



Munich Personal RePEc Archive

# **How Does Intergovernmental Competition through the Hometown Tax Donation System Affect Local Government Efficiency?**

Ogawa, Akinobu and Kondoh, Haruo

1 August 2024

Online at <https://mpra.ub.uni-muenchen.de/121688/>  
MPRA Paper No. 121688, posted 17 Aug 2024 14:21 UTC

# **How Does Intergovernmental Competition through the Hometown Tax Donation**

## **System Affect Local Government Efficiency?**

### **Abstract**

Many studies show that fiscal redistribution among regions carried out by a national government undermines the cost efficiency of local governments. In Japan, a unique fiscal system, the Hometown Tax Donation (HTD) system, was launched in 2008. Citizens may donate some of their inhabitant taxes to a different local government than their own. We examine the effects of the HTD using panel data of Japanese municipalities and stochastic frontier analysis. We find that revenue received by other regions leads to a misestimation of the cost of public services, even if this redistribution is based on residents' intentions.

JEL Classification H27; H71

Keywords: Cost efficiency of local governments; Intergovernmental fiscal transfer;

Donation of inhabitant tax; Hometown tax donation system (HTD)

## I. INTRODUCTION

This study investigates whether the Hometown Tax Donation (HTD) system in Japan affects the efficiency of local governments. The Japanese HTD is a unique donation system started in 2008, under which taxpayers can donate a small individual payment (2,000 yen, 13 US dollars) to any local government (including municipalities and prefectures) and receive very generous deductions depending on their taxable income and family structure. The purpose of the HTD system<sup>1</sup> is as follows. Many people who are born in rural Japan move to metropolitan areas when entering universities or starting jobs. Although they used the local public services provided by their hometown while growing up, when they start earning, they pay most of their taxes to the municipality where they are living, in a metropolitan area. While the fiscal imbalance resulting from this population shift from rural to urban areas has been viewed as a problem, it has also been noted that the system of redistribution among regions adopted by the national government to correct this imbalance has undermined the efficiency of local government (Akai et al., 2003). Meanwhile, the HTD was thought to allow for redistribution among regions based on the intentions of citizens, rather than redistribution by the national government. Thus, as a desirable effect of the HTD system, it was expected

---

<sup>1</sup> See “Philosophy of Hometown Tax Donation” on the webpage of the Ministry of Internal Affairs and Communication (in Japanese).  
[https://www.soumu.go.jp/main\\_sosiki/jichi\\_zeisei/czaisei/czaisei\\_seido/furusato/policy/](https://www.soumu.go.jp/main_sosiki/jichi_zeisei/czaisei/czaisei_seido/furusato/policy/).

that interjurisdictional competition seeking donations would result in a more transparent and efficient government. Indeed, such an expectation was reasonable, based on the predictions of the fiscal federalism literature (Turati et al., 2012). However, there is an important objection to this argument. Based on the literature on the relationship between intergovernmental grants and local government efficiency, it is hypothesized that dependence on intergovernmental grants from other governments causes local taxpayers to miscalculate their tax levels, leading to wasteful expenditures or inefficiency (Akai et al., 2003; Eom and Rubenstein, 2006; Kalb, 2010)<sup>2</sup>. As donations from citizens living in other jurisdictions under the HTD system are financial resources that are not borne by residents, the same logic may apply. Therefore, a greater dependence on donations under the HTD system may result in inefficiency.

This study contributes to the existing literature in the following ways. First, few studies have attempted to analyze the effects of the HTD system, which is unique and recently introduced in Japan<sup>3</sup>, enabling us to discover whether this new policy experiment in Japan is

---

<sup>2</sup> As theoretical arguments explain this phenomenon, some alternative models can be considered. Kalb (2010) assumed that the citizens of the local jurisdictions are susceptible to a misperception of the true tax price of local public service provision due to fiscal illusion. De Borger and Kerstens (1996) pointed out the possibility that the flypaper effect contributes to inefficiency, and Akai et al. (2003) discussed how intergovernmental grants cause a soft budget problem.

<sup>3</sup> A similar tax donation scheme will be introduced in South Korea from 2023, but few data

beneficial or harmful to the performance of the local public sector<sup>4</sup>. Second, our results provide insights into important debates regarding the two dimensions of intergovernmental relationships. One is a vertical relationship, which relates to whether decentralization or centralization is better (Oates, 1972; Costa-Font et al., 2015), and the other is a horizontal relationship, relating to whether interjurisdictional competition is good or not (Tiebout, 1956; Hatfield and Kosec, 2013).

The remainder of this paper is organized as follows. In Section II, we introduce the HTD system in Japan, provide an overview of the local government finance system, and develop the hypotheses. Section III describes the analysis methodology and data. After presenting the results of the analysis in Section IV, we discuss them and conclude with policy recommendations as well as a vision for future research in Section V.

---

are available.

<sup>4</sup> Fukasawa (2021) is one of the few exceptions; this study investigated the relationship between the HTD and local government efficiency using cross-sectional analysis. Although it has important results, unobserved heterogeneity between municipalities or year-specific effects were not considered because the cross-sectional data setting was only 1 year. Fukasawa et al. (2020) found that competition for donations induced by the HTD system reduced the net revenue of municipalities seeking the donation. Kato and Yanagihara (2021) developed a two-region model to investigate theoretically how tax deductions under the HTD system affect local tax revenue.

## **2. BACKGROUND AND HYPOTHESES**

### **2.1 Related Literature**

Local public sector efficiency is one of the most important issues in public economics (Aiello and Bonanno, 2019), especially in term of cost because efficient provision of local public services may require less tax burden or transfer from upper-tier governments, resulting in economic growth, thereby, enhancing citizens' satisfaction. Therefore, many scholars have attempted to measure and analyze local government efficiency.

The motivation behind empirical studies related to local government efficiency is threefold. The first is to clarify how to measure (in)efficiency of local governments using alternative empirical methods (De Borger and Kerstens, 1996; Worthington, 2000), thereby, focusing primarily on the technical aspects and attempting to clarify which method is superior. For example, De Borger and Kerstens (1996) calculated the cost efficiency indices of Belgian local governments for five different technologies, including two non-parametric (free disposal hull, FDH, and data envelopment analysis, DEA) and three parametric methods (deterministic and stochastic frontiers).

The second motivation is to discover the sources of (in)efficiency of local governments. Here, the possible candidates are political or budgetary institutions (Borge et al., 2008; Geys et al., 2010; Ashworth et al., 2014), intergovernmental grants (Geys and Moesen, 2009b; Kalb, 2010), the degree of decentralization (Balaguer-Coll et al., 2010; Turati et al., 2012),

municipality amalgamation (Nakazawa, 2013), existence of abundant natural resources (Borge et al., 2015; Ayala-García and Dall’erba, 2021), and introduction of accrual accounting (Lampe et al., 2015), among others. Although most relevant studies have clarified some important sources of (in)efficiency, more dependence on intergovernmental grants or less political competition tends to lower efficiency. However, other factors might affect the (in)efficiency of local governments.

