is more interested in how households behave when they have meaningful, sustained changes of income which may support a change in lifestyle and/or perspective. Therefore, this study uses the endpoint of that data on charitable donations, which are 2003 and 2017 respectively. It is important to recall that, as noted previously, the survey responses are lagged one year, so responses given in the years 2003 and 2017 represent income and donations that occurred in the years 2002 and 2016. I created variables that evaluate the change in income and donations from 2002 to 2016 and are controlled for inflation to be reported in 2016 dollars. This is done not for each charitable cause that is included in the PSID, but for four groups. The first is charitable donations to religious organizations. The second is charitable donations to organizations serving the needy. The third is charitable donations to combined purpose organizations. The fourth is the sum of charitable donations to any other cause,

including health organizations, environmental organizations, community organizations, and youth organizations, among others. This combination of causes is done in part because the causes included in the other category received far smaller donations on average. As a result, combining them not only improves clarity by not reporting an unnecessarily large number of models but also provides four causes that receive donations of relatively similar size from each religion.

The observations must be scaled so that the resulting regression coefficients will give a measure of elasticity as opposed to the raw amount of the income that is donated. The magnitude of most individual's donations is much less than the magnitude of their income and so in for the  $\beta$  values to be more meaningful it is necessary to perform a transformation. Usually the transformation here would be to take the log of both income and donations, however since the log function is undefined at 0, and many household's donations or income do not change during this time period, the inverse hyperbolic sin function is used. This changes the interpretation of the  $\beta$ 's in the model so that  $\beta$  of 1 would mean that a 1% change in income is associated with a one percent change in donations. This gives the starting point:

$$\begin{aligned} & \text{arcsinh}(\Delta \text{Donations to a Specific Cause}(2002 - 2016)) \\ & = \beta_0 + \beta_1 \text{arcsinh}(\Delta \text{Income}(2002 - 2016)) \end{aligned}$$

From this equation, variables for each religion and interaction terms between the change in income and the head of household's religious group are added so that the model takes the form:

$$\begin{aligned} & \text{arcsinh}(\Delta \text{Donations to a Specific Cause}) \\ & = \beta_0 + \beta_1 \text{arcsinh}(\Delta \text{Income}) + \beta_2 \text{Religious Group 1} \\ & + \beta_3 \text{arcsinh}(\Delta \text{Income}) * \text{Religious Group 1} + \beta_4 \text{Religious Group 2} \\ & + \beta_5 \text{arcsinh}(\Delta \text{Income}) * \text{Religious Group 2} \dots + \text{controls} \end{aligned}$$

Where the  $\beta_3$  for interaction term between religious group 1 and the transformed change in income shows how the elasticity of donations varies for religious group 1 and the  $\beta_5$  shows how the elasticity varies for religious group 2. Comparing these  $\beta$ 's gives a comparison for how one religious group's elasticity varies from another group's elasticity. The baseline in this case is a household whose reference person that does not identify with any religious groups. The response in this case is "None" or "Atheist". This does not include any response of "Don't know" or "N/A" which are reported together, separately from each religion. This model is then expanded to include each religion in the dataset as well as additional variables such as race, number of children, and years of education completed by the head of household. These additional variables serve as controls and are chosen looking back at the aforementioned studies and adding those that have been found to be statistically significant and are recorded in the survey. The PSID records donations separately for different causes, so no further separation is needed on this front. Some variables are not recorded each year but are less likely to change and can in some cases be treated as constants. Since we use 2016 dollars as the reference point for these models, years of education completed by the head of household, number of children in household unit, and wealth are the 2016 responses whereas religion and race are assumed to be constant over the length of the survey. While Showers (2011) uses consumption as its income measure which would control for varying costs of living, the PSID does not have data for consumption. With this in mind, income remains the best response variable.

Meer, Miller, and Wulfsberg (2016) concluded that attitudes towards charitable giving changed in the years surrounding the Great Recession. It therefore would not be surprising if, in general, donations are observed to be decreasing over the length of the survey. While it is true that recessions and drops in income are correlated, the results in Meer (2016) suggests that the

there is a change in donations that cannot be explained by the changes in income that occurred during this time. Knowing that donations may be decreasing over time, it is important to consider that a result that shows religious groups' donations decreasing, but to a lesser degree than non-religious groups, would support the hypothesis that religious individuals are more likely to donate to a given cause irrespective of income changes. In order to see if the elasticities observed among different religious groups hold constant for different causes, a model will be built for each charitable cause. Comparing the results for each cause will show whether or not religious groups' elasticities hold true for non-religious causes. If religious people donate to all causes with greater consistency than non-religious people, then this might suggest that religious people do in fact donate due to altruistic motivations rather than a want to be viewed favorably by their peers in their church or place of worship.

