Altruistic and selfish motivations of charitable giving: The case of the hometown tax donation system (Furusato nozei) in Japan

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Abstract

This study analyzes the altruistic and selfish motivations of charitable giving in the context of Japan's hometown tax donation system, whereby people can donate to municipalities where they do not live and receive reciprocal gifts, using local government-level panel data for 2008–2015. We find that the Great East Japan earthquake led to an increase in donations through the system for municipalities with disaster victims, reflecting altruistic motivation. Furthermore, a 1% increase in gift expenditure for donors leads to 0.61% increase in donations, suggesting selfish motivation. Gift provision reduces altruistic donation by nearly 300%, compared with no such provision.

JEL classification: D64; H23; H84; Z13

Keywords: Altruism; Hometown tax donation; Self-interest; Redistribution.

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1. Introduction

In Japan, the system of Hometown Tax Donation (hereafter, HTD), also known as Furusato Nozei in Japanese, was launched in 2008 with an aim to revitalize regional economies that encountered depopulation and aging. As the name suggests, the HTD program was initially anticipated to rely on people's attachment and nostalgia to their hometown and so can be considered as large-scale field experiments planned formally as economic policy. According to data from the Statistical Bureau of Ministry of the Internal Affairs and Communication (hereafter, MIC), the total amount of donations was approximately 8 billion yen in 2008, which reached 160 billion yen in 2015, showing a drastic increase by 20 times in eight years. The HTD has been increasingly permeated in the Japanese society. However, in reality, rather than financially supporting local governments, people tend to make donations for the purpose of pursuing self-interest since many local governments provide gifts to donors (Sato, 2017). Consequently, the HTD has worsened the public finances of many local governments (Hagami, 2017a). There have been intensive debates among policymakers and researchers regarding the effectiveness of the HTD system, (e.g., Sato, 2016a, b; Hagami, 2017a, b; Bessho, 2017).

The HTD system enables taxpayers to direct a portion of their taxable income toward a local government of their choice, rather than paying their residential and income taxes directly to the local government of the area where they reside. In other words, people who make a donation to municipalities where they do not live can enjoy a certain amount of tax deduction through this donation. Furthermore,

contributors can receive local gifts in exchange for their donation. The HTD system provides urban residents with an incentive to contribute, in an attempt to enhance income redistribution toward financially poor rural areas, and to reduce urban-rural economic inequality.

In addition to self-interest factors, such as tax deductions and gifts, social values and norms are considered as a key factor in enhancing redistribution policy (e.g., Luttmer, 2001; Luttmer and Singhal, 2011; Klor and Shayo, 2010). In the case of the Great East Japan earthquake in 2011, donations through the HTD program were considered as an effective way of helping victims of natural disasters, and subsequently, the amount of donation remarkably increased for municipalities that were severely affected by the disaster (Otake 2016; Japan Times 2016). This is consistent with Ishino et al. (2012), who argued that an increase in altruism due to the Great East Japan earthquake spurred people to give to charity, and in turn feel happy[2]. Such altruistic behavior seems to be more pervasive for those who feel nostalgia for the damaged areas[3]. Even under ordinary circumstances, altruism can provide an incentive to the rich to redistribute their wealth to the poor (Fehr and Schmidt, 1999; Fong, 2001). Various dimensions of social capital, such as social ties, possibly encourage high-income earners to support income redistribution (Yamamura, 2012). Altruism and social capital are anticipated to make the HTD system effective.

However, the drastically increasing popularity of the system during these years does not seem to be

[2] People are more likely to trust others in the areas damaged by the Great East Japan earthquake after the earthquake (Yamamura et al., 2015).
[3] Favorable news about their hometown makes individuals feel happy, partly because of a sense of identity and nostalgia for hometown (Yamamura, 2017).

driven by altruism for the countryside. Belying the name of the HTD, money can be sent anywhere and much of it is being directed toward municipalities that offer lavish gifts in return (Nohara, 2017). Under the HTD system, contributors can purchase gifts at prices lower than the market prices. Thus, the institutional failure of the HTD may possibly induce the moral hazard problem. Consequently, as pointed out by Sato (2016a, b; 2017), the HTD system harms the culture of charity. As opposed to its initial purpose, the HTD system is likely to deteriorate social capital and hamper the charitable behavior to support an individual's "hometown."

Despite increasing policy debates, researchers have not examined the influence of the Great Eastern earthquake on the amount of donations under the HTD system[4]. Further, it is unknown how gifts received in return for donations reduce charitable donations driven by altruistic motivation. Thus, this study attempts to deal with this issue using both panel data and cross-section data. The major 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 to donors led to a remarkable reduction in altruistic donation, and this detrimental effect was larger for areas with disaster victims. These findings imply that offering gifts changes the norms of altruistic behavior related to donation. This is consistent with the argument of norm changes as a consequence of monetary incentives, which is in contrast to the original purpose of altruistic behavior (Gneezy & Rustichini, 2000a, b).

[4] As was observed in the boost of volunteer activity in response to the Great Hanshin Awaji earthquake in 1995, individuals tend to support others during a crisis, such as a natural disaster (Yamamura, 2016). Official Development Assistance (ODA) has surged in the aftermath of large natural disasters (Becerra et al., 2014).

Recently, tax issues have been analyzed from the perspective of behavioral economics (e.g., Blumenthal et al., 2012; Null, 2010; Slemrod, 2010). The warm-glow phenomenon and charitable giving have been analyzed in various experimental settings (e.g., Andreoni, 1989,1990; Crumpler & Philip, 2008; Eckel & Philip, 2003, 2006). However, systems like the HTD, in which contributors can receive reciprocal gifts, have not been introduced in other countries. So far, tax systems accompanied by deductions and gifts have not been analyzed using statistical methods, although a large number of empirical works have dealt with the issues of tax and charity (e.g., Auten et al., 2002; Ackerman & Auten, 2011; Allgood, 2009; Bakija & Heim, 2011; Cordes, 2012; Duquette, 1999; Greene & McClelland, 2001; Scharf & Smith, 2015; Slemrod, 1989; Tiehen, 2001). Further, except for Brooks (2002) and Ishino et al. (2012), studies analyzing charitable issues have not sufficiently been conducted other than in Western countries. This study aims to offer important findings for the improvement of tax policies on charitable donations in non-Western countries using the novel setting of Japan from the perspective of behavioral economics.

