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ALTRUISTIC AND SELFISH MOTIVATIONS OF CHARITABLE GIVING: CASE OF THE HOMETOWN TAX DONATION SYSTEM IN JAPAN

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Altruistic and selfish motivations of charitable giving: Case of the hometown tax donation system in Japan

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Abstract

In Japan's hometown tax donation system, people can donate to municipalities where they are not resident and in return receive reciprocal gifts from the local governments of those municipalities. A large part of the donated amount can be deducted from their income and residence taxes. This study examined altruistic and selfish motivations in donating money to municipalities where people are not resident through that donation system; we did so using panel data of local governments for 2008–2015. We made the following key findings. (1) The Great East Japan earthquake increased the amount of money donated through that system for local governments with disaster victims. We considered that motivation altruistic. (2) A 1% increase in expenditure for gifts to donors led to a 0.61% increase in donations. We considered that motivation selfish. (3) Compared with donors not receiving gifts, providing gifts to donors led to a reduction in altruistic donations by almost 300%.

JEL classification: D64; H23; H84; Z13

Keywords: Altruism; Charitable giving; Hometown tax donation; Warm glow; Self-interest; Redistribution

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1. Introduction

In Japan, the system of hometown tax donation (HTD; *furusato nozei* in Japanese) was launched in 2008 with the aim of revitalizing regional economies suffering from depopulation and aging. According to data of the Statistical Bureau of the Ministry of Internal Affairs and Communication (MIC), total donations amounted to approximately 8 billion yen (US$80 million US $) in 2008; that figure reached 160 billion yen in 2015. Thus, total donations drastically increased 20-fold over a period of 8 years. HTD has increasingly permeated Japanese society. However, instead of actually supporting the intended municipalities, individuals tend to make donations for the purposes of self-interest because many municipalities provide gifts to donors (Sato 2017). The HTD system has resulted in the weakening of the public finances of many local governments (Hagami 2017a). Heated arguments among policy makers and researchers have taken place about issues related to the HTD system (e.g., Sato 2016a, b; Hagami 2017a, b; Bessho 2017).

As reflected in its name, the HTD program was initiated in consideration of people's attachment to and feelings of nostalgia for their places of origin; it may be considered a kind of formally planned, large-scale field experiment in terms of economic policy. With the HTD system, taxpayers can choose the municipality to which a portion of their tax money should be paid; this is in contrast to paying their residence and income taxes directly to the local government of their residence. Thus, taxpayers who make a donation to municipalities where they are not resident can to a certain extent receive tax deductions from such donations. Further, contributors can receive gifts from local municipalities as a result of such donations. Toward enhancing income redistribution for declined rural areas and reducing economic inequality between urban and rural areas, the HTD system offers urban residents an incentive for making a contribution.

In addition to matters of self-interest, such as tax deductions and gifts, the role of social values and norms is considered a key factor in enhancing this type of redistributive policy (e.g., Luttmer 2001; Luttmer and Singhal 2011; Klor and Shayo 2010). In the case of the Great East Japan earthquake of 2011, donations through the HTD program were an effective way of helping victims of the disaster; the amount of donations increased remarkably for the affected towns and villages (Otake 2016; Japan Times 2016). This is consistent with the findings of Ishino et al. (2011), who argued that an increase in altruism due to the Great East Japan earthquake spurred people to give to related charities, which increased the donors' feelings of happiness[4]. Such altruistic behavior appears to be stronger for individuals who feel a sense of nostalgia for badly affected areas[5]. Even during normal times, altruism can give rich people an incentive to redistribute their wealth to poorer people (Fehr and Schmidt 1999; Fong 2001). A kind of social capital, such as social ties, may induce high-income earners to opt for

[4] After the Great East Japan earthquake, people were more likely to trust individuals in areas that had been badly affected by the disaster (Yamamura et al., 2015).

[5] Favorable news about people's home areas makes them feel happy, partly because of a sense of identity and nostalgia for those areas (Yamamura, 2017).

income redistribution (Yamamura 2012). It was believed among policy makers that feelings of altruism and social capital would help make HTD effective in its aims.

However, the drastically increasing popularity of HTD in recent years does not appear to have been driven by altruistic sentiments for rural regions. Despite the HTD name, money can be sent anywhere under this scheme, and much of it goes to places that offer lavish gifts in return for donations (Nohara 2017). Under the HTD system, contributors can in effect buy the offered gifts at prices that are lower than market prices. Thus, the institutional failure of HTD may result in moral hazard problems. Consequently, as pointed out by Sato (2016a, b, 2017), the HTD system harms the culture of charity. In contrast to its initial purpose, it is possible that the HTD system deteriorates social capital and hampers charitable behavior of support for a person's hometown.

Despite increasing policy debate, research has not examined the influence of the Great East Japan earthquake on the amount of donations under HTD[6]. Further, it has not been determined how gifts received in return for donations reduce charitable donations spurred by altruistic motivations. Thus, in the present study, we addressed this issue using both panel data and cross-section data. Our main findings are as follows. The Great East Japan earthquake led to an increase in the amount of money donated through the HTD system for local governments with disaster victims. Providing gifts for donors produced a remarkable reduction in altruistic donations; the detrimental effect of the gifts was greater for areas with disaster victims. These findings indicate that offering gifts alters the norms regarding altruistic behavior related to making donations. Our results are consistent with norm changes as a consequence of monetary incentives, which are in conflict with the original purpose of altruistic incentives (Gneezy and Rustichini 2000a; b).

Recently, tax issues been analyzed from the perspective of behavioral economics (e.g., Blumenthal et al. 2012; Null 2010; Slemrod 2010). The "warm glow" effect and charitable giving have been analyzed in experimental settings (e.g., Crumpler and Philip 2008; Eckel and Philip 2003, 2006). However, systems like HTD, in which contributors can receive reciprocal gifts, have not operated in other countries. Tax systems accompanied by deductions and gifts have not been analyzed using statistical methods; however, many empirical works have dealt with the issue of tax and charity (e.g., Auten et al. 2002; Ackerman and Auten 2011; Allgood 2009; Bakija and Heim 2011; Cordes 2012; Duquette 1999; Greene and McClelland 2001; Scharf and Smith 2015; Slemrod 1989; Tiehen 2001). Further, except for Brooks (2002) and Ishino et al. (2011), studies analyzing charitable issues have not been sufficiently undertaken other than in Western countries. From the viewpoint of behavioral tax economics, the present paper aims to offer findings toward improving tax policies about charitable donations in non-Western countries in the novel setting of Japan.

