



# Religiosity may not be a panacea: Importance of prosociality to maintain humanitarian donations

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## Abstract

Past literature examines determinants of charitable activities and shows that prosocial and religious people provide more contribution. However, when an individual faces opportunities of multiple donations, an interplay among them in the context of substitutability or complementarity, along with limited sources extrinsically and intrinsically, can matter on her choice. In this paper, we study this phenomenon for religious and humanitarian donations by analyzing a survey-experiment data from a developing country, Bangladesh. Our result finds that as the degree of religiosity is intensified, people tend to donate more to religious activities at the expense of humanitarian donation. We argue that such different effects of religiosity originate from limited sources for donations and the substitutability between humanitarian and religious donations. The analysis also presents that social value orientation is an important predictor for humanitarian donation, but not for religious donation, such that prosocials donate more for humanitarian activities than the proselves. Our results conclude that to maintain humanitarian donations, religiosity may not be a panacea but prosociality is rather needed for a society. Given the argument that ongoing modernization makes people become less prosocial and thus might dissatisfy the growing needs of humanitarian activities that require prosocial behaviors, some policy device is necessary to sustain humanitarian donations in developing countries of Asia and Africa since they are becoming modernization in a faster speed.

**Key Words:** Religious and humanitarian donations; religiosity; prosociality; substitutability of multiple donations

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## Nomenclature

BDT Bangladeshi taka

SD Standard deviation

SVO Social value orientation

# 1 Introduction

2 Since voluntary donations or contributions play a significant role in providing various social needs  
3 and public goods, understanding organized philanthropies and charities is one of the major interests for  
4 social scientists. Many studies have discussed this issue by examining determinants of voluntary do-  
5 nations in advanced countries, particularly the Western countries (Brown and Lankford, 1992, Wright,  
6 2001, Van Lange et al., 2007, Bekkers and Schuyt, 2008, Wiepking, 2009, Bauer et al., 2013, Einolf,  
7 2013, Forbes and Zampelli, 2013, Beldad et al., 2015, Galen et al., 2015). However, the importance  
8 of voluntary donations is not limited in advanced countries. Even in developing countries, although  
9 limited, voluntary donations also prevail, and organizing voluntary activities contributes to providing  
10 individual and social needs. Nevertheless, voluntary donations in developing countries have not been  
11 studied extensively. One crucial issue that past studies missed to address is human behavior of volun-  
12 tary contributions when people face several opportunities of voluntary donations. The most common  
13 contributions are religious and humanitarian donations. In this case, an interplay among multiple dona-  
14 tions can matter on people's choice in the contexts of substitutability or complementarity. In addition,  
15 since people have limited sources extrinsically and intrinsically, as suggested in Selten and Ockenfels  
16 (1998), it is plausible to assume that they make a decision of multiple donations under the constraint,  
17 which requires us to discuss an interplay of these donation activities.

18 Religious and humanitarian organization initiate voluntary donations in the Western countries. Lit-  
19 erature reveals that religiosity and prosociality are the major motivations behind people's voluntary  
20 contributions to religious and humanitarian activities (Van Lange et al., 2007, Bekkers and Schuyt,  
21 2008, Van Lange et al., 2011, Vermeer and Scheepers, 2011, Taniguchi and Thomas, 2011, Einolf,  
22 2013, Forbes and Zampelli, 2013, Galen et al., 2015). Concerning the role of religiosity, Taniguchi  
23 and Thomas (2011), Einolf (2013), Wiepking et al. (2014) and Galen et al. (2015) show that religiosity  
24 promotes both religious and nonreligious donations and volunteering. However, Johnson et al. (2013)  
25 and Bekkers and Schuyt (2008) observe that religiosity advances religious volunteering or donations  
26 without any significant effect on nonreligious contributions. Forbes and Zampelli (2013) reveal a mixed  
27 result regarding the role of religiosity and present that church attendance increases both religious and

28 secular donations, although religious belief positively and negatively relates to religious and secular  
29 donations, respectively.

30 On the other hand, there are also several studies on the link of prosociality with voluntary contribu-  
31 tions. Bekkers and Schuyt (2008) show that prosocials donate more to both religious and nonreligious  
32 activities than competitors and individualists. The work of Van Lange et al. (2007) on the effect of  
33 social value orientation (SVO) finds that prosocials are more engaged in donation activities, especially  
34 humanitarian donations, although a relatively weak relationship between SVO and religious donations.  
35 In addition, the laboratory experiments of Van Lange et al. (2011) confirm that prosocials tend to vol-  
36 unteer more than individualistic and competitive individuals. Selten and Ockenfels (1998) emphasize  
37 that individuals might face a fixed budget for voluntary donations, like a typical choice problem of  
38 consumption goods. This notion can be linked with a possible interplay between religious and humani-  
39 tarian donations, i.e., substitutability or complementarity with respect to the two major determinants of  
40 voluntary contributions, religiosity and prosociality. For instance, religious motive can inspire highly  
41 religious individuals to donate more to religious organizations, and at the same time they might reduce  
42 their humanitarian donations under their budget constraint for donations. None of the past studies con-  
43 sider an interplay between the two types of donations, which is deduced by the argument of Selten and  
44 Ockenfels (1998) on the fixed budget for voluntary donations. Thus, the objective of this study is to  
45 discuss such a critical issue of voluntary contributions.