The remainder of this paper is organized as follows. Section 2 presents an overview of the HTD system in Japan. Section 3 proposes the testable hypotheses. Section 4 explains the data and empirical method used. Section 5 presents the estimation results and their interpretation. Finally, section 6 concludes the study.

2. Overview of the HTD system

In Japan, the local tax law requires people to pay their inhabitant tax to the prefectures and municipalities where they reside. Previously, people were not allowed to decide to which municipality they would want to pay their taxes. However, with the introduction of the HTD system in 2008, people were provided with an opportunity to channel their tax amounts toward the betterment of rural areas that struggled with falling population and shrinking revenues. In other words, the HTD system allowed people to make donations to the local governments of their choice. A donation is expected to increase the contributor's subjective well-being if the donation helps to improve the situation of the selected municipalities. Thus, it is important for contributors to know and specify how their donations will be used, such as helping parents with young children or assisting in environmental projects. In most cases under HTD, individuals who send donations can decide on how their donations must be utilized by the local governments. After World War II, Japan experienced massive migration from rural agricultural areas to urbanized areas and migrants' attachment and nostalgia for their hometown influenced their subjective well-being (Yamamura, 2017). The original purpose of HTD to revitalize local governments encountering financial difficulties through charitable donations seems to be driven by such types of social capital as non-market social networks between rural and urban areas[5]. That is, the initial effectiveness of HTD depended on altruism, which is defined as a positive emotional feeling that individuals derive from helping others.

[5] Social capital has a significant impact on various facets of daily life; however, with time, this impact has declined in the United States (Costa & Kahn, 2003; Putnam, 2000).

The HTD system allows contributors to enjoy the benefit of rationally pursuing self-interest, even if they are truly altruistic. Contributors can claim a deduction on the amount of donations from their local income tax amount. Donations exceeding 2000 yen are eligible for full tax deduction. However, there is a limit on the amount contributors can deduct, which means that a contributor cannot expect to make a contribution beyond the limit to offset actual taxes owed. More precisely, as of 2015, the limit is up to 20% of individuals' residence and income taxes. The limit inevitably depends on individuals' annual income and family composition; therefore, higher earners can claim greater deduction. Further, contributors can receive reciprocal gifts from the local governments to which they make donations. As of 2015, to simplify office procedure and for the convenience of contributors, people do not have to file a tax return in order to claim their deduction in principle. Figure 1 illustrates the amount of donations from 2008 to 2015, and demonstrates that the amount of donations increased, especially after 2014.

If a local government fails to receive donations because its residents make a donation to other local governments, the amount of net revenue from taxes for that particular local government decreases (Bessho, 2017). Consequently, local governments compete to obtain larger donations. Local governments have been highly motivated to offer lavish "reciprocal" gifts as a token of thanks to donors so as to increase the amount of donations from contributors, even though these governments do not offer gifts to follow the original purpose of the HTD system (Hagami, 2017a, b)[6]. Websites promoting the

[6] An 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).

HTD program have displayed the lavish gifts that can be easily exchanged for money or resold, including 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 in figure 1 can be explained by the competition to offer lavish gifts.

In 2017, some websites discontinued from displaying the gifts in accordance with the MIC's attempts to deter local governments from providing gifts, since it deviated from the original purpose of HTD (Daily Yomiuri, 2017a). With the aim of controlling the competition among local governments, the MIC requested them to cap reciprocal gifts at 30% of the donated amount (Daily Yomiuri, 2017b). However, even after these revisions were made to the HTD, problems persist. According to a calculation of Hashimoto & Suzuki (2017), assuming that unmarried individuals with an annual income of 28.8 million yen living in City A can contribute 1 million yen to Town B, they are eligible for a deduction of 0.998 million yen (2000 yen is subtracted from the donated amount of 1 million yen) from their taxes, which would otherwise have to be paid to City A. Then, from Town B, they receive gifts with a market value of 0.3 million yen by simply paying 2000 yen. This implies that contributors enjoy an economic benefit equivalent to 0.298 million yen. Town B increased its net revenue by 0.70 million yen (1 million yen – 0.3 million yen). On the other hand, the net revenue of City A is reduced by 0.998 million yen (1 million yen – 0.002 million yen)[7]. With a different initial assumption, the same calculation suggests that

[7] Local allocation tax grants will be allocated to City A to compensate partly for the reduction in the amount of revenue (Besssho, 2017). Such tax grants are sourced in part from Japanese government bonds. Therefore, the reduction in revenue of City A is considered to be compensated through future taxes gathered from all over Japan.

unmarried individuals with an annual income of 3 million can only contribute 0.028 million yen, but receive gifts worth 8400 yen. The contributors enjoy an economic benefit of 6400 yen. Thus, under the HTD system, unmarried individuals with an annual income of 28.8 million yen can enjoy a larger economic benefit of approximately 0.29 million yen than those with an annual income of 3 million yen. This example clearly demonstrates that the HTD system increases inequality between high- and low-income earners. Furthermore, the HTD widened the economic inequality among local governments with small amounts of tax revenue (Sato, 2017). Such unexpected effects are certainly opposed to the original purpose of the HTD to reduce the economic inequality between urban and rural areas.