The remainder of this paper is organized as follows. In section 2, we overview the current situation

[6] As was observed in the boost of volunteer activity in response to the Great Hanshin earthquake of 1995, people tend to support other people in a time of crisis, such as a natural disaster (Yamamura 2016). Official development assistance has surged in the aftermath of large natural disasters (Becerra et al. 2014).

in Japan with respect to the HTD system. We present our testable hypotheses in section 3. Section 4 provides an explanation of the data and empirical method used. Section 5 presents our estimation results and their interpretation. The final section offers conclusions.

2. System overview

In Japan, the local tax law requires that people pay their inhabitant tax to the prefectures and the municipalities of their residence. In this paper, we limited our sample to municipalities. Previously, people could not decide the municipality to which they paid their taxes. However, when the HTD system was instituted in 2008, it offered individuals the chance to use their tax money to help rural areas struggling with falling populations and shrinking revenues. After HTD was introduced, people were able to choose the local governments to which they paid their taxes.

When people make such tax donations, it is thought they increase their subjective well-being if the donation helps improve the situation of the selected municipalities. If so, it is important for the contributors to know or specify how their donations will be used, such as helping parents with young children or environmental projects. In most cases under HTD, people who send donations can designate how the donations should be used. Table 1 shows the definition of variables used in our estimation, with the mean values based on 2015 data. *RIGHT* is a dummy that takes 1 if a local government allows contributors to specify how their donations are used, otherwise 0. The mean value of *RIGHT* is over 0.90. This means that over 90% of local governments in Japan allow contributors to specify how their donations should be used.

After World War II in Japan, a massive migration took place from rural agricultural areas to urbanized areas; migrants' attachments and nostalgia for their home areas influenced their subjective well-being (Yamamura 2017). The original purpose of HTD was to revitalize local governments encountered difficulties: charitable donations appear to be driven by such types of social capital as non-market social networks between rural and urban areas[7]. Thus, the initial effectiveness of HTD depended on warm glow, which is defined as the positive emotional feeling people derive from helping others (Andreoni 1989, 1990).

With the HTD system, contributors can enjoy the benefits of rationally pursuing their self-interests. The amount of donations can be deducted from their local income tax. Donations of over 2,000 yen are eligible for full tax deduction. There is a limit to the amount a contributor can deduct: a contributor cannot make a contribution beyond that limit to offset taxes owed. As of 2015, that limit is up to 20% of people's residence and income taxes. That limit clearly depends on a person's annual income and family composition; thus, higher earners may claim greater deductions. Further, contributors can receive reciprocal gifts from the local governments to which they make donations. As of 2015, to simplify office procedures and for the convenience of contributors, contributors do not in principle

[7] Social capital has a great impact on various facets of daily life; however, with time, it has declined in the United States (Costa and Kahn 2003; Putnam 2000).

have to file a tax return in order to claim their deductions. Figure 1 illustrates the amount of donations made from 2008 to 2015; it indicates that the amount of donations increased, especially after 2014.

If one local government fails to receive donations because its residents make donations to other local governments, the amount of net revenue through taxes for the first government decreases (Bessho 2017). As a result, local governments compete to obtain larger donations. Local governments have been highly motivated to offer lavish reciprocal gifts by way of thanks to donors so as to increase the amount donated by contributors—even though the offering of such gifts does not follow the original purpose of the HTD system (Hagami 2017a, b)[8]. Web sites promoting the HTD program display such gifts, which can be easily exchanged for money or resold, such as home appliances, jewelry, precious metals, computers, and gift vouchers. Some of these gifts are worth 50% or more of the amount donated (Hagami, 2017b). To a certain extent, the drastic increase in the amount of donations shown in Figure 1 can be explained by the competition to provide these lavish gifts.

In 2017, some of those Web sites stopped displaying such gifts. That was in line with the MIC's attempts to deter local governments from providing the gifts since it deviated from the original purpose of HTD (Daily Yomiuri 2017a). Toward controlling competition among local governments, the MIC requested that they cap reciprocal gifts at 30% of the donated amount (Daily Yomiuri 2017b).

However, even after these revisions to HTD were implemented, the problem persisted. Hashimoto and Suzuki (2017) made the following calculation. Assuming an unmarried person with an annual income of 28.8 million yen living in City A contributes 1 million yen to Town B, they are eligible to a deduction of 0.998 million yen (2,000 yen is subtracted from the donated 1 million yen) from their taxes, which would ordinarily be paid to City A. Then, from Town B, they receive gifts with a market value of 0.3 million yen by paying only 2,000 yen. This implies that the contributor enjoys an economic benefit equivalent to 0.298 million yen. Town B increases its net revenue by 0.70 million yen (1 million yen minus 0.3 million yen). However, the net revenue of City A is reduced by 0.998 million yen (1 million yen minus 0.002 million yen)[9].

With a different initial assumption, the same calculation indicates that a person with an annual income of 3 million yen can contribute only 0.028 million yen but receive gifts at a value of 8,400 yen. The contributor therefore has the economic benefit of 6,400 yen. Thus, under the HTD system, a person with an annual income of 28.8 million yen receives a greater economic benefit—of roughly 0.29 million yen—than someone with an income of 3 million yen. This example clearly shows that HTD increases inequality between high and low earners. Further, HTD has widened economic

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8 One official commented, "We thought sending people attractive goodies would make it look like we are pressuring them to repeat their donations to us. Rather we want donors to feel genuinely motivated to support our policy" (Osaki 2014).

9 Local allocation tax grants will be allocated to City A to partly compensate for the reduction in the amount of revenue (Bessho 2017). Local allocation tax grants are sourced in part from Japanese government bonds. Therefore, the reduced revenue of City A is considered to be paid through future taxes gathered from all over Japan. Bessho (2017) pointed out that current net benefits to contributors come from the burden of future generations of people throughout Japan.

inequality among local governments with small amounts of tax revenue (Sato 2017). Such unexpected effects of HTD are clearly at odds with its original purpose in reducing economic inequality between urban and rural areas.