Through the use of the PSID, this study aims to understand how different groups' charitable donations within the United States react to changes in income. This is done using an OLS regression and observing the coefficients for the interaction terms between the variable for a specific group and the  $\ln(\Delta Income)$  variable. The group that will be looked at in this study most directly is religious groups (Catholicism, Judaism Islam etc.). Race, and education level and other groups will be included as controls. By observing the results of this regression in conjunction with any trends among these groups over time this study can be used to advise both the charitable organizations that rely on these donations as well as the United States Government which is tasked with balancing its taxation practices with the donation levels of the population of the United States. Furthermore, the results will show if religious people exhibit different behaviors towards different causes. This behavior might show whether religious people donate because of altruism or because of religious requirements.

## Summary Statistics

Before getting into the formal models discussed above it is first necessary to look at summary statistics of the data set. This improves the study in two main ways. First off it allows us to see whether or not the general trends observed in other studies hold true in this dataset. For example, it has been shown that, in general, religious people donate more than non-religious people, even when controlling for income. If this did not prove to be true in the summary statistics of this dataset, then it would be necessary to point that out before making any other conclusions about the dataset. Secondly, summary statistics allow us to look at the general properties of the dataset, providing context for any of the conclusions that might be drawn later on in the study. The first thing that is necessary to look at is the level of donations that is seen among different religious groups for different charitable causes. As discussed previously we use four main categories for charitable donations, religious organizations, organizations serving the needy, combined purpose organizations, and a general other category that includes all other charitable causes in the survey over these years.

The first set of summary statistics looks at donations in one year (2002) and shows us what donations look like before the income changes which we will be evaluating. Looking at Table 1a we can see that the majority of the household in the data are households where the head of household identifies as Protestant. This is especially noteworthy in looking at the summary statistics since these statistics do not use the survey's weighting system. For the sample used in the religious donation bucket, we have 20,603 households with a Protestant head of household and 12,933 in all other categories. The group that donates the most per household to religious organizations is the group of households where the head of household identifies as Jewish, with an average of ~\$1,091. This is followed closely by Protestant households before a large drop off

for the rest of the religions. These observations need to be looked at with an additional control for income before we can draw many conclusions from them, but it is unsurprising that the Jewish and Protestant households donate more to religious organizations, as this is what has been observed previously. It is important to note that for religious donations in 2002, close to 60% of the households in the dataset report no donations to religious organizations. This will drag down the average donation in this category but has a greater effect on the other categories of donations as about 75% of respondents did not donate to combined purpose organizations or organizations serving the needy in 2002 and 70% of respondents did not donate to organizations in the “other” category.

Noticeably, in households where the head of household is not religious, the mean donation to religious organizations is not much lower than the non-Protestant or non-Jewish religious groups. This is an important observation since the main observation we will be looking at compares religious groups to the non-religious groups with respect to the elasticities of donations for various causes. Since the non-religious group’s donations do not differ from most of the religious groups, we will have to look at how their elasticities vary from religious causes to non-religious causes as well. This means that in order for this study to draw the conclusion that a certain religion is more motivated by altruistic causes, we will have to see that their elasticities of donations are smaller across all causes in a way that is different than the non-religious group.

Looking at Tables 1b-1d we see more variation in which groups donate more on average. While the Jewish household donate the most for each cause, households where the head of household answered Other Non-Christian (defined as Muslim/Rastafarian etc.) donate the second most for all other causes and Catholic households the third most when the cause is organizations

combined purpose organizations. Non-religious households donate the third most to causes outside the aforementioned top three causes. It is important to note the sample sizes in each of these groups as they vary greatly. The Other Non-Christian group is much smaller than the Catholic and Protestant groups and so the average donation is much more sensitive to outliers such as the \$10,000 max donation observed. The same is true of the Jewish group. These observations are important to keep in mind when looking at the regression tables that use change in donations. For the smaller groups it is more likely that a major change in the behavior of one respondent will greatly affect the model. For the groups with a smaller average donation, the average change in donation need not be as big in order for the percentage change in donation to be significant.

To supplement Tables 1a-1d are tables 2a and 2b. These tables take a more holistic approach to the 2002 donations, looking at donations to each charitable cause by the head of household's religious affiliation as well as religious donations versus non-religious donations for each religious group. Looking at these two tables, it is clear that households in each group donate more on average to religious organizations and that religious groups donate more on average as well. The next steps are to introduce income controls, interaction terms, and change variables.

