

# **A Study on the Donations to Help Tsunami Victims<sup>1</sup>**

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## **Abstract**

This paper uses PSID data to study households' donating behaviors, with a focus on the households' donations to help the victims of the tsunami, which struck in Indonesia at the end of 2004. Both households and donating channels through which households donated are studied. Three models, the charitable givers model, the reciprocity model and the family transfer model, are tested to help identify potential donors for tsunami relief. The empirical evidence suggests that among all the charitable givers, those who donated to religious organizations are more likely to donate also to tsunami relief. In addition, if a household has received help from non-family members, its probability of giving to tsunami victims increases. The probability of tsunami giving also increases when a household gives significant financial support to its parents. Furthermore, the study also shows that among all the available donating channels for tsunami relief, stores are best at attracting non-regular givers, although they induced the least amount from each donor. In comparison, internet, TV and radio generated the best responses in term of amount from each donor.

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## 1. Introduction

Charitable giving in the U.S has been studied extensively in the economics literature. Statistics show that the total amount of charitable giving in the U.S each year is substantial and more than 70% of families are involved. However, most of the studies are based on annual data, which include charitable giving on an annual basis. Therefore, a study of donations in response to an unexpected natural disaster would be interesting considering the large magnitude of voluntary help needed for the victims within a short period of time. Since charitable giving for particular disaster relief has been far less studied than regular charitable giving, it would be helpful to compare and contrast the two types of giving.

The major aim of the paper is to determine if more voluntary help can be induced for the victims. Generally, there are two ways to increase the total amount of donations to tsunami relief: (1) encourage more households to donate; or (2) induce larger donations per household.

To encourage broader participation, it is necessary and desirable to have more comprehensive knowledge about the existing donating households and to try to find out whether they share unique traits that can distinguish them from those not donating. Three models, including different types of factors, are tested in order to identify the potential donating households. The first one restricts the households to those who gave to charity regularly and tries to see whether we could identify potential donating households by directly observing the types of charitable organizations to which they had donated annually. The second one explores the idea of reciprocity, which is frequently mentioned as a reason for donation but rarely tested in empirical analysis. The third one looks at the effect of family transfers on donating behaviors.

To increase the total amount of donations, I consider the donating channels available to households. The last part of the paper looks at the efficiency of different donating channels.

The study is based on the data in the Panel Study of Income Dynamics, which include survey questions on individuals' donations for the victims of the tsunami in Indonesia 2004. PSID also records households' regular donating decisions every other year. Both the 2005 and 2007 data on regular charitable giving are being used in this paper. Specifically, 2005 data are used in the charitable givers model, the reciprocity model and the model testing the efficiency of donating channels, while 2007 data are only used in the family model. The major reason for the difference of data used in the family model is that most of its

independent variables are only available in the 2007 data set. There are more discussions about the data problem in the family model section.

The remainder of the paper is organized as follows. Section 2 provides background of both tsunami relief giving and regular charitable giving and compares the two. Section 3 includes the three models for identification purposes and Section 4 presents the model for donating channels. Section 5 concludes.

## **2. Background and General Statistics**

For the year of 2004, regular charitable giving is defined in the PSID as any dollar given to any type of charitable organizations, excluding those given to help tsunami victims. However, in the following analysis, only people who donated to charitable organizations a total amount of 25 dollars or more during 2004 are considered as regular charitable givers due to the design of the questionnaire in the PSID. Furthermore, the survey also divides the charitable organizations into different types by their purposes, such as religious purpose, helping the needy, improving education, contributing to community development, protecting the environment, promoting international peace, advancing medical research, raising funds for youths, strengthening cultural awareness, etc.

One important question is how the regular charitable givers responded to the request of help from tsunami victims. Table 1 summarizes the donating behaviors of 5950 families drawn from the 2005 data set of the PSID. It can be seen that 65% of the families donated to charitable organizations during 2004, among which only 27% of the families also donated to tsunami relief. Moreover, the number of families who donated only to tsunami relief accounts for just 5%. This fact indicates that if a family did not engage in regular charitable giving, it is unlikely for it to donate to help tsunami victims in particular.

It is natural to think that income plays an important role in a family's decision to donate. Figure 1 justifies the expectation that the higher a family's income, the higher its probability of showing donating behaviors. This is true for both regular charitable giving and tsunami relief giving. However, there is an obvious gap at each income level between the proportion of people who donated to charitable organizations and those who donated for tsunami relief. Moreover, the gap enlarges significantly as income increases. It can be seen that around 18% of families at an income level around 5,000 dollars donated to tsunami relief and around 23% in that income brackets gave to charity. The difference between those that gave to tsunami relief and those who gave to charity was only about 5%. However, more than 90% of the

families whose annual income level was more than 200,000 dollars engaged in charitable giving, while only less than 50% gave monetary help to tsunami victims. The gap here was more than 40%.

It is also worthwhile to look at donating behaviors by age range. Intuitively, age can affect people's decisions to donate through their change of income, life attitude, etc. Figure 2 shows that the probability of donating to charity did increase with age, with the lowest around 50% to the highest 75% at the age around 55. However, as for tsunami relief donation, the probability hardly changed across ages.

The brief comparison between the two types of donating behaviors suggests that the decision for donating to tsunami relief is less explained by fundamental variables, such as income and age. Therefore, it is reasonable to expect some special contributing factors for this particular donating behavior.

### **3. Identifying Potential Donors to Tsunami Relief**

This section contains three models aimed at identifying potential households for tsunami relief giving. The first model investigates in more depth the relationship between charitable giving and tsunami relief giving. It tries to determine whether we can predict households' decisions about donations to help tsunami victims from their choices of charitable organizations. The second and the third models start to examine the detailed factors of households. The existing literature has shown that there are many factors that contribute to the donating decisions. Such factors include income, age, education, religion, employment types, number of adults, number of children in the household, etc.

One major contribution of this paper is to introduce the idea of reciprocity by examining the effect of the history of receiving help on donating decisions. Another major contribution is to analyze further the effect of family transfer on donating behaviors, which is also relatively less studied in the literature. In order to focus on the analysis of these newly introduced factors, only the fundamental variables, such as income, age, education and religion are included as covariates.

#### **3.1. Tsunami Relief Giving from Specific Types of Charitable Givers**

If we divide regular givers into different groups according to the purpose of the organization to which they donated, certain types of charitable givers turn out to be more likely to donate for tsunami relief. Table 2 shows the result of the regression of tsunami relief

donation on a set of dummy variables suggesting different types of organizations individuals chose to donate during the year of 2004. Among all the types, only the religious group shows a statistically significant relationship. One possible reason is that those people who donated for religious reasons consistently got motivated to help others because of belief in their religions. It could also be the case that during their visits to churches and other places for worship, those people had more exposure to advertisements about helping tsunami victims. We will explore this idea further when considering the effectiveness of different donating channels.

### **3.2. Reciprocity Model**

In many studies, when a donor is asked why he donates, he frequently replies “because I was helped by others before.” This reflects reciprocity in the process of making decisions about donating. Since PSID includes data on whether an individual received help from relatives and non-family members during the past year, it provides a good opportunity to examine the existence of reciprocity, which is normally studied in the context of experiments instead of among a representative large population.<sup>2</sup> Figure 3 summarizes the proportion of people who received help from relatives or non-family members during 2004. It shows that the lower the income, the more likely an individual received help from both relatives and non-family members. In addition, at each income level, an individual was more likely to receive help from relatives, with the largest difference at the lowest income bracket.

In order to test whether receiving help from others influences individuals’ decisions to donate, two groups of probit regressions are estimated. Table 3.1 and Table 3.2 summarize the results.

“Help from others” is the dummy variable indicating whether the family received help from non-family members. In model 1, there is a statistically significant positive relationship between the variable and tsunami relief giving dummy (Table 3.1). However, the relationship is not observed for charitable giving (Table 3.2). This result corresponds nicely to the idea that “I was helped before” is a candidate for the robust motivations for donors at lower income range. When income level plays a small role (the coefficient of coded income value for the tsunami relief giving regression in the Table 3.1 is only around 0.25), the fact of having received help from others is correlated with a higher probability of donating for tsunami relief. When income level plays a greater role (the coefficient of coded income value for the charitable giving regression in the Table 3.2 is more than 0.5), the effect of help from

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<sup>2</sup> One typical example of experimental study on reciprocity is Berg, Dickhaut, and McCabe (1995).

others doesn't show up. Moreover, Model 4 for the charitable giving (Table 3.2) suggests a statistically significant negative effect of help from others. This is very likely caused by the strong correlation between receiving help and low income. Therefore, when income measure is introduced, the negative effect disappears.