The third motivation is to determine spatial interdependence. These studies generally show the spatial effects of local government efficiency, implying yardstick competition between local governments (Geys, 2006; Balaguer-Coll et al., 2019; Santolini, 2020).

## **2.2. Institutional Setting**

In Japan, according to the local tax law, inhabitant taxes are paid to the prefecture and municipality in which one resides. Meanwhile, under the new system called the Hometown Tax Donation System (*Furusato Nozei* in Japanese), which was introduced in 2008, a portion of inhabitant tax is deducted by making donations to other municipalities. A public report published by the Ministry of Internal Affairs and Communications states that the significance of the HTD is that (1) tax awareness is enhanced because people can choose where to donate their money; (2) donors can contribute to their hometown, the region where they were born, and want to support; and (3) competition among local governments increased, requiring them to consider how the region should be and what should be chosen as a donation destination.

The report also states that “in order for a local government to receive donations from taxpayers, it is a prerequisite that it conducts its administration in a manner that is appropriate for receiving donations” and that “tireless management efforts are required toward desirable local politics and administration.” Policymakers hoped that the HTD would lead to good competition among local governments. As already mentioned, the background of this system was an awareness of the fiscal imbalance among regions resulting from the population shift from rural to urban areas and the problem of redistribution among regions by the national government, which is the main system for correcting this imbalance.

Under this system, when taxpayers donate to any local government<sup>5</sup>, they receive a deduction on their taxable income under their local inhabitant and national income tax policy, proportionate to the amount donated, making it a unique local fiscal system, even from an international perspective. The total amount of local taxes in FY 2022 was 46.2 trillion yen, with HTD donations amounting to approximately 2 percent of the local tax revenues. In addition, given that most HTD donations are made to municipalities rather than to prefectures, this amounts to approximately 4 percent of municipal tax revenues. The financial impact of the HTD amount received by each municipality is not small. On average, HTD revenue accounts for approximately 12 percent of local tax revenues, with some

---

<sup>5</sup> Donors do not necessarily have to choose their “real” hometown, such as defined by place of birth, and can donate to more than one municipality.



municipalities receiving more than 200 percent (FY 2019). In addition, the financial impact of the HTD is relatively larger for municipalities with smaller populations (Figure 1)<sup>6</sup>.

[Insert Figure 1 here]

The structure of HTD system is shown in Figure 2.

[Insert Figure 2 here]

For example, a resident of Municipality A (a part of Prefecture X) donates 50,000 yen to Municipality B (a part of Prefecture Y) and therefore, is entitled to a deduction of 48,000 yen from the inhabitant and income tax payable to Municipality A, Prefecture X, and the national government, respectively. Note that 2,000 yen (13 US dollars) is the self-payment required to receive a tax deduction through the HTD system. However, in practice, this mechanism differs from the horizontal fiscal transfers between Municipalities A and B. This is because municipalities that lose local tax revenue due to the HTD are compensated for 75 percent of their loss by the national government through an intergovernmental grant. As we will mention later, the main intergovernmental grant is the Local Allocation Tax grants (LAT) in the

---

<sup>6</sup> Dependence on the HTD is defined as the ratio of HTD revenues to the standard financial scale, which is the sum of local tax revenues and fiscal transfers from the national government that are not predetermined for use. It can be regarded as the sum of general financial resources.

Japanese municipality<sup>7</sup>. Therefore, in the previous case, in which a resident of Municipality A donates 50,000 yen to Municipality B,

- The national government loses 9,600 yen (20 percent of 48,000 yen) of income tax revenue

- Municipality A loses 23,040 yen (48 percent of 48,000 yen) of the inhabitant tax revenue

- Prefecture X loses 15,360 yen (32 percent of 48,000 yen) of the inhabitant tax revenue

However, below are listed compensation made by the national government through LAT<sup>8</sup>.

- 17,280 yen (75 percent of 23,040 yen) lost by Municipality A

- 11,520 yen (75 percent of 15,360 yen) lost by Prefecture X

Thus, the national government bears the majority of the deductions associated with this donation. In addition, the amount of donations through the HTD has increased 50-fold since 2008, when the program was launched (Figure 3), because local governments send gifts back to donors. Donors generally receive gifts from the recipient government in return, depending

---

<sup>7</sup> However, some municipalities do not receive LAT grants because they are deemed unnecessary based on the criteria set by the national government. Such municipalities are not compensated through LAT grants.

<sup>8</sup> The amount of the tax deduction is capped and depends on the donor's income and family structure. The higher the donor's income, the higher the deduction. This is another problem of the HTD system.

on the donation amount<sup>9</sup>As in the previous example, Municipality A is allowed to send gifts of up to 50 percent of the donation amount to donors to collect more donations<sup>10</sup>. Therefore, the donor not only receives a tax deduction for the donated amount but also enjoys an economic benefit equivalent to 50 percent of it, which is 25,000 yen. Several studies in Japan have empirically demonstrated this as the reason for donors' motivation (Nishimura et al., 2017; Yamamura et al., 2023). However, there is an upper limit to the deduction amount; high-earners can obtain higher deductions than can low-earners. Some studies note that this has led to regressive taxation (Sato, 2017; Hashimoto, 2019). Moreover, Japan's finances are extremely tight and most of the national budget is financed by issuing government bonds. Therefore, donations through the HTD can be thought of as shifting the burden to future generations (Bessho, 2017).

---

<sup>9</sup> Many municipalities began sending return gifts circa 2014. Return gifts must not be highly redeemable and must be produced in the area. The most popular return gifts are agricultural and marine products. In addition, the amount of return gifts must not exceed 30 percent of the donation amount.

<sup>10</sup> In 2019, the Ministry of Internal Affairs and Communications amended the Local Tax Law to limit the combined cost of procuring and sending return gifts to not more than 50 percent of the donation amount. Until the local tax law was amended, some municipalities sent gifts with a monetary value exceeding 60 percent to donors. In addition, after 2019, gifts are required to be locally produced, so the most popular gifts are agricultural and marine products. Typical examples are rice, wagyu beef, and scallops.

[Insert Figure 3 here]

### **2.3 Local Public Finance System in Japan**

Japan is a highly unitary state consisting of three levels of government: national, prefectural, and municipal. Municipalities in Japan are divided into four categories according to population size (cities with a population of 500,000 or more, cities with a population of 200,000 or more, cities with a population of 50,000 or more, and towns and villages with a population of less than 50,000)<sup>11</sup>, and the scope of affairs under their jurisdiction varies.