### **Preliminary Regressions**

In the same way that we used summary statistics to look at the relationship between religion and charitable donations in order to frame the final model, we also want to look at the how income interacts with donations and religion in one year. Table 3a shows four regressions, two which compare donations (to religious organizations and organizations serving the needy respectively) against income and two which add in the household's religion. Each model is of the

following form where the donation variable is the response against income, religious group, and the interaction between each religious group and income.

$$\begin{aligned}
 & \text{arcsinh}(\Delta \text{Donations to a Specific Cause}) \\
 &= \beta_0 + \beta_1 \text{arcsinh}(\Delta \text{Income}) + \beta_2 \text{Religious Group 1} \\
 &+ \beta_3 \text{arcsinh}(\Delta \text{Income}) * \text{Religious Group 1} + \dots + \beta_{10} \text{Religious Group 7} \\
 &+ \beta_{11} \text{arcsinh}(\Delta \text{Income}) * \text{Religious Group 2}
 \end{aligned}$$

Here it can be seen that income has a statistically significant effect on the size of donations for a specific household. Specifically, a 1% increase in a household's income is associated with a 0.765% percent increase in donations to religious causes for households with any religious preference. Similarly, a 1% increase in a household's income is associated with a 0.476% percent increase in donations to organizations serving the needy for households with any religious preference.

As religion and religion and income interaction terms are added into the model, the income coefficients must be interpreted in combination with the interaction terms. For models in this study, the base case is when the household responds as non-religious. As a result, the coefficient for income in these models shows the effect of income on donations for households that responded that they were not religious. The effect of income for any of the other households is the coefficient of income plus the coefficient for the interaction term. For example, in Table 3a, the effect of income on donations to religious causes for Protestant households is  $(0.362+0.581=0.934)$ . This implies that for a 1% increase in income, Protestant households donate on average .934% more. This elasticity is less than 1, suggesting that these donations are inelastic and move at a rate slower than income. One thing that can be seen here as well is that this increased impact of income as compared to non-religious households is consistent across

Catholic, Jewish, Protestant and Other Religion households when the cause receiving donations is religious organizations. This, however, is not true when the cause receiving donations is organizations serving the needy. In this model, the only religion with a significant interaction effect, meaning a significantly different impact as compared to non-religious households, is Judaism. These results suggest that religious people actually have a higher elasticity of donations as compared to non-religious people, but this is hard to tell without using a model that looks at changes in income and donations as opposed to income and donations from one year. This is why this study later uses data from the length of the survey, from 2002-2016. As noted above, this will have implications for the interpretation of the result but will better represent long term changes in income

Additionally, another important consideration is the PSID's survey weights. Because of attrition among the respondents in the survey, the population in the survey changes from year to year. Using the provided Survey weights will allow the study to better reflect its intended population rather than the sample that has remained in the survey over the years. This will control for any unintended changes such as if families with more income were more likely to stay within the survey over a period of few years. When cross-sectional weights are added in to the same four regressions previously shown in Table 3a, it can be seen that, in general, the coefficients that had are significant in the previous versions are no longer significant. The exception here is for donations to religious causes, the interaction effect between Protestant and income remains significantly positive. This would suggest that for households who do identify as religious but do not identify as Protestant there is not a significant difference between the effect of income on their donations to religious organizations and the effect of income on the donations of non-religious households to religious causes. This underscores the

necessity of including the appropriate sample weights when analyzing the effect of the changes in income on donations of the time span of 2002-2016, since using the weights may alter the results.

### **Change Regressions**

Having looked at the data in a single year, it is necessary to look at what happens over a longer span of time. In order to contextualize the changes that occurred in the time span 2002-2016, it is first necessary to look how income and donations changed over time. Looking at Table 4a, the average change in total annual household income from 2002-2016 is just over \$3,000 in 2016 dollars<sup>2</sup>. The standard deviation, however, for this change in income is a much larger \$113,000. On average, households in the PSID have incomes that are increasing at a rate greater than inflation during the same period. Since there is a positive relationship between income and donations, we would expect an increase in income generally to lead to an increase in donations. This proves not to be the case. Table 4a shows the changes in donations to each category of charity type (Religious organizations, combined purpose organizations, organizations serving the needy, and the “other” category). Average donations to religious organizations, average donations to combined purpose organizations, and average donations to organizations serving the needy are decreasing over time. Donations to religious causes decreased on average by about \$290. Donations to “other” organizations remained relatively constant during this time period, increasing by just over \$2. In all of these variables, both income and donations, there are significant outliers on either side, with income dropping by as much \$2.7 million and some donations changing by as much as \$50,000, which may explain why there are such large standard

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<sup>2</sup> 2016 Dollars were chosen as the reference period since all control variables are also reported in 2016

deviations on these variables. These observations will have significant impacts on the regressions but are still of interest and so have not been removed.