46 The majority of the past studies on voluntary donations has been conducted in advanced coun-  
47 tries. As suggested by Henrich et al. (2005, 2010a,b), more studies on voluntary donations should also  
48 be conducted in developing countries to generalize the understanding about determinants of volun-  
49 tary donations and develop voluntary organizations as a mean of public goods provision in developing  
50 countries. Our study focuses on the case of Bangladesh, one of developing countries in South Asia.  
51 To the best of our knowledge, this is the first attempt that analyzes religious and humanitarian dona-  
52 tions in relation to individual's degrees of religiosity and prosociality in a single framework, with the  
53 consideration of the possible substitutability or complementarity between the two types of voluntary  
54 contributions. We discuss this issue by collecting the survey-experiment data in rural, semiurban and  
55 urban regions in Bangladesh.

## 56 **2 Data and methodology**

### 57 **2.1 Study regions**

58 To collect a representative sample which includes individuals from rural, semiurban and urban  
59 areas, we conducted our survey and experiment in three different regions in Bangladesh: (i) Dhaka, an  
60 urban area and the capital of Bangladesh, (ii) Shajahanpur, a semiurban area and a sub-district in the  
61 northern Bogra district and (iii) Dacope, a representative of rural areas and a sub-district in the southern  
62 Khulna district. The locations of these areas are shown in Figure 1, where Dhaka, Bogra and Dacope  
63 correspond to regions (i), (ii) and (iii), respectively. As the first survey area, Dhaka city is located  
64 between  $90^{\circ}18'$  and  $90^{\circ}57'$  east longitude and  $23^{\circ}55'$  and  $24^{\circ}81'$  north latitude. The total land area,  
65 population and population density are  $1371 \text{ km}^2$ , 14.51 million and  $10\,484 \text{ people km}^{-2}$ , respectively  
66 (Dewan and Corner, 2014). Dhaka is the capital city and the center of industrialization, business and  
67 service in Bangladesh.

68 For the second study area, Shahjanpur subdistrict in the northern Bogra district is located between  
69  $89^{\circ}16'$  and  $89^{\circ}29'$  east longitudes and  $24^{\circ}41'$  and  $24^{\circ}50'$  north latitudes. The total land area and pop-  
70 ulation density are  $215.64 \text{ km}^2$  and  $1307 \text{ people km}^{-2}$ , respectively (Bangladesh Bureau of Statistics,  
71 2013). Bogra is one of the modernized cities in Bangladesh and the villages we studied have good  
72 communication with the district city Boga. Due to the green revolution, infrastructural development  
73 and suitable location for industrialization, these villages have gradually been transformed to urbanized  
74 areas from rural ones. For simplicity, we call this study region as Bogra for the rest of this paper. The  
75 third study zone comprises remote rural villages of Dacope sub-district in the southern Khulna district.  
76 Dacope is located between  $89^{\circ}24'$  and  $89^{\circ}35'$  east longitudes and  $22^{\circ}24'$  and  $22^{\circ}40'$  north latitudes.  
77 The total land area is  $991.58 \text{ km}^2$  and the population density is approximately  $980 \text{ people km}^{-2}$ . The  
78 infrastructure in this region is least developed. River network is the main channel of transportation.  
79 Except for some hatcheries and agriculture, few industries exist in this region. This region is adjacent  
80 to world's largest mangrove forest, the Sundarbans on the costal belt of Bangladesh.



Figure 1: The three regions: Dhaka, Bogra and Dacope

## 81 **2.2 Random sampling**

82 Taking into account the difference in geographical and sociodemographic characteristics among the  
83 three study regions, we applied three different approaches for random sampling. In each study region,  
84 we implemented our experiment and survey with 334 subjects.<sup>1</sup> Females with financial contribution  
85 to their family were included. We conducted the survey and experiment at the Information and Com-  
86 munication Technology Department of Dhaka University in Dhaka and several elementary schools in  
87 the study regions in Bogra and Dacope. In Dhaka we conducted a randomization based on occupations  
88 for avoiding over-representation of some specific groups of people. We first calculated the proportion  
89 of each occupation in the total population based on some past surveys conducted by the governmen-  
90 tal agencies (Bangladesh Bureau of Statistics, 2011, 2013). Then some organizations were randomly  
91 selected following occupational categories. Based on these organizations' compliance, we arbitrarily  
92 selected individuals from each of the organizations. To include individuals from low income occupa-  
93 tions with flouting nature, we selected several slums and accordingly picked the required number of  
94 individuals based on the occupation categories.

95 In Bogra, we implemented a household-based randomization. We run our survey and experiment in  
96 three unions of Shahjanpur sub-district, namely Aria Bazar, Amrool and Chupinagar unions.<sup>2</sup> We con-  
97 ducted the survey and experiment with 145, 99 and 90 subjects from Aria Bazar, Amrool and Chupina-  
98 gar unions, respectively, based on the number of households in each union. We collected the household  
99 identification numbers from the local government offices and randomly selected the required number  
100 of households from each of the unions. Accordingly, we invited one earning member from each of the  
101 selected households to participate in our survey by sending them an invitation letter.