Devastating disasters often occur in Japan, such as the Great Hanshin earthquake, the Great East Japan earthquake, and the Kumamoto earthquake of 2016. HTD is an effective way of helping areas hit by such disasters. In the case of a disaster, people making HTD donations to affected communities do not obtain reciprocal gifts (Japan Times 2016; Otake 2016). Figure 1 compares the amount donated under HTD between local governments with victims of the Great East Japan earthquake and those without; it covers the period before and after the disaster. There was surge in donations following that earthquake in March 2011. Thereafter, its effect persisted until 2015, although the gap in the amount donated to areas with and without victims decreased with time. Even without the gift incentive, the disaster remarkably increased the level of donations. This finding indicates the possibility that people feel motivated to make donations to disaster-affected areas based on altruistic rather than selfish reasons. Thus, there are two types of donations: those based on selfish and on altruistic motivations.

3. Hypotheses

From the previous section, it is evident that there are two types of contributors: altruistic and selfish ones. Such disasters as earthquakes occur almost randomly in many parts of Japan. Accordingly, the occurrence of a devastating disaster in one area leads people living in other areas to reflect on what might happen if a similar disaster struck them. This situation raises the awareness of disaster prevention throughout Japan. Further, frequent disaster experience forms the basis for cooperation and undertaking reciprocal behavior; that in turn enhances volunteer activity (Yamamura 2016) and helps reduce the overall damage (Yamamura 2010). People who consider a greater likelihood of a disaster occurring tend to be more altruistic. Even if altruistic individuals cannot participate in volunteer activities because of various constraints, they may support disaster-affected areas through charitable donations with the HTD system. Hence, we propose Hypothesis 1:

Hypothesis 1

An unexpected negative shock increases the altruistic motivation of people who do not directly suffer from the shock to donate to severely affected areas.

In terms of standard economics, financial incentives improve individuals' performance, but psychologists claim that incentives lower such performance. Gneezy and Rustichini (2000a, b) investigated this issue and found that subjects who were offered monetary incentives performed more poorly than those who were offered no compensation. According to their interpretation, policies and rules change an individual's perception of their social situation. Gneezy and Rustichini (2000b) analyzed the effect of rewards in an experimental performance related to an individual's IQ test score.

In the experiment, the authors asked the subjects to solve a set of 50 questions from an IQ test. They then compared the results of a group in which payment was promised for each correctly answered question with those of a group that was not offered any money. The authors found that the scores of individuals who received a small amount of compensation were lower than those without any financial incentives.

Those results indicate that mentioning payment is sufficient to alter perceptions of a contract: from a service (due to them as subjects in a experiment) to market exchange. In a similar manner, offering gifts in exchange for donations may change the meaning of the donations; that then influences people's perceptions and their charitable behavior. In the real-world situation with the HTD system, offering gifts in exchange for donations leads people to regard a purely charitable donation (stemming from warm glow) to one of market exchange, driven by self-interest. Thus, introducing gifts increases donations from people with selfish motivations; however, it decreases donations from people with altruistic motivations. Accordingly, we derive the next hypothesis:

Hypothesis 2

Providing gifts to increase self-interest reduces the altruistic incentive to contribute, whereas it increases the selfish incentive to contribute.

4. Material and methods

4.1. Data

In this study, we used a local government-level panel dataset of the amounts of HTD donations. The data included all 1,741 local governments throughout Japan and covered the period 2008–2015, which amounted to 13,918 observations. The data are available from the Web site of the MIC[10]. The key variables were the number of victims of the Great East Japan earthquake for each local government and a dummy for local governments that suffered damage as a result of the subsequent tsunami. With local government-level panel data, it is difficult to obtain control variables that cover all local governments over a study period. So we obtained only the amount of taxable income, which provided 13,918 observations that completely matched the amount of donations.

In addition to panel data estimations to determine the effect of the disaster, we used a different cross-sectional dataset for 2015 to assess the effect of donation gifts and other control variables. The reason for restricting the data to 2015 is that details of the costs involved in providing gifts are available only for 2015. The dummy for the right to designate how donation money was to be used could also be obtained from the MIC dataset. We gathered other variables (such as population, proportion of elderly households, and rate of workers in primary industry in a year prior to 2015) for estimations and treated them as predetermined control variables. The mean values of the variables for

[10]Data are available at http://www.soumu.go.jp/main_sosiki/jichi_zeisei/czaisei/czaisei_seido/furusato/topics/20160614.html (accessed 02.08.16)

the two groups (local governments with and without victims) appear in Table 1. The sources of those variables are shown in the footnote to Table 1.

Figure 2 shows the relationship between the amount donated in 2011 and the number of disaster victims for each local government. It is evident from Figure 2 that the number of victims was positively related to the amount donated; this implies that the greater the damage, the larger was the amount donated. This finding is consistent with that of Ishino et al. (2011), who found that the Great East Japan earthquake increased the altruistic motivation to make charitable donations.

Figure 3 uses the full sample of our data for 2015 to demonstrate the relationship between the amount donated and amount received as gifts. In Figure 3, many plots are evident beside the vertical axis, indicating that many local governments obtained donations without having to offer gifts. Two regression lines appear based on the full sample and on the sample where gifts are greater than 0. Both lines show a positive slope. Thus, the greater the amount of the gift, the larger was the amount donated: the return increased the selfish motivation to contribute. Values for both the vertical and horizontal axes are in log form, and so the slope indicates elasticity. If elasticity is less than 1, the increase in the gift amount is greater than the increase in the amount donated. In Figure 3, neither regression line is steeper than 45°, which means that elasticity is below 1. From the perspective of local governments, increasing the gift amount does not generate a net benefit. If a local government offers no gift, its revenue likely diminishes because residents may contribute to other governments (Hagami 2007b). Thus, even if its net benefit is reduced by offering the gift, the local government provides the gift to avoid a decline in revenue.

