CIRJE-F- 1254

Ending the Race for Return Gifts: Do Gift Caps in the *Furusato Nozei* Program Work?

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June 2025

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Abstract

This paper examines the effects of a regulation aimed at mitigating competition among municipalities to attract donations by offering return gifts under Japan's *Furusato Nozei* program. The main theoretical finding is as follows: when a cap is imposed on the return gift rate for donations, both regulated and unregulated municipalities reduce their return gift rates, thereby lessening competition. However, the reduction in return gift rates induced by the cap may incentivize municipalities that had previously refrained from competing to newly enter the competition, potentially intensifying overall competition. A comparison of descriptive data before and after the introduction of the regulation reveals that municipal responses are consistent with the theoretical predictions.

*This paper was presented at the Spring Meeting of the Japanese Economic Association in 2025. The authors are grateful to the participants for their valuable comments, particularly to Mitsuyoshi Yanagihara. Ogawa and Makino were supported by a grant from the Japan Society for the Promotion of Science (Nos. 23K22125 and 24KJ0813).

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1 Introduction

Reducing regional disparities within a country is a major policy concern worldwide. To address this issue, various interregional fiscal transfers systems have been widely implemented in different forms. In Japan, a unique initiative is the *Furusato Nozei* (Hometown Tax Donation) program, which allows individuals to allocate a portion of their income tax to any municipality in the form of donations.[1] Municipalities treat these donations as ordinary tax revenue, and donors receive an income tax deduction approximately equivalent to the amount donated. In addition to the tax deduction, a distinctive feature of the program is that donors receive "reciprocal" (thank-you) gifts from the recipient municipality, typically consisting of local products and specialties, which can be consumed or resold. This system has triggered competition among municipalities to attract donations, primarily through the "return gift rate," which reflects the percentage of the donation value returned as gifts.[2]

The competitive nature of the program through the use of the "return gift rate" has been empirically confirmed, and concerns about excessive competition have been raised by both researchers and the government. For instance, in a model of inter-municipal competition for donations, Fukasawa et al. [2020], using data from 2015 to 2018, show that there is "excessive" competition among municipalities.[3] The central government has also taken measures to address cases in which municipalities offer particularly expensive gifts or highly liquid products. In 2017, it issued a non-binding request for municipalities to keep return gift rates below 30%. This request was taken a step further in 2019, when the restrictions were legally enforced through a legislative amendment.[4]

[1] While this is an inter-regional tax allocation program with no direct parallel elsewhere, Korea has recently launched the Hometown Love Donation system, which is similar to the Japanese program.

[2] Individuals do not necessarily choose municipalities solely based on self-interest, but Nishimura et al. [2017] and Yamamura et al. [2023] confirm that self-interested motives for gifts, along with altruistic motives, significantly influence their donation decisions.

[3] In their model, competition is "excessive" due to externalities: increasing the return gift rate by one municipality imposes negative fiscal externalities by reducing donations received by others, which in turn leads to overall excessively high return gift rates. See also Fukasawa [2019], Fukasawa [2020], Fukasawa et al. [2020], Suematsu [2020], Kato and Yanagihara [2021], and Uemura [2023].

[4] In 2023, additional regulations limited the total cost of gifts and related expenses to no more than 50% of the total donation amount.

This paper explores the effects of the 2019 regulation that set a 30% cap on the return gift rate. Several studies share our interest. Suzuki [2019] shows that the 2017 government request to limit return gift rates to 30% was largely ineffective at the macro level. Hashimoto and Suzuki [2021] shows that the introduction of the 2019 regulation, which carried legal force rather than being a mere request, may have eased inter-municipal competition. A similar result is presented in Fukasawa [2024], who analyzed the issue in more detail using kernel density estimation. In addition, Uemura [2023] used a monopolistic competition model to simulate the effect of a cap on the return gift rate and found that it helped curtail the behavior of the top 100 municipalities in terms of donation revenue. While all of these prior studies concluded that the 2019 regulation reduced competition among municipalities, this paper argues that they may have overlooked the possibility that regulation not only reduces but may also promote competition. This implies that the impact of regulation can be decomposed into two opposing effects: a competition-mitigating effect and a competition-promoting effect.