Japan has frequently experienced devastating disasters in the recent past, such as the Great Hanshin-Awaji earthquake in 1995, the Great East Japan earthquake in 2011, and the Kuamamoto earthquake in 2016. The HTD is an effective way of helping areas severely affected by such natural disasters. In the case of a disaster, people donating to affected communities do not receive reciprocal gifts (Japan Times, 2016; Otake, 2016). Figure 1 illustrates the comparison of the amount of donations between local governments with victims of the Great East Japan earthquake and those without victims, covering the period before and after the earthquake. There was a surge in donations following the earthquake. This effect persisted until 2015, although the gap in the amount of donations between the two groups decreased with time. Even in the absence of any gifts, the disaster remarkably increased the level of

Bessho (2017) demonstrated that the current net benefits of the contributors are expected to impose a huge burden on the future generations throughout Japan.

donations. This finding suggests that people make donations to disaster-affected areas for altruistic reasons rather than for self-interest. Thus, there are two types of donations: donations based on altruistic motivation and those based on selfish motivation.

3. Hypotheses

From the previous section, it is clear that there are two types of contributors; altruistic and selfish contributors. Disasters such as earthquakes occur almost randomly in Japan. Consequently, the occurrence of devastating disasters in one area leads people living in other areas to consider the possibility of a similar disaster hitting them. This raises the awareness of disaster prevention throughout Japan. Further, frequent experiences of disasters form the basis for cooperation and reciprocal behavior, which in turn enhance volunteer activity (Yamamura, 2016) and help reduce the damage (Yamamura, 2010). That is, people who consider a greater likelihood of a disaster are more likely to be altruistic. Even if altruistic people cannot directly participate in volunteer activities because of various constraints, they have an intention to support the damaged areas by charitable donations through the HTD system. Hence, we propose the following hypothesis.

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, monetary incentives improve individuals' performance; however, psychologists claim that such incentives may lower performance. Gneezy & Rustichini (2000a, b) tested these contrasting claims and found that subjects who were offered monetary incentives performed more poorly than those who were offered no compensation. In their interpretation, policies and rules change individuals' perception of their social situation. Gneezy & Rustichini (2000b) analyzed the effect of rewards on performance measured by individual's IQ test score. In the experiment, they asked the subjects to solve a set of 50 questions from an IQ test. Thereafter, they compared the results of the group in which a payment was promised for each correctly answered question with that in which no such payment was offered. They found that the scores of individuals who were offered a small compensation was lower than those without any monetary incentives. These results indicate that mentioning a payment is sufficient to change the perception of a contract: from a service to a market exchange. Likewise, offering gifts in exchange for donations may possibly change the meaning of the donation, which may then influence people's perception and their charitable behavior. Applying this principle to a real-world scenario such as the HTD system, we can distinguish between two types of people; altruistic and selfish people. The provision of gifts in exchange for donations leads people to alter their perception of a pure charitable donation stemming from altruism as a market exchange driven by self-interest. Thus, the introduction of gifts increases donations from people with selfish motivation; however, it decreases

donations from people with altruistic motivation. Accordingly, we derive the next hypothesis.

Hypothesis 2:

The provision of gifts negatively affects altruistic motivation and positively affects selfish motivation.

4. Data and Methods

4.1 Data

In this study, we used a local government-level panel dataset of the amount of donations under the HTD system[8]. This dataset includes all 1741 local governments throughout Japan and covers the period 2008–2015, which amounted to 13918 observations. The data are available on the website of MIC[9]. The key variables include the number of victims of the Great East Japan earthquake in each local area or under each local government and a dummy for the local governments of the areas that suffered damage as a result of the subsequent tsunami. From the local government-level panel data, it is difficult to obtain control variables covering all local governments in the studied period. Thus, we obtained only the amount of taxable income, which provided 13918 observations that completely matched with the

[8] We limited the sample to municipalities.
[9]Data are obtained from http://www.soumu.go.jp/main_sosiki/jichi_zeisei/czaisei/czaisei_seido/furusato/topics/20160614.html (Access Date: 2016-08-02).

amount of donations. In addition to panel data estimations to examine the effect of the disaster, we used a different cross-sectional dataset for 2015 to investigate the effect of gifts and other control variables. The reason for restricting the data to 2015 is that the details related to the cost of providing gifts is only available for 2015. The dummy for the right to specify how to use the donations can also be obtained only for 2015 from the dataset of MIC. The data for other variables such as population (*POP*), the proportion of elderly households (*ELDRAT*), and ratio of workers in primary industry (*AGRAT*) cannot be obtained for all years, and thus are excluded in the fixed-effects estimations using the panel data. However, these variables can be obtained for a year prior to 2015, and are gathered for estimation and treated as the predetermined control variables. Table 1 presents the definition of variables used in our estimation, with mean values based on 2015 data; the mean value of *RIGHT* is over 0.90. This suggests that over 90% of the local governments allow contributors to specify how their donations must be utilized.

Figure 2 illustrates the relationship between the amount of donations in 2011 and the number of disaster victims for each local government. It is evident from figure 2 that the number of victims is positively related to the amount of donations, implying that the greater the damage, the larger the amount of donations. This finding is consistent with that of Ishino et al. (2011) that a disaster increases the altruistic motivation to give charitable donations. Figure 3 illustrates the relationship between the amount of donations and the amount of gifts, based on full sample data for 2015. In this figure, numerous plots are observed on the vertical axis, implying that many local governments were able to receive

donations even without offering any gifts. Two regression lines appear based on the full sample and on the sample with gifts being greater than 0. Both lines show a positive slope, indicating that the greater the amount of the gift, the larger the amount donated, which in turn implies that the provision of gifts increases the selfish motivation to contribute. Values for both vertical and horizontal axes are in log form, and thus, the slope indicates the elasticity. If the elasticity is less than 1, the increase in the gift amount is larger than the increase in the amount donated. In figure 3, both regression lines are not steeper than 45°, indicating that the elasticity is less than 1. From the perspective of local governments, increasing the gift amount does not generate any net benefit. If a local government offers no gift, then the revenue of this local government is likely to decrease possibly because its residents 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 prevent a decline in revenue.