If donations without gifts are removed from the sample, the slope in Figure 3 becomes steeper and the intercept moves downward. This indicates that people with selfish motivations are more sensitive to the monetary value of a gift. Conversely, a decrease in the intercept means that people with altruistic motivations are less likely to contribute if a gift is offered. The gap between the intercepts of the two slopes can be interpreted as reflecting the degree of reduction in altruistic donation as a consequence of offering a gift. The greatest amount of donations is at around 15 on the vertical axis and at 15 for gifts on the horizontal axis. Among the records without a gift at 0 on the horizontal axis, the greatest donation is at around 13, which is clearly less than 15. Hence, offering gifts provides a strong motivation to make large donations than offering no gifts.

In a similar manner, Figure 4 presents the sample of local governments with disaster victims. Unlike with Figure 3, the largest values of donations on the vertical axis (when a gift is not provided) are almost the same as the largest values on the horizontal axis. This means that the amount of donations from altruistic motivations (driven by warm glow for damaged areas) are almost equivalent to those from selfish motivations (driven by financial advantage). Considered together, Figures 3 and 4 indicate that contributing to municipalities with disaster victims seemingly comes from altruistic motivations; offering financial motivations gives a signal of market exchange, and so altruistic individuals cannot feel warm glow from donating, resulting in decreased donations.

Using the data for 2015, Table 2 presents the results of the mean difference test in the amount

donated between local governments with and without disaster victims and between those offering and not offering gifts. Among local governments without victims, the amount donated was larger when a gift was offered than when it was not offered; the difference is statistically significant at the 1% level. Further, the amount donated when a gift was offered was roughly 6.5 times larger than when a gift was not offered. Therefore, people rationally respond to a financial incentive to contribute. It is interesting that we found no statistical difference between gifts being offered and not being offered among municipalities with disaster victims. Therefore, individuals who made donations to towns and villages with such victims were not influenced by financial incentives. Further, among municipalities that did not offer gifts, the amount donated to local governments with disaster victims was significantly (2.5 times) larger than to those without victims.

What we observe in Figures 1–4, and Table 2 is in line with the findings of Gneezy and Rustichini (2000a, b). However, it is necessary to examine the situation based on statistical evidence, which we do in the following section.

4.2. Econometric framework and estimation strategy

To examine our proposed hypotheses, the estimated function of the baseline model takes the following form:

$$Ln(DONAT)_{it} = \alpha_1 LN(DEATH)_i * After\ disaster_t + \alpha_2 After\ disaster_t + \alpha_3 Ln\ (INCOM)_{it} + e_i + k_t + u_{im},$$

where $Ln(DONAT)_{it}$—log values of *(DONAT+1)*—represents the dependent variable in local government i and year t. To control for differences in scale among local governments, *DONAT, DEATH*, and *INCOM* are in log form. Regression parameters are represented by α. Unobservable time-invariant features of a local government are controlled by e_i. Time-specific effects, such as macro shock, are controlled by k_t, (year dummies). The fixed-effects model is thus used for the baseline model. The key variable to test Hypothesis 1 is the cross term *LN(DEATH)* $_i$ * *After disaster Ln(DONAT).* The Great East Japan earthquake mainly affected three prefectures: Iwate, Fukushima, and Miyagi. The earthquake led to a tsunami, which caused devastating damage in coastal areas. Though some municipalities were affected by the tsunami, they had no disaster victims. Hence, in alternative specifications, instead of *LN(DEATH), TSUNAMI* or *PREFEC_3* are used to capture areas badly affected by the disaster. If Hypothesis 1 applies, the coefficient of *LN(DEATH), TSUNAMI* and *PREFEC_3* has a positive sign. *Ln(DONAT)* can be 0 because some local governments received no donations. And so in addition to the fixed-effects model, we used the random Tobit model for estimations (Greene 2008). In the fixed-effects model, *POP, ELDRAT*, and *AGRAT* are completely captured by e_i; that is because those variables are constant values during the study period owing to data limitations, as noted earlier. However, in the random Tobit model, those variables can be included to show their impact on donations.

In addition to the panel estimation, we used cross-section data for 2015 to analyze the effect of gifts and other key variables: those variables were only available for 2015. We used the Tobit model

when *Ln(DONAT)* was 0; otherwise, we used the OLS model. The functional form is

$$Ln(DONAT)_i = \alpha_0 + \alpha_1 GIFT_i + \alpha_2 Ln(RETURN)_t + \alpha_3 LN(DEATH)_i + \alpha_4 Ln(INCOM)_i + \alpha_4 RIGHT_i + \alpha_5 Ln(POP)_i + \alpha_6 ELDRAT_i + \alpha_7 AGRAT_i + u_{im},$$

Apart from *LN(DEATH),* the key variables are *GIFT* and *Ln (RETURN)*, which capture the selfish incentive to make a donation. For selfish people, the return from donations takes the form of the economic value of a gift, which increases the amount donated. Conversely, for altruistic people, offering a gift reduces the warm glow motivation. Thus, if Hypothesis 2 holds, the predicted sign for *RETURN* and *GIFT* (dummy for offering a gift) is positive and negative, respectively. Among control variables, there is decreased likelihood of making donations to areas where higher earners reside. Further, the proportion of elderly people is considered to reflect the degree of economic decline in an area. Hence, *Ln (INCOM)* and *ELDRAT* are predicted to have negative and positive signs, respectively. The right of a contributor to designate how their donation is used increases the motivation to contribute. Thus, we predicted a positive sign for *RIGHT.* Goods from primary industry are preferred by contributors (Nohara 2017). Thus, the amount of donations increases as primary industry develops to provide appropriate gifts. Viewed differently, the proportion of workers in rural areas in primary industry is relatively high. If urban residents originally from rural areas feel an attachment to those areas, they feel motivated to contribute. We predicted that *AGRAT* would have a positive sign.

5. Results and discussion

Tables 3 and 4 present the estimation results based on the panel data. In Table 3, the results of the fixed-effects model appear in columns 1–3; those of the random Tobit model appear in columns 4–6. Table 4 shows the results of the random Tobit model, including the control variables. Table 3 shows the positive sign of the cross terms *Ln(DEATH)* After disaster, TSUNAMI* After disaster*, and *PREFEC_3*After disaster*; they are statistically significant at the 1% level and appear in columns 1–6. The same results appear in Table 4, where other control variables are included. Hence, Hypothesis 1 is strongly supported. Concerning control variables, the coefficient of Ln(*INCOM*) shows a negative sign, whereas those of *ELDRAT* and *AGRAT* are positive. Further, they are statistically significant. These findings are consistent with our predictions.