Looking at the 2002 regressions, the survey weights had a significant impact on the significance of the results. Since the regressions using the change in donations and income from 2002-2016 are working multiple years, the weights used differ. In the 2002 regressions, 2002 cross-sectional weights are used whereas the 2002-2016 regressions use 2016 longitudinal weights to account for changes in the survey's population over time. I use the same technique here as above and include both the weighted and unweighted regression results. In Table 4b, survey weights are not used. In this table it can be seen that all of the religions, except for "other," in the survey have a significantly positive coefficient, which implies a greater average donation (with no change in income) than the baseline of no religion. While the religion coefficients only estimate what a person of a certain donation would donate when their income did not change, they remain important, especially considering that the coefficients on the interaction terms of change in income and religion which are relatively small. The coefficient on the change in income, when the cause being donated to is religious organizations, is 0.001. This means that a 1% increase in the change in income for the non-religious, is associated with a 0.001% increase in donations to religious organizations. Since the average change in income is about \$3,000, an average 1% change would be about \$30, so it is not surprising that a difference of such a change in income from 2002-2016 has a small effect on the donations. The coefficient for the interaction term between a household religion of Judaism and the change in income in this model is -0.002. This means that the donations of a household that identifies as Jewish are actually equally responsive to income as a household that does not identify as any religion, except in the opposite direction, (-0.001 vs 0.001). Most of the coefficients for the interaction

between income and religion are similarly small and not statistically significant. The exceptions to this rule are when a household identifies as Protestant or as Other non-Christian. Since the Other non-Christian group is very small<sup>3</sup>, this may not mean much. On the contrary, the Protestant group is very large. The interaction effect between a household identifying as Protestant is and the change in income is 0.005 and statistically significant at the 5% level. This indicates that donations from Protestant households are more responsive to changes in income than households who do not identify as religious.

Table 4c adds in the 2016 longitudinal survey weights to the regressions. As in the cross-sectional results using the 2003 data, one of the main changes in between the two versions of the regressions on the change in donations from 2002-2016 is that coefficients that are significant in the unweighted regressions are not significant in the weighted regressions. In fact, none of the coefficients in this model are statistically significant at the 5% level. This seems to suggest that the results from the previous regression were due to the population surveyed as once the PSID controls for changes in the population over time, the results are no longer significant. It is hard to know why this occurs, but it is possible that there are certain characteristics shared by the population that is more likely to remain in the survey that are associated with the findings from the non-weighted regression.

As was the case with the previous regression, the main variables of interest are the coefficients for the interaction terms between household income and religion. Starting with the donations to religious organizations case, each of these interaction coefficients is relatively small, with each below 0.1 indicating that a 1% difference in the change in income from 2002-2016 is associated with a less than .1% change in the amount of money donated (relative to the

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<sup>3</sup>  $N \approx 500$  but is different in each regression

base group of the non-religious). Note that there is significant variation in income change over this period (a one standard deviation change in income change from 2002 to 2016 would be equivalent to a change in the change in income from ~\$3,000 to ~116,000, which is a 360% increase). For a Protestant household (one with an interaction coefficient for religious donations of 0.006) this increase would be associated with a 2.16% change in donations. These can be compared to coefficients of each religion, which measures the change in donation for a household of a specific religion relative to the change in donation for a non-religious household, assuming no change in income. In the case of Jewish households, the estimate is 0.751, which indicates that Jewish households' donations will increase by 0.751% more than households with no religious affiliation. This is also relatively small, despite being the largest coefficient for any of the religious groups. All of the estimated coefficients on the religious categories are much greater than the estimated coefficients on the interaction effects but are smaller than the effect of a one standard deviation change to the change in income for the non-religious households. In order for a change in income to have a similar effect for the non-religious group as identifying as Jewish does, they would have to have a change in income of 250%. This is of course for the largest coefficient but gives an idea of the size of an income change for a non-religious household that would have a similar effect to identifying as religious.