The expenditure by the national and local governments in FY 2020 was 222.5 trillion yen, of which 44 percent and 56 percent was spent by the national government and local governments, respectively. Meanwhile, the proportions of national and local taxes, which are the main sources of expenditure by national and local governments, are 61.4 percent and 38.6 percent, respectively. Among the local taxes, municipal and prefectural taxes account for 21.2 percent and 17.4 percent, respectively. Individual and corporate inhabitant taxes account for 37.5 percent and 8.1 percent of municipal taxes, respectively, whereas property taxes account for 41.8 percent.

There are large differences in local tax revenues by region, and when examined by prefecture, local tax revenue in Tokyo, the capital city, is 1.5 times the national average.

---

<sup>11</sup> However, there are some exceptions, such as some municipalities that have a population of over 50,000 but remain a town or village.

Intergovernmental fiscal transfers from the national to local governments finance the gap between local tax revenue and government expenditure. As mentioned, the main fiscal transfer system is called the Local Allocation Tax grants (LAT), and its total amount is decided by the negotiation between the national Ministry of Finance and the Ministry of Internal Affairs and Communications, while the national Ministry of Internal Affairs and Communications is in charge of allocation. The amount allocated to each municipality is determined by the difference between expenditure and revenue, based on certain criteria, which also corrects the gap in local tax revenue to some extent. In addition, the existence of an intergovernmental fiscal transfer system, called National Government Disbursement (NGD), in which transfers are made by national ministries and agencies, is also an important source for local governments to execute their policies. The difference between the two grants is that the LAT is an unrestricted source of funds, whereas the use of NGD is a pre-determined by each ministry of the central government. Among local government revenues, local taxes, LAT grants, and NGD account for 40.8 trillion, 16.7 trillion, and 37.4 trillion yen, respectively. Thus, because Japanese local governments largely depend on fiscal transfers from the central government, they are generally eager to increase their independent financial resources through the HTD.

## **2.4 Hypotheses**

Silkman and Young (1982) is one of the papers that began discussion of the impact of financial resources borne by other jurisdictions, such as intergovernmental grants and donations through the HTD system, on the efficiency of local governments. According to Silkman and Young, such “other people’s money” leads residents to misjudge their burden and causes inefficiency of local governments. De Borger and Kerstens’ (1996) pioneering study analyzed the efficiency of local governments within their particular theoretical perspective, and many studies have since analyzed the impact of intergovernmental grants on the efficiency of local governments. Numerous studies have found intergovernmental grants to be a source of inefficiency (Geys and Moesen, 2009b; Kalb, 2010); in particular, grants from other governments that mislead taxpayers regarding tax levels lead to inefficiency in local governments (Akai et al., 2003; Eom and Rubenstein, 2006; Kalb, 2010), implying that the HTD may lead to such inefficiency. The logic is that if revenues from the HTD are viewed as being borne by other regions, as in the case of intergovernmental grants, residents of recipient regions will consider the tax levy to be discounted, thereby reducing their incentive to monitor their region’s fiscal management. Accordingly, we framed the following hypothesis.

H1: The HTD undermines the cost efficiency of local governments.

Specifically, as the HTD is based on the willingness of the donor, it does not depend on the size of the population or finances of the municipality accepting the HTD. The smaller the

municipality, the more likely they are to be willing to accept more revenue from the HTD. In this case, the HTD accepted by municipalities of relatively small size (in terms of population and finances) will be larger than that of relatively large municipalities. In addition, because the size of the HTD in terms of population and finances would be larger in such small municipalities, residents would be more likely to perceive the tax to be discounted<sup>12</sup>.

Therefore, we posited the following hypothesis.

H2: Smaller municipalities are more likely to lose cost efficiency due to the HTD.

### 3. ESTIMATION APPROACH, AND DATA

To analyze the cost efficiency of municipalities, we use the stochastic parametric approach of Aigner et al. (1977) and Meeusen and van den Broeck (1977), which employs the deviation of combination of actual costs and output from the efficient frontier as an indicator of the inefficiency of the decision-maker. In the current study, the following Cobb–Douglas functional form used is employed:

$$\ln C_{it} = \beta_0 + \sum_{r=1}^s \beta_r \ln y_{r,it} + v_{it} + u_{it} + \eta_t \quad (1)$$

---

<sup>12</sup> In fact, one of the municipalities with the highest HTD revenues in FY2023, Monbetsu City, Hokkaido (population 20,000), received approximately 20 billion yen through the HTD, which is more than 30 percent of its general account. Meanwhile, Hakodate City (population 260,000), also in Hokkaido, received 1.5 billion yen through the HTD, which is only approximately 1 percent of its general account.

where  $C_{it}$  is the dependent variable representing the cost (input),  $y_{it}$  is a variable representing the output of the decision-maker,  $\eta_t$  is a year-specific dummy variable,  $\beta_r, r = (1, \dots, s)$  is the parameter to be estimated,  $i$  represents the decision-maker, and  $t$  represents the year. The error term in the stochastic frontier models is assumed to consist of two independent components ( $v_{it}$  and  $u_{it}$ ), where  $v_{it}$  is the usual stochastic error term, and  $u_{it}$  is a random variable representing cost inefficiency ( $u > 0$ ). The inefficiency term  $u_{it}$  in this model is expressed as

$$u_{it} = \sum_{j=1}^J \delta_j z_{j,it} + w_{it} \quad (2)$$

where  $z_{it}$  is a factor variable that represents inefficiency and  $\delta_j, j = (1, \dots, J)$  is a parameter to be estimated. The normal stochastic error term  $v_{it}$  follows a normal distribution  $N(0, \sigma_v^2)$  and the cost-inefficiency random variable  $u_{it}$  follows a truncated normal distribution  $N(z_{it}\delta, \sigma_u^2)$ , which is truncated at 0. Additionally,  $w_{it}$  follows a truncated normal distribution  $N(0, \sigma_w^2)$ , truncated at  $-z_{it}\delta$ . By simultaneously estimating equations (1) and (2) using the maximum likelihood method, the contradiction of assumption that the inefficiencies are identically distributed in equation (1), while equation (2) is regression model for the inefficiencies is eliminated (Battese and Coelli, 1995). However, if the model faces an endogeneity problem, the parameters estimated by the maximum likelihood method will no longer be consistent. The standard response to this problem is to use instrumental variables (IVs). Karakaplan and Kutlu (2017) presented a method to overcome this endogeneity



problem through a panel stochastic frontier model using IVs. In the case of the HTD, the amount is an output that should be maximized for local governments and, indeed, it may be possible to control the amount by offering attractive gifts; in such a case, the amount of the HTD would not be exogenous to the model. Therefore, we conduct an analysis using the approach presented by Karakaplan and Kutlu (2017) and the STATA code “xtsfkk” presented by Karakaplan (2018), considering the possibility that the HTD is endogenous.