Tables 5 and 6 indicate the results using the cross-section data for 2015. Here, we focus on *Ln (DEATH)* as the proxy for the degree of damage from the disaster. Table 5 shows that *Ln(DEATH)* and *Ln(RETURN)* have a positive sign and are statistically significant at the 1% level in columns 1 and 2. This indicates that both the degree of damage and offering of gifts increased the amount of donations. Thus, both selfish and altruistic motivations led to increased donations. The effect of offering gifts in exchange for donations appears in the coefficient of *GIFT.* There is a negative sign for *GIFT*, which is statistically significant at the 1% level, in column 2 in Table 5; its absolute value of coefficient is 2.93. This suggests that compared with offering a gift, donations increase by 293% with no gift being

offered. Therefore, the amount donated is roughly four times greater without a gift than with a gift on offer. This can be interpreted as people with altruistic incentives being unlikely to make a donation if a gift is being offered. By contrast, as seen in column 2 in Table 5, the absolute value of the coefficient of *Ln(RETURN)* is 0.61; this suggests that a 1% increase in the monetary value of a gift leads to a 0.61% increase in the amount donated. This supports Hypothesis 2**.** The coefficient of *RIGHT* has a significant positive sign, and its value is 0.32. Thus, people increase their donations by 32% if they can specify how their donations are used. *Ln(INCOM)* has a significant negative sign, which is consistent with predictions: contributors are unlikely to make donations to rich areas. *ELDRAT* and *AGRAT* have a positive sign, which is statistically significant. This implies that people tend to contribute to rural areas with aging populations and shrinking economies. Therefore, HTD is, to a certain extent, effective in fulfilling its original purpose. From Table 5, it is evident that both altruistic and selfish contributors are motivated to make donations under the HTD system. However, the detrimental effect of offering gifts for donations among altruistic contributors is overwhelmingly greater than the positive factors for increasing donations.

To compare areas with and without disaster victims, we divided our sample into two sub-samples and conducted an estimation. Table 6 exhibits the results. By definition, we could not include *Ln(DEATH)* for estimations based on a sub-sample without victims. Hence, apart from specifications common to different sub-samples, we report additional specifications in which *Ln(DEATH)* is included based on a sub-sample with victims. *Ln(RETURN)* shows a positive sign and is statistically significant at the 1% level in all columns, regardless of the sub-sample and specification. Further, the value of the coefficient of *Ln(RETURN)* becomes larger if *GIFT* is included. This is in line with Figures 3 and 4: the slope of the regression line becomes steeper if the sample is restricted to local governments offering gifts. Further, *GIFT* shows a negative sign and is statistically significant at the 1% level in columns 4 and 6. This is congruent with Figures 3 and 4: the constant on the vertical axis moves downward once the sample is restricted. Thus, we simultaneously observe the negative effect of offering a gift and the positive effect of the amount of the gift. The absolute value of *GIFT* is 3.66 in column 4, whereas it is 2.86 in column 6. This can be interpreted as implying that offering a gift reduces the amount donated by 366% and 286%, respectively, for local governments with and without disaster victims. Accordingly, the negative effect of *GIFT* on altruistic donations is 80% greater for areas with victims than those without.

The above findings are in line with those of Gneezy and Rustichini (2000a, b). We found that the market incentive offered through a gift in return for donation changes the individual's perception about the social and economic situation in which they are contributing. We determined that offering a gift altered the meaning of donation: from the degree of warm glow to payment for buying goods in market exchange. The effect of offering such gift is considered greater in the case of seriously damaged areas, where most donations appear to be based on altruistic motivations.

The aim of the HTD system was to reduce economic inequality between poor rural and rich urban areas through charitable donations. One study found that voluntary charitable giving increases with

inequality aversion among high-income individuals (Derin-Güre and Uler 2010). Therefore, HTD would be effective in reduce inequality if the system were appropriately constructed. The original HTD aimed to promote competition among local governments by considering the effectiveness of a redistribution policy if charitable donations were offered. Competition in the form of gifts being offered in exchange for donations does not actually increase efficiency: large donations by high-income earners to receive lavish gifts increases the burden on others (Sato 2016a, b, 2017). The formal HTD system promoted by the national government possibly crowds out charitable donations through non-profit organizations (Dokko 2009). HTD generates moral hazard and rent-seeking behavior taken by those who are allowed to sell their products through this system. Further, as we have observed, offering gifts reduces altruistic incentives and promotes selfish ones.

6. Conclusion

The HTD was intended to reduce economic inequality between urban and rural areas by income redistribution, promoting donations from rich urban to poor rural areas. However, HTD has actually widened economic inequality between high- and low-income earners (Hashimoto and Suzuki 2017). Further, as a consequence of permeation of HTD, local revenue inequality has widened among local governments with small tax revenues (Sato 2017). The public finances of many local governments have worsened owing to HTD (Hagami 2017a). It is necessary to investigate the reason for HTD not functioning well and having resulted in this unexpected outcome.

The HTD system was planned on the assumption that urban residents would tend to have altruistic motivations in supporting rural areas to which they felt attached although they were not resident there. We examined whether that assumption was valid from the perspective of behavioral economics, using panel data from local governments for 2008–2015. We found the following. (1) The Great East Japan earthquake increased the amount of money donated through the HTD system for local governments with disaster victims. We consider that motivation altruistic. (2) A 1% increase in expenditure on reciprocal gifts for donors led to an 0.61% increase in donation. We consider that motivation selfish. (3) Providing gifts for donor led to an approximately 300% reduction in altruistic donations compared with the case in which donors did not receive gifts. Thus, offering reciprocal gifts leads to a reduction in donors with altruistic motivations and an increase in donors with selfish motivations. Furthermore, offering gifts reduced altruistic donations to municipalities with disaster victims by 366%; it reduced altruistic donations to municipalities without those victims by 286%.

