important cause of widened income differentials in the 1980s and after was the aging of population, other reasons including increasing two-income families with high income levels, increasing part-timers and larger gaps in wages between these part-timers and full-time workers.[2] There were many studies on income difference in Japan. Many of these studies mention population aging and aging of the household structure as the background causes of increasing income difference in recent years (e.g., Ohtake (1994), Ohtake and Saito (1998), Takayama and Arita (1996), Funaoka (2001), Kojima (2001)). Also, Shirahase (2002) used the data of the Luxembourg Income Study to make international comparison, and noted that there are aging population and other socioeconomic factors as the background of widening income difference.

What can commonly be observed in these studies is that the researchers recognized that income difference has been increased. The expansion of income difference means that the increase of the persons living in low income too. The percentage of such persons has been rising in present Japan. "Poverty" has become the one of the main social problems and one of the most important policy fields now. In addition to Japan, income difference has become large in Korea and Taiwan. We should pay attention to this for policy making in long term care in order not to make the cost burden too heavy for the persons. In this paper, I would like to analyze the trend of the income difference in Japan from the mid-1980's to last-2000s using data with international compatibility and comparison with Korea and Taiwan.

2. The data, definition of income and other terms
(1) The data

I have used the micro data of the MHLW's "Comprehensive Survey of Living Conditions (income questionnaires)" [3] in 1986, 1995, 2001, 2004, 2007 and 2010. I

---

[2] See the Editorial Department of the *Chuo Koron*, ed. (2001).

[3] The "Comprehensive Survey of Living Conditions" aims at investigating the basic matters of people's life, such as health, medical service, welfare, pension and income and at obtaining fundamental data for the planning and implementation of health, labor and welfare policies. Questionnaires on household and income are conducted every year. In every three years, questionnaires on savings and health and long-term care are added to these two questionnaires as large scale survey. The data in this paper were large sample surveys. In the 2010 survey, the "household questionnaires" covered about 289,000 households, and the "income questionnaires," about 36,000 households.

have made tables by the methods mentioned later. Because the incomes of this survey have been that of the previous year of the survey, the income data I have used for analysis are those for 1985, 1994, 2000, 2003, 2006 and 2009. In other studies that the author has participated in supported by the Health Science Research Grants from the Ministry of Health and Welfare (MHW; former organization of the MHLW) (Study Project for Promotion of Policy Sciences) , the data used were tabulated by the same method basically. So, I also have referred to these results.

(2) Definitions of income and income difference indicators

  In this paper, I have made tables about income levels and income distribution based on the standard used by the OECD's "Income Distribution Project," "Luxembourg Income Study" and other studies.

  First of all, the units of our analysis are individual persons and I have decided to use disposable income per capita (household member). This is because all payments from a family budget, including medical expenses, are made from disposable income, the amount of income after the taxes and social insurance premiums have been deducted from it. Another reason is that if I adopt personal income for our analysis, I will fail to notice the effect of income transfers between household members in it. When calculating disposable income per capita, I have used the equivalence scale [4] to take account of differences in the size of households to which individuals belong. Adopting 0.5 as the equivalent value of elasticity, I calculated the amount of disposable income using the following equation:

$$W = D/S^{0.5}$$

(W: disposable income per capita; D: disposable income of the household; S: number of household members; 0.5: equivalent value of elasticity)

  I have used five types of source of income and payment to government that compose disposable income: (1) employment income; (2) business income; (3) property income (interest and dividends, house and land rents (these income items were in 1995

---

[4] For further details, see Atkinson (1995).

and 2001 survey, these items were merged into property income from 2004 survey), other private transfers); (4) social security benefits (public pensions, including public employees' pensions, unemployment benefits (from 2004 survey), child allowance(2010 survey only) and other social security benefits); and (5) direct taxes (income tax, inhabitant tax, property tax) and social insurance premiums. For (1) employment income, we sometimes subdivided it into the employment income of the head of the household, the head's spouse, and other household members when we needed for analysis.

Disposable income is the sum of (1) to (4) less (5). To examine the effect of income redistribution by direct taxes and social security benefits, I used the concept of "market income" defined as the sum of (1) to (3), in addition to that of disposable income. Composed of the earnings resulting from the person's employment and from the management of his or her property and private transfers, such as allowances and corporate pension benefits, market income is the income that excludes the effect of direct taxes and social security benefits.