102 Finally, in Dacope we conducted the survey and experiment in two unions, namely Kamarkhola and  
103 Sutarkhali, with the total number of households of 3559 and 7536, respectively (Bangladesh Bureau of  
104 Statistics, 2011, 2013). We randomly selected 108 (32% of the total subjects) and 226 (68% of the  
105 total subjects) subjects from Kamarkhola and Sutarkhali, respectively, and invited one earning member  
106 from each of the households. However, due to the unavailability of the complete lists of households and

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<sup>1</sup>The surveys and experiments were administered mainly by the first author.

<sup>2</sup>The union is the lowest administrative unite in Bangladesh.



107 frequent human movement within the study region, we were unable to conduct a household based ran-  
108 domization. Thus, we conducted a randomization by applying a geographic cluster sampling procedure  
109 used in Himelein et al. (2013, 2014). With the GIS technology, we observed human traffic prior to the  
110 experiment and visited the study region twice before conducting the field survey. Based on the visits  
111 and GIS technology, we divided each of the unions into five sub-regions. Each of the sub-regions is di-  
112 vided into several stratum with approximately same number of households. Accordingly, we randomly  
113 selected the required number of subjects from each of the stratum and invited them to participate in  
114 the survey and experiment by sending them an invitation letter.

### 115 **2.3 Religious and humanitarian donations**

116 Unlike the Western countries, charitable activities initiated by organizations are limited, so that  
117 donations by individuals are more spontaneous rather than organizational in Bangladesh. Since no  
118 data of such voluntary donations are available, eliciting individual's self-reported donations through  
119 conducting field survey is the only way to obtain the data. To elicit the information of religious and  
120 humanitarian donations from individuals, we asked each respondent about their household's dona-  
121 tions to various sectors or activities over the past one year. For computing religious donations, the  
122 question we asked each respondent is: How much money/labor you have donated for the following  
123 purposes/institutes over the past one year? (i) mosque/temple/church, (ii) madrasah and maktab, (iii)  
124 religious gathering, (iv) religious festivals, (v) development of Eidgah (open-air gathering place for the  
125 Muslim people to perform Eid prayer) or other religious infrastructures, (vi) religious speech sharing  
126 activities, (vii) graveyards/barial ground managed by religious organizations, (viii) orphanage home run  
127 by religious organization, (ix) Zakaah to religious organizations and(x) any other religious activities or  
128 organizations.<sup>3</sup>

129 On the other hand, we collected the data of humanitarian donations by asking each respondent  
130 the question: How much money/labor you have donated for the following purposes/institutes over the  
131 past one year? (i) beggar, (ii) flood affected people, (iii) cold affected people, (iv) cyclone affected

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<sup>3</sup>Madrashes are the religious educational institutes that emphasize teaching based on the islamic religious scriptures, and maktab is mainly for teaching Quran, the holy book for the muslims.

132 people, (v) poor neighbors, (vi) poor relatives, (vii) marriage ceremony of poor people, (ix) educational  
133 institutes other than religious educational institutes, (x) Zakaah to poor and disadvantaged people, (xi)  
134 orphanage home run by nonreligious organizations and (xii) other humanitarian activities that help  
135 disadvantaged people in the society.<sup>4</sup> We have converted labor donations into monetary values by using  
136 the lowest per hour wage as a conversion rate.<sup>5</sup>

## 137 **2.4 Measuring religiosity and prosociality**

138 Past studies use different indices for measuring individual's level of religiosity with the consid-  
139 eration of various aspects, such as people's perception about the importance of religion in their life,  
140 involvement in organized and non-organized religious activities, degree of belief on god, intrinsic and  
141 extrinsic religiosity and religious saliency (see, e.g., Bekkers and Schuyt, 2008, Koenig and Bussing,  
142 2010, Vermeer and Scheepers, 2011, Taniguchi and Thomas, 2011, Einolf, 2013, Forbes and Zampelli,  
143 2013, Galen et al., 2015). Among them, frequency of pray or church attendance is the most commonly  
144 used as a measure of religiosity because it is considered as the most appropriate behavioral measure of  
145 individual's religiosity (Bekkers and Schuyt, 2008, Forbes and Zampelli, 2013). In Bangladesh, 90 % of  
146 people are Muslims, and they strongly believe religion and the existence of god. In this case, a behav-  
147 ioral measure would be the best way to capture individual's degree of religiosity. Given this argument,  
148 we elicited individual's frequency of pray per month including prayer place (mosque/temple/church)  
149 attendance as a measure of religiosity.

150 To measure individual's degree of prosociality or social preference, we implemented a field ex-  
151 periment of social value orientation (SVO) developed by Van Lange et al. (1997, 2007). This mea-  
152 sure characterizes an individual's social preference as either competitive, individualistic, prosocial, or

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<sup>4</sup>The majority of people in Bangladesh are Muslim, and charitable giving to poor and disadvantaged people is one of the major obligations in Islam (Lambarraa and Riener, 2015). Two kinds of charities are instructed. The first is called Zakaah, which is a mandatory form of charity and can often be comparable to redistributive tax system, and the second is the voluntary form called Sadaqah. However, according to the national laws of Bangladesh, attaining Zakaah is not mandatory. In our survey only a negligible number of people stated that they had attained Zakaah over the past one year. In addition, few people donated Zakaah to religious organizations, even though Zakaah is instructed for poor and disadvantaged people. Thus, we considered Zakaah as humanitarian donations when it was donated to humanitarian activities and as religious donations when it was donated for religious activities.

<sup>5</sup>In our survey, very few people stated that they had donated labor over the past one year, since labor donation is not a common practice in Bangladesh.