The key contribution of our study is that we relax an assumption implicit in previous studies. Prior research on the *Furusato Nozei* program assumes that all municipalities participate in the competition and that the number of competing regions is fixed. However, this assumption is not robust, either theoretically or empirically. Several studies on inter-regional competition have presented theoretical models in which municipalities endogenously decide whether to participate, highlighting the strategic nature of such decisions (Cai and Treisman [2005]; Matsumoto [2008]; Matsumoto [2010]; Kikuchi [2021]). A municipality's decision to participate in the *Furusato Nozei* program should be no exception. It is also evident that a non-negligible number of municipalities do not participate in the competition: in 2018, municipalities with return gift rates of 0% or below 10%–effectively nonparticipants–accounted for 3.4% and 11.2% of all municipalities, respectively. Ignoring such municipalities may lead to misleading conclusions regarding the effects of regulation.

Given the possibility that the number of competing municipalities varies, we show that a cap on the return gift rate has two conflicting effects. Setting a 30% cap leads municipalities with higher return gift rates to lower them, thereby easing competition. Interestingly, in our model, municipalities that are not directly constrained by the cap also reduce their return gift rates due to strategic

complementarity, amplifying the competition-mitigating effect. However, our novel insight is that this reduction in return gift rates may incentivize previously nonparticipating municipalities to join the competition, thereby increasing overall competition. Hence, the ultimate effect of regulation is determined by the relative strength of these two opposing forces.

Descriptive statistics support these predictions. Among municipalities with pre-regulation return gift rates exceeding 30%, the average rate fell from 38.7% in 2018 to 28.6% in 2019. Conversely, municipalities whose return gift rates had been below 10% saw their average rates increase from 2.9% to 7.6%, suggesting that a non-negligible number of previously inactive municipalities joined the competition by raising their return gift rates.[5] The possibility that the regulation encouraged competition is also reflected in changes in municipal participation. The number of non-participating municipalities declined by 10.2% after the regulation took effect in 2019. Anecdotal evidence of newly participating municipalities is particularly common in urban areas that originally had few attractive local specialty products suitable for return gifts. For example, the number of Tokyo's special wards participating in return gift competition increased by 1.5 times between 2019 and 2024 (Sugimoto and Satsunai [2024]). These findings suggest that, contrary to prior conclusions, regulation may promote competition by affecting heterogeneous municipalities differently and encouraging new entrants.

The remainder of this paper is organized as follows. Section 2 presents a baseline model in which all municipalities participate in the competition for donations. Section 3 extends the analysis to allow the number of competitors to vary with or without regulation, leading to the finding that regulation has two opposing effects. Section 4 provides descriptive evidence in support of the theoretical predictions, and Section 5 concludes.

2 Two-region model with active participation

The *Furusato Nozei* program is a unique scheme that allows residents to redirect a portion of their local income tax payments to a municipality of their choice. In exchange, they receive a reduction in their residential tax obligations to their

[5] Fukasawa [2024] also found that municipalities with return gift rates below 10% raised their rates after the regulation took effect.

home municipality in an amount equivalent to their donation, minus a small administrative fee.

A distinctive feature of the program is the provision of "return gifts" from recipient municipalities to donors. These gifts, often consisting of regional specialties such as rice, fruit, seafood, or meat, have effectively turned the system into a form of Internet shopping mediated by taxation. The selection and value of these gifts are determined at the discretion of each municipality, leading to fierce competition among them to attract donations. Consequently, municipalities have been incentivized to offer increasingly attractive gifts, which in some cases has escalated into excessive competition. Donations received through this system constitute an important part of local government finances, as they are classified as general revenue. In some municipalities, the share of donations received through the program as a percentage of total expenditures can reach as high as 50%.[6]

This section presents a baseline model depicting a situation in which two municipalities compete for donations and examines the effects of a cap on the return gift rate introduced to ease inter-regional competition.

2.1 Equilibrium without a cap on the return gift rate

The donation received by region $i(= 1, 2, \cdots)$, which participates in the *Furusato Nozei* program, is given by

$$x_i = a_i + p_i - b\sum_{j \neq i} p_j. \tag{1}$$

$a_i(\geq 0)$ represents the baseline donation demand for region i, which is determined by various factors such as the quality of return gifts provided by the region and the strength of donors' altruism toward region i. $p_i(\geq 0)$ is the "return gift rate", and $b \in (0, 1)$ is a parameter representing the degree of substitutability between municipalities.[7] The return gift rate refers to the ratio of the value of the returned gifts (such as local specialties) to the total amount donated. It is often a key factor in attracting donors, as higher rates offer more value in return for the donation. Although municipalities that do not participate in the

[6] The ratio was highest in Shiranuka Town, Hokkaido, in 2022, at 49.1%.

[7] Fukasawa et al. [2020] derive (2) by solving the donor's utility maximization problem. We follow their model to represent the donation demand function in a simplified form, omitting the coefficient on p_i for notational convenience, as it does not affect our qualitative results.

program may still receive donations through other channels, this paper focuses on competition over donations within the program. Therefore, we assume that a municipality setting a zero return gift rate receives zero donations.

