Chapter 5

The Impact of the Declining and Aging the Population on the Livelihood Assistance Allowance of Local Public Finance in Japan

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1. Introduction

As can be seen from the decrease in local allocation tax, there are reductions in the fiscal revenues being transferred from the national to local governments. Although the economic situation has improved, the path towards financial reconstruction for local governments with enormous debts is still distant. Financial administration of local governments in rural areas lacking self-financial resources is particularly in dire circumstances.

Japan’s population has been decreasing since 2005 and it is predicted that over the next 100 years its population will decrease by half. Some local governments have been experiencing population decreases for more than a decade. A declining birthrate is not a new problem for rural areas in Japan. The degree of decline in the birthrate produces inequalities among regions in population. Local governments experiencing population decline are obliged to carry out fiscal reconstruction with an ever-decreasing number of taxpayers.

Figure 1 shows the rates of increase of population and the number of households through to 2025 from 2005 by prefecture. While both rates indicate the same trend, as nuclear families increase the number of households increases slightly nationally, but the population declines. The rate of changes varies by prefecture, but in general terms; it is evident that urban areas increase while rural areas decrease in population.

Generally speaking, the influence of population decline suppresses expenditure on necessary public services. And at the same time, the aging of society drains local
public finances. Hence, the rapid aging of Japanese society influences local public finance. The aging will likely bring about a more serious situation in rural as compared to urban areas. Even if population decline suppresses expenditure, public services for the elderly will need to be expanded as the aging of society progresses.

This paper focuses on the income inequalities that increase due to the aging of Japanese society. Although opinions vary as to whether or not income inequalities are expanding in Japan, there is agreement that the aging of society is a major factor. In general, due to the long life of older people, income inequalities are larger. For this reason, the aging of society becomes a factor contributing to the increase in livelihood assistance allowance for local governments.

Figure 2 indicates the percentage of the number of elderly households in 2005 and 2025. The percentage of elderly households will increase by as much as 10% nationwide over the next 20 years. The ratio of elderly households varies greatly among prefectures and is higher for rural areas than for urban areas.

The livelihood assistance allowance for local governments will be influenced by population decline and the aging of society. This paper analyzes the impact that a rapidly declining birthrate and the aging of society will have on future local government livelihood assistance allowance in Japan.

We focus upon livelihood assistance allowance for the following reasons. For local governments, livelihood assistance allowance is a mandatory expenditure as long as a household on welfare exists. Within the Japanese government’s “Triple Reform of Fiscal Relationships” livelihood assistance allowance attracts attention due to the ongoing tug-of-war between the national and local governments over the subsidy rate of livelihood assistance allowance that should be funded from national tax revenues. The main point of interest for this paper is how the livelihood assistance allowance will impact upon local government finances as a result of the inevitable decline in the birthrate and increase of the elderly.

This paper estimates income distribution including low-income groups by age. It estimates the expenditures of livelihood assistance allowance by prefecture. In addition, taking into account future changes in population, it carries out a simulation
at the prefectural level of how livelihood assistance allowance will change.

This paper is composed as follows. Section 2 introduces existing studies and discusses the contribution of this paper. Section 3 explains the income distribution model used in this paper. Section 4 carries out a simulation analysis of the declining birthrate and aging society. Section 5 summarizes findings of the paper, and comments on future issues.

2. Existing Studies and Contribution of this Paper

The existing studies related to this paper are empirical studies on the livelihood assistance allowance.

First of all, there are studies estimating the number of low-income households that qualify for household welfare. For example, Yamada (2000), Ogawa (2003), and Komamura (2003) use individual data to estimate the percentage of low-income households. Komamura (2003) estimates that livelihood assistance allowance take up rate is 12%–25%. Sohara (1985) and Wada and Kimura (1998) combine several sources of statistical data.

Second, there are some studies focusing on the livelihood assistance allowance system and employment. Murakami (1984) and Takayama (1980) estimated the financial cost required when introducing “Negative Income Tax (NIT)” in Japan. Also, Tamada and Otake (2004) compared the livelihood assistance allowance system in the United States with the Japanese system, empirically demonstrating that the Japanese system restrains employment.