Considering that none of the coefficients for the interaction effects are statistically significant at the 95% level, it appears that there is not a significant difference in how the donations of households of different religions change when those same households' incomes change. Additionally, these results do not change significantly when looking at a different cause being donated to as the response variable. This suggests that not only do non-religious households not behave differently with respect to different charitable causes, but neither do

religious households. Additionally, religious and non-religious households do not react differently with respect to changes in income. Adding in more controls to this model (specifically, adding wealth, education level, and race) does increase the r-squared value, meaning that the model is able to account for more of the variation in the data, but this does not meaningfully change the estimated coefficients on the variables that are of greatest interest to this study. One interesting change is the inclusion of a wealth variable. As wealth (2016) is introduced into the model, it has a coefficient that is significant at the 95% level for donations to religious organizations and combined purpose organizations. This could be a variable that future studies could take into account, as the inclusion of the wealth variable lowered the impact of most of the other variables, this study was more interested in how donations interacted with changes in income rather than wealth.

## **Conclusion**

This study set out primarily to answer to questions. First, do religious and non-religious households' charitable behavior change differently when they are face with changes in income? Given that the coefficients of the interaction terms between religion and income are not statistically significant, this does not seem to be the case. Secondly, do changes in income have different effects when controlling for the cause being donated to? The interaction coefficients do not vary significantly from cause to cause, which suggests that households do not treat donations to different organizations differently. This makes making any conclusion about the motivations behind these donations difficult because there does not seem to be any significant difference in the behavior of religious and non-religious groups.

One interesting conclusion that can be drawn from this survey is that household's treat their pre-tax and post-tax income differently. As mentioned in the literature review section of

this paper, tax policy has been seen to have a significant effect on the donative behavior of household. This study suggests that pre-tax income changes do not have a significant impact on the behavior of households which suggests that pre-tax and post-tax income are treated differently. Showers' (2011) uses a consumption variable in place of income, which might be one way to get around this pre-tax versus post-tax income difference. Additionally, this study's models may be affected by outliers or by large difference in household's income levels. One modification that could be possible for further studies would be the use of a quartile regression. This would give different estimates for groups in each quantile, thereby controlling for large differences in income changes. This study elected not to use this method out of concern that its results would be difficult to interpret in conjunction with the scaled incomes and donations as well as the interaction terms that are used. Another potential modification would be to look at wealth changes as opposed to income changes. Wealth changes would account for household's accumulating savings over time and donating from those savings which may be a more accurate representation of how households make their donative decisions. While each of these modifications would provide interesting results to compare to, that does not discount the findings of this study that donative behavior does not seem to be affected significantly by changes in income, by religion, or by the cause which is being donated to.

## Appendix 1 Unweighted Summary Statistics 2002: Donations by Religion

Table 1a

Summary of \$ Amount Donated to Religious Organizations in 2002	Count	Mean	Variance	SD	Min	Max
Catholic	6479	396.01	1145277.00	1070.18	0	28000
Jewish	492	1091.79	11700000.00	3420.88	0	25000
Protestant	20603	1046.72	7875082.00	2806.26	0	45121
Other non-Christian	524	451.36	1895292.00	1376.70	0	7500
Greek/Russian/Eastern Orthodox	43	222.33	209161.10	457.34	0	2000
Other	203	349.90	619404.90	787.02	0	3000
Not Applicable or Don't Know	1362	300.88	1162039.00	1077.98	0	12000
None/Atheist	3830	227.67	1064514.00	1031.75	0	12000

Table 1b

Summary of \$ Amount Donations to Combined Purpose Organizations 2002	Count	Mean	Variance	SD	Min	Max
Catholic	6471.00	145.18	985210.00	992.58	0.00	30000.00
Jewish	514.00	366.13	441155.50	664.20	0.00	5000.00
Protestant	20890.00	94.24	189714.00	435.56	0.00	12000.00
Other non-Christian	532.00	155.89	608056.30	779.78	0.00	10000.00
Greek/Russian/Eastern Orthodox	44.00	55.45	5880.25	76.68	0.00	200.00
Other	203.00	21.38	4484.23	66.96	0.00	300.00
Not Applicable or Don't Know	1389.00	81.56	208017.50	456.09	0.00	5000.00
None/Atheist	3835.00	73.88	124437.70	352.76	0.00	5000.00

Table 1c

Summary of \$ Amount Donations to Organizations Serving the Needy 2002	Count	Mean	Variance	SD	Min	Max
Catholic	6440	92.15	159612.80	399.52	0.00	8500.00
Jewish	499	365.82	693169.60	832.57	0.00	5000.00
Protestant	20774	96.60	240052.90	489.95	0.00	25000.00
Other non-Christian	530	150.05	341390.40	584.29	0.00	4000.00
Greek/Russian/Eastern Orthodox	54	771.67	3172063.00	1781.03	0.00	5000.00
Other	203	22.86	2725.90	52.21	0.00	250.00
Not Applicable or Don't Know	1386	65.19	77965.58	279.22	0.00	3000.00
None/Atheist	3834	82.73	87865.52	296.42	0.00	3000.00

