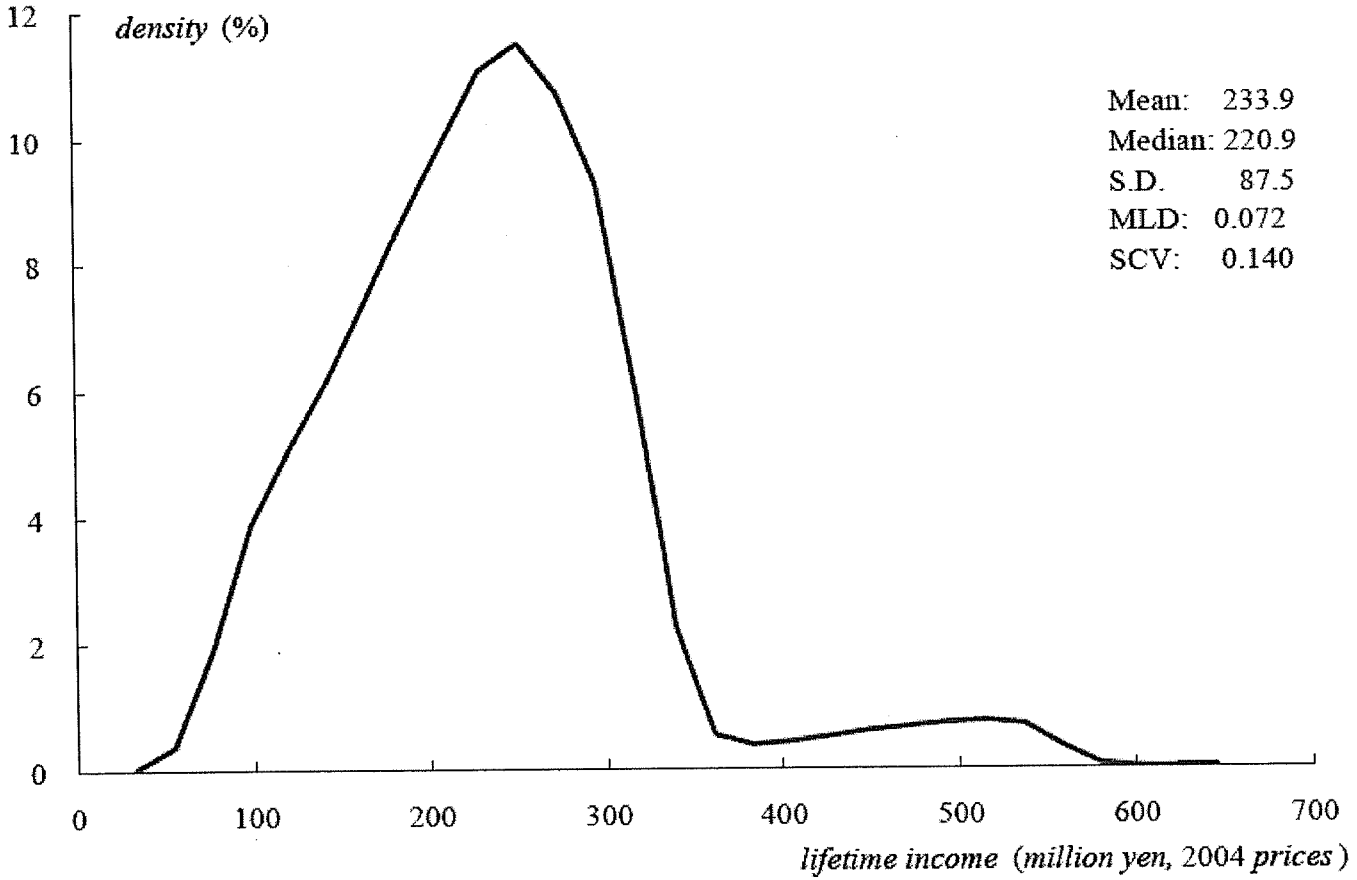
Figure 1: Estimated distribution of lifetime income for the male 1944 cohort



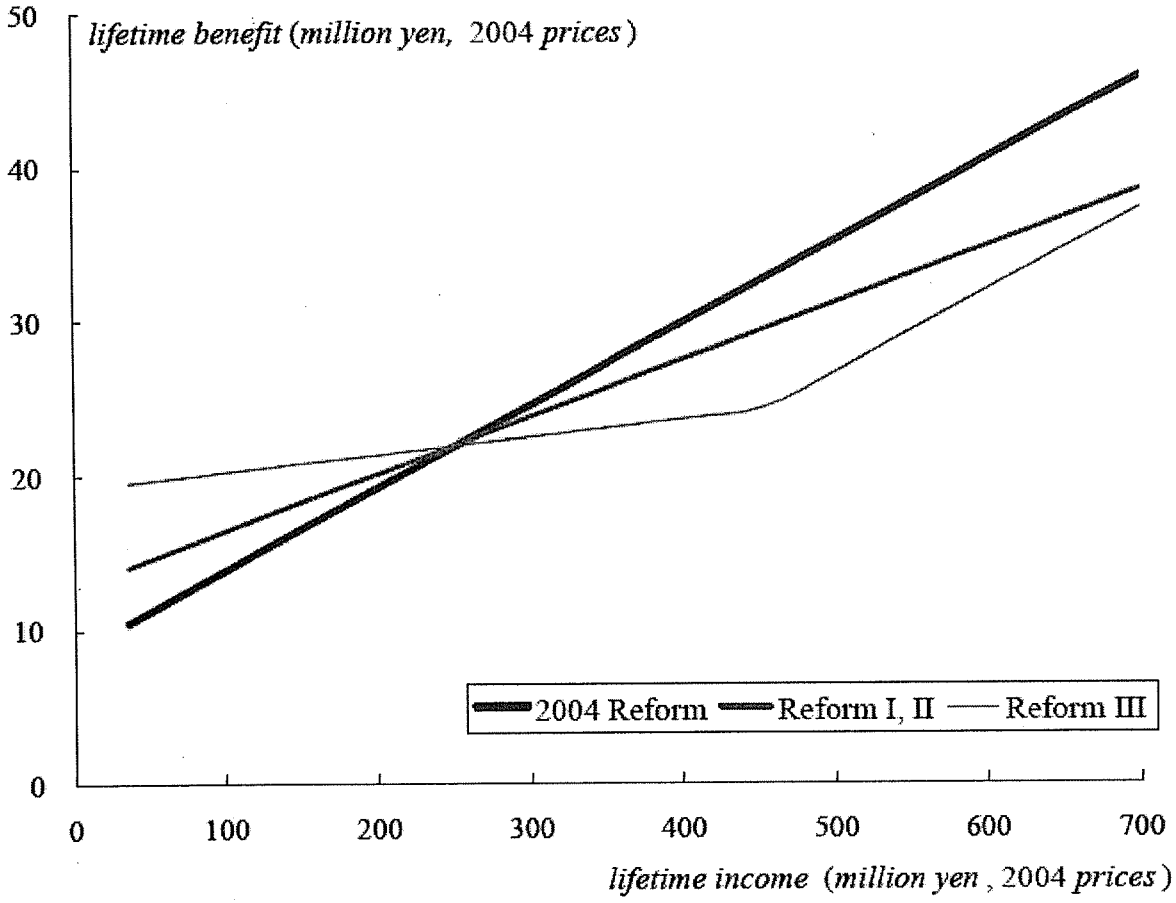
(Note) Excludes employers' social security contributions.
(Source) The author's calculation based on the Annual Report of the Social Insurance Agency 2004.