Then, I calculated three types of indicators of income difference: the Gini coefficient, MLD (mean log deviation) and SCV (squared coefficient of variation). While the Gini coefficient is the best known indicator of income difference, MLD can conduct decomposition paying attention to population structure, thus allowing the calculation of income differentials according to the contribution of each age group. [5] SCV can carry out decomposition according to income source and can examine the "effect of social security benefits on income difference of the elderly." The equations for calculating these indicators are as follows:

(a) Gini coefficient:

$$Gini = \left(\frac{2}{\mu . n^2} \cdot \sum_{k=1}^{n} k . W_k \right) - \frac{n+1}{n}$$

---

[5] This indicator can also conduct decomposition of changes in income differentials using the decomposition method developed by the U.S. Department of Commerce (1993). Analyses using this method include those made by Kojima (2001) and Kojima (2003).

When I calculated Gini coefficient, I also estimated standard error of it in 2009. I have used bootstrap method[6].

(b) MLD:

$$MLD = \frac{\sum_{k=1}^{n} ln\left(\frac{\mu}{W_k^*}\right)}{n}$$

(c) SCV:

$$SCV = \frac{var\left(W_k\right)}{\mu^2} = \frac{\frac{1}{n}\sum_{k=1}^{n}\left(W_k - \mu\right)^2}{\mu^2}$$

Note: Wk is income per person of Individual k, n is the number of household members, and μ is the arithmetic average of income per capita. For Wk* of MLD, the income of those whose disposable income is less than 1% of the average disposable income is regarded as 1% of the average.

Besides these income difference indicators, I calculated the poverty rate, too. "Poverty rate" means the percentage of those who earn income below the given income level (poverty line) to the population. When using the data poverty pate in this paper, there is a point to pay attention with care. If we were in the households with the income under the poverty line that is the criteria of poverty rate in this paper, we were NOT always deprived materially in the needs of daily life. In other words, we can NOT say that persons under poverty do not have enough foods, television, place to live and other goods and services. For the analysis of such deprivations, we need other data like consumption survey in addition to the data in this paper. While the poverty line is defined as 50% of the median of disposable income in most cases, there are some cases where 30%, 40% or 60% of the median is used. In this paper, I used 50% of the

---

[6] For Gini coefficient standard error estimation, I have used Stata command "ineqerr" with 500 replications.

median of the equivalent disposable income in our analysis.[7]

(3) Data cleaning etc.

Some samples with unknown income items data were excluded and treated for our purpose of the analysis along the standard of OECD. I excluded the samples whose disposable income was unknown, and I treated the samples with negative disposable income as those having no income.

In addition, I excluded the households having any member whose age was unknown and the single-member households whose head was younger than 18 years in the analysis of the situation by the household structure or age class (included in the analysis of the situation in all Japan).[8]

I also made adjusted with price index for time-series analyses. More specifically, the incomes in 1985, 1994, 2000, 2003, 2006 and 2009 were converted into that at 1985 prices using CPI (consumers' price indexes). The rates of deflation were 13% in 1994, 14% in 2000, 11% in 2003, 2006 and 2009 respectively. It is because the use of the 1985 prices in CPI that it has been used in previous papers that I have written and the standard of OECD for income distribution analysis.

3. Basic Analysis

First of all, I would like to look at population and household structures. The percentage of those aged 65 years and over was 10.3% in 1985 and 28.6% in 2009. Population aging has been in progress. The average household size (persons) was 3.42 in 1985 and 2.51 in 2009, which indicate that the household size has become smaller consistently. The percentage of those belonging to the elderly households (household headed by 65 years and over) also increased from 13.2% in 1985 to 35.5% in 2009. We can see that aging in household structure has been in progress too.

Next, the average of equivalent disposable income was ¥2,423 thousand in 1985, ¥2,918 thousand in 1994 and ¥2,584 thousand in 2009; due to social and

---

[7] 60% of the median as poverty line is used in the EU countries. For the definition of poverty rate and the measurement of the poverty rate of the elderly, see Yamada (2003).