The decision-making entity in this study is the local government, and  $y$  is the output supplied by them; however, the output and factor prices of production supplied by them cannot be directly observed (De Borger et al., 1994). Thus, we used the following six variables based on previous studies (Vanden Eeckhaut et al., 1993; De Borger et al., 1994; De Borger and Kerstens, 1996; Geys and Moesen, 2009a; Geys and Moesen, 2009b; Geys et al., 2010; Lampe et al., 2015).<sup>13</sup>

*STU*: Students in primary and secondary school

*INF*: Infants in kindergarten and nursery

*REC*: Number of recreational facilities (number of public halls, civic halls, museums, libraries, sports facilities, and meeting places)

*POP*: Total population

---

<sup>13</sup> These variables are used following Lampe et al. (2015), after taking logs and then standardizing by the mean.

*OLD*: Population older than 65 years

*EMP*: Number of employees

These variables are commonly used in previous research (De Borger et al., 1994; De Borger and Kerstens, 1996; Kalb, 2009; Lampe et al., 2015). The total population (*POP*) reflects the demand for public services in a municipality. The number of primary and secondary school students (*STU*) and the number of kindergarten and nursery students (*INF*) represent the demand for services by young people, while the population over 65 years of age (*OLD*) represents the demand for nursing homes and services for older persons. Additionally, the number of employees (*EMP*) is a proxy variable for those paying social security contributions, representing the demand for infrastructure for business development. The number of recreational facilities (*REC*) represents the demand for recreational services. As mentioned earlier, these are not direct outputs, as these outputs and production factor prices cannot be directly observed. Additionally, the quality of services has also not been considered. However, by selecting output indicators based on previous studies, we can compare our findings with prior results.

Additionally, the following variables are employed to affect the level of inefficiency:

most relevant to the hypotheses discussed earlier are the amount of the HTD recipients.

Moreover, considering that LAT grants inhibit cost minimization incentives, as identified by

Akai et al. (2003), we also include the LAT grant amount<sup>14</sup>. To account for simultaneity bias, we use these variables from one period earlier.

We analyze this model with the cost of local governments: current expenditure (*CEXP*), which excludes real investments and debt repayments. Based on the above, the estimated model is as follows.

$$\ln CEXP_{it} = \beta_0 + \beta_1 STU_{it} + \beta_2 INF_{it} + \beta_3 REC_{it} + \beta_4 POP_{it} + \beta_5 OLD_{it} + \beta_6 EMP_{it} + v_{it} + u_{it} + \eta_t \quad (3)$$

$$u_{it} = \delta_0 + \delta_1 HTD_{it-1} + \delta_2 LAT_{it-1} + w_{it} \quad (4)$$

As of September 2023, there were 1718 municipalities in Japan, but we exclude the following municipalities from our sample: those in Iwate, Miyagi, and Fukushima prefectures that were heavily affected by the 2011 Great East Japan Earthquake (122 municipalities); those merged during the analysis period (54 municipalities); and the one in Yubari City (1 municipality), as the city financially collapsed in 2006. Moreover, we exclude the

---

<sup>14</sup> The previous studies used subsidies per capita as one of the variables representing the inefficiency factor (Kalb, 2009). In the current study, per capita was also used for the HTD and LAT. Furthermore, when considering outflow due to the tax deduction, the net HTD may be negative in some municipalities. In addition, not all municipalities receive LAT. Therefore, when HTD per capita and LAT per capita were 0 or negative, they were converted to a positive value that was smaller than the minimum positive value, the log was taken, and the value included in the analysis.

municipalities that do not receive the LAT grant from the national government. In this study, cities in the category of those with populations between 50,000 and 200,000 and towns and villages with populations of less than 50,000 we include in the analysis; the sample is separated because of the different scope of administrative services between cities and towns and villages. The sample size is 580 cities and 658 towns and villages. The data analysis period is from 2015 to 2019.

As already mentioned, the amount of the HTD may be endogenous. In addition, in Japan, there is a significant difference in financial strength between urban and rural areas; therefore, rural areas with smaller populations may be trying to attract more HTD (Fig.1). By way of comparison, rural areas with smaller populations have a higher proportion of workers engaged in primary and secondary industries than do urban areas. Therefore, we use the primary industry worker ratio (*INDST1*) and the secondary industry worker ratio (*INDST2*) as instrumental variables. In addition, as noted by Yamamura et al. (2023), municipalities hit by natural disasters such as earthquakes are likely to attract HTD donations. Therefore, a dummy variable indicating whether the municipality was hit by at least one large-scale disaster in the previous year is also used as an instrumental variable (*DISASD*).

[Insert Table 1 here]

## **4. ESTIMATION RESULTS**

### **4.1 Baseline Estimations**

The parameters of the stochastic frontier function (Equation 3) and the inefficiency model (Equation 4) have been estimated simultaneously using the maximum likelihood estimation method. Table 2 shows the estimated results. In this table, Model EX represents a model without IVs, while Model EN represents a model that takes endogeneity into account by using IVs. Neither  $p$ -value of the eta endogeneity test, 0.842 for cities and 0.951 for towns and villages, is significant, indicating that the *HTD* is not endogenous.

Our main variable of interest is *HTD*. It is positively significant at the 0.1 percent level both in cities and towns and villages. Thus, a larger *HTD* means a larger deviation from the cost frontier, and the *HTD* can be considered to reduce cost efficiency. In terms of the magnitude of the coefficients, the coefficient for cities is 0.029 and that for towns and villages is 0.044. Therefore, towns and villages have a greater impact on cost efficiency when the *HTD* per capita increases. Thus, both H1 and H2 are supported. *LAT* is also positively significant for both cities and towns and villages. The result that subsidies from the central government reduce the cost efficiency of local government is similar to previous studies (Akai et al., 2003). The coefficient of 0.117 for cities and 0.409 for towns and villages suggests that the impact of *LAT* on cost efficiency is larger for towns and villages, which are more dependent on *LAT*, a subsidy from the central government. The variables included in the cost function are generally positively significant; this result is consistent with previous studies that used similar explanatory variables.