Once observations without gifts are eliminated from the sample, the slope become steeper and the intercept moves downward. This indicates that people with selfish motivation are more sensitive to the monetary value of a gift. On the other hand, a decrease in intercept indicates that people with altruistic motivations are less likely to contribute if a gift is offered. The gap of intercept between the two slopes can be interpreted as the degree of reduction in altruistic donation as a consequence of offering a gift. The maximum amount of donations is at around 15 on the vertical axis and at 15 for gifts in the horizontal axis. Among observations without gifts in the horizontal axis, the maximum amount of donation is around 13, which is clearly smaller than 15. Hence, offering gifts provides a strong

motivation to make large donations than when no gift is offered. Similarly, figure 4 illustrates using the sample of local government with victims. Unlike figure 3, figure 4 demonstrates that the largest value of donations shown on the vertical axis (when the gift is not provided) is around 13, which is almost the same as those of gifts shown on the horizontal axis (the point 13 on the vertical axis and 12 on the horizontal one). This result implies that the amount of donations from altruistic motivations driven by altruism for damaged areas are almost equivalent to those from selfish motivations driven by the monetary exchange. Considered together, figures 3 and 4 indicate that contributions to municipalities with victims are seemingly driven by altruistic motivations, and that offering monetary incentives gives a signal of market exchange, leading altruistic people to feel no satisfaction from donation, thereby resulting in decreased donations.

Using the data for 2015, table 2 demonstrates the results of the mean difference test of the amount of donations between local governments with and without victims and between those offering and not offering gifts. As for the sample of local governments without victims, the amount donated is larger when a gift is offered than when it is not offered, which is statistically significant at 1% level. Further, the amount donated when a gift is offered is approximately 6.5 times larger than when a gift is not offered. Therefore, people rationally respond to monetary incentives for contribution. It is interesting to observe that there is no statistical difference between the case when a gift is offered and that when it is not for the sample with victims. Therefore, people who made a donation to municipalities with victims are not influenced by monetary incentives. Further, in the sample of those that did not offer any gifts,

the amount donated to local governments with victims was significantly (2.5 times) larger than to those without victims.

Our results in figures 1–4 and table 2 are consistent with those of Gneezy & Rustichini (2000a, b). However, it is important to examine these results based on statistical evidence, which are provided in the following sections.

4.2. Econometric Framework and Estimation Strategy

For the purpose of examining the hypotheses previously proposed, the estimated function of the baseline model takes the following form:

$$Ln(DONAT)_{it} = \alpha_1 LN(DEATH)_i * After\ disaster_t + \alpha_2 After\ disaster_t + \alpha_3 Ln(INCOM)_{it} + e_i + k_t + u_{im}, \quad (1)$$

where $Ln(DONAT)_{it}$, representing the log values of $(DONAT+1)$, denotes the dependent variable in local government i and year t. In order to control for the differences in scale among local governments, *DONAT*, *DEATH*, and *INCOM* are expressed in log form. Regression parameters are represented by α. Unobservable time-invariant features of a local government are controlled by e_i. Further, time-specific effects, such as macro shocks, 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, $LN(DEATH)_i * After\ disaster\ \ Ln(DONAT)$. In general, the Great East Japan earthquake is known to have mainly affected

three prefectures: Iwate, Fukushima, and Miyagi. The earthquake led to a tsunami, which caused devastating damage to the coastal areas. Although some municipalities were affected by the disaster, they had no disaster victims. Hence, in alternative specifications, *TSUNAMI or PREFEC_3* are used to capture areas severely damaged by the disaster, instead of *LN(DEATH).* If *hypothesis 1* holds true, its coefficient has the positive sign. *Ln(DONAT)* can take 0 because there are local governments receive no donations. Thus, in addition to the fixed-effects model, the random-effects Tobit model is used for estimations (Greene, 2008). In the fixed-effects model, *POP, ELDRAT*, and *AGRAT* are completely captured by e_i because these variables are constant values during the period due to data limitations as explained earlier. However, in the random-effects Tobit model, these variables can be included to show their impact on donations.

In addition to the panel estimation, we use cross-section data in 2015 to analyze the effect of gifts and other key variables; these variables are only available for 2015. We use the Tobit model if there are observations where *Ln(DONAT)* is 0; otherwise, we use the OLS model. The functional form is

$$Ln(DONAT)_i = \alpha_0 + \alpha_1 GIFT_i + \alpha_2 Ln(RETURN)_t + \alpha_3 LN(DEATH)_i + \alpha_4 Ln(INCOM)_i + \alpha_4 RIGHT_i + \alpha_5 Ln(POP)_i + \alpha_6 ELDRAT_i + \alpha_7 AGRAT_i + u_{im}, \quad (2)$$

In addition to *LN(DEATH),* we include *GIFT* and *Ln (RETURN)* as the key variables to test Hypothesis 2. The reason why these are key variables are as follows. The larger the returns from

donations, the larger the incentives for selfish people to make donations, leading to larger amount of donations. On the other hand, we assume the following: (1) Altruistic people's decision to make a donation does not depend on the amount of returns from donations because they do not pursue self-interest. (2) Altruistic people are sensitive to the signal that local governments offer a gift regardless of its economic value. Based on these assumptions, the dummy for offering gift (*GIFT*) can capture the effect of offering gifts on altruistic people's incentive to make a donation when we control for the selfish people's incentive by including *Ln (RETURN)* in the function. That is, introducing a gift reduces altruistic people's motivation. Thus, if hypothesis 2 holds, the predicted signs of *RETURN* and *GIFT* are positive and negative, respectively. As for the control variables, the higher the income, less people are likely to have motivation to give a donation (Derin-Güre & Uler, 2010). Further, the ratio of elderly people indicates the degree of economic decline of an area. Hence, *Ln (INCOM)* and *ELDRAT* are predicted to have negative and positive signs, respectively. The right to designate how one's donation is used increases the motivation to contribute. So, we predict a positive sign for *RIGHT*. Goods from primary industry are preferred as gifts by contributors (Nohara, 2017). Thus, the amount of donations increases as the primary industry develops to provide suitable gifts. This result can be viewed from a different perspective. In rural areas, the ratio of workers in the primary industry is relatively high. If urban residents who come from rural areas feel an attachment to the "rural hometown," they are likely to have a motivation to contribute to these areas. Therefore, *AGRAT* is predicted to have a positive sign.