[8] For the methods in data cleaning etc, see Kaneko, Kojima and Yamada (2004).

economical changes in recent years, the income in 2009 was smaller than that in 1994. By age group, the average income of those from 18 to 64 years old was ¥2,785 thousand in 2009, which was higher than that of all age groups by about 8%. That of those 65 years and over were ¥2,265 thousand in 2009, which was about 88% of the income of all age groups. These statistics show that the average income level of the elderly in not too low comparing to that of all age groups and with that of working generations.

[Table 1 Basic Result of the data]

4. Analysis of situation of income difference and effect of income redistribution policy

(1) Situation of income difference

(a) Income Difference based on disposable income

The situation of income difference in Japan as shown by the Gini coefficient on disposable income is 0.336 in 2009. It was 0.301 in 1985, 0.337 in 2000, and 0.329 in 2006 respectively. So, we can say that it was on an upward trend from 1980s to 2000 and a stable trend since 2000. The other two indicators show similar tendencies, too.

By age group, the Gini in 2009 was 0.332 for those between 18 to 64 and 0.341 for those aged 65 and over. These data suggest that younger generations have a smaller income difference and the elderly have a greater difference as compared with all age groups. The similar trends were observed from the data in other years, and it is noteworthy that the elderly had higher Gini coefficient than all age groups: the Gini of the elderly was 0.373 in 1985 and 0.348 in 2006. The Gini coefficients of all age groups and those from 18 to 64 have stable trends since 2000, but with some upward trend from 2003 to 2009. That of those aged 65 and over has tendency to decrease. These suggest that the elderly have greater income difference than all age groups and younger generations but their income difference have some downward tendency[9].

[Figure 1 Gini Coefficient in Japan by type of income and age]

---

[9] Standard error of Gini coefficient in 2009 is 0.17% for all age, 0.2% for 18 − 64 years old, and 0.4% for 65 years old and over.

[Table 2 MLD & SCV in terms of disposable income in Japan]

(b) Income difference based on market income

The Gini coefficient based on market income, which excludes the effect of income transfers by direct taxes and social security benefits, are higher than those based on disposable income. The index of all age groups was 0.488 in 2009, higher than that on disposable income by about 0.15. It was 0.342 in 1985, 0.403 in 1994, 0.462 in 2006, which are higher than that in the respective corresponding years' Gini coefficient based on disposable income.

Similar tendencies can be observed in the Gini by age group, and those aged 65 and over have especially higher Gini coefficient on market income. In 2009, it was 0.409 for those between 18 to 64 and 0.694 for those aged 65 or over, the latter being about 1.7 times the former. It was 0.335 and 0.510 in 1985, and 0.392 and 0.684 in 2006 respectively. As these data indicate, income difference on market income is wider than those on disposable income, and this is especially noticeable among the elderly. Furthermore, it has an upward trend from 1985 to 2003 and a stable trend from 2003 to 2009. The factors behind this fact will include the labor participation rate and the household structure among elderly people.

First, there is a difference in working income among the elderly between working and non-working, because originally the labor force participation rate of the elderly in Japan is higher than other OECD countries[10]. But, those who are aged 75 and more has been increasing in number and percentage of the elderly. It has led to the decrease of the working elderly recently to widen the working income difference among the elderly more.

Second, many of the elderly in Japan belong to three-generation households[11]. Therefore there was the income transfer within household from working child to the elderly with small income source or without income. So, the elderly in such household

---

[10] The labor participation among the elderly in Japan was 28.4% for male and 13.2% for female in 2011 (based on the "Labor Force Survey" by the Statistics Bureau of the Ministry of Internal Affairs and Communications).

[11] The ratio of the elderly who lived together with their children was 69.0% in 1980. Although the ratio has tended to decrease thereafter, it was still 42.2% in 2011 (based on the MHLW's "Comprehensive Survey of Living Conditions ").

has income at some level at the income per household member. However, the living arrangement of the elderly has been changing with increase single household and a couple only household. It has led the elderly without any intra-household income transfer. As a result of these change, it seems that Gini coefficient of the market income of the elderly may have come to gradually reflect economic conditions of elderly him/herself more (Figure1).