## 4.2 Robustness Check

In the baseline estimation, the cities and towns and villages samples are estimated separately. Thus, the measure of local government output is standardized by the mean of each sample. Here, we present the results of the estimation using the same sample of cities and towns and villages as a robustness check. For the indicators representing the output of local governments, we use those standardized by the mean of cities and towns and villages combined. The estimation results are presented in Table 3. The results of the eta endogeneity test have a  $p$ -value of 0.020, indicating that *HTD* is an endogenous variable at the 5 percent level. As already mentioned, *INDST1*, *INDST2*, and *DIASD* are used as instrumental variables. Because the  $\chi^2$  statistic is 32.35, these instrumental variables are not weak IVs. We now turn to the Model EN estimation results, where *HTD* is positively significant at the 0.1 percent level. Thus, we confirm that the HTD undermines the cost efficiency of local government even in the combined cities and towns and villages sample. Note that *LAT* is also positively significant at the 0.1 percent level.

The estimation results show that the ability of the HTD to divert tax revenue from other regions as donations is a disincentive to cost minimization for local governments. Although the HTD might have been designed to encourage local governments to compete for better administrative management, this has not been the outcome. That is, the more a municipality relies on tax revenues from other regions by HTD donations, the more residents

feel that the tax burden is discounted, thereby giving residents no incentive to monitor, which ultimately is likely to create a moral hazard.

[Insert Tables 2 and 3 here]

## **5. DISCUSSION AND CONCLUSION**

The purpose of this study is to determine how the efficiency of local governments is affected by revenues obtained from other governments, focusing on the unique Japanese HTD system. Under this system, residents donate to other local governments of their choice, and receive a deduction for a portion of the local and national taxes payable.

According to previous studies, grants from other governments mislead taxpayers about tax costs, leading to local government inefficiencies. HTD donations may have the same effect as intergovernmental grants, as they bring in tax revenue from other municipalities. Therefore, this study uses stochastic frontier analysis to clarify whether cost minimization incentives are inhibited by HTD donations. To the best of our knowledge, few studies have been conducted to date on this topic. Therefore, we aimed to answer whether the HTD has increased local governments' efficiency or decreased it.

Our results show that local governments with high rates of dependence on the HTD are less efficient in public service delivery. This is similarly seen for local governments with a high rate of dependence on LAT grants. As implications for local public finance, decentralization may be important, given that our results show that while decentralization

requires local governments to have greater autonomy in terms of revenues, if autonomy is enhanced by revenues borne by other regions, this will lead to residents misjudging the burden and will undermine the cost efficiency of local governments in the provision of public services. This is a result that has not been obtained from previous studies that focused on subsidies from the central government. That is, in Japan, LAT grants guarantee the minimum financial resources necessary for local governments to provide a minimum level of public services to residents<sup>15</sup>, which is based on national standards. Despite this, the HTD provides additional revenue, impeding the local government's cost minimization incentive. Simply put, the competition for income through the HTD is a zero-sum game.

There are certain issues that this study has not considered, which provides scope for future research. First, it is possible that purchasing of gifts<sup>16</sup> by local governments with tax revenue may help stimulate the local economy (Doi, 2014), which makes it necessary to analyze how the HTD affects the local economy. Second, it is imperative to estimate a cost function for each administrative area and measure its efficiency. This would help determine the areas in which the HTD has impaired efficiency.

---

<sup>15</sup> However, because the determination of the total LAT grants amount and that distributed to each municipality are based on different criteria, there is over/under-compensation by the LAT grants when viewed on a municipality-by-municipality basis.

<sup>16</sup> The Ministry of Internal Affairs and Communications has instructed that return gifts must be local products.



## **Acknowledgments:**

We would like to thank Sunghoon Hong, Bruno De Borger, Amihai Glazer, and participants from the Japan Institute of Public Finance held at Toyo University. We gratefully acknowledge financial support from JSPS KAKENHI Grant Number 21K01535. Usual disclaimers apply.

## **References**

- Aiello, F., Bonanno, G., 2019. Explaining differences in efficiency: A meta-study on local government literature. *J. Econ. Surv.* 33, 999–1027. <https://doi.org/10.1111/joes.12310>.
- Aigner, D.J., Lovell, C.A.K., Schmidt, P., 1977. Formulation and estimation of stochastic frontier production models. *J. Econ.* 6, 21–37. [https://doi.org/10.1016/0304-4076\(77\)90052-5](https://doi.org/10.1016/0304-4076(77)90052-5).
- Akai, N., Sato, M., Yamashita, K., 2003. Economics of local allocation tax. Yuhikaku, Tokyo. (in Japanese).
- Ashworth, J., Geys, B., Heyndels, B., Wille, F., 2014. Competition in the political arena and local government performance. *Appl. Econ.* 46, 2264–2276. <https://doi.org/10.1080/00036846.2014.899679>.
- Ayala-García, J., Dall’erba, S., 2021. The natural resource curse: Evidence from the Colombian municipalities. *Pap. Reg. Sci.* 100, 581–603. <https://doi.org/10.1111/pirs.12577>.

- Balaguer-Coll, M.T., Brun-Martos, M.I., Márquez-Ramos, L., Prior, D., 2019. Local government efficiency: Determinants and spatial interdependence. *Appl. Econ.* 51, 1478–1494. <https://doi.org/10.1080/00036846.2018.1527458>.
- Balaguer-Coll, M.T., Prior, D., Tortosa-Ausina, E., 2010. Decentralization and efficiency of local government. *Ann. Reg. Sci.* 45, 571–601. <https://doi.org/10.1007/s00168-009-0286-7>.
- Battese, G.E., Coelli, T.J., 1995. A model for technical inefficiency effects in a stochastic frontier production function for panel data. *Empirical Econ.* 20, 325–332. <https://doi.org/10.1007/BF01205442>.
- Bessho, S., 2017. How should we improve the gaps of local public finances among local governments? *Chuo Koron.* 3, 76–83. (in Japanese).
- Borge, L.E., Falch, T.F., Tovmo, P., 2008. Public sector efficiency: The roles of political and budgetary institutions, fiscal capacity, and democratic participation. *Public Choice.* 136, 475–495. <https://doi.org/10.1007/s11127-008-9309-7>.
- Borge, L.E., Parmer, P.P., Torvik, R., 2015. Local natural resource curse? *J. Public Econ.* 131, 101–114. <https://doi.org/10.1016/j.jpubeco.2015.09.002>.
- Coelli, T., Henningsen, A., 2013. Frontier: Stochastic frontier analysis, R package version 1.1-0. [http://CRAN.R-Project.org/package= frontier](http://CRAN.R-Project.org/package=frontier).

Costa-Font, J., De-Albuquerque, F., Doucouliagos, H., 2015. Does interjurisdictional competition engender a “race to the bottom”? A meta-regression analysis. *Econ. Pol.* 27, 488–508. <https://doi.org/10.1111/ecpo.12066>.