In the two-region model, the amount of donations received by region $i(=1,2)$ is given by

$$x_i = a_i + p_i - bp_j, \tag{2}$$

where $a_1 > a_2$ is assumed without loss of generality. Given (2), we assume that the objective function of a municipality is the net revenue, R_i, which is given by

$$R_i = x_i - p_i x_i - c(p_i). \tag{3}$$

The first term represents the amount donors contribute to region i, the second term is the cost of providing return gifts in exchange for donations, and the final term is the fixed cost of participating in the program and competing for donations:

$$c(p_i) = \begin{cases} f & \text{if } p_i > 0 \\ 0 & \text{if } p_i = 0 \end{cases}. \tag{4}$$

If a municipality offers return gifts and participates in the competition, it incurs a fixed cost f; however, no fixed cost is incurred if it chooses not to participate.

The revenue-maximizing regional government sets the return gift rate p_i to satisfy

$$p_i = \frac{b}{2} p_j + \frac{1-\alpha_i}{2}, \tag{5}$$

where $b \in (0,1)$ ensures the stability of the Nash equilibrium. (5) shows that the two regions are strategic complements with respect to the return gift rate and yields the Nash equilibrium level in the absence of a cap on this rate, as follows:

$$p_i^e = 1 - \frac{1-b}{2-b} - \frac{Ab}{(2-b)(2+b)} - \frac{(2-b)a_i}{(2-b)(2+b)}, \tag{6}$$

where the superscript e indicates that it is the equilibrium value in the absence of a cap on the return gift rate, and $A \equiv \sum_{i=1}^{2} a_i$ represents the total baseline demand for donations within the program.

Here, we discuss the efficiency of the return gift rate in equilibrium. In regional competition for donations, the return gift rate in equilibrium is generally set too high compared to the cooperative solution (Fukasawa et al. [2020]). This result also holds in our model: using (2) and (3), we obtain $\partial R_i/\partial p_j < 0$, which implies that an increase in the return gift rate in region j imposes negative externalities on region i in the form of reduced net revenues. The non-cooperative behavior of regions, which fail to internalize these externalities, leads to an equilibrium return gift rate that exceeds the level that would maximize the total net revenue across all regions. This inefficiency provides the rationale for the regulation analyzed in the next section.

Using (3) and (6), the donation received by municipality i in equilibrium is given by:

$$x_i^e = \frac{a_i(2-b) + Ab + (1-b)(2+b)}{(2-b)(2+b)}, \tag{7}$$

which gives the net revenue for municipality i as

$$R_i^e = \left[\frac{a_i(2-b) + Ab + (1-b)(2+b)}{(2-b)(2+b)}\right]^2 - f. \tag{8}$$

From (6)–(8), the comparison of equilibrium values yields the following result.

Proposition 1. *$p_1^e < p_2^e$, $x_1^e > x_2^e$, and $R_1^e > R_2^e$ when $a_1 > a_2$.*

This result implies that regions that are less attractive as donation destinations will set relatively high return gift rates and offer more expensive gifts to their donors. In this case, region 2 allocates more resources to return gifts, yet it receives fewer donations and generates lower net revenue than region 1.

Here, we clarify the condition implicitly assumed in deriving Proposition 1. In Proposition 1, both regions participate in the competition for donations by setting a positive return gift rate. This outcome holds when f is sufficiently low such that the sign of (8) is positive, which is formally expressed by the following condition.

Condition 1. Net revenues in equilibrium are positive in all regions, i.e., $R_i^e > f$, where R_i^e is given by (8).

If Condition 1 is not satisfied, there is no interregional competition through the provision of return gifts for donations. To analyze the characteristics of the

equilibrium under active competition for donations, we assume that Condition 1 holds in the following analysis and defer the discussion of non-active regions to Section 3.

2.2 Equilibrium with a cap on the return gift rate

As noted in the previous section, raising the return gift rate in one region imposes negative externalities on other regions, which leads to an excessively high return gift rate in equilibrium. Suppose, then, that a cap q is placed on the return gift rate that each region can set, in order to mitigate excessive competition in offering return gifts for donations. The larger (smaller) q is, the looser (tighter) the cap on the return gift rate. If q is too high, the cap is ineffective. Conversely, if q is too low, all regions are subject to the cap, and the central government effectively determines the return gift rates for all municipalities. The case in which only some regions are subject to the cap corresponds to assuming q lies in the range $p_1^e < q < p_2^e$. We state this condition explicitly as follows:

Condition 2. A cap on the return gift rate is binding for some regions, $p_1^e < q < p_2^e$, where p_i^e is given by (6).