(2) Effect of income redistribution

There is a difference between market income and disposable income in their definitions. The latter includes direct taxes and social security benefits and the former does not. Gini coefficient is larger on market income than on disposable income, which is especially noteworthy among the elderly. This fact indicates that taxation and social security schemes have the function of income redistribution. Thus, I analyzed this income redistribution effect by defining the rate of change between the Gini coefficient of market income and that of disposable income ((market-income based Gini coefficient) – (disposable-income based Gini coefficient)) as the "improvement rate."

The improvement rate in 2009 was 31.2%, which shows that taxation and social security schemes made considerable contribution to reduce the income difference. The rate was 11.9% in 1985, 28.8% in 2006. It has been on an increasing trend. This shows that, in the situation where income difference are increasing year by year, the role of taxation and social security benefits in income redistribution is growing more and more important.

By age group, the improvement rate of those from 18 to 64 is lower than that for all the age groups, but that of those from 65 years and over is remarkably higher. In 2009, while it was 18.9% for those between 18 and 64, it was 50.8% for those aged 65 and over, or nearly twice that for all the age groups. In 1985 and 2006, it was 10.4% and 17.4% for those from 18 to 64, respectively, and 26.8% and 49.2% for those of 65 years and over, considerably higher than the former group. This suggests that taxation and social security schemes had great effect on the elderly's income redistribution. This is probably because the elderly have higher Gini coefficient on

market income and because social security benefits, including public pensions, are paid mainly to the elderly, especially to medium- and low-income persons[12].

[Figure 2 Income redistribution effect in Japan (Improvement rate by age)]

5. Background of income difference in Japan

(1) What types of income sources do contribute to income difference in Japan?

Income difference has been on an upward trend in Japan. Income has several different types of sources in addition to employment income, such as property income and social security benefits. Some of these income sources would be distributed mainly to higher income persons, and others, to low-income ones. Therefore, if we analyze the background of income difference from the point of income source, we may find what kind of income sources contribute to increase income difference most. Thus, we conducted the decomposition of the SCV to find the degree of contribution of each income source to increase in income difference. [13]

Employment income had the greatest contribution to the income difference (shown by SCV) of all age groups: it explained 97.1% of the income difference in 2009. The employment income of the head of household had an especially high degree of contribution, explaining 63.5% of the income difference. The contribution of business income and property income was 14.4% and 24.5%, respectively. That of social security benefits and direct taxes/social insurance premiums was -0.1% and -36.9%, respectively, the latter being a large negative contribution. Employment income had a high degree of contribution in 1985 (69.0%) and 2006(92.7%) too. For other types of income sources, while the contribution of property income has increased from 2006 to 2009, , the negative contribution to SCV has been showed in direct taxes and social insurance premiums during the same period. The contribution to SCV of it would vary

---

[12] See Ministry of Health and Welfare (2000), In FY2009, the social security expenditure for public pension was 51,724.6 billion Yen, which is 51.8% of the social security expenditure. Most of it was paid to the elderly.
[13] For a detailed description of the technique for decomposing the SCV according to the type of income source, see A.F. Shorrocks (1982).

considerably with the changes in the tax and social security schemes. [14]

By age group, those from 18 to 64 show a similar tendency to all the age groups, but a unique trend can be observed for those from 65 years and over. While employment income plays the most important role as in other age groups, its degree of contribution in 2009 was 71.9%, which is lower than that of all age groups by about 26 percentage points. For property income, the degree of contribution in 2009 was 40.9%, which was higher than those of all age groups. The contribution of social security benefits and taxes/social insurance premiums was 9.4% and -34.8%, respectively. While the latter has a smaller negative figure than all age groups by several points, the former is higher than all the age groups by about 9 points. In addition, social security benefits tended to have higher degrees of contribution with other year's data. Behind this is probably the fact that the elderly's main income source is social security benefits, such as public pensions; these benefits have the effect of lessening income difference, but because employees' pension (Kosei Nenkin) has a part of the scheme based on wage during working age, it would increase the difference in the amount of the benefits payment[15].