5. Estimation Results

Tables 3 and 4 present the estimation results based on the panel data. In table 3, the results of the fixed-effects model and random-effects Tobit model are shown in columns (1)–(3) and (4) – (6), respectively. Table 4 shows the results of the random-effects Tobit model, including the control variables. Table 3 shows positive signs for the cross term, *Ln(DEATH)* After disaster, TSUNAMI* After disaster,* and *PREFEC_3*After disaster*, which are statistically significant at the 1% level, in columns (1)–(6). We observe the same results in Table 4 if other control variables are included. Hence, *hypothesis* 1 is strongly supported. Concerning control variables, the coefficient of Ln(*INCOM*) has a negative sign, while those of *ELDRAT* and *AGRAT* have positive signs. Further, they are all statistically significant. These findings are consistent with our predictions.

Tables 5 and 6 present the results using the cross-section data for 2015. Here, we focus on the *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 shows that both the degree of damage and return from donation increased the amount of donations. This result clarifies that both selfish altruistic motivations lead to increase donations. The effect of offering gifts in exchange for donations is shown in the coefficient of *GIFT.* We observe a negative sign for *GIFT,* which is statistically significant at the 1% level in column (2). Further, its absolute value of coefficient is 2.93, indicating that the amount of donations reduced by 293% if a gift

was announced. Thus, compared with the case of offering a gift, the donations increased by 293% in the case without the gift. Therefore, the amount of donations is approximately four times larger without the gift than when the gift is offered. This result can be interpreted as follows: people with altruistic incentives to contribute are unlikely to make donations if a gift is offered. On the other hand, as shown in column (2), the absolute value of coefficient of *Ln(RETURN)* is 0.61, suggesting that a 1% increase in amount of monetary value of the gift leads to 0.61% increase in the amount of donations after the introduction of the gift. This result supports *hypothesis 2.* The coefficient of *RIGHT* has a significant positive sign and its value is 0.32. This implies that people increase their donations by 32% if they can specify how their donations must be used. *Ln(INCOM)* shows a significant negative sign, which is consistent with our prediction; people are unlikely to contribute to relatively affluent areas. *ELDRAT* and *AGRAT* have a positive sign, which is statistically significant. This implies that people tend to contribute to rural areas experiencing an aging population and shrinking economy. Therefore, the HTD is, to a certain extent, effective in fulfilling its original purpose. From table 5, it is clear that not only altruistic contributors but also selfish ones are motivated to make a donations under the HTD system. However, the detrimental effect of offering gifts on donations from altruistic contributors is overwhelmingly larger than the positive effect of offering gifts to increase donations.

To facilitate comparison between areas with and without disaster victims, we divided the sample into two sub-samples and then conducted the estimation. *Ln(DEATH)* cannot be included by definition for the estimation based on sub-samples without victims. Hence, apart from specifications in common

for different sub-samples, we also report additional specifications, where *Ln(DEATH)* is included based on the sub-sample with victims. *Ln(RETURN)* shows a positive sign and is statistically significant at the 1% level in all columns, regardless of sub-samples and specifications. Further, the value the coefficient of *Ln(RETURN)* becomes larger if *GIFT* is included. This is in line with figures 3 and 4 illustrating that the slope of the regression line becomes steeper once the sample is restricted to local governments with victims. Compared to the value of 0.61 for the coefficient of *Ln(RETURN)* in column (6), the coefficient is smaller (0.56 and 0.54) in columns (3) and (4). That is, donations to areas with victims based on selfish motivation are smaller than to areas without victims. Moreover, *GIFT* shows a negative sign and is statistically significant at the 1 % level in columns (4) and (6). This is congruent to figures 3 and 4 demonstrating that the constant on the vertical line moves downward once the sample is restricted. That is, 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 amount of donations by 366% and 286%, respectively, for local governments with and without ones, victims. That is, the negative effect of *GIFT* on altruistic donations is 80% larger for areas with victims more than those without victims. From these findings, we derive the following argument as follows: In line with Gneezy & Rustichini (2000a, b), the market incentive offered through the gift in return for donations changes the individual's perception about the social and economic purposes toward which people have contributed. The results show that offering a gift is sufficient to change the meaning of donations: from the degree of altruism to the

payment for buying the goods in market exchange. The effect of offering gifts is considered to be greater in the case of seriously damaged areas where most of donations seems to be based on altruistic motivations.

The HTD was anticipated to reduce economic inequality between poor rural and rich urban areas through charitable donations from rich areas to poor ones. Earlier works found that voluntary charitable giving increases with inequality aversion among high-income individuals (Derin-Güre & Uler 2010). Therefore, the HTD would be effective in reducing inequality if the system were appropriately constructed. The HTD originally aimed to promote competition among local governments by considering how a redistribution policy is effective when it is supported by the donations. In reality, however, competition in the form of gifts in exchange for donations does not increase efficiency and a large amount of donations by high-income earners to purchase lavish gifts increases the overall burden on others (Sato, 2016a, b; 2017). The formal HTD system promoted by the government possibly crowds out the charitable donations through non-profit organizations (Dokko, 2009). The HTD system generates moral hazard and rent-seeking behavior by those who are allowed to sell their products through the system. Further, as we observed thus far, offering gifts decreases altruistic motivation and increases selfish motivation to donate. Eventually, donation based on altruistic motivation changed to payment for goods in the market exchange to increase one's self-interest.