Table 5: Alternative pension reforms and their impacts on lifetime income distribution

	Basic Pension benefit		Wage-proportional benefit	Post-SS lifetime income			
	Flat-rate benefit (yen, per month)	Adjustment factor (/1000)	Benefit multiplier (/1000)	MLD level	MLD change (%)	SCV level	SCV change (%)
2004 Reform	67,017	-	5.481	0.0662	(- 8.2%)	0.1298	(- 7.1%)
Reform I	100,000 (minimum)	0	3.789	0.0635	(-12.0%)	0.1251	(-10.6%)
Reform II	100,000 (minimum)	-1.692	5.481	0.0635	(-12.0%)	0.1251	(-10.6%)
Reform III	150,000 (minimum)	-4.319	5.481	0.0598	(-17.1%)	0.1193	(-14.7%)

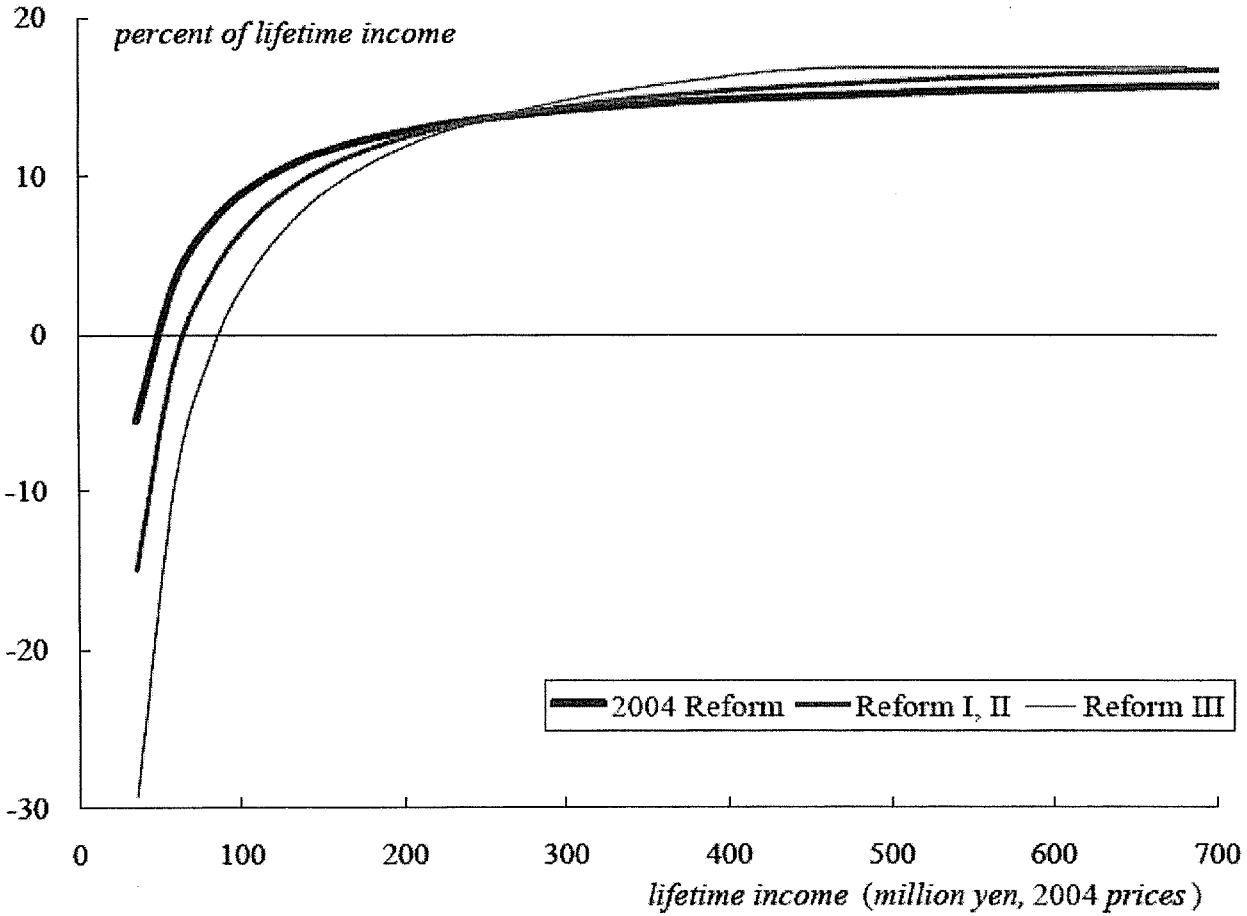
(Note) 1. In the cases of Reforms I and II, Basic Pension benefit = max[Miminum benefit - Adjustment factor * Lifetime income].
2. Changes in MLD and SCV are from their levels for pre-SS lifetime income.
(Source) The author's calculation based on the Annual Report of the Social Insurance Agency 2004.

