Tax and Social Insurance Burden on Households: Estimate Using National Survey of Family Income and Expenditure*

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Abstract

This paper uses micro household data from the National Survey of Family Income and Expenditure by the Ministry of Internal Affairs and Communications in order to assess the actual status of the tax and social insurance burden on households. To identify the structure of the burden on a lifetime basis, it is necessary to compile data by lifetime income bracket. Based on the life cycle hypothesis, consumption may be used as a proxy variable for lifetime income. In recent years, efforts have been made to estimate the lifetime burden through this approach. However, consumption on items that require very large one-time spending cannot be equalized over a life cycle. Therefore, this paper estimates the burden through a similar approach while taking account of consumption indicators that better reflect lifetime income.

As a result of this analysis, it was found that if looked at on a lifetime basis, (1) the earned income and resident and consumption taxes are progressive, (2) pension, health insurance and long-term care insurance premiums are generally proportional and (3) the earned income and resident taxes are less progressive than seen on a point-in-time basis.

Keywords: households, micro data, tax burden, social insurance burden

JEL classification: H24, H55

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I. Introduction

Today, Japan’s fiscal situation is very severe. A key factor behind the severe fiscal situation is social security spending growth accompanying the aging of population. How to secure financial resources for social security has become a key challenge. Under this situation, not a small number of people have concluded that Japan has no choice but to further increase the tax and insurance burden on households. Before considering a specific direction in this regard, it is important to figure out the actual tax and insurance burden on households. There have been a number of studies attempting to estimate the tax and insurance burden on households in Japan. Various analyses have been conducted on the matter. Remarkable relevant changes in the past years include an increase in studies using micro household data (individual questionnaire data).

In this kind of study, researchers had initially focused on estimating the burden on a point-in-time basis (for a specific year or month for surveying) due to constraints on available statistical data. Paying attention to the tax and insurance burden structure in Japan, earlier studies made the following conclusions (see Table 1):

• The direct tax (earned income and resident tax) burden is progressive [Tanaka, 2010].
• The consumption tax burden is regressive [Tanaka, 2010; Takayama and Shiraishi, 2010; Shiraishi, 2011].
• The social insurance burden is regressive [Abe, 2000; Tanaka, 2010].
• The combined tax and insurance burden, though progressive, is close to proportional [Tanaka, 2010]

In contrast, some studies have recently estimated the burden on a lifetime basis by making special calculations to determine lifetime earned income and the tax and insurance burden from the life cycle viewpoint, though on the precondition of constraints on available data (Otake and Kohara, 2005; Oshio, 2009; Shiraishi, 2011).

While households have been categorized mainly by income bracket for classifying them by economic capacity, noteworthy comments have recently been made on the categorization by income bracket itself. These comments point out that the income level for a household at a specific point in time may fail to reflect the real economic capacity of the household. For example, Yashio and Hasegawa (2009) state, “While income widely fluctuates over the life cycle including retirement from work and job changes, individuals use savings for adjusting...”

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1 Micro data analyses in the tax and social security field use (1) tax and insurance burden amounts written on survey questionnaire sheets on an unadjusted basis or (2) (theoretical) tax and insurance premium amounts calculated through the adjustment of household and income information written on survey questionnaire sheets to actual systems. Recently, micro simulation analyses to look into effects of various planned policies on households before and after their introduction are popular in tax, social security and other fields. These analyses use theoretical data. Earlier studies cited here amount to the former case (written data). This study does so as well.
Table 1. Earlier Studies on Tax and Insurance Burden

