Income Inequality in the New Millennium

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Abstract

This paper explores income inequality in Japan. Of particular interest is the disparity among workers' households. After discussing the condition of the Japanese economy and focusing on the living standard of workers' households, income disparity among the wage earners is examined. Based on inequality indices such as the Gini coefficient, the squared coefficient of variation (SCV), and the mean log distance (MLD), the degree of Japan's income inequality is then compared to other OECD countries by way of cluster analysis. Despite many people's beliefs that Japan is a relatively equal society, this study shows that income inequality in Japan is not only rather high when compared to other OECD countries, but also that income inequality within Japan is increasing in the new millennium. Further attested to in the data is that income disparity is more evident and increasing among highly educated people.

1. Introduction

Disparity, in many forms, exists in every society, perhaps the most noticeable being the inequality of income. Although most people will agree that income disparity is not desirable for society, fixing the problem is, by no means, an easy task, since it involves redistribution of wealth, which in turn requires value judgment. The first stage to fixing any problem is to give a proper diagnosis of the problem, and it is the aim of this article to identify the problem of income inequality in Japan, particularly in relation to workers' households. As globalization continues, there have been reports that income inequality is rising in many countries. Is this the case for Japan as well? And how severe is the income disparity in Japan when compared to other OECD countries? These are some of the questions addressed in this paper.

Japan has long been considered to be a relatively equal society. According to the annual survey on the lives of Japanese citizens conducted by the cabinet office, approximately 90% of the people consider themselves to be in the middle class (including the upper-middle, middle, and the lower-middle). Surprisingly, this tendency has not changed for over 40 years. Unlike the social unrest observed in various countries over economic issues in 2011, people of Japan have stayed relatively calm, in spite of growing bad news on the

economy. This, of course, is not an automatic assurance that Japan does not suffer from income disparity. In fact, Momma (2005) has shown that disparity among workers' households has been growing gradually since the late 1990's. The question is whether or not this rising trend has stopped in the new millennium, and what the driving factors are of these trends.

The paper is organized as follows. Section 2 discusses general condition of Japan's current economy and the economic conditions of workers' households. Cluster analysis is applied in Section 3 to determine the level of Japan's income inequality and the effectiveness of government's policy on the matter. Section 4 investigates the nature of income disparity of Japanese workers in more detail, and Section 5 concludes.

Data used in the analyses are taken from several sources, including the family income and expenditure survey by the ministry of Internal Affairs and Communications, basic survey on wage structure by the ministry of Health, Labor and Welfare, and OECD Social Expenditure Statistics (taken from OECD StatExtract).

2. Emerging trends in the new millennium

After the collapse of the asset price bubble, Japan suffered a severe economic setback in the 1990's. This era is often referred to as the "Lost Decade", indicating the loss of speed in the country's economic growth-rate as well as a lack of consistent and effective economic policy implemented by the government. During the "Lost Decade", the government was often criticized for its adoption of timid fiscal policies. Income of the working class started to decay for the first time since the 1960's, and disparity among wage earners began to increase. Now that more than ten years have passed since the start of the new millennium, are we doing any better?

Unfortunately, the economy is still sluggish, as seen in Figure 1. The growth rate of GDP both in nominal and real terms have not picked up, especially for nominal GDP. This indicates that Japanese economy is in deflation, a possible contributing factor being the globalization of the economy. Considering the fact that Japanese society is aging rapidly with a shrinking of its workforce, Japan may need to embrace the reality of having now entered into a period of low economic growth. Add to it the disaster of the Great East Japan Earthquake, there does not seem to be a fast and easy way out of this slump.

What is more troubling is the declining trend in income of workers' households. Figure 2 depicts disposable income, equivalent disposable income, and the unemployment rate for men ages 15-64, over the last 25 years, for workers' households with 2 or more persons in a household (excluding agriculture, forestry, and fishery households). Equivalent disposable income indicates income per household member, defined