Figure 2: Estimated benefit



(Note) Based on the estimated lifetime income distribution of the male 1944 cohort.
(Source) The author's calculation based on the Annual Report of the Social Insurance Agency2004.

Figure 3: Estimated net lifetime tax rate



(Note) Based on the estimated lifetime income distribution of the male 1944 cohort.
(Source) The author's calculation based on the Annual Report of the Social Insurance Agency 2004.

Income inequality trends and their challenges to redistribution policies in Japan *

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Abstract

This paper overviews income inequality trends during the 1980s and 1990s and discusses their challenges to redistribution policies in Japan. The key results are summarized as follows. First, widening disparity in market income for the working-age population has been a driving for rising income inequality for the overall society, while population aging has added to its uptrend. Second, wide income inequality for the aged population reflects high rates of co-residency and labor force participation among the elderly. This uniqueness to the Japanese elderly explains the fact that population aging has led to a rise in overall inequality measures. Third, the current scheme of redistribution policies is less effective in reducing income inequality compared to other OECD countries, leaving distribution of disposable income relatively uneven in Japan.

JEL classification: D31, D63

Key words: Japan, income inequality, income redistribution.

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1. Introduction

Income inequality has kept widening in Japan during the 1980s and 1990s, when the country faced both the "bubble" expansion and the subsequent long recession. According to the Survey on Income Redistribution (SIR) conducted by the Ministry of Health, Labour and Welfare (MHLW), the Gini coefficient of pre-tax, pre-transfer (household size-unadjusted) income rose 25% to 0.498 in 2002 from 0.398 in 1984. It is often argued that the SIR tends to indicate a higher inequality than other household surveys, but the uptrend of inequality is commonly observed in most surveys over the past few decades. In addition, a cross-sectional analysis of OECD countries by Förster and Mira d'Ercole (2005) highlights uneven income distribution and high poverty rates in Japan.

The widening trend in income inequality has stimulated debates among economists, sociologists as well as government officials in Japan as to whether the country is moving toward a more unequal and stratified society. Most of all, there is a discrepancy in views on how demographic factors affect income distribution. Some analysts as well as government officials argue that the recent rise in income inequality is due to a larger share of elderly population (see Ohtake and Saito, 1999, Ohtake, 2005, and Cabinet Office, 2006). The other analysts stress that the fact that wider income inequality among the elderly than among the young is unique to Japan (see Yamada, 2002, and Mira d'Ercole, 2006) Also, Tachibanaki (2005) emphasize the momentum for widening inequality within the economy.

This paper extends the literature by overviewing the long-term trend in income inequality and poverty covering most of the 1980s and 1990s and discusses policy issues to be addressed. To be more specific, we first aim to investigate how and why Japan has experienced widening income inequality during the past two decades, in particular by estimating the impact of population aging as well as changes in between-age and within-age inequalities. Then, we focus two age sub-populations: the working-age population (aged 25 to 54) and the aged population (aged 64 or over), and discuss the inequality and poverty trends as well as the impact of redistribution

policies for each age group. In particular, we emphasize the limited impact of social security policies among the young. We also focus on the importance of residential arrangements for economic life of the aged population.

The remainder of the paper is constructed as follows. Section 2 briefly describes the features of the SIR, on which our empirical analysis is based. Section 3 summarizes the trends in income inequalities during the past two decades and examines the extent to which population aging can explain a widening of income inequality. Sections 4 discusses income distribution and the impact of redistribution policies for the working-age and aged population, respectively. Section 5 conducts some policy simulations to examine the redistributive impact of the current tax and social security programs. Section 6 discusses the empirical findings and presents their policy implications. Finally, section 7 concludes.

2. Data

Our empirical analysis is based on the micro data from the SIR, which is conducted by the MHLW every three years. Unlike other household surveys, this survey primarily aims at measuring income distribution and the effects of redistribution policies. As emphasized by Mizoguchi and Takayama (1984) and Tachibanaki and Yagi (1994), the SIR is one of the most suitable household surveys for analysis of income distribution given its inclusion of a wide variety of households (including single-person households) and reliability of reported income. We use the micro data from seven SIRs, from 1984 to 2002[1].

We look at three income measures: market income, gross income (market income plus social security benefits) and disposable income (gross income minus tax and social security contributions). Market income is defined as the sum of a) wages and salaries, b) self-employed income, c) asset income, d) occupational pensions and retirement allowance from companies, and e) private remittance received, such as

[1] Information about income reported in each survey is from the previous year, but we refer to the survey year in this paper.

payment from life or other insurances[2]. In this paper, only cash benefits (public pension benefits, child allowances, public assistance, and others) are included in social security benefits. Health expenditure is not included in them[3]. Tax includes national and local income taxes, immobile property tax, and automobile tax, but not consumption tax. Social security contributions include only the employees' part, but not the employers' one.

In the empirical analysis, we scale all income by an equivalence scale to account for household size: counting the first adult (aged 18 or over) as one, the second adult as 0.7 and each other adult and child (aged 0-17) as 0.5[4]. We use the equivalized household data in section 3, while we use individual data in sections 4 and 5 assuming that all members of a household have the same equivalized income.

In our analysis based on the household data in section 3, we bottom-code income at 1% of mean income and top-code it at ten times the median income in every survey year for both market and disposable incomes, following Gotteschalk and Smeeding (1997) and others. Such bottom-coding and top-coding are required because most measures of income inequality are sensitive to outliers. Excluding those households, the range of the sample size falls to between 6,320 (in 1984) and 7,873 (in 1990) households in section 3, which is about 90 percent of the original size. In section 4, the sample size is between 21 thousand (in 2002) and 28 thousand (in 1990) individuals.