153 unidentified. In this game, a pair is formulated randomly, and an individual's payoff is represented by  
154 the sum of the outcomes of oneself and the other or partner in the pair, where the partner is unknown  
155 to the subject. This game is called triple-dominance decomposed game, as stated by Van Lange et al.  
156 (1997, 2007), since each subject is asked to choose one from the following three options, where the  
157 options deduce a matrix of the outcomes of the subject and her unknown partner:

158 Option 1: You receive 500 and the other receives 100.

159 Option 2: You receive 500 and the other receives 500.

160 Option 3: You receive 560 and the other receives 300.

161 Option 1 represents the competitive orientation that maximizes the gap between her own outcome and  
162 the unknown other's one ( $500 - 100 = 400$ ). The subjects who choose this option are regarded as  
163 competitors. The second option ensures that the joint outcome, which is the sum of her own outcome  
164 and the unknown other's one ( $500 + 500 = 1000$ ), is maximized, representing prosocial orientation.  
165 The subjects who choose this option are regarded as prosocials. Finally, the third option represents  
166 individualistic orientation. By choosing this option, an individual maximizes her own outcome 560 and  
167 appears to be indifferent to the unknown other's outcome. This game consists of nine selections. In  
168 each of the nine selections, every subject needs to choose one from the above three options, i.e., every  
169 subject reveals nine choices in total. If at least six out of the nine selections are consistent with one of  
170 the value orientations (competitive, prosocial and individualistic), she is categorized as an individual  
171 with that value orientation. Otherwise, the subject is categorized as unidentified.

172 We implemented our experiment with monetary payments, taking account into respondents' trans-  
173 portation and opportunity costs and also the encouragement to come and participate in our experiment  
174 seriously. In each experiment, 20 ~ 40 subjects participated. We provided the experimental instruc-  
175 tions to the subjects carefully, and an experimenter (the first author) gave them a verbal presentation  
176 and confirmed participants' understanding. We informed the subjects that the more payoff a subject  
177 gets, the more real money she can earn from the game. To compute the payoff of each subject, we  
178 randomly match a subject with another subject after eliciting all subjects' choices in nine selections.  
179 We calculated the total payoff by summing the payoffs over the nine sessions for each subject. Then we

180 determined the real money payment by using the total payoff and exchange rate. The average payment  
181 was 300 BDT ( $\approx 3.30$  USD) with a show-up fee of 150 BDT ( $\approx 2.00$  USD). Each experiment took  
182 40  $\sim$  50 minutes on an average.

## 183 **2.5 Empirical method**

184 This study applies a tobit model to examine how prosociality and religiosity relate to humanitarian  
185 and religious donations, since some portion of people make zero (religious and humanitarian) donation  
186 over the past one year in our survey.<sup>6</sup> The tobit regression is appropriate to evaluate the relationship  
187 between a non-negative dependent variable and a set of independent variables. Specifically, voluntary  
188 donation  $y_i$  of subject  $i$  is defined to be equal to the latent variable  $y_i^*$  whenever  $y_i^*$  is above zero and  
189 zero otherwise, i.e.,  $y_i = y_i^*$  if  $y_i^* > 0$  and  $y_i = 0$  if  $y_i^* \leq 0$ . The latent variable  $y_i^*$  is described by  
190 the linear equation,  $y_i^* = \beta x_i + \epsilon_i$ , where  $x_i$  is a set of control variables that are expected to affect  
191 voluntary donation and  $\epsilon_i$  is the error term. As a dependent variable, we consider religious donation,  
192 humanitarian donation and total donation that is the sum of the two types of donations.

193 To capture the degrees of religiosity and prosociality, we respectively include the frequency of pray  
194 and three SVO dummies as the main control variables of the model. Since all subjects are classified  
195 into four types of SVOs (prosocial, competitive, individualistic and unidentified), we include three  
196 dummies of competitive, individualistic and unidentified orientations (the base group is prosocials).  
197 Concerning other controls, we incorporate household income, age, gender, education, religion, the  
198 number of children and family structure into the model. The number of children in the household is  
199 included since having more children might motivate individuals to act more prosocially, as argued in  
200 Van Lange et al. (1997) and Galen et al. (2015). We also include the family structure into the model.  
201 Individuals from joint families experience the higher level of interdependence than those from a single  
202 family, which may encourage them to donate more (Van Lange et al., 1997). Moreover, our model  
203 includes regional dummies to capture the effect of regional differences on voluntary donations. Table 1  
204 presents the descriptions of variables used in this study.

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<sup>6</sup>In our sample, 10 and 34 individuals expressed zero humanitarian and religious donations.