Tamada and Otake (2004) also point this out, but empirical research on the Japanese livelihood assistance allowance system is extremely rare. The main reason is that the usability of data for analysis is very low. In order to carry out an empirical analysis of the livelihood assistance allowance system that covers low-income groups, income data for these groups are necessary. However, it is extremely difficult to obtain such income data for low-income groups from Japanese statistics.

For example, the “Annual Report on the Family Income and Expenditure Survey (ARFIES)” and the “National Survey of Family Income and Expenditure (NSFIE)”
published by the Ministry of Internal Affairs and Communications Statistics Bureau only provide data above a certain income. In general, it is difficult to obtain individual data including that of low-income groups. Even if it can be obtained, the degree of latitude for analysis is limited. Moreover, the fact that it is not freely available means variability is also low. For this reason, despite the importance of fiscal policy for low-income groups, it has been difficult to make it the focus of empirical analysis.

This paper puts forward a method of estimating distribution functions using income distribution data that has been aggregated. By estimating the income distribution, it is possible to artificially generate data for low-income groups that cannot be obtained in aggregated data. If we utilize the estimated income distribution, we can analyze the livelihood assistance allowance system using micro-simulation.¹

According to Suzuki (2006), the rate of aid of local government livelihood assistance allowance can be explained by the rate of aging, the unemployment rate, the divorce rate, etc. Among these, the unemployment rate is an economic factor and the divorce rate a social factor, making them difficult to predict. On the other hand, it is possible to make predictions regarding aging. Therefore, this paper analyzes the impact that a predictable declining birthrate and the aging of society have on livelihood assistance allowance.

To start with, in the next section we discuss the specific method for estimating distribution functions from the National Institute of Population and Social Security Research “Household Projections for Japan by Prefectures” and the “National Survey of Family Income and Expenditure (NSFIE).” We indicate the method of applying the livelihood assistance allowance system to the income distribution data estimated. By estimating income distribution by age, it is possible to analyze the declining birthrate and the aging of society using simulation.

¹ Saito (1989) estimated residential tax revenues by projecting logarithmic normal distributions for each prefecture.
3. Income Distribution Model

3.1 Estimation of Income Distribution Factors by Age

The National Institute of Population and Social Security Research (2005) “Household Projections for Japan by Prefectures” indicates the number of households, by age, in each prefecture in 2005. The age categories are fundamentally divided into five-year increments, but linear imputation allows us to extrapolate the number of households to one-year increments.

To estimate income distribution we need average income data. “Table 41 Monthly Receipts and Disbursements per Household by Age Group of Household Head” in the “National Survey of Family Income and Expenditure (NSFIE)” published by the Ministry of Internal Affairs and Communications Statistics Bureau, indicates “Yearly income” by age group of household head in 2004 for all households. There are ten categories, with the lowest as “200 ten thousand yen, under” and the highest as “1500 ten thousand yen, and over.” We have adopted this as average income data. Since this is also divided into five-year increments in terms of age, we carried out the linear imputation as mentioned above to extrapolate the data to one-year increments.

From the operation above, we were able to generate the number of households and average income in one-year age increments (22 to 87 years of age). The aim here is to apply distribution functions to income distribution data that has been aggregated to a certain extent, thereby estimating an income distribution that includes low-income groups earning “200 ten thousand yen, under” In order to do that, we need to specify the distribution functions. With regard to the income distribution, assuming continuous logarithmic normal distribution, the distribution function is formulated as follows;

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2 In this paper, the benchmark year is 2005 but the “National Survey of Family Income and Expenditure (NSFIE)” is a five-yearly survey so the latest data is that of 2004. This produces a one-year gap, but we have chosen to ignore this difference.

3 See Aoki (1979) for an explanation of logarithmic normal distribution.
\[ f(x) = \frac{1}{\pi \sigma \sqrt{2\pi}} \exp \left[ -\frac{1}{2\sigma^2} \left( \ln x + \frac{\sigma^2}{2} \right)^2 \right] \quad \text{for} \quad 0 \leq x \leq \infty. \quad (1) \]

Here, \( x \) is the weighted index expressing income brackets, with \( \sigma^2 \) the variance of the distribution logarithm, and \( \pi \) as pi. The distribution of the weight \( x \) results in the income bracket inequality. Furthermore, here, income distribution \( x \) is characterized by an average of 1, and the variance \( \exp(\sigma^2) - 1 \). When provided the distribution data to be estimated and the average income data, the only unknown variable is the variance parameter, \( \sigma^2 \).