It is often argued that the SIR tends to indicate higher income inequality, especially on a market income basis, compared to other household surveys in Japan[5]. The key reason is that the SIR does not include pension benefits in market income, presumably raising income inequality on a market income basis compared to some surveys that include them in market income. We do not need to worry about this criticism since we

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[2] Lump-sum income is divided by ten when and only when calculating inequality measures, in order to avoid arbitrary fluctuations of the results.

[3] Health service shares a majority of in-kind benefits, and the reliability of its data is much lower than that for cash benefits.

[4] However, original (not equivalized) individual income is used when and only when considering contribution level of the working-age population.

[5] Funaoka (1999) and Umetani (2000) compared several household surveys on income and expenditures from a viewpoint of The Gini coefficients, and pointed an upward bias of income inequality in the SIR.

focus on disposable income as well as market income, and we aim to discuss the impact of redistribution policies, including public pensions.

Another factor to raise income inequality in the SIR is that the Survey includes single-person households whose income levels are generally lower than those of households of two or more members, while other surveys do not cover single-person households or cover only a limited portion of them. We include single-person households in our analysis adjusting for household size, because we believe that by doing so a more precise and comprehensive picture of income distribution for the overall society can be obtained.

3. An overview of income inequality trends

3-1 Widening income inequality and rising poverty

We start with overviewing the trend in income inequality during the past two decades. We focus on four inequality measures: (1) The Gini coefficient, which is one of the most conventional measures and also used in the MHLW's official reports on income redistribution; (2) the coefficient of variation (CV), which is defined as the ratio of the standard deviation to the mean income; (3) the mean logarithmic deviation (MLD), which is defined as the average of logarithm of the ratio of the mean income to each individual one; and (4) logarithmic variation (LV), which is the variance of the logarithm of income.

Table 1 shows how these inequality measures changed during 1981 and 2002 both for pre-tax, pre-transfer and disposable income. For the Gini coefficients we also show the MHLW's official figures for household size-unadjusted income for comparison (Gini-MHWL). The official figures are somewhat lower than our estimates, but there is no significant difference to our figures in both the levels and trends of inequality.

We can confirm the following facts from the table. First, income inequality of market income widened substantially between 1984 and 2002. For example, the Gini coefficient rose 43 percent during that period to 0.472 in 2002 from 0.369 in 1984. Comparing the two periods of nine years1984-1993 and 1993-2002–we find that the

pace of rising inequality was somewhat faster in the former period–at 1.7 percent compared to 1.0 percent at an annual rate–as already pointed out by several preceding studies.

Table 1. Long-term trend in income inequality

	1984	1987	1990	1993	1996	1999	2002
Market income							
Gini	0.369	0.381	0.399	0.404	0.411	0.441	0.472
(Gini-MHWL)	(0.398)	(0.405)	(0.433)	(0.439)	(0.441)	(0.472)	(0.498)
CV	0.787	0.779	0.836	0.813	0.829	0.885	0.927
MLD	0.385	0.436	0.499	0.539	0.575	0.676	0.807
LV	1.177	1.281	1.378	1.451	1.506	1.633	1.782
Disposable income							
Gini	0.308	0.302	0.320	0.313	0.312	0.326	0.335
(Gini-MHWL)	(0.358)	(0.356)	(0.364)	(0.365)	(0.361)	(0.381)	(0.381)
CV	0.651	0.613	0.677	0.650	0.651	0.697	0.711
MLD	0.166	0.156	0.187	0.180	0.177	0.196	0.202
LV	0.586	0.567	0.641	0.635	0.623	0.655	0.655
Relative poverty rate (%)	11.7	10.3	12.4	13.3	13.2	13.8	14.8

(Note) Based on an an equivalized household income basis, except for Gini-MHWL.
(Source) Authors' calculations based on the microdata from the Surveys on Income Distribution: 1984-2002.

Second, a rise in the inequality measure of disposable income was much lower than that of market income. In the case of the Gini coefficient, the former rose 17 percent while the latter rose 43 percent between 1981 and 2002. The discrepancy between the trends of two types of income suggests that redistribution policies succeeded at least partially in preventing income inequality from widening at least on a macro level. In fact, the Gini coefficient of disposable income declined 29 percent from market income in 2002, much more than the 13 percent in 1981 due to taxation and social security policies. A reduction in inequality *per se* is welcome, but it should be noted that population aging tends to automatically raise between-age income transfer through public pensions and other social security programs. This makes it difficult to assess the redistributive effects of social security policies (see Oshio, 2006).

The two facts mentioned above, which can be observed also in other indices. On the whole, we can summarize that income inequality has been widening in Japan during the 1980s and 1990s especially for market income. Table 1 also shows the trend of the relative poverty rate, which is defined as the share of households whose income is below 50 percent of median income. The rate rose substantially to 14.8% in 2002 from 8.9% in 1981, indicating that poverty has become an issue to be seriously

addressed, even though the living standard has been improving on average over the period. Indeed, Förster and Mira d'Ercole (2005), whose analysis is based on another household survey, find that Japan now belong to the group whose poverty rate is the highest among the OECD member countries.

3-2 Decomposition of widening income inequality and rising poverty

As is often discussed, one most plausible reason to explain the uptrend of income inequality in Japan appears to be population aging. Theoretically, population aging affects income inequality through two channels. First, the elderly tend to have lower income than the young, so when the share of the elderly in the total population rises, inequality will tend to widen because of larger between-group income differences. The second effect relates to how income inequality among the elderly compares to that of the total population. In most of advanced countries, disposable income is more equally distributed among the elderly than among the young, and this will dampen the increase in overall inequality.

Under population aging, these opposing factors affect overall income distribution. In Japan, however, these factors work in the same direction, because the income of the elderly is lower than that of the young and their inequality is higher (see Yamada, 2002, and Mira d'Ercole, 2006). Both factors mainly reflect the comparatively high labor force participation rate of older people, and their combined effect is to increase income inequality with population aging.