Table 1d

Summary of \$ Amount Donations to Causes outside top 3 2002	Count	Mean	Variance	SD	Min	Max
Catholic	6482	154.74	517659.70	719.49	0	12500
Jewish	489	806.83	4938658.00	2222.31	0	12700
Protestant	20812	106.35	575679.80	758.74	0	32725
Other non-Christian	520	180.68	433645.60	658.52	0	10000
Greek/Russian/Eastern Orthodox	44	38.41	5612.53	74.92	0	280
Other	203	4.77	265.98	16.31	0	100
Not Applicable or Don't Know	1395	68.27	68255.97	261.26	0	4050
None/Atheist	3824	150.80	442111.90	664.92	0	13010

## Appendix 2 Unweight Summary Statistics 2002: Religious vs Non-Religious Causes

Table 2a

Mean Religious Donation vs Mean Donation for other causes			
Religious Affiliation	Religious	Other	Difference
Catholic	396.01	43.36	-89%
Jewish	1091.79	165.07	-85%
Protestant	1046.72	32.93	-97%
Other non-Christian	451.36	53.54	-88%
Greek/Russian/Eastern Orthodox	222.33	98.28	-56%
Other	349.90	5.45	-98%
Not Applicable or Don't Know	300.88	23.82	-92%
None/Atheist	227.67	34.10	-85%

Table 2b

Average Donation Religious vs Non-Religious Respondants			
Charitable Cause	Religious	Non-Religious	Difference
Religious	881.51	227.67	-74%
Combined	111.19	73.88	-34%
Needy	102.05	82.73	-19%
Health	32.04	53.70	68%
Education	52.16	40.12	-23%
Youth	18.55	10.98	-41%
Cultural	8.65	17.00	97%
Community	5.32	2.63	-50%
Environmental	6.51	18.07	177%
International	6.61	8.13	23%

### Appendix 3 Preliminary Regressions

Table 3a: Unweighted Preliminary Regressions

PRELIMINARY REGRESSIONS USING 2002 DONATIONS AND INCOME	RELIGIOUS DONATIONS	DONATIONS TO ORGANIZATIONS SERVING THE NEEDY	RELIGIOUS DONATIONS	DONATIONS TO ORGANIZATIONS SERVING THE NEEDY
2002 INCOME	0.765***	0.476***	0.362***	0.464***
	0.040	0.024	0.050	-0.060
CATHOLIC			-2.799	-0.524
			1.491	1.154
JEWISH			-9.537***	-7.280***
			1.648	1.172
PROTESTANT			-4.456***	-0.432
			0.871	0.746
OTHER NON-CHRISTIAN: MUSLIM/RASTAFARIAN			-0.072	0.929
			0.897	0.960
GREEK/RUSSIAN/ EASTERN ORTHODOX			3.951	7.366
			4.843	4.746
OTHER			-7.917**	-3.087
			2.545	1.673
NA; DK			2.203**	2.829***
			0.677	0.765
CATHOLIC*INCOME			0.404**	0.034
			0.130	0.102
JEWISH*INCOME			0.993***	0.744***
			0.137	0.101
PROTESTANT*INCOME			0.581***	0.036
			0.078	0.067
OTHER NON-CHRISTIAN* INCOME			0.115	-0.042
			0.082	0.087
GREEK/RUSSIAN/ EASTERN ORTHODOX* INCOME			-0.229	-0.564
			0.422	0.403
OTHER			0.827***	0.294
			0.240	0.159
NA; DK			-0.137*	-0.277***
			0.061	0.069
Constant	-5.652***	-3.999***	-2.828***	-3.841***
	0.45	0.274	0.550	0.666
R-Squared	0.073	0.059	0.116	0.071
Adjusted R-Squared	0.073	0.059	0.115	0.071
N	34005	34189	34005	34189
*p<0.05,	**p<0.01,	***p<0.001		



## Appendix 4: 2002-2016 Summary Statistics and Regressions

Table 4a: Unweighted Summary Statistics 2002-2016

Changes of Variables of Interest 2002-2016	Count	Mean	Variance	SD	Min	Max
Change In Income	21833	3107.75	12800000000.00	113127.10	-2772283.00	1796172.00
Change In Donations to Religious Organizations	21833	-293.56	10700000.00	3273.61	-51305.93	50000.00
Change In Donations to Combined Purpose Organizations	21833	-28.28	1339952.00	1157.56	-40023.00	45000.00
Change in Donations to Organizations Serving the Needy	21833	-19.93	637724.80	798.58	-33052.50	19933.29
Change in Donations to Other Organizations	21833	2.20	1936673.00	1391.64	-43518.42	41592.30