The income bracket \( x \) is expressed as a continuum, however, in terms of the mathematical calculations it is calculated as a discrete type. If we differentiate the income bracket \( x \) with the subscript \( i \), the range of the income brackets is given an interval of \( x_{i+1} - x_i = 0.01 \), which is calculated from \( x_i = 0.01 \) to \( x_{500} = 5.00 \) \((1 \leq i \leq 500)\). Then, this results in 500 household income types, and the cumulative density \( \int f(x)dx \) for the logarithmic normal distribution becomes approximately 1.

As set out above, when given the specific variance parameter \( \sigma^2 \) and the average income, the distribution function \( f(x) \), the density function \( xf(x) \) and the cumulative density \( \int f(x)dx \) are established. Specifically, the following operation is used to estimate the variance parameter \( \sigma^2 \).

Step 1) Calculate the distribution function and density function when the variance parameter \( \sigma^2 \) is given an appropriate default value.

Step 2) By multiplying the income bracket \( x \) by the average income for each age bracket, we obtain 500 types of income data for the distribution function.

Step 3) By multiplying the density function by the total number of households in each age bracket, we obtain the number of households with 500 household income and expenditure types for the distribution function.

Step 4) Substitute the income distribution in the distribution function with “annual income” from income increments found in the “National Survey of Family Income and Expenditure (NSFIE),” and calculate the number of households for each income bracket for that case.
Step 5) Compare the distribution data of the number of households obtained from the “National Survey of Family Income and Expenditure (NSFIE)” and the distribution of the number of households obtained in Step 4, and calculate the sum square of the difference between the two. This also calculates the R-squared.

Step 6) If the sum of squares is sufficiently large, by changing the variance parameter $\sigma^2$ we return once again to Step 1. When the sum of squares is at its smallest, then adopt the variance parameter $\sigma^2$.

By following the procedure outlined above, we are able to obtain the variance parameter $\sigma^2$ of the income distribution function by age bracket. We also calculated the R-squared to establish the extent of the explanatory power of the variance parameter. Figure 3 indicates the variance parameter $\sigma^2$ estimated from 2004 data and the R-squared.

The variance parameter $\sigma^2$ tends to become higher with increased age. The advancement of age allows us to understand the de-equalizing nature of income distribution. This indicates that advanced age heightens the degree of inequality within a generation.4

To determine how well they match, Appendix 1 offers a diagrammatic representation of a comparison of the theoretical values obtained through the distribution function described above with the actual distribution of the number of households. On the whole, the theoretical values can be seen to represent the actual distribution of the number of households. From the above, using the estimated distribution function, it is possible to generate the distribution of the number of households by age including low-income groups.

### 3.2 Estimation of the Household Characteristics by Prefecture

Moreover, that the determination coefficient deteriorates between the age of 50 and 59 is due to the existence of two peaks in the income distribution data of that age bracket. It is difficult to correct this, and because other age brackets are judged to have high explanatory power, it was decided to adopt the estimated variance parameter $\sigma^2$.  

4
Judging that the age bracket variance parameters estimated in the previous section closely resemble the distribution of the number of households throughout the prefectures, we measured the 2004 livelihood assistance allowance for each prefecture. However, before that, in considering the attributes of the income distribution of prefectures, it is essential to determine the difference between average income and household characteristics.

First of all, assuming that income inequalities exist among prefectures, it is necessary to obtain the average incomes for each age bracket. For this we used the 2004 data on “Contractual cash earnings,” “Annual special cash earnings.” and “Numbers of Workers” by prefecture available in the Ministry of Health, Labor and Welfare’s “Basic Survey on Wage Structure (2006);” “Table1.Contractual cash earnings, scheduled cash earnings and annual special cash earnings by age group,” “corporate scale calculations” and “Male Workers.”

Since the above-mentioned data is basically arranged in five-year increments, it is adjusted to one-year increments by means of linear imputation. Annual earnings are calculated from the “Fixed payments of cash earnings” and the “Annual bonuses and other special payments,” and by multiplying this by the “number of workers,” it is possible to measure the worker income by age category for each prefecture. We are able to obtain the average income by age from the “Basic Survey on Wage Structure” by dividing the aggregated figures by the number of workers.

