Low-Income Household Attributes and Government Income Adjustments in Japan[1)2)3)]

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1. Introduction

The fiscal conditions of the Japanese government are worsening under an aging economy and natural disasters such as COVID-19. Social security payments have been increasing steadily, and the government has had to increase public burden by raising the consumption tax rate in 2014 and 2019. The government hikes the contribution rate of social security every year, expanding the enrollment of employees' public pensions and health care insurance for part-time workers to sustain the insurance systems. However, the total income tax burden for each household is not as high as in other countries. The government can increase the public burden to reconsolidate the fiscal situation.

However, Japan is also concerned about its expanding income differences. The share of part-time workers among the total number of workers is increasing, and the income gap between full-time and part-time workers remains significant. Abe (2008) indicates that low-income households struggle to pay social insurance payments under prevailing part-time rather than full-time work.

As Kitamura and Miyazaki (2012) point out, economic disparities are widening. Although taxation and social insurance systems are often reformed separately, it is crucial to examine the mutual effects of the two systems when combined and what their result would be in terms of public burden. Doi (2010), Tanaka et al. (2013), Matsuda (2014), Yashio and Hachisuka (2014), and Doi (2017) conducted analyses focusing on the relationship between tax and social security systems. However, the systems on which they focus differ. Ohno et al. (2018) evaluate the income redistribution effect through the public burden using a decomposition of the coefficient of variation. Regarding the burden of income and local taxes, Kaneda (2018) uses a national consumption survey to assess burden status by income group.

This study evaluates each household's data using the Japan Household Panel Survey (JHPS/KHPS), which considers the burden of social insurance premiums and taxes. In Kawade (2016), using the 2009–2012 survey of the Keio Household Panel Survey (KHPS), the predecessor of the Japan Household Panel Survey (JHPS/KHPS), the author applies the tax system and social insurance system to income from 2008 to 2011, the data of which is obtained by asking respondents their previous year's income. Kawade (2016) recalculates the tax and social insurance contribution amounts, and the burden amount and burden rate are tabulated by decile in terms of equivalent gross income, including public transfers. Kawade (2016) compares the public system in 2015 with the previous system of public burden from 2008 to 2011 and applies the tax and social insurance systems in 2015 to conduct a policy simulation regarding income tax credit reduction.

Kawade (2019) conducts an analysis that focuses on income fluctuations across different time points to obtain a realistic public burden. Kawade (2020) focuses on public benefits and attempts to evaluate them in terms of net public burden. As public benefits mainly consist of benefits for children, such as child allowances and free high school education benefits, this study evaluates the public net burden rate on connection with the number of children.

To understand the effects of government benefits, this study investigates the relationship between income levels, household attributes, and public benefits for low-income households. Low-income households may have fixed income fluctuations, whereas the benefits of the Japanese government are likely to be inadequate. By understanding the characteristics of low-income households and the size of government benefits, we can better consider how to ease the harmful effects of a consumption tax rate hike and other increases in the public burden on low-income households.

The rest of the paper is organized as follows: Section 2 explains the data, calculation methodology, and fundamental attributes of the data; Section 3 presents the results concerning household attributes under the explored tax from 2009 to 2019; Section 4 presents the share of the public benefits items on total household income; and Section 5 summarizes the paper.

2. Panel Data and Calculation

In this study, the Japan Household Panel Survey (JHPS) is used to determine each household's income level and tax and social insurance burden. In 2014, the Keio Household Panel Survey (KHPS), which has been conducting annual follow-up surveys of 7,000 people in approximately 4,000 households nationwide since 2004, was combined with the JHPS, covering 4,000 men and women nationwide since 2009. Because of its large size, the KHPS is one of the few data sources beneficial for individual analyses in Japan[4)].

The KHPS targets men and women aged 20–69, while the JHPS targets men and women aged 20 years and older, although the sample populations overlap. However, there is no overlap in the survey respondents between the KHPS and the JHPS. The JHPS surveys employment, income, education, health, and medical care. In contrast, the KHPS mainly surveys employment, consumption, income, and housing, but the survey items have been unified since 2014. The JHPS is designed to maintain the sample size as much as possible by adding new survey targets as appropriate. However, the number of eligible households will decrease owing to the long-term tracking of the survey. In addition, the survey includes both married and widowed households and unmarried and widowed households.

In this study, the JHPS and KHPS are analyzed together. The same method is used to calculate each household's income, public burden, and public benefits. Although data have been available for the KHPS since 2004, for reasons relating to income and expenditure information, it was decided to limit the study analysis to surveys conducted from 2009 to 2019, when a more detailed evaluation is possible. Since the survey had been conducted in January of each year, income information is based on the previous year's income, and questions are asked taking into account units of 10,000 yen.

Income tax, a national tax, is levied for the current year, whereas inhabitant tax, a local tax, is levied using the previous year's information. In some cases, the burden of social insurance premiums is partially and individually answered. However, from the standpoint of accuracy and consistency of answers, figures are recalculated within

the framework of this study.

To investigate the attributes of lower-income households, this study limits its analysis to households with an equivalent household income of less than 2.5 million yen. In Japan, if the annual income is less than one million yen, one is exempt from taxation. Additionally, the number of inhabitant tax exemptions increases as the number of household members increases. For example, a household consisting of a couple and two children earning salaried income is considered an inhabitant tax-exempt if the household income is less than 2.23 million yen. In terms of equivalent total income, such a household has a total income of 1.12 million yen. Therefore, we analyze lower-income households as those with incomes up to about twice the income level of inhabitant tax-exempt households.

2.1 Calculation of Incomes

The study questionnaire includes an item on income: "annual income earned in the last year." That questionnaire is available with regard to "earned income," "self-employment/business/internal employment income," "rent/ground rent income," "interest/dividends," "money sent or received," "public pension," "company pension/public pension," "unemployment benefit/child care leave benefit," "child allowance/child support allowance," "welfare benefit," and "other income." In particular, "earned income" is recalculated to estimate monthly income and bonuses, since such information is necessary for the subsequent calculation of social insurance premiums. Other income details are based on respondents' answers. The questionnaire was administered separately to the respondents, their spouses, and other family members, and the social insurance premium burden and taxation system were applied to each of them. The target year is referred to in order to avoid confusion between the survey and target years.

"Earned income" is separated by the monthly salary and the total bonus amount earned in the last year. Usually, a monthly salary is obtained by subtracting the total bonus amount from the "earned income" and dividing it into 12. However, if there is no bonus information, the "earned income" is divided into 12. Suppose there is no "earned income" and the total monthly salary and bonus amount are available. In that case, the "earned income" is estimated from the total monthly salary and any bonuses. Bonuses are estimated by dividing them into two, assuming that bonuses are paid twice a year. As there are no questions in the study questionnaire on monthly salary and total bonuses for other family members, the monthly salary is calculated by dividing "earned income" into 12. If more than one household member works as a member of another family, the public burden is equally divided among workers.

The total income used for the analysis in this study is the "annual income earned in the last year," excluding "child allowance/child support allowance" and "welfare benefits," which are considered public benefits. Kawade (2016) and Kawade (2019) exclude the sample with a total income of 120,000 yen or less to assess the appropriateness of the answers they retrieved. However, this is added to the analysis in this study and the study of Kawade (2020), considering the withdrawal of savings from low-income households.

The total income is defined as the income of the entire household. In this analysis, the equivalent total household income is used, which is the total household income divided by the square root of the number of household members. It shows the ratio of each public benefit item to disposable income. Disposable income is defined as the total income minus the public burden plus public benefits. The public burden is tax (income tax and inhabitant tax), as described below, and social insurance premiums (public pensions, health insurance, long-term care insurance,

and unemployment insurance). Public benefits are child allowance, child support allowance, high school enrollment support allowance, high school scholarship benefit, and public assistance.

2.2 Calculation of Income Tax

In this study, the income tax, inhabitant tax, and consumption tax are calculated. The inhabitant tax is levied using the previous year's income, and individual data for which the previous year's income is unavailable are excluded from the analysis.

Income tax and inhabitant tax are imposed on " employment income," "self-employment, business, and home occupation," "rent and land rent," "interest and dividends," "public pensions," "corporate and public pensions," and "other income" as an annual income. For "employment income," "public pensions," and "corporate and public pensions," income deductions such as the \deduction for employment income and the deduction for public pensions are applied. For "interest and dividends," answers in units of 10,000 yen, the favorable choice between the dividend tax credit, a tax credit under the general taxation system, and the separate taxation system is applied[5)]. Other sources of income are added as taxable income.

Taxable income is applied for the basic exemption, deduction for social insurance premiums, deduction for medical expenses, deduction for spouses (special exemption for spouses), deduction for dependents, and deduction for the widow(er). Tax rates are imposed on the taxable income in the tax system each year. In addition, as tax credit, a special deduction for housing loans and dividend deductions are also applied.

2.3 Calculation of Social Security Payments

The social insurance premium burden is calculated for four categories: public pensions, health insurance, long-term care insurance, and unemployment insurance[6)]. First, the social insurance premium burden was calculated for regular employees ("full-time staff and employees ［regular employees］" and not "1–4 employees" in size). It is assumed that a public pension covers these employees, the National Health Insurance Association-managed health insurance (including long-term care insurance premiums), and unemployment insurance, but not the Employees' Pension Fund. Each premium is calculated using standard monthly remuneration and bonus amounts. The insurance premium rate is also calculated using the annual rate (applicable in Tokyo and after September each year).

Contract employees, part-time workers, dispatched workers, and temporary employees are treated the same as regular employees if their income exceeds 1.3 million yen. In contrast, other employees are covered separately by National Pension Insurance, National Health Insurance, and Nursing Care Insurance. If the employer is a public agency, the employee is separately enrolled in the mutual aid association with local government employees. Social insurance premiums are not imposed if the respondent did not answer "working" and could be presumed dependent based on income conditions. Otherwise, the respondent is separately enrolled in National Pension Insurance, National Health Insurance, and Long-Term Care Insurance.

For the National Pension Plan, the monthly premiums are multiplied by 12; for low-income households, premium exemptions (from complete to one-quarter exemption) are applied according to the income level. Since the National Health Insurance and Long-Term Care, insurance systems have been set up on a regional basis, and the systems vary widely. Therefore, we calculate the contribution amount using the equal portion and the income-based rate without an asset-based rate in Nakano City, Tokyo. In this case, premiums are reduced for low-income

households by using reduction provisions for each fiscal year. If there is no answer to whether a household is covered by social insurance and if the household is not a regular employee, it is assumed that the household is not covered by social insurance. Suppose that the previous year's income is used to determine premiums when national health insurance is used[7)]. In this case, the inhabitant tax calculation method is used, and individual households with no previous year's income are excluded from the analysis.

2.4 Calculation of Government Assistance

For public benefits, we mainly used the theoretical values for child allowance, child support allowance, high school enrollment support allowance, scholarship benefits for high school students, and public assistance. The subsidy for students needing aid is not included as part of public benefits because it is thought to be determined on a school-by-school basis, and the criteria and benefit amounts are unknown.

For the child and support allowance, the benefit amounts are calculated based on the number of applicable children. Theoretical values are used instead of actual values, considering the effects of income restrictions and other factors. For child allowance, we use theoretical figures, including the transition to child allowance in 2010 and the re-transition to child allowance in 2012. Although benefits are initially determined on an annual basis, for the sake of simplicity, we assume that benefits are paid on a calendar year basis based on the family structure at the time of the survey. Although the Child Support Allowance was to be paid to single-father families from August 2010, this calculation assumes that the allowance will be paid for one year from 2010.

For the high school enrollment support grant and scholarship benefit for high school students, theoretical values are calculated assuming public schools because there is no information on school enrollment status, that is, whether it is public or private schools. For the high school enrollment support grant, it is assumed that households within the income limit would receive 118,000 yen, equivalent to public school tuition if they had a high school student child. The scholarship benefit for high school students is provided to households receiving public assistance that satisfies the income requirements.

The amount of welfare payments received on the survey form was used because theoretical values cannot be measured. In cases where a child allowance is provided in addition to welfare payments, we assume that the income is not certified due to the additional childcare allowance and is provided as is.

2.5 Basic Results

Table 1 summarizes the basic attributes of the individual data. In this study, the analysis was limited to households with an equivalent total income of less than 2.5 million yen. Since the analysis is limited to low-income households, the largest number of households are headed by an unemployed head of household and by a head of household aged 60 years or older. The largest number of households with an equivalent total income is between 2 and 2.5 million yen. The number of observed households decreased from 2032 to 1437, owing to dropouts from the survey from 2009 to 2019.

3. Household Attributes and Income Levels

Table 2 shows the relationship between occupation of the household head and income sources. Employment income accounts for a large share, even among households with "self-employed" household heads. Family

Table 1. Basic Attributes of Individual Data

Number of Households	Self-Employed	Employed at a Commercial Company	Employed at a Nonprofit Company	Employed by the Government	Not Employed
Head Occupation of household (2010)	335	462	55	32	1148
Head Occupation of household (2019)	115	182	25	13	1138

Number of Households	20s	30s	40s	50s	60s	70s and over
Head Age of Household (2010)	97	332	266	238	425	684
Head Age of Household (2019)	50	98	120	75	177	953

Number of Households	1 million yen or less	1–1.5 million yen	1.5–2 million yen	2–2.5 million yen
Equivalent Total Income (2010)	278	400	576	778
Equivalent Total Income (2019)	217	268	386	602

Table 2. Sources of Income by Occupation of Household Head

Self Employed	Employment Income	Business Income	Other Income	Public Pension	Corporate Pension	Interest/ Dividend Income	Real Estate Income
Less than 1 million yen	47.3%	15.0%	0.6%	14.8%	1.4%	0.6%	1.3%
1-1.5 million yen	48.9%	23.4%	0.2%	15.1%	1.8%	0.3%	1.2%
1.5-2 million yen	57.4%	21.7%	0.8%	12.3%	1.2%	0.1%	0.9%
2-2.5 million yen	58.7%	21.2%	0.6%	12.1%	1.1%	0.1%	1.3%

Employed	Employment Income	Business income	Other Income	Public Pension	Corporate Pension	Interest/ Dividend Income	Real Estate Income
Less than 1 million yen	65.2%	1.6%	0.4%	6.4%	2.5%	2.7%	0.3%
1-1.5 million yen	79.3%	2.4%	0.1%	6.0%	1.6%	0.1%	0.1%
1.5-2 million yen	86.3%	0.9%	0.4%	7.4%	1.0%	0.1%	0.3%
2-2.5 million yen	88.9%	0.6%	0.4%	6.6%	1.0%	0.1%	0.2%

Not Employed	Employment Income	Business Income	Other Income	Public Pension	Corporate Pension	Interest/ Dividend Income	Real Estate Income
Less than 1 million yen	43.6%	4.5%	2.8%	41.2%	4.6%	1.3%	1.6%
1-1.5 million yen	40.2%	5.4%	1.5%	45.1%	4.6%	0.6%	1.0%
1.5-2 million yen	35.4%	3.9%	0.8%	52.3%	4.6%	0.7%	1.3%
2-2.5 million yen	33.1%	4.2%	0.8%	53.9%	5.4%	0.6%	1.4%

enterprises can have family members as employees and thus have the potential to pay salaries to family employees. If the household head is employed, the percentage of employment income increases as equivalent total income increases. Conversely, the lower the income, the greater the public pension, business income, and interest dividend income. This suggests that retired households are particularly likely to have low incomes, even if a household head is employed. Households with an "unemployed" head also provide higher employment income. If the household head is unemployed, the household head is more likely to be a pensioner and their children are likely to be employed.

Table 3 shows the relationship between the one-year equivalent total income and three-year average equivalent total income. Table 3 indicates that the percentage of households that maintained each given year's income level in the next three years is approximately 40%. As the household income level rises, the likelihood of rising from a given year's income decreases. Households with heads older than 60 years are less likely to increase their income. Households with an equivalent income of less than $1.5 million and a head under age 60 are more likely to increase their income in 2009 than in 2017. On the other hand, households with a head of household aged 60 or older are more likely to have rising incomes in 2017 than in 2009 for almost all income levels.

Table 4 shows the relationship between the number of children and income level.

The average number of children tended to increase with income growth. The number of children showed a downward trend in 2019 compared with 2009. Households with more children (five or more) tended to have more children in 2009 than households with lower incomes, but this trend disappeared in 2019.

4. Household Attributes and Government Benefits

Table 5 shows household attributes and the level of government benefits by equivalent total income group from 2009 to 2019. It shows the ratio of each item of public benefit to disposable income. Child and child support allowances are significant sources of benefits for all households. Welfare benefits also account for a large share of low incomes with equivalent total income of less than 1 million yen. For households with children, the share of child allowance and child support allowance decreases as income levels rise. This is because the child allowance and child support allowance are fixed-amount benefits. Households receiving public assistance account for at most half of all households, although public assistance makes up a large share.

5. Conclusion

This study attempts to evaluate the concept of income fluctuations in the JHPS using the panel data characteristics of individual data that consider social insurance contributions and public benefits, in addition to taxes. First, using the 2005–2019 JHPS surveys, this study recalculates the tax and social insurance burden and public benefits by applying each year's tax and social insurance systems. Public burden is tabulated by income level.

This study investigates income fluctuations and attribute assessments of low-income households and government funding adjustments. It is found that the probability of low-income households exceeding their income level one year above the average income level for the next three years would generally exceed 50% in income fluctuations. However, this study also finds that the probability decreases as income levels increase. Employment income is the primary source of income, even if the household head is self-employed or unemployed. The share of business

Table 3. Relationship between One-year Income and Three-year Averaged Income

(a) Head of Household Below 60		Averaged Equivalent Total Income from 2009 to 2011				
		Less than 1 million yen	1-1.5 million yen	1.5-2 million yen	2-2.5 million yen	Percentage Above 2009 Income Level
Equivalent Gross Income (2009)	Less than 1 million yen	38.6%	22.7%	9.1%	6.8%	61.4%
	1-1.5 million yen	8.8%	35.3%	21.8%	12.9%	55.9%
	1.5-2 million yen	3.1%	8.9%	37.8%	23.2%	50.2%
	2-2.5 million yen	1.0%	2.7%	11.1%	39.9%	45.3%

(b) Head of Household Below 60		Averaged Equivalent Total Income from 2017 to 2019				
		Less than 1 million yen	1-1.5 million yen	1.5-2 million yen	2-2.5 million yen	Percentage Above 2017 Income Level
Equivalent Gross Income (2017)	Less than 1 million yen	52.0%	12.0%	4.0%	4.0%	48.0%
	1-1.5 million yen	5.6%	44.4%	27.8%	2.8%	50.0%
	1.5-2 million yen	1.4%	4.1%	35.1%	25.7%	59.5%
	2-2.5 million yen	0.7%	2.1%	9.1%	42.7%	45.5%

(c) Head of Household Over 60		Averaged Equivalent Gross Income (2009-2011)				
		Less than 1 million yen	1-1.5 million yen	1.5-2 million yen	2-2.5 million yen	Percentage Above 2009 Income Level
Equivalent Gross Income (2009)	Less than 1 million yen	45.3%	18.9%	13.2%	3.7%	54.7%
	1-1.5 million yen	8.3%	38.7%	23.0%	9.1%	53.0%
	1.5-2 million yen	2.2%	11.4%	39.1%	21.1%	47.3%
	2-2.5 million yen	0.8%	3.2%	12.6%	46.8%	36.6%

(d) Head of Household Over 60		Averaged Equivalent Gross Income (2017-2019)				
		Less than 1 million yen	1-1.5 million yen	1.5-2 million yen	2-2.5 million yen	Percentage Above 2017 Income Level
Equivalent Gross Income (2017)	Less than 1 million yen	43.0%	21.8%	8.5%	4.2%	57.0%
	1-1.5 million yen	11.5%	37.9%	12.6%	7.5%	50.6%
	1.5-2 million yen	3.2%	14.0%	42.3%	17.6%	40.5%
	2-2.5 million yen	0.0%	2.5%	6.8%	43.1%	47.6%

Table 4. Household Income and Number of Children (Head of Household Below 60)

Number of Children in 2009	0	1	2	3	4	5 or more	Mean
less than 1 million yen	47	17	15	4	3	2	1.98
1-1.5 million yen	86	25	32	20	5	2	2.06
1.5-2 million yen	85	51	81	33	8	1	2.35
2-2.5 million yen	125	94	128	49	10	0	2.32

Number of Children in 2019	0	1	2	3	4	5 or more	Mean
Less than 1 million yen	27	5	6	1	1	1	1.71
1-1.5 million yen	27	4	8	5	1	0	1.87
1.5-2 million yen	49	7	18	10	5	0	2.04
2-2.5 million yen	64	37	45	16	5	1	2.20

income is not large. The number of children tends to increase with income, and the number of low-income families with many children has declined in recent years. Government benefits for children are essential for low-income families in raising children. Welfare benefits do not cover all living expenses.

This study uses panel data, a characteristic of the JHPS, to evaluate income fluctuations and public burden, focusing on life events and employment status. The JHPS uses panel data, with the advantage that information on life events and household attributes is available. Panel data for up to 15 years are available. However, the analysis in this study had to be limited to an overview of the data, and although a simple panel regression was conducted, a more detailed analysis is impossible. While analysis of the data by household attributes has been conducted in the past, this time focus is placed on income level, which may have limited our ability to fully evaluate the impact of these factors. In the future, it will be necessary to expand the analysis to include more sophisticated theoretical models of household changes and life events.

Notes

Table 5. Composition of Government Benefits

All Household	Total	Child Allowance	Child Support Allowance	High school Enrollment Support Allowance	Scholarship Benefits for High School Students	Public Assistance
Less than 1 million yen	12.0%	3.6%	2.3%	0.9%	0.7%	4.5%
1-1.5 million yen	3.8%	1.7%	1.0%	0.4%	0.2%	0.5%
1.5-2 million yen	2.7%	1.9%	0.3%	0.3%	0.1%	0.1%
2-2.5 million yen	2.1%	1.7%	0.2%	0.3%	0.1%	0.0%

Household with Children	Total	Child Allowance	Child support Allowance	High school Enrollment Support Allowance	Scholarship Benefits for High School Students	Public Assistance
Less than 1 million yen	37.3%	22.1%	11.0%	1.5%	1.1%	1.5%
1-1.5 million yen	15.1%	9.8%	4.2%	0.5%	0.3%	0.3%
1.5-2 million yen	9.7%	8.0%	1.0%	0.4%	0.2%	0.1%
2-2.5 million yen	7.2%	6.3%	0.4%	0.3%	0.1%	0.0%

Households receiving Public Assistance	Total	Child Allowance	Child Support Allowance	High School Enrollment Support Allowance	Scholarship Benefits for High School Students	Public Assistance
Less than 1 million yen	55.2%	1.3%	1.2%	0.6%	2.9%	49.2%
1-1.5 million yen	29.3%	0.8%	1.4%	0.1%	1.8%	25.2%
1.5-2 million yen	21.7%	2.2%	2.6%	0.1%	1.2%	15.5%
2-2.5 million yen	12.4%	1.3%	1.0%	0.0%	1.0%	9.1%

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4） To compensate for sample omissions, approximately 1,400 (2007) and then approximately 1,000 (2012) were added to the sample.

5） On “interest and dividends,” interest income is subject to separate taxation, while dividend income is subject to a choice between separate taxation and comprehensive taxation. In this analysis, however, interest and dividend income cannot be distinguished, and interest income is not considered very significant because of the current low-interest rates. Interest income is not considered to generate much income, so the choice between comprehensive and separate taxation was used.

6） The JHPS/KHPS also asks for the actual amount of some social insurance premiums. However, Ohno et al. (2015) fid that in the National Survey of Current Consumption and the Survey of Household Economy, the filled-in values are undercounted compared with the theoretical values. This theory also tended to be underfilled, but since some unfilled entries were scattered throughout the survey, we assume the theoretical value.

7） The calculations assume that no business office employs full-time workers and is obligated to provide social insurance coverage but does not join the social insurance system.

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