6. Conclusions

The HTD was anticipated to reduce the economic inequality between urban and rural areas through income redistribution by promoting donations from rich urban areas to poor rural areas. However, in reality, the HTD widened the economic inequality between the high- and low-income earners (Hashimoto & Suzuki, 2017). Further, as a consequence of permeation of the HTD, local revenue inequality widened among local governments with low tax revenues (Sato, 2017). The public finances of many local governments have worsened due to the HTD (Hagami, 2017a). In this light, it is valuable to investigate the reason for the poor functioning and unexpected outcome of the HTD. The HTD system was planned under the assumption that urban residents tend to have altruistic motivation to support the rural areas that they feel attached to although they do not reside there. This study examined whether the assumption holds from the viewpoint of behavioral economics, using local government-level panel data for 2008–2015. The key results are as follows: (1) The Great East Japan Earthquake led to an increase in the amount of money donated through the system for local governments with disaster victims, reflecting altruistic motivation. (2) A 1% increase in expenditure for reciprocal gifts for donors led to a 0.61% increase in donations, suggesting selfish motivation. (3) Providing gifts to donors led to a reduction in altruistic donation by approximately 300%, compared with the case in which donors do not receive gifts. Thus, setting up reciprocal gifts leads to a reduction in donors with altruistic motivation and an increase in donors with selfish motivation. Furthermore, offering gifts reduced altruistic donations to municipalities with and without disaster victims by 366% and 286%, respectively.

Our study indicates two different motivations for donation: altruistic and selfish motivations. Furthermore, gifts increased selfish motivation, while it reduced altruistic motivation. Accordingly, there is a trade-off between selfish and altruistic motivation. As observed in the results using the full sample, the amount of donations for local governments offering gifts is far larger than those which do not offer gifts. However, once we restrict the sample to local governments with disaster victims, there is no significant difference of donations between the local governments offering gifts and those not offering gifts. In our interpretation, providing a motivation to selfish donors remarkably reduced altruistic donations for local governments seriously affected by the disaster. Overall, for the affected local government, offering gifts does not increase the total amount of donations because of both positive and negative effects on donations.

Thus far, our findings made it evident that reciprocal gifts are liable to distort the original purpose of the HTD program. The HTD seems to create a negative externality, in that a reduction of tax revenue for urban municipalities by the tax deduction for contributors based on the selfish motivation to buy "the gift" at lower prices than the market price. The rules of the HTD system should be revised to reduce the externality by deterring the selfish behavior and to enhance altruistic behavior to support the local areas. That is, local governments can play a role in promoting the local industry through activating market exchange. It is possible that high-quality local goods are not well advertised and thus do not increase in demand. The local goods can be sold in the market if consumers are informed about them. However, due to lack of know-how about advertising or funding, the goods are not purchased. Thus, local

governments need to reasonably advertise and diffuse information about the goods in the market so as to revitalize its local industry. Hence, we propose the policy suggestion that local governments should promote their local goods by sufficiently advertising the goods and selling them in the market rather than offering such goods as gifts at a price far lower than in the market. Under the amended HTD system, to avoid the moral hazard problem, voluntary charitable donations are expected to be effective to reduce economic inequality between rich urban and poor rural areas if the donations do not have detrimental effects on market mechanisms. By far, donations based on individuals' choice are preferable to the compulsory redistribution policy by the government.

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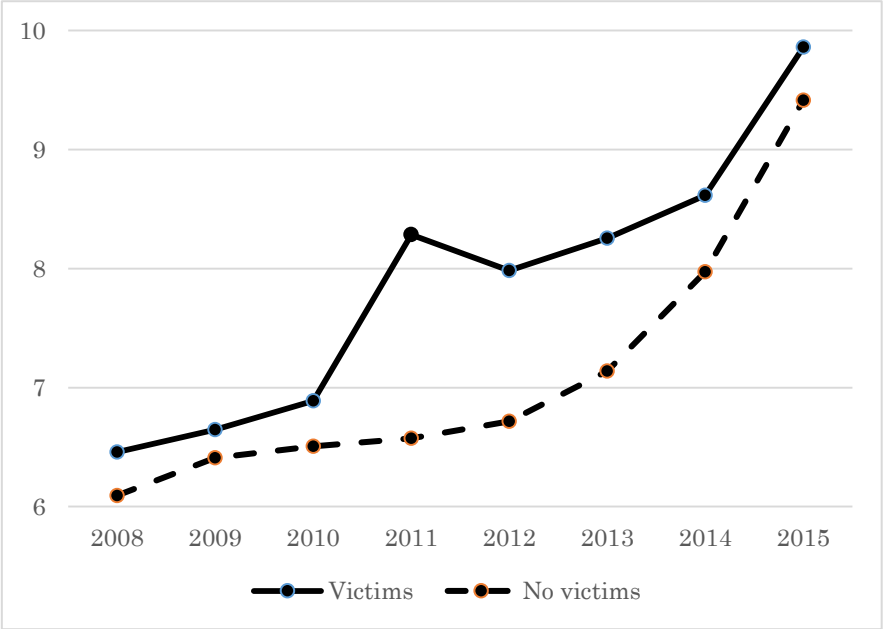

Figure 1. *Difference in donations under HTD between local governments with and without victims of the Great East Japan earthquake*