In this study, we found two different motivations for donation: gifts increased selfish and reduced altruistic motivations. Accordingly, there is a trade-off between selfish and altruistic motivations. Further, in contrast to municipalities without disaster victims, municipalities with victims offering gifts had greatly reduced altruistic donations and an increase in smaller selfish donations. Generally speaking, the amount of donations to local governments providing gifts was far larger than those that did not provide such gifts. However, once we restricted our sample to local governments with disaster victims, we observed no significant difference in donations between those providing and not providing

gifts. In our interpretation, providing a motivation to selfish donors greatly reduced altruistic donations to local governments seriously affected by the disaster. On the whole, local government with victims, providing gifts did not increase the total amount of donations because of both positive and negative effect on donations.

From our findings, it is evident that reciprocal gifts are liable to distort the original purpose of the HTD system. There is the negative externality from the HTD, which is reduction in tax revenues for urban municipalities through tax deductions for selfish contributors, who are effectively buying the gifts at less than market price. The rules of the HTD system should be revised to reduce that negative externality and deter selfish behavior. The rules should also be amended to enhance altruistic behavior in supporting local areas. Local governments can play a role by promoting local industry and activating market exchange. It is possible that high-quality local goods are not being well advertised and so do not fulfill their potential demand. Local goods can be sold on the market if consumers are informed about them. However, owing to lack of know-how about advertising or funding, the goods are not purchased. Thus, local governments need to advertise appropriately and spread information about their goods to markets so as to revitalize local industry. Hence, we make the policy suggestion that local governments should promote their own goods in the market by appropriate advertising rather than offering gifts at greatly reduced prices. An amended HTD system would avoid the moral hazard problem. Voluntarily charitable donations are believed to be effective in reducing the economic inequality between rich urban and poor rural areas if the donations do not have a detrimental effect on market mechanisms. Donations based on an individual's choice are preferable to compulsory government redistribution.

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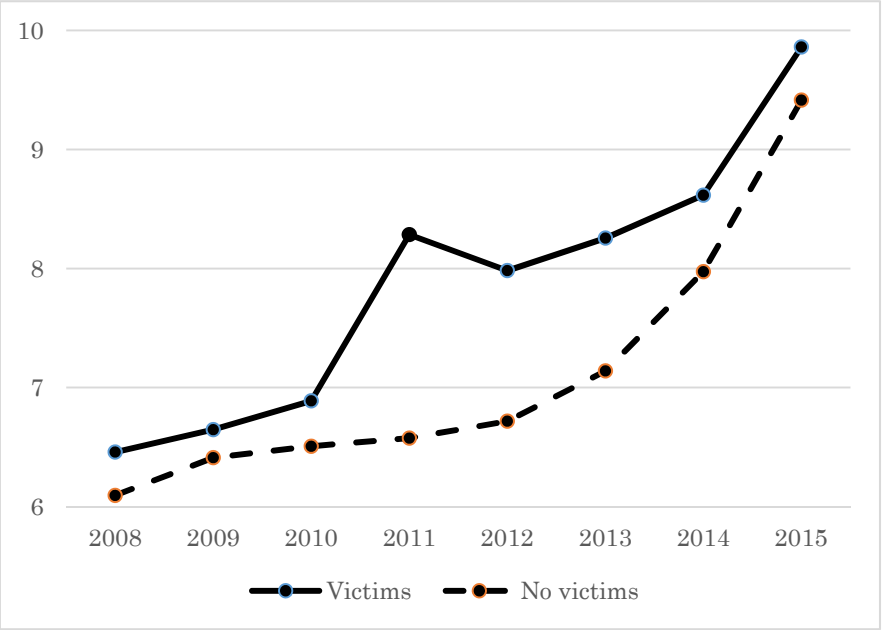

Figure 1. Difference in the log form amount in the hometown tax paid to local governments with and without victims of the Great East Japan earthquake

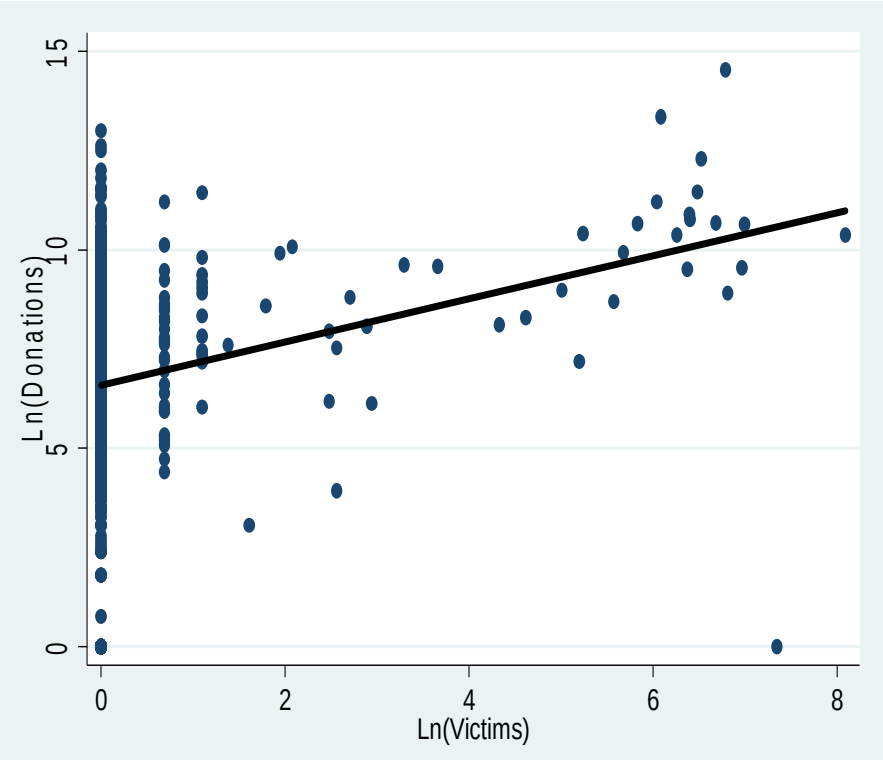

Figure 2. Relationship between the log form amount of hometown tax paid in 2011 and number of victims of the Great East Japan earthquake of that year