“Help from relatives” is the dummy variable indicating whether the family received any help from their relatives during 2004. Although this is also a kind of help people received, it may generate reciprocal behaviors within the family which can hardly be witnessed through donating behaviors. It is observed that the negative sign of the variable is robust in the regressions of charitable giving (Table 3.2). However, the sign switches to positive as soon as income measure is introduced in regressions of donation for tsunami relief (Table 3.1). One possible explanation is that help from relatives is negatively correlated with income, and income effects are larger for charitable giving. Moreover, the negative income effects may be overcome by the reciprocity effect for tsunami relief giving and thus the sign is positive in model 1 and model 3 for tsunami relief giving (Table 3.1).

“Coded income level” is the coded value of income for each family. The coding scale is presented in the Table 4. Although income level has a statistically significant positive effect on the probability of both types of giving, their magnitudes differ. For tsunami relief donation (Table 3.1), the coefficient is only around 0.2, compared with 0.5 for regular charitable giving (Table 3.2).

“Coded head age” is the coded value of age of the head in each family. The coding scale is presented in the Table 5. The difference of magnitudes of positive effects of head ages is much larger here. The coefficient for tsunami relief is only around 0.08 (Table 3.1), compared with 0.2 for charitable giving (Table 3.2).

In addition, it is worth noticing that the model with income and age level alone has an  $R^2$  of almost 18% for charitable giving (Table 3.2), while only 4% for tsunami relief giving (Table 3.1). This suggests that when it comes to tsunami relief, income and age play less important roles in people's decision.

“Catholic” and “Protestant” are dummy variables indicating whether the head of a family is Catholic or Protestant. They both have statistically significant positive effects on probability of charitable giving (Table 3.2). However, when it comes to tsunami relief giving (Table 3.1), the signs turn negative, although not statistically significant. Firstly, the negative signs are not related with the possibility that religious people give to tsunami victims in church. The reason is donations like that should be already counted as donation for tsunami relief (in fact, in the following, we can see that church is one channel for tsunami relief

donation). Therefore, the negative signs are caused by actual zero giving to tsunami relief. One explanation for it may be that some people simply donate to their church based on their religious beliefs but don't know where the funds go eventually. In this case, their donations may ultimately become part of money used to help tsunami victims but they didn't donate for tsunami relief on purpose. Since motivation is the focus here, those people should be counted as non-givers.

“Debt” represents the total amount of debt of the family at the time of interview. Although the effect is not statistically significant, the negative sign in the regression of charitable giving is as expected (Table 3.2). However, again, as for tsunami relief giving, the negative effect seems to disappear (Table 3.1).

“Head education years” represents years of schooling of the head of a family, which doesn't show a statistically significant relationship with either tsunami relief giving or charitable giving.

The above regression analysis tells us that elderly people, with higher income and a history of receiving help from non-family members, are more likely to donate to tsunami victims. Therefore, when advertising for donation, people with these backgrounds should be given more attention. Although an individual's history of receiving help may not be easily observed, advertising that stresses the idea of reciprocity may generate favorable responses in terms of number of donating actions. However, it may not be more effective in terms of amounts, as the following analysis illustrates.

Table 6 summarizes the results from regressions of the total amount of tsunami relief donation on the same sets of independent variables. It shows that income and age still have statistically significant effects. However, help from others does not. This is reasonable since gratitude for others' help can motivate people to help others, but it cannot greatly change their ability to help.

### **3.3. Family Transfer Model**

In the literature, there are two major topics concerning the influence of family. One is the parental effects in giving behaviors across generations. Deb (2008) found a statistically significant positive relationship between the donating decisions of parents and their children by using the data from the Indonesia Family Life Surveys (IFLS). Two explanations were offered for the positive relationship. One is role-model effect. That is, children adopt the habit of donating by observing the behavior of their parents. The other is the empirical finding of the positive correlation of income levels of parents and their children. Results supporting the idea of role-model effect were also obtained by Tan (2005), who examined

both the donating and volunteering behaviors between parents and children by using the 2003 and 2005 data from Panel Study of Income Dynamics (PSID). It is worth pointing out that, apart from the different subjects surveyed, the two papers also differ in their definition of children. For Deb (2008), both the parents and the children are adults and they lived in different households at the time of interview. However, Tan (2005) focuses on non-adult children who were still staying with their parents at the time of study. Given the results in the two papers, we might infer that the role-model effect is both immediate and persistent in the long run.

The other topic discussed is the relationship between giving to family and giving outside the family. Deb (2008) tried to determine whether transfers to the family and community network are complements or substitutes. Before conducting the empirical analysis, he suggested why either relationship was possible. One of the main arguments in favor of complementary relationship is the altruistic instincts of givers. For those who give out of altruism or generosity, they will feel like giving in most cases regardless of the type of the recipient. Another supporting argument is related with resource availability. People with high income levels are likely to give in many situations. Social norms may also contribute to the complementary relationship between family transfer and community network transfer. The argument for negative relationship is that givers may be self-interested and may expect benefits from their giving behaviors. Therefore, if the benefit could be obtained through any type of giving, it is likely that people will only choose one. Specifically for family transfer and community network transfer in Indonesia, it could be that “both networks provide similar services such as mutual insurance and credit to the household.” However, the final results in Deb’s paper support the arguments for complements.

Since the purpose of my paper is to identify people who give to charity and to help tsunami victims, I will only try to deepen understanding of the second topic, the relationship between giving to one’s family and giving outside the family. Furthermore, the focus on community network transfer (the major concern of Deb’s paper) is shifted to charitable giving and tsunami relief giving in this paper. Therefore, the ideas, like the one saying that people choose one type of giving (family or non-family) to obtain certain benefits, may be less or even not at all applicable in this new situation, especially for tsunami relief giving. In order to evaluate the effect of the family as a whole, apart from family giving, several other related variables are also included. Generally speaking, I would like to study the effect of family from three aspects: family giving, family receiving and emotional attachment.

As for family giving, both giving time and giving money are considered. In the 2007 PSID data, there are two variables that indicate family giving. One is “whether spent a lot of



time caring for parents” and the other is “whether gave significant financial support to parents”. These two variables together remind me of a long-term topic discussed in the literature. That is the relationship between volunteering and charitable giving. Most empirical findings support the idea of complementary relationship between the two, and Putnam (2000) pointed out that both of them were related to similar variables. Furthermore, Tan (2005) ascertained the above findings by using PSID data. Correspondingly, as for family giving, “care” could be compared to the volunteering for organizations and “financial support” could be compared to the charitable giving. Therefore, it is interesting to see whether the “time transfer” and “money transfer” have similar correlation in the family too. The following are some basic summary statistics which will give us a general idea. Among the 2970 families surveyed, 25% of them spent a lot of time caring for parents, 20% of them gave significant financial support to their parents, and 8% of them gave both time and money. The correlation between the two is approximately 0.19, which is positive and thus supports the complementary relationship between the time giving and money giving within families (a larger sense) too. Table 7 is the tabular display of the data.

Furthermore, Figure 4 shows the distribution of the income for the four types of populations. It can be seen from the figure that the income of those households who gave money to parents tends to center more on a relatively smaller amount. However, for those giving time only, the income levels are less centered. This seems to suggest that the money giving behaviors within family are not motivated by availability of and willingness to share the excessive financial resources since the statistics show that the financial-support givers don’t enjoy higher income and may even suffer from lower income levels themselves. Therefore, it is highly likely that the money giving behavior within a family is due to the necessity of helping their parents in most cases. Fortunately, there is a question in 2007 PSID data that can help test the validity of this assumption. The question asked the subjects about the financial conditions of their parents when they were young. The wealth of the parents is reflected by the value of “1”, “3” or “5”, with “1” indicating poor, “2” average and “5” pretty well off. I created a variable that equals “1” if the original wealth variable equals “1” and “0” otherwise. The result shows that the parents’ poverty indicator has a correlation of 0.15 with the dummy variable of financial support giving; thus, the positive sign of the correlation supports the assumption mentioned above.