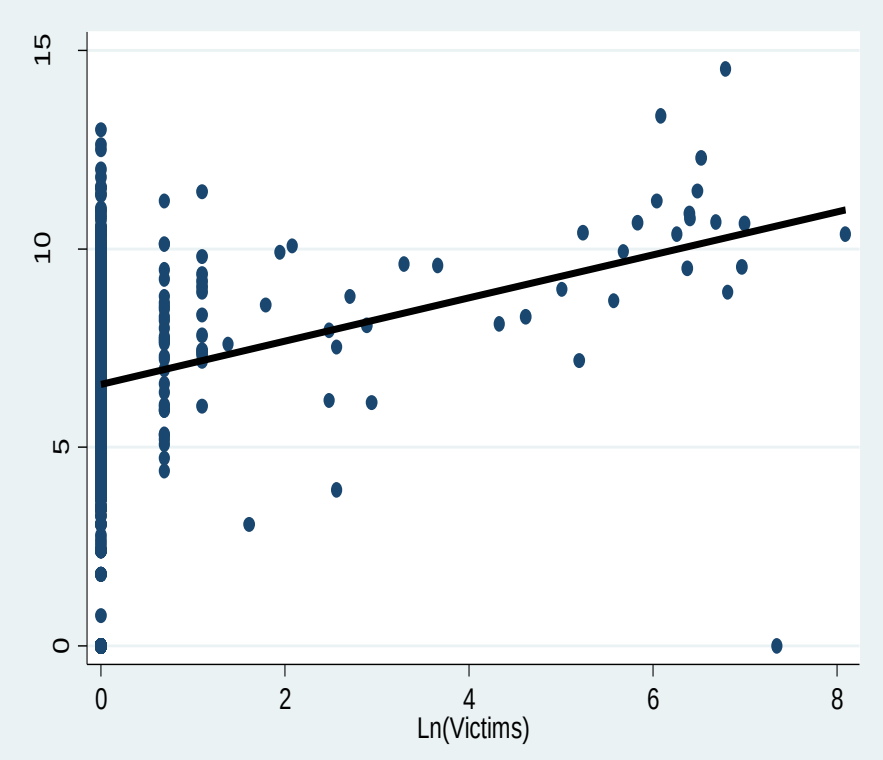

Figure 2. *Relationship between log form amount of hometown tax paid in 2011 and number of victims of the Great East Japan earthquake in 2011*

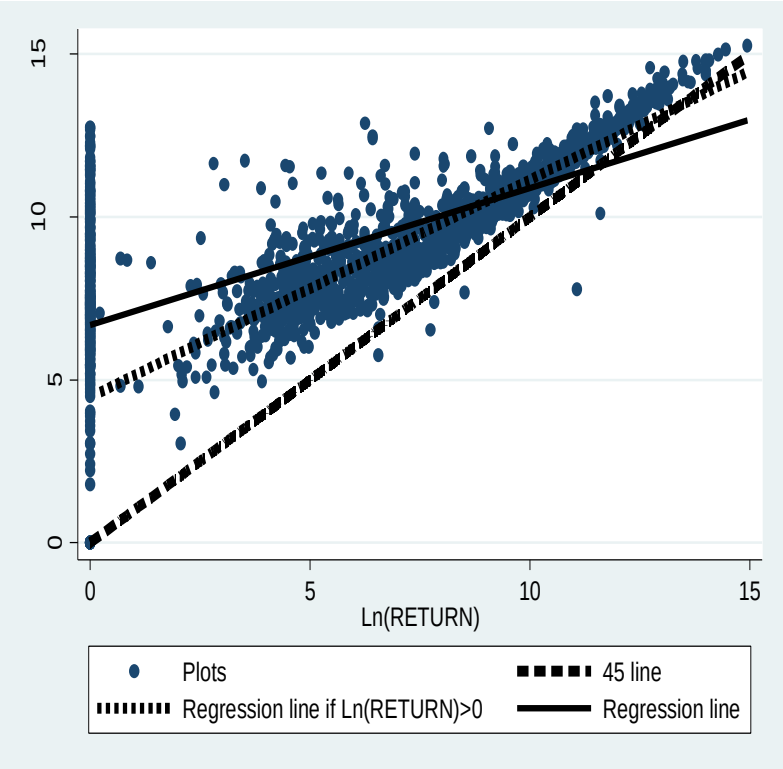

Figure 3. *Full sample: Relationship between log form amount of hometown tax paid and log of amount of return for contributors in the form of gifts (local government data) in 2015*

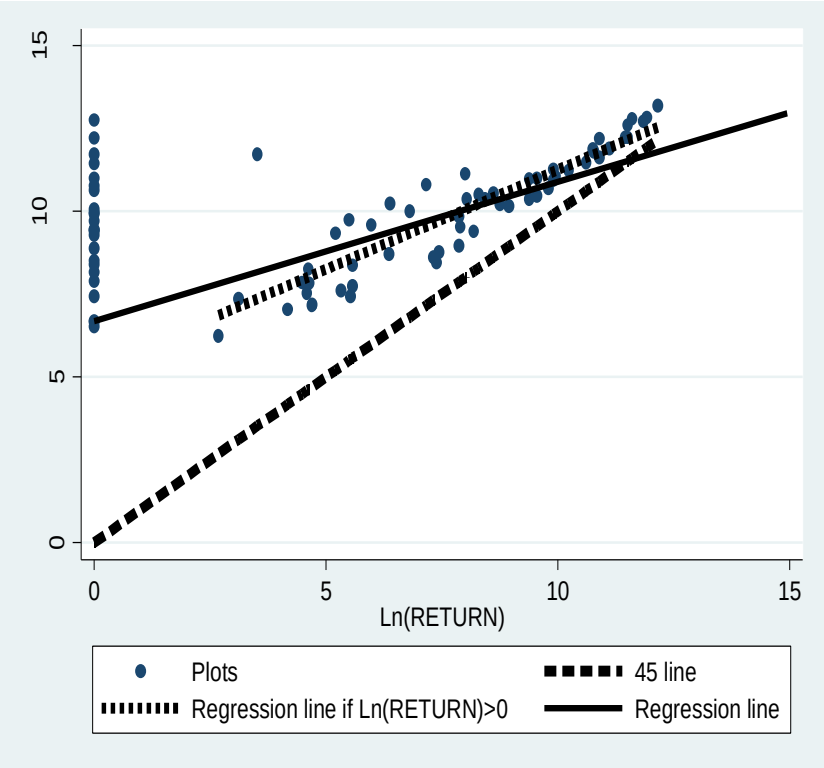

Figure 4. *Restricted sample of local governments with victims of disasters: Relationship between the log form amount of hometown tax and log of amount of return for contributors in the form of gifts (local government data) in 2015.*

Table 1

Definition of variables, and their mean values for governments with and without victims in 2015.