[Table 3 Decomposition of SCV by type of income in Japan]

(2) Which age group does contribute to income difference in Japan? (From the point of population aging)

The population in Japan has been aging, and elderly people have greater income difference than all the age groups. From these facts, we would be able to say that the elderly has contributed for increasing the income difference considerably. To examine this degree of it quantitatively, I decomposed the MLD, one of the indicators of income difference, into three age groups (0-17, 18-64, 65 and over) and calculated the degree of contribution for each of these age groups.

---

[14] In 1986 (before the drastic taxation reform in 1987), the rates of income tax and individual inhabitant tax were divided into 15 and 14 classes, respectively, and the highest rate for the two tax types was 88%. At present, these taxes have 4 and 3 classes, and the highest rate has been reduced to 50%. Reductions in income tax at a fixed rate have also been made, lessening the burden of direct taxes.

[15] The distribution of the amount of the elderly's pensions has a peak in the ¥400 - 600 thousand class, but there are many who receive ¥3 million or more, too (See Ministry of Health and Welfare (2000)).

In the results for 2009, the contribution of those of 65 and over was 28.7% of the MLD, which is close to the percentage of those aged 65 and over to household members (28.6%). I could say that the more the population aging, the more the income difference in Japan.

By contrast, those between 18 and 64 had the highest degree of contribution in 2009 (56.8%), but it was 61.5% in 1985, showing that the contribution of this age group was on a downward trend. That for those below 18 years declined from 21.3% in 1985 to 11.4% in 2009, reflecting declining birth rates. The reason for this is probably the fact that as the elderly with large income difference increased, their contribution to the entire income difference became greater. Thus, I estimated the degree of contribution of aging and changes in the elderly income difference to changes in the entire income difference. Of the change in the MLD from 1985 to 2009 of 0.038, 0.022 can be attributed to the population structure (aging) and 0.016, to other factors, including income difference itself. Income difference in Japan has been some upward trend from 1985 to 2009 in MLD, but population aging has some power to increase income difference. I also could get the same population aging effect from the decomposition of MLD from 2000 to 2009.

[Figure 3 Decomposition of MLD and Population by age group in Japan]
[Table 4 Decomposition of change in income difference in Japan]

6. Poverty rate in Japan

The existence of income difference means that some of people will fall into poverty. While I have some definitions in measuring poverty, I would examine the trend of the poverty rate with the "poverty rate" defined earlier in this paper. The poverty rate (poverty line = 50% of the median of equivalent adjusted disposable income for each year) in 2009 was 16.0% based on disposable income, which is little higher than 15.7% in 2006, but it has a stable trend from 2000. On the other hand, the poverty rate based on market income (poverty line is the same as above: 50% of the median of equivalent adjusted disposable income for each year) was 32.0% in 2009. The rate was on an upward trend in this case, too: 12.7% in 1985, 23.9% in 2000, and 28.7% in 2006. The results on market income were greater than those on disposable

income, and the difference in 2009 was as large as about 16 percentage points. Without the income transfers by taxation and social security schemes, those who would fall into poverty will increase. From another point of view, I could say that taxation and social security schemes have the function to reduce poverty.

The poverty rate was higher among the elderly. The rate on disposable income in 2009 was 14.4% for those from 18 to 64 and 19.4% for those of 65 years and over. They were 10.6% and 23.2% in 1985, and 13.4% and 21.7% in 2009, respectively. As these data show, the elderly had higher poverty rates, which was consistent in these years. One characteristic of the elderly's poverty rate is that there were remarkable differences between the rate on market income basis and that on disposable income. In 2009, the former was 64.2% and the latter, 19.4%, with a difference of more than 40 percentage points. Considerable gaps were observed in other year's results, too: 35.8% vs. 23.2% in 1985, 55.4% vs. 21.2% in 2000, and 61.5% vs. 21.7% in 2006. These large differences indicate that the poverty-reducing function of taxation and social security schemes has worked well, especially among the elderly in Japan.