Figure 1 GDP and its growth rate[1]
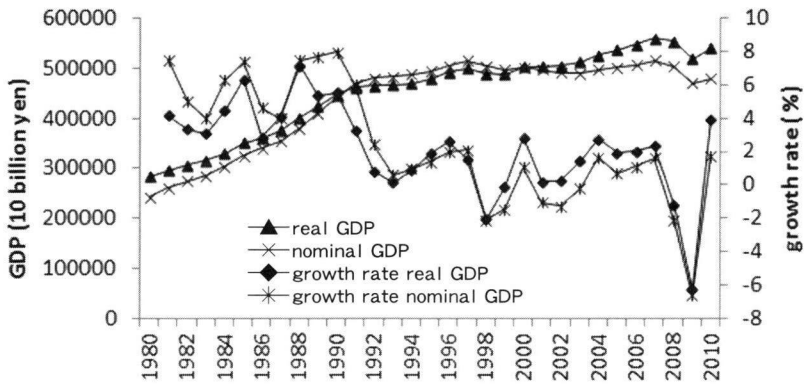
Figure 2 Disposable incomes of workers' households and the unemployment rate[2]
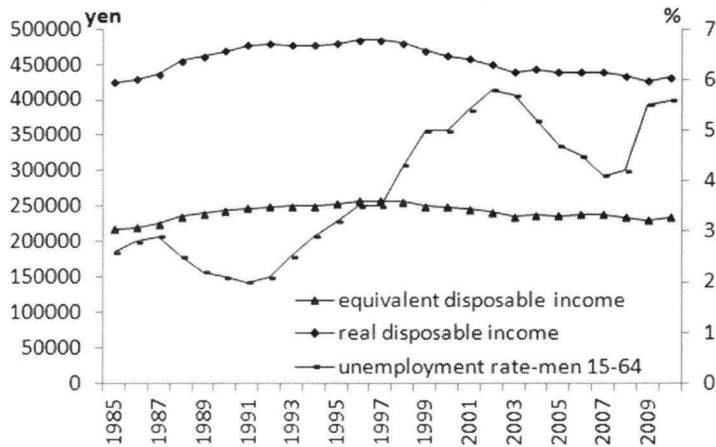
as $Y_E = \dfrac{Y}{m^\varepsilon}$, where Y indicates disposable income, m is the number of individuals in a household and ε denotes equivalence elasticity, a measure introduced to reflect "economies of scale" in a household. It is customary to use $\varepsilon = 1/2$, and this will be followed here as well. Both incomes are deflated by the consumer price index (CPI 2005=1) in order to account for the changes in commodity price levels.

As is clear from Figure 2, incomes of workers' households were still increasing after the collapse of the asset price bubble. It was only in the late 1990's that the average income level began to fall, and since then, it has been declining steadily, even between 2002 and 2008 when the unemployment rate was seen to be

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1   *source of data) SNA(National Accounts of Japan) (ESRI)*

2   *sources of data)   unemployment rate : lobour force survey, income : family income and expenditure survey.*

improving. The mechanism of declining incomes alongside an improving unemployment rate is one that classical economic theory cannot explicate, and therefore, further investigation is essential to comprehending the nature of this phenomenon. One possible explanation is the impact of economic globalization. The unemployment rate suddenly took a turn for the worse in 2009 and continued to worsen in 2010. This worsening trend will surely continue with the fallout of the Great East Japan Earthquake, another troubling factor for Japanese economy.

How, then, are workers' households coping with the newly-found economic woe of continuously waning incomes? Figure 3 shows the amount spent on each item as a percentage of total consumption, for workers' households with 2 or more persons. Interestingly enough, values of the Engel coefficient, which are the percentages spent on food, have shown a steady downward trend even with declining income levels until very recently. This indicates that although average income is declining, the minimum standard of living is still intact for workers' households, and consequently, absolute poverty is not the main concern for them. Decreasing values of the Engel coefficient could also be a reflection of the aging society with older members in a house hold needing less, or it could very well be a consequence of globalization with cheaper imported food prices.

Among items other than food that are regarded as living necessities, the proportions spent on transportation and communication are rapidly growing. In fact, they have now become the second largest spending items (excluding "other expenditures"). It is not hard to conjecture that the main driving force behind both these rate hikes is communication costs. Ironically, advancement of information technology is forcing us to pay more just to communicate. Fuel, light and water charges, as well as medical care are also basic necessities whose percentages are increasing, while proportion spent on furniture and household utensils is showing