As for family receiving, the variable being considered is “whether received help from relatives.” This variable is also used in the previous reciprocity model, which includes both the variables indicating help received from relatives and help received from non-family members. According to the previous discussion, there is a negative relationship between the probability of getting help from relatives and the income level of the family. Although this

variable is included in both models, we are trying to obtain different information from it. In the reciprocity model, we are interested in all kinds of help people received in order to test whether the idea of reciprocity plays a role when people make decisions about donating. In comparison, for this family transfer model, we particularly focus on whether transfer within a family (in a larger sense) would be extended beyond family.

To measure emotional attachment, there are three variables, added for the first time in 2007 PSID data, that could be used. The questions asked subjects whether it was important for them to leave an estate or inheritance to their children or relatives, their religious organizations, or to charity. The importance is reflected by a scale from “1” to “4” with 1 indicating very important and “4” not at all important. To simplify the following analysis, three new variables are created correspondingly, with value “1” meaning important (that is “1” and “2” for the original variables) and “0” meaning unimportant. Introspection supports that more people would like to leave their estates to their children, and the following statistics ascertain this. Among the families, 79% agree that it is important to leave their assets to relatives, while 27% for religious organization and 28% for charity. I believe these three variables could be used to measure emotional attachment because the attitude one holds toward the treatment of their inheritance could reflect the extent to which the society is seen as a large family and the extent of appreciation for the idea of wealth transfer beyond real units of families.

The above analysis sheds some light on the possible influences the three types of family factors may have on donating behavior. For the variable indicating giving financial support, I expect a negative relationship with donations of any kinds because of the related problems of low income level and higher probability of parents’ poverty. It is reasonable to assume that the obligation to help parents out financially could generate a great burden for the households and thus prevent them from donating. However, for the variable indicating time spent in caring for parents, it is harder to predict. Firstly, there is no obvious difference in income distribution between the population that spent considerable amount of time caring for their parents and those didn’t (here, meaning neither gave money nor time). Therefore, I would try to analyze this by considering two different situations. If a household is rich and it spent time caring for parents, then I would expect the “care” to have a positive effect on donating because of the favorable helping instincts reflected from the caring behavior as well as the possession of financial resources for donation. On the other hand, if a household is poor and it spent a lot time caring for parents, it could be that the care was meant to replace financial support, which cannot be given because of the low income of the household itself. If this is the case, the “care” variable might have a large negative impact on the probability of donating. These two opposite conditions suggest that there could be many underlying factors

going along with the indicator of caring behaviors. Hopefully, the regression estimated later in the paper may tell us which effect dominates.

Comparatively, the effects of the variables indicating the emotional attachment are easier to predict intuitively. It is natural to expect those who feel it is only important to leave assets to relatives to exhibit a lower probability of donating than those who also feel it important to leave assets to religious organizations and charity. At last, the effect of receiving help from relatives has been discussed in the reciprocity model. The two major factors concerned are income level and the idea of reciprocity. According to the results from the former model, we can expect the sign of the effect to be positive when controlling the income level.

Apart from the independent variables described above, family income and the age of the head are also included. Furthermore, to be consistent with the analysis in the previous reciprocity model, coded values of the family incomes and the head ages are used in the regressions and the coding rule is the same as before. One thing worth pointing out is that there is a time difference between the dependent variable indicating tsunami relief giving and the independent variables of family giving and emotional attachment. Since the two sets of the family-giving and emotional-attachment variables are new and neither available for 2005, when the data on donation to help tsunami victims was collected, it may not be appropriate to estimate a regression of tsunami relief giving on these newly added 2007 variables. However, fortunately, the late emergence of the independent variables may not generate serious problems. Firstly, for the emotion indicators, they reflect one's perspectives and thus should be generally stable, especially when there is only two years of time difference. Secondly, the questions for the family-giving behaviors were framed to ask about the whole past history of giving instead of behaviors during the past year. Therefore, these are not highly time-dependent variables. Although we may not exclude the possibility that significant changes might have occurred for some families during the year between 2005 and 2007, which means their answers to the questions of family giving could be different if asked in 2005, we might still be able to assume that, for most households, support given to parents is consistent across years.

Table 8 shows the result of the probit regression of the dummy variable indicating whether or not the family donated to charity during the past year (2006) on the three sets of family related variables (family giving, family receiving and emotional attachment), together with coded value of the head age and the family income. Table 9 summarizes the expected effects discussed in the previous section.

By comparing Table 8 and Table 9, we can see that the effects of the variables indicating giving significant financial support to parents, receiving help from relatives, and admitting

the importance of leaving assets to religious organizations are as expected; all are statistically significant. As for the “asset to charity,” it has the positive sign as expected, but the effect is not that significant. The surprisingly unexpected result is the effect of the “asset to relatives,” which is expected to have a negative impact on donating, but exhibits a statistically significant positive impact. However, this may not totally overturn our intuition for the donating attitudes reflected from the emotion indicators, because there are some other possible factors that could lead to this result. One is the problem of overlapping population. In fact, the three populations (admitting importance of three different ways of dealing with inheritance) overlap. Statistics shows that among those who admitted importance of leaving assets to charity, 93% also think leaving assets to relatives is important. The percentage for the group supporting leaving asset to religious organizations is 95%. Figure 5 illustrates this problem visually. Therefore, the positive sign in front of the variable of “asset to relatives” may be due to the active donating behaviors of those who also belonged to the groups of “asset to charity” and “asset to religious organizations”.

Another problem is that after all, donation doesn’t mean the same to a family as inheritance does. Therefore, people who are even against the idea of leaving their assets to charity may still feel happy about sparing some money to help others from time to time. In addition, social norms may also play a role here. More specifically, most societies have the tradition of bequeathing assets to one’s children, and social norms also encourage people to help the needy. Therefore, they are not contradictory ideas. The variable whose effect is hard to predict is “spent a lot of time caring parents” and the empirical result suggests that it has a negative effect on the charitable donation. Although we can’t tell with confidence due to the relatively small absolute value of the  $z$ , we could still infer that the caring behaviors, in general, indicate a lower probability of donating behaviors. According to the analysis in the previous section, the reason for that might be the following. For those low income families, the effect is negative and for those normal or higher income families, there is no big difference between those who “cared” parents and those who didn’t. Therefore, the total effect of “cared” is negative.

As before, the age and income effects are expected to be positive and significant. However, the age effect is not statistically significant. This may be caused by the coding. In order to ascertain this, a regression with original values of income and age is estimated. Table 10 demonstrates that except for the age variable, the effect of which is significant in the new regression, all other variables have the same qualitative results as before.

Table 11 shows the result of the probit regression of the dummy variable indicating whether or not the family donated to help tsunami victims on the same independent variable

used in the previous regression of charitable donation. Compared with regression of charitable donation, the  $R^2$  for the regression of tsunami relief donation is much smaller (0.08, compared to 0.21 for the former regression). The phenomenon is also observed in the reciprocity model. It tells us again that normal factors can explain much less about donation for tsunami- relief than about the regular charitable giving.

Comparing the two regressions, there are three factors showing the same effects—receiving help from relatives, income and age of household head. For the following, I would like to focus on the comparisons of the different effects the two sets of variables (family giving and emotional attachment) had on the two types of donations. Firstly, Table 12 summarizes the signs of the effects of the variables “cared” and “gave financial support.” The ones with statistically significant effects are shaded.

Obviously, the effects of “cared” are consistent but not significant for either type of donation. Therefore, we may assume that the above related analysis for the effect of “cared” on charitable donation would also apply to tsunami relief donation. The more interesting variable is “gave financial support,” the effects of which are statistically significant for both, but with opposite signs. It has been discussed previously that the negative effect of “gave financial support” comes from the burden placed on the households to help parents financially. It is clear that the financial burden will not disappear when households making their decisions about donation to help tsunami victims. As a result, the positive sign must be due to some influential factors, which are able to counteract the negative effects of the financial burden. In fact, the lack of charitable donations from those who gave significant financial support to their parents is due to a financial resource constraint instead of unwillingness to help people. In that case, they may save their limited amount of donation money for those most urgent events or those most touching ones. Furthermore, compared with charitable giving, donating for tsunami relief is more like a one-time behavior, which is more likely to be “affordable” for the less well-off.

Table 13 summarizes the effects of emotional attachment indicators. From the table, we can see that the effect of “asset to relatives” changes its sign from positive for charitable donation to negative for tsunami relief donation. Although the sign of “asset to religious organizations” remains positive, the effect becomes insignificant for donation to tsunami relief. The only factor that shows significant effect on tsunami relief donation is “asset to charity.” If we could assume the emotion indicator to be a measure of unselfishness, then we would rank the levels of unselfishness reflected from the attitudes toward inheritance in the following order: “asset to relatives”, “asset to religious organizations,” and “asset to charity,” with the last one demonstrating the highest level.