If a cap on the return gift rate satisfying Condition 2 is introduced, only region 2 is constrained, so $p_2^r = q$, where the superscript r denotes the equilibrium value with a cap on the return gift rate. Then, from (5), the return gift rate for region 1 is given by

$$p_1^r = \frac{b}{2}q + \frac{1 - a_1}{2}. \tag{9}$$

The change in the return gift rate due to the introduction of a cap on the return gift rate is illustrated in Figure 1. $p_i(p_j)$ represents the response curve for region i, and the unregulated equilibrium, given by (6), is located at point A. If a cap on the return gift rate q is introduced such that $p_1^e < q < p_2^e$, the range of feasible return gift rates for each region becomes narrower. In particular, region 2 can no longer set p_2^e, and its response curve becomes vertical at q; region 2 thus chooses $p_2 = q$, the ceiling value. Given $p_2 = q$, the optimal response for region 1–which is not constrained by the cap–is to reduce its return gift rate from p_1^e to p_1^r, shifting the regulated equilibrium to point B. Because the cap forces region 2 to lower its return gift rate and thereby reduces the intensity of competition for donations, region 1, which is not subject to the cap, also finds it optimal to lower its return gift rate.

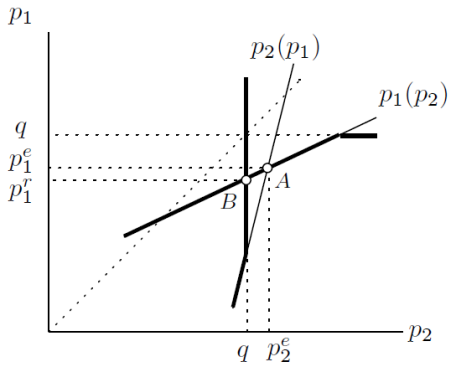


Figure 1: Reaction curves of two active regions

The results can be summarized as follows.

Proposition 2. *A cap on the return gift rate q lowers not only the return gift rate of region 2, which is constrained by the regulation, but also that of unconstrained region 1.*

Proof. The comparison of (6) and (9) yields $p_1^e - p_1^r = b(p_2^e - q)/2 > 0$, where the inequality is given by Condition 2. □

Given (9) and $p_2^r = q$, the donations to each region will be $x_1^r = (1+a_1-bq)/2$ and $x_2^r = [q(2-b^2) + 2a_2 - b(1-a_1)]/2$, and the net revenues are

$$R_1^r = \frac{b^2}{4}q^2 - \frac{b\,(1+a_1)}{2}q + \frac{(1+a_1)^2}{4}, \tag{10}$$

$$R_2^r = -\frac{\left(2-b^2\right)}{2}q^2 + \frac{(1+b)\,(2-b) - 2a_2 - ba_1}{2}q + \frac{2a_2 - b(1-a_1)}{2}. \tag{11}$$

Let us now examine the effect of a change in the cap level on return gift rates on net revenues. Taking the first derivative of R_i^r with respect to q yields:[8]

$$\frac{\partial R_1^r}{\partial q} = -\frac{ba_1 + b^2(1-q) + b(1-b)}{2}, \tag{12}$$

$$\frac{\partial R_2^r}{\partial q} = -\left(2-b^2\right)q + \frac{(1+b)\,(2-b)}{2} - \frac{2a_2 + ba_1}{2}. \tag{13}$$

[8]The second-order derivatives are $\partial^2 R_1^r/\partial q^2 = b^2/2 > 0$ and $\partial^2 R_2^r/\partial q^2 = -(2-b^2) < 0$.

(12) suggests that $\partial R_1^r/\partial q < 0$ since $b \in [0,1]$ and $q \in [0,1]$. This indicates that the introduction of a cap on the return gift rate always increases net revenues in region 1. We also obtain from (13):

$$\frac{\partial R_2^r}{\partial q} \underset{<}{>} 0 \quad \leftrightarrow \quad q \underset{>}{<} 1 - \frac{(2-b)a_2 + Ab + (1-b)(2+b)}{2(2-b^2)} \;\equiv\; \bar{q}, \tag{14}$$

which yields the following result.