<table>
<thead>
<tr>
<th>Paper</th>
<th>Used statistical surveys</th>
<th>Years for statistical surveys</th>
<th>Major analysis target</th>
<th>Analysis results regarding tax and insurance burden</th>
</tr>
</thead>
</table>
- Health insurance premiums are more regressive than pension insurance premiums.                                    |
| Otake and Kohara      | National Survey of Family Income and Expenditure | 1999                | Consumption tax                                                                        | - The consumption tax burden is progressive on a lifetime income basis.                                            |
Social insurance premiums (pension, health, long-term care, employment and other insurances)  
Social security benefits | - The direct tax burden is progressive.  
- The social insurance burden is regressive.                                                                 |
Social insurance premiums (pension, health, long-term care, employment and other insurances)  
Social security benefits | - On a lifetime income basis, the direct tax burden is progressive.  
- On a lifetime income basis, the social insurance burden is regressive.                                   |
| Tanaka (2010)         | Comprehensive Survey of Living Conditions  
Social insurance premiums (pension, health, nursing care, employment and other insurances)  
Social security benefits | - The direct tax burden is progressive.  
- The consumption tax burden is regressive.  
- The social insurance burden is regressive.  
- The combined tax and insurance burden, though progressive, is close to proportional.                  |
| Takayama and Shiraiishi | National Survey of Family Income and Expenditure | 2004                | Consumption tax                                                                        | - The consumption tax burden is regressive.                                                                          |
| Shiraiishi (2011)     | National Survey of Family Income and Expenditure | 2004                | Consumption tax                                                                        | - On a lifetime income basis, the consumption tax burden is regressive.                                             |

<Analyses on aggregated data regarding indirect tax burden>

<table>
<thead>
<tr>
<th>Paper</th>
<th>Used statistical surveys</th>
<th>Years for estimation</th>
<th>Major analysis target</th>
<th>Analysis results regarding tax and insurance burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uemura (2006)</td>
<td>Family Income and Expenditure Survey, etc.</td>
<td>FY1950-2003</td>
<td>Indirect taxes (consumption tax, individual indirect taxes)</td>
<td>- The indirect tax burden is regressive.</td>
</tr>
<tr>
<td>Hashimoto (2010)</td>
<td>National Survey of Family Income and Expenditure, etc.</td>
<td>2004</td>
<td>Consumption tax</td>
<td>- On a lifetime income basis, the consumption tax burden is regressive.</td>
</tr>
</tbody>
</table>
| Saito and Uemura (2011)| Family Income and Expenditure Survey, etc. | FY2001-2007            | Indirect tax (consumption tax, individual indirect taxes)                          | - The consumption tax burden is regressive.  
- The indirect tax burden including individual indirect taxes is regressive.                                      |

Note. Fukuwa (2006) and Oshio (2009) include fixed asset, automobile and minivehicle taxes as well as income and resident taxes into direct taxes.
income fluctuations while predicting permanent income sizes and make their consumption more stable (Yashio and Hasegawa, 2009, p. 27).” This means that permanent household income is reflected in consumption\(^2\). Unayama (2011) states: “Based on the life cycle hypothesis for consumption, consumption reflects expected lifetime household income and indicates the relevant household’s economic welfare more accurately than income or assets at a point of time. In this sense, the categorization by consumption level is more suitable for classifying households by economic affluence (Unayama, 2011, p. 14).” In other words, consumption is required to be used as a proxy variable for permanent household income (expected lifetime income) for an analysis.

Based on these points, this study uses micro household data from the National Survey of Family Income and Expenditure by the Ministry of Internal Affairs and Communications for estimating the tax and insurance burden on households. To identify the structure of the burden over a lifetime basis, it is necessary to compile data by lifetime income bracket. Based on the life cycle hypothesis, consumption may be used as a proxy variable for lifetime income. This study takes advantage of this point for estimating the lifetime burden. This approach is common to Otake and Kohara (2005). But there are two major differences. First, this study expands analysis targets to include various taxes and insurances (covering earned income, resident and consumption taxes, and public pension, health, long-term care and other social insurances), although Otake and Kohara (2005) focus on the consumption tax. Second, this study considers that consumption on some specific items is too large to be equalized over a life cycle. Based on the consideration, this study analyzes consumption indicators that better reflect lifetime income. Specifically, this study prepares the tax and insurance burden by lifetime income bracket while determining items for which consumption can be equalized the most between age brackets.