**Figure 3 Consumption of items, percentage of total consumption[3]**

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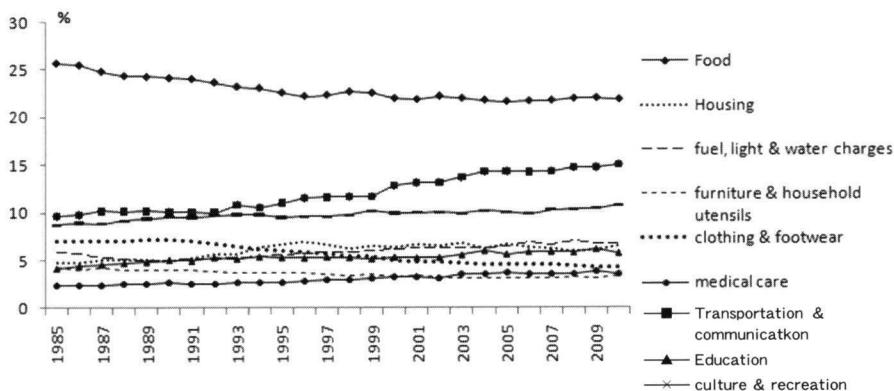
3   *calculated from consumption data on workers' households, family income and expenditure survey.*

a downward trend. Among items considered to be luxuries, percentage spent of clothing and footwear is showing a steep decline, while people are spending more on education, regardless of the fact that the number of children in a household is decreasing. Note that clothing is one item where price has clearly come down with globalization. A clear picture emerges from the above findings that it is no longer about the distinction between basic necessities and luxuries. People are spending more on services and less on physical things as the whole country moves toward a service-oriented economy.

Having studied the economic situation of workers' households, the next question to ask is whether or not income inequality is increasing among them. This is done most effectively by observing Gini coefficient values. Figure 4 depicts values of the Gini coefficient based on quintile data of the income of workers' households. It shows a gradual upward trend, indicating that inequality is rising steadily. The comparative age of a household head has also been gradually rising during this period, and this may have contributed to the increase in Gini coefficient values. Lack of a true economic recovery may also have played a role in increasing income disparity, since it is well-known that income inequality tends to worsen when the economy is weak. In either case, data indicate that Japanese workers of the new millennium are not better off than those of the "Lost Decade" as regards the absolute standard of living or the equality of income.

Proportion of income acquired by the richest 20%, the middle 60%, and the poorest 20% among workers' households are depicted in Figures 5(a), 5(b) and 5(c). It is seen that the ratio of income earned by the top 20% is steadily rising, and it is the middle 60% that is paying the price for it. Ratio of the lowest 20% of workers' households is holding steady, although not showing any improvement. This squeezing of the middle class has already been observed in Momma (2005). The trend has not reversed its course during the first 10

Figure 4 Values of the Gini coefficient[4]

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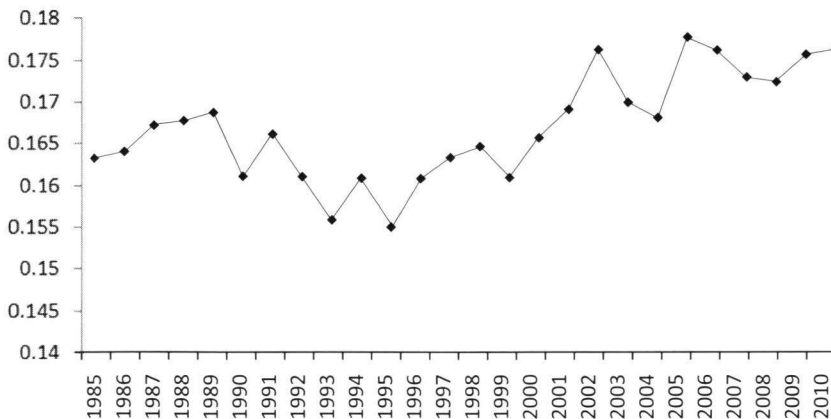
4   calculated from quintile income data on workers' households, family income and expenditure survey.