De Borger, B., Kerstens, K., 1996. Cost efficiency of Belgian local governments: A comparative analysis of FDH, DEA, and econometric approaches. *Reg. Sci. Urban Econ.* 26, 145–170. [https://doi.org/10.1016/0166-0462\(95\)02127-2](https://doi.org/10.1016/0166-0462(95)02127-2).

De Borger, B., Kerstens, K., Moesen, W., Vanneste, J., 1994. Explaining differences in productive efficiency: An application to Belgian municipalities. *Public Choice.* 80, 339–358. <https://doi.org/10.1007/BF01053225>.

“What to do with your hometown in the battle of gratuities?” *Toyo Keizai*.

<http://toyokeizai.net/articles/50954> (in Japanese).

Eom, T.H., Rubenstein, R., 2006. Do state-funded property tax exemptions increase local government inefficiency? An analysis of New York State’s STAR program. *Public Budg. Fin.* 26, 66–87. <https://doi.org/10.1111/j.1540-5850.2006.00839.x>.

Fukasawa, E., 2021. Impact on local government efficiency due to acceptance of the Hometown Tax Donation System in Japan: From the perspective of reduction in technical efficiency caused by “financial illusion.” *Reference.* 848, 1–30. (in Japanese).

Fukasawa, E., Fukasawa, T., Ogawa, H., 2020. Intergovernmental competition for donations:

The case of the Furusato Nozei Program in Japan. *J. Asian Econ.* 67, 101178.

<https://doi.org/10.1016/j.asieco.2020.101178>.

Geys, B., 2006. Looking across borders: A test of spatial policy interdependence using local

government efficiency ratings. *J. Urban Econ.* 60, 443–462.

<https://doi.org/10.1016/j.jue.2006.04.002>.

Geys, B., Heinemann, F., Kalb, A., 2010. Voter involvement, fiscal autonomy and public

sector efficiency: Evidence from German municipalities. *Eur. J. Pol. Econ.* 26, 265–278.

<https://doi.org/10.1016/j.ejpoleco.2009.11.002>.

Geys, B., Moesen, W., 2009a. Measuring local government technical (in)efficiency: An

application and comparison of FDH, DEA, and econometric approaches. *Public Perform.*

*Manag. Rev.* 32, 499–513. <https://doi.org/10.2753/PMR1530-9576320401>.

Geys, B., Moesen, W., 2009b. Exploring sources of local government technical inefficiency:

Evidence from Flemish municipalities. *Public Fin. Manag.* 9, 1–29.

<https://doi.org/10.1177/152397210900900101>.

Hashimoto, K., 2019. Hometown tax payment system and fiscal relations between central and

local governments. *Kansai Univ. Econ. Theor. Collect.* 69, 1–23. (in Japanese).

Hatfield, J.W., Kosec, K., 2013. Federal competition and economic growth. *J. Public Econ.*

97, 144–159. <https://doi.org/10.1016/j.jpubeco.2012.08.005>.

Kalb, A., 2009. What determines local governments' technical efficiency? The case of road maintenance. ZBW Discussion Paper Number 09047. Centre for European Economic Research, Mannheim.

Kalb, A., 2010. The impact of intergovernmental grants on cost efficiency: Theory and evidence from German municipalities. *Econ. Anal. Policy.* 40, 23–48.

[https://doi.org/10.1016/S0313-5926\(10\)50002-X](https://doi.org/10.1016/S0313-5926(10)50002-X).

Karakaplan, M.U., Kutlu, L., 2017. Endogeneity in panel stochastic frontier models: An application to the Japanese cotton spinning industry. *Appl. Econ.* 49, 5935–5939.

<https://doi.org/10.1080/00036846.2017.1363861>.

Kato, H., Yanagihara, K., 2021. Gift competition in the “Furusato Nozei system”: A theoretical approach in the framework of tax competition. *Stud. Reg. Sci.* 51, 176–195.

Lampe, H.W., Hilgers, D., Ihl, C., 2015. Does accrual accounting improve municipalities' efficiency? Evidence from Germany. *Appl. Econ.* 47, 4349–4363.

<https://doi.org/10.1080/00036846.2015.1030562>.

Meeusen, W., van den Broeck, J., 1977. Efficiency estimation from Cobb–Douglas production functions with composed error. *Int. Econ. Rev.* 18, 435–444.

<https://doi.org/10.2307/2525757>.

Nakazawa, K., 2013. Cost inefficiency of municipalities after amalgamation. *Procedia Econ. Fin.* 5, 581–588. [https://doi.org/10.1016/S2212-5671\(13\)00068-3](https://doi.org/10.1016/S2212-5671(13)00068-3).

- Nishimura, Y., Ishimura, T., Akai, N., 2017. Analysis on incentives of hometown tax payment: Empirical analysis using donation acceptance data of municipalities, in: Japan Association of Local Public Finance (Ed.), pp. 150–178. (in Japanese).
- Oates, W.E., 1972. Fiscal Federalism. Harcourt Brace Jovanovich, New York.
- Santolini, R., 2020. Spatial effects on Local Government efficiency. *Pap. Reg. Sci.* 99, 183–201. <https://doi.org/10.1111/pirs.12475>.
- Sato, M., 2017. “Remove gift in return from subjects covered by tax deduction, nikkei newspaper.” *Nihon Keizai Shimbun*, April 7. (in Japanese).
- Silkman, R., Young, D.R., 1982. X-efficiency and state formula grants. *Natl Tax J.* 35, 383–397. <https://doi.org/10.1086/NTJ41862452>.
- Tiebout, C.M., 1956. A pure theory of local expenditures. *J. Pol. Econ.* 64, 416–424. <https://doi.org/10.1086/257839>.
- Turati, G., Boetti, L., Piacenza, M., 2012. Decentralization and local governments’ performance: How does fiscal autonomy affect spending efficiency? *FinanzArchiv.* 68, 269–302. <https://doi.org/10.1628/001522112X653840>.
- Vanden Eeckhaut, P., Tulkens, H., Jamar, M.A., 1993. Cost efficiency in Belgian municipalities, in: Fried, H.O., Lovell, C.A.K., Schmidt, S.S. (Eds.). *The measurement of productive efficiency: techniques and applications*. Oxford University Press, New York, pp. 300–340.

Worthington, A.C., 2000. Cost efficiency in Australian Local Government: A comparative analysis of mathematical programming and econometric approaches. *Financ. Acc. Manag.* 16, 201–223. <https://doi.org/10.1111/1468-0408.00105>.

Yamamura, E., Tsutsui, Y., Ohtake, F., 2023. An analysis of altruistic and selfish motivations underlying hometown tax donations in Japan. *Jpn. Econ. Rev.* 74, 29–55. <https://doi.org/10.1007/s42973-021-00083-x>.