Before decomposing a rise in income inequality in detail, let us look at Figure 1, which compares the age pattern of the Gini coefficients of disposable income in 1984, 1993, and 2002. We divide the households into six age groups of ten-year spans (-29, 30-39, 40-49, 50-59, 60-69, 70+) based on the age of the household head, and calculate the Gini coefficient for each age group. This figure confirms that income inequality widens as age increases, implying that population aging has added to overall income inequality. At the same time, however, we observe that income inequality has been widening especially among the young, while it has been relatively stable for those aged 50 or over. This pattern is most likely to be confirmed when more recent data are

available, judging by the recent trend in the labor market where a share of low-salaried, part-time workers has been rising especially among the young workers.

Figure 1. The age pattern of Gini coefficients for disposable income

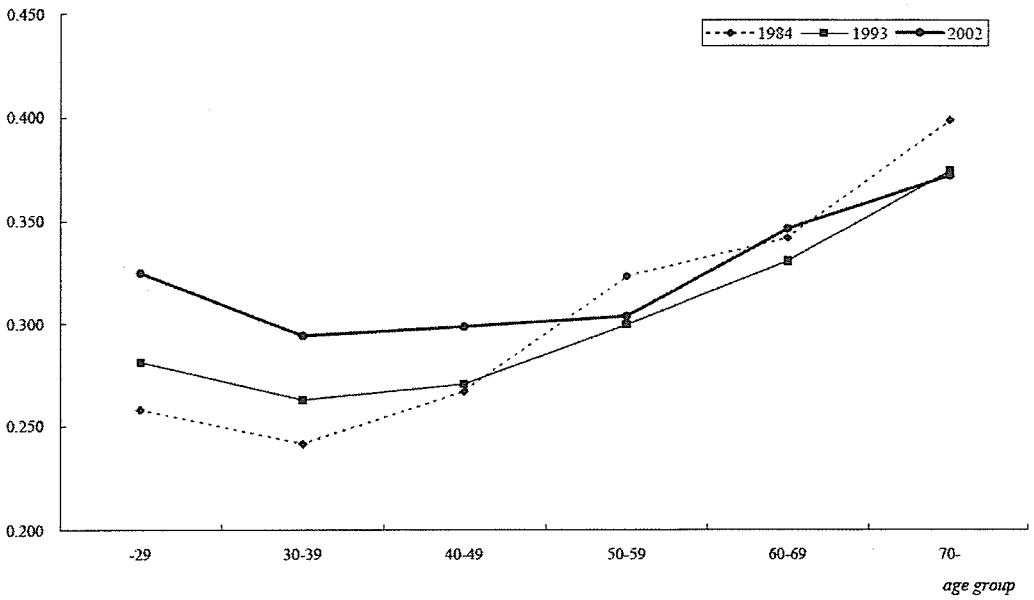
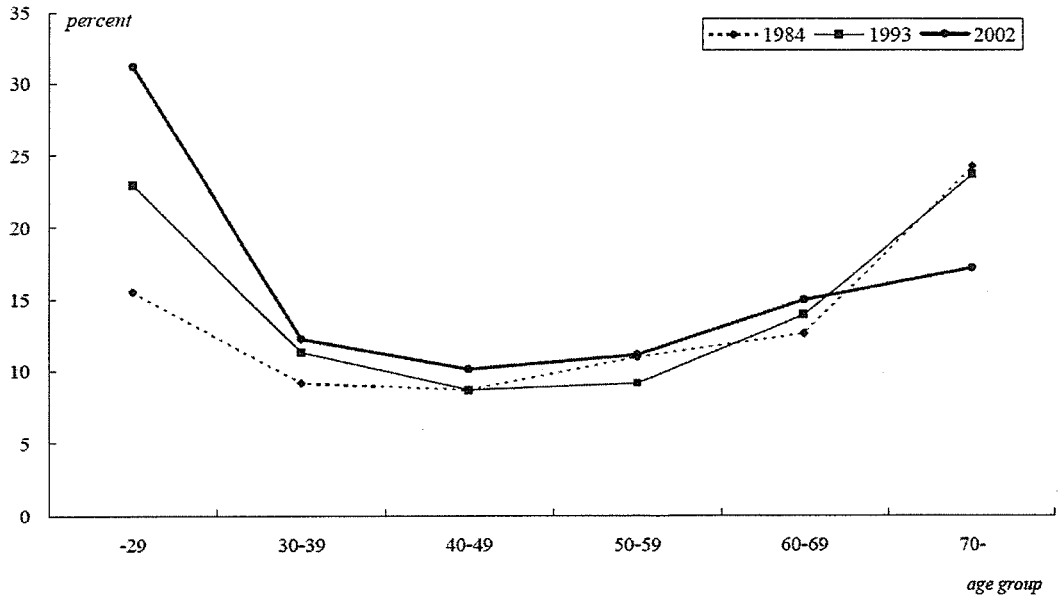


Figure 2. The age pattern of elative poverty rates for disposable income



The same type of change can be observed in the age pattern of the relative poverty rate, which is illustrated in Figure 2 on a disposable income basis. The curve has the inverted U shape, reflecting higher poverty among the elderly and very young. Comparing the curves for three survey years, however, we recognize that the poverty

rate has been rising remarkably among the young, whereas it has been stable or even declining in recent years among the elderly. The structural change in the labor market seems to have deteriorated income conditions for young workers.

These two figures imply that the recent rise in income inequality cannot be explained entirely by demographic factors. A wider gap in wage income and working status appear to have led to more uneven income distribution, even after redistribution policies. Then, we try to more quantitatively gauge the degree to which population aging can explain a rise in income inequality. Our analysis is based on a modification of the method which was originally suggested by Mookherjee and Shorrocks (1982) and has been applied in a series of OECD studies and other studies of income distribution. To decompose changes of the MLD over time (over periods 0 and 1), we have

$$\Delta MLD = MLD^1 - MLD^0 = \sum_{g=1}^{m} \overline{\alpha}_g \Delta MLD_g + \sum_{g=1}^{m} \overline{\alpha}_g \left(\ln \frac{\bar{y}^{01}}{y_g^1} - \ln \frac{\bar{y}^0}{y_g^0} \right) + \sum_{g=1}^{m} \left[\overline{MLD}_g + \overline{\ln\left(\frac{\bar{y}}{y_g}\right)} \right] \Delta\alpha_g + \sum_{g=1}^{m} \overline{\alpha}_g \left(\ln \frac{\bar{y}^1}{\bar{y}^{01}} - \ln \frac{\bar{y}^0}{\bar{y}^0} \right),$$

where $\bar{y}^{01} = \sum_{g=1}^{m} \alpha_g^0 y_g^1$ is the mean income holding the age structure constant and the bars on $\alpha_g, MLD_g, \text{and} \ln(\bar{y}/y_g)$ refer to their means during the period, respectively. The first term on the right hand side indicates the impact of changes in inequality within each age group keeping the structure of the population constant. The second term indicates the impact of changes in inequality between age groups, with the structure of the population constant. And the sum of the third and fourth terms reflects the demographic effect due to changes in the population structure, keeping both the within-group and between-group components constant[6].