Figure 5 Income shares by quintile groups[5]

5(a) 5(b) 5(c)
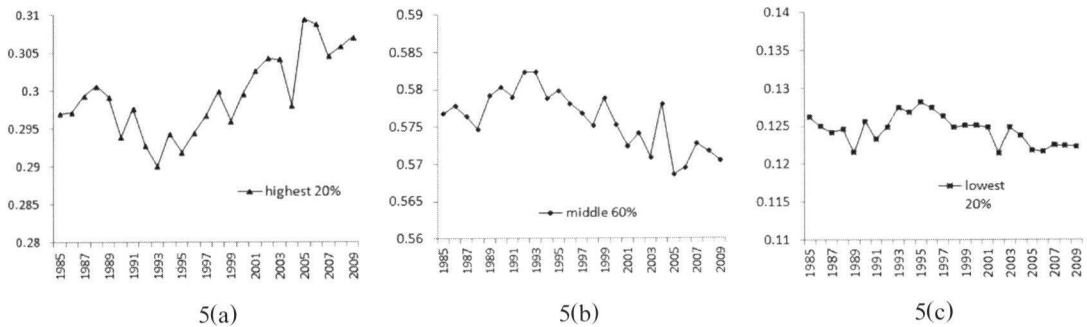
years of this century.

It should be noted that the above data on workers' households do not include households engaged in agriculture, forestry and fishery for the period prior to 2005, whereas after 2005, every type of household is included. This change is due to the limited availability of the data. Careful inspection of the data reveals that the impact of adding households engaged in agriculture, forestry and fishery is negligible, the difference in average income being in the order of several hundred yen. Therefore, it is safe to combine the two series for analytical purposes.

3. Cluster analysis

In this section, the level of Japan's income inequality is compared to other OECD countries. Data taken from OECD StatExtracts are the sources for the following analyses. To assess the degree of Japan's income inequality compared to other OECD countries, the following 7 indices of income inequality are employed:

- $p5/p1$:ratio of median($p5$) to the bottom 10% ($p1$) gross earnings of full-time employees, men
- $p9/p1$:ratio of the top 10% ($p9$)to the bottom 10%($p1$) gross earnings of full-time employees, men
- poverty gap :distance between 50% of the median income(the poverty threshold) and the mean income of the people under the poverty threshold, measured as a percentage of the poverty threshold, after tax and transfers,
- poverty rate:percentage of people with an income below 50% of the median income, after tax and transfers,
- SCV:Standard Coefficient of Variation for working age population
- MLD:Mean Log Distance for working age population (18-65)
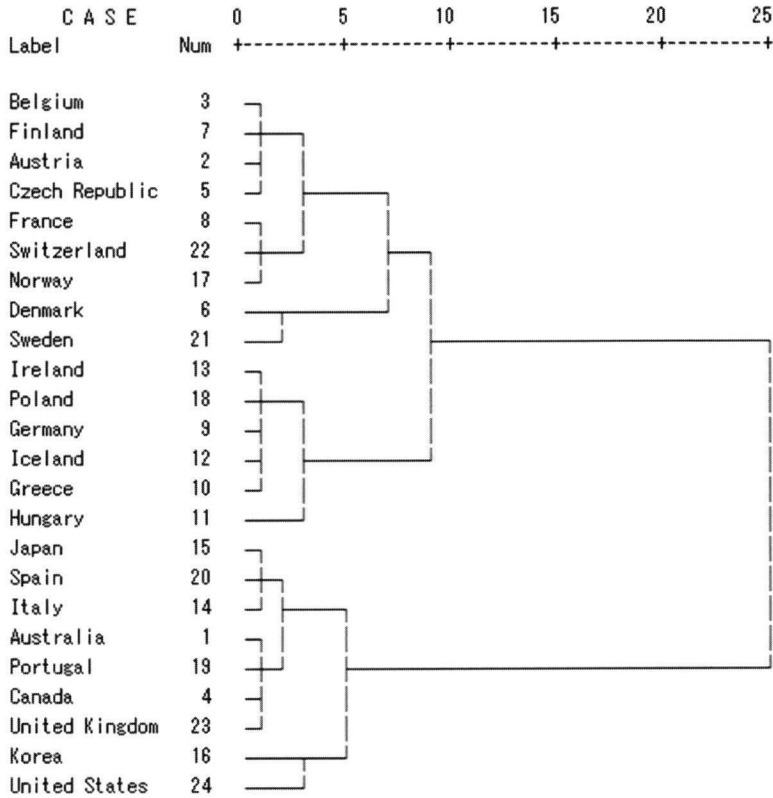- Gini:Gini coefficient for working age population(18-65), after tax and transfers

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5   *calculated from quintile income data on workers' households, family income and expenditure survey.*