It is commonly agreed that donating for tsunami relief requires a higher level of unselfishness, because it helps unrelated and unknown people far away. Therefore, the least unselfish group, with those only belonging to the group of “asset to relatives,” withdraws its help for the tsunami victims most obviously, resulting in a change in the sign of the effect. As for the “asset to religious organizations” group, it is known that most of their charitable donations are made to their religious organizations, such as churches, mosques, etc. Even though religious beliefs may encourage them to donate to help tsunami victims, the effect is still not that significant. Finally, the “asset to charity” group is the most unselfish and this leads to the variable’s significant effect for the tsunami relief donation. However, it is hard to explain why this factor did not show a significant effect in the regression of charitable donation. Perhaps, in order to answer the question, more complicated models are needed. It would also be helpful if similar data sets are available for testing.

#### **4. Effectiveness of Donating Channels**

There are many ways that people can donate for tsunami relief, such as through the internet, charity events, church, TV and radio, stores, work-place, schools, etc. The survey of PSID asks donors to specify the channels through which they donated to help tsunami victims. Since they could have donated through multiple ways, those categories overlap. However, in order to infer the effectiveness of each individual channel, only people who donated through a single channel are counted as donors through that channel. All people who donated through more than one channels are grouped into the category “multiple ways”.

From Section 2, we know that among all the donors to tsunami relief, some of them were regular charitable givers, while others were not. Figure 6 shows the density of each donating channel through which people donated to tsunami relief. The sample is restricted to the population that did donate to tsunami relief and is divided into two groups, regular charitable givers and non-regular charitable givers. At the horizontal axis, “0” represents donating through charity event, “1” represents donating through TV or radio, “2” represents the channel of internet, “3” includes all other channels which are not specified in the PSID, “4” presents multiple channels, “5” represents the channel of church, 6 represents store and 7 represents the channel of work or school.

It is striking that church was the most popular channel chosen by charitable givers. This might be due to the intensive advertising for tsunami donation at churches. In contrast, church was not popular for non-regular charitable givers; most of them donated to tsunami relief at

schools or work places, represented by group “7”. This channel was also the second most popular channel for regular charitable givers. This suggests that advertising at schools or work places was effective in inducing more people to donate to tsunami relief, especially in inducing people who seldom or never engaged in charitable giving. Another interesting observation is that stores (represented by “6” in the figure) were popular places where non-regular charitable givers donated, but they were not very common choices for regular charitable givers.

The previous analysis is concerned about the number of donors each channel induced, while the following regression analysis is concerned about the amount. Table 14<sup>3</sup> summarizes the result of the regression of amount of donation from each individual on a set of dummy variables indicating the channels through which individuals donated. Among all the channels, “TV or Radio”, “Internet” and “Multiple ways” exhibit statistically-significant, positive effects on the donation amount, while “Stores” shows a negative relationship.

The result shows that the average amount of individual donation through church was around 60 dollars. Compared with it, TV and Radio generated the largest average amount from each donor, which was around 180 dollars. The second largest was from individuals who donated through multiple ways. The third was through the internet with an average around 120 dollars. Meanwhile, donations coming from stores were only around 4 dollars, the least among all the channels. Figure 7 gives a more vivid interpretation of Table 14.

One major reason leading to the result could be that individuals from different income level chose different channels correspondingly. For example, we might expect people who donated through the internet belonged to higher income brackets, since they should at least have access and extensive experience to internet. We might also expect the average income of donors who chose stores was lower. To test whether this is the case, regressions of the channels showing statistically significant relationship with the donating amount are estimated on fundamental variables-income, age and education. Table 15 summarizes the result, which shows that income is the only one that shows statistically significant relationship among all three fundamental variables.

Figure 8 summarizes the predicted amount of donation from the channels by income profile. Firstly, it can be seen that the income range for the channel of stores is the smallest and most donors center on the range less than 50,000 dollars of income. Moreover, even for donors with an income level at 100,000 dollars, the average amount predicted is still less than 100 dollars. Comparatively, the predicted average amount from donors at the same income

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<sup>3</sup> The number listed beside the name of the variable corresponds to the value for the channel in the Figure 5.

level, but donating through internet and TV or radio, is around 170 dollars and 250 dollars respectively. This also suggests that TV or Radio generated better responses than internet from donors at each income level.

Apart from the objective differences in the background of donors, subjective factors could also play a great role. For example, the large donations from those giving through multiple channels could be due to their active searching for giving opportunities. On the contrary, donors who gave at stores might not give “on purpose.” Moreover, different advertising methods used by each channel may also result in different amount of donations. For instance, stores may encourage donations by asking customers whether they would like to donate one dollar for tsunami relief at the time they pay for their purchases. This could be another reason for stores’ smallest donation per donor.

From this section, we know that in general, church is the most common way for people to donate to help tsunami victims. The advantage of stores lies in their ability to attract people who usually do not engage in donating. Thus it is the number of donors attracted that makes stores an effective channel to raise fund for tsunami victims. In contrast, the channels of internet, TV and radio stand out in their ability to induce larger donation from each donor.

## **5. Conclusions**

The PSID data on donations show that most tsunami-relief donors are regular charitable givers. However, in general, only about half of the regular charitable givers did help tsunami victims. The charitable givers model suggests that, among all the charitable givers, those who donated to organizations with religious purposes outperformed other types in tsunami-relief giving. From the reciprocity model, we know that, apart from commonly known factors such as income and age, the history of receiving help might also contribute to the act of donating. From the family transfer model, we know that family concerns are important for households when they make decisions regarding donations. The effects of family factors can be distinct for each type of donation. Empirical results show that family-giving behavior could indicate a lower probability of charitable giving, but a higher probability of tsunami-relief giving. In addition, we might expect that the attitudes people hold toward inheritance can help predict their donating behaviors. Those who consider leaving assets to charity as important were very likely to give to help tsunami victims. Those who value leaving assets to religious organizations give more to charity and less to tsunami



relief. However, they still are more likely to give to tsunami relief than those only believing in leaving assets to relatives.

The paper also studies the number of donors and amount of donations from each donor induced by each specific donating channel. Stores are good at inducing non-regular givers to donate to tsunami relief, but the size of the donations is the smallest among all the channels. In comparison, internet, TV and radio generated the largest amount per donor.

With the knowledge of background of existing donors, we might identify potential donors by their income level, age profile, charitable giving activities, history of receiving help, family transfer behaviors, and even their attitudes toward inheritance. Consequently, we might want to design advertising more targeted toward people with the desirable traits. In the meantime, we might take advantage of different channels to target different types of potential donors, thus inducing more donations for unexpected disasters like tsunami.

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**Proportion of Tsunami Relief Givers and Charitable Givers**

|                           | Charitable givers | Non-Charitable givers |      |
|---------------------------|-------------------|-----------------------|------|
| Tsunami relief givers     | 0.27              | 0.05                  | 0.32 |
| Non-Tsunami relief givers | 0.38              | 0.3                   | 0.68 |
|                           | 0.65              | 0.35                  |      |

Table 1

**Different Types of Charitable Givers' Tsunami Giving Decision**

| Variables              | Coefficient | z     |
|------------------------|-------------|-------|
| Coded income level     | 0.203957    | 7.06  |
| Coded Head age Level   | 0.057157    | 2.58  |
| Head Education         | 0.008627    | 0.68  |
| Religious Purposes     | 0.169897    | 2.53  |
| Helping the needy      | 0.084764    | 1.29  |
| Education Purposes     | 0.035121    | 0.43  |
| Cultural Purposes      | -0.11842    | -1.14 |
| Environmental Purposes | -0.0665     | -0.65 |
| Developing Community   | 0.150424    | 1.32  |
| International Peace    | -0.04362    | -0.33 |
| Medical Research       | -0.0226751  | -0.34 |
| Fund Raising for Youth | -0.02759    | -0.34 |
| $R^2$                  | 0.0276      |       |