Table 2 summarizes the decomposition of the trends in the MLD over the period from 1984 to 2002 and two sub-periods of nine years. For the increase of the MLD for market income (0.422) over the whole period, 32.8 percent was caused by the

[6] We can apply almost the same methodology to LV. We do not report LV results to save space, because their pattern is basically the same as that of MLD results.

demographic effect (0.138). It confirms that population aging was a key factor of widening inequality during the 1980s and 1990s. However, the within-age effect (0.222) was more important, accounting for 52.6 percent of the change. Dividing the whole period into two nine years, we find that all the three factors increased their contribution to widening inequality in the latter periods. In the case of disposable income, the impact of the demographic factor was much more limited and the within-age factor has dominated an overall increase in income inequality.

Table 2. Decomposing a change in MLD

(1) Market income

ΔMLD	1984-93	1993-2002	1984-2002
Total	0.154	0.268	0.422
within-age	0.089	0.132	0.222
between-age	0.018	0.030	0.062
demographics	0.047	0.106	0.138

(2) Disposable income

ΔMLD	1984-93	1993-2002	1984-2002
Total	0.014	0.022	0.036
within-age	0.018	0.019	0.034
between-age	0.003	-0.005	0.001
demographics	-0.007	0.007	0.001

(Note) Based on an equivalized household income basis.

(Source) Authors' calculations based on the microdata from the Surveys on Income Distribution: 1984-2002.

3-3 Income growth and income distribution

The analysis in the previous subsection implies that the economic factors have largely determined the income inequality trends, even though demographic factor has significantly contributed to widening inequality. In fact, the decomposition of widening inequality reveals that a significant portion of a rise in MLD is attributable to the within-age factor, which corresponds to wage and other income discrepancies. This subsection focuses on the impact of income growth on income distribution from a macroeconomic viewpoint. Generally speaking, income growth subdues income inequality by raising the mean average with other things being equal, because all inequality measures are determined by the relation between the mean and variation of income. The Japanese economy faced both the "bubble" expansion and the subsequent long recession during the 1980s and 1990s, so it is plausible to hypothesize that rapid

income growth subdued inequality widening during the 1980s, whereas sluggish income growth added to it during the 2000s.

We examine this issue in two ways. First, we conduct simple counter-historical simulations on a disposable income basis: we tentatively assume no change in the mean income between the two survey years and examine how the values of inequality measures would change from their actual ones. This change can be roughly interpreted as the impact of income growth on income distribution; if the simulated value is higher (lower) than the actual one, we can conclude that income growth increased (decreased) income inequality[7].

Second, we conduct kernel density estimation, which is an alternative to using traditional summary statistics to measure income inequality. It provides a picture of the entire income distribution in terms of the income density function, from which we can observe the distribution's location, spread, and modality. It can also capture absolute changes in income levels via shifts in the density function to the right or left. Hence, it can show that increases in inequality arise from a variety of changes in the shape of the density function (see Burkhauser, *et al.*).

Table 3 summarizes the results of the counter-historical simulations, which are mentioned above. We first subtract the mean income in 1984 from that in 1993, and then add the difference to each household's income in 1993, with the variation around the mean intact in 1993. Then, we recalculate the Gini coefficient and CV based on the new 1993 dataset and compare these values to their actual ones. We also do the same calculation for the period between 1993 and 2002.[8] This table highlights a substantial difference in the impact of income growth between the two periods. During 1984 and 1993, the mean income rose 50% to 3,399,000 yen from 22,265,000 yen. If there were no income growth over the period, the Gini coefficient would have been as high as 0.470 in 1993. This level is much higher than actually observed 0.313 in 1993 as well

[7] It should be noted that these simulations are likely to overestimate the impact of income growth on income inequality, because they ignore the impact of income growth on the absolute magnitude of income variation.

[8] We did not conduct this simulation for MLD and CV, because some low-income households would face negative income in the simulation and cannot calculate the logarithm.

as 0.308 in 1984, so we conclude that income growth offset 97.1 percent (=(0.470-0.313) /(0.470-0.308)*100) of the impact of widening variation of income. During 1993 and 2002, in contrast, the mean income rose only 2 percent reflecting the long recession, and income growth offset just 22.2 percent of the impact of widening income variation. These patters are observed in the case of CV, too; income growth succeeded in avoiding any income inequality from widening during the former period, while it offset only 18 percent of the impact of widening income variation.