Since only a limited number of countries report decile ratios (*p5/p1* and *p9/p1*), data were extracted from the year 2006 instead of the most recent year for p5/p1 and *p9/p1* in order to ensure that the maximum number of countries could be included in the following analysis. This led to the selection of 23 countries for the analysis. It should also be noted that earnings of men were chosen for decile ratios instead of earnings of women. The reason for this is twofold. First, according to the income and expenditure survey, over 86% of the total income for workers' households in Japan is earned by the head of the household alone, and the head of the household is typically male. Second, women choose various forms of employment when they have families. Some may continue working on an equal footing with men either with or without children, while others may choose to take a prolonged leave of absence, take a part time job, or undertake a full-time but less demanding job. They tend to have more freedom and variation in the way they work, and their incomes do not necessarily match their families' economic status. Income levels of women reflect more of their lifestyles. Since the aim of this paper is to focus on the economic situation of workers' households, earnings of men were decided to be the better indicator.

For other measures of inequality, data from the latest year were chosen. All variables were standardized as Z scores, and hierarchical cluster analysis with the Ward method and squared Euclidian distance was applied. The result is shown in the form of a dendrogram.

Countries are clustered in ascending order of their level of disparity, so the top four countries (Belgium, Finland, Austria and the Czech Republic) have the smallest overall inequality. After careful inspection of the values of indices, it can be concluded that Belgium Finland, Austria, Czech Republic, France, Switzerland and Norway form group 1, the countries with least disparity. Denmark and Sweden shape the second group, the main difference between group 1 and group 2 being in the values of the Standard Coefficient of Variation. Ireland, Poland, Germany, Iceland, Greece as well as Hungary constitute the third group which can be considered as the middle group within the 23 countries. Interestingly, values of disparity indices of Japan, Spain and Italy, showing higher disparity than the three groups above, are very similar even though there seems to be little in common between Japan and the two countries. The three countries, along with Australia, Portugal, Canada and United Kingdom form the fourth group displaying a rather large disparity. Countries with the largest disparities are Korea and the United States. Both countries assume very high values on almost all indices, the exception being Korea's Mean Log Distance value amongst its working-age people. Countries that value economic and individual freedom as well as competition the most tend to have larger income disparity, whereas countries with socialistic concern have higher level of equality. Whether it is the right course or not, Japan seems to be moving toward individualism, showing more disparity than a many European countries.

Figure 6 Dendrogram of income inequality

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            C A S E          0        5       10       15       20       25
            Label       Num  +--------+--------+--------+--------+--------+