Proposition 3. *In the range where $\bar{q} \leq q$, lowering a cap on the return gift rate q improves the net revenue of all regions.*

Proposition 3 can be visually confirmed in Figure 2. If q is set at a level higher than p_2^e, the cap on the return gift rate is not binding, and the net revenue of region i is given by R_i^e. When q marginally decreases within the range $\bar{q} < q < p_2^e$, the cap improves the net revenue of all regions compared to the Nash equilibrium level. [9] To ensure that all regions are better off relative to the Nash equilibrium, the cap q must satisfy $q > \underline{q}$, where $\underline{q}$ denotes the value of q for which $R_2^r = R_2^e$ holds:

$$\underline{q} = \bar{q} - \frac{b^2}{2}\frac{(2-b)a_2 + Ab + (2+b)(1-b)}{(2+b)(2-b)(2-b^2)}. \tag{15}$$

which represents the minimum level at which the cap can be set in order to improve net revenue under the Nash equilibrium. If the cap q is set above the level $\underline{q}$, its introduction increases the net revenue of all regions compared to the Nash equilibrium outcome. Conversely, setting the cap below $\underline{q}$ does not lead to Pareto improvement.

We now explain the mechanism by which a change in the cap level on the return gift rate improves net revenues not only for the unconstrained region 1, but also for region 2, which is constrained by the cap. Introducing a regulation that lowers return gift rates from the Nash equilibrium helps curb excessive competition, thereby increasing net revenue in region 1. This occurs because region 2 reduces its return gift rate to the cap q, allowing region 1 to attract more donations even while lowering its own return gift rate. A reduction in the cap q from the Nash equilibrium level has two opposing effects on region 2. The first is a negative effect: When the less attractive region 2 is forced to lower its return gift rate, it experiences a substantial decline in donations, which lowers

[9] It can be verified that $\bar{q} < p_2^e$ always holds under the parameter values considered.

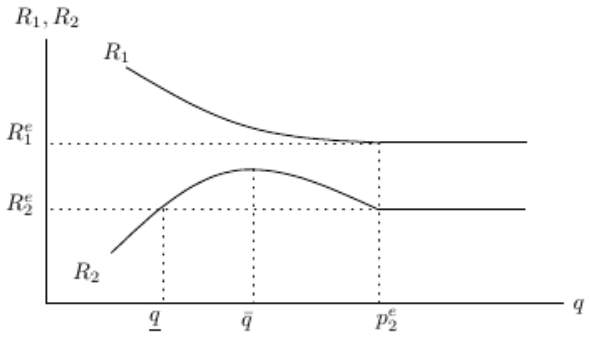


Figure 2: Tax revenues

its net revenue. The second is a positive effect, similar to the benefit enjoyed by region 1: it mitigates excessive competition and thereby increases net revenue. When q remains relatively high, the positive effect outweighs the negative one, so a marginal tightening of the cap improves net revenue. However, once q becomes sufficiently low, the negative effect dominates, and further reductions in the cap result in a decline in net revenue.[10]

3 Three-region model with an inactive region

This section considers a setting in which three regions potentially compete for donations and begins the analysis with a case where one of the three regions does not participate in the competition. We then demonstrate that Proposition 2 does not necessarily hold when a cap on return gift rates is introduced. Specifically, region 2, which is constrained by the cap, lowers its return gift rate to q, while region 1 may either decrease or increase its return gift rate.

[10]This mechanism is similar to that discussed in Hebous and Keen [2023], who analyze the effects of introducing a global minimum corporate tax rate. They show that when a minimum tax floor constrains tax havens from setting excessively low tax rates, countries not directly constrained by the minimum can raise their tax rates as well, thereby reducing excessive tax competition and potentially achieving a Pareto improvement.

3.1 Equilibrium without a cap on the return gift rate

Using (1) and (3), the response function in the three-region model is obtained as

$$p_i = \frac{b}{2}\sum_{j\neq i} p_j + \frac{1-a_i}{2}. \tag{16}$$

The equilibrium return gift rate in the absence of a cap on the return gift rate is given by

$$p_i^{e*} = \frac{2+b-2a_i\,(1-b)-bA}{2\,(b+2)\,(1-b)}, \tag{17}$$

where $A \equiv \sum_{i=1}^{3} a_i$. The superscript $e*$ indicates the equilibrium value in the three-region model without regulation. The donation received by region i is

$$x_i^{e*} = \frac{2a_i\,(1-b)+Ab+(b+2)\,(1-2b)}{2\,(b+2)\,(1-b)}, \tag{18}$$

and the net revenue is

$$R_i^{e*} = \left[\frac{2a_i\,(1-b)+Ab+(b+2)\,(1-2b)}{2\,(2+b)\,(1-b)}\right]^2 - f. \tag{19}$$

From (17) and (19), under the condition $a_3 < a_2 < a_1$, we obtain $p_1^{e*} < p_2^{e*} < p_3^{e*}$ and $R_3^{e*} < R_2^{e*} < R_1^{e*}$.

The discussion so far assumes that all regions choose $p_i > 0$ and thus participate in the competition. However, depending on the level of fixed costs f, some (or all) regions may opt not to participate. In our analysis, we assume that a municipality earns no net revenue if it does not participate in the program–not because it receives zero donations, but because the cost of supplying return gifts is zero.

Under these assumptions, to analyze a situation in which one of the three regions does not participate in the competition while the remaining two do, we impose the following condition.

Condition 3. The fixed cost f satisfies $R_3^{e*} < 0 < R_2^{e*} < R_1^{e*}$, where R_i^{e*} is given by (19).

Under Condition 3, we have $p_3 = 0$. Substituting this into (3) for regions 1 and 2, we obtain that the return gift rates set by regions 1 and 2 when region 3 does not participate in the competition are given by $p_1^{e*} = p_1^e$ and $p_2^{e*} = p_2^e$.

3.2 Equilibrium with a cap on the return gift rate

Suppose, as in Section 2.2, that a cap on the return gift rate is introduced such that $p_1^{e*} < q < p_2^{e*}$. In this case, the return gift rate set by region 2, which is constrained by the cap, is $p_2 = q$. Region 3, given that $a_2 > a_3$, would choose a higher return gift rate than p_2^{e*}. Therefore, if region 3 participates in the competition in the absence of regulation, it will choose $p_3 = q$ after the introduction of the cap. Substituting $p_2 = p_3 = q$ into (17) for region 1 yields its return gift rate as follows:[11]

$$p_1^{r*} = bq + \frac{1 - a_1}{2}, \tag{20}$$

where the superscript $r*$ represents the equilibrium value when a cap on the return gift rate is imposed in the three-region model.

The donations in equilibrium under (20) and $p_2^{r*} = p_3^{r*} = q$ are given by $x_1^{r*} = (a_1 - 2bq + 1)/2$ and $x_j^{r*} = [2q(1 - b - b^2) + 2a_j - b(1 - a_1)]/2$, and the net revenues are

$$R_1^{r*} = \frac{(1 + a_1 - 2bq)^2}{4} - f, \tag{21}$$

$$R_j^{r*} = \frac{(1 - q)\left[2q\left(1 - b - b^2\right) + 2a_j - b(1 - a_1)\right]}{2} - f, \tag{22}$$

where $j = 2, 3$. The conditions under which region 3 can set a positive return gift rate and participate in donation competition after the introduction of a cap on the return gift rate are described as follows.

Condition 4. After the introduction of a cap on the return gift rate, region 3 will set a positive return gift rate and participate in the competition, i.e., $R_3^{r*} > 0$, where R_3^{r*} is given by (22).

In the two-region model presented in Section 2, which analyzed a setting in which no additional municipalities could newly participate in the program, return gift rates decreased in all regions following the introduction of a cap on the return gift rate. If the cap is introduced such that Condition 4 is satisfied, region 3 enters the competition for donations, and the return gift rate in region

[11] Note that we assume here that only one region participates in the competition after the introduction of the cap on the return gift rate. If n homogeneous municipalities enter, (20) is rewritten as $p_i^{r*} = nbq + (1 - a_i)/2$.

1 becomes p_1^{r*}. The sign of the difference between p_1^{e*} and p_1^{r*}–that is, whether the return gift rate in region 1 decreases or increases after the introduction of the cap–depends on the following conditions.

$$\begin{aligned} p_1^{e*} - p_1^{r*} &= b \cdot \left(\underbrace{\frac{2(1-a_2)+b(1-a_1)}{(2-b)(2+b)}}_{>0} - q - \frac{2(1-a_2)+b(1-a_1)}{2(2-b)(2+b)} \right) \\ &= b \cdot (\tilde{q} - q), \end{aligned}$$

where

$$\tilde{q} \equiv \frac{2(1-a_2)+b(1-a_1)}{2(2-b)(2+b)}. \tag{23}$$

Under the three-region model, the introduction of a cap on the return gift rate has two opposing effects on the return gift rate set by region 1, which is not subject to regulatory constraints. First, since the regions are strategic complements with respect to return gift rates, region 1 lowers its return gift rate when region 2, being subject to the cap, reduces its return gift rate. This effect was observed in the two-region model described in Section 2.2. Second, with the entry of region 3–which had not previously participated in the program–the number of competitors increases, thereby putting upward pressure on the return gift rate in region 1. If q is sufficiently high, the first effect dominates, and region 1 lowers its return gift rate. However, if q is sufficiently low, the second effect dominates, and region 1 raises its return gift rate.

Under the above mechanism, the introduction of a cap that encourages new entrants into the interregional competition for donations has the following effects on the return gift rate of each region.

Proposition 4. *Under Condition 4, the introduction of a cap on the return gift rate results in the following changes.*

(a) *Region 2 constrained by a cap on the return gift rate reduces the return gift rate to q.*

(b) *Region 3, which was previously inactive, joins the race to set a positive return gift rate.*

(c) *Region 1, which is not subject to the cap, lowers (does not change or raises) the return gift rate if $q < (\geq)\ \tilde{q}$.*

If a relatively lax cap (i.e., a large q) is introduced for regions already participating in the competition, region 2–being constrained by the regulation–lowers its return gift rate. As a result, overall competition is mitigated, and region 1 also lowers its return gift rate. This is the same effect observed in Proposition 2 following the introduction of a cap on the return gift rate.

In addition to this competition-mitigating effect, the introduction of a stricter cap (i.e., a smaller q) for regions already participating in the competition may intensify competition, as region 3, which had not previously participated, now enters the competition. This effect does not appear in Proposition 2, as the two-region model excludes the possibility of new entrants. Therefore, in the three-region model, if the competition-enhancing effect from region 3's entry outweighs the competition-reducing effect of the cap on region 2, region 1 will raise its return gift rate after the cap is introduced.

3.3 Numerical example

To clarify the difference in the return gift rate before and after the introduction of a cap, p_i^{e*} and p_i^{r*}, it is helpful to consider a numerical example in which the two can be explicitly compared, particularly in the case of region 1, which is affected by new entry. Consider the case where $(a_1, a_2, a_3, b, f) = (0.45, 0.40, 0.375, 0.10, 0.43)$, which satisfies all of Conditions 1–4. Using this setup, we can quantitatively examine how the introduction of a cap on the return gift rate changes both the return gift rates and net revenues.

Inserting these parameter values into (17), we obtain the return gift rates under no regulation as $p_1^{e*} = 0.29073$, $p_2^{e*} = 0.31454$, and $p_3^{e*} = 0$. Now suppose the maximum return gift rate is set at 30%, i.e., $q = 0.3$. Then, both region 2 and the newly entering region 3 are constrained and set their return gift rates equal to the cap: $p_2^{r*} = p_3^{r*} = 0.3$.[12] Although Proposition 4(c) shows that a cap can exert both upward and downward pressure on region 1's return gift rate, in this numerical example, region 1's optimal response would be to raise its rate to $p_1 = 0.305$. However, due to the cap, region 1 cannot set a rate above 30%, and therefore also sets $p_1^{r*} = 0.3$, resulting in all three regions converging

[12] Sumi [2024] conducted a survey of four municipalities that began participating in *Furusato Nozei* program after the 2019 regulatory reform. The survey reveals that these municipalities, despite having the option to start with a low return gift rate and gradually increase it, set the rate at around 30% from the outset, which is consistent with our findings.

to the regulatory maximum.

The effect of the cap on net revenue varies by region. For region 3, which newly participates due to the cap, net revenue naturally increases compared to the pre-regulation level: $0 = R_3^{e*} < R_3^{r*}$. In this example, region 2, which is constrained by the cap, experiences a decline in net revenue: $R_2^{e*} > R_2^{r*}$. This decline stems from the entry of region 3, which captures a share of the donations, and the forced reduction in region 2's return gift rate–both of which cut into its received donations.

The change in net revenue of region 1 is inherently ambiguous because the cap operates through two countervailing forces. By forcing region 2 to lower its return gift rate, it relaxes competitive pressure—allowing region 1 to raise its own rate—yet it also induces entry by region 3, which intensifies competition. In our numerical example, whether net revenue in region 1 rises or falls depends on the cap level q: if $q < \tilde{q} = 0.15727$, the competition-easing effect predominates, and net revenue increases ($R_1^{e*} < R_1^{r*}$); if $q > \tilde{q}$, the effect of having more competitors dominates, and net revenue decreases ($R_1^{e*} > R_1^{r*}$).

4 Descriptive Statistics

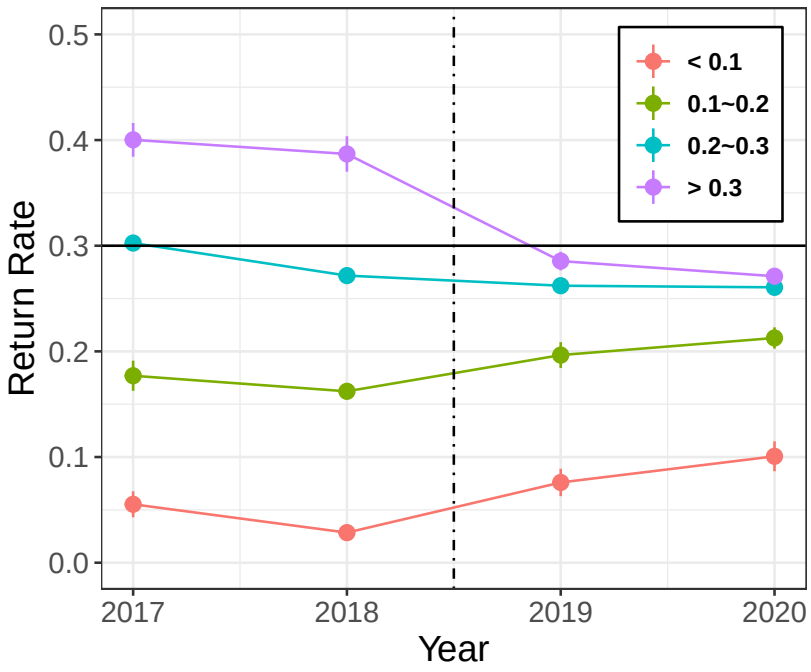
Our theoretical predictions regarding the effects of introducing a cap on the return gift rate are summarized in Proposition 4. In what follows, we compare these theoretical predictions with actual data.

Figure 3 illustrates trends in return gift rates from 2017 onward.[13] In this figure, municipalities are grouped based on their return gift rates in 2018–prior to the introduction of the regulation–to track how their rates evolved after the policy was implemented.[14] The figure highlights three key findings. First, the cap effectively reduced return gift rates among municipalities that had previously set rates above 30%, with their average rate falling below that threshold. Second, if the cap had merely mitigated competition, we would expect munici-

[13]The data source is the "Findings on the *Furusato Nozei* Program" published by the Japanese Ministry of Internal Affairs and Communications. The return gift rate is calculated as the ratio of gift procurement cost to the amount of donations received. Municipalities that did not report gift procurement costs and indicated that no gifts were sent are treated as having a return gift rate of 0.

[14]Figure 3 is prepared with reference to Buettner and Poehnlein [2024], which analyzes the effects of introducing a minimum tax rate in Germany.

Figure 3: Change in return gift rates by group



Note. The four groups are categorized based on return gift rates as of 2018. The number of municipalities with return gift rates exceeding 30% is 428, those with rates between 20% and 30% is 942, between 10% and 20% is 194, and below 10% is 197.

palities with rates below 30% to also lower their return gift rates–but this trend is not observed. In particular, municipalities with rates below 10%, which had effectively not participated in competition, increased their average return gift rates. Third, among municipalities with return gift rates between 10% and 30%, post-2019 trends are mixed: those with rates between 20% and 30% have generally exhibited stable or slightly declining rates, while those with rates between 10% and 20% have experienced increases.

These descriptive statistics are consistent with the prediction presented in Proposition 4 that the introduction of a cap can have two opposing effects: a competition-mitigating effect, which lowers the return gift rates of constrained municipalities, and a competition-promoting effect, which encourages entry by previously inactive ones. This insight suggests that a cap on return gift rates

does not necessarily reduce competition, but may simultaneously mitigate and promote it.

5 Conclusion

The *Furusato Nozei* program is a unique Japanese scheme that allows individuals to allocate a portion of their income tax payments to any municipality as a donation. While the program is intended to reduce disparities between urban and rural municipalities, it has triggered interregional competition as municipalities attempt to attract donations by offering more appealing return gifts. To curb such competition, the central government introduced a cap on the return gift rate. However, we theoretically show that this regulation does not necessarily reduce competition, and may even exacerbate it by increasing the number of municipalities participating in the competition.

Our theoretical model, which incorporates endogenous participation decisions, reveals that a cap on the return gift rate has two contrasting effects. First, it has a competition-mitigating effect: municipalities that previously set return gift rates above the cap are compelled to lower them. Second, it has a competition-promoting effect: lower rates among previously active municipalities make participation more attractive for those that had remained inactive, thereby encouraging new entry. Whether unconstrained municipalities lower or raise their return gift rates depends on the relative strength of these two opposing forces.

Descriptive statistics support the theoretical prediction, suggesting that a cap on the return gift rate does not necessarily mitigate competition. Evaluating the effectiveness of such a regulation therefore depends on its dual impact: how successfully it curbs excessive competition among actively competitive municipalities, and how effectively it encourages participation by previously inactive ones.

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