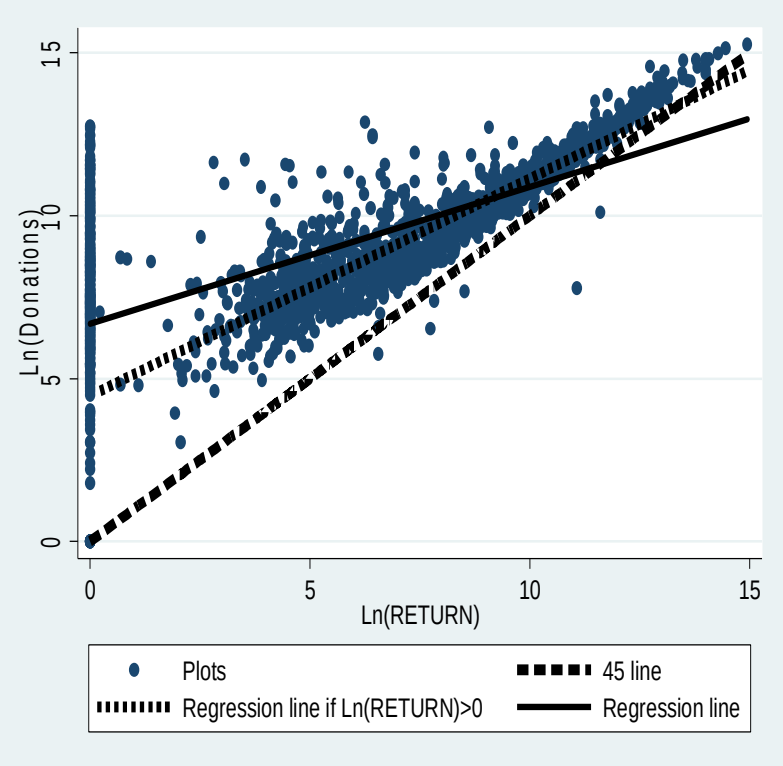

Figure 3. Full sample: relationship between the log form amount of hometown tax and log of the return for contributors in the form of gifts (local government data) in 2015

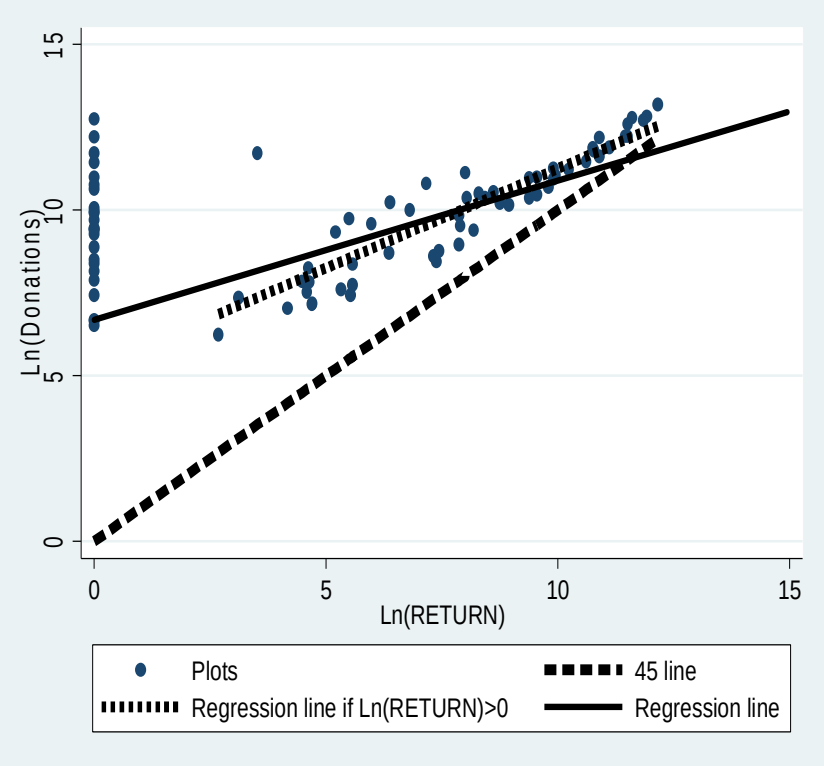

Figure 4. Restricted sample of local governments with disaster victims: relationship between the log form amount of hometown tax and log of return for contributors in the form of gifts (local government data) in 2015

Table 1. Definition of variables and mean values for governments with and without disaster victims in 2015

	Definition	Government with victims	Government without victims
DONAT [a]	Amount of payments in hometown tax donation system (million yen)	65.5	94.7
GIFT [a]	Takes 1 if local government provided reciprocal gift in return for donations	0.70	0.82
DEATH [b]	Number of victims of Great East Japan Earthquake for local government	196	0
DEATH_DM [b]	Takes 1 if there are victims of Great East Japan Earthquake for the local government, otherwise 0	1	0
PREFEC_3	Takes 1 if local governments located in three main prefectures affected by Great East Japan earthquake (Fukushima, Iwate, Miyagi), otherwise 0	0.55	0.05
TSUNAMI[c]	Takes 1 if local government damaged by tsunami following Great East Japan earthquake, otherwise 0.	0.55	0.004
RETURN [a]	Monetary value of reciprocal gifts: total cost to local government of gifts (million yen).	17.4	37.0
INCOM [d]	Amount of taxable income (billion yen)	264.0	96.8
RIGHT [d]	Takes 1 if local government allows contributors to specify how donations are used, otherwise 0	0.95	0.90
POP [d]	Population (thousands)	162.5	69.2
ELDRAT [d]	Rate of elderly households (number of households with people aged over 65 years / total number of household)	0.10	0.12
AGRAT [d]	Rate of workers in primary industry (Workers in primary industry / all workers)	0.07	0.11

Notes: Sources of variables are

a. Web site of Ministry of Internal Affairs and Communications: Furusato-nozei portal site. http://www.soumu.go.jp/main_sosiki/jichi_zeisei/czaisei/czaisei_seido/furusato/topics/20160614.html. (accessed 19.08. 16)

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Web site of Iwate Prefecture, http://www.pref.iwate.jp/

Web site of Miyagi Prefecture, http://www.pref.miyagi.jp/site/ej-earthquake/(accessed 19.08.16)

c. Web site of Ministry of Agriculture, Forestry and Fisheries http://www.maff.go.jp/j/tokei/census/afc/2010/saigai.html (accessed 22.08.16).

d. Web site of Statistics Bureau, Ministry of Internal Affairs and Communications. http://www.stat.go.jp/data/ssds/(accessed 19.08.16)

Table 2. Comparison of DONAT between local governments with and without the victims in 2015 (million yen)

	With victims 1	Without victims 2	Difference in *DONAT* 2–1	*t* values
GIFT=0 (I)	44.3	17.6	–26.7	–2.57**
GIFT=1 (II)	74.5	111.5	37.0	0.87
Difference in *DONAT* (II)–(I)	30.1	93.9		
t values	1.25	5.05***		

Note: ** and *** indicate significance at the 5% and 1% levels, respectively.