Table 4b: Unweighted Regressions 2002-2016

CHANGE IN DONATIONS 2002-2016 VERSUS CHANGE IN INCOME 2002- 2016	CHANGE IN RELIGIOUS DONATIONS 2002-2016	CHANGE IN DONATIONS TO COMBINED PURPOSE ORGANIZATIONS 2002- 2016	CHANGE IN DONATIONS TO ORGANIZATIONS SERVING THE NEEDY 2002-2016	CHANGE IN DONATIONS TO OTHER ORGANIZATIONS 2002- 2016
CATHOLIC	0.065* (0.029)	0.066* (0.030)	0.067* (0.030)	0.067* (0.029)
JEWISH	0.981*** (0.088)	0.967*** (0.092)	1.003*** (0.087)	1.034*** (0.083)
PROTESTANT	-0.095*** (0.024)	-0.092*** (0.024)	-0.093*** (0.024)	-0.098*** (0.024)
OTHER NON-CHRISTIAN: MUSLIM/RASTAFARIAN	0.191** (0.060)	0.212*** (0.061)	0.213*** (0.060)	0.212*** (0.060)
GREEK/RUSSIAN/ EASTERN ORTHODOX	0.753** (0.237)	0.764** (0.237)	0.754** (0.236)	0.766** (0.234)
OTHER	0.009 (0.115)	0.046 (0.114)	0.050 (0.114)	0.044 (0.114)
NA; DK	-0.183*** (0.048)	-0.173*** (0.048)	-0.182*** (0.048)	-0.184*** (0.048)
CHANGE IN INCOME 2002-20016	0.001 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
CATHOLIC*INCOME	0.005* (0.002)	0.005* (0.003)	0.005* (0.002)	0.005* (0.002)
JEWISH*INCOME	-0.002 (0.007)	-0.002 (0.007)	-0.003 (0.007)	-0.004 (0.007)
PROTESTANT*INCOME	0.005* (0.002)	0.003 (0.002)	0.003 (0.002)	0.003 (0.002)
OTHER NON-CHRISTIAN* INCOME	-0.012* (0.005)	-0.013* (0.005)	-0.013* (0.005)	-0.012* (0.005)
GREEK/RUSSIAN/ EASTERN ORTHODOX* INCOME	0.028 (0.018)	0.028 (0.018)	0.029 (0.018)	0.029 (0.018)
OTHER	0.037** (0.011)	0.031** (0.011)	0.031** (0.011)	0.031** (0.011)
NA; DK	0.011** (0.004)	0.010* (0.004)	0.009* (0.004)	0.009* (0.004)
Constant	10.217*** (0.021)	10.205*** (0.021)	10.206*** (0.021)	10.210*** (0.021)
R-Squared	0.015	0.013	0.014	0.015
Adjusted R-Squared	0.014	0.013	0.013	0.014
N	21647	21816	21818	21814
*p<0.05, **p<0.01, ***p<0.001				