The following discusses the organization of this paper. Section 2 confirms the method and characteristics of the National Survey of Family Income and Expenditure before explaining data and the estimation method used for this paper. Next, Section 3 checks the tax and insurance burden estimated on a point-in-time basis. Based on the check, Section 4 considers consumption used as a proxy variable for lifetime income and analyzes the tax and insurance burden estimated on a lifetime basis. Then, attention is paid to comparison between the point-in-time burden and the lifetime burden. Lastly, Section 5 gives conclusions of this paper and future challenges.

\(^2\) It is important whether the permanent income or life cycle hypothesis for household consumption can be established as a precondition of this kind of comment. Citing a U.S. study, Abe (2011) states: “Consumption responds to long-term income fluctuations… This result is in line with the permanent income hypothesis proposed by Friedman (1957) which states that consumption responds to permanent income changes (Abe, 2011, p. 72).” The study also makes the same point while demonstrating that household consumption in Japan also responds to long-term income fluctuations (Abe, 2011, p. 70).
II. Data and Estimation Method

Here, the method and characteristics of the National Survey of Family Income and Expenditure are confirmed before the data and estimation method used for this paper are explained.

II-1. Method and characteristics of National Survey of Family Income and Expenditure

The National Survey of Family Income and Expenditure is aimed at comprehensively checking household balance sheets and assets including savings, debts, durable consumer goods, housing and land holdings involving national livelihood to specify consumption, income and asset levels, structure and distribution. The survey takes place every five years, covering some 57,000 households (including 4,400 single-person households) in Japan. Compared with the monthly Family Income and Expenditure Survey by the Ministry of Internal Affairs and Communications, the National Survey, though taking place less frequent, can take advantage of its larger scale to collect more details.

In fixing sample households, the ministry picks up sample municipalities and unit areas for the survey and selects sample households within each unit area.

Survey questionnaires include the household questionnaire, the annual income and savings questionnaire, the consumer durables questionnaire and the household accounts questionnaire that cover detailed matters for investigation. In the household accounts questionnaire, wage-earning and jobless households specify income, spending, and the tax and insurance burden during a period subject to the survey. Non-wage-earning households (excluding jobless households) including self-employed households specify only spending during the survey period in the questionnaire.

Survey dates or periods differ from questionnaire to questionnaire. In the household questionnaire, multiple-person households specify details as of September 1 and single-person households as of October 1. In the annual income and savings questionnaire, households specify annual income between December of the previous year and November of the survey year and outstanding savings and loans at the end of November of the survey year. In the consumer durables questionnaire, households provide details for October of the survey year. In the household accounts questionnaire, multiple-person households specify details for three months from September of the survey year and single-person households those for two months from October of the survey year. In this way, the National Survey of Family Income and Expenditure covers only two or three specific months, indicating that annual household accounts data including consumption expenditure, and the tax and insurance burden cannot be provided and that the survey could contain seasonality problems.

Questionnaires are filled out by sample households and collected by surveyors (see Table 2).
Given the above, the characteristics of tax and insurance burden data in the National Survey of Family Income and Expenditure are confirmed here as follows. As noted above, the household accounts questionnaire for the survey is designed to cover details including the tax and insurance burden for only two or three specific months. In paying tax, wage-earning households have their tax and insurance premium payments withheld from wages and bonuses. As the National Survey of Family Income and Expenditure excludes bonus payment dates, survey data could be interpreted as understating the tax and insurance burden. As for the earned income tax, particularly, tax rates are relatively lower for monthly wages and higher for bonuses (basically due to the characteristics of the withholding tax table). The difference between tax rates for wages and bonuses indicates that survey data could understate
the earned income tax burden. Attention must be paid to this point in the analysis for this paper.

II-2. Data used for this paper and calculation method

This study uses questionnaire data in the National Survey of Family Income and Expenditure in 2009. In the selection of sample households for this analysis, non-wage-earning households (excluding jobless households) that are not required to specify the tax and insurance burden were excluded. In this way, this paper focuses on wage-earning and jobless households. Also excluded were households that left income, consumption, and tax and insurance burden columns, as explained later, blank or attached the “unknown” code or the top code (indicating extra high income) to these columns. In addition, households that changed their organization during the survey periods were excluded. As a result, 44,176 sample households were left subject to the analysis.

As earned income, this study uses annual income data specified in the annual income and savings questionnaire for the National Survey of Family Income and Expenditure. Hereinafter, this is called “gross income\(^3\).”

As for consumption, this study uses the total for the 10 major items specified in the household accounts questionnaire and calls this “the total consumption expenditure” hereinafter in this paper. The 10 items are (1) food, (2) dwelling, (3) light, fuel and water, (4) furniture and household goods, (5) clothing and footwear, (6) healthcare, (7) transportation and communications, (8) education, (9) culture and entertainment, and (10) others.

The following taxes and insurance premiums are subject to this analysis:

(1) Earned income tax
(2) Individual resident tax
(3) Consumption tax
(4) Public pension insurance premium
(5) Health insurance premium
(6) Long-term care insurance premium
(7) Other social insurance premiums (including employment insurance premium)

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\(^3\) Annual income details cover (1) annual income from work, (2) agriculture, forestry and fisheries income, (3) business operation income other than agriculture, forestry and fisheries income, (4) annual side job and other income, (5) annual house and land rent income, (4) public and government pension, (7) corporate and private pension, (8) interest and dividends, (9) money provision from relatives, etc., and (10) other annual income.
The consumption tax is calculated by multiplying consumption expenditure for the consumption items other than tax-exempt ones by 0.05/1.05. The tax-exempt items are (1) house rent, (2) land rent, (3) fire and earthquake insurance premiums, (4) medicine, (5) medical care fees, (6) dental care fees, (7) osteopathy and acupuncture fees, (8) auto insurance premiums, (9) tuition, etc., (10) textbooks, study books and other educational materials, (11) overseas package tour fees, (12) childcare center fees and (13) long-term care service fees.

The National Survey of Family Income and Expenditure provides consumption, tax and insurance data only for two or three months. For each household, therefore, a monthly average for two or three months is calculated and multiplied by 12 into an annual amount. Furthermore, the annual amount is calculated into the equivalent household basis through Equation (1). Income as annual data for each household is used for the calculation into the equivalent household basis in the same way.

\[
\text{Equivalent household income (consumption, tax and insurance fees, etc.)} = \frac{\text{Household income (consumption, tax and insurance fees)}}{\sqrt{\text{Number of household members}}} \tag{1}
\]

Then, the ratio of tax and insurance premium payments to gross income is estimated as the tax and insurance burden rate.

### III. Tax and insurance burden on households on a point-in-time basis

This section analyzes the structure of the tax and insurance burden on a point-in-time basis. Here, the following brackets are used for the analysis:

1. **Income brackets:**
   - Households are broken down into 10 income brackets. (The first bracket represents the lowest income range and the 10th the highest range.)

2. **Age brackets:**
   - Householders are broken down by householder age into six brackets -- below 30, 30-39, 40-49, 50-59, 60-69, 70 or older.

3. **Occupational categories**
   - Households are broken down based on occupational conditions of householders into two categories -- wage-earning households and jobless households.

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4 Under the present consumption tax system, house rents are exempt from tax, while housing purchases are subject to tax. The household accounts questionnaire for the National Survey of Family Income and Expenditure excludes expenses for house and land purchases, house construction, house reforming, housing loans, etc. from the dwelling expenditure. Therefore, the consumption tax burden accompanying house purchases, though not light, fails to be reflected in the consumption tax burden for our analysis. Accordingly, the consumption tax burden could be understated for brackets in which a relatively large number of households purchase houses.
III-1. By income bracket

First, as seen from tax and insurance premium amounts, the combined tax and insurance burden amount rises as income increases. Behind this tendency is the fact that “earned income tax,” “resident tax” and “pension insurance premium” levels are greater for higher income brackets (see Figure 1 (1)).

Next, as seen from tax and insurance burden rates, the “earned income tax,” “resident tax” and “pension insurance” burden rates are higher for higher income brackets, indicating a progressive structure. But the pension insurance burden rate for the 10th income bracket is lower than for the ninth bracket. The “consumption tax,” “health insurance” and “long-term care insurance” burden rates are lower for higher income brackets, indicating a regressive structure (see Figure 1 (2)). When estimation results by income bracket are analyzed, attention should be paid to the point that the age mix differs from income bracket to income bracket. Usually, households are broken down by gross household income into income brackets. But income levels are influenced by the life cycle. Therefore, households in a specific age bracket may be dominant in a specific income bracket. For example, “consumption tax” and “health insurance” burden rates are higher for lower income brackets, reflecting the fact that elderly households are more dominant for lower income brackets. As explained later, this point can be confirmed based on estimation results by age bracket. Estimation results also indicate that the “pension insurance” burden structure is progressive. Behind this indication may also be a similar point.

Lastly, the combined tax and insurance burden rate, though being almost the same for the second to fourth income brackets, is almost progressive from the second bracket. But the rate

Figure 1. Tax and insurance burden seen from a point-in-time basis: by income bracket

(1) Amount

Unit: 10,000 yen
for the first bracket is higher than for the second bracket, indicating a regressive structure at the lower income brackets. As noted above, the combined tax and insurance burden amount rises as income increases. The tendency remains the same between the first and second income brackets. But the income amount fails to increase faster than the burden rate, leading the burden rate for the first income bracket to be higher than for the second bracket (see Figure 1 (3)).

III-2. By age bracket

First, as seen from tax and insurance premium amounts, the combined tax and insurance
burden amount increases as the age rises for young and middle-aged (working) households below the age of 60. The amount peaks in the 50-59 age bracket. Behind this tendency is the fact that “earned income tax,” “resident tax” and “pension insurance premium” levels are greater for higher income brackets. In contrast, tax and insurance burden levels for elderly (retired) households in the 60 or older age bracket are relatively lower (see Figure 2 (1)).

Next, as seen from tax and insurance burden rates, the “earned income tax,” “resident tax” and “pension insurance” burden rates are relatively higher for young and middle-aged (working) households below the age of 60 and relatively lower for elderly (retired) households in the 60 or older age bracket. Particularly, the “income tax” and “resident tax” burden rates are higher for older age bracket households among working households, peaking in the 50-59 bracket. The pension insurance burden rate is the highest for working households. In contrast, the “consumption tax,” “health insurance” and “long-term care insurance” burden rates are relatively lower for young and middle-aged (working) households below the age of 60 and relatively higher for elderly (retired) households in the 60 or older age bracket. The “consumption tax” and “health insurance” burden rates are the highest for retired households (see Figure 2 (2)).

Lastly, the combined tax and insurance burden rate is not so different among working households. This may be because the combined tax and insurance burden amount as well as

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5 In this paper, for the sake of convenience, households headed by adults “below the age of 45” are described as young households, those headed by adults “between 45 and 64” as middle-age households, and those headed by adults “at the age of 65 or older” as elderly households. Young and middle-age households below the age of 65 are described as working households and those at the age of 65 or more as retired households.
the income amount for working households increases as the age rises. For retired households, the combined tax and insurance burden rate declines as the age rises (see Figure 2 (3)).
III-3. By occupational category

First, as seen from tax and insurance premium amounts, the tax and insurance burden on wage-earning households is greater than on jobless households. This reflects the fact that “earned income tax,” “resident tax” and “pension insurance premium” amounts are greater for wage-earning households. In contrast, there is little “earned income tax” or “pension insurance” burden on jobless households (see Figure 3 (1))\(^6\).

Next, as seen from tax and insurance burden rates, the “earned income tax,” “resident tax” and “pension insurance” burden rates are relatively greater for wage-earning households and smaller for jobless households. For wage-earning households, the pension insurance burden rate is the highest. In contrast, the “consumption tax,” “health insurance” and “long-term care insurance” burden rates are relatively lower for wage-earning households and relatively higher for jobless households. For jobless households, the “consumption tax” and “health insurance” burden rates are the highest (Figure 3 (2)).

Lastly, the combined tax and insurance burden rate is higher for wage-earning households than for jobless households. As is the case with tax and insurance premium amounts, there is little “earned income tax” or “pension insurance” burden on jobless households (Figure 3 (3)).

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\(^6\) Estimation results for comparison between households headed by adults aged below 65 and those headed by older adults are similar to the results for comparison between wage-earning and jobless households.
IV. Tax and insurance burden on households on a lifetime basis

This section analyzes the structure of the tax and insurance burden on a lifetime basis. To identify the structure of the burden over a lifetime basis, it is necessary to compile data by lifetime income bracket. Based on the life cycle hypothesis, consumption may be used as a proxy variable for lifetime income. In recent years, efforts have been made to estimate the lifetime burden through this approach. However, consumption on items that require very large one-time spending cannot be equalized over a life cycle. Therefore, this paper estimates the burden through a similar approach while taking account of consumption indicators that better reflect lifetime income.

(2) Rate of burden: by tax and insurance category

(3) Rate of burden: combined tax and insurance burden
IV-1. Considering consumption used as proxy indicator for lifetime income

It is not easy to figure out lifetime income for each household for preparing a household breakdown by lifetime income because actually available statistical data are for a specific point of time or surveying. Based on the life cycle hypothesis, consumption (at a point of time) reflects lifetime income. This is because, unless lifetime income changes, consumption may remain unchanged and be equalized between age brackets. What consumption indicator should be used as a proxy indicator for lifetime income? The answer to the question is not simple. The total consumption expenditure (covering the 10 major items) may not be used as it is. This is because consumption on items that require very large one-time spending depending on household attributes cannot be equalized over a life cycle. For example, households with children spend much on education and elderly households on healthcare. As a matter of course, education and healthcare spending sizes depend on the economic capacities of households and could reflect lifetime income. Education spending may expand temporarily when school or academy admission and tuitions fees are paid. Healthcare spending may increase temporarily when household members undergo healthcare. Education and healthcare spending timings are difficult to change. This means that it is difficult to equalize consumption between points of time (age brackets). In this paper, therefore, considerations are given to desirable consumption indicators as a proxy for lifetime income. Specifically, consumption items for which consumption can be equalized the most between age brackets are determined. The following compares and analyzes three consumption expenditure cases:

Case 1: Total consumption expenditure excluding education expenses  
Case 2: Total consumption expenditure excluding education and healthcare expenses  
Case 3: Total consumption expenditure excluding education, healthcare and dwelling expenses  

First, a household breakdown by income is prepared for each age bracket before section-by-section consumption amounts (averages) are calculated. Specifically, households are broken down into five income brackets -- first and second, third and fourth, fifth and sixth, seventh and eighth, and ninth and 10th brackets -- based on the 10 income brackets. Then, consumption is calculated for each section (a total of 30 sections = six age brackets * five income brackets). Such classification and calculation are implemented for the three cases. In Case 1, for example, consumption is larger for higher income brackets in each bracket. This trend is established in Cases 2 and 3 as well (see Figures 4 (1)-(3)).

Here, a case where the consumption variation is the smallest is determined to select the most desirable consumption indicator as a proxy for lifetime income. For each of the three cases, a consumption variation coefficient is determined in each income bracket before the average between income brackets is computed. As a result, the variation coefficient (average) comes to 10.427 in Case 1, 9.825 in Case 2 and 11.891 in Case 3 (see Table 3). Based on these results, the Case 2 consumption (total consumption expenditure minus education and
healthcare expenses) is used as a proxy indicator for lifetime income.

Figure 4. Consumption by income bracket

(1) Case 1
Unit: 10,000 yen

(2) Case 2
Unit: 10,000 yen
(3) Case 3

Unit: 10,000 yen

![Graph showing lifetime tax and insurance burden by income bracket]

Table 3. Statistical data for each case

<table>
<thead>
<tr>
<th>Case</th>
<th>Average</th>
<th>Standard deviation</th>
<th>Variation coefficient</th>
<th>Variation coefficient (average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st-2nd brackets</td>
<td>134.123</td>
<td>12.348</td>
<td>9.207</td>
<td>10.427</td>
</tr>
<tr>
<td>3rd-4th brackets</td>
<td>165.639</td>
<td>20.006</td>
<td>12.078</td>
<td>10.427</td>
</tr>
<tr>
<td>5th-6th brackets</td>
<td>191.037</td>
<td>23.981</td>
<td>12.553</td>
<td>10.427</td>
</tr>
<tr>
<td>7th-8th brackets</td>
<td>219.215</td>
<td>24.562</td>
<td>11.205</td>
<td>10.427</td>
</tr>
<tr>
<td>9th-10th brackets</td>
<td>277.905</td>
<td>19.715</td>
<td>7.094</td>
<td>10.427</td>
</tr>
</tbody>
</table>

IV-2. Lifetime tax and insurance burden

This section analyzes the lifetime tax and insurance burden by lifetime income bracket. In the estimation of tax and insurance burden rates, a common breakdown by lifetime income bracket (consumption bracket) is prepared for all age brackets before households are classified into lifetime income brackets. A cross table covering breakdowns by age bracket and by lifetime income bracket is used for computing income (gross income) and the tax and insurance burden for each section. Next, income amounts for all age brackets are accumulated...
into lifetime income for each lifetime income bracket. In a similar way, tax and insurance burden amounts for all age brackets are accumulated into the lifetime burden amount for each lifetime income bracket. Lastly, the lifetime burden rate is computed as the ratio of the lifetime burden amount to the lifetime income7.

Among tax and insurance burden rates, the “earned income tax,” “resident tax” and “consumption tax” burden rates are higher for higher lifetime income brackets, indicating a roughly progressive structure. The progressivity of the consumption tax burden on a lifetime basis has been indicated by Otake and Kohara (2005) and the Cabinet Office (2011) and reaffirmed by this paper8. The “pension insurance” burden rate is slightly lower for lower lifetime income brackets but roughly the same for all brackets. The “health insurance” and “long-term care insurance” burden rates are also roughly the same for all brackets, indicating a proportional structure (see Figure 5 (1)). When the lifetime social insurance burden is figured out, it is desirable to give considerations to benefits as well. Attention must be paid to this point as this paper focuses on the insurance burden alone. The total tax (earned income, resident and consumption tax) burden rate is higher for higher lifetime income brackets, indicating a progressive structure (Figure 5 (2)).

Lastly, estimation results on a lifetime basis are compared with those on a point-in-time basis. The “earned income tax” and “resident tax” are progressive both on lifetime and point-in-time bases. But both taxes on a lifetime basis are less progressive than on a point-in-time basis (see Figure 6 (1)). As mentioned above, the “earned income tax,” “resident tax” and “consumption tax” each have been confirmed as roughly progressive on a lifetime basis. The total tax burden (combining the earned income, resident and consumption taxes) is also progressive. The total on a lifetime basis is more progressive than on a point-in-time basis. This is because the “consumption tax” burden structure is regressive on a point-in-time basis and progressive on a lifetime basis. Of the social insurance burden components, the “pension insurance premium” on a lifetime basis is less progressive than on a point-in-time basis. For

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7 The estimation is based on an assumption that trends of income and the tax and insurance burden at a survey point will remain unchanged over a lifetime. When income amounts in all age brackets are accumulated, future levels must be discounted. This study used the three discount rates of 0%, 2% and 4%. Estimation results were almost the same for all these rates. Therefore, this paper introduces the 0% case alone.

8 Savings are cited as a reason for the regressivity of the consumption tax burden on a point-in-time basis. The consumption tax burden rate (the ratio of the consumption tax burden to income) is higher for lower income brackets because the average consumption propensity (the ratio of consumption to income) is higher or the average savings propensity (the ratio of savings to income) is lower. Conversely, the consumption tax burden rate is lower for higher income brackets because the average savings propensity in these brackets is higher. In a similar way, inheritance is expected to have a great influence on the consumption tax burden structure on a lifetime basis. When the inheritance rate (the ratio of inheritance to lifetime income) is higher, the consumption tax burden rate (the ratio of the consumption tax burden to lifetime income) is lower. When the inheritance rate is lower, conversely, the consumption tax burden rate is higher. As pointed out by the Cabinet Office (2011), Horioka (2009) found that inheritance is a lesser factor for higher-income people. This finding is closely related to the progressivity of the consumption tax burden on a lifetime basis.
Figure 5. Tax and insurance burden on a lifetime basis

(1) Rate of burden: by tax and insurance category

(2) Rate of burden: combined tax burden

(3) Rate of burden: combined tax and insurance burden
lifetime income brackets excluding lower ones, the premium is roughly proportional. The “health insurance” and “long-term care insurance” premiums are regressive on a point-in-time basis and roughly proportional on a lifetime basis. This means that these premiums on a lifetime basis are less regressive than on a point-in-time basis (see Figure 6 (2)).

V. Conclusion

This paper used micro household data from the National Survey of Family Income and Expenditure by the Ministry of Internal Affairs and Communications for analyzing the tax and insurance burden on households while comparing burden estimates on point-in-time and lifetime bases. To identify the structure of the burden on a lifetime basis, it is necessary to
compile data by lifetime income bracket. Based on the life cycle hypothesis, consumption may be used as a proxy variable for lifetime income. In recent years, efforts have been made to estimate the lifetime burden through this approach. However, consumption on items that require very large one-time spending cannot be equalized over a life cycle. Therefore, this paper estimated the burden through a similar approach while taking account of consumption indicators that better reflect lifetime income.

As a result of the analysis, it was found that if seen on a lifetime basis, (1) the earned income, resident and consumption taxes are progressive and (2) pension, health insurance and long-term care insurance premiums are generally proportional. When the social insurance burden on a lifetime basis is figured out, it is desirable to give considerations to insurance benefits as well. Attention must be paid to the point that this paper focused on the burden alone. (3) Another finding was that the earned income and resident taxes on a lifetime basis are less progressive than seen on a point-in-time basis.

As the National Survey of Family Income and Expenditure used in this paper is a large-scale survey implemented to figure out income, consumption, assets and other household data, its questionnaire data are very useful. Since the survey has some statistical characteristics, however, attention must be paid to some points when this paper’s findings are considered. First, the National Survey of Family Income and Expenditure asks wage-earning and jobless households alone to specify tax and insurance payments in the household accounts questionnaire. Therefore, sample households subject to this paper’s analysis are limited to wage-earning and jobless households, excluding non-wage-earning households (other than jobless households) such as self-employed households. Second, the household accounts questionnaire for the National Survey of Family Income and Expenditure is designed to cover the tax and insurance burden (a non-consumption item) as well as consumption items for only two or three specific months. Therefore, household accounts questionnaire data could have been understated due to seasonality problems. Solutions to the problems with the National Survey of Family Income and Expenditure may include a switch to the Comprehensive Survey of Living Conditions by the Ministry of Health, Labour and Welfare, which covers self-employed households and annual tax and insurance premium payments. But attention must be paid to the point that the Comprehensive Survey of Living Conditions cannot provide sufficient consumption data as found in the National Survey of Family Income and Expenditure.

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