	Definitions	Government with victims	Government without victims
DONAT [a]	Amount of donations in the Hometown Tax Donation system (million yen).	65.5	94.7
GIFT [a]	Takes 1 if the local government offers a reciprocal gift to donors.	0.70	0.82
DEATH [b]	Number of victims of the Great East Japan earthquake for the local governments.	196	0
DEATH_DM [b]	Takes 1 if there are victims of the Great East Japan Earthquake in the local governments, otherwise 0.	1	0
PREFEC_3	Takes 1 if local governments are located in three prefectures mainly hit by the Great East Japan earthquake (Fukushima, Iwate, and Miyagi prefectures), otherwise 0.	0.55	0.05
TSUNAMI[c]	Takes 1 if local governments are damaged by tsunami following the Great East Japan earthquake, otherwise 0.	0.55	0.004
RETURN [a]	Monetary values of reciprocal gifts: total costs incurred by local governments burdened for 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 governments enables contributors to specify how their donations are used, otherwise 0	0.95	0.90
POP [d]	Population (thousands).	162.5	69.2
ELDRAT [d]	Ratio of elderly households. (Number of households comprising members who are over 65 years old/ total number of households).	0.10	0.12
AGRAT [d]	Ratio of workers in the primary industry (Workers in the primary industry/all workers)	0.07	0.11

Notes: Sources of variables are as follows:

a. Website 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. (Access Date: 2016-08-19).

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Website of Miyagi prefecture, http://www.pref.miyagi.jp/site/ej-earthquake/(Access Date: 2016-08-19).
c. Website of Ministry of Agriculture, Forestry and Fisheries
http://www.maff.go.jp/j/tokei/census/afc/2010/saigai.html (Access Date: 2016-08-22).
d. Website of Statistics Bureau, Ministry of Internal Affairs and Communications. http://www.stat.go.jp/data/ssds/(Access Date: 2016-08-19).

Table 2

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

	With victims (1)	Without victims (2)	Difference of *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 of *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-effects Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Ln(DEATH)	0.21***			0.20***		
**After disaster*	(5.81)			(5.33)		
TSUNAMI		0.87***			0.86***	
**After disaster*		(5.40)			(5.06)	
PREFEC_3			0.30***			0.29***
**After disaster*			(2.89)			(2.63)
Ln(DEATH)				0.11*		
				(1.79)		
TSUNAMI					0.07	
					(0.27)	
PREFEC_3						0.31*
						(1.67)
After disaster	3.31***	3.21***	3.31***	3.41***	3.41***	3.41***
	(54.6)	(54.5)	(54.0)	(60.4)	(60.4)	(60.0)
Ln(INCOM)	0.34	0.24	0.09	0.30***	–1.22***	0.31***
	(1.10)	(0.77)	(0.31)	(10.9)	(–6.84)	(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 the results 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-effects Tobit		
	(1)	(2)	(3)
Ln(DEATH)	0.17***		
**After disaster*	(4.54)		
TSUNAMI		0.76***	
**After disaster*		(4.47)	
PREFEC_3			0.25**
**After disaster*			(2.29)
Ln(DEATH)	0.11**		
	(1.96)		
TSUNAMI		0.21	
		(0.82)	
PREFEC_3			0.42**
			(2.35)
After disaster	3.27***	3.26***	3.27***
	(55.6)	(55.4)	(55.2)
Ln(INCOM)	–1.17***	–1.22***	–1.19***
	(–6.53)	(–6.84)	(–6.59)
Ln(POP)	2.02***	2.08***	2.06***
	(10.5)	(10.8)	(10.7)
ELDRAT	12.1***	12.1***	12.7***
	(9.53)	(9.53)	(9.82)
AGRAT	4.39***	4.37***	4.26***
	(8.15)	(8.10)	(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 the results are not reported.

Table 5

Estimations using data for 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-Rsqaure	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, a constant is included as an independent variable, but the results are not reported.

Table 6

Estimations using data for 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-Rsquare is reported in columns (5) and (6). In all estimations, a constant is included as an independent variable, but the results are not reported.

Table 7

Estimations using data for 2015 (with dependent variable as GIFT and Ln(RETURN), respectively)

	Probit		Tobit	
	GIFT estimation		*Ln(RETURN)* estimation	
	(1)	(2)	(3)	(4)
TSUNAMI		0.04		0.34
		(0.67)		(0.37)
Ln(DEATH)	–0.01	–0.02	–0.15	–0.21
	(–1.23)	(–1.40)	(–1.12)	(–1.02)
Ln(INCOM)	–0.32***	–0.32***	–4.82***	–4.83***
	(–6.82)	(–6.80)	(–7.79)	(–7.79)
Ln(POP)	0.36***	0.36***	5.90***	5.90***
	(7.20)	(7.19)	(9.00)	(9.00)
ELDRAT	0.43	0.44	8.63**	8.70**
	(1.34)	(1.37)	(2.41)	(2.43)
AGRAT	0.29**	0.29**	6.36***	6.38***
	(2.19)	(2.21)	(4.25)	(4.26)
Left-censored observations			321	321
Pseudo-Rsqaure	0.06	0.06	0.01	0.01
Observations	1,739	1,739	1,739	1,739

Note: Numbers without parentheses are marginal effects. 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, a constant is included as an independent variable, but the results are not reported.