Table 3. The impact of income growth on income distribution

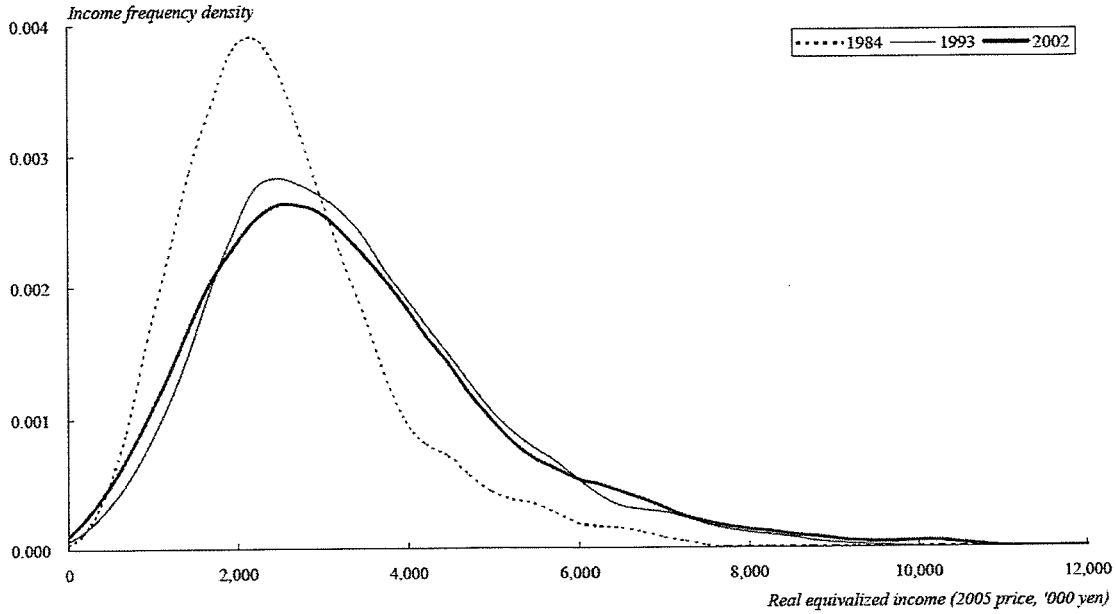
	1984	1993			2002		
	Actual (a)	Actual (b)	No growth (c)	(c-b)/(c-a) *100%	Actual (d)	No growth (e)	(e-d)/(e-a) *100%
Gini	0.308	0.313	0.470	97.1	0.335	0.341	22.2
CV	0.651	0.650	0.975	100.4	0.711	0.724	18.0
Mean ('000 yen)	2,265	3,399			3,463	3,399	

(Note) Based on an equivalized disposable income basis.
No growth cases assume no growth in the mean income during the past nine years.
(Source) The author's calculation based on the microdata from the Surveys on Income Distribution: 1984, 1993, and 2002.

Kernel density estimation graphically depicts the change in the impact of income growth. Figure 3 compares distributions of disposable income for the working-age population (aged 25 to 54) in 1984, 1993, and 2002, where all income data are evaluated at 2005 prices based on the Consumer Price Index. We here present income distribution for the working-age population rather than the total population to focus on the momentum for widening inequality in market income.

This figure shows that income distribution had the traditional inverted U shape with the great mass of the population bunched around the mode of the distribution in all the three survey years. However, we find a big difference in the shift of the curve between 1984 and 1993 and between 1993 and 2002. During 1984 and 1993, we observe two changes. First, the curve became much flatter with the middle mass around the mode falling, pointing to more uneven income distribution. Second, the curve moved to the right and vast majority spilling toward the higher tail of the distribution. This change reflects an overall increase in income during the period. A combination of these two changes made widening inequality relatively limited.

Figure 3. The shape of disposable income distribution for the working-age population



During 1993 and 2002, in contrast, the curve became flatter, albeit to less extent compared to the previous period, and moved slightly to the left reflecting a reduction in real disposable income. Both of this change added to income inequality. Long economic recession after the burst of the "bubble" economy allowed income inequality to widen during the period, consistent with the results of the counter-historical simulations.

4. Income distribution by sub-populations

4-1 Income distribution of the working-age population

This section examines the trend of income inequality by age. We focus on two sub-populations: the working-age population as individuals between 25 and 54 years old and the aged population as individuals 65 years old or over. We exclude those 55-64 years old, who are considered to be in transition from work to retirement and not suitable to treat as the working–age population in a narrow sense[9].

[9] The mandatory retirement age is 60 in most Japanese firms, but many individuals retire earlier or later than this age.

Figure 4. Average market income, gross income and disposable income according to disposable income decile for the working-age population : 2002. Median = 100 %

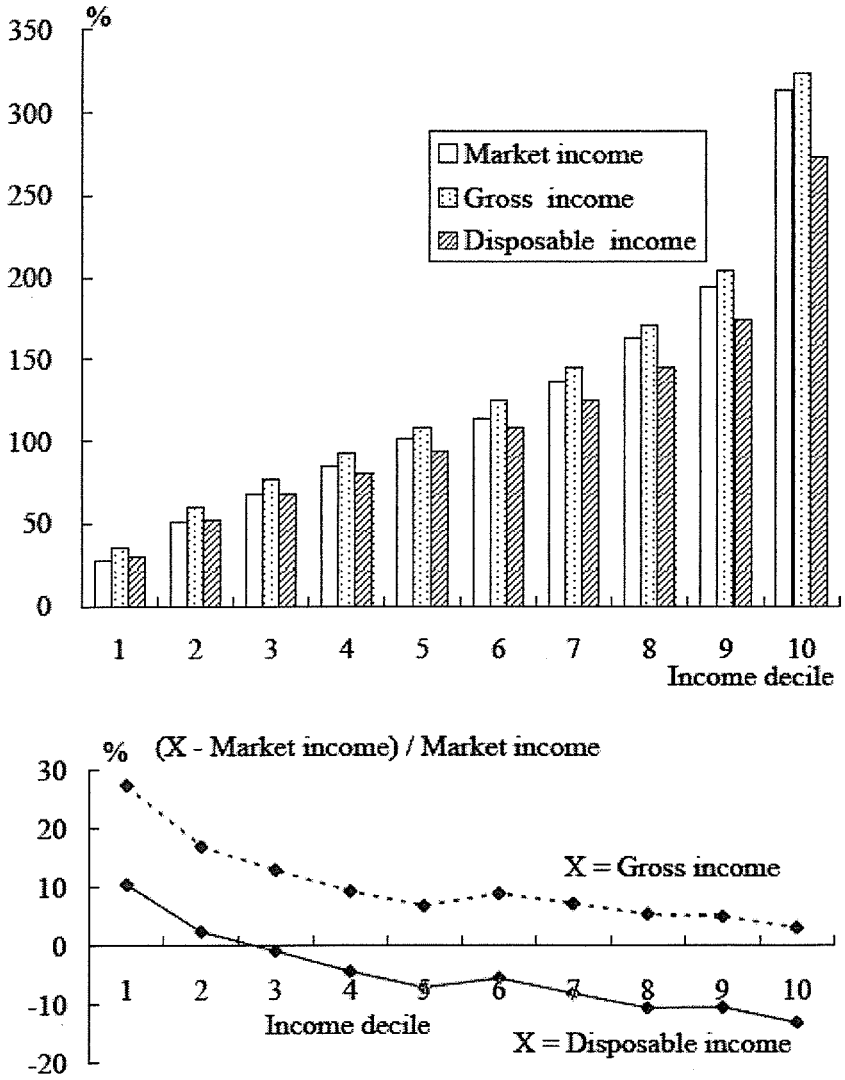
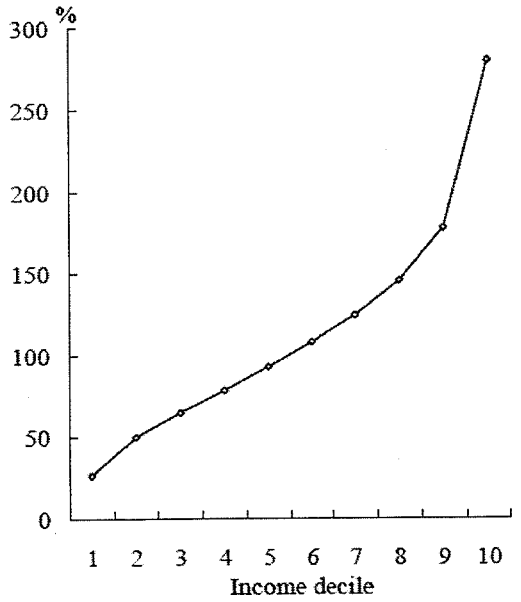


