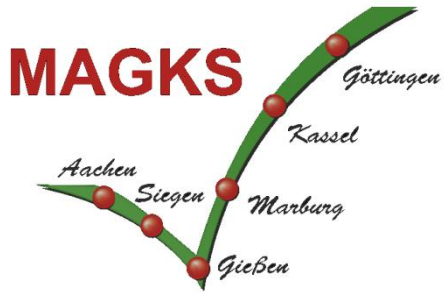

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Municipality amalgamation and free-ride behavior: Eligibility assessments for long-term care insurance in Japan

Katsuyoshi Nakazawa*

ABSTRACT

Amalgamation offers municipalities an incentive to free ride when they can subrogate the load to a new municipality after amalgamation. Previous literature has clarified opportunistic behavior in local public bond issues. However, if the municipality does not have a leeway in policy decision making, it cannot adopt free-ride behavior. Although the Japanese long-term care insurance system has been so designed that the municipality does not have discretion in its working, doubts have been raised on this score. This study empirically considers this issue by examining municipality behavior before amalgamation. Difference-in-difference regression confirms a free-ride effect in the eligibility assessments for long-term care by the Japanese municipality. These results mean that the Japanese long-term care insurance system is not managed in accordance with the institutional design.

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1 Introduction

The fiscal common-pool problem, that is, the overuse of fiscal resources, was first explored by Tullock (1959) and Buchanan and Tullock (1962). Some studies have recently applied this idea to the municipal amalgamation scenario. Amalgamation offers municipalities an incentive to accumulate public debt before amalgamation because the new municipality after amalgamation subrogates the load. Hinnerich (2009) and Jordahl and Liang (2010) found that smaller local governments tend to accumulate public debt to free ride on the increased number of taxpayers in the new, expanded municipal entity. While Hinnerich (2009) focuses on the 1969–1974 boundary reform in Sweden, Jordahl and Liang (2010) explore the country's first wave of boundary reform in 1952. These studies use difference-in-difference (DID) estimation to clarify municipalities' free-ride behavior before amalgamation. Employing the same estimation method, Nakazawa (2013) confirms the pre-amalgamation free-ride effect in Japan but shows that it is wholly counterbalanced by the regulation of local public borrowing.

The studies cited earlier focus on local public debt. They postulate that municipalities adopt free-ride behavior when they visualize the possibility that the new, larger municipality would share the public-spending load after amalgamation. This study focuses on eligibility assessments for the long-term care insurance (LTCI) program by Japanese municipalities as an alternative setting for free-ride behavior on amalgamation.

The Japanese LTCI is administered at the municipal level over a three-year "program management period" based on the pay-as-you-go principle. The insurers have established special LTCI accounts for the purpose. Campbell and Ikegami (2000) and Mitchell et al. (2004) emphasize that the linkage between benefit expenditure and premium burden as well as municipalities' discretion in management are important innovations of Japan's LTCI program. Residents aged 65 years and more (category I) and 40–64 years (category II) are insured under the LTCI scheme. When an insured individual needs long-term care, the Certification Committee for Long-term Care Need of the municipality makes an eligibility assessment by evaluating the person's physical and mental condition necessitating care. If the number of eligible individuals and the amount of benefits in a period increase, the municipality increases the next period's premium to balance the budget. Meanwhile, eligibility assessments are conducted by an objective evaluation based on the physical and mental care needs of individuals. However, Hayashi and Kazama (2008) find that municipalities facing financial

difficulties control the assessments to balance the LTCI budget. Therefore, it is argued that municipalities should not be given a free hand to carry out arbitrary eligibility assessments under the LTCI system.

On amalgamation, the eligible individuals of the municipality before amalgamation succeed to the post-amalgamation municipality. Thus, if eligibility assessments could be conducted arbitrarily, the municipality would be apt to increase the number of eligible individuals immediately before amalgamation considering that the load would be borne by the larger entity after amalgamation. Therefore, this study examines not only the opportunistic behavior of municipalities upon amalgamation but also their arbitrary eligibility assessments, which are not factored into the LTCI program.

The remainder of this paper is organized as follows. Section 2 explains the institutional background of the local LTCI system and municipality amalgamation in Japan. The empirical methodology is presented and data described in Section 3. Section 4 presents the estimation results and discusses the main findings. Section 5 concludes the paper.

2 Background

2.1 The LTCI system in Japan

LTCI was introduced for the elderly in FY2000 to solve the long-term care problem in Japan. The insurers (municipalities) have established special LTCI accounts for a three-year "program management period" to administer the system. They estimate the total benefits for the next period and maintain a constant ratio of the total insurance benefits provided to the category I insured. Therefore, the category I premium is linked to the benefit level. Surpluses, if any, are transferred to the Long-term Care Benefit Fund (LTCBF henceforth) against future deficits. When fiscal resources for a certain program management period are insufficient because of increasing benefits or decreasing revenue (owing to, for example forecast error regarding increase in the number of eligible individuals or failure in premium setting), the municipality could draw down the LTCBF or borrow from the Fiscal Stabilization Fund (FSF henceforth). However, to repay the FSF loan, the municipality will need to increase the premium for the next program period. Moreover, using the general budget to fund the municipality's LTCI special account is prohibited by law, beyond its entitlement of 12.5% of the LTCI benefits.[1]

[1] LTCI benefits are financed by premium revenue from category I and II insured (50%),

Insured categories I and II can be grouped according to the nature of care required by the process of eligibility assessments. Conditions requiring care range from mild to serious in a multistep approach. The degree of eligibility ranges across six levels from "support need" (the lowest level) to "long-term care need V" (the highest level). The eligibility levels have been increased to seven since FY 2006 with the division of the support need into two stages (support I and support II). Individuals eligible for support are not permitted to use some LTCI services (e.g., facility care services). The benefits are allocated on the basis of points and are limited by the degree of eligibility.[2] For example, the benefit limits range approximately from 49,770 JPY (for support I) to 358,300 JPY (for long-term care V) per month.[3] Benefit limits are also set for the utilization of facility services by facility type, according to the level of eligibility.[4] The insured person should pay 10% of the care cost, while LTCI would cover the remaining 90%. By these institutional criteria, universal service use and horizontal equity vis-à-vis eligibility for LTCI benefits are guaranteed, irrespective of the insured individual's income and place of residence.

Eligibility assessments are done in two stages. The first stage is a hearing on the physical and mental conditions of the person in need of long-term care. The person is asked a set of standardized questions, and the answers are evaluated mechanically by a judgment program. In addition, the person's physician writes a comment based on a unified style. In the second stage, the Certification Committee for Long-term Care Need, consisting of medical and welfare specialists, decides the level of eligibility based on the result at the first stage. The eligibility is re-evaluated first within six months and then after every twelve months.[5] Thus, the eligibility assessment process appears to be objective and uniform. However, Hayashi and Kazama (2008) argue that municipalities that face financial problems control eligibility assessments to balance the LTCI budget. Their finding, if indeed correct, would undermine the very basis of the LTCI system.

2.2 Municipality amalgamation in Japan

The municipality amalgamation in Japan is roughly divided into three big waves. The first wave, from 1888 to 1889, reduced the number of municipalities from 71,314 to

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the central government (25%), the prefectural government (12.5%), and the municipal government (12.5%).

[2] One point is equal to 10 to 10.5 JPY, depending on the region.

[3] The data relate to the fifth program management period (from FY 2012 to FY 2014).

[4] Of course, the insured can purchase additional services above the limit at his or her own cost.

[5] Before FY 2004, eligibility was re-evaluated every six months.

15,820. The second wave lasted from 1953 to 1961, further reducing the number from 9,868 to 3,472. In the latest wave, between April 1999 and January 2012, the number almost halved from 3,229 to 1,719. The Japanese government enacted the Municipal Amalgamation Law (the old law, henceforth) in 1965 to promote amalgamation. The old law included several measures to promote amalgamation, such as guaranteeing the same inter-governmental subsidy (the local allocation tax grant [LAT])[6] to the merged municipality for 10 years after amalgamation. However, although the old law was revised every 10 years until the 1990s, it did not provide for voluntary amalgamation, and the number of municipalities decreased by only 163 from 1965 to 1999.

A remarkable change occurred in the latter half of the 1990s when the Japanese government reviewed the roles of the central, prefectural, and municipal governments. In 1999, the old law was amended to conform to the provisions of the Omnibus Law of Decentralization, and additional measures were included to provide financial support for municipality amalgamation.

Figure 1 shows the numbers of amalgamations and participant municipalities from FY 1999 to FY 2011. Many municipalities pursued amalgamation only until the end of FY 2005 because the financial support provided by the national government for amalgamation under the old law was revised in FY 2006 under the new law. This explains why amalgamations peak in FY2004 and FY2005 (see Figure 1).

[Figure 1 around here]

The old law provided several types of financial support for amalgamation. First, the LAT guarantee period was extended to 15 years after amalgamation. Second, the law allowed amalgamated municipalities to finance 95% of the amalgamation cost (e.g., for construction) by issuing special-purpose amalgamation bonds for 10 years after amalgamation. Moreover, the central government covered 70% of the principal and interest payments on the bonds by LAT. These incentives induced many municipalities to undergo amalgamation.

3 Empirical framework and data

3.1 Empirical framework

[6] LAT is the inter-governmental subsidy intended to adjust the uneven distribution of central government resources between local governments.

Weingast et al. (1981) considered the incentive to free ride in a formal framework. At the efficient spending level, the marginal social cost of a public-spending project in a certain district equals the marginal social benefit. However, if the costs of the project must be shared among n districts, only $1/n$ of the social marginal cost of the project should be loaded on a district.[7] Therefore, when municipalities amalgamate, a small municipality tends to have a strong incentive to free ride. Where N_i denotes the population of municipality i, which participates in an amalgamation, and N_j the total population of the post-amalgamation municipality, including municipality i, the social marginal borrowing cost of municipality i is equal to $N_i/N_j < 1$. Hinnerich (2009) formulates the strength of municipality i's incentive to free ride as $Freeride_i = 1 - N_i/N_j \in [0,1]$. Jordahl and Liang (2010) employ the same concept, which they refer to as the "law of $1/n$."

Employing Hinnerich's definition of the free-ride incentive associated with amalgamation and applying eligibility assessments of the Japanese LTCI, one can define the following relation:

$$Eligibility_i = \alpha + \beta Freeride_i + u_i, \qquad (1)$$

where $Eligibility_i$ is the eligibility ratio, defined as the number of eligible individuals divided by the number of category I insured. The parameter β represents the free-ride effect, and u_i represents the observed or unobserved eligibility ratio determinates. Considering the difference of eq.(1), I can write the equation as

$$\Delta Eligibility_i = \theta + \beta \Delta Freeride_i + v_i, \qquad (2)$$

where Δ indicates the difference operator, representing the difference between the base fiscal year and one fiscal year before amalgamation. Since $\Delta Freeride = Freeride$, eq.(2) can be written as follows:

$$\Delta Eligibility_i = \theta + \beta Freeride_i + v_i, \qquad (3)$$

To address the issue of municipalities facing financial difficulties controlling the assessments to balance the LTCI budget (raised by Hayashi and Kazama 2008), I employ variables relating to the municipality's LTCI finances. The first variable is the

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[7] Baqir (2002), Bradbury and Crain (2001), Bradbury and Stephenson (2003), and Gilligan and Matsusaka (1995, 2001) have empirically analyzed the *1/n* effect.

LTCBF balance per category I insured person, and the second the amount of FSF loan per category I insured person. I also employ the LTCI premium for the category I insured because the municipality might control eligibility assessments, considering the premium already high and therefore difficult to raise any further. Thus, eq.(3) can be written as

$$\Delta Eligibility_i = \theta + \beta_1 Freeride_i + \beta_2 LTCBF_i + \beta_3 FSF_i + \beta_4 premium_i + v_i, \qquad (4)$$

where the fiscal condition of the LTCI is sound if *LTCBF* is high but is in poor shape if *FSF* is high. Therefore, the former is expected to have a positive and the latter a negative influence on an eligibility ratio change.

3.2 *Data*

As mentioned in section 2, the LTCI system is administered over a three-year program management period. Important components of the LTCI system (e.g., the eligibility levels, the benefit limits at each level, and the income levels for premium reduction) are often significantly different between periods. Furthermore, the premium is revised when a new period begins. Therefore, amalgamation scenarios should preferably be compared within the same management period, considering that DID regression requires at least one difference estimation.

While both FY2004 and FY2005 amalgamations occurred in the second management period and were adequate for the selection of an appropriate treatment group, the former would require estimation of differences between FY2002 in the first and FY2003 in the second management period. Further, FY2002 data are available only at the aggregated prefecture level.[8] Therefore, FY 2004 amalgamations are not appropriate for regression analysis. For FY 2005, however, difference estimation is possible within the same management period, and municipality-level data are available. Therefore, I consider municipalities that amalgamated in FY 2005 as the treatment group to test my hypothesis (i.e., a municipality that has opted to amalgamate would increase the number of eligible people immediately before amalgamation). Municipalities that have never amalgamated form the control group. The treatment group comprises 842 municipalities and the control group 1,061.[9]

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[8] The first management period is from FY 2000 to FY 2002, and the second from FY 2003 to FY 2005.

[9] The number of municipalities employed is lower than the total number of municipalities because municipalities that jointly manage an LTCI system are excluded

From the above discussion, $\Delta Eligibility_i$ is the FY 2004 eligibility ratio minus the FY 2003 ratio. The data for $LTCBF_i$ and FSF_i are captured from FY 2003. Moreover, I consider other variables that might affect the pre-treatment control eligibility ratio. In the second period, the LTCI system categorizes those aged 65 years and over and their families into six income brackets. The standard premium rate applies to those in the third bracket. I employ the ratio of the elderly population in the first and second brackets, as well as the fourth, fifth, and sixth brackets, to the total number of category I insured as proxies for income factors. The proportion of LTCI benefits financed from the municipality's general budget is compensated for by LAT disbursements. Therefore, I employ LAT per capita as an index of dependency on LAT revenue. The ratio of the late-stage elderly (i.e., those 75 years and over) to the total elderly is one of the indexes of long-term care need because the estimated long-term care need increases sharply for this age group. The tolerable quantity of long-term care facilities is defined as the capacity of, or the number of beds in, long-term care, healthcare, and sanatorium-type facilities per category I insured individual. These variables are for FY 2003. Table 1 describes the summary statistics and their sources.

[Table 1 around here]

The average, minimum, and maximum eligibility ratios for FY 2003 are 0.149, 0.079, and 0.301, respectively. The highest eligibility ratio for a municipality is approximately 30% (for the category I insured). The average standard premium per month in the second management period is 3,162 JPY. The difference between the highest and lowest premiums across municipalities is 4,157 JPY.

4 Estimation results

4.1 Baseline results

In this subsection, I show the regression results of eq. (4) as the baseline specification. For these regressions, I use the natural logarithm of the standard premium. The results of the baseline specification are shown in Table 2.

[Table 2 around here]

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from this analysis.

All estimated values of *Freeride* are significantly positive. Therefore, smaller municipalities have an incentive to increase eligibility assessments before amalgamation. *LTCBF* is significantly positive, which means municipalities have sufficient maneuverability with LTCI finances to increase the eligibility ratio. However, the *FSF* loan result is not significant. This is probably because the LTCI finances of most municipalities are in good shape in the period. The higher premium clearly shows a controlled increase in the eligibility ratio. These results show, as Hayashi and Kazama (2008) conclude, that the municipality has a leeway in controlling eligibility assessments according to its fiscal condition. Moreover, with the free-ride incentive at amalgamation, smaller municipalities adopt the opportunistic behavior of increasing the eligibility ratio. These results are constant regardless of pre-treatment control.

4.2 The other specification

In the preceding regressions, I changed the total eligibility ratio. However, in this subsection, I change the eligibility ratio at each level. As described in section 2, LTCI limits are set according to the level of eligibility. Figure 2 shows that in the second management period (from FY 2003 to FY 2005), support limits are set according to the level of eligibility.

[Figure 2 around here]

The difference in the limits of care benefits is greatest between support and long-term care I, that is, 104,300 JPY per month. Moreover, individuals eligible for support could not use facility services. The difference in the unit cost between at-home care and facility care is very large. The average unit cost is 3,400 JPY for at-home care and 33,645 JPY for facility care.[10] Therefore, whether the insured are eligible for support or long-term care I is significant for the LTCI finances of the municipality. In this section, regressions are used to examine degree-of-eligibility changes in the pre-amalgamation municipality.

The municipality decides simultaneously for all level of care need levels whether to increase the eligibility ratio. Thus, the decisions possibly influence each other, and the OLS regression could not capture the unobserved relationship. Therefore, I employ simultaneous equation methods, such as seemingly unrelated regression (SUR) models,

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[10] These data were calculated from *The Annual Report on LTCI Programs 2003*, Ministry of Health, Labour and Welfare.

to estimate a system of equations involving contemporaneous correlations between the errors of different equations for the same period. The coefficients of regression by SUR and OLS are equal because both equations use the same explanatory variables; however, the standard errors and significance are different. After estimating SUR, I check the hypothesis of independence of both equations using the Breusch-Pagan (BP) test. The regression results are shown in Table 3.

[Table 3 around here]

The chi square of the BP test of independence is 342.793, which supports the use of SUR. The results show that the free-ride effect is positively significant for LTC I and V, and negatively for the support need. Moreover, the result of LTC I is significant at the 5% level, and the estimated premium for LTC I is significantly negative at the 1% level. Therefore, the pre-amalgamation municipality controls the eligibility ratio centering on the LTC I need. From these results, pre-amalgamation municipalities seem to have upgraded the insured's eligibility from the support need to LTC I.

5 Conclusion

Amalgamation offers municipalities an incentive to free-ride when they can subrogate the load to the new municipality after amalgamation. However, a municipality that does not have a leeway in policy decision making cannot adopt free-ride behavior. Although the Japanese LTCI system has been so designed that the municipality does not have discretion in its working, doubts have been raised on this score. This study empirically considered this issue by examining municipality behavior before amalgamation.

Hayashi and Kazama (2008) point out that municipalities facing financial difficulties control eligibility assessments to balance the LTCI budget. If so, the municipality might increase the eligibility ratio immediately before amalgamation. Empirical results based on DID regression support this assumption. Free-ride incentives are significantly positive for a change in the eligibility ratio. Moreover, the amount saved in the Long-term Care Benefits Fund is significantly positive, and the standard premium of category I insured is significantly negative for a change in the eligibility ratio. Therefore, a municipality that has a leeway in fixing the eligibility ratio would increase the ratio before amalgamation. SUR regression results show that pre-amalgamation municipalities upgraded the insured's eligibility status from support need to LTC I.

These results confirm free-ride behavior before amalgamation in a setting other than local public debt. The study demonstrates a common-pool problem in which the newly created municipality subrogates the increased load of eligible individuals covered by the municipality before amalgamation. Moreover, it is shown that the Japanese LTCI system is not managed in accordance with the institutional design. If this situation persists, municipalities with poor LTCI finances would face the possibility of an increase in the number of insured who are not eligible for cover. This is a serious threat to the horizontal equity of the LTCI system in Japan.

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Fig. 1. Numbers of amalgamations and participant municipalities

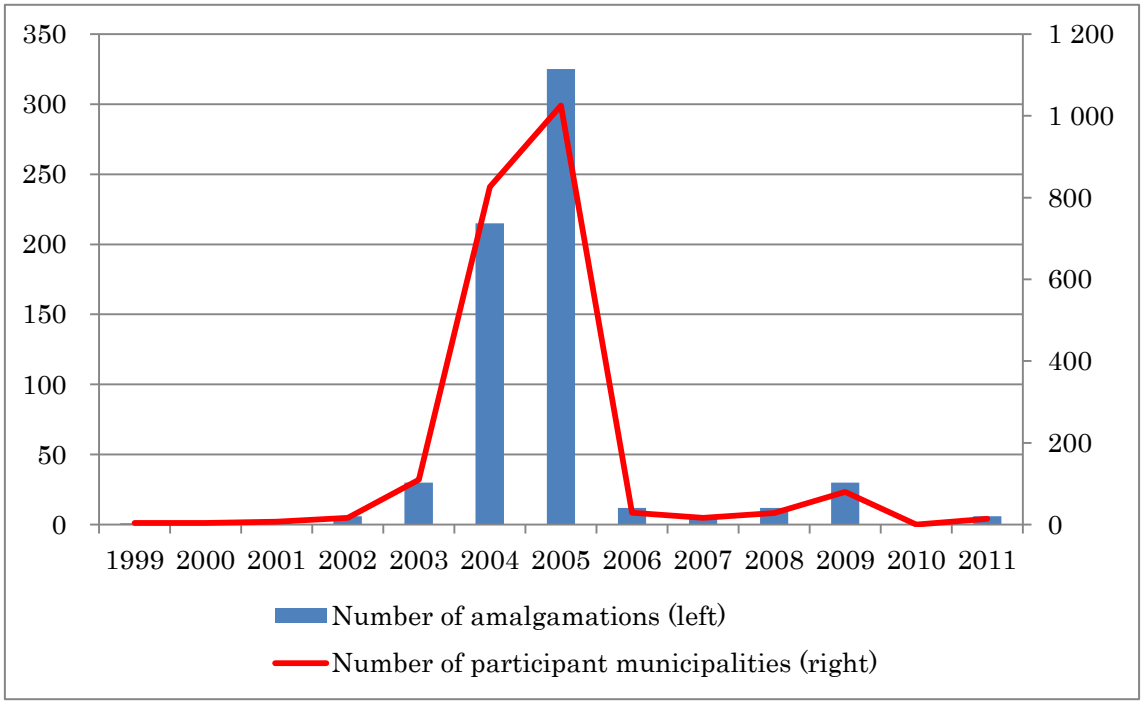

Table 1

Summary statistics.

Variables	N	Mean	S.D.	Min	Max
Eligibility ratio in 2003	1903	0.149	0.028	0.079	0.301
Change in eligibility ratio (treatment)	842	0.007	0.008	-0.030	0.049
Change in eligibility ratio (control)	1061	0.006	0.007	-0.028	0.029
Freeride	1903	0.306	0.391	0	0.998
LTCBF per category I insured individual (1,000 JPY)	1903	9.183	8.463	0	52.052
FSF per category I insured individual (1,000 JPY)	1903	0.171	0.866	0	10.051
Standard premium for category I insured (1 JPY)	1903	3,162	559	1,785	5,942
Ratio of poor elderly population to total population	1903	0.367	0.124	0.069	0.852
Ratio of rich elderly population to total population	1903	0.196	0.075	0.041	0.501
LAT per capita (1,000 JPY)	1903	178.112	186.849	0	2369.875
Ratio of 75-year-and-above population to total population	1903	0.471	0.049	0.290	0.617
Tolerable quantity of long-term care facilities	1903	0.020	0.021	0	0.276
Tolerable quantity of healthcare facilities	1903	0.011	0.017	0	0.197
Tolerable quantity of sanatorium-type facilities	1903	0.004	0.014	0	0.337

Sources: The Ministry of Health, Labour and Welfare *The Annual Report on LTCI Programs 2003 and 2004, The Survey of the Long-term Care Facilities and Offices 2003*, The Statistics Bureau, Ministry of Internal Affairs and Communications

Table 2

The free-ride effect of smaller municipalities before amalgamation.

Variables of interest	Estimation 1		Estimation 2		Estimation 3		Estimation 4	
Freeride	0.00120 **	(0.00048)	0.00116 **	(0.00048)	0.00117 **	(0.00518)	0.00117 **	(0.00051)
LTCBF			0.00005 *	(0.00002)			0.00055 **	(0.00002)
FSF			-0.00002	(0.00237)			0.00000	(0.00024)
premium			-0.00765 ***	(0.00125)			-0.00615 ***	(0.00145)
Controls	No		No		Yes		Yes	
Number of observations	1903		1903		1903		1903	
R^2	0.004		0.048		0.033		0.058	

Notes: ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.1 levels, respectively.

Robust standard errors are shown in parentheses.

Pre-treatment controls: ratio of poor elderly population to total population, ratio of rich elderly population to total population, LAT per capita, ratio of 75-year-and-over population to total population, tolerable quantity of long-term care facilities, tolerable quantity of healthcare facilities, and tolerable quantity of sanatorium-type facilities.

Fig. 2. Support limits according to level of eligibility in the second management period

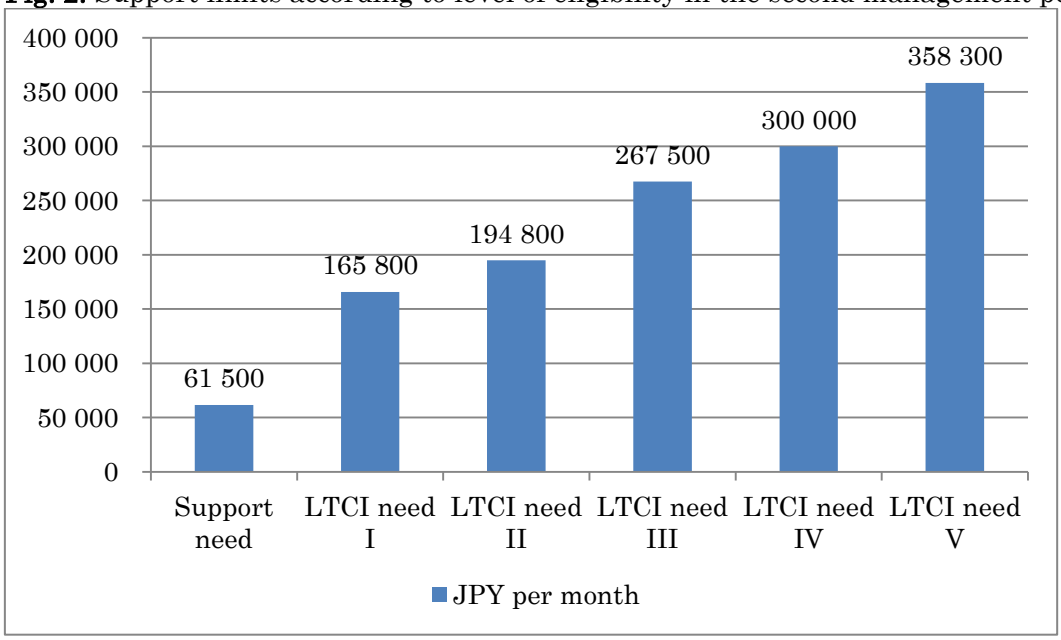

Table 3

The free-ride effect of smaller municipalities for each level of eligibility

Variables of interest	Necessary to support		Necessary of LTC I		Necessary of LTC II		Necessary of LTC III		Necessary of LTC IV		Necessary of LTC V	
Freeride	-0.00047 *	(0.00027)	0.00076 **	(0.00034)	0.00005	(0.00023)	0.00014	(0.00020)	0.00019	(0.00019)	0.00031 *	(0.00018)
LTCBF	0.00001	(0.00001)	0.00001	(0.00002)	0.00000	(0.00001)	0.00001	(0.00001)	0.00001	(0.00009)	0.00000	(0.00009)
FSF	0.00007	(0.00012)	0.00010	(0.00015)	-0.00004 **	(0.00010)	0.00014 *	(0.00008)	0.00014 *	(0.00008)	-0.00005	(0.00008)
premium	0.00115	(0.00074)	-0.00524 ***	(0.00094)	0.00008	(0.00064)	0.00007	(0.00055)	-0.00044	(0.00053)	-0.00652	(0.00048)
Controls	Yes		Yes		Yes		Yes		Yes		Yes	
Number of observations	1903		1903		1903		1903		1903		1903	
R^2	0.022		0.055		0.014		0.005		0.031		0.009	
BP test	Chi^2 (15) = 342.793 [0.000]											

Notes: ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.1 levels, respectively. Standard errors are shown in parentheses. Pre-treatment controls: ratio of poor elderly population to total population, ratio of rich elderly population to total population, LAT per capita, ratio of 75-year-and-above population to total population, tolerable quantity of long-term care facilities, tolerable quantity of healthcare facilities, and tolerable quantity of sanatorium-type facilities.