[Table 5 Poverty rate in Japan]

7. Income difference by type of household

In Japan, most of the elderly live together with their child's family, which is one of the characteristics of the living arrangement of the elderly in Japan. [16] This means that the household structure in Japan has a greater variety than that in other countries. Such household structures will have some influence on the economic status and income difference. Thus, I would like to outline the state of income difference by type of household. I classified the type of household according to the age of the head of household (whether or not the head was 65 and over), the age of household members (whether or not they were 18 and over), and whether or not the household had working

---

[16] The "Annual report on Aging Society 2002" describes in a column the results of special tabulation of the data of the "International Comparison Study on the Life and Opinions of the Elderly," conducted in 2001 by the Cabinet Office, for international comparison of the elderly's living arrangement in Japan, South Korea, U.S., Germany and Sweden. According to the column, Japan and South Korea had many three-generation households, but these households were rare in the other countries.

members. For example, the household having a head below 65, no child and one working person is one-person household of a young working person[17].

(1) Income levels and the distribution of income by type of household

I can find remarkable differences in income levels by household type. Among the households whose head was younger than 65, equivalent adjusted disposable income per capita was high in the households having an adult, no child and one working person (equivalent to the one-person household of a young working person), in the households having two or more adults, no child and two or more working persons, and in the households having two or more adults, no child and one working person (equivalent to the households of a married couple and to those of a married couple and their parent(s)). Among the households whose head was 65 and over, those having two or more adults and two or more working persons (equivalent to three -generation households having two or more employed persons) had high equivalent adjusted disposable income per capita. The disposable income of these types of households was ¥2,633 thousand, ¥3,334 thousand, ¥2,657 thousand and ¥3,038 thousand, respectively.

On the other hand, among the households headed by younger than 65, income was low in the households having an adult, no child and no working person (one-person household of a young person without job), in the households having an adult, a child or children and working person (one parent household with job), and in the households having an adult, a child or children and an no working person (one parent household without job). Among the households headed by 65 and above, those having an adult and no working person (equivalent to, for example, one-person household of an elderly without working person, the households composed of an elderly not working person and a child or children (younger than 18) had low equivalent disposable income per capita. The disposable income of these types of households was ¥1,258 thousand, ¥1,431 thousand, ¥1,326 thousand and ¥1,445 thousand, which are about a half the income of

[17] In this paper, working status of the persons was based on the survey items about the working status between employed or self-employed ("Tsutome Ka Jiei ka"). In "one adult and children household", most of them in this household type would be the household member of the one-parent household. But, some of them would be other type of household (eg, the household of the brothers and sisters only).

the high-income earning households mentioned above.

Next I would like to look at the distribution of household members according to their income levels by type of household. To describe the results simply, the income levels are classified as follows. Three deciles from the first to third ones of income were regarded as those belonging to the low-income group, those from the fourth to seventh deciles, as those belonging to the medium-income group, and those from the eighth to tenth deciles, as those belonging to the high-income group. Because the deciles of income were divided based on all the age groups, the percentage of the household members is 30% for the low-income group (three deciles), 40% for the medium-income group (four deciles), and 30% for the high-income group (three deciles).

The results show that there are the household structures having many members belonging to the low-income group and those not. Among the households whose head was younger than 65, the households with many low-income members were those having an adult, no child and no working person (one-person household of a young no working person), those having an adult, a child or children and no working person, those having an adult, a child or children and a working person (one parent household), and those having two or more adults, a child or children and no working person (households of not working persons having a child or children). Among the households whose head was 65 years and over, the households with many low-income members were those having an adult and a working person (one-person household of an elderly person or those composed of an elderly person and a child or children (younger than 18) and those having an adult and no working person (one-person household of no working elderly person or those composed of no working elderly and a child or children (younger than 18). The percentage of low-income members in these households was about 50-90%.

On the other hand, many high-income members were distributed in the households having two or more adults, no child and two or more working persons and those having two or more adults, no child and two or more working person (e.g., households of a couple, those of a couple and the husband's (or the wife's) parent or parents) among the households with the head younger than 65, and those having two or

more adults and two or more working persons (e.g., three-generation households with two or more working persons) among the households with the head 65 years and above. Thirty to fifty percent of the members of these households belong to the high-income group.

As described above, there are remarkable differences between household types in the income level and income distribution.