Figure 4 compares average market income, gross income and disposable income according to disposable income decile for the working-age population in 2002. Compared to the median disposable income of the working-age population, average market income of the lowest decile was 27 percent and that of the highest decile was 314 percent. The role of social security cash benefits is rather limited, increasing average gross income of the first decile only 27 percent from market income. The progressiveness of total contributions (direct taxes and social security contributions) is also limited, decreasing average disposable income of the tenth decile only 13 percent from market income.

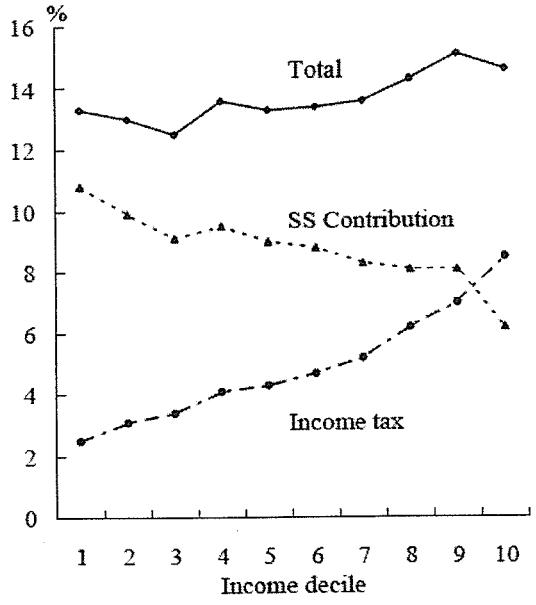
The above observation can be more clearly shown in Figure 5. Figure 5 (a) shows average original (not equivalized) disposable income of individual persons aged 25-54 according to disposable income decile in 2002. The median of individual disposable income is about 2.5 times the median of equivalized disposable income of the working-age population in Figure 4. The shapes of disposable income according to income decile are rather similar in both figures, however. Figure 5 (b) shows the proportion of contributions (direct taxes and social security contributions) to average individual gross income according to individual disposable income decile. Although income tax is progressive, social security contributions are clearly regressive.

Figure 5. Average income and contribution rate according to original disposable income decile for the working-age population: 2002

(a) Average income according to original disposable income decile (Median = 100%)



(b) Proportion of contribution to average original gross income according to original disposable income decile



4-2 Income distribution of the aged population

The Gini coefficient of disposable income is higher among the aged population than for the total population. The main reason for this is that many elderly stay in the labor market, which results in a large difference of income between those who have earnings and those not. In addition, about half of the aged population live in single or

couple-only households (single/couple elderly), while the remaining half live together with their children (co-resident elderly). To grasp income distribution of the aged population as a whole, we explicitly look at the co-resident elderly as well. In what follows, we compare the patterns of income distribution for single/couple elderly and for the co-resident elderly. As of the co-resident elderly, we divide them into two groups according to the age of household head: younger than 65 years old (-65), and 65 years old or over (65+).

Income distribution for the single/couple elderly

Disposable income for the fully retired is much lower, but much more evenly distributed than those with earnings (Table 4). The Gini coefficient of the fully retired (0.277) is in fact smaller than that for the total population (0.324) in 2002. Because the income of those with earnings is quite unevenly distributed, however, the Gini coefficient of the single/couple elderly as a whole is 0.328, which is slightly higher than that of the total population. Moreover, it is important to note that income distribution for the single/couple elderly has improved since 1990 (Figure 7).

Income distribution for the co-resident elderly

Average disposable income for the co-resident elderly is higher than that of the single/couple elderly, owing to the income of younger generation co-residing with the elderly. If we take only elderly income into consideration (Case E in Table 4), however, average disposable income of the co-resident elderly is slightly lower than that of the single/couple elderly (Table 4). It means that due to co-residence with their children and the sharing of economic resources among individuals in the same household, disposable income of the co-resident elderly increased about 30 percent, and their Gini coefficient fell by 21 percent from 0.427 to 0.337 in 2002.

Table 4 also suggests that among the co-resident elderly, those elderly living in households headed by the elderly have higher disposable income and smaller gain through co-residence than those elderly living in households headed by children. For the co-resident elderly as a whole, income distribution has improved dramatically