Table 2

### Tsunami Relief Donation

| Variables                     | Model 1     |        | Model 2     |        | Model 3     |       | Model 4     |      | Model 5     |        |
|-------------------------------|-------------|--------|-------------|--------|-------------|-------|-------------|------|-------------|--------|
|                               | Coefficient | z      | Coefficient | z      | Coefficient | z     | Coefficient | z    | Coefficient | z      |
| Help from others              | 0.3366      | 2.97   |             |        | 0.3273      | 2.9   | 0.1272      | 1.18 |             |        |
| Help from relatives           | 0.099       | 1.24   |             |        | 0.09908     | 1.24  | -0.1769     | -2.3 |             |        |
| Coded income level (0-6)      | 0.2545      | 13.1   | 0.2469      | 13.14  | 0.2576      | 13.28 |             |      |             |        |
| Coded head age level (0-5)    | 0.0812      | 5.82   | 0.0724      | 5.32   | 0.07886     | 5.68  |             |      |             |        |
| Amount of non-collateral debt | 2.09E-07    | 0.44   |             |        |             |       |             |      |             |        |
| Head education                | 0.0031      | 0.4    |             |        |             |       |             |      |             |        |
| Head is Catholic              | -0.0076     | -0.11  |             |        |             |       |             |      | -0.012      | -0.18  |
| Head is Protestant            | -0.094      | -1.61  |             |        |             |       |             |      | -0.0938     | -1.61  |
| Constant                      | -1.569      | -11.29 | -1.5132     | -18.78 | -1.586      |       | -0.4496     | -20  | -1.453      | -16.02 |
| $R^2$                         | 0.0458      |        | 0.0428      |        | 0.0448      |       | 0.0011      |      | 0.0436      |        |

Table 3.1

### Charitable Donation

| Variables                     | Model 1     |        | Model 2     |        | Model 3     |       | Model 4     |      | Model 5     |      |
|-------------------------------|-------------|--------|-------------|--------|-------------|-------|-------------|------|-------------|------|
|                               | Coefficient | z      | Coefficient | z      | Coefficient | z     | Coefficient | z    | Coefficient | z    |
| Help from others              | 0.05548     | 0.44   |             |        | 0.05722     | 0.46  | -0.2823151  | -2.6 |             |      |
| Help from relatives           | -0.0141     | -0.16  |             |        | -0.01771    | -0.2  | -0.5361449  | -7   |             |      |
| Coded income level (0-6)      | 0.52043     | 22.12  | 0.519233    | 22.68  | 0.51938     | 22.04 |             |      |             |      |
| Coded head age level (0-5)    | 0.19617     | 13.34  | 0.202522    | 14.2   | 0.20257     | 13.83 |             |      |             |      |
| Amount of non-collateral debt | -4.07E-07   | -1.01  |             |        |             |       |             |      |             |      |
| Head education                | 0.00225     | 0.27   |             |        |             |       |             |      |             |      |
| Head is Catholic              | 0.19604     | 2.68   |             |        |             |       |             |      | 0.30742     | 4.59 |
| Head is Protestant            | 0.21303     | 3.37   |             |        |             |       |             |      | 0.23145     | 4.01 |
| Constant                      | -1.8661     | -12.11 | -1.67961    | -18.62 |             |       | 0.5718035   | 25   | 0.30816     | 6.12 |
| $R^2$                         | 0.1813      |        | 0.1786      |        | 0.1787      |       | 0.0126      |      | 0.005       |      |

Table 3.2

### Coding Scale for Income Level

|       |              |               |               |                |                 |         |
|-------|--------------|---------------|---------------|----------------|-----------------|---------|
| 0     | 1            | 2             | 3             | 4              | 5               | 6       |
| 5000- | (5000,10000] | (10000,20000] | (20000,50000] | (50000,100000] | (100000,200000] | 200000+ |

Table 4

### Coding Scale for Age Level

|     |         |         |         |         |     |
|-----|---------|---------|---------|---------|-----|
| 0   | 1       | 2       | 3       | 4       | 5   |
| 25- | [25,35) | [35,45) | [45,55) | [55,65) | 65+ |

Table 5

### Donation Amount for Tsunami Relief

| Variables                     | Model 1     |       | Model 2     |       | Model 3     |       |
|-------------------------------|-------------|-------|-------------|-------|-------------|-------|
|                               | Coefficient | t     | Coefficient | t     | Coefficient | t     |
| Help from others(dummy)       | 2.72478     | 0.53  |             |       | 2.4852239   | 0.48  |
| Help from relative(dummy)     | 3.245782    | 0.87  |             |       | 4.533916    | 1.24  |
| Coded income level (0-6)      | 23.45416    | 10.2  | 23.2926     | 10.24 | 23.52832    | 10.25 |
| Coded head age level (0-5)    | 5.070047    | 5.35  | 4.13113     | 4.76  | 4.296248    | 4.83  |
| Amount of non-collateral debt | -6.06E-06   | -0.29 |             |       |             |       |
| Head education(years)         | 0.177439    | 0.3   |             |       |             |       |
| Head is Catholic(dummy)       | -31.1326    | -3.15 |             |       |             |       |
| Head is Protestant (dummy)    | -28.819     | -3.02 |             |       |             |       |
| Constant                      | -37.9765    | -2.97 | -56.7835    | -8.29 | -58.44836   | -8.17 |
| $R^2$                         | 0.0432      |       | 0.0375      |       | 0.0376      |       |

Table 6

**Giving Time and Giving Money within Family**

|                  | Giving Time | Not Giving Time |     |
|------------------|-------------|-----------------|-----|
| Giving Money     | 0.08        | 0.12            | 0.2 |
| Not Giving Money | 0.17        | 0.63            | 0.8 |
|                  | 0.25        | 0.75            |     |

Table 7

**Charitable Donation**

| Variables                        | Model1      |       | Model2      |        | Model3      |       |
|----------------------------------|-------------|-------|-------------|--------|-------------|-------|
|                                  | Coefficient | z     | Coefficient | z      | Coefficient | z     |
| Cared                            | -0.127803   | -1.74 | -0.125371   | -1.72  |             |       |
| Financial support                | -0.416784   | -5.4  | -0.378778   | -5.01  |             |       |
| Help from relatives              | 0.7063965   | 4.03  |             |        |             |       |
| Asset to charity                 | 0.1134162   | 1.31  |             |        | 0.0817037   | 0.96  |
| Asset to relatives               | 0.2270823   | 3.02  |             |        | 0.2247788   | 3.02  |
| Asset to religious organizations | 0.1818506   | 2.13  |             |        | 0.136398    | 1.66  |
| Coded value of head age          | 0.0423931   | 1.4   | 0.0430396   | 1.42   | 0.0511503   | 1.68  |
| Coded value of family income     | 0.7145546   | 15.72 | 0.6778702   | 15.98  | 0.6919881   | 15.51 |
| Constant                         | -2.349503   | -11.5 | -1.944324   | -11.11 | -2.333872   | -11.9 |
| R2                               | 0.211       |       | 0.193       |        | 0.1899      |       |

Table 8

### Expected Effects of Family Factors on Donation

| Variables                        | Sign | Reason                                            |
|----------------------------------|------|---------------------------------------------------|
| Cared                            | ?    | High income family +<br>Low income family -       |
| Financial support                | -    | The obligation to help parents financially        |
| Help from relatives              | +    | Based on the former result from reciprocity model |
| Asset to charity                 | +    | Attitude directs action                           |
| Asset to relatives               | -    |                                                   |
| Asset to religious organizations | +    |                                                   |

Table 9

### Charitable Donation

| Variables                        | Model1      |       | Model2      |       | Model3      |       |
|----------------------------------|-------------|-------|-------------|-------|-------------|-------|
|                                  | Coefficient | z     | Coefficient | z     | Coefficient | z     |
| Cared                            | -0.081839   | -1.08 | -0.071366   | -0.94 |             |       |
| Financial support                | -0.389052   | -4.97 | -0.358859   | -4.65 |             |       |
| Help from relatives              | 0.59733     | 4.06  |             |       |             |       |
| Asset to charity                 | 0.1004906   | 1.17  |             |       | 0.0720531   | 0.85  |
| Asset to relatives               | 0.2316656   | 3.04  |             |       | 0.2303356   | 3.05  |
| Asset to religious organizations | 0.1952303   | 2.36  |             |       | 0.1595898   | 1.98  |
| Head age                         | 0.0109863   | 2.42  | 0.0089121   | 2.01  | 0.0097673   | 2.21  |
| Family income                    | 0.0000142   | 13.31 | 0.0000136   | 13.07 | 0.0000142   | 13.45 |
| Constant                         | -1.105425   | -5.09 | -0.694906   | -3.59 | -1.107597   | -5.29 |
| R2                               | 0.2089      |       | 0.1927      |       | 0.1924      |       |