[Table 6 Income difference by type of household in Japan (2000)]

(2) Poverty rate by type of household

The poverty rate by type of household based on the poverty line (50% of the median of equivalent adjusted disposable income for each year) of all the age groups is as follows: among the households whose head was younger than 65, the poverty rate on disposable income was very high in the households having an adult, no child and no working person (one-person household of a young not working person), those having an adult, a child or children and no working person, those having an adult, a child or children and one working person (one parent household), and those having two or more adults, a child or children and no working person (households having a child or children and no working person). Among the households whose head is 65 and over, the rate was high in those having an adult and no working person (one-person household of an elderly not working person or households composed of an elderly not working person and a child or children (younger than 18). The percentage was 57.7%, 50.9%, 50.4%, 36.0% and 43.3%, respectively, suggesting that many members of these households were below the poverty line.

In terms of the poverty rate on market income, poverty rates are more than 50% in many household types. Among the households with the head younger than 65, they were those having an adult, no child and no working person (one-person household of a young not working person), those having an adult, a child or children and no working person, those having an adult, no child and one working person (one parent household), and those having two or more adults, no child and no working person (households having a child or children and no working person). Among the households whose

head is 65 years and over, they were all households except for those having two or more adults and two or more working persons (e.g., three-generation households having two or more working persons).

The comparison between the poverty rate on disposable income and that on market income allows us to observe to what degree the poverty-reducing effect of taxation and social security benefits has worked on each household type. When this effect was measured by checking the difference between the two types of the poverty rate, the difference was negative for all the households whose head was 65 or over, indicating that taxation and social security schemes had the poverty-reducing effect. By contrast, some of the households headed by householder younger than 65 remained to have a high poverty rate on disposable income. They were those having an adult, no child and no working person (one-person household of a young working person), those having two or more adults, with or without child and working person (households having a child or not and working person). This probably suggests that the taxation and social security schemes on cash base has effects in poverty-reduce but to some extent in such households and working persons contribute with paying tax and social security premiums in low income households (Table 7).[18]

[Table 7 Poverty rate by type of household in Japan (2000)]

8. Comparison with Korea and Taiwan

Larger income inequality and higher poverty rate in not limited only to Japan. In East Asia, Korea and Taiwan also are faced with same problems. Korea is a member of OECD, provides income distribution data to it and release to public. The data are available from mid-2000s data. It is because Korean "Family Income and Expenditure Sample Survey" had covered only the households with two or more

---

[18] "Poverty rate" in this paper is on cash base without in-kind social services from social welfare scheme. Especially, it does NOT include the in-kind social services like childcare, medical services, which are offered well to the one-parent households, non-working households. Some countries offer such services by cash benefit. Therefore, it seems that the level of the poverty rate would be different when in-kind benefit were converted on cash base and included as income. The same would be true in the case of the voucher like "Food Stamp" in the United States. As for these points, there were some arguments in the OECD Joint Conference with University of Maryland "Measuring Poverty, Income Inequality, and Social Exclusion Lessons from Europe" on March in 2009.

household members, and excluded the agricultural household. It had continued until 2005 survey. In 2006 survey, it covers all households. Since then, Gini coefficient and poverty rate based on OECD standard has been released every year. Gini coefficient is estimated by the same standards in Taiwan. They are available from the mid-1990s in recent official documents[19]. By using these data, we can compare Gini coefficient and poverty rate in Japan, Korea and Taiwan like table 8. When we look at this, we can find that Korean Gini coefficient has risen from 0.306 in mid-2000 to 0.314 in last 2000s. In Taiwan, it has risen from 0.270 in mid-1990s to 0.284 in mid-2000s only to 0.286 in last-2000s. They are slightly lower than Japan. But, they are in upward trend. So, we can say that income difference in East Asian country and area has been expanding.

When we look at poverty rate in table8, we can find that it has risen from 14.3% in mid-2000s to 15.2% in last-2000s in Korea. These are close to the poverty rate level in Japan. In Taiwan, the poverty rate is lower than Japan and Korea, but it has risen from 6.3% in mid-2000s to 7.7% in last-2000s. Thus, the upward trends in poverty rates are commonly observed in Japan and South Korea.

In Japan, the Gini coefficient and the poverty rate of the elderly are higher than those of all ages. In addition to it, similar trends are found both in Korea and Taiwan. Gini coefficient of the elderly is 0.405 in mid-2000s; it is higher than that of all ages (0.314). Poverty rate is 45% in mid-2000s; it is about three times of all age's poverty rate. In Taiwan, poverty rate of the elderly is more than 20% in 2009. It is about 3-4 times of that of all ages (7.7%). There seems to be insufficient beneficiaries and benefits in public pension etc as factors of it (Table 8).