Table 1: Description of variables

Variables	Description
Total donation	Total household voluntary donation by the last one year in 1000 BDT (sum of religious and humanitarian household donations by the last one year)
Humanitarian donation	Total household donation for humanitarian organizations and activities by the last one year in 1000 BDT
Religious donation	Total household donation for religious organizations and activities by the last one year in 1000 BDT
SVO dummy (Base group = Prosocial)	
Competitive	Dummy variable that takes value 1 when a respondent is competitive, otherwise (prosocial, individualistic, and unidentified) 0
Individualistic	Takes value 1 for individualistic individuals, otherwise (prosocial, competitive and unidentified) 0.
Unidentified	Coded as 1 for respondents with unidentified SVO, 0 otherwise (prosocial, competitive and individualistic).
Religiosity	Number of pray per month including mosque/mandir/ church attendance
Household income	Household income per month in 1000 BDT.
Age	Categorical variable of {0, 1, 2, 3, 4, 5} where ages between 20 and 29, 30 and 39, 40 and 49, 50 and 59, 60 and 69 and 70 and over are coded as 0, 1, 2, 3, 4 and 5, respectively.
Education	Years of schooling.
Children less than 12 years of age	Number of children less than 12 years of age in the household
Male	Male respondents are coded as 1, 0 otherwise females
Single family	Takes value one for single family structures, otherwise joint families 0
Non-muslim	Takes value one when an individual's religion is other than Islam (Hinduism, Buddhism and Christianity) otherwise 0
Regional dummy (Base group = Semi-urban)	
Urban	Dummy variable that takes value 1 when a respondent is from the urban area, Dhaka, otherwise (from semi-urban, Bogra and rural, dacope) 0
Rural	Takes value 1 for individuals from the rural area, Dacope, 0 otherwise (for individuals from urban, Dhaka and semi-urban, Bogra.

## 205 **3 Results**

### 206 **3.1 Summary statistics**

207 Table 2 presents the summary statistics of variables used in this study. First, households donate ap-  
208 proximately 6200 BDT ( $\approx 77$  USD) per year on average, among which the amounts of humanitarian and  
209 religious donations are approximately 3200 BDT and 3000 BDT, respectively. Although the averages  
210 of humanitarian and religious donations are almost identical, the standard deviations of these donations  
211 differ substantially, such that the standard deviation of religious donations is much larger than that  
212 of humanitarian ones. Concerning the degree of religiosity that is captured by the frequency of pray,  
213 Bangladeshi people pray approximately 53 times per month on average with the standard deviation of  
214 55 times. For SVO-related dummy variables, the ratios of individualists, competitors, prosocials and  
215 individuals with unidentified SVO are 29 %, 25 %, 24 % and 22 %, respectively. This implies that al-  
216 though well-balanced, individualists are dominant in Bangladesh, followed by competitors, prosocials  
217 and individuals with unidentified SVO. It should be noticed that a substantial number of individuals  
218 are classified as unidentified SVO, which can be explained by a temporary instability of people's social  
219 preference and behavior (Shahrier et al., 2016, 2017).<sup>7</sup>

### 220 **3.2 Humanitarian and religious donations**

221 The main interest in this study is on how prosociality (and SVO) and religiosity relate to voluntary  
222 donation, particularly humanitarian and religious donation. Table 3 presents the results of our tobit  
223 estimations for total, humanitarian and religious donations, and Table 4 shows the marginal effects for  
224 each independent variable. This subsection first evaluates the effects of religiosity and then explains  
225 the effects of SVOs including prosociality. We finally discuss the roles of other control variables.

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<sup>7</sup>Shahrier et al. (2016, 2017) discuss the relationship between unidentified SVO and the instability of social preference and behavior. The state of unstable social preference implies that individual's value orientation is gradually changing from one orientation to another in the long-run. This transformation can reflect changes in socioeconomic conditions, such as urbanization, economic development, social norms and values and patterns of social and economic interactions.

Table 2: Summary statistics

Variables	Mean	Median	SD <sup>1</sup>	Min	Max
Total donation per year (1000 BDT)	6.23	3.44	10.10	0	156.70
Humanitarian donation per year (1000 BDT)	3.21	1.70	5.50	0	62.40
Religious donation per year (1000 BDT)	3.03	1.00	9.18	0	155.00
SVO dummy (Base group = Prosocial)					
Competitive	0.25	0	0.43	0	1
Individualistic	0.29	0	0.45	0	1
Unidentified	0.22	0	0.41	0	1
Religiosity	53.11	30	55.12	0	154
Household income per month (1000 BDT)	46.84	15	330.16	2	10000
Age	1.26	1	1.26	0	5
Education	8.49	10	5.76	0	20
Children less than 12 years of age	0.79	1	0.93	0	6
Male	0.89	1	0.30	0	1
Single family	0.61	1	0.49	0	1
Non-muslim	0.13	0	0.34	0	1

<sup>1</sup> The “SD” stands for standard deviation.

### 226 3.2.1 Religiosity and prosociality

227 The results of the effects of religiosity on total voluntary donation show that the coefficient on  
228 religiosity is positive and significant, implying that religiosity appears to increase total donation. An  
229 additional frequency of pray increases total donation by approximately 10 BDT per year. Once we  
230 consider the two types of donations, our analysis presents a clear difference between them. The coef-  
231 ficients on religiosity are significantly negative and positive for humanitarian and religious donations.  
232 Holding other factors fixed, an additional frequency of pray per month is associated with the decrease  
233 in humanitarian donation per year by approximately 10 BDT, while it is associated with the increase in  
234 religious donation per year by approximately 20 BDT. In summary, as people becomes more religious,  
235 they reduce their humanitarian donation and raise religious donation. The increase in religious donation  
236 is twice as much as the decrease in humanitarian donation for an additional frequency of pray.