            Belgium       3   ┐
            Finland       7   ┤
            Austria       2   ┤
            Czech Republic 5  ┘
            France        8   ┐
            Switzerland  22   ┤
            Norway       17   ┘
            Denmark       6   ┐
            Sweden       21   ┘
            Ireland      13   ┐
            Poland       18   ┤
            Germany       9   ┤
            Iceland      12   ┤
            Greece       10   ┘
            Hungary      11
            Japan        15   ┐
            Spain        20   ┤
            Italy        14   ┘
            Australia     1   ┐
            Portugal     19   ┤
            Canada        4   ┤
            United Kingdom 23 ┘
            Korea        16
            United States 24
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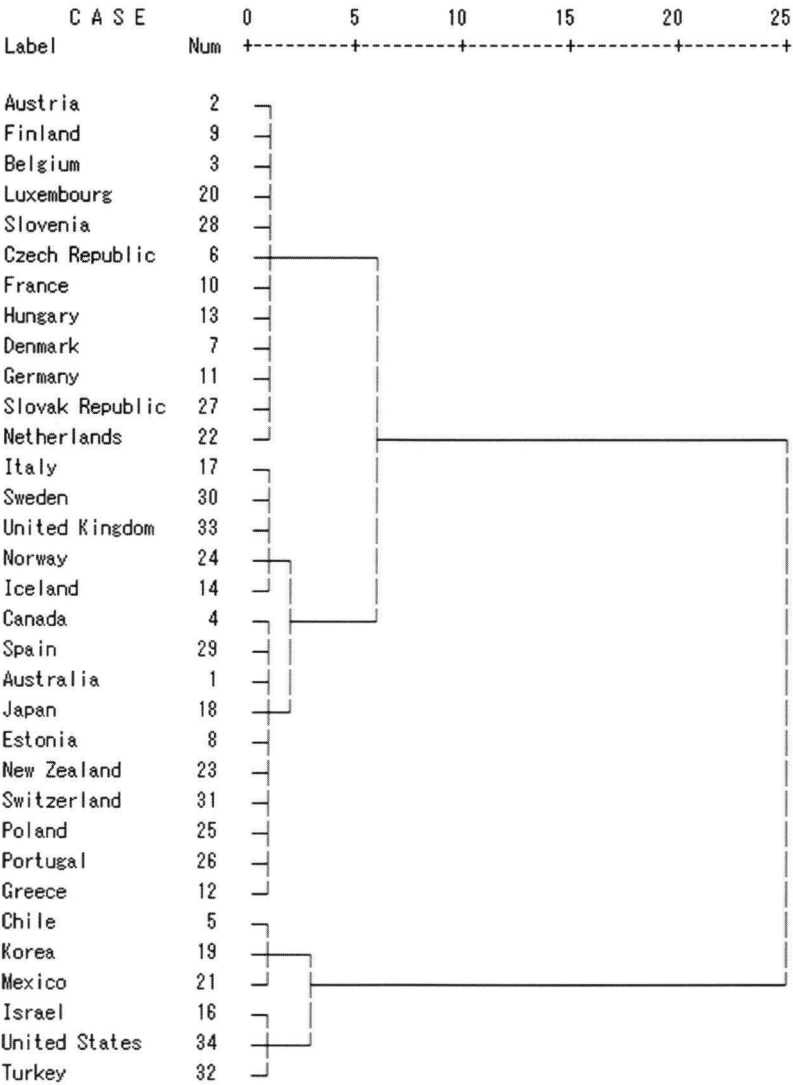
Of the seven indices in the above analysis, three have data on both before tax and transfers and after tax and transfers. Comparing the values before and after re-distribution should give insight into the effectiveness of the government's policy to alleviate income disparity. For this purpose, ratios of the value after tax and transfers to the corresponding value before tax and transfers were calculated for each of the three indices, and cluster analysis was performed again with the Ward method and squared Euclidean distance, to assess government's effectiveness on reducing income inequality. In this case, standardizations of variables were unnecessary since all three variables are in the form of ratios. Variables used to cluster the countries are the poverty gap ratio, the poverty rate ratio, and the Gini coefficient ratio.

More countries are included in this analysis than before, base on the availability of the data. Figure 7 shows the dendrogram of the analysis. Top 11 countries from Austria to Denmark are the most effective in reducing disparity through tax and transfers. Countries in this group succeeded in reducing both the poverty rate and the poverty gap by re-distribution to less than 35% of the rates before tax and transfers, and values

Figure 7 Dendrogram of the effectiveness of government policy

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          C A S E            0        5       10       15       20       25
     Label                 Num  +--------+--------+--------+--------+--------+

     Austria                 2   ┐
     Finland                 9   ┤
     Belgium                 3   ┤
     Luxembourg             20   ┤
     Slovenia               28   ┤
     Czech Republic          6   ┼────────────┐
     France                 10   ┤            │
     Hungary                13   ┤            │
     Denmark                 7   ┤            │
     Germany                11   ┤            │
     Slovak Republic        27   ┤            │
     Netherlands            22   ┘            ├──────────────────────────────┐
     Italy                  17   ┐            │                              │
     Sweden                 30   ┤            │                              │
     United Kingdom         33   ┤            │                              │
     Norway                 24   ┼─┐          │                              │
     Iceland                14   ┘ │          │                              │
     Canada                  4   ┐ ├──────────┘                              │
     Spain                  29   ┤ │                                         │
     Australia               1   ┤ │                                         │
     Japan                  18   ┼─┘                                         │
     Estonia                 8   ┤                                           │
     New Zealand            23   ┤                                           │
     Switzerland            31   ┤                                           │
     Poland                 25   ┤                                           │
     Portugal               26   ┤                                           │
     Greece                 12   ┘                                           │
     Chile                   5   ┐                                           │
     Korea                  19   ┼─┐                                         │
     Mexico                 21   ┘ ├──────────────────────────────────────────┘
     Israel                 16   ┐ │
     United States          34   ┼─┘
     Turkey                 32   ┘
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of the Gini coefficient to around 60 to 70% of the values before re-distribution. The second group managed to reduce the poverty rate to around 30 to 35% of the poverty rate before tax and transfers, the poverty gap to 40-55%, and the Gini coefficient to mostly under 76%. Japan is included in the third cluster along with countries such as New Zealand, Canada, as well as countries in southern Europe. Countries in this group have both the poverty rate and the poverty gap reduced to under 55% of the rates before tax and transfers, and values of the Gini coefficient are mostly around 75% of the values before tax and transfers.