However, for the purposes of this paper, we have used the average income by age bracket from “National Survey of Family Income and Expenditure (NSFIE).” of the Ministry of Internal Affairs and Communications 2004 data to estimate the variance parameters of the income distribution. We compare the average earnings estimated on a national base from the “Basic Survey on Wage Structure” with the average income in the “National Survey of Family Income and Expenditure (NSFIE).” By taking a percentage of the age categories of both, and dividing that percentage by the former, we match the data from the “Basic Survey on Wage Structure” with that from

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5 The use of the “Male Workers” data was based upon the fact that most head of household’s are male.
the “National Survey of Family Income and Expenditure (NSFIE).” In this way, the annual average income estimated for each prefecture is then used for the subsequent simulation analysis.

Moreover, a projection is required for household characteristics by prefecture. The reason for this is that the livelihood assistance varies according to such characteristics as whether the household is that of an individual or a family, the number of children, or whether one or both adults are working.

Even so, it is almost impossible to give accurate household characteristics to each household within the estimated income distribution data. For this reason, we judge that among households of a certain age, a set percentage of households exist with certain characteristics. This is aggregated into a matrix parameter called a household characteristics matrix.

First of all, we obtain the household number distribution by age bracket in five-year increments for households of two or more people from “Table2. Distribution of Households by Characteristic of Household and Prefecture” in the Ministry of Internal Affairs and Communications Statistics Bureau (2004) “National Survey of Family Income and Expenditure (NSFIE).” From this household number distribution, we also ascertain the number of households comprising two, three, four, five or six or more people. Further, concerning households with three or four people, only those with one person gainfully employed are indicated. Here, it is assumed that households where one person is gainfully employed are single income households.

However, for households of five, or six or more people, no breakdown is given of people gainfully employed in those households. From the households comprising three people or four people, we calculated the percentage of households by age bracket that have one person gainfully employed, and by multiplying this by the number of households with five, six or more people we estimated the number of households with five, six or more people that have one person gainfully employed.

6 The rate that indicates deviation was within the range of 0.9 to 1.3, so there was not a large difference.
7 Takayama (1980) and Murakami (1984) who measure the cost of introducing “negative income tax” also consider household characteristics.
For households with more than one gainfully employed person, we assumed a dual income household for all. Using this approach, in five-year age increments we are able to differentiate the number of people in households from two to six or more people, and obtain the distribution for the number of households with single and dual income adults. Next, we carried out linear imputation to convert this distribution data to one-year increments.

However, since this data is limited to households of two or more people, single-person households are not included. For this reason, we carried out, on the number of households by five-year age brackets for “general households,” “single person households” and “overall total” found in the National Institute of Population and Social Security Research (2005) “Household Projections for Japan by Prefectures,” a linear imputation to extrapolate the data to one-year increments, and by obtaining a ratio with “general households” and “overall total,” calculated the percentage of single person households in age brackets.

Also, the same National Institute of Population and Social Security Research (2005) “Household Projections for Japan by Prefectures” indicates the number of single parent households by age. For the purposes of this research, we assume that these single parent households are either mother and child (or father and child). Then, by calculating the ratio to nuclear families households, we can generate the percentage of mother child families in one-year increments.

The family characteristic matrix is completed if we add the percentage of above-mentioned single-person households and single parent households to the previously mentioned household distribution indicating family characteristics for households of more than two people. With the family characteristics matrix, rows represent one-year increments of age and columns the family characteristics. The family characteristics considered are single person households, family households and mother child households, single and dual income households, having one to five children; all households are given any one of these characteristics.

With regard to the income of spouses in households with dual incomes, we hypothesized that there is a set relationship between the income of the head of the
household and that of the spouse, and processed it as follows. We determined that the ratio of the “Wages and Salaries of Household Head” and the Wages and salaries, Spouse of household head “head of household’s spouse’s income” found in the Statistics Bureau Ministry of Internal Affairs and Communications 2004 “National Survey of Family Income and Expenditure (NSFIE)” “Table1.Monthly Receipts and Disbursements per Household by Yearly Income Group” was constant in annual income brackets. Therefore, this implies that, as concerns dual income households, the head of the household’s income is distributed to the spouse.

In closing, for households including a married couple, we assumed that the age difference between the two is three years, and that the first child was born when the head of the household reached 30 years old. For households with two or more children, it is assumed that there is a three-year gap between each child. The table lists the household characteristics considered in this paper.