Table 3. Estimations using panel data; baseline model—dependent variable is ln (*DONAT)*

	Fixed effects			Random Tobit		
	1	2	3	4	5	6
Ln(DEATH) *After disaster	0.21*** (5.81)			0.20*** (5.33)		
TSUNAMI *After disaster		0.87*** (5.40)			0.86*** (5.06)	
PREFEC_3 *After disaster			0.30*** (2.89)			0.29*** (2.63)
Ln(DEATH)				0.11* (1.79)		
TSUNAMI					0.07 (0.27)	
PREFEC_3						0.31* (1.67)
After disaster	3.31*** (54.6)	3.21*** (54.5)	3.31*** (54.0)	3.41*** (60.4)	3.41*** (60.4)	3.41*** (60.0)
Ln(INCOM)	0.34 (1.10)	0.24 (0.77)	0.09 (0.31)	0.30*** (10.9)	–1.22*** (–6.84)	0.31*** (11.2)
Left-censored observations				784	784	784
Wald statistics				5,729	6,100	5,687
within R-square	0.32	0.32	0.32			
Groups	1,741	1,741	1,741	1,741	1,741	1,741
Observations	13,918	13,918	13,918	13,918	13,918	13,918

Note: Numbers in parentheses are *z* statistics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. In all estimations, year dummies are included as independent variables but are not reported because of space limitations.

Table 4. Estimations using panel data; models with time-invariant control variables—dependent variable is ln (*DONAT)*

	Random Tobit		
	1	2	3
*Ln(DEATH) *After disaster*	0.17*** (4.54)		
*TSUNAMI *After disaster*		0.76*** (4.47)	
*PREFEC_3 *After disaster*			0.25** (2.29)
Ln(DEATH)	0.11** (1.96)		
TSUNAMI		0.21 (0.82)	
PREFEC_3			0.42** (2.35)
After disaster	3.27*** (55.6)	3.26*** (55.4)	3.27*** (55.2)
Ln(INCOM)	–1.17*** (–6.53)	–1.22*** (–6.84)	–1.19*** (–6.59)
Ln(POP)	2.02*** (10.5)	2.08*** (10.8)	2.06*** (10.7)
ELDRAT	12.1*** (9.53)	12.1*** (9.53)	12.7*** (9.82)
AGRAT	4.39*** (8.15)	4.37*** (8.10)	4.26*** (7.92)
Left-censored observations	784	784	784
Wald statistics	6,100	6,087	6,070
Groups	1,739	1,739	1,739
Observations	13,912	13,912	13,912

Note: Numbers in parentheses are *z* statistics. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. In all estimations, year dummies are included as independent variables but are not reported.

Table 5. Estimations using data in 2015. Baseline model: dependent variable is ln (*DONAT)*

	Tobit	
	1	2
GIFT		–2.93***
		(–17.0)
Ln(RETURN)	0.38***	0.61***
	(31.2)	(54.0)
Ln(DEATH)	0.13***	0.11***
	(3.29)	(3.42)
Ln(INCOM)	–0.36	–0.58***
	(–1.62)	(–2.81)
RIGHT	0.31**	0.32**
	(2.26)	(2.32)
Ln(POP)	0.89***	1.02***
	(3.66)	(4.55)
ELDRAT	2.32**	1.90*
	(2.02)	(1.88)
AGRAT	2.90***	2.30***
	(5.98)	(5.62)
Left-censored observations	12	12
Pseudo-R-square	0.20	0.26
Observations	1,739	1,739

Note: Numbers in parentheses are *z* statistics calculated based on robust standard errors. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. In all estimations, the constant is included as an independent variable but not reported.

Table 6. Estimations using data in 2015; sub-sample estimations—dependent variable is ln (*DONAT)*

	With victims				Without victims	
	OLS				Tobit	
	1	2	3	4	5	6
GIFT			–3.89***	–3.66***		–2.86***
			(–5.81)	(–5.31)		(–17.0)
Ln(RETURN)	0.22***	0.22***	0.56***	0.54***	0.40***	0.61***
	(5.26)	(5.35)	(9.44)	(8.82)	(31.0)	(58.3)
Ln(DEATH)		0.17***		0.10**		
		(2.98)		(2.17)		
Ln(INCOM)	–0.24	0.58	–1.08	–0.56	–0.49**	–0.66***
	(–0.31)	(0.98)	(–1.53)	(–0.87)	(–2.13)	(–3.10)
RIGHT	0.75	0.16	0.07	0.12	0.29**	0.30**
	(0.22)	(0.43)	(0.14)	(0.26)	(2.06)	(2.18)
Ln(POP)	0.88	0.02	1.54*	1.01	1.00***	1.09***
	(1.06)	(0.04)	(1.97)	(1.43)	(4.06)	(4.75)
ELDRAT	–4.37	–4.10	–9.34	–8.96	2.27*	1.99*
	(–0.54)	(–0.53)	(–1.33)	(–1.29)	(1.95)	(1.93)
AGRAT	4.87	6.04	1.28	2.19	2.73***	2.21***
	(1.16)	(1.38)	(0.51)	(0.79)	(5.67)	(5.39)
Left-censored observations	0	0	0	0	12	12
R-square	0.42	0.46	0.64	0.66	0.21	0.26
Observations	81	81	81	81	1,658	1,658

Note: Numbers in parentheses are *t* statistics and *z* statistics, respectively. These statistics are calculated based on robust standard errors. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. Pseudo-R-square is reported in columns 5 and 6. In all estimations, the constant is included as an independent variable but not reported.