Inter-jurisdictional Interaction on Premium-setting: The Case of Long-term Care Insurance in Japan

Katsuyoshi Nakazawa  
*Faculty of Economics, Toyo University*

Kota Sugahara  
*Faculty of Economics, Kyoto Sangyo University*

Minoru Kunizaki  
*Faculty of Economics, Aichi University*

Last revision date: 25, May, 2012

Abstract

This study considers the effect of inter-jurisdictional interaction on the premium-setting behavior of municipalities in the Japanese system of long-term care insurance (LTCI). We find that cities are facing political pressure from the elderly and are engaged in yardstick competition vis-à-vis premium-setting. This results in insufficient premium revenue for financing benefit expenditures, and so LTCI special accounts require intra-municipal transfers from municipal general accounts. On the other hand, towns and villages are also facing political pressure from the elderly with respect to premium-setting; however, they can be controlled by upper-level governments.

*Keywords*: long-term care insurance, inter-jurisdictional interaction, financial transfer

*JEL Classification*: H73, H75, H77, I18, I38
1. Introduction

In the previous Japanese system of long-term care, the municipalities (i.e. cities, towns, and villages) of each respective jurisdiction had been made responsible for managing its own health insurance and nursing care for the elderly. However, many issues have been raised with regard to the previous system, as society has been ageing: a gap between the need for and provision of quality care, the growing cost burden associated with certain subsets of the elderly population, and the financial difficulties inherent in insurance programs managed especially by small municipalities.¹

To resolve these issues, Long-term Care Insurance (LTCI) was introduced nationally in 2000. While each municipality still basically manages the insurance program by setting up a special budget account for LTCI, in addition, national law requires that financial assistance from the central and prefectural governments be directed to each municipal LTCI special account, in order to maintain horizontal equity in insurance benefits among municipalities (Hayashi and Kazama, 2008).

LTCI covers those aged 65 and over (Category I) and those aged 40 – 64 years (Category II). Municipalities need to set insurance premiums for the Category I insured according to forecasts for the benefit expenditure for care-service users, which are crafted as per the three-year ‘program management period’, unlike premiums for the Category II insured, which are collected by nationwide health insurers at a uniform premium rate.

Although LTCI special accounts are financially assisted by upper-level governments, the premiums for the Category I insured must be set to so as to balance those accounts’ budgets for the program management period. However, from a ‘big picture’ perspective, one can see that Category I premiums have increased only 43% on average, in spite of a 114% increase in total benefit expenditure for 2000 – 09. That is, the premium seems not to be sufficiently linked to an increase in benefit expenditure. In fact, as we will describe later, financial transfers from the upper-level governments and municipal general accounts to the LTCI special accounts have exceeded the statutory amount of the transfers.

In this study, we focus on the premium-setting behavior of municipalities with regard to the premium revision, from the first management period (2000 – 02) to the second period (2003 –

¹ See Campbell and Ikegami (2000) and Yong and Saito (2011) for more detailed descriptions of the background and purpose of introducing LTCI in Japan.
05). At that revision, the cities with low premiums in the first period tended to restrain increases in their premiums in the second period, unlike that seen with cities with high premiums. On the other hand, towns and villages raised their premiums fully. The question posed in this study is just how the discretion of municipality vis-à-vis premium-setting has taken place. Discretion has been considered an important and innovative feature of the Japanese LTCI system.

There is a dearth of literature analyzing LTCI’s financial issues. In addition, while some literature has studied the effect of the financial conditions of municipalities and financial support from upper-level governments on the certification of care needs by municipalities, neither the behavior of municipalities nor their discretion has been greatly considered. The main purpose of this study to determine whether LTCI premiums are set based on specific regional characteristics (i.e. municipality-based). If this is indeed the case, it means that discretion on premium-setting has worked to capture those characteristics, and thus premiums were set in such a way that they correspond to benefit expenditures as expected when the LTCI system was introduced. On the other hand, if it is found that other factors affect premium-setting behavior, we should reconsider meaning of discretion as it bears on premium-setting and instructions from upper-level governments or leading cities in the context of LTCI.

Intuitively, discretion can be considered to prompt the externalities that bring about inter-jurisdictional interaction and distorted resource allocation among municipalities, according to the literature on fiscal decentralization. In the context of LTCI, two types of interaction can be supposed: yardstick competition and welfare competition. In yardstick competition, it can be imagined that municipalities compete to restrain an increase in Category I premiums, as they would be worried about political pressure from the elderly, assuming high voter turnout among them. Accordingly, premium-based revenue will not accord with an increase in benefit expenditure. On the other hand, it is supposed that some municipalities, for example, those in a dire financial state intend to encourage the elderly to emigrate (or at least prevent more from immigrating) by increasing the premium burden. That is, they are engaged in welfare

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2 Hayashi and Kazama (2008) and Shimizutani and Inakura (2006) are two studies that focus on the financial issues of the LTCI and municipality behavior. Sato et al. (2006), using micro-level data, find that an additional benefit subsidy for those with the lowest income stratum who are eligible prompts their overuse of care service.

3 Based on the framework of Besley and Case (1995) – who consider a general tax-setting model – we suppose a model where LTCI premium-setting by the incumbent is affected by the voting behavior of the elderly.
competition, against the general trend of premium-setting. Therefore, we need to examine whether yardstick competition or welfare competition occurs among municipalities, in terms of premium revision.

Based on theoretical considerations, we empirically analyze the factors that affect the LTCI premium and the rate at which it increase. We find the following results: 1) the political power of the elderly strongly enforces restraint vis-à-vis premiums and their rates of increase, 2) cities are engaged in yardstick competition, and 3) towns and villages are engaged in neither yardstick competition nor welfare competition. These results suggest that inter-jurisdictional interaction restrains premium-setting, particularly in the case of cities. While towns and villages are not engaged in such competition, they might basically require financial transfers and instruction from upper-level governments. Consequently, there is the possibility of a loose linkage between premium burden and benefit expenditure, due to inter-jurisdictional interaction – contrary to what was expected upon the introduction of this new insurance system.

In what follows, we first outline the particulars of the Japanese LTCI system and focus in section 2 on the relationship between premium revenue and benefit expenditure. In section 3, we theoretically consider the factors behind premium-setting by municipalities. We set up an empirical model that examines the effect of inter-jurisdictional interaction on premium-setting, and then present the results in section 4. Finally, in section 5, we discuss the relationship between premium-setting behavior and financial transfers from upper-level governments or the municipal general account to an LTCI special account.

2. Background and motivation

2.1. Institutional background

LTCI in Japan covers people aged 65 years and over (Category I) and those aged from 40 – 64 years (Category II). Municipalities (i.e. cities, towns, and villages) are required to establish special accounts for the LTCI and manage the insurance program during a three-year ‘program management period’. The Category I insured pays LTCI premiums to their municipality of

While benefit expenditure is considered a policy instrument in a common model of welfare competition – see, for example, Wildasin (1991) and Saavedra (2000) – we imagine that municipalities control the premium burden on individuals in order to influence resource flow, which is represented in our model by migrations among the elderly.
residence. Category II premiums, meanwhile, are collected by nationwide health insurers (e.g. National Health Insurance) and then distributed to municipalities, according to the ratio of the Category II insured to the total number of the insured in each municipality. Benefits from the LTCI special account are paid to the eligible insured – according to the types of service and disorder stage care needs they have – when they purchase long-term care service.

**Benefits**

The eligible insured can purchase long-term care services – most of which are provided by private providers – at the fixed-rate burden of 10% of the service cost; the remaining 90% of the service cost is covered by LTCI benefits, which are financed by premium revenues, subsidies from upper-level governments (i.e. the central and prefectural governments) and financial transfers from the general account of the municipality to the LTCI special account.

To be eligible for LTCI benefits, the insured must be assessed about their needs and be certified by the Certification Committee for Long-term Care Need in the municipality of their residence. The committee judges which stage of care needs is to be applied to the applicant, based on investigatory results of the applicant’s mental and physical conditions. The nationally uniform criteria for the certification are established objectively, and needs are categorized into seven stages: requiring support (1 or 2), or requiring long-term care (1 – 5; for the most serious disorders). In addition, benefit limitations for long-term care need are defined also by nationally uniform criteria. For example, the benefit limits for in-home care are approximately ¥50,000 (US$ 620) to ¥358,000 (US$ 4,420) per month, according to the stage of long-term care need. Benefit limitations are also set for the utilization of facility services by facility type, according to the stage of care need. By these institutional criteria, universal service use and horizontal equity vis-à-vis eligibility for LTCI benefits are guaranteed, irrespective of the insured’s income and place of residence.

**Financing**

The annual budget for each LTCI special account is required to balance on a three-year basis; that three-year period for budget-planning is called the ‘program management period’.

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5 While benefits typically do not cover meals and residence expenses for those hospitalized and institutionalized, individuals from low-income households (e.g. incomes lower than the municipal-tax-exemption level) are granted coverage with a ceiling amount of extra benefits.

6 Of course, the insured can purchase additional services, above the limit amounts, at their own expense. Thus, these standard limit amounts can be considered guaranteed service amounts paid via LTCI benefits.
When a municipality draws up its budget, it forecasts local LTCI expenditures for the full three years, based on recent results of the number of eligible persons, the number of applications for LTCI certification, and the extent to which those who are certified as being eligible utilize their entitlements.

After expenditures are forecasted, revenues are considered. As mentioned, the revenues of an LTCI special account consist of 1) subsidies from upper-level governments (i.e. central and prefectural governments), 2) financial transfers from the municipal general account, 3) premiums directly paid by the Category I insured within the jurisdiction, and 4) distributed premiums from the Category II insured via nationwide insurers.

One-half of the benefit expenditures is covered by public expenditures. The central government covers 20% through the Long-term Care Benefit Subsidy. In addition, 5% of all benefit expenditures of all municipalities is covered by an Adjustment Subsidy from the central fund; this subsidy is distributed with a matching rate, according to the ratio of those aged 75 years and over and the share of low-income insured within the jurisdiction. Thus, the matching rates of this subsidy vary by municipality. Prefectural governments cover 12.5% through the Cost-sharing Subsidy.\(^7\)

The remaining 12.5% is covered by an intra-municipal transfer from the general account to the LTCI special account. These intra-municipal transfers are counted in the ‘standard fiscal demands’ used to calculate Local Allocation Tax (LAT) disbursements – a system of general-purpose financial transfers from the central government to local governments. The LAT disbursements are calculated as the difference between the ‘standard fiscal demands’ and the ‘standard fiscal revenues’.\(^8\) That is, an increase in benefit expenditure is indirectly compensated through LAT disbursements, via an increase in intra-municipal transfers.

The other half of the benefit expenditures is covered by Category I and II premiums, of which the statutory standard of the share of each category is 20% and 30%, respectively. It has changed over time: the amounts for Category I and II were 17% and 33%, respectively, in the first three-year program management period (2000 – 02); 18% and 32% in the second period (2003 – 05); and 19% and 31% in the third period (2006 – 08). The premium rate, based on the

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\(^7\) With regard to the costs of facility care services, 20% of benefit expenditures is covered by the central government and 17.5% is covered by the prefectural government.

\(^8\) Standard fiscal demands are calculated as the financial requirements of each municipality, based on rational and appropriate standards. Standard fiscal revenues consist of standard local tax revenue and some basic subsidies.
income of the Category II insured, is decided by each nationwide health insurer. This premium is collected along with the health insurance premium. Thus, the Category II insured are allowed to pay the same premium, irrespective of their place of residence, if they are insured by the same health insurance.

On the other hand, the Category I premium is decided by each municipality. To determine burden-bearing according to an individual’s ability to bear the premium, differential premium rates are allowed to be set by each municipality in accordance with the income level of the insured. In a common case, an individual’s income is discriminated among six levels. Municipalities can discretionally decide the standard premium, based on the distribution of the insured’s income and forecasts of benefit expenditures. The standard premium is revised at the start of the program management period and fixed for the full three-year period. Therefore, it is required that the standard premium is set so as to balance the budget of the LTCI special account on a three-year basis.

If deficits occur, they must be covered by withdrawals from the Long-term Care Benefits Fund of the municipality, extra intra-municipal transfers, or loans from the Fiscal Stabilization Fund managed by the prefecture. The loans borrowed in a previous management period need to be repaid in the next period.

2.2. Discretion in LTCI management

According to the Annual Health, Labour and Welfare Report 2009 – 2010 published by the Ministry of Health, Labour and Welfare (MHLW), while the number of the Category I insured has increased at a constant annual upward rate (approximately 3%), it seems that increases in the numbers of the eligible insured and service users have been restrained since the third management period, which started in 2006. The average increase rate of each population since 2006 has been 2.9% (the eligible) and 3.6% (the users), in contrast to the 2000 – 05 average rate, which saw rates of 13.9% and 17.6% for the eligible and the users, respectively.

There are a few reasons behind such change: an institutional amendment that includes revisions to the long-term care need stages and certification criteria, and the introduction of a

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9 An insured individual with income exempt from municipal tax is defined as being at the standard level (Level 4) and is required to pay the standard premium rate. The Level 1 insured individual – who is a beneficiary of public assistance – is allowed to pay one-half the standard premium rate; meanwhile, the highest-level insured individuals – Level 6 individuals, whose annual income are 2 million yen and over each – are required to pay 1.5 times the standard premium.
new service category.\textsuperscript{10} We see from Figure 1 that this amendment helped restrain a rapid increase in benefit expenditure. The annual average rate of increase in benefit expenditure since 2006 has been 4.3\%, while the average rate during 2000 – 05 was 12.6\%.

Figure 1 also shows changes in Category I premium revenue. Since a temporary reduction was implemented to defuse a sudden increase in the burden on the Category I insured, the actual ratio of premium revenue to benefit expenditure was 5.9\% at the beginning of the first period. It has been gradually increased, to 18.4\% in 2003, 21.5\% in 2006, and 20.2\% in 2009. As mentioned, the statutory standard revenue-to-benefit expenditure ratio was set at 17\% in the first management period, 18\% in the second period, 19\% in the third period, and 20\% in the fourth and current period (2009 – present). That is, we see that the actual ratio has been increased, so as to be consistent with the statutory standard ratio. However, we acknowledge that a kind of institutional change has been implemented on the revenue side since the third management period, because the premium revenue increased by 28\% with the second revision (2005 – 06), while it increased by only 16\% with the first revision (2002 – 03).\textsuperscript{11}

Although, as Campbell and Ikegami (2000) emphasized, the linkage between premium burden and benefit expenditure and the discretion of municipalities in managing the LTCI program are important innovations in the Japanese system, institutional amendments are needed on both the expenditure and revenue sides. It means that there might be some problems with the fiscal finance of LTCI. Thus, the body of literature that analyzes the LTCI’s financial issues has been increasing in size.

However, only a few studies examine how discretion and the behavior of municipalities have played a part. On the expenditure side, Hayashi and Kazama (2008) and Shimizutani and

\textsuperscript{10} ‘Requiring support 2’ was newly established among the long-term care need stages. The eligible individuals whose disorders were relatively easier to treat were removed from ‘Requiring long-term care 1’ and added to this stage. In addition, Community-based Services and Nursing Care Prevention Services for those with easier-to-treat disorders were added to the category of care services whose user expenses were covered by LTCI benefits.

\textsuperscript{11} In the Amendment Act of Long-term Care Insurance enacted in 2005, while revision of the service stages of certification criteria were mainly mentioned, amendments to premium-setting were also included. For example, municipalities have been allowed to extend the range of income discrimination of the insured to more than six levels, and to set higher premium rates for the high-income insured individuals.
Inakura (2006) each conclude that municipalities have controlled LTCI benefits by adjusting the eligibility criteria in order to balance the LTCI account budget, but that subsidies from upper-level governments have played a more significant role in maintaining budgetary health and guaranteeing horizontal equality in care-service use. Meanwhile, Sato et al. (2006), by using micro-level data, found that an additional benefit subsidy for the lowest-income eligible individuals induces their overuse of care service.

On the other hand, the study of Nakazawa (2009) may be the only one to focus on the issue of discretion on the revenue side. He finds that smaller municipalities take a more obvious mimicking behavior vis-à-vis premium-setting with the first-period premiums, and that they could not have had the ability to draw up an LTCI management plan by themselves. This means that the small municipalities would have depended on information from neighboring jurisdictions or upper-level governments, that is, it seems that discretion has not worked for premium-setting, perhaps also forecasting the fate of benefit expenditures.

Based on this perspective, let us examine changes in the Category I premium between the first and second management periods (Figure 2), using data samples from 553 cities and 1,748 towns and villages. In the case of cities, the cities whose premiums were low in the first period tended to restrain premium increases in the second period, unlike those with high premiums. Consequently, the coefficient of variance (CV) of the cities’ premiums increased by 50.9% (i.e. from 0.104 to 0.157). On the other hand, in the case of towns and villages, although the CV was larger than that of the cities (i.e. 0.149 in the first period and 0.184 in the second period), they raised their premiums fully. According to Nakazawa’s (2009) perspective, it can be considered that towns and villages follow the instruction of upper-level government or the behavior of neighboring large cities, while cities set premiums based on their forecasts of benefit expenditures. In contrast, it may have been that some cities could not raise their premiums, for certain reasons. In particular, it has been confirmed from our sample that 19% of the municipalities actually reduced their premiums or kept them unchanged when the time came to revise their premiums, despite seeing overall increase in benefit expenditure.

12 To be considered a city, municipality needs to be certified by the central government. A city is allowed special administrative discretions, in accordance with its city type. There are four types of city in Japan: designated cities, core cities, special cities, and regular cities. They are basically distinguished by population size: designated cities, over 500,000; core cities, 300,000 – 500,000; special cities, 200,000 – 300,000; and regular cities, 50,000 – 200,000. Figure 2 excludes the designated cities’ data, as well as that of municipalities that co-manage the LTCI program due to institutional differences.
What is the factor that influences this variation in premium-setting behavior? If the variation is explained only by specific regional characteristics of the municipalities, – for example, the costs and utilization of care services, – and other demographic situations related to LTCI, it means that discretion vis-à-vis premium-setting has worked in capturing the characteristics, and thus premiums were decided to correspond to benefit expenditures as expected when the LTCI system was introduced. If, on the other hand, another factor is found to affect or induce a variation in premium-setting behavior, we should re-consider the effect of discretion on premium-setting and the instructions of upper-level governments or leading cities in the context of LTCI.

As is well known, discretion can create externalities that bring about inter-jurisdictional interaction and distort resource allocation among municipalities, according to the literature on fiscal decentralization. Empirical findings on strategic interaction are surveyed by Brueckner (2003) and Revelli (2005). Inter-jurisdictional interaction could, conceivably, be a factor that affects variations in premium-setting behavior.

In the context of LTCI, two types of interaction can be imagined: yardstick competition and welfare competition. As laid out in our detailed description in the next section, in terms of yardstick competition, we can imagine a scenario wherein municipalities compete to restrain an increase in Category I premiums, as they are worried about political pressure from the elderly voter bloc, which can evaluate the relative performance of policy-makers in their jurisdiction and compare them with those in neighboring jurisdictions. Taking the seminal study by Besley and Case (1995) as a starting point, yardstick competition on tax-setting has been empirically analyzed on municipal property tax in the Netherlands (Allers and Elhorst 2005), Italy (Bordignon et al. 2003), and Spain (Bosch and Solé-Ollé 2007) and on income tax in Belgian municipalities (Heyndels and Vuchelen 1998). While our basic idea resembles those of these studies – each of which considers a general tax-setting model – we treat LTCI premium-setting that levies a burden not on all residential voters but only on the elderly, and thus consider the importance of their voting.

On the other hand, it is supposed that municipalities intend to influence the elderly to emigrate from the jurisdiction, or at least to prevent new immigration, by raising the premium burden. That is, they are engaged in a kind of welfare competition. Benefit expenditure is
considered a policy instrument in a common model of welfare competition, based on the theoretical framework of Wildasin (1991). Figlio et al. (1999) and Saavedra (2000) find strategic interaction among US states in deciding the benefit levels of families with dependent children (AFDC). In addition, Baily and Rom (2004) point out that the logic of interstate competition should be considered not only with respect to matters touching AFCD, but also in other programs like Medicaid and Supplemental Security Income-State (SSI-S); they conclude that variations in strategic interaction on welfare programs depends on political circumstance. The ‘race to the bottom’ in the setting of welfare benefits level can be also found in Nordic countries and Western Europe. However, Koethenbuerger (2012) explains that welfare competition possibly occurs not only by controlling the benefit transfer level but also by tax-setting, depending on whether the competing jurisdictions have similar policy preferences. Thus, we imagine in our model that municipalities control the premium burden at the individual level, to influence resource flow as represented by migration among the elderly.

Two possible types of competition

We finally consider evidence that supports the possibility that there is both yardstick competition and welfare competition in the context of the Japanese LTCI system. Figures 3 and 4 show recent trends in the election of municipal policy-makers, according to the Survey of Unified Local Elections by the Association for Promoting Fair Elections. From Figure 3, we see the strong political power of the elderly, backed by the highest voter turnout among the voting population. For example, the turnout of those in their 60s is double that of those in their 20s, which means that the political weight of the elderly is twice that of the younger generation. In addition, it can also be understood from Figure 4 that voters – a majority whom may be elderly – greatly consider the quality and quantity of long-term (and medical) care service when they vote. Moreover, since this demographic’s second-greatest concern is tax burden, a high degree of interest would be possibly attached to the premium burden of LTCI. Therefore, given certain assumptions about high voter turnout, it can be supposed that policy-makers intend to focus on care service for the elderly (including how heavy its burden should be), if they seek to be

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13 Dahlberg and Edmark (2008) investigate the case of Swedish municipalities. Fiva (2009) finds that welfare policy causes recipient migration among municipalities in Norway. Hübler (2009) shows welfare competition among German counties, and that it has declined as a result of major reforms in Germany’s welfare system; this result seems to complement the argument of Revelli (2006) who studies the interdependence of expenditure for social service provision in the UK.
re-elected. Although such evidence does not immediately suggest the existence of yardstick competition, it does provide conditions that suggest LTCI premiums are decided within a voting model.

[Figures 3 and 4]

Figures 5 and 6 describe migratory trend, according to the Survey of Migration published by the National Institute of Population and Social Security Research. From Figure 5, we can see that the migration rate of those aged 55 and over in the 2000s has increased by 23.9% compared to the 1990s, while the migration rate of the younger generation decreased by –5.5%. This evidence seems to be consistent with the enforcement of LTCI, contingently. Figure 6 shows the reasons for immigration, by age. Health conditions relate directly to long-term care. Living with children is a major reason for using in-home care service in Japan, given the remnants of care by family prior to the introduction of LTCI. Elderly persons with disorders intend to live in urban areas that offer a convenient way of life that does not require the use of a car. These three reasons related to long-term care seem to underpin a large share of the elderly’s decision to immigrate. Kawase and Nakazawa (2009) find that interregional differences in the capacity of long-term care facilities generate strong magnetic effects on the migration of the elderly. In addition to the effects of such facilities, the burden of LTCI premium would be considered a factor that would greatly affect migration among the elderly.

[Figures 5 and 6]

3. Theoretical considerations

In the context of LTCI in Japan, the discretion of municipalities in managing LTCI allows us to imagine two types of inter-jurisdictional interaction: 1) yardstick competition in a voting model where a policy-maker decides LTCI premiums, especially while considering voting behavior among the elderly in particular, and 2) welfare competition in a migration model where a policy-maker manages LTCI with forecasts vis-à-vis migration among the elderly as a reaction to his or her policy-making.

The development of our empirical specification, discussed in the next section, was
motivated by our drive to identify whether inter-jurisdictional interaction occurs among municipalities. In addition, we study which mechanism is behind that interaction. To identify these points concretely by means of empirical analysis, we theoretically consider those two models.

**Basic framework**

At first, we summarize the commonalities of these two models. It can be supposed that the premium for the Category II insured (aged 40–64) does not affect voting or migration, among that demographic – especially among the younger individuals, because the premiums are collected by nationwide health care insurers, and so its burden does not differ by municipality, as mentioned in the previous section. On the other hand, since the premium for the Category I insured (aged 65 and over) is decided by each respective municipality, differences in premiums among municipalities can be considered to affect voting behavior or inter-jurisdictional migration among these individuals. Therefore, we will focus solely on the behavior of the Category I insured.

To explain the models in terms of institutional background and empirical specification, we suppose the following three-stage game situation that describes premium-setting behavior vis-à-vis the second-period premium. In the first stage, the nature decides the unit-cost level associated with providing long-term care service and the type of incumbent policy-maker involved; they are private information held by the incumbent. Then the incumbent forecasts the amount of long-term care service need \( G \) and decides a premium on the elderly \( p \) and the amount of intra-municipal transfers from the general account \( S \) in the second stage. Finally, the elderly decide their behavior, with the aid of incomplete information, in the third stage. Although we cannot clearly describe the games after the third stage, it can be imagined that the stages are repeated in the real world.

The unit cost is represented as \( \mu = \theta + c(N) \). \( \theta \) is the technical cost of providing long-term care services which is independently and identically distributed with \( \theta \in [L, H] \), \( H > L \), and \( \Pr(\theta = H) = \phi \in (0,1) \). \( c(N) \) denotes per-capita congestion cost related to an increase in the number of the elderly \( N \) who are care-service users, with \( c' > 0 \) and \( c'' > 0 \).

A budget constraint on an LTCI special account is represented as \( Np + S = \mu G N \).\(^{14}\) \( Np \) is

\(^{14}\) For the sake of simplicity, we ignore financial transfers from upper-level governments (i.e. central and
the total premium revenue from the Category I insured, and $\mu G N$ is the total benefit expenditure to service users. We assume that the intra-municipal transfer ($S$) is used to cover any deficit in the special account and the general administrative expense associated with managing the LTCI program. A budget constraint on the municipal general account is represented as $M t = S + Mg$. $\bar{t}$ is the tax rate on the younger residents ($M$), and $g$ is public good for them. In following the situation of municipalities in Japan, we assume that $\bar{t}$ is given for a policy-maker.

Social welfare within a jurisdiction is written simply as:

$$W = n(u(G) - p) + (1 - n)(v(g) - \bar{t}), \quad n = N/(N + M),$$

where $u(\ )$ and $v(\ )$ are ordinary utility functions of the elderly and the younger individuals, respectively, with $u', v' > 0$ and $u'', v'' < 0$.

Politicians may be one of two types: they can ‘prefer long-term care for the elderly’ or ‘prefer public good for the younger’. Thus, we label the politician’s type as $i \in \{e, y\}$. The objective function of politician is described as:

$$V^i = \lambda' n(u(G) - p) + (1 - \lambda')(1 - n)(v(g) - \bar{t}) + \rho R^i, \quad \forall i = e, y.$$

Each type of politician intends to maximize his or her objective function by choosing $G$ and $p$, on the condition that the type $e$ politician $a$ has higher parameter ($1/2 < \lambda' \leq 1$) compared to the relatively lower parameter ($0 \leq \lambda'' < 1/2$) of the type $y$ politician. $\rho < 1$ is the discount factor on the politician’s payoff after the third stage ($R'$).

**Political agency problems and yardstick competition**

Let us consider a voting model, where an election is implemented in the third stage. During an election, the elderly decide whether to re-elect the incumbent or to remove him or her from office. The elderly are assumed not to move among jurisdictions, and so $c(N)$ holds
constant. The probability that the challenger prefers long-term care is $\pi \in [0,1]$.  

The incumbent chooses $G$ and $p$ – and, consequently, $S$, which is also veiled from the elderly. If he or she is re-elected, he or she will be able to receive a political rent after the third stage ($R^i$); however, this depends upon the probability of re-election. Thus, the objective of the politician is written as follows:

$$V^i = \tilde{\lambda}^i n(u(G) - p) + (1 - \tilde{\lambda}^i)(1 - n)(v(g) - \tilde{t}) + \rho \sigma^i R^i \quad \forall i = e, y,$$

where $\sigma^i$ shows the probability of re-election to a second term, for each type of incumbent.

According to Besley and Smart (2007), political equilibrium can be characterized as a perfect Bayesian equilibrium in a game featuring incomplete information. The rational voting rule for the elderly is to re-elect the incumbent if the posterior probability that the incumbent is a type $e$ politician exceeds the prior probability $\pi$ that the challenger is type $e$. The posterior beliefs of the elderly are formed according to the equilibrium policy at the second stage ($G, p$). On the other hand, an incumbent policy-maker who seeks to be re-elected chooses policy while considering the voting behavior of the elderly. Accordingly, it is known that there are three possible equilibrium configurations: pooling, hybrid, and separating equilibrium. With either the pooling or hybrid equilibrium, the type $y$ incumbent gives up on minimizing the intra-municipal transfer and succeeds in making him or herself indistinguishable from type $e$, at a high unit cost, in order to be re-elected. Consequently, the LTCI premium would be restrained by the effect of the election.

When the elderly can observe the policy decided by the incumbent in a foreign jurisdiction, this restraining effect will become stronger. In such a situation, the elderly can base their decision to re-elect an incumbent or not on his or her relative performance, compared to that seen in neighboring jurisdictions. Accordingly, the probability of the re-election of the incumbent in a domestic jurisdiction ($\sigma^i$) depends not only on the policy set by him or her, but also on that set by the incumbents of foreign jurisdictions in the vicinity. The elderly can easily discern whether or not an incumbent is type $y$, by referring to a benchmark that consists of observations vis-à-vis policy set in foreign jurisdictions, even though the incumbent intends to cheat. Therefore, it becomes more difficult for the type $y$ incumbent to minimize intra-municipal transfers. Moreover, even if the incumbent is type $e$, he or she would have to reduce premiums in order to avoid being judged with a Type I error.

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16 See Belleflamme and Hindricks (2005) and Besley and Smart (2007) for detailed explanations.
In this context of yardstick competition, it is most important that jurisdictions be in a symmetric environment, with the states of neighboring jurisdictions correlating positively, according to Besley and Smart (2007). If regional characteristics – for example, population, ageing rate and industrial structure – differ among neighboring jurisdictions, the unit cost of providing long-term care service will differ among jurisdictions. Consequently, comparative observations of second-stage policy would not be helpful for the elderly in assessing whether an incumbent is type e or y; therefore, the greater the number of similar jurisdictions in the vicinity of one’s domestic jurisdiction, the more the restraining effect of election via comparative observation would work on premium-setting, particularly with respect to a type y incumbent.

**Migration of the elderly and welfare competition**

In a migration model, the events at the second stage are the same as those in the aforementioned voting model – that is, a policy-maker chooses \( G \) and \( p \). The intra-municipal transfer (\( S \)) is also veiled from the elderly.

Then, the elderly decide at the third stage whether to move from or to remain living in their jurisdiction, in accordance with the quality of long-term care service and the amount of LTCI premium. If they believe that the policy-maker is a type \( e \) politician according to equilibrium policy-setting (i.e. \( G \) and \( p \)), they should remain living there in order to enjoy a sufficient net benefit from the LTCI program, as expected in the second program management period.

In this model, the objective for each politician is written as:

\[
V^i = \lambda^i \hat{n}(u(G(\hat{\mu})) - p) + (1 - \lambda^i)(1 - \hat{n})(v(g) - \bar{r}) + \rho R^i \quad \forall i = e, y.
\]

Since we assume that the younger do not migrate among jurisdictions, \( \hat{n} \) denotes \( \hat{N}/(\hat{N} + M) \), represented by the expected population of the elderly after they migrate, while the younger population remains unchanged.

We also consider the equilibrium that is characterized as a perfect Bayesian equilibrium in a game of incomplete information. That is, the rational decision by the elderly is to remain living in their jurisdiction if the posterior probability that the incumbent is a type \( e \) politician exceeds the prior probability \( \pi \). The posterior beliefs of the elderly are formed according to the equilibrium policy at the second stage \((G, p)\). The incumbent policy-maker sets policy while considering the migration behavior of the elderly.
In this game, we assume that the elderly can observe the policy set by incumbents in foreign jurisdictions. The elderly can base their decision to emigrate from or remain living in their domestic jurisdiction on the relative performance of neighboring jurisdictions. Accordingly, the expected population of the elderly after the third stage depends not only on the policy set by the incumbent in one’s own domestic jurisdiction, but also on those set by incumbents in foreign jurisdictions.

Suppose that an increase in the population of the elderly due to the second stage policy \((G, p)\) attracts the elderly in foreign jurisdictions and drives their immigration to the domestic jurisdiction. The effect on the budget of LTCI special account is written as:

\[
dp + \frac{1}{N} dS = \left( c' G + \frac{S}{N^2} \right) d\hat{N}.
\]

Since \(c'\) – which denotes marginal congestion cost – is positive, it can be suggested that an increase in the elderly population reduces the expected social welfare via increases in the burden of LTCI premium \((dp/d\hat{N})\) and the amount of intra-municipal transfer \((dS/d\hat{N})\), both of which consequently decrease the provision of public good for the younger.

In considering the effect of an increase in the elderly population, a type \(y\) incumbent would intend to minimize the intra-municipal transfer and set the LTCI premium as high as possible, in order to prevent foreign elderly from immigrating – or, moreover, to prompt the domestic elderly to leave the jurisdiction. Even if the incumbent is a type \(e\) politician, he or she would hesitate to make the policy overly attractive to the elderly, concerned as he or she would be about the above negative effect of the elderly population on the utility of the elderly. Particularly for a type \(e\) incumbent who seeks the utility of the original elderly, the immigration of outsiders – which will cause a higher premium burden – might be undesirable.

Therefore, we can expect LTCI premiums to increase if jurisdictions are engaged in welfare competition, as described above, versus the voting model. However, we should note that the incentive to raise premiums would differ among jurisdictions if they differ in terms of financial capacity. For example, the type \(e\) incumbent of a municipality with a large financial capacity would be able to make the premium attractively low for the elderly, irrespective of certain amounts of immigration. On the other hand, the type \(y\) incumbent of a municipality where the ageing rate is very high – and thus the congestion cost of care service is already large – should raise the premium as high as possible, in order to drive the emigration of the elderly from the
jurisdiction.

Presumption for empirical estimation

In summarizing theory-based discussion, in the next section, we consider the relationship between the models used in LTCI premium-setting and the results of empirical estimation.

First, if an LTCI premium were decided in a voting model, the premium or its rate of increase in a municipality with a high ageing rate would be lower than that in a municipality with a low ageing rate. That is, the premium or its rate of increase will correlate negatively with the ageing rate. As discussed, it would be difficult for a type y incumbent to increase premiums in order to minimize the intra-municipal transfer, as he or she face a large number of elderly individuals who collectively wield strong political power.

In addition, if municipalities were engaged in yardstick competition, lower premiums would be observed among municipalities that face a greater number of jurisdictions with similar situations. We will present the effect of yardstick competition in terms of correlation between LTCI premiums as a dependent variable, and cross-term variables that consist of the ageing rate and a dummy variable that indexes the numbers of neighboring municipalities that bear similar conditions.

On the other hand, if an LTCI premium were decided in a migration model, the estimation results will show that the premium or its rate of increase correlate positively with the ageing rate. Since a higher ageing rate – which is considered to incur large long-term care service costs – is undesirable not only for a type y incumbent but also in some cases for a type e incumbent, a policy-maker in a municipality with a high ageing rate would look to raise premiums in order to push the elderly from the jurisdiction, or at least to make immigration undesirable. Consequently, municipalities are engaged in welfare competition, whereupon they look to shift the elderly onto each other.

However, it is not enough to simply recognize welfare competition as a form of inter-jurisdictional interaction vis-à-vis premium-setting, given the estimation results that show a positive correlation between premiums and ageing rate; the premium must be consistent with the ageing rate, via a forecast of the demand for long-term care service.

Therefore, we will also use aforementioned cross-term variables to examine welfare competition. As discussed, if the elderly are deciding whether to move from or to remain living
in their domestic jurisdictions, they are likely to perform relative comparisons of similar jurisdictions. Therefore, in order to influence the elderly to emigrate – or at least to make immigration more undesirable – a policy-maker should set the premium in his or her municipality to be higher than those seen in similar neighbors. That is, if municipalities were engaged in welfare competition with respect to premium-setting, a higher premium would be observed in each municipality that faces a greater number of jurisdictions with a similar situation.

4. Empirical estimations

Empirical specification

In a common strategy of empirical analysis with respect to inter-jurisdiction interaction, the estimation of the reaction function of policy-setting is a well-known approach – that is, we check the correlation between the policy level of one municipality as a dependent variable and those of other neighboring jurisdictions, which are collectively treated as an exogenous variable; this is done, for instance, via the instrumental variables method. In addition, the literature has sought to identify yardstick competition by splitting samples according to governors’ term limits (Besley and Case 1995), examining types of error correlation (Bordignon et al. 2003), and exploiting natural experiments (Revelli 2006).17

However, we do not employ the estimation for the reaction function, for the following reasons. First, this method cannot distinguish yardstick competition from welfare competition in our model, since both forms of competition are described as strategic complements of the reaction function – despite having an opposite direction of change in LTCI premium that will be observed in each competition, as discussed in the previous section. Second, since there is no mayoral term limit in the case of Japanese municipalities, we cannot apply a splitting sample or examine error correlations to distinguish yardstick competition and welfare competition – at least not by using data that express who is a ‘lame duck’ policy-maker. In addition, there is little available information that captures the political situation of municipalities – because, for example, virtually no mayors (and very few local legislators) are affiliated with specific political

17 For a more detailed explanation of identification problems related to inter-jurisdictional interaction, see Revelli (2005).
parties.

Therefore, we alternatively propose the following estimation equation:

\[ p_{i,2} = X_{i,1,4} a_k + \beta Z_{i,1} + Z_{i,1} D_i \gamma_i + D_i \delta_i + u_i. \]

We employ estimations with two types of dependent variables: the premium in the second program management period and an increasing premium rate from the first to the second period.

\( X_{i,1,4} \) and \( a_k \) are a vector of explanatory variables and a vector of their coefficients, respectively. \( X_{i,1,4} \) includes variables representing cost factors and revenue factors. They are basically represented by the values in the first management period, because it is considered that a policy-maker would forecast particularly the costs of providing long-term care service based on those seen in the previous management period.

As cost factors that are thought to raise premiums and their rates of increase, we employ an average cost of in-home care service \((HOME)\), that of facility care service \((FACI)\), and the ratio of eligible people \((RELI)\) to the total number of the Category I insured in a municipality.

As revenue factors, four variables are employed. First, the Financial Capacity Index \((FCI)\) – calculated as the ratio of standard fiscal revenues to standard fiscal demands – is basically thought to reduce premiums and their rates of increase, because municipalities with sufficient financial capacity would be able to use intra-municipal transfers. However, in contrast, this variable would correlate positively with the dependent variable, because the low-FCI municipalities may be able to set lower premiums, as they are supported by large amounts of Local Allocation Tax (LAT) disbursements.\(^{18}\) A higher ratio of low-income insured \((LOW)\) to total Category I insured individuals is assumed to raise premiums; since low-income insured individuals are allowed to pay discounted premiums, a high ratio of them would require a municipality to set its standard premium higher, in order to balance its LTCI account budget. However, this variable would correlate negatively with premiums if it is a proxy for the amount of the Adjustment Subsidy, which allows municipalities to reduce their premiums through special financial support.\(^{19}\) The ratio of high-income insured \((HIGH)\) to total Category I insured

\(^{18}\) Since the LAT disbursements are calculated as the standard fiscal demands minus the standard fiscal revenues, a low FCI means higher LAT disbursements to municipalities’ budgets.

\(^{19}\) The Adjustment Subsidy is distributed according to the average income level of the Category I insured and the ratio of the older elderly people in the municipality.
individuals is assumed to reduce premiums, in an effect that mirrors that seen with \textit{LOW}. The ratio of the older elderly people aged 75 and over (\textit{R75}) to total Category I insured individuals is considered both a revenue factor and a cost factor, because it is one of the standards for allocating the Adjustment Subsidy; on the other hand, older elderly people frequently acquire disorders and incur high costs related to the provision of long-term care.

In addition to these cost and revenue factors, we include the first-period premium (\textit{PREM$_1$}) as an explanatory variable in the premium estimation, considering the incremental nature of municipal behavior.

\textit{Z$_{i,1}$} is the ageing rate in municipality \textit{I} in the first management period (\textit{AGR}). One explanation is that a higher ageing rate gives rise to a higher premium via higher forecasted benefit expenditure. The other is the effect of the political pressure of the elderly, which is thought to restrain the second-period premium or its rate of increase. According to the theoretical consideration in the previous section, a positive correlation between the ageing rate and the dependent variable would show that premium-setting was based on the forecast of service cost in a migration model. On the other hand, a negative correlation would show that a policy-maker revises the premium while being mindful that he or she could be rejected in the next election through the strong political pressure of the elderly.

Moreover, to examine the existence of inter-jurisdictional interaction, we employ the cross-term (\textit{Z$_{i,1}$D$_I$}) of the ageing rate and dummy variables that index how many neighboring municipalities there are with similar conditions. A vector of dummy variables (\textit{D$_I$}) consists of three dummy variables: \textit{D$_04$}, \textit{D$_06$}, and \textit{D$_06OV$}. \textit{D$_04$} takes a value of 1 for municipalities that have the same population size as 20 – 40% of the municipalities in the same prefecture. \textit{D$_06$} take a value of 1 if that figure is 40 – 60%; and \textit{D$_06OV$} takes a value of 1 if that figure is 60% and more. Consequently, reference municipalities lacking a dummy variable are those that have the same population size as < 20% in the same prefecture.\textsuperscript{20} In addition, to control the coefficient of the

\textsuperscript{20} According to the Similar Group Classification by the Ministry of Inter Affairs and Communications (MIAC), cities are classified by population into four groups; (A) under 50,000, (B) 50,000 – 100,000, (C) 100,000 – 150,000, and (D) 150,000 and over.

Suppose that city \textit{y} in prefecture \textit{Y} is in group (A). We calculate the share of cities in group (A) in prefecture \textit{Y} at first. Then, for example, if the share is 30%, we indicate that \textit{D$_{04}$} = 1, \textit{D$_{06}$} = 0, and \textit{D$_{06OV}$} = 0 on city \textit{y}. This means that 30% of the cities in prefecture \textit{Y} are similar to city \textit{y}, in terms of population size.

Towns and villages are classified into five groups; (a) under 5,000, (b) 5,000 – 10,000, (c) 10,000 – 15,000, (d) 15,000 – 20,000, and (e) 20,000 and over. We make dummy variables for towns and villages.
cross-term variable, we also control intercepts with the term $D_i \lambda_i$.

<table>
<thead>
<tr>
<th>Table 1. Expected coefficient signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta (Z_{i1})$</td>
</tr>
<tr>
<td>Voting model</td>
</tr>
<tr>
<td>Yardstick competition</td>
</tr>
<tr>
<td>Cost forecasting</td>
</tr>
<tr>
<td>Welfare competition</td>
</tr>
</tbody>
</table>

Following our theoretical consideration in the previous section, we can summarize in Table 1 the relationship between the expected coefficient signs and the situations of inter-jurisdictional interaction vis-à-vis premium-setting.

If LTCI premium-setting is affected only by political pressure from the elderly who do not evaluate the relative performance of the policy-maker in their municipality, only the coefficient of the ageing rate will be significant and negative. Whether or not neighboring jurisdictions are in a similar condition is irrelevant to premium-setting, if the elderly do not evaluate relative jurisdiction performance. On the other hand, if municipalities were engaged in yardstick competition, lower premiums would be seen in municipalities that face a greater number of jurisdictions with similar situations – that is, they are exposed by the elderly to stricter comparisons with neighbors. Significant and negative coefficients among the cross-terms confirm this scenario.

In a similar way, we can identify the existence of welfare competition: if municipalities set LTCI premiums based on forecasts of the costs of service provision, the coefficient of the ageing rate must be significant and positive. The ageing rate is but one of the cost factors, regardless of how many neighboring municipalities have similar conditions. On the other hand, if municipalities were engaged in welfare competition on premium-setting, higher premiums would be observed in those municipalities that have a higher number of jurisdictions in a similar situation.

in the same way as cities, based on this classification.
Results

Our empirical estimation uses cross-section data including a sample of 553 cities and 1,748 towns and villages, at the premium revision from the first program management period (2000 – 02) to the second period (2003 – 05). As shown in Table 2, only a few data records come from the values in 2003, because of restricted data availability; therefore, we employ almost all of the values in the first period as explanatory variables, in order to treat the municipalities’ forecasts based on past results and to preclude any endogeneity problems. In order to examine the degree of effect of the explanatory factors on the dependent variable, we implement a log translation to the dependent and explanatory variables, excluding dummy variables and the rate of increase. The ordinal least squares (OLS) method with heteroskedasticity consistent standard errors (HCSEs) for heteroskedasticity is implemented.

Table 3 shows the estimation results for cities. On the whole, the cost factors (HOME, FACI, and RELI) correlate positively with the premium and its rate of increase, as expected. Particularly, the ratio of eligible people (RELI) has the largest and most significant influence on premium-setting. As described in section 2, the discretion of municipalities hinges on the certification of eligibility, while the costs of providing long-term care service are controlled by private providers. Thus, it would be easier for policy-makers to forecast increases in the number of eligible people when they revise premiums.

The sign of the high-income insured (HIGH) is consistent with expectations; however, it is insignificant. It seems that cities with large financial capacities tend to restrain premiums in line with FCI. The ratio of low-income insured (LOW) shows a negative correlation with the rate of increase – that is, it represents the effect of the Adjustment Subsidy. The ratio of the older elderly (R75) would represent a cost factor that accords with a positive correlation with a rate of increase.

The coefficient of PREM1 means that the cities that set high premiums in the first period

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21 The data set excludes the designated cities’ data and the data of municipalities that co-manage the LTCI program as the wide-area local public bodies due to institutional differences. Very small municipalities establish the wide-area local public bodies with some neighboring municipalities and cooperate in managing LTCI.

22 As shown in Figure 4, since the rates of increase in some municipalities – in particular towns and villages – have minus values, we cannot apply log translation to them.
tended also to set high premiums in the second period, probably because of incrementalism. However, premium increases in those cities would tend be smaller than those of cities that had set low premiums in the first period, since the coefficient is smaller than 1.

Ageing rate in city ($AGR$) has a significant and negative correlation with the premium and its rate of increase; moreover, it has the strongest influence on the dependent variable. This means that the policy-makers of cities where more elderly reside intend to restrain premiums in the second period, as they are worried about being rejected by the strong political pressure wielded by the elderly.

The cross-term and dummy interceptions also show significantly negative correlations with premiums and its rate of increase, especially for cities in the situation where 40% and or more of the neighboring cities within the same prefecture have a similar population size. As discussed in the previous section, it is more competitive for policy-makers if many cities in the same prefecture are of a similar size, from the viewpoint of yardstick competition. Since, in this situation, the elderly can more accurately identify the policy-maker’s typology based on concrete comparisons of performance among similar cities, the policy-maker needs to restrain premium increase to a level seen in those other cities, if he or she wishes to be re-elected. This explanation can be supported by the result that shows that the coefficient of $AGR*D_{06ov}$ is the largest and most significant of the cross-terms.

[Table 3 here]

We next consider the results for towns and villages (Table 4). Cost factors ($HOME$, $FACI$, and $RELI$) show results similar to those seen for cities. In addition, as with cities, $RELI$ has the largest influence among the cost factors on the premiums of towns and villages.

On the whole, the revenue factors are not significant for premium-setting; in this respect, towns and villages differ from cities. Towns and villages seem to set their premiums in the second period, irrespective of their financial capacities or their amount of LAT disbursement. In addition, towns and villages tend to take stricter incrementalism policies than cities, as their coefficient of $PREM_t$ is larger and more significant than that of cities.

As with cities, the ageing rate has a significant and negative correlation with premiums and their rate of increase among towns and villages. Thus, we can suppose that the elderly there exert strong political pressure on premium-setting. However, the coefficients of the cross-terms show a significantly positive correlation, unlike the results seen among cities. In summarizing
the results of ageing rate and the cross-terms, it can be said that the political pressure of the elderly weakens among the towns and villages that face a greater number of municipalities within the same prefecture that share similar conditions.

This might be caused by insufficient discretion due to a shortage of official staff engaged in LTCI management. As mentioned above, Nakazawa (2009) concludes that small municipalities are thought to depend on neighboring jurisdictions or upper-level governments – prefectures, in the case of Japan. In line with his findings, our results on towns and villages can be explained thus. Although policy-makers in towns and villages basically try to revise LTCI premiums by complying with requests from the elderly, those who do not have the sufficient ability to draw up a program tend to mimic neighboring jurisdictions or depend on the advice of upper-level governments in premium-setting. Accordingly, the premiums in towns and villages – particularly in those with a greater number of similar municipalities – differ from the premiums preferred by the elderly.

[Table 4 here]

5. Concluding remarks and discussion

In this study, we examined the financial issues surrounding Long-term Care Insurance (LTCI) in Japan. Our question was about how the discretion of municipalities on premium-setting has worked to date. Discretion has been considered an important factor in the Japanese LTCI system. We particularly focus on the premium-setting behavior of municipalities upon the revision of premiums from the first management period to the second period, in which cities with low premiums tended to restrain increases in their premiums in the second period (unlike those with high premiums). On the other hand, towns and villages raised their premiums as high as was necessary.

What is the factor that influences this variation in premium-setting behavior? If the variation can be explained solely in terms of specific regional, municipality-level characteristics, it means that discretion with respect to premium-setting has worked to capture the characteristics, and thus premiums are thought to correspond to benefit expenditures. On the other hand, if it is found that another factor affects variation in premium-setting behavior, we should reconsider the implications of discretion with respect to LTCI premium-setting.

According to the literature on fiscal decentralization, we can suppose two types of
interaction in the context of long-term care insurance: yardstick competition and welfare competition. We examined which competition occurs among municipalities during that premium revision. Based on theoretical considerations, we empirically analyzed the factors that affect premiums and their rates of increase. We found the following results: 1) the political power of the elderly strongly enforces restraints vis-à-vis premiums and their rates of increase, 2) cities engage in yardstick competition, and 3) towns and villages engage in neither yardstick competition nor welfare competition. These results suggest that inter-jurisdictional interaction restrains premium-setting, particularly in the case of cities. Towns and villages basically need transfers, and no competition was found. They might instead operate under the instruction of upper-level governments.

Finally, we considered the effect of this interaction on the linkage between premium revenue and benefit expenditure, and financial transfers from upper-level governments or the municipal general account to the LTCI special account. Figure 7 shows changes in the actual ratio of premium revenue to benefit expenditure, by different types of municipalities. As mentioned, the statutory standard ratio was 17% in the first management period, 18% in the second period, 19% in the third period, and 20% in the fourth and present; this is denoted in Figure 7 by a dotted line. However, it can be seen in that figure that the actual ratio varies by municipality. In the first and second periods, the ratios in large and small cities were almost the same, but differed from those in towns and villages. On the other hand, a disparity in those ratios between large and small cities can be seen from 2006; this means that premium-setting by municipalities has not yet unified, and that it has been particularly difficult for small municipalities to raise their premiums and make their actual ratios consistent with the statutory standard.

In addition, Figure 7 shows that the actual ratio of premium revenue to benefit expenditure has been less than the statutory standard in the latter years (2004–05) of the second period, unlike in the first year. That is, it seems that discretion on premium-setting has not adequately worked to balance the budget of the LTCI account, contrary to its nationally mandated purpose. According to our results, it is appears that the increase in premiums during the revision could not sufficiently finance benefit expenditures in the latter years, due to the effect of yardstick competition on premium-setting in the case of cities. For the case of towns and villages, we should consider other evidence – e.g. mimicking or a dependence on upper-level governments.

[Figure 7 here]
An answer to the question of how the LTCI special account was balanced, despite the fact that the premium revenue was insufficient for benefit expenditure, is offered in Figure 8. That figure shows that the actual amount of intra-municipal transfers from the general account to the LTCI special account exceeds the statutory amount, which is equivalent to 12.5% of the benefit expenditure. Moreover, the smaller municipalities have transferred larger financial contributions to their LTCI accounts – that is, it seems that insufficient premium revenue has been compensated by extra transfers from the general account to the LTCI special account in the second management period.

[Figure 8 here]

In addition, we considered the relationship between premiums and transfers; Table 5 summarizes the correlation coefficients, based on data from the second management period. It is interesting to note that transfers from the central and prefectural governments correlated positively with premiums and their rates of increase. These transfers might be a kind of reward for their efforts to set high premiums – at least, in relation to premium-setting. In contrast, intra-municipal transfers from municipal general accounts to LTCI special accounts compensated for low premium, as expected in our theoretical considerations. Particularly, it seems that transfers play more significant roles in cities, according to the correlation coefficient: the values for cities were nearly twice those of towns and villages.

As described, intra-municipal transfers could be financed by cutting expenses for other public services, or through extra support through LAT disbursements. It is considered that the former approach could reduce the welfare of residents other than the elderly, while the latter could decrease the general expenditures of the central government. Although rigid premium-setting – which would place an excessively heavy burden on the elderly – should be avoided, restrictions on intra-municipal transfers are needed to tame inter-jurisdictional interactions and maintain balanced LTCI special account budget, if there is to be no extra financial support or a linkage between premium burden and benefit expenditure.

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23 The Long-term Care Benefit Subsidy with the Adjustment Subsidy from the central government and the Cost-sharing Subsidy from prefectural governments have not been so different from a statutory amount. The highest ratio of the actual to the statutory was 106.6% (a value of the Cost-sharing Subsidy to towns and villages in 2000).
References


Figure 1. Premium revenue and expenditures (billion yen)

- Category I premium revenue (right axis scale)
- Benefit expenditure
- Total expenditure of the LTCI account

Figure 2. Changes in Category I premium

Regression line on cities:
\[ y = 1.246x - 341.19 \]
\[ R^2 = 0.5337 \]

Regression line on towns and villages:
\[ y = 0.9476x + 574.52 \]
\[ R^2 = 0.4396 \]
Table 2. Definition and Descriptive statistics (Obs. 2301)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Premium in the first period (JPY)</td>
<td>2784.77</td>
<td>389.40</td>
<td>1533</td>
<td>4100</td>
</tr>
<tr>
<td>2) Premium in the second period (JPY)</td>
<td>3201</td>
<td>569</td>
<td>1783</td>
<td>5942</td>
</tr>
<tr>
<td>3) Increasing rate (from 1st to 2nd)</td>
<td>0.154</td>
<td>0.157</td>
<td>-0.312</td>
<td>1.094</td>
</tr>
<tr>
<td>4) Average cost of in-home care service (HOME)</td>
<td>32.901</td>
<td>4.743</td>
<td>15.038</td>
<td>56.157</td>
</tr>
<tr>
<td>5) Average cost of facility care service (FACI)</td>
<td>344.717</td>
<td>20.833</td>
<td>165.454</td>
<td>426.893</td>
</tr>
<tr>
<td>6) Ratio of the eligible people (RELI)</td>
<td>0.036</td>
<td>0.015</td>
<td>0.007</td>
<td>0.209</td>
</tr>
<tr>
<td>7) Ratio of low income insured (LOW)</td>
<td>0.373</td>
<td>0.122</td>
<td>0.070</td>
<td>0.852</td>
</tr>
<tr>
<td>8) Ratio of high income insured (HIGH)</td>
<td>0.188</td>
<td>0.070</td>
<td>0.059</td>
<td>0.502</td>
</tr>
<tr>
<td>9) Ratio of the older elderly (R75)</td>
<td>0.461</td>
<td>0.044</td>
<td>0.307</td>
<td>0.639</td>
</tr>
<tr>
<td>10) Financial Capacity Index (FCI)</td>
<td>0.423</td>
<td>0.274</td>
<td>0.050</td>
<td>2.160</td>
</tr>
<tr>
<td>11) Aging rate (AGR)</td>
<td>0.252</td>
<td>0.078</td>
<td>0.048</td>
<td>0.533</td>
</tr>
</tbody>
</table>

| HOME | 2002 | Total cost of in-home service / the number of service use of in-home |
| FACI | 2002 | Total cost of facility service / the number of service use of facility |
| RELI | 2002 | The number of eligible persons / the number of Category I insured |
| LOW  | 2003 | The number of the insured in Level 1 and 2 income level / the number of Category I insured |
| HIGH | 2003 | The number of the insured in Level 4 and 5 income level / the number of Category I insured |
| R75  | 2002 | The number of the insured aged 75 and over / the number of Category I insured |
| FCI  | 2002 | Financial Capacity Index calculated by the Ministry of Internal Affairs and Communications (MIAC) |
| AGR  | 2002 | The number of Category I insured / total population |

Table 3. Results for cities

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Premium in the second period</th>
<th>Rate of increase in premium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coef.</td>
<td>robust S.E</td>
</tr>
<tr>
<td>HOME</td>
<td>0.266 ***</td>
<td>0.040</td>
</tr>
<tr>
<td>FACI</td>
<td>0.311 **</td>
<td>0.130</td>
</tr>
<tr>
<td>RELI</td>
<td>0.480 ***</td>
<td>0.027</td>
</tr>
<tr>
<td>LOW</td>
<td>0.014</td>
<td>0.019</td>
</tr>
<tr>
<td>HIGH</td>
<td>-0.028</td>
<td>0.022</td>
</tr>
<tr>
<td>R75</td>
<td>0.068</td>
<td>0.062</td>
</tr>
<tr>
<td>FCI</td>
<td>-0.055 ***</td>
<td>0.018</td>
</tr>
<tr>
<td>AGR</td>
<td>-0.567 ***</td>
<td>0.044</td>
</tr>
<tr>
<td>AGR*D04</td>
<td>-0.045</td>
<td>0.040</td>
</tr>
<tr>
<td>AGR*D06</td>
<td>-0.053</td>
<td>0.039</td>
</tr>
<tr>
<td>AGR*D06ov</td>
<td>-0.139 ***</td>
<td>0.046</td>
</tr>
<tr>
<td>D04</td>
<td>-0.093</td>
<td>0.071</td>
</tr>
<tr>
<td>D06</td>
<td>-0.104</td>
<td>0.068</td>
</tr>
<tr>
<td>D06ov</td>
<td>-0.214 ***</td>
<td>0.075</td>
</tr>
<tr>
<td>PREM1</td>
<td>0.430 ***</td>
<td>0.048</td>
</tr>
<tr>
<td>Constant</td>
<td>2.726 ***</td>
<td>0.773</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Adj-R²</th>
<th>BP test</th>
<th>White test</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.780</td>
<td>51.05 ***</td>
<td>164.95 ***</td>
<td>553</td>
</tr>
</tbody>
</table>

Note: Asterisks ***, ** and * indicate statistical significant at the 0.01, 0.05 and 0.10 levels, respectively.
Table 4. Results for towns and villages

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Premium in the second period</th>
<th>Rate of increase in premium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coef.</td>
<td>robust S.E</td>
</tr>
<tr>
<td>HOME</td>
<td>0.237 ***</td>
<td>0.022</td>
</tr>
<tr>
<td>FACI</td>
<td>0.087 *</td>
<td>0.045</td>
</tr>
<tr>
<td>RELI</td>
<td>0.395 ***</td>
<td>0.019</td>
</tr>
<tr>
<td>LOW</td>
<td>0.019 *</td>
<td>0.011</td>
</tr>
<tr>
<td>HIGH</td>
<td>-0.016</td>
<td>0.011</td>
</tr>
<tr>
<td>R75</td>
<td>-0.118 **</td>
<td>0.047</td>
</tr>
<tr>
<td>FCI</td>
<td>-0.014 *</td>
<td>0.008</td>
</tr>
<tr>
<td>AGR</td>
<td>-0.458 ***</td>
<td>0.029</td>
</tr>
<tr>
<td>AGR*D04</td>
<td>0.070 ***</td>
<td>0.026</td>
</tr>
<tr>
<td>AGR*D06</td>
<td>0.064 **</td>
<td>0.028</td>
</tr>
<tr>
<td>AGR*D06ov</td>
<td>0.077 *</td>
<td>0.046</td>
</tr>
<tr>
<td>D04</td>
<td>0.099 ***</td>
<td>0.038</td>
</tr>
<tr>
<td>D06</td>
<td>0.097 **</td>
<td>0.041</td>
</tr>
<tr>
<td>D06ov</td>
<td>0.162 *</td>
<td>0.087</td>
</tr>
<tr>
<td>PREM1</td>
<td>0.506 ***</td>
<td>0.027</td>
</tr>
<tr>
<td>Constant</td>
<td>3.291 ***</td>
<td>0.321</td>
</tr>
</tbody>
</table>

Adj-R²               | 0.619         |            |  | 0.144         |            |         |
BP test             | 79.06 ***     |            |  | 109.63 ***    |            |         |
White test          | 255.73 ***    |            |  | 161.45 ***    |            |         |
Sample              | 1748          |            |  | 1748          |            |         |

Note: Asterisks ***, ** and * indicate statistical significant at the 0.01, 0.05 and 0.10 levels, respectively.
Table 5. Correlation coefficient between premium and transfers

<table>
<thead>
<tr>
<th></th>
<th>From the central gov.</th>
<th>From prefectural gov.</th>
<th>Intra-municipal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premium</td>
<td>0.374***</td>
<td>0.218***</td>
<td>−0.237***</td>
</tr>
<tr>
<td>Rate of increase</td>
<td>0.281***</td>
<td>0.136***</td>
<td>−0.267***</td>
</tr>
<tr>
<td>Towns and villages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premium</td>
<td>0.274***</td>
<td>0.174***</td>
<td>−0.149***</td>
</tr>
<tr>
<td>Rate of increase</td>
<td>0.118***</td>
<td>0.043</td>
<td>−0.112***</td>
</tr>
</tbody>
</table>

Note: Asterisks ***,** and * indicate statistical significant at the 0.01, 0.05 and 0.10 levels, respectively.