Using these, for each of the 47 prefectures, we assumed households as being represented by 56 age brackets (22–87 years) × 500 income brackets × household characteristics. Households generated using the income distribution model will all belong to one of these types.8

3.3 Application of the Livelihood Assistance Allowance System

Based upon the age bracket income distribution data set and the household characteristic matrix estimated in the previous section, we are able to calculate the livelihood assistance allowance for each type of household by prefecture based on the 2004 system. The following approach is used to calculate the livelihood assistance allowance.9

Step 1) Household gross income = amount of income - miscellaneous deductions

8 Every type of family income and expenditure does not necessarily exist. For which do not exist, the number of households are aggregated to zero.
9 Moreover, we hypothesize that households on welfare are living in level 2 region 1. Also, nursing care assistance and various additional payments were not able to be taken into consideration. An outline of the livelihood assistance allowance system is summarized in Appendix 2. With regard to the prefectural distribution of levels and regions, they are presumed to be taken into account to a certain extent by the adjustment factors that appear below.
Step 2) Minimum living expenses = livelihood + housing + education + medical

Step 3) Livelihood assistance allowance = minimum living expenses - household gross income

In addition, because applications are required in the livelihood assistance allowance system, even if incomes are low, benefits are not paid unless an application is made. Also, even if an application is made, the livelihood assistance allowance will not be paid in cases in which a household does not qualify for welfare through the means test. In other words, merely having a low income does not mean that the criteria to receive welfare have been met.

This paper employs a stochastic approach to classify which households are and which are not eligible to receive the livelihood assistance allowance 1 assistance payments. In specific terms, the livelihood assistance allowance entitlement function is hypothesized as follows;

\[
\text{if } N_{0,1} \geq \phi \text{ then the livelihood assistance allowance is not received} \quad (2) \\
\text{if } N_{0,1} \leq \phi \text{ then the livelihood assistance allowance is received (application is made and entitlement is approved).}
\]

Here, \( N_{0,1} \) represents uniform random numbers from 0 to 1, with \( \phi \) as the livelihood assistance allowance entitlement parameters \( 0 \leq \phi \leq 1 \). When the value of the random numbers exceeds the livelihood assistance allowance entitlement parameter \( \phi \), there is no entitlement for the livelihood assistance allowance; and in the reverse situation the livelihood assistance allowance can be received. With regard to the livelihood assistance allowance entitlement parameter \( \phi \), a convergent calculation is carried out so the rate of aid in the model matches the actual rate of aid. In addition, the covered rate is represented in units of people rather than households. Figure 4 indicates the 2004 covered rate by prefecture.

In addition, we obtain the ratio (adjustment factor) of the total amount of the livelihood assistance allowance payments in the model and the actual amount of the
livelihood assistance allowance payments. The adjustment factor for each prefecture is fixed in the subsequent simulation.\(^{10}\) Here, the actual livelihood assistance data employed utilizes the 2004 prefectural and municipal livelihood assistance allowance totals found in the “Local Finance Statistical Yearbook” issued by the Institute of Local Finance.

\[
\text{Adjustment rate } \gamma = \frac{\text{actual livelihood assistance}}{\text{livelihood assistance in model}}
\]

4. Simulation Analysis of the Declining Birthrate and Aging of Society on the Livelihood Assistance Allowance System

Assuming that the adjustment factor \(\gamma\) obtained in the previous section and the rate of aid are fixed, let us use simulation analysis to clarify how livelihood assistance allowance changes as the demographic composition changes with a declining birthrate and aging of society.\(^{11}\) With 2005 as the benchmark year and 2025 as the year for comparison, the effect brought about by the change in demographic composition is analyzed.\(^{12}\) Since 2005 is also set as the benchmark year for price levels, we are able to ascertain the real changes in livelihood assistance allowance. Changes in demographic composition are determined through changes in each prefecture’s number of households by age bracket and changes in family characteristic matrix.

Figure 5 indicates the changes in the livelihood assistance allowance for each prefecture. In comparison to 2005, the nature of change in the livelihood assistance

\(^{10}\) Fixing the adjustment factor involves the assumption that a linear relationship exists between livelihood assistance in the model and actual livelihood assistance. However, there should be empirical verification of whether or not a linear relationship exists between the two to begin with. However, we chose to follow this method in this paper because a viable alternative does not seem to exist and existing research on the tax system (for example, Kimura, Yoshida and Hashimoto(2004), etc.) also uses the same method.

