NBER WORKING PAPER SERIES

SOCIAL SECURITY AND RETIREMENT IN JAPAN

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Working Paper 6156
http://www.nber.org/papers/w6156

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 1997

This paper was prepared for the NBER Conference on Social Security and the Tax on Work around the World. We thank Professors David Wise, Jonathan Gruber, and participants in the conference for helpful discussions. This paper is part of NBER's research programs in Aging and Public Economics. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

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NBER Working Paper No. 6156
September 1997
Aging and Public Economics

ABSTRACT

We discuss the incentive mechanism of the public pension on the retirement decisions made in the Japanese labor market. Though the labor market participation of Japanese older persons is quite high by international standards, a principle incentive mechanism of the public pension system in Japan affecting the retirement behavior has many things in common with those in other OECD countries. The pension benefits are designed "actuarially unfair," and the decision to work beyond age 60 is penalized. As the population ages quite rapidly, it is wasteful to maintain the disincentive mechanism arising from the actuarially unfair pension scheme for older persons.

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Introduction

While the aging of the population is a common feature for many industrial countries, the most striking feature in the case of Japan is the high speed at which the process is occurring. The reason for this is closely related to Japan's swift economic development, which has triggered rapid social changes, namely falling fertility ratios and rising life expectancies. As a result, the ratio of elderly people - usually defined as those who are over age 65 -- to the working-age population (age 20-64) has risen from 0.10 in 1930 to 0.24 in 1995, and is projected to rise to 0.48 in 2025. This will lead to a large expansion of social expenditures in the coming decades.

Japan's Social Security (SS) expenditures in 1994 amounted to 57 trillion yen, which is 11.9 percent of Japan's GDP in that year, doubling its share of GDP in the past 20 years. The public pension benefits accounted for a large share of total SS expenditures (51.3 percent), followed by medical insurance benefits (38.2 percent). Public pension benefits also account for over 50 percent of the total family income of the average household whose head is age 65 or over. Thus, like other industrial countries, the benefit structure of the public pension program is likely to have important effects on the retirement decisions of older persons.

Nevertheless, there are several important characteristics particular to the case of Japan. One is the high household saving rate, which was 13.2 percent in 1994, compared with 3.8 percent in the U.S. According to opinion polls, the major incentive of the people to save (including older persons), is to prepare for their retirement. Another characteristic is the high level of labor force participation (LFP) of older persons. The average LFP ratio of males between 60-64 and 65-69 years of age were 75 percent and 54 percent, respectively. These high LFP of Japanese older persons are one factor behind the high levels of household savings, as it is likely that people continue to save so long as they work. To what extent these high ratios of both LFP and savings of Japanese older persons are affected by the Social Security system remains a source of much controversy.

The purpose of our paper is to provide an overview of the interaction between Social Security (in particular the public pension scheme), and the labor force behavior of older persons in Japan. The structure of the paper is in line with Diamond and Gruber (1996) who conduct a similar study for the U.S. social security system. In Part I, we examine several key features of the labor market behavior of older persons with specific reference to the recent reversal to the previous trend towards earlier

retirement[1]. In Part II, we describe the basic structure of the Public Pension System in Japan, focusing on the recent major changes in the institutional details concerning retirement behavior. In Part III, we estimate the Social Security Wealth (SSW) of the average employee in Japan, and document the retirement incentives inherent in the current Social Security system. Finally, we present several issues concerning country-specific social security issues and the labor market which are closely related with the social security wealth.

Part I: The Labor Market Behavior of Older Persons

One of the common features in the labor markets in many OECD countries in the postwar period, including Japan, has been the declining participation of older persons in the labor market. In 1960, almost 70 percent of men aