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Structure of the Hometown Tax Donation Market (*Furusato Nozei*) and Revenue and Expenditure Structure of Local Governments in Japan

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Structure of the Hometown Tax Donation Market (*Furusato Nozei*) and Revenue and Expenditure Structure of Local Governments in Japan

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Abstract

This study analyzes the market structure of the "Hometown Tax Donation (*Furusato Nozei*) Market" and the revenue and expenditure structure of local governments, while examining the impact of the Ministry of Internal Affairs and Communications (MIC) regulations. To the best of our knowledge, this study is the first to contribute to these analyses. First, an analysis of the market structure showed that the market share of the top 500 local governments in Japan in terms of donation revenue exceeded 80% of the total. Previously, the market share of the top 100 local governments was over 60% but has since declined. The Herfindahl-Hershman index rose sharply in FY 2018 and declined from FY 2019 onwards, due to the MIC regulations. Spearman's rank correlation coefficients also revealed a fixation of the within-class rankings of donation revenue. Fixation was particularly pronounced for the top-ranked local governments, and fluctuations in rankings among classes decreased following the regulations. Second, according to an analysis of the revenue and expenditure structures of local governments based on an economic behavior model, the composition ratio of revenue and expenditure obtained from the contribution decomposition stabilized after 2019, the year after the regulations were introduced. The correlation coefficients for the donation price and quantity of reciprocal gifts, and for the marginal cost and quantity of reciprocal gifts were both negative, which is consistent with the theoretical results of the economic behavior model. The MIC regulations have had some success in curbing competition for reciprocal gifts by maintaining a certain proportion

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of the revenue and expenditure of local governments and have prevented the overall monopolization of the market; however, they have also fixed the market structure of the hometown tax donation market. The upper classes are becoming particularly fixed, and local governments in the highest class are engaged in fierce competition over donation prices.

JEL Classification: H71, H72, and H77

Keywords: Hometown tax donation system, Market structure, Revenue and expenditure structure, Local governments

1. Introduction

In 2023, the total amount of donations received through the hometown tax donation system (*Furusato Nozei*) reached 1.1175 trillion yen, exceeding 1 trillion yen for the first time since the system was launched.[1] The total sales of the fishing industry in 2022 were 1.2605 trillion yen, so the market size of the hometown tax donation system grew to an extent comparable to that of a single industry in Japan.[2] Over the last four years (2020–2023), the amount of donations received increased at an astonishing rate of 23.36% per year on average. Finding a market in Japan that has grown to this extent is rare and calling it the "Hometown Tax Donation Market" is no longer strange.

This study refers to the market created by the hometown tax donation system as the "Hometown Tax Donation Market." Evaluating its structure and how it is changing is also useful when discussing the hometown tax donation system.

For example, market structure analysis has been considered primarily

[1] For information on the amount of donation revenue, see the Ministry of Internal Affairs and Communications' "Survey on Current Status on Hometown Tax Donation System."
[2] For information on the total amount of sales in the fishing industry, see the Policy Research Institute, Ministry of Finance Japan's "Ministry of Finance Statistics Monthly: Annual Report on Statistics of Corporate Enterprises."

in industrial organization theory. This theory emphasizes the structure of the competitive conditions of the market as a result of the influence of sellers and buyers. Market structure defines the economic behavior of individual sellers and determines their profit and loss structures.

This study focuses on the revenue and expenditure structures of local governments that participate as sellers in the market structure created by the hometown tax donation system. Thus, it would be useful to consider the hometown tax donation system by examining the revenue and expenditure structure of local governments participating in the hometown tax donation system and how it is changing.

Additionally, it is worth considering the impact of the Ministry of Internal Affairs and Communications (MIC) regulations on the market structure of hometown tax donations and the revenue and expenditure structures of local governments. Particularly, the reciprocal gift ratio rule, which requires the reciprocal gift expense ratio to be within 30% of the donation revenue, and the appropriate recruitment rule, which requires the total cost of soliciting donations to be within 50% of the donation revenue, are considered to have had significant impacts on the market, revenue, and expenditure structures.

In industrial organization theory, various competition policies are considered to avoid monopolies by companies. Is the hometown tax donation market a competitive environment or is it approaching monopolism? Is a hometown tax donation market controlled by a few local governments a desirable situation? As the hometown tax donation market grows, the ideal system for hometown tax donations from the perspective of market structure should be considered.

Based on the above awareness of these issues, this study analyzes the market structure of the hometown tax donation system, presents a model of the economic behavior of local governments, and empirically analyzes the revenue and expenditure structures of local governments involved in the

hometown tax donation system.

Few previous studies have conducted analyses based on a model of the economic behavior of local governments, similar to this study. Fukasawa (2020, 2024) presented an economic behavior model that incorporates competition between local governments and develops an analysis using quantitatively estimated parameters. Analyses using a tax competition model include Fukasawa et al. (2020), Kato and Yanagihara (2022), and Ayukawa (2022, 2023). Uemura (2025) analyzed the policy effects of the MIC regulations by expressing the economic behavior of local governments enthusiastic about the hometown tax donation system using a monopolistic competition model. Furthermore, no previous studies have focused on the market, revenue, or expenditure structures of the hometown tax donation system. To the best of our knowledge, this is the first study to make this contribution.

The remainder of this paper is structured as follows. Section 2 presents the data analysis of the market structure of hometown tax donation. Section 3 presents a model of economic behavior of local governments related to the hometown tax donation system and decomposes the contribution of the revenue and expenditure structure of local governments. Section 4 presents a data analysis of the revenue and expenditure structure of local governments. Finally, Section 5 summarizes the results of the analysis, presents the policy implications, and concludes the paper.

2. Data analysis of the market structure of hometown tax donation

This section describes the data analysis on the market structure of hometown tax donations using data for each local government from the "Survey on Current Status of Hometown Tax Donation System" by the MIC for the fiscal years (FYs) 2016–2023, for which unified data can be obtained. Data analysis will be conducted using general methods to analyze the market and industry structures.

First, market share is employed to analyze the market structure.[3] Considering that the donation revenue R of individual local governments i corresponds to sales in the hometown tax donation market, the following market share s (%) is obtained ($0 \leq s \leq 100$).

$$s_i = 100 \times \frac{R_i}{\sum_{j=1}^{N} R_j} \qquad (1)$$

Here, N is the total number of local governments, with subscripts i or j representing local governments.[4] Then, using the ranking data ordered by local governments with the largest market share s, the total market share $S_n = \sum_1^n s_i$ from ranks 1 to n is obtained. For each ranking, the results are illustrated in Figure 1 (left axis), which shows the total market shares S_{100}, S_{200}, S_{300}, S_{400}, and S_{500} for each of the following classes: 1–100th ($n = 100$), 1–200th ($n = 200$), 1–300th ($n = 300$), 1–400th ($n = 400$), and 1–500th ($n = 500$), respectively.

According to Figure 1, the total market share of local governments ranked up to 500th place S_{500}, which is less than one-third of the total number of local governments, exceeds 80%.[5] The total market share of local governments, ranked up to 300th place S_{300} also exceeds 60%. Therefore, not all local governments actively participate in the hometown tax donation market.

Let us consider changes in each fiscal year: we see an increase in the overall market share in FY 2018; in FY 2018, the total market share of the top 100 ranking local governments S_{100} was 60% of the total market share; and in FY 2019, the total market share decreased, likely due to the MIC regulations. The total market share has not changed significantly since FY

[3] See Herfindahl (1950) and Hirschman (1980) for market shares and the later Herfindahl–Hirschman Index.
[4] The total number of local governments, including prefectures and municipalities, for the period analyzed in this study is $N = 1{,}788$.
[5] Considering this, this study analyzes local governments ranked up to 500th place in terms of donation revenue.

2019, and has tended to decline slightly. [6]

Figure 1 around here

Second, the Herfindahl–Hirschman Index (HHI), which is used to determine whether a market is oligopolistic or competitive, is measured.

$$HHI = \sum_{i=1}^{N} (100 \times s_i)^2 \qquad (2)$$

The HHI is an index that approaches 1 the more competitive the market is and 10,000 the more monopolistic the market is ($1 \leq \text{HHI} \leq 10{,}000$). The results are shown in Figure 1 (right axis). Figure 1 shows that the HHI rose sharply in FY 2018, but has declined since FY 2019, showing a calmer trend; the decline in FY 2019 is likely due to the MIC regulations.

The market shares and HHI in Figure 1 show that the competitive environment in the hometown tax donation market in FY 2018 was approaching a monopoly. During this time, competition for reciprocal gifts from local governments was intensifying, and the regulations implemented by the MIC to curb this were thought to have stopped the monopolization of the competitive environment in the hometown tax donation market.

While the market shares and HHI can be used to evaluate the market as a whole, knowing how these changes occur is difficult. This is because the market shares and HHI are the only indicators to evaluate a point in time, and not indicators that can capture movements and changes over time.

Therefore, Spearman's rank correlation coefficient ρ is measured against two years of local government donation revenue rank data. [7]

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[6] From June 1, 2019, the MIC could revoke the designation of local governments participating in the hometown tax donation system if they are found to be in violation of the criteria.

[7] See Spearman (1904). Spearman's rank correlation coefficient when rank data include tie data (data of the same rank) is a different formulation, but the rank data used by this study does not include tie data.

$$\rho = 1 - \frac{6\sum_{i=1}^{n} d^2}{n(n^2-1)} \qquad (3)$$

Here, d is the difference between two years of rank data for the same local government and n is the total number of rank data. The rank correlation coefficient ρ is used to determine the correlation coefficient between data whose populations do not follow a normal distribution and takes a value between minus 1 and plus 1 ($-1 \leq \rho \leq 1$). When $\rho = 1$, two rank data are the same; when $\rho = 0$, there is no correlation; $\rho > 0$ is a positive correlation; and $\rho < 0$ is a negative correlation. A larger absolute value of the rank correlation coefficient ρ indicates a stronger correlation.

The two-year ranking data is, for example, the ranking data for the previous year, FY 2022 (the comparison year), arranged to correspond to the ranking data arranged from the local governments with the largest donation revenue in FY 2023 (the base year). The target fiscal year for this ranking data is indicated as "FY 2022–2023."

The total number of ranking data n assumed five classes of ranking 1–100th ($n = 100$), 1–200th ($n = 200$), 1–300th ($n = 300$), 1–400th ($n = 400$), and 1–500th ($n = 500$), and the ranking correlation coefficient ρ for each. The results are shown in Figure 2 (left axis).

Figure 2 around here

For all classes, the rank correlation coefficient ρ increases over time. This indicates that the rankings within each class were fixed. Particularly, in FY 2022–2023, the rank correlation coefficient ρ is 0.8 or higher in all classes, and the rankings within each class tend to become fixed overall.

In FY 2018–2019, a decrease is observed in the correlation coefficient for the rankings of classes from 1–200th to 1–500th. Therefore, the MIC regulations encouraged the fixation of rankings within classes. The

rankings for the 1–100th place class show distinctive movements compared with the other classes. In FY 2017–2018, the correlation coefficient for rankings in other classes increased, but the correlation coefficient for the 1–100th place class decreased. In FY 2021–2022, the correlation coefficient ρ for rankings in the 1–100th place class alone decreased.[8]

Although the rank correlation coefficient can be used to evaluate changes in rankings within a class, it cannot be used to evaluate changes in rankings between classes. In order evaluate the changes in rankings between classes, the number of local governments that improved or worsened their ranking from one year to the next, and from one class to another, are counted. The classes are divided into three groups: rankings 1–100th, 101–200th, and 201–300th.[9] The results are shown in Figure 2 (right axis). The number of rank-ups is shown as a positive number, and the number of rank-downs as a negative number.

The increase in the number of local governments promoted to higher classes from 2018 to 2019 is thought to be largely due to the impact of the MIC regulations. Local governments that were unable to comply with the MIC regulations were downgraded, whereas those that were able to comply were upgraded. Subsequently, the fluctuation in rankings between classes stagnated, and the number of local governments that improved their rankings in the top 100 classes was less than 15 in the 2021–2022 and 2022–2023 fiscal years. Therefore, rankings tend to become fixed in the top class of the donation revenue ranking.

This market structure of the hometown tax donation system defines the economic behavior of individual local governments. In the following

[8] For FY 2021–2022, the reason for the decrease in the ranking correlation coefficient for the ranking 1–100th class is because several local governments were ranked in the top 100 in FY 2022. Examples include Nagoya City, Aichi Prefecture; Sanjo City, Niigata Prefecture; Kesennuma City, Miyagi Prefecture; Oyama City, Tochigi Prefecture; and Kobe City, Hyogo Prefecture.

[9] The illustration of the classes with rankings 301–400th and 401–500th is omitted because of the complexity of the figure and because the results for the other classes tended to be similar to the results for the other classes.

sections, a model of the economic behavior of local governments is presented, and a contribution analysis of the revenue and expenditure structure is conducted, before analyzing the data on the revenue and expenditure structure of the hometown tax donation system.

3. An economic behavior model of local governments related to hometown tax payment and contribution decomposition of revenue and expenditure structure

This section presents a model of the economic behavior of local governments related to the hometown tax donation system and decomposes the contribution of the revenue and expenditure structure of the hometown tax donation system.

In the economic behavior model presented in this section, households are assumed to have a quasi-linear utility function. The donation demand function D using the hometown tax donation system is obtained as follows. The demand function D is assumed to have a negative coefficient on the donation price p.

$$q = D(p), \qquad \frac{\partial D}{\partial p} < 0 \qquad (4)$$

where the number of donations (or quantity of reciprocal gifts) is q and the inverse demand function is $p(q)$.

Local governments participating in the hometown tax donation system are assumed to conduct business activities to supply reciprocal gifts (goods) together with participating businesses by utilizing resources within the local community. Local governments are also assumed to act to maximize the net donation revenue from the hometown tax donation system by subtracting the total cost from the donation revenue.

Formulate the donation revenue R by multiplying the quantity of reciprocal gifts q that a certain local government i can offer in the hometown tax donation market by the donation price p. The donation price

p is the donation amount for each reciprocal gift. Considering the inverse demand function $p(q)$, a situation in which the reciprocal gifts offered by the local government i have price dominance because of their brand power is assumed.

$$R_i = p_i(q_i)q_i \qquad (5)$$

The total cost C for a local government i to procure and ship reciprocal gifts can be divided into variable costs mq and fixed costs f.

$$C_i = m_i q_i + f_i \qquad (6)$$

Here, marginal cost m is assumed to be linear for simplicity. The cost is considered to increase due to various regulations by the MIC, such as the reciprocal gift ratio rule, appropriate recruitment rule, and local product standard, which is included in the marginal cost m and fixed cost f.

Subtract the total expenses C from the donation revenue R to obtain the net donation revenue Π.

$$\Pi_i = R_i - C_i = p_i(q_i)q_i - m_i q_i - f_i \qquad (7)$$

To obtain the number of donations q that maximizes the net donation revenue Π of the local government i, differentiate the above equation and set it to zero.

$$\frac{\partial \Pi_i}{\partial q_i} = \frac{\partial R_i}{\partial q_i} - \frac{\partial C_i}{\partial q_i} = MR_i - MC_i = \frac{\partial p_i}{\partial q_i} q_i + p_i - m_i = 0 \qquad (8)$$

Here, MR is the marginal donation revenue. The local government i determines the optimal quantity of reciprocal gifts q such that the marginal donation revenue MR equals the marginal cost MC. Thus, the conditions that maximize the net donation revenue Π of the local government i are as follows.

$$\frac{\partial p_i}{\partial q_i} q_i + p_i = m_i \qquad (9)$$

That is, given the marginal cost m, the optimal donation price p and number of donations q are determined.

To analyze the contribution of the revenue and expenditure structure,

let us assume that the optimal number of donations q for the local government i is realized over a two-year period. The change in net donation revenue $\Delta\Pi$ of the local government i would then be shown as follows.

$$\Delta\Pi_i = \Delta R_i - \Delta C_i = (\Delta p_i q_i + p_i \Delta q_i + \Delta p_i \Delta q_i) - (\Delta q_i m_i + q_i \Delta m_i + \Delta q_i \Delta m_i + \Delta f_i) \approx (\Delta p_i q_i + p_i \Delta q_i) - (\Delta q_i m_i + q_i \Delta m_i + \Delta f_i) \quad (10)$$

According to this formula, the revenue and expenditure structures of local governments can be divided into revenue factors in the first half of the right-hand side of the equation and expenditure factors in the second half. The terms in $\Delta p_i \Delta q_i$ and $\Delta q_i \Delta m_i$ that multiply change by change are quite small, so for simplicity, these terms are ignored ($\Delta p_i \Delta q_i \approx 0,\ \Delta q_i \Delta m_i \approx 0$).

The above equation can be used to determine the contribution of the revenue and expenditure factors. This equation is organized by dividing it by the net donation revenue from the previous period Π. Here is the percentage increase in net donation revenue π.

$$\frac{\Delta\Pi_i}{\Pi_i} = \pi_i \approx \frac{p_i q_i}{\Pi_i}\frac{(\Delta p_i q_i + p_i \Delta q_i)}{p_i q_i} - \left(\frac{q_i m_i}{\Pi_i}\frac{(\Delta q_i m_i + q_i \Delta m_i)}{q_i m_i} + \frac{f_i}{\Pi_i}\frac{\Delta f_i}{f_i}\right)$$

$$= \left(\alpha_i \frac{\Delta p_i}{p_i} + \alpha_i \frac{\Delta q_i}{q_i^*}\right) - \left(\beta_i \frac{\Delta q_i}{q_i^*} + \beta_i \frac{\Delta m_i}{m_i} + \gamma_i \frac{\Delta f_i}{f_i}\right)$$

$$= (\alpha_i P_i + \alpha_i Q_i) - (\beta_i Q_i + \beta_i M_i + \gamma_i F_i) \quad (11)$$

Therefore, as shown on the right side of this equation, the revenue and expenditure structure of local governments for hometown tax donations can be decomposed into five contribution factors. These are: the contribution of the revenue factor (positive factor) on the donation price αP; contribution of the revenue factor (positive factor) on the quantity of reciprocal gifts αQ; contribution of the marginal cost factor (negative factor) on the quantity of reciprocal gifts βQ; contribution of the marginal cost factor (negative factor) on the marginal cost βM; and contribution of the fixed cost factor (negative factor) γF. These two factors are as follows. The components of each contribution are the percentage of revenue and expenditure ($\alpha,\ \beta,\ \gamma$) and the rate of change ($P,\ Q,\ M,\ F$).

First, the revenue and expense components are: $\alpha = pq/\Pi \geq 0$, the component of the revenue factor; $\beta = m/\Pi \geq 0$, the component of the marginal cost factor; and $\gamma = f/\Pi \geq 0$, the component of the fixed cost factor. These are positive values, but since the revenue factor is positive and the expense factor is negative, $\alpha - \beta - \gamma = 1$ holds. For many local governments, the component ratio of the revenue factor α exceeds 1 ($\alpha > 1$).

Second, the rates of change include the rate of change in donation price $P = \Delta p/p$, rate of change in number of donations $Q = \Delta q/q$, rate of change in marginal cost $M = \Delta m/m$, and rate of change in fixed cost $F = \Delta f/f$. Given the condition that maximizes the net donation revenue Π of the local government i, the rate of change in marginal cost M affects the rate of change in the number of donations Q. Furthermore, based on the household demand function D, the rate of change in the donation price P affects the rate of change in the quantity of reciprocal gifts Q.

As described above, the contribution decomposition of the revenue and expenditure structures of local governments was conducted using the local governments' economic behavior model concerning the hometown tax donation system. In the next section, these results are measured and the data regarding the revenue and expenditure structure of local governments concerning hometown tax donations are analyzed.

4. Data analysis of the revenue and expenditure structure

This section analyzes the data on the revenue and expenditure structure, following the model of the previous section. As in the previous section, the analysis is limited to local governments ranked in the top 500 in terms of donation revenue.

Data for each local government from the MIC's "Survey on Current Status of Hometown Tax Donation System" for fiscal years 2016 to 2023 are used. Data items are indicated by " ." Donation revenue R is taken from the "amount" accepted by local governments and the quantity of reciprocal gifts

q is taken from the "number of cases." The donation price p was obtained by dividing the donation revenue R by the quantity of reciprocal gifts q.

The total costs C are divided into variable costs mq and fixed costs f. Since variable costs mq are costs that vary depending on the quantity of reciprocal gifts q, they are defined as the sum of "costs related to procurement of reciprocal gifts," "costs related to sending reciprocal gifts," and "costs related to settlement." Thereby, the variable cost mp is divided by the quantity of reciprocal gifts q to obtain the marginal costs m. Fixed costs f are defined as the sum of "costs related to settlement," "costs related to administration," and "other."

The contribution ratio can be measured using the data above. As shown in the previous section, the contribution ratio comprises two elements: the composition ratio (α, β, γ) and rate of change (P, Q, M, F).

First, the first component of the contribution is measured: the percentage of revenue factor α, percentage of marginal cost factor β, and percentage of fixed cost factor γ.

The results for FY 2018 and FY 2023 are illustrated in Figures 3 and 4, respectively. The component percentage of the revenue factor α is a positive factor, while that of the marginal cost factor β and fixed cost factor γ are negative factors. The latter two component percentages are depicted as a stacked area figure, and the figure shows the sum of the component percentages of the marginal cost and fixed cost factors, $\beta+\gamma$. Note that $\alpha \geq \beta+\gamma$ and $\alpha-(\beta+\gamma) \geq 0$ correspond to net donation revenue.

Figure 3 around here

As shown in Figures 3 and 4, the composition percentages changed significantly from FY 2018 to FY 2023. [10] The composition percentages for

[10] The maximum value of memory on the vertical axis is 5 for Figure 3 and 2.5 for Figure 4.

FY 2018 (Figure 3) vary considerably among local governments. Conversely, the composition percentages for FY 2023 in Figure 4 show that the respective composition percentages are more consistent than those in FY 2018.

Table 1 shows the average and coefficient of variation of the composition ratio of revenue and expenditure for each year. Changes in the average level of each composition ratio were observed before and after the MIC in 2019. After 2019, the average composition ratio of the revenue factor decreased, the average composition ratio of the marginal cost factor decreased, and the average composition ratio of the fixed cost factor increased. In other words, on average, the MIC regulations negatively impacted revenue, negatively impacted marginal costs, and positively impacted fixed costs. According to the coefficient of variation, the variance in the composition ratio increased in FY 2017 and FY 2018, but decreased after FY 2019. This shows that the local governments complied with the MIC regulations. As can be seen, the composition ratio of revenue and expenditure changed dramatically after FY 2019.

Figure 4 around here

Table 1 around here

The large variation in the revenue and expenditure structure of local governments up to FY 2018 can be seen amid the accelerating competition for reciprocal gifts. Owing to the MIC regulations, local governments have begun to take action to maintain a certain proportion of their revenue and expenditure. Considering this, the MIC regulations can be said to have had a certain degree of success in curbing the competition for reciprocal gifts. The proportions of revenue and expenditure structures of local governments after the regulations have a similar structure. According to Figure 4, the proportion of the structure does not depend on the ranking of the donation revenue, and there is almost no change.

Next, the second component of the contribution is measured: the rate of change in donation price P, rate of change in the quantity of reciprocal gifts Q, and rate of change in marginal cost M. To measure these rates of change, two years of data from FY 2022 and FY 2023 were used.

Local governments maximize their net donation revenue while following the household demand function D, with the regulated composition ratio (α, β, γ) remaining almost constant. According to the optimal behavior of local governments, the optimal donation price p and quantity of reciprocal gifts q are determined when the marginal cost m is given, and this study focuses on the relationship between these variables.

First, based on the household demand function D, an increase (decrease) in the donation price p will lead to a decrease (increase) in the quantity of the reciprocal gift q ($\partial q/\partial p < 0$). Second, based on the local government's behavior of maximizing its net donation revenue, an increase (decrease) in the marginal cost will lead to a decrease (increase) in the quantity of the reciprocal gift ($\partial q/\partial m < 0$). These are the theoretical consequences of the economic behavior model mentioned earlier; however, whether they hold true must be checked.

Table 2 presents the correlation coefficients between the change in donation price P and change in the quantity of reciprocal gifts Q for the revenue factor, and between the change in marginal cost M and change in the quantity of reciprocal gifts Q for the marginal cost factor, measured for each class of donation revenue ranking. The test results for uncorrelation are also presented. For the rates of change in revenue factors P and Q, the correlation coefficient for the class of ranking 1–100th is statistically significant; however, for the class of ranking 1–200th and beyond, the correlation cannot be rejected at the 5% significance level. However, for the rates of change in marginal cost factors M and Q, the correlation coefficients are statistically significant for all classes.

Notably, this is an association coefficient and not a causal

relationship, but the fact that the obtained correlation coefficient is negative can be considered the result of $\partial q/\partial p < 0$ and $\partial q/\partial m < 0$ being supported, which is a theoretical consequence of economic behavioral models.

The correlation coefficients for marginal cost factors are statistically significant in all classes, and if this is a causal relationship, an increase (decrease) in marginal cost m will lead to a decrease (increase) in the quantity of reciprocal gifts q ($\partial q/\partial m < 0$). However, the revenue factor is statistically significant only for the classes ranked 1–100th in terms of donation revenue. If this is a causal relationship, local governments in the classes ranked 1–100th face a household demand function D, and if they raise the donation price p, the quantity of the reciprocal gifts q will decrease ($\partial q/\partial p < 0$). This suggests intense competition over donation prices among local governments in the classes ranked 1–100th in terms of donation revenue.

Table 2 around here

Figure 5 around here

For visual confirmation, Figure 5 plots the data for the top 500 donation revenue rankings used in the analysis. The vertical axis is the rate of change in donation price P, and the horizontal axis is the rate of change in the quantity of reciprocal gifts Q, or the rate of change in marginal cost M. Both, the revenue and marginal cost factors can be plotted as a downward-sloping regression line, and the results shown by the theoretical consequences of the economic behavior model can also be confirmed from the graph.

5. Conclusion

This paper considered “Hometown Tax Donation Market” brought about by the hometown tax donation system, whose donation revenue has

surpassed 1 trillion yen, and analyzed its market structure and the revenue and expenditure structure of local governments. The impact of the Ministry of Internal Affairs and Communications (MIC) regulations on the market structure and revenue and expenditure structure was also discussed. This study is the first to analyze the market structure of hometown tax donations and the revenue and expenditure structure of local governments. This section concludes by summarizing the results of this analysis and presenting their implications.

First, market structure data were analyzed. According to the measurement of market share, when local governments are ranked in order of their contribution revenue, the total market share of the local governments ranked from 1–500th exceeds 80% of the total. Before the MIC regulations, the total market share of local governments ranked up to 100th increased to over 60%; however, the market share decreased due to the regulations. Next, the Herfindahl–Hirschman Index sharply rose in FY 2018, but declined from FY 2019 onwards. Therefore, the MIC regulations can be said to have prevented the monopolization of the competitive environment of the market.

Additionally, according to Spearman's rank correlation coefficient measurement results, the rank correlation coefficient increased over time, indicating that the rankings within classes became fixed. Particularly, the rank correlation coefficient for the period from FY 2022 to FY 2023 was 0.8 or higher, indicating that rankings within classes became quite fixed. The impact of the MIC regulations can also be seen in the changes in rankings between classes, with the changes in rankings between classes becoming smaller. Particularly, this study highlighted the tendency towards the fixation of local governments in the highest class of revenue from donations. The MIC regulations prevented the overall monopolization of the market but led to the fixation of local governments in the highest class.

Second, this study presented a model of the economic behavior of local governments, conducted a contribution analysis, and analyzed the data

on the revenue and expenditure structure, based on the economic behavior model. Since the contribution can be decomposed into the composition ratio and rate of change of the revenue and expenditure, the composition ratio was measured first. The composition ratios of all revenue factors, marginal cost factors, and fixed cost factors greatly varied up to FY 2018, but this variation decreased after FY 2019. The composition ratios of revenue and expenditure changed dramatically after FY 2019, which is thought to be due to the MIC regulations. Local governments began to take action to maintain a certain composition ratio of revenue and expenditures owing to MIC regulations.

Next, the correlation coefficients between the rate of change in the donation price and rate of change in the quantity of reciprocal gifts and between the rate of change in marginal cost and rate of change in the quantity of reciprocal gifts were measured in accordance with the economic behavior model. In the class of donated revenue ranking from 1–100th, the negative correlation coefficients were statistically significant for the rate of change in the donation price and rate of change in the quantity of reciprocal gifts. For all classes up to the 500th rank, the rates of change in marginal cost and quantity of reciprocal gifts had negative and statistically significant correlation coefficients.

As it is only a correlation coefficient, it should be borne in mind that it does not indicate a causal relationship; however, the fact that the correlation coefficient obtained is negative can be said to support the theoretical consequences of the economic behavior model. Particularly, local governments ranked 1–100th in terms of donation revenue face a household demand function; if the donation price is increased, the quantity of reciprocal gifts decreases. This indicates fierce competition over donation prices among the highest-ranking local governments.

The following implications can be drawn from the above. The MIC regulations have helped maintain a certain level of balance in local governments' revenue and expenditure structures and have had some success

in curbing competition for reciprocal gifts. The MIC regulations have prevented the market from becoming a monopoly, but top-class local governments tend to become fixed. Particularly, the top 100 local governments, in terms of donation revenue, are becoming increasingly fixed, and local governments in this class are engaged in fierce competition over donation prices.

References

Ayukawa, M. (2022) "Effects of Administrative Cost for Acceptancing Hometown tax donation by Local Governments on Local Public Finance," ***Journal of Household Economics***, No.56, pp.49–67, The Japan Society of Household Economics. (in Japanese)

Ayukawa, M. (2023) "Effects of Corporate Inhabitant Tax on Local Finance under the Hometown Tax Payment System," ***Journal of Regional Studies***, Vol.53, No.1, pp.37–57, Japan Society of Regional Science. (in Japanese)

Fukasawa, T. (2020) "Structural Estimation of Hometown Tax Donations System," ***Discussion Paper Series***, DP2020-J13, Institute of Economic and Business Research, Kobe University. (in Japanese)

Fukasawa T. (2024) "Competition for Reciprocal Gifts of Hometown Tax Donation and Introduction of 'Designation System': Has Competition for Reciprocal Gifts Dissolved under 'Designation System'?", ***Reference***, No.877, pp.3-22, Research and Legislation Review Bureau, National Diet Library. (in Japanese)

Fukasawa, E., T. Fukasawa and H. Ogawa (2020) "Intergovernmental Competition for Donations: the Case of the Furusato Nozei Program in Japan," ***Journal of Asian Economics***, Vol.67, 101178.

Herfindahl, O.C. (1950) ***Concentration in the Steel Industry***, Joost Smits, Political Academy, Amsterdam.

Hirschman, A.O. (1980) ***National Power and the Structure of Foreign Trade***,

University of California Press.

Kato, H. and M. Yanagihara (2022) “Gift Competition in the ‘Furusato Nozei System’: A Theoretical Approach in the Framework of Tax Competition,” ***Journal of Regional Studies***, Vol.51, No.2, pp.175–195, Japan Society of Regional Science. (in Japanese)

Spearman, C. (1904) “The Proof and Measurement of the Association between Two Things,” ***The American Journal of Psychology***, Vol.15(1), pp.72-101.

Suematsu T. (2020) “Analysis of Competition in Reciprocal Gift Ratio of Hometown Tax Donations,” ***PRI Discussion Paper Series***, No.20A04, General Affairs Research Department, Policy Research Institute, Ministry of Finance. (in Japanese)

Uemura,T. (2025) “Economic Behavior of Local Governments and Hometown Tax Donation (Furusato Nozei) in Japan: Effects of Regulations in a Monopolistic Competition Model,” ***Research Series of the Japan Institute of Local Finance***, No.32, Japan Institute of Local Finance, Gogensha, forthcoming. (in Japanese)

Figure 1: Total market shares and Herfindahl-Hershman Index

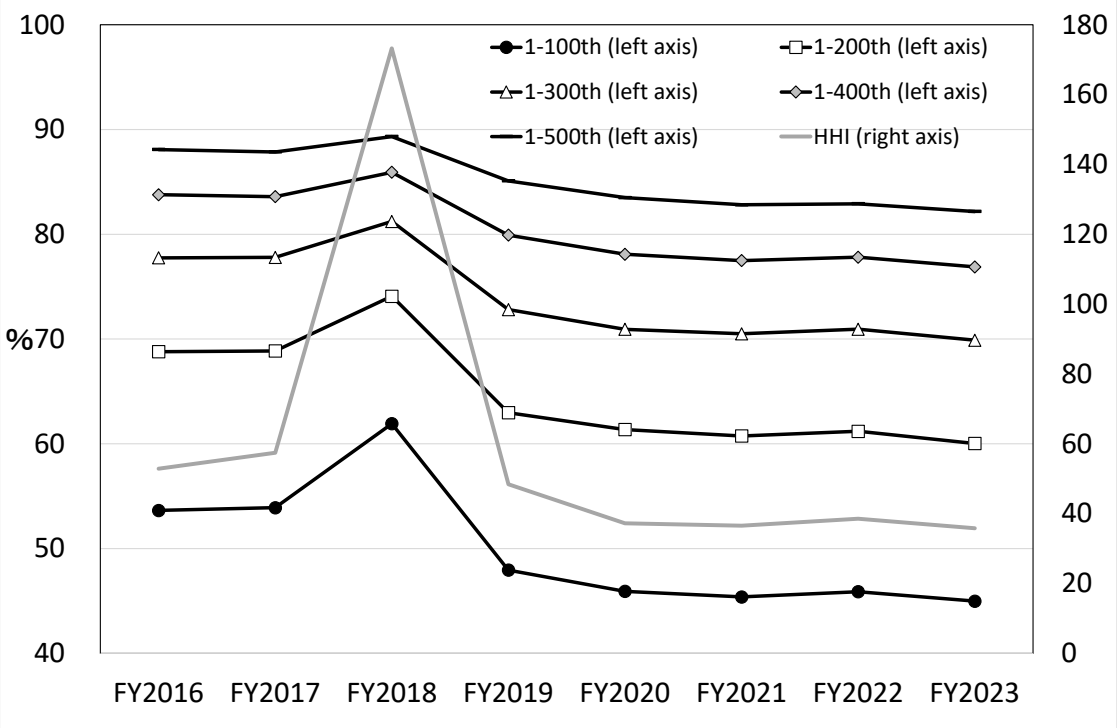


Figure 2: Rank correlation coefficient and number of local governments ranked up and down

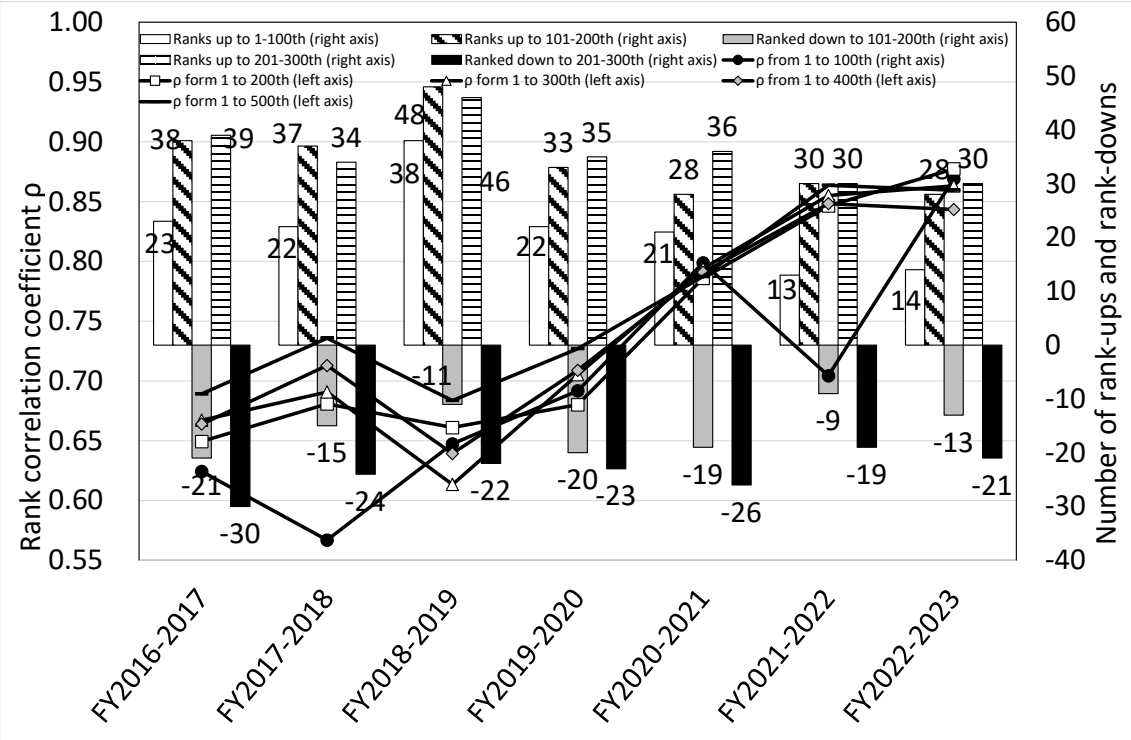


Figure 3: Composition of revenue and expenditure factors in FY 2018 (before regulations)

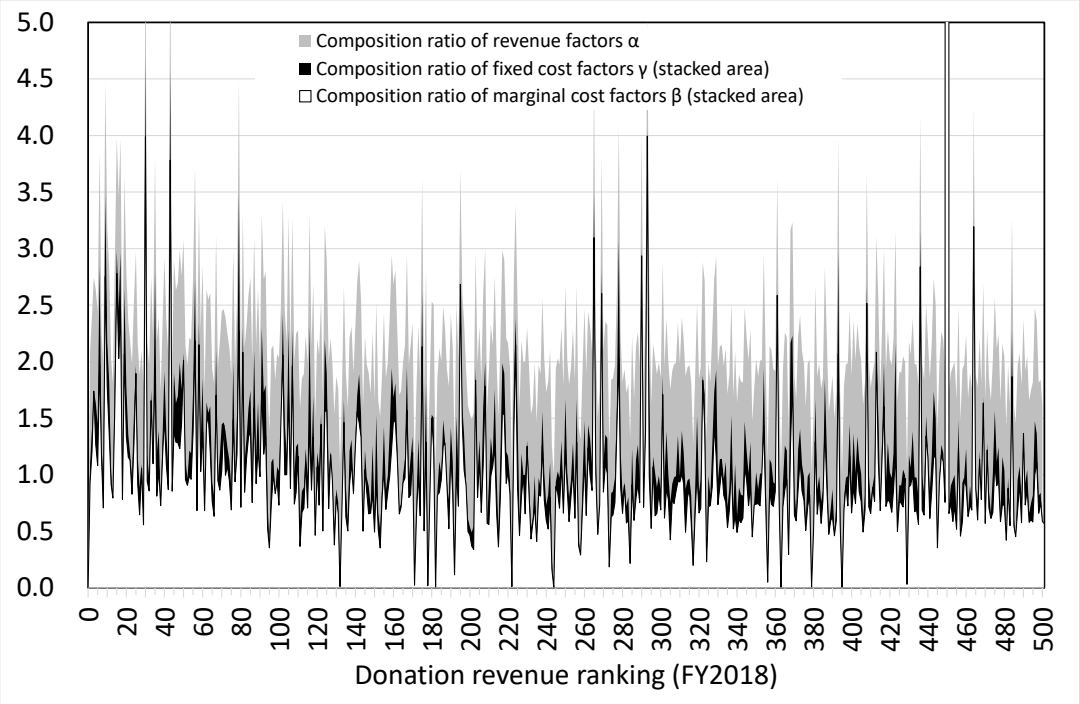


Figure 4: Composition of revenue and expenditure factors in FY 2023 (after regulations)

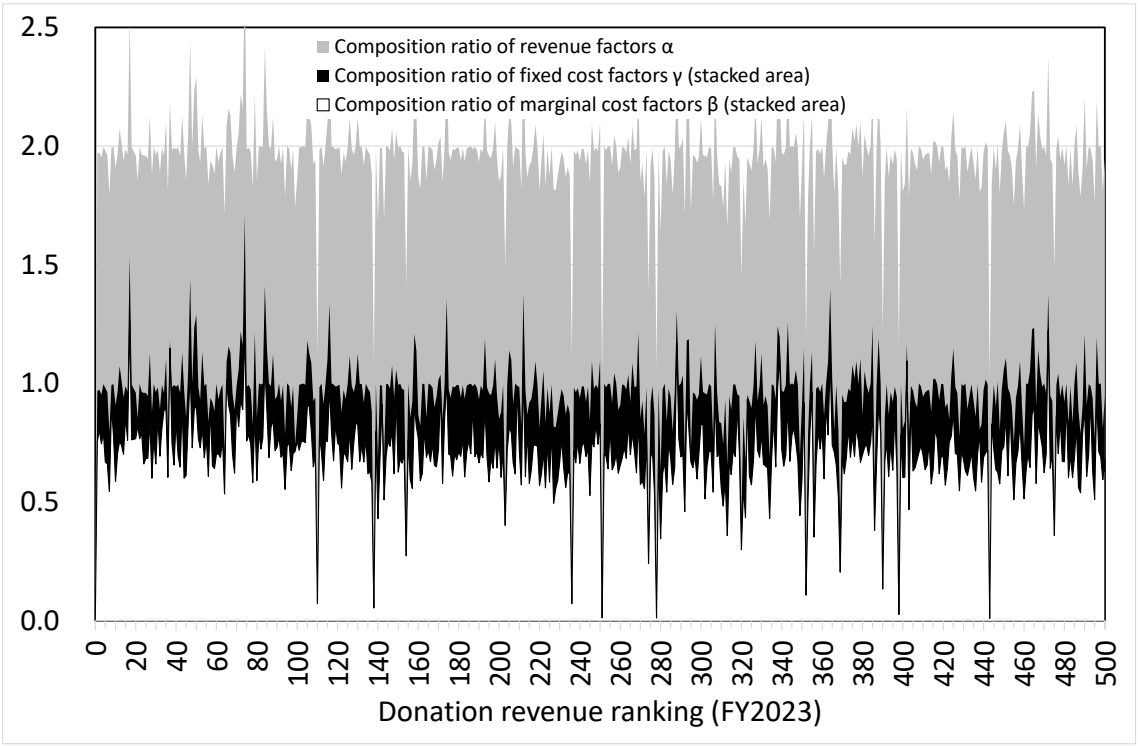


Table 1: Mean and variance of composition of revenues and expenses of local governments

FY	Revenue factor composition ratio α		Marginal cost factor composition ratio β		Fixed cost factor composition ratio γ	
	average	coefficient of variation	average	coefficient of variation	average	coefficient of variation
FY 2016	2.1228	0.4040	0.9824	0.7611	0.1403	1.6518
FY 2017	2.1241	1.1851	0.9906	1.4937	0.1335	8.6105
FY 2018	2.5533	3.0683	1.2723	5.2529	0.2810	4.1322
FY 2019	1.8384	0.3027	0.6610	0.7171	0.1773	0.8606
FY2020	1.8621	0.1171	0.6848	0.2843	0.1773	0.4795
FY 2021	1.8846	0.0885	0.7009	0.2325	0.1838	0.4169
FY 2022	1.8849	0.0953	0.7013	0.2472	0.1836	0.3894
FY 2023	1.9550	0.0906	0.7020	0.2277	0.2530	0.3119

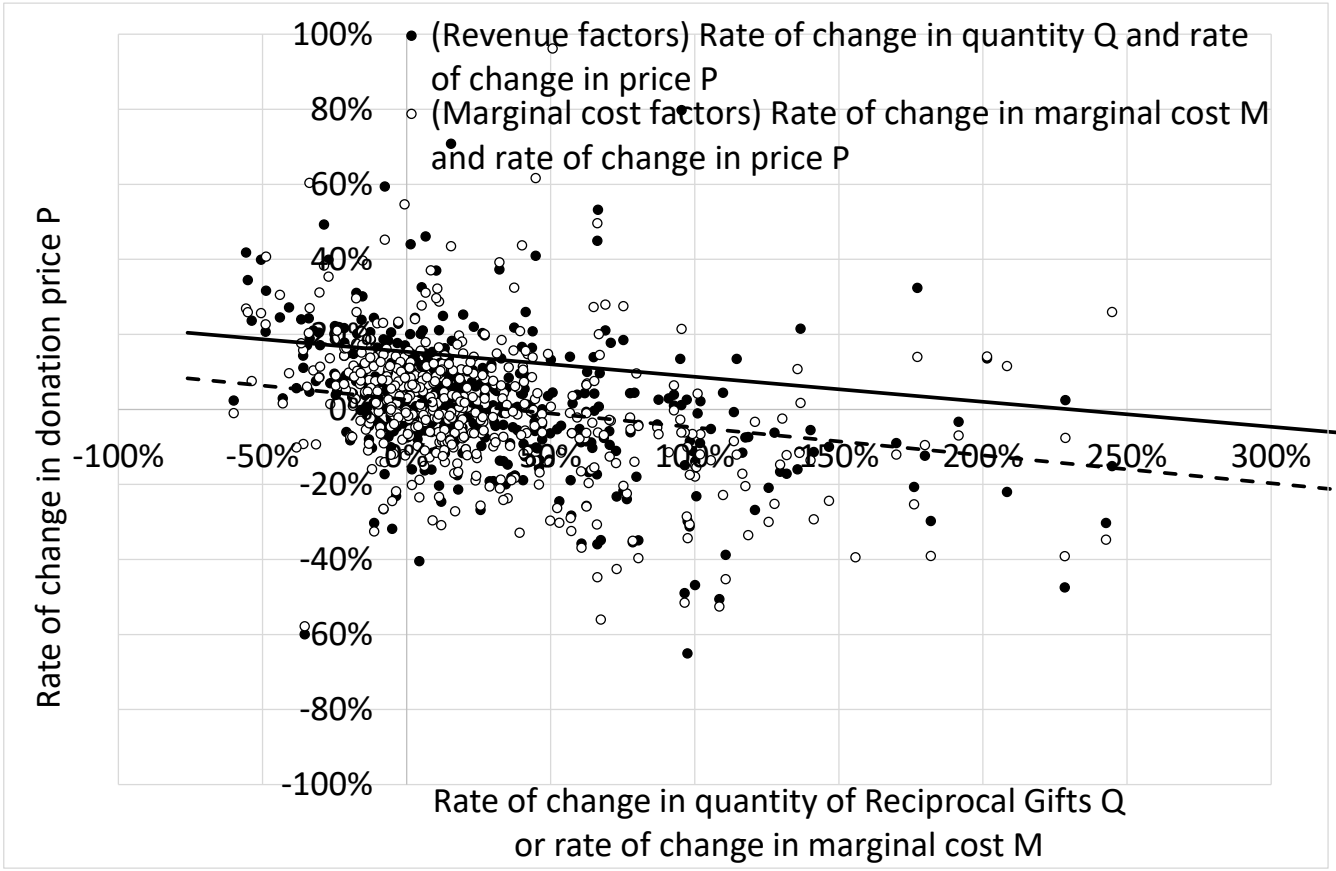
Note: These are the measurement results for the top 500 local governments in terms of donation revenue ranking.

Table 2 Correlations of percent change in revenue factors and marginal cost factors (FY 2022–2023)

class	(Revenue Factor) percent change P and Q			(Marginal cost factor) rate of change M and Q		
	correlation coefficient	t-value	p-value	correlation coefficient	t-value	p-value
1– 100th	-0.4246*	4.6427	0.0000	-0.3702*	3.9450	0.0001
1– 200th	-0.1854	1.8681	0.0647	-0.4760*	5.3575	0.0000
1– 300th	-0.0536	0.5313	0.5964	-0.4618*	5.1540	0.0000
1– 400th	-0.0792	0.7863	0.4335	-0.4709*	5.2846	0.0000
1– 500th	-0.0500	0.4956	0.6212	-0.4586*	5.1082	0.0000

Note: * mark indicates $p<0.05$.

Figure 5: Correlation of rate of changes in revenue factors and marginal cost factors (FY 2022–2023)



Note: Donation revenue ranking up to 500 is shown.