[Table 8 Gini coefficient and Poverty Rate in Japan, Korea and Taiwan]

9. Conclusion

The conclusions of this paper could be summarized as follows:

(1) The Gini coefficient in Japan has increased from 0.329 in 2006 to 0.336 in 2009, and

---

[19] For Korea, it is from "Family Income and Expenditure Trend in 1st quarter 2008" (May 2008). As for Taiwan data, we can use Gini coefficient data from "Family Income and Expenditure Survey", and use poverty rate from "Social Indicator 2010" (2011) by Statistics Bureau of Executive Yuan.

income differences was on an upward trend from 1985 and some stable trend from 2000. By age group, those aged 65 and over had large income difference than those younger than 65, but their income difference were on a decreasing trend from 1994.

(2) On the other hand, taxation and social security benefits had the function of income redistribution. This income redistribution function seen from the degree of improvement of the Gini coefficient became higher from year to year from 1985 to 2009. Also, those aged 65 and over had a higher degree of improvement than all the age groups and those younger than 65.

(3) By the type of income, employment income made the greatest contribution to income difference. The degree of this contribution is large, but that of social transfer is about 10% only for those aged 65 and over. The decomposition of the degree of contribution to income difference by age group shows that the degree of contribution of those aged 65 years and over was over 20%, which was close to the percentage of this age group to the total number of household members.

(4) The poverty rate on disposable income was about 16.0% for all the age groups, but was about 20% for those aged 65 and over. It has a stable trend from 2000 and a little increase from 2006. On the other hand, the poverty rate on market income was substantially higher than that on disposable income, which indicates that taxation and social security benefits had the poverty-reducing function.

(5) The observation of income levels by type of household reveals the remarkable differences in income existing between different household types. In particular, one-person households, non-working households and elderly households have higher poverty rates than other type of households. But, the poverty rates on market income in those types of households are higher than those on disposable income. It might mean that taxation and social security scheme (cash benefit only) have poverty reduction on those households to some extent.

(6) There is an upward trend in Gini coefficient and poverty rate in Korea and Taiwan, too.

This study has found that income difference in Japan tend to become larger from 1985 to 2000, and a stable trend from 2000 to 2009, but a little increase trend from 2006 to 2009. We need to collect and analyze carefully using future data, of course. It also shows that backgrounds of this conclusion are (1) the fact that by the type of income, employment income makes a greater contribution to income difference, and (2) the fact that by age group, the contribution of those aged 65 and over increases with the aging of the population. Many studies have showed that population aging is a background of income difference increase. From 2000 to 2009, it still has a power to increase income difference. We have to note that income difference among the elderly in Japan has been on downward trend from 1985, but it was in a stable trend from 2000. So, it is necessary for us to watch a future trend carefully.

While the poverty rate has increased by little from 2006 to 2009, taxation and social security benefits perform the poverty-alleviating function, which works more on the elderly.

However, some types of households (households of not working young generations and those of one parent) are benefited by this function only to some extent. It is because that the benefits from social policy are provided mainly by in-kind scheme to such households, while the main benefits to the elderly are cash benefits like old age pension. As for the elderly cash benefits are included to their income. But, in-kind benefits like childcare service are not included to the income of such households (some countries provide such benefit by cash benefits). If we have seen this result without paying attention to the fact that in-kind social services are is not included, we would like to make evaluation based on the features far from the reality in policy and society in Japan. In that case, I should to use other data relating to in-kind services in addition to the data in this paper.

In policy making in long-term care system, it is necessary to consider the difference of capacity to pay the long term care cost between families. If the burden of long term care cost were too high for low income family, they would hesitate to utilize long term care services. Therefore, it is necessary for us to make long term care system with the cost share scheme considering the income difference, keeping the balance with other

social security schemes like health care insurance. On the other hand, we should consider the ideal scheme of the social policy like employment public pension and other social welfare, so as to make low-income families to have certain level of income. Such considerations would be essential in the East Asian region with rapid population aging and need of long term care.