Chile, Korea and Mexico are the least effective with regards to reducing income inequality. Among the three indices of disperity, both the poverty gap and the poverty rate remain at 80 to 90% of the rates before

tax and transfers, and the Gini coefficient decreased only by several percentages. Either intentionally or nonintentionally, governments of the three countries in this group are clearly not doing much to reduce inequality. Israel, United States and Turkey are not very effective in reducing poverty as well, with poverty gap after tax and transfers to around 60% of the original value, poverty rate between 64% and 77%, and the Gini coefficient ratio between 77% and 87%.

Note that the clusters for this analysis were solely determined by how much reduction was possible by the government as regards values of the inequality indices. It does not necessarily reflect the absolute level of income inequality or the absolute poverty level in each country. Of the three countries that were the least effective in reducing income inequality, Korea and Mexico for example, have relatively low poverty rates (in relation to the mean income of each country) before taxes. When cluster analysis was applied using the level of disperity before and after taxes as well as the rate of reduction, however, the result essentially remained the same.

4. Income inequality among wage earners

Data on wages of male workers sorted by age and education level, taken from the basic survey on wage structure by the ministry of Health, Labor and Welfare, is analyzed in order to examine, in more detail, the nature of income disparity among Japanese wage earners. Figure 8 shows ratios of the top 10 % ($p9$) income relative to the bottom 10% ($p1$) income, classified by age for two educational levels, high school graduates and graduates from colleges or higher institutions.

It is only natural, among working people in their 20s, that high school graduates would have a larger value

Figure 8 Values of $p9/p1$, by age and education level[6]

8(a)   8(b)

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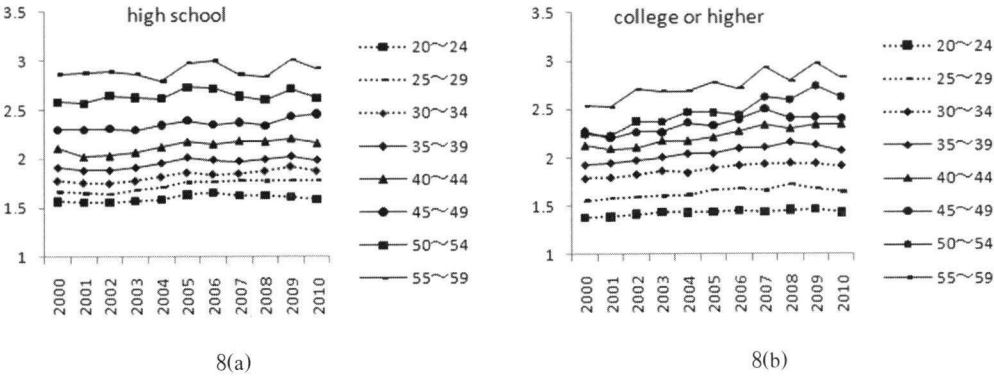
6   *calculated from data on wage by age and education level, basic survey on wage structure.*

of income disparity than graduates of colleges or other higher institutions, since graduates of colleges or higher instisutions of learning will have just started working upon graduation, whereas highschool graduates will have been working for several years. As the age bracket goes up, the ratio becomes larger, but with maximum value less than 3 for both educational levels, i.e., among all wage earners of the same age group, the top 10% wage earner earns less than 3 times the bottom 10% wage earners.

A noticeable feature is the increasing trend in values among people graduating from college or higher institution. Values of high shool graduates reamain stable for each age group over the last 10 years, whereas there is a clear increasing trend for higher educated persons, especially among people in their 40s and 50s. It is well known that Japanese companies have moved considerably toward the merit pay system to ensure economic efficiency. This may have created a more competitive atmosphere and more disparity among the "social ellites". Whether the values of these ratios indicate too much disparity is open to question. Although not depicted here, the ratio of median to the bottom 10%($p5/p1$) shows the same pattern.