Table 10

### Tsunami Relief Donation

| Variables                        | Model1      |        | Model2      |        | Model3      |        |
|----------------------------------|-------------|--------|-------------|--------|-------------|--------|
|                                  | Coefficient | z      | Coefficient | z      | Coefficient | z      |
| Cared                            | -0.019692   | -0.29  | -0.013489   | -0.2   |             |        |
| Financial support                | 0.1633578   | 2.31   | 0.1664187   | 2.37   |             |        |
| Help from relatives              | 0.5872894   | 4.96   |             |        |             |        |
| Asset to charity                 | 0.22076     | 2.97   |             |        | 0.2074931   | 2.83   |
| Asset to relatives               | -0.113878   | -1.65  |             |        | -0.109014   | -1.61  |
| Asset to religious organizations | 0.1250124   | 1.67   |             |        | 0.1494719   | 2.02   |
| Coded value of head age          | 0.133277    | 4.77   | 0.1351085   | 4.93   | 0.1335586   | 4.86   |
| Coded value of family income     | 0.403433    | 12.61  | 0.3701112   | 12.14  | 0.3805976   | 12.16  |
| Constant                         | -2.188257   | -15.08 | -2.015757   | -15.42 | -2.039372   | -14.64 |
| R2                               | 0.086       |        | 0.0702      |        | 0.0759      |        |

Table 11

### Comparison Table for Family Giving

|                   | Charity Donation | Tsunami Relief Donation |
|-------------------|------------------|-------------------------|
| Cared             | -                | -                       |
| Financial Support | -                | +                       |

Table 12

### Comparison Table for Emotion Indicators

|                                  | Charity Donation | Tsunami Relief Donation |
|----------------------------------|------------------|-------------------------|
| Asset to Charity                 | +                | +                       |
| Asset to Relatives               | +                | -                       |
| Asset to Religious Organizations | +                | +                       |

Table 13



### Individual Donation Amount through Different Channels

| Variables                | Coefficient | t     |
|--------------------------|-------------|-------|
| Income                   | 0.0005193   | 5.03  |
| Head Age                 | -0.0391654  | -0.11 |
| TV or Radio (1)          | 124.2014    | 2.17  |
| Internet (2)             | 59.21416    | 2.09  |
| Stores (6)               | -61.6219    | -4.48 |
| Work Place or School (7) | -25.21874   | -1.68 |
| Charity Event (0)        | -13.9019    | -0.73 |
| Multiple Way (4)         | 90.16311    | 2.53  |
| Other(3)                 | 34.20578    | 1.79  |
| Constant (5)             | 65.75715    | 2.8   |
| $R^2$                    | 0.0956      |       |

Note: the church group is used as the base group and thus represented by the constant

Table 14

### Donating Channel and Fundamental Variables

| Variables | TV Radio    |      | Internet    |       | Store       |      | Multiple    |       |
|-----------|-------------|------|-------------|-------|-------------|------|-------------|-------|
|           | Coefficient | t    | Coefficient | t     | Coefficient | t    | Coefficient | t     |
| Income    | 0.003029    | 2.07 | 0.001117    | 2.49  | 0.000828    | 1.43 | 0.001948    | 2.66  |
| Age       | 2.248373    | 1.07 | -0.67119    | -0.55 | 0.699821    | 1.88 | 0.501777    | 0.42  |
| Education | 2.336528    | 0.14 | 3.225884    | 0.33  | 0.628796    | 0.37 | -7.22052    | -0.86 |
| $R^2$     | 0.2231      |      | 0.2402      |       | 0.1481      |      | 0.0575      |       |