**Table 1** Descriptive statistics (1238 municipalities over 5 years)

Variabl	Cities (No. of obs=2.900)				Towns and Villages (No. of obs=3.290)				Year
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	
CEXP <sup>1</sup>	1.87e+07	1.14e+07	2570188	1.12e+08	4309892	2085365	904924	2.15e+07	2015-19
STU <sup>1</sup>	-0.065	-0.977	-4.866	2.926	-0.033	0.988	-3.200	2.155	2015-19
INF <sup>1,2</sup>	-0.065	0.976	-6.283	2.841	-0.033	0.987	-3.846	2.317	2015-19
REC <sup>1</sup>	0.014	0.988	-3.473	2.260	0.035	0.980	-4.045	3.111	2015-19
OLD <sup>1</sup>	-0.036	0.997	-14.531	2.859	-0.017	0.992	-3.858	2.009	2015-19
EMP <sup>1</sup>	-0.057	0.987	-13.437	2.741	-0.032	0.985	-3.490	2.118	2015-19
POP <sup>1</sup>	-0.054	0.989	-14.257	2.702	-0.029	0.987	-3.461	2.083	2015-19
HTD <sup>1</sup>	301429.5	1192597	0	4.98e+07	172929.7	813647	0	2.51e+07	2014-18
LAT <sup>1</sup>	5650242	3842695	33882	2.34e+07	2240898	1249107	594	8290326	2014-18
INDST <sub>1</sub> <sup>1</sup>	0.069	0.596	0.001	0.314	0.146	0.110	0.002	0.770	2014-18
INDST <sub>2</sub> <sup>1</sup>	0.263	0.070	0.110	0.478	0.240	0.079	0.015	0.471	2014-18
DISAS <sub>D</sub> <sup>3</sup>	0.083	0.276	0	1	0.087	0.282	0	1	2014-18

Notes: EMP, owing to data limitations, linear completion was performed using data from 2005, 2010, 2015, and 2020. STU, INF, REC, OLD, EMP and POP are output variables.

These are normalized by the sample mean and natural logs. *Source:* <sup>1</sup> Survey of the Ministry of Internal Affairs and Communication; <sup>2</sup> Survey of the Ministry of Health, Labor, and Welfare; <sup>3</sup> Legal application status of the Cabinet Office.



**Table 2** Results of the multi-output frontier estimation (baseline)

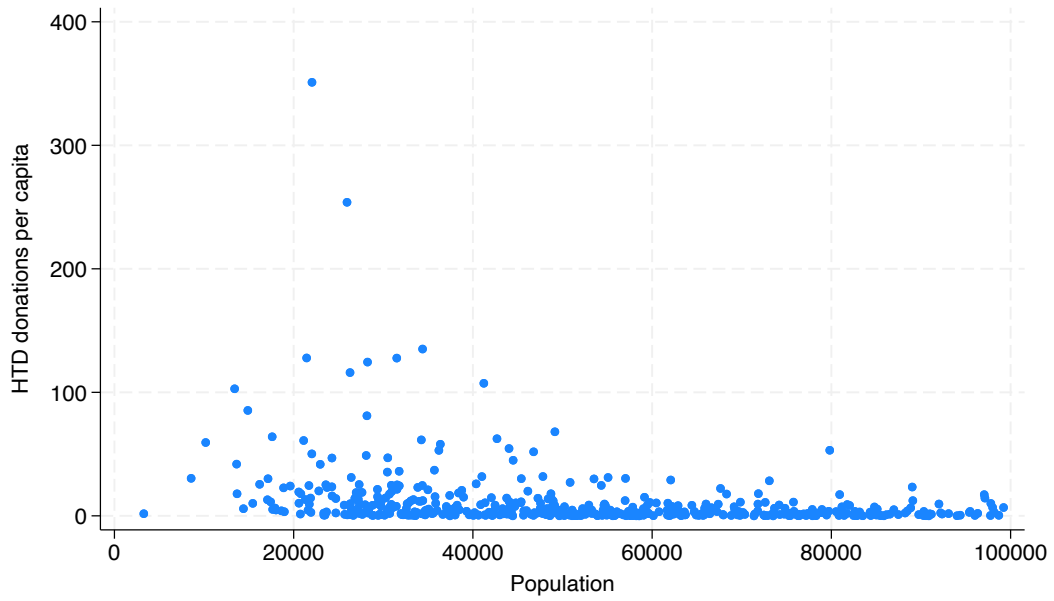
	Cities		Towns and Villages			
	Model EX	Model EN	Model EX	Model EN	Model EX	Model EN
Constant	16.318 (0.006)	*** 16.318 (0.006)	*** 16.318 (0.006)	*** 14.813 (0.008)	*** 14.813 (0.008)	*** 14.813 (0.008)
ln(STU)	0.212 (0.017)	*** 0.212 (0.017)	*** 0.212 (0.017)	*** 0.054 (0.029)	* 0.054 (0.029)	* 0.054 (0.029)
ln(INF)	0.055 (0.009)	*** 0.055 (0.009)	*** 0.055 (0.009)	*** 0.060 (0.013)	*** 0.060 (0.013)	*** 0.060 (0.013)
ln(REC)	0.013 (0.003)	*** 0.013 (0.003)	*** 0.013 (0.003)	*** 0.022 (0.005)	*** 0.022 (0.005)	*** 0.022 (0.005)
ln(OLD)	0.279 (0.029)	*** 0.280 (0.030)	*** 0.280 (0.030)	*** 0.164 (0.031)	*** 0.164 (0.031)	*** 0.164 (0.031)
ln(EMP)	0.036 (0.049)	0.035 (0.050)	0.035 (0.050)	0.037 (0.048)	0.037 (0.049)	0.037 (0.049)
ln(POP)	-0.023 (0.068)	-0.024 (0.068)	-0.024 (0.068)	0.185 (0.080)	** 0.185 (0.080)	** 0.185 (0.080)
Year dummy	yes	yes	yes	yes	yes	yes
Dependent variable: $\ln(\sigma^2_u)$						
Constant	-2.551 (0.203)	*** -2.551 (0.203)	*** -2.551 (0.203)	*** -4.104 (0.298)	*** -4.108 (0.304)	*** -4.108 (0.304)
ln(HTD per capita)	0.029 (0.004)	*** 0.030 (0.006)	*** 0.030 (0.006)	*** 0.044 (0.006)	*** 0.044 (0.009)	*** 0.044 (0.009)
ln(LTAX per capita)	0.117 (0.043)	*** 0.117 (0.043)	*** 0.117 (0.043)	*** 0.409 (0.054)	*** 0.409 (0.055)	*** 0.409 (0.055)
Dependent variable: $\ln(\sigma^2_v)$						
Constant	-6.547 (0.031)	***		-4.990 (0.028)	***	
Dependent variable: $\ln(\sigma^2_w)$						
Constant			-6.547 (0.031)	***		-4.990 (0.028)
Eta ln(HTD per capita)			0.000(0.001)			0.000(0.002)
Eta endogeneity test			P> $\chi^2=0.842$			P> $\chi^2=0.951$
Observations	2900	2900	3290	3290	3290	3290
Log Likelihood	3995.65	-1656.67	2421.80	-4320.09	2421.80	-4320.09
Mean Cost Efficiency	0.7607	0.7606	0.7290	0.7291	0.7290	0.7291
Median Cost Efficiency	0.7675	0.7675	0.7359	0.7359	0.7359	0.7359