Table 4d: Weighted Regressions with Controls 2002-2016

CHANGE IN DONATIONS 2002-2016 VERSUS CHANGE IN INCOME 2002-2016 WITH SURVEY WEIGHTS	CHANGE IN RELIGIOUS DONATIONS 2002-2016	CHANGE IN DONATIONS TO COMBINED PURPOSE ORGANIZATIONS 2002-2016	CHANGE IN DONATIONS TO ORGANIZATIONS SERVING THE NEEDY 2002-2016	CHANGE IN DONATIONS TO OTHER ORGANIZATIONS 2002-2016
CATHOLIC	-0.030 (0.032)	-0.028 (0.030)	-0.031 (0.030)	-0.027 (0.035)
JEWISH	0.661 (0.301)	0.663 (0.279)	0.705 (0.261)	0.703 (0.253)
PROTESTANT	-0.050 (0.053)	-0.066 (0.074)	-0.062 (0.074)	-0.065 (0.070)
OTHER NON-CHRISTIAN: MUSLIM/RASTAFARIAN	0.070 (0.295)	0.070 (0.331)	0.086 (0.316)	0.082 (0.317)
GREEK/RUSSIAN/ EASTERN ORTHODOX	0.430 (0.982)	0.435 (0.981)	0.418 (0.982)	0.442 (0.969)
OTHER	0.065 (0.253)	0.081 (0.236)	0.083 (0.235)	0.080 (0.243)
NA; DK	-0.152 (0.120)	-0.153 (0.133)	-0.190 (0.108)	-0.182 (0.104)
CHANGE IN INCOME 2002- 20016	-0.006 (0.002)	-0.006 (0.001)	-0.006 (0.002)	-0.006 (0.002)
CATHOLIC*INCOME	0.005 (0.004)	0.005 (0.004)	0.005 (0.004)	0.005 (0.004)
JEWISH*INCOME	0.003 (0.007)	0.003 (0.010)	0.002 (0.010)	0.002 (0.010)
PROTESTANT*INCOME	0.003 (0.002)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)
OTHER NON-CHRISTIAN* INCOME	-0.012 (0.015)	-0.013 (0.015)	-0.012 (0.015)	-0.013 (0.015)
GREEK/RUSSIAN/ EASTERN ORTHODOX* INCOME	0.034 (0.031)	0.034 (0.030)	0.035 (0.028)	0.035 (0.028)
OTHER	0.037 (0.022)	0.034 (0.021)	0.034 (0.020)	0.033 (0.020)
NA; DK	0.003 (0.005)	0.002 (0.007)	0.001 (0.005)	0.001 (0.006)
WEALTH	0.014* (0.000)	0.014* (0.001)	0.014 (0.001)	0.014 (0.001)
NUMBER OF KIDS IN FAMILY UNIT	-0.032 (0.004)	-0.033 (0.006)	-0.032 (0.006)	-0.031 (0.006)
HEAD OF HOUSEHOLD'S RACE: BLACK/AFRICAN AMERICAN	-0.414 (0.071)	-0.402 (0.076)	-0.385 (0.064)	-0.412 (0.061)
HEAD OF HOUSEHOLD'S RACE: AMERICAN INDIAN	-0.085 (0.095)	-0.094 (0.082)	-0.084 (0.095)	-0.086 (0.093)
HEAD OF HOUSEHOLD'S RACE: ASIAN	0.166** (0.001)	0.183 (0.019)	0.122 (0.014)	0.160 (0.028)
HEAD OF HOUSEHOLD'S RACE: NATIVE HAWAIIAN	0.168 (0.736)	0.409 (0.437)	0.418 (0.417)	0.409 (0.461)
HEAD OF HOUSEHOLD'S RACE: OTHER	-0.187* (0.004)	-0.195* (0.015)	-0.191* (0.008)	-0.196* (0.011)
HEAD OF HOUSEHOLD'S RACE: DK/NA/REFUSED	-0.550 (0.083)	-0.541 (0.054)	-0.517 (0.068)	-0.527 (0.067)
SPOUSE'S RACE: WHITE	0.336 (0.132)	0.299 (0.126)	0.311 (0.125)	0.297 (0.117)
SPOUSE'S RACE: BLACK/AFRICAN AMERICAN	0.481 (0.095)	0.453 (0.113)	0.439 (0.134)	0.448 (0.125)
SPOUSE'S RACE: AMERICAN INDIAN	0.472 (0.281)	0.488 (0.250)	0.462 (0.280)	0.453 (0.281)
SPOUSE'S RACE: ASIAN	0.382 (0.035)	0.319** (0.005)	0.389 (0.041)	0.354* (0.020)
SPOUSE'S RACE: NATIVE HAWAIIAN	0.977 (1.089)	0.840 (0.767)	0.846 (0.767)	0.826 (0.802)
SPOUSE'S RACE: OTHER	0.163 (0.021)	0.142* (0.006)	0.152* (0.003)	0.138* (0.007)
SPOUSE'S RACE: DK/NA/REFUSED	0.564 (0.076)	0.559* (0.038)	0.568 (0.045)	0.557* (0.039)
HEAD OF HOUSEHOLD'S AGE	-0.010 (0.003)	-0.010 (0.002)	-0.010 (0.003)	-0.010 (0.003)
SPOUSE'S AGE	-0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
HEAD OF HOUSEHOLD'S YEARS OF EDUCATION	0.009 (0.003)	0.009 (0.003)	0.009 (0.003)	0.009 (0.003)
SPOUSE'S YEARS OF EDUCATION	0.002 (0.001)	0.001 (0.002)	0.001 (0.002)	0.002 (0.001)
Constant	10.396** (0.148)	10.411** (0.117)	10.400** (0.123)	10.407** (0.121)
R-Squared	0.072	0.069	0.070	0.072
N	21647	21816	21818	21814

\*p&lt;0.05,

\*\*p&lt;0.01,

\*\*\*p&lt;0.001

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