237 Since helping disadvantaged people is a major instruction in Islam (Lambarraa and Riener, 2015),  
238 one might expect a positive association of religiosity with both of religious and humanitarian dona-

Table 3: Regression coefficients of independent variables in tobit regression ( $N = 1002$ )

	Total donation	Humanitarian donation	Religious donation
SVO dummy (Base group = Prosocial)			
Competitive	-2.52*** (0.87)	-2.51*** (0.68)	0.04 (0.59)
Individualistic	-1.48* (0.80)	-2.12*** (0.61)	0.64 (0.54)
Unidentified	-0.67 (0.94)	-1.07 (0.72)	0.27 (0.68)
Religiosity	0.01** (0.01)	-0.01*** (0.00)	0.03*** (0.01)
Household income per month (1000 BDT)	0.01*** (0.00)	0.00** (0.00)	0.01*** (0.00)
Age	0.40** (0.18)	0.14 (0.11)	0.23 (0.15)
Education	0.41*** (0.05)	0.19*** (0.03)	0.21*** (0.05)
Children less than 12 years of age	0.17 (0.35)	-0.03 (0.18)	0.17 (0.32)
Male	1.01 (1.06)	0.80 (0.63)	0.53 (0.97)
Single family	-0.88 (0.62)	-0.72** (0.36)	-0.19 (0.53)
Non-muslim	-1.30*** (0.51)	-0.94*** (0.37)	-0.30 (0.38)
Regional dummy (Base group = Semi-urban)			
Urban	2.51*** (0.88)	1.38*** (0.48)	0.85 (0.70)
Rural	-0.99** (0.49)	-0.74*** (0.28)	-0.31 (0.41)
Constant	1.17 (1.24)	3.04*** (0.61)	-2.12* (1.18)
$F$ -statistics	19.70	7.04	30.50

Numbers in parentheses are robust standard errors

\*\*\*significant at the 1 percent level, \*\*significant at the 5 percent level and \*significant at the 10 percent level.



Table 4: Marginal effects of independent variables in tobit regression

	Total donation	Humanitarian donation	Religious donation
SVO dummy (Base group = Prosocial)			
Competitive	-1.84*** (0.59)	-2.51*** (0.68)	0.03 (0.38)
Individualistic	-1.10** (0.58)	-2.12*** (0.61)	0.41 (0.36)
Unidentified	-0.50 (0.71)	-1.07 (0.72)	0.17 (0.44)
Religiosity	0.01** (0.01)	-0.01*** (0.00)	0.02*** (0.00)
Household income per month (1000 BDT)	0.01*** (0.00)	0.00** (0.00)	0.00*** (0.00)
Age	0.30** (0.13)	0.14 (0.11)	0.15 (0.09)
Education	0.31*** (0.03)	0.19*** (0.03)	0.13*** (0.03)
Children less than 12 years of age	0.13 (0.27)	-0.03 (0.18)	0.11 (0.21)
Male	0.74 (0.76)	0.80 (0.63)	0.33 (0.60)
Single family	-0.67 (0.48)	-0.72** (0.36)	-0.12 (0.34)
Non-muslim	-0.96*** (0.36)	-0.94*** (0.37)	-0.19 (0.24)
Regional dummy (Base group = Semi-urban)			
Urban	1.93*** (0.65)	1.38*** (0.48)	0.55 (0.45)
Rural	-0.74** (0.38)	-0.74*** (0.28)	-0.20 (0.27)

Numbers in parentheses are robust standard errors

\*\*\*significant at the 1 percent level, \*\*significant at the 5 percent level and \*significant at the 10 percent level.

239 tions.<sup>8</sup> However, our results are not the case. The analysis suggests the contrasting effects of religiosity  
240 on humanitarian and religious donations. As the degree of religiosity is intensified, people tend to  
241 donate more to religious activities at the expense of humanitarian donation, i.e., humanitarian and re-  
242 ligious donations are substitutes with respect to religiosity. Our finding is quite intuitive and plausible  
243 with the consideration of people's consumption behavior in conventional consumer theory.

244 Two possible concepts of economic theory can account for the substitutability between humanitar-  
245 ian and religious donations. First, as mentioned in Selten and Ockenfels (1998), individuals may face  
246 a fixed budget for voluntary donations implicitly. In this case, religious motive inspires individuals to  
247 donate more to religious organizations, and at the same time they need to reduce their humanitarian  
248 donations under their budget constraint for donations. Second, an individual's preference involves an  
249 interplay between humanitarian and religious donations in relation to religiosity. The results support-  
250 ing the substitutability of the two types of donations suggest that the marginal utility of humanitarian  
251 donation is decreasing in religious donation. In this case, as the degree of religiosity increases, peo-  
252 ple donate more to religious activities, which in turn decreases the marginal utility of humanitarian  
253 donation and thus results in the reduction of humanitarian donation.

254 The results related to religiosity are inconsistent with the findings of previous studies, most of which  
255 find a positive effect of religiosity on both religious and nonreligious donations (see, e.g., Bekkers and  
256 Schuyt, 2008, Wiepking, 2009, Taniguchi and Thomas, 2011, Vermeer and Scheepers, 2011, Einolf,  
257 2013, Forbes and Zampelli, 2013, Johnson et al., 2013, Galen et al., 2015). The inconsistency between  
258 our results of the Bangladesh case and those of the Western countries in previous studies would reflect  
259 institutional differences between developing and advanced countries. In Europe and the United States,  
260 there are many not-for-profit organizations that initiate charity and collect religious and nonreligious  
261 donations from highly religious people through channels of churches and religious groups (Bekkers  
262 and Schuyt, 2008).