Table 15

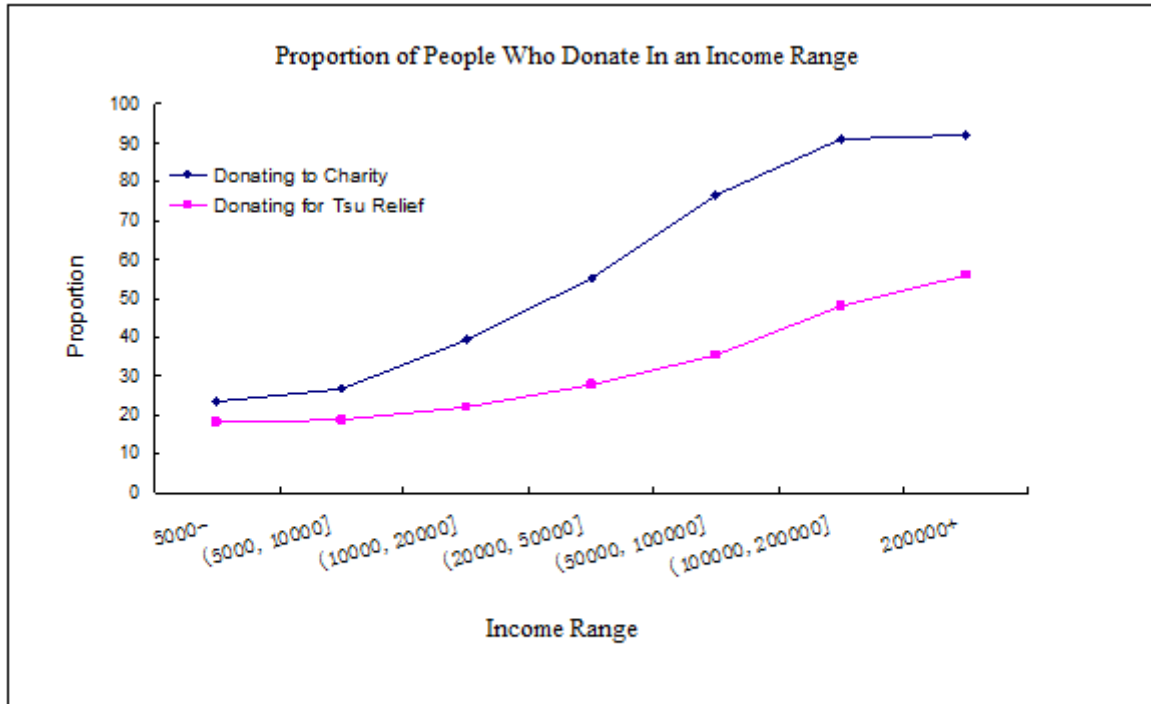


Figure 1

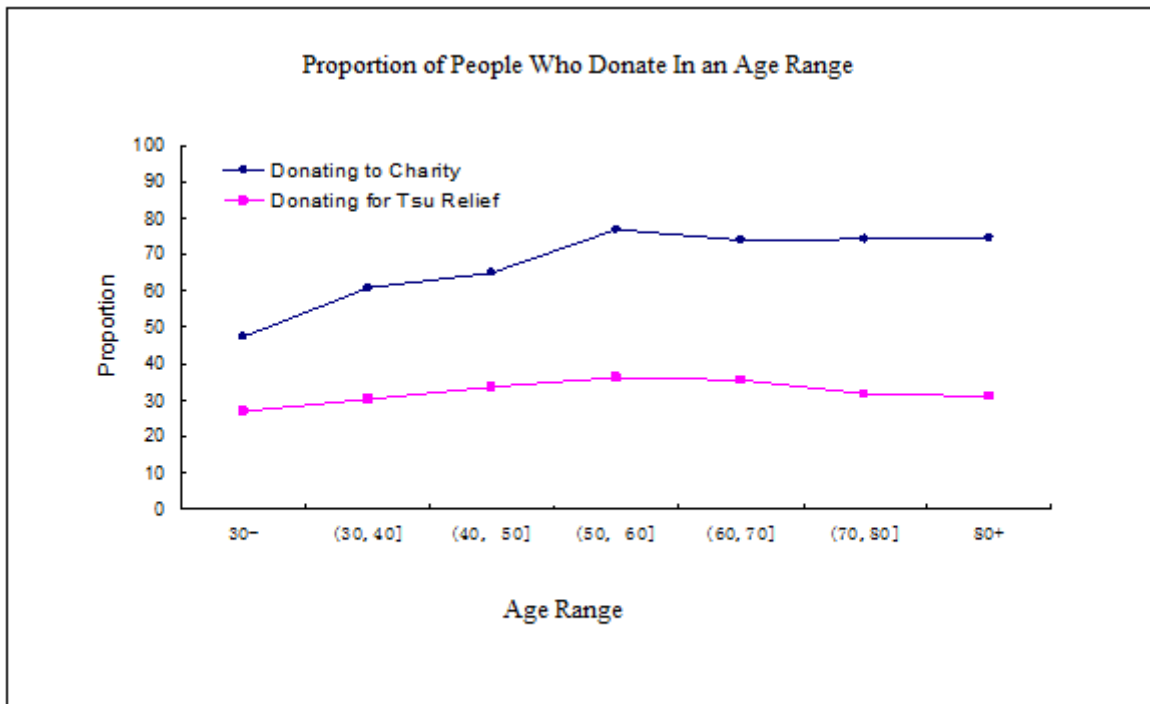


Figure 2

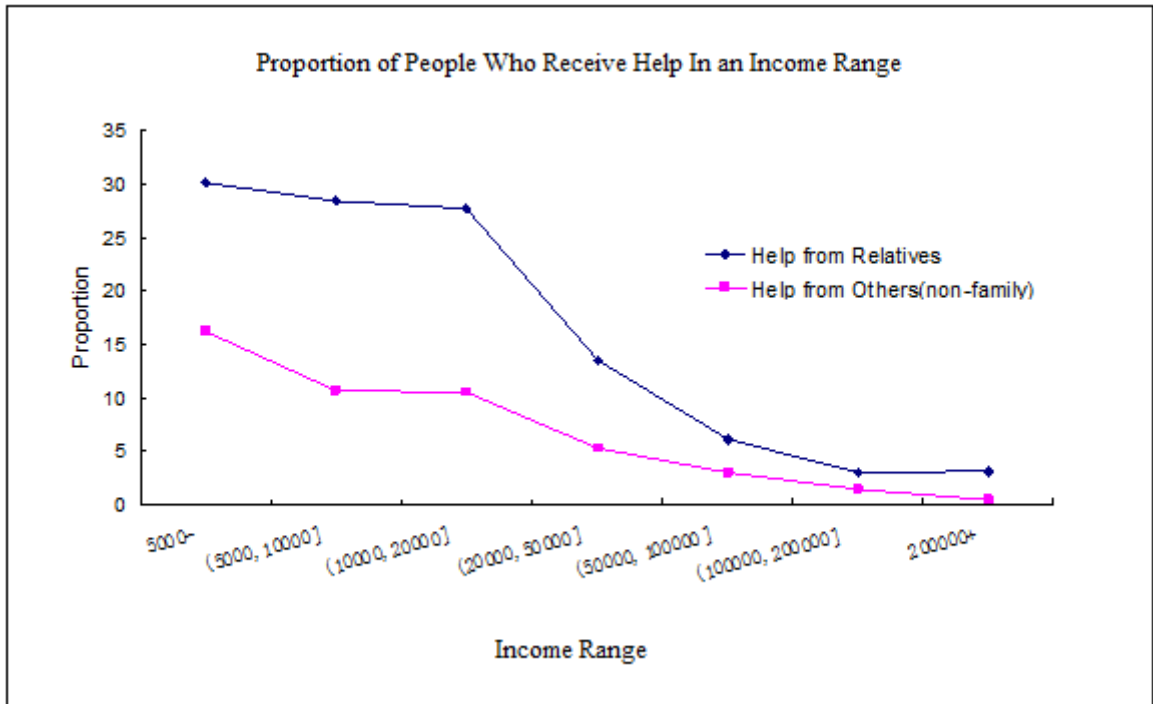


Figure 3

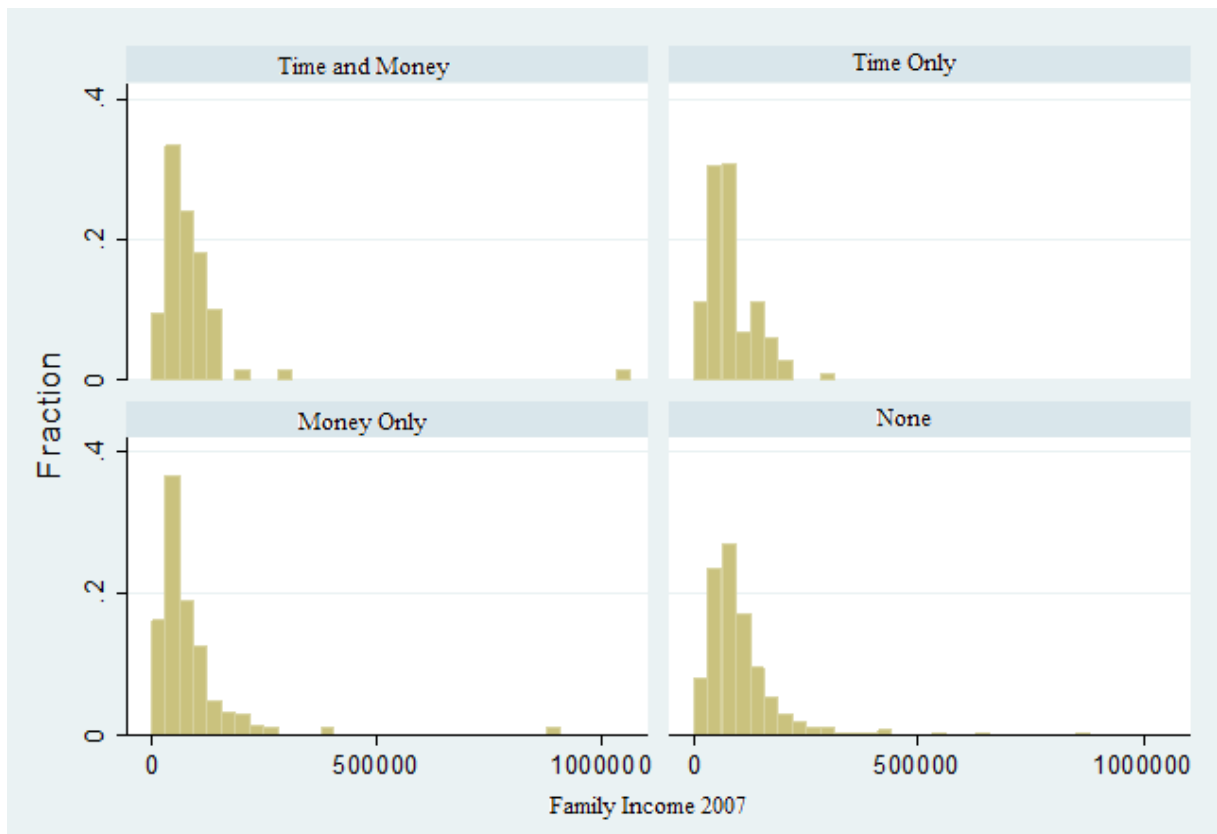