\(^{11}\) Of course, there is a high probability that the transformation parameter will change in future. However, in this paper, we want to focus purely on extracting the effects of the aging of society on the livelihood assistance allowance for local government finance, so these parameters have been fixed.

\(^{12}\) In the end of 2006 the National Institute of Population and Social Security Research released new population projection figures, but because the public announcement of the estimate of household number for each prefecture is still several years away, this paper is unable to reflect those new estimates.
allowance for 2025 by prefecture is varied. The livelihood assistance allowance will increase for most prefectures, and in particular, the rate of change will be high in the urban areas of the Kanto and Kansai regions.\textsuperscript{13}

However, livelihood assistance allowance will decrease in Hokkaido and Nagasaki prefecture. The local governments of these two prefectures will be affected more by population decline than the aging of society. In Hokkaido, the decrease in the number of households in most age brackets contributes to a decrease in livelihood assistance allowance.

In this way, differences appear in the change of livelihood assistance allowance among prefectures due to the dual influence of population decline and aging of society. In order to differentiate the effect of these it is necessary to ascertain the change in livelihood assistance allowance for each age bracket. Figure 6 indicates the changes in the livelihood assistance allowance by age brackets for each prefecture. See Appendix 3 for the results of analysis for each individual prefecture.

According to Figure 6, the overall trends in the change of livelihood assistance allowance will not change greatly when looked at on a prefectual basis. In all regions, aging will increase the number of elderly households in the over 75 years of age category, which will increase the livelihood assistance allowance. At the same time, the declining birthrate will decrease households of the generation still working, serving to suppress the livelihood assistance allowance. The livelihood assistance allowance for local governments will be determined by the combination of these effects. In the Kanto region, livelihood assistance allowance to young households decreases but for elderly households increases. In relative terms, the region showing the opposite trend to the Kanto region is Shikoku.

For many local governments, increases in livelihood assistance allowance are inevitable in the future. It goes without saying, but the simulation analysis described in this paper has been carried with the presumption that aspects of income distribution and the percentage of low-income households will not change from the current

\textsuperscript{13} The reason that rate of change for Yamanashi Prefecture is high is due to the original livelihood assistance allowance for 2005 being low, thereby increasing the manifested rate of change.
situation. If they do change, the probability is high that future livelihood assistance allowance will change.

However, getting a quantitative view of the increases and decreases in livelihood assistance allowance that accompany the declining birthrate and the aging of society, and showing that especially in urban areas livelihood assistance allowance for elderly households will increase rapidly is important in terms of local governments considering future welfare policy.

5. Conclusion

This paper quantitatively analyzes the effect that a declining birthrate and aging of society will have on livelihood assistance allowance of local public finance. The livelihood assistance allowance is a required expenditure that cannot be easily reduced. Future trends in the livelihood assistance allowance are important for local governments obliged to press ahead with fiscal reconstruction despite being burdened with huge amounts of debt. The results of the analysis in this paper are summarized as follows.

Since income inequalities are greater the older the persons, it is highly probable that livelihood assistance allowance for local governments will increase as the aging of society progresses. At the same time, because population decreases as the birthrate declines, it is also possible that livelihood assistance allowance will decrease.

The simulation analysis indicates that livelihood assistance allowance will increase for most local governments. When the results of the analysis are viewed by age, we see that while livelihood assistance allowance to the younger generation decrease because of the declining birthrate, particularly in urban areas, livelihood assistance allowance rapidly increase for the elderly group above 75 years of age. This suggests that it is possible that the expansion of income inequalities that accompanies the aging of society will have a major impact on the future welfare policies of local governments.

Finally, let us conclude by summarizing the issues raised in this paper.

First, the income distribution variance parameters calculated from Japanese
national data was applied to the prefectures. It would be preferable to estimate the income distribution variance parameters for each prefecture. However, since data does not exist for each prefecture to make it possible to estimate income distribution by age, we decided that this would not be possible. Nevertheless, the fact that the household number distribution by age bracket, the average income, and the household characteristic parameters are taken into account, means that to a certain extent we have been able to reflect the demographic composition or economic environment of prefectures.

Second, since expenditure of livelihood assistance allowance is fundamentally carried out by the municipalities, under normal circumstances it would be preferable to carry out the analysis for each local municipality, but because of the difficulty in obtaining the necessary data to allow such analysis, in this paper the analysis is limited to prefectures.

These issues remain for future analysis.

Tables and Figures

Figure 1: The Rates of Increase of Population and the Number of Households by Prefecture

Figure 2: Ratio of the Number of Elderly Households in the Number of Households by Prefecture


Figure 3: Variance Parameter of Income Distribution and R-squared

Age
Table: Divisions of Household Characteristics

<table>
<thead>
<tr>
<th>1. Prefectures (47)</th>
<th>4. Dual income and single income</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Head of household’s age (22–87)</td>
<td>5. Single person household family household, and single mother household</td>
</tr>
<tr>
<td>3. Income bracket (500 brackets)</td>
<td>6. Number of children (one child household–five children household)</td>
</tr>
</tbody>
</table>

Figure 4: Rate of Aid by Prefecture (2004: unit‰)

Figure 5: Changes in Livelihood Assistance Allowance by Prefecture
(from 2005 to 2025)

Figure 6: Changes in Livelihood Assistance Allowance by Region for Age Bracket (from 2005 to 2025)
Appendix

Appendix 1. Income Distribution Data and a Comparison of Estimate Results

Figure 1.1: Estimate Results and Data for Income Distribution of People Aged 30 & 40 Years

Figure 1.2: Estimate Results and Data for Income Distribution of People Aged 50 & 60 Years
Appendix 2. Outline of Livelihood Assistance Allowance System in Japan

As this paper’s simulation analysis has 2004 as the benchmark year, the following represents the system in 2004. There are slight differences in the livelihood assistance base between 2004 and 2006.


Household gross income = amount of income - miscellaneous deductions

Livelihood assistance allowance = minimum living expenses - household gross income
### Livelihood assistance (Type 1 costs)

<table>
<thead>
<tr>
<th>Age</th>
<th>Base amount (unit: yen)</th>
<th>Number of people</th>
<th>Base amount (unit: yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 2 years</td>
<td>16,200 – 20,900</td>
<td>1 person</td>
<td>33,660 – 43,430</td>
</tr>
<tr>
<td>3 – 5 years</td>
<td>20,420 – 26,350</td>
<td>2 people</td>
<td>37,250 – 48,070</td>
</tr>
<tr>
<td>6 – 11 years</td>
<td>26,400 – 34,070</td>
<td>3 people</td>
<td>41,300 – 53,290</td>
</tr>
<tr>
<td>12 – 19 years</td>
<td>32,610 – 42,080</td>
<td>4 people</td>
<td>42,750 – 55,160</td>
</tr>
<tr>
<td>20 – 40 years</td>
<td>31,210 – 40,270</td>
<td>Amount added</td>
<td></td>
</tr>
<tr>
<td>41 – 59 years</td>
<td>29,590 – 38,180</td>
<td>for the fifth person and beyond</td>
<td>360 – 440</td>
</tr>
<tr>
<td>60 – 69 years</td>
<td>27,980 – 36,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>70 years or older</td>
<td>25,510 – 32,340</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Livelihood assistance (Type 2 costs)

<table>
<thead>
<tr>
<th>Age</th>
<th>Base amount (unit: yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 – 40 years</td>
<td>31,210 – 40,270</td>
</tr>
<tr>
<td>41 – 59 years</td>
<td>29,590 – 38,180</td>
</tr>
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<td>27,980 – 36,100</td>
</tr>
<tr>
<td>70 years or older</td>
<td>25,510 – 32,340</td>
</tr>
</tbody>
</table>

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[2] Housing assistance: 8,000 – 13,000 yen

[3] Education assistance: 2,150 – 4,180 yen

[4] Nursing care assistance: average monthly amount spent on home nursing care, etc.

[5] Medical assistance: average monthly amount spent on medical costs such as doctor’s fees
Appendix 3. Changes in Livelihood Assistance Allowance by Age Bracket by Prefecture (from 2005 to 2025)

Figure 3.1 The Hokkaido and Tohoku Region

Figure 3.2 The Kanto Region
Figure 3.5: The Chugoku Region

Figure 3.6: The Shikoku Region
Figure 3.7: The Kyushu and Okinawa Region