263 In addition, the measure of religiosity in western countries may be affected by various organiza-

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<sup>8</sup>In Islamic countries, it should be noticed that as individuals become more religious, they think more about the life after death, as instructed in Islam. They attempt to accumulate a satisfactory amount of rewards to achieve heaven. Donating for the promotion and institutionalization of religion is a mandate in Islam, which is associated with higher rewards like helping deprived people. The higher level of religiosity might enhance people's desire for the promotion of religion. Thus, religious people donate more to religious institutions and activities.

264 tional promotion and social pressures. In contrast, donations in developing countries, like Bangladesh,  
265 are spontaneous rather than through organizations, and even religious organizations rarely initiate hu-  
266 manitarian donations in a systematic way. Due to the spontaneous nature of donation activities, our  
267 measure of religiosity may reflect the truly intrinsic behavior and belief of religiosity. Such an institu-  
268 tional difference in charitable activities between the Western countries and Bangladesh can be one of  
269 the reasons behind the inconsistency. Thus, more religious people tend to donate more to both religious  
270 and nonreligious activities in the Western countries. On the other hand, in Bangladesh, more religious  
271 people donate more to religious activities but less to humanitarian activities due to the substitutability  
272 along with an implicit budget constraint.

273       Regarding the effects of SVOs, including prosociality, on voluntary donations, the results for total  
274 donation show that the coefficients on competitive and individualistic dummies are significantly nega-  
275 tive, while the coefficient on an unidentified dummy is insignificant. Total donations per year by com-  
276 petitive and individualistic people are relatively small compared with a prosocial person by 1840 BDT  
277 and 1100 BDT per year, respectively. More importantly, once we consider humanitarian and religious  
278 donations, the analysis presents clear differences between them. For humanitarian donation, the coeffi-  
279 cients on competitive and individualistic dummies are significantly negative, while the coefficient on an  
280 unidentified dummy is insignificant. Competitors and individualists donate less to humanitarian activi-  
281 ties compared with prosocials by 2510 BDT and 2120 BDT per year, respectively. On the contrary, for  
282 religious donation, the coefficients on all of the three SVO-related dummies are insignificant, implying  
283 that religious donation is insensitive to the type of SVOs.

284       Our estimation suggests that prosociality is a crucial determinant of only humanitarian donation.  
285 This result differs partially from the finding of Bekkers and Schuyt (2008) showing a positive effect of  
286 prosociality on both religious and nonreligious donations. However, our result is consistent with the  
287 finding of Van Lange et al. (2007) that prosocials tend to be engaged in more humanitarian activities,  
288 but the link between SVOs and religious donation is relatively weak. Compared with competitors and  
289 individualists, prosocials are more motivated to contribute to humanitarian activities that include do-  
290 nations for disadvantaged, poor and disaster susceptible people, since they care more about equality,  
291 fairness, humanity and social welfare (Van Lange et al., 2007). In connection with the results of the

292 effects of religiosity, prosociality plays an important role in promoting humanitarian donation. This  
293 argument should be emphasized since another important internal factor, religiosity, encourages people  
294 to motivate more religious donation at the expense of humanitarian donation due to the possible substi-  
295 tutability between the two types of donations. That is, religiosity may not be a panacea, and prosociality  
296 is crucial to maintain and promote humanitarian donation.

### 297 **3.2.2 Other controls**

298 Concerning other control variables, our analysis presents some important results related to humani-  
299 tarian and religious donations. First, total, humanitarian and religious donations are not sensitive to the  
300 income level. Although the coefficients on household income are positive and statistically significant  
301 for all of the three types of donations, their magnitudes are relatively small and are not economically  
302 meaningful. This finding is inconsistent with previous studies such as Bekkers and Schuyt (2008),  
303 Forbes and Zampelli (2013) and Galen et al. (2015). Second, total donation is age sensitive, but reli-  
304 gious and humanitarian donations are not significantly associated with age. Total donation increases  
305 by 300 BDT in relation to a 10 years increase in age. Third, the estimated coefficients on education  
306 show its positive effect on all the three types of donations as expected. An additional year of schooling  
307 is associated with 400, 190 and 210 BDT rise in total, humanitarian and religious donations per year,  
308 respectively. Humanitarian and religious donations are almost equally sensitive to individual's educa-  
309 tion level. The positive effect of education is consistent with the finding of previous studies (see, e.g.,  
310 Bekkers and Schuyt, 2008, Forbes and Zampelli, 2013, Galen et al., 2015).

311 Forth, the estimation reveals that the family structure relates to humanitarian donation but not to  
312 religious donation. For humanitarian activities, single family households donate 720 BDT less per year  
313 than the joint family. Van Lange et al. (1997) mention that individuals from joint families experience  
314 more interdependence than those from a single family. This argument encourages them to donate  
315 more to humanitarian activities, which is closely related to interdependence among people. Fifth, the  
316 estimated effects of religion (muslim vs non-muslim) reveal that humanitarian donation per year by  
317 a muslim household is larger than that by a non-muslim person by 960 BDT per year, although no  
318 significant disparity of religious donation between muslim and non-muslim people. Given the fact that

319 the majority of people are muslims, our results are inconsistent with the findings of Bekkers and Schuyt  
320 (2008) and Wiepking et al. (2014), where the former argues that individuals of the religious minority  
321 donate more for religious sectors, and the latter shows that people of religious minorities donate more  
322 for both religious and humanitarian sectors.