Notes: Std. errors are shown in parentheses. Except for the variables in the inefficiency model, each variable is normalized by its sample mean and natural logs. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

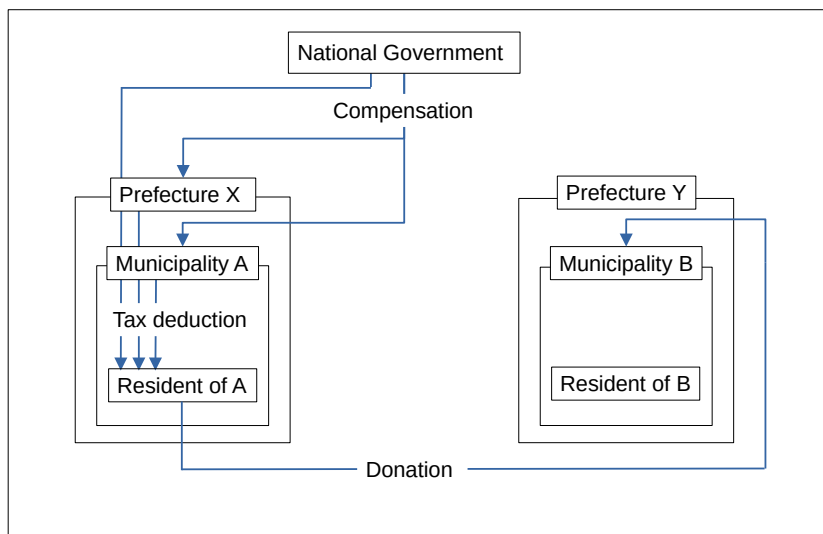
**Table 3** Results of the multi-output frontier estimation (robustness check)

	Cities, Towns and Villages			
	Model EX		Model EN	
Constant	15.452	***	15.452	***
	(0.006)		(0.006)	
ln (STU)	0.026		0.028	
	(0.031)		(0.031)	
ln(INF)	0.074	***	0.074	***
	(0.013)		(0.013)	
ln(REC)	0.034	***	0.035	***
	(0.004)		(0.004)	
ln(OLD)	0.356	***	0.351	***
	(0.046)		(0.045)	
ln(EMP)	0.162	***	0.162	***
	(0.062)		(0.062)	
ln(POP)	0.459	***	0.468	***
	(0.102)		(0.102)	
Year dummy	yes		yes	
Dependent variable: $\ln(\sigma^2_u)$				
Constant	-3.681	***	-3.813	***
	(0.191)		(0.193)	
ln(HTD per capita)	0.029	***	0.020	***
	(0.003)		(0.005)	
ln(LTAX per capita)	0.404	***	0.428	***
	(0.036)		(0.036)	
Dependent variable: $\ln(\sigma^2_v)$				
Constant	-5.422	***		
	(0.021)			
Dependent variable: $\ln(\sigma^2_w)$				
Constant			-5.419	***
			(0.021)	
Eta ln(HTD per capita)			0.003*	(0.001)
Eta endogeneity test			$P > \chi^2 = 0.020$	
Observations	6190		6190	
Log Likelihood	5523.88		-6916.98	
Mean Cost Efficiency	0.6946		0.6966	
Median Cost Efficiency	0.7072		0.7090	

Notes: Std. errors are shown in parentheses. Except for the variables in the inefficiency model, each variable is normalized by its sample mean and natural logs. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

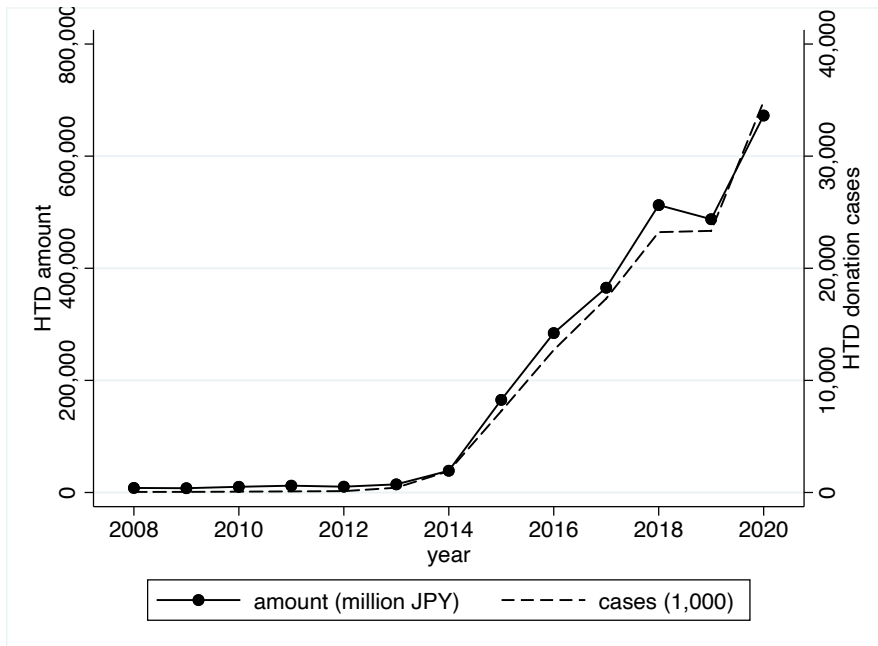


**Figure 1.** HTD donations per capita (FY 2019). *Notes:* This represents HTD donations per capita for cities with populations under 100,000. Source: Survey of the Ministry of Internal Affairs and Communication.



**Figure 2.** The structure of the HTD system. *Notes:* Compensation is 75 percent of the donation amount; if a municipality does not receive an LAT grant, there is no compensation.

Source: Ministry of Internal Affairs and Communication.



**Figure 3.** Amount and number of HTD donations from FY2008 to FY2020. *Notes:* HTD amount represents the total amount of donations made through the HTD system, and HTD cases represents the number of donations. Source: Survey of the Ministry of Internal Affairs and Communication.