Figure 4

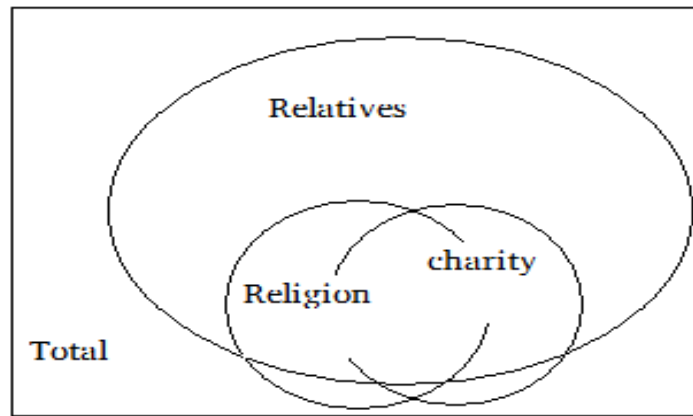


Figure 5

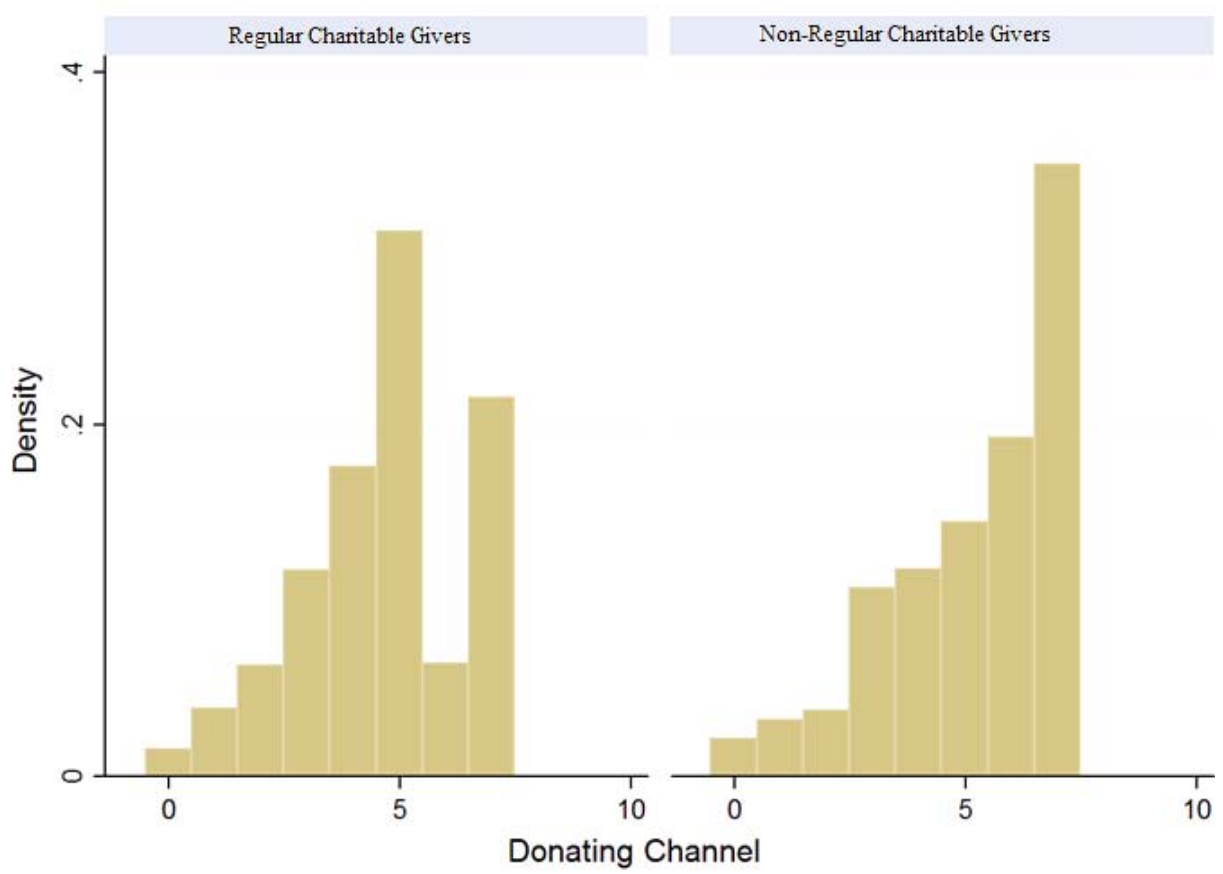


Figure 6

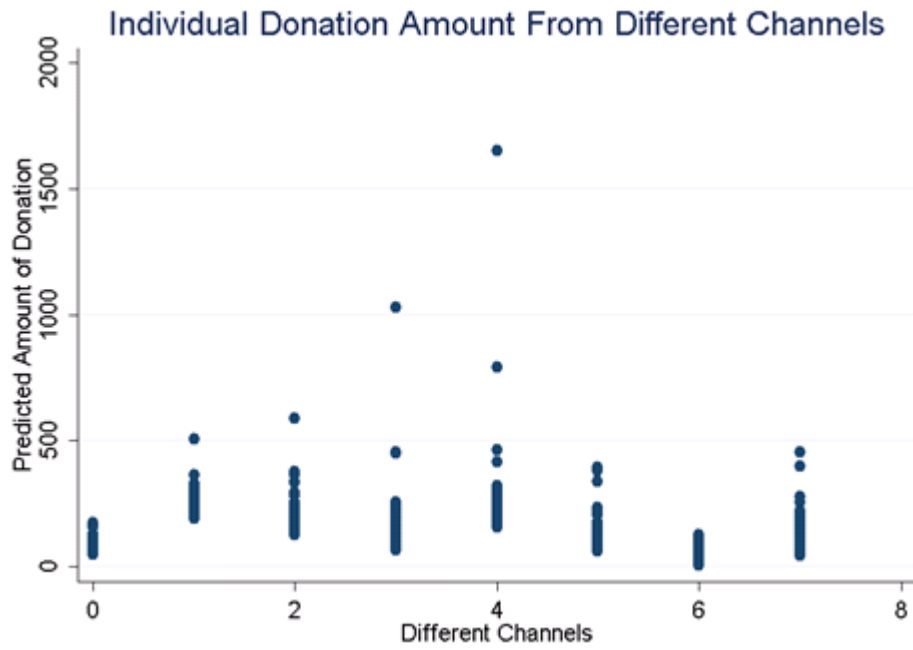


Figure 7

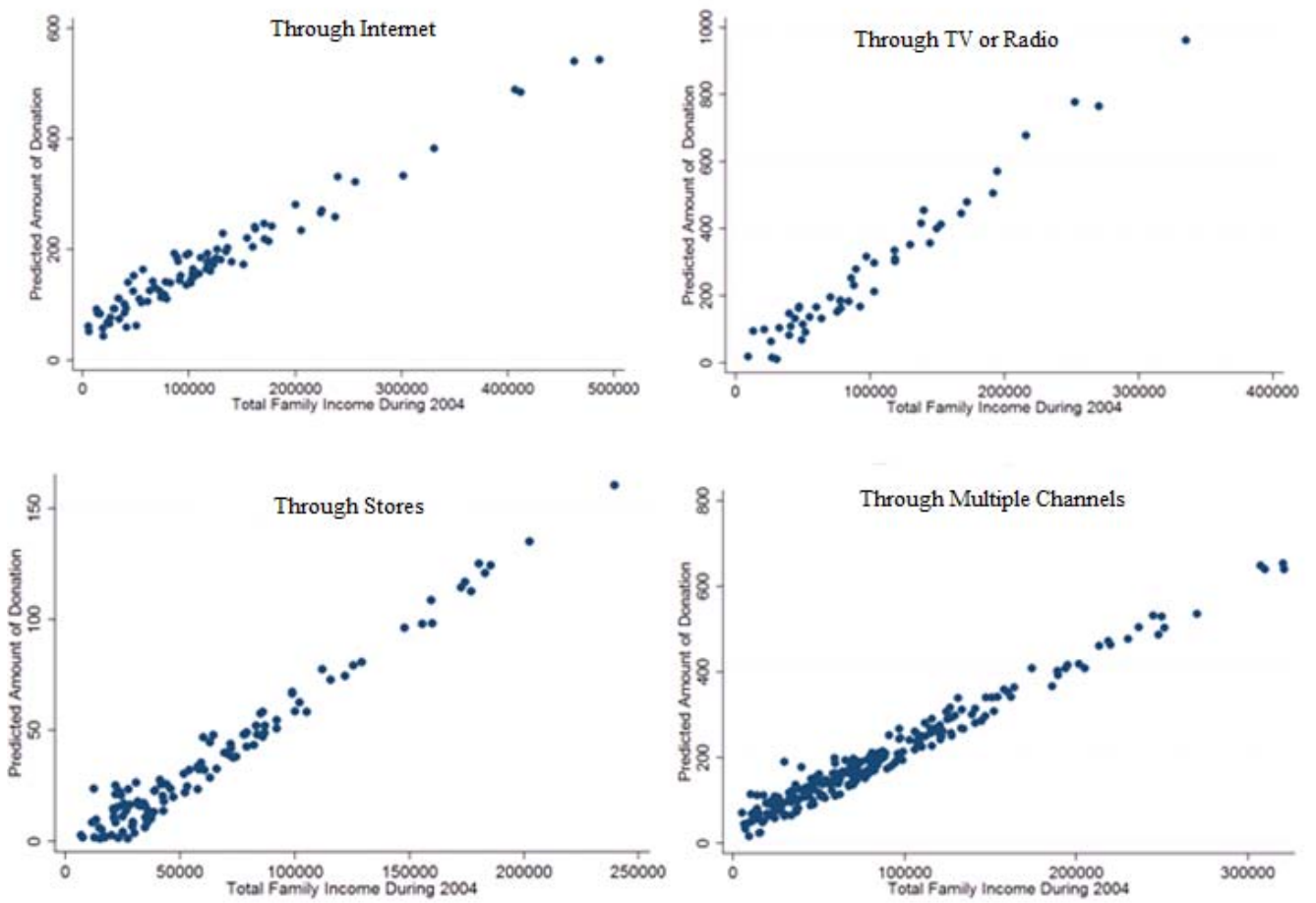


Figure 8