Another measure often used to indicate the size of variation is the decile variance coefficient, defined by

$$y = \frac{p9 - p1}{2 \cdot p5}$$

where p_i denotes the i th decile. Smaller values of the decile variance coefficient indicates that the dispersion is smaller, i.e., more income equality. Figure 9 denotes values of decile variance coefficient by age and education level. As was the case with the decile ratio, values of the decile variance coefficient for people with college or higher education are increasing. This tendency is most prominent for older people, another possible consequence of a more competitive workplace. In contrast, values of the decile variance coefficient for high school graduates are holding steady.

Figure 9 Values of the decile variance coefficient, by age and education level[7]

9(a)   9(b)

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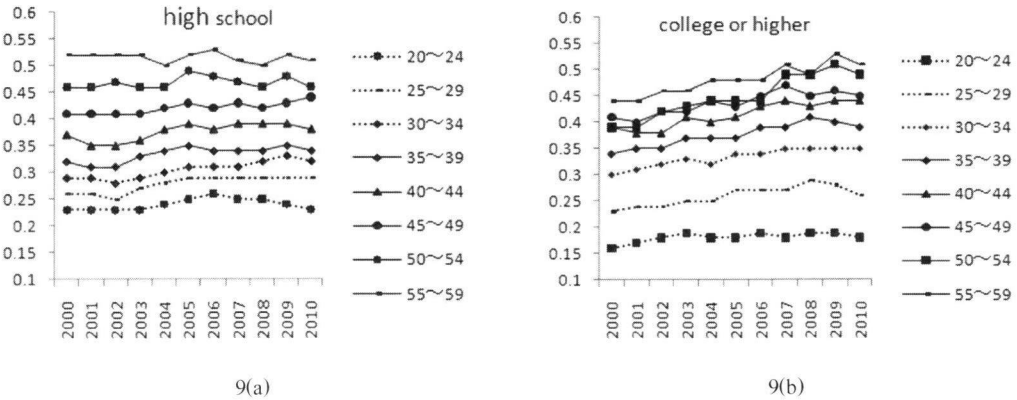
7   *source of data) basic survey on wage structure*

5. Conclusion

The new millennium has brought with it, new features to the nation's economy. Signs of a decreasing unemployment rate can no longer be a predictor of, or a guarantee for, higher incomes. People are spending more on services and less on goods. Income inequality is steadily growing among workers' households, and the disparity is widening for highly-educated people. Although 90% of the Japanese still think they are the middle class, the collective income share of the middle class is shrinking and the level of Japan's income inequality can no longer be considered as low among OECD countries.

Income disparity is not in and of itself harmful, but when it is coupled with abject poverty for the lower income class, the government needs to intervene. Although data analyzed in this article did not necessarily indicate severe poverty for workers' households in Japan, the same may not be true for retired or unemployed persons. Government intervention involves re-distribution of income, which is not always welcomed by people of wealth. On the other hand, large income inequality could lead not only to a less- efficient economy, but also to social unrests, as seen in many countries in 2011. Government, therefore, needs to perform a delicate balancing act and decide on just the right amount of intervention, a very difficult task.

Just how much government intervention will be required to reduce income inequality depends both upon the state of the economy of the country and the nature of its people. As has been discussed before, Japan is a country where most people consider themselves to be in the middle class. A majority of the people feel comfortable to be in the middle. As such, it would not seem to be too difficult for the government to aim for a high level of income equality. Japan's income inequality, meanwhile, has been increasing over time. In the face of changing demographics and fluid economic conditions, maybe it is time for the government to re-assess its policies and chose the right course of action for the new millennium.

E-References

OECD.StatExtracts http://stats.oecd.org/Index.aspx

Ministry of Health, Labor and Welfare http://www.mhlw.go.jp/index.shtml

Portal Site of Official Statistics of Japan http://www.e-stat.go.jp/SG1/estat/eStatTopPortal.do

Statistics Bureau, Director-General for Policy Planning (Statistical Standards) & Statistical Research and Training Institute
    http://www.stat.go.jp

Cabinet Office, http://www.cao.go.jp

Reference

Momma, Maki (2005) Income Distribution in Japan. The Economic Review of Toyo University, Vol. 31, pp41-54.