323 This can be explained by differences in social structures between the Western countries and de-  
324 veloping countries like Bangladesh. Bekkers and Schuyt (2008) and Wiepking et al. (2014) examine  
325 societies with high religious heterogeneity, while Bangladesh consists of two major religions, Islam  
326 and Hinduism, where Islam is dominant. In addition, unlike developed countries, Bangladesh does not  
327 have enough social security system. Thus, people belonging to Hinduism may feel detached from the  
328 society, which drives them to take less liabilities for the society. As a result, rather than donation, Hindu  
329 people might have more motivation to accumulate wealth for the future safety.

330 Sixth, the results present clear regional differences only in humanitarian donation. Compared with  
331 people in semiurban Bogra, people in urban Dhaka and rural Dacope tend to donate more and less to  
332 humanitarian activities, respectively. Shahrier et al. (2016) find that modernization processes cause  
333 people's preferences to change their SVOs from prosocial toward competitive and individualistic in the  
334 long-run. Our analysis suggests that even after controlling for SVOs, the regional effects would still  
335 remain, such that people in urban areas tend to donate more to humanitarian activities than those in rural  
336 areas. A possible reason includes that urban areas are relatively modernized, like the Western countries,  
337 with the existence of not-for-profit organization initiating nonreligious donation. Such an institutional  
338 factor would promote humanitarian donation in urban areas. Finally, the estimated results show no  
339 clear evidences that the number of children and gender determine people's behavior of humanitarian  
340 and religious donations.

## 341 **4 Discussion and conclusion**

342 Past studies have shown that prosocial and religious people donate more to various charities. How-  
343 ever, given the possible arguments of a limited budget for multiple donations and a substitutability  
344 among them, as suggested by Selten and Ockenfels (1998), the effects of religiosity and prosociality

345 might take different forms for religious and nonreligious donations. Past studies on voluntary donations  
346 have not considered such possibilities extensively. In addition, few studies have discussed voluntary  
347 donations in developing countries. Thus, this paper has examined this phenomenon for religious and  
348 humanitarian donations by analyzing a survey-experiment data from a developing country, Bangladesh.  
349 Our result has suggested that as the degree of religiosity is intensified, people tend to donate more to  
350 religious activities at the expense of humanitarian donation. We argue that such different effects of reli-  
351 giosity originate from limited sources for donations and the substitutability between humanitarian and  
352 religious donations. The analysis also has presented that social value orientation is an important pre-  
353 dictor for humanitarian donation, but not for religious donation, such that the prosocials donate more to  
354 humanitarian activities than the proselfs. Our results conclude that to maintain humanitarian donations,  
355 religiosity may not be a panacea but prosociality is rather needed for a society.

356 Moreover, our study presents some important implications in a dynamic sense. Many studies show  
357 that culture determines human behavior of competitiveness, fairness, equity and trust (Boyd and Rich-  
358 erson, 1985, Henrich and Mcelreath, 2003, Henrich et al., 2005, Dawkins, 2006, Richerson and Boyd,  
359 2008). Shahrier et al. (2016, 2017) demonstrate that a proportion of proself people increases with the  
360 modernization of societies, including urbanization and economic development. As economic devel-  
361 opment proceeds over time, the number of cities and city dwellers has increased drastically in Asia  
362 and Africa, and the projection says that by 2050, 75 % of the world urbanities will be located in these  
363 regions (American Association for the Advancement of Science, 2016, Wigginton et al., 2016). Our  
364 results imply that such ongoing modernization would have two contrasting effects on people's behav-  
365 iors of humanitarian donation. First, urbanization would promote humanitarian donation. Second, the  
366 modernization of a society would shift people's preferences from prosocial to proself, which results in  
367 the decline in the motivation of humanitarian donation. Whether or not the ongoing modernization  
368 promotes humanitarian donation depends on the balancing of the two effects.

369 Recently the importance of voluntary contribution has been emphasized to provide various social  
370 needs and public goods, particularly for socially vulnerable people. This trend will be more intense  
371 in the modernization process, so that the need of voluntary donation to humanitarian activities is ex-  
372 pected to increase in developing countries. Thus, the argument that proself people donate less than the

373 prosocials for humanitarian activities suggests one possibility that ongoing modernization in developing  
374 countries may cause the lack of humanitarian donation and the sustainability of humanitarian activities  
375 at risk. To mitigate it, some policy devices or institutions should be necessary to sustain humanitarian  
376 donation in developing countries through maintaining individuals' prosocial motive.

377 To this end we mention some limitations of our study. Our study did not measure the contextual  
378 effects of religious groups and the effects of social capital and social interactions on voluntary dona-  
379 tions. Future studies should discuss such issues in developing countries. Moreover, our framework  
380 and finding of substitutability between religious and humanitarian donations should be tested in other  
381 developing countries to be generalized. These caveats notwithstanding, it is our belief that this study  
382 provides the first example of the novel possibility of substitutability between religious and humanitar-  
383 ian donations in relation to the degree of religiosity. In addition, religiosity may not be a panacea but  
384 prosociality is rather needed for maintaining humanitarian donation. We suggest that some policy de-  
385 vices or cultural activities are necessary to keep up human's prosocial attitudes to sustain humanitarian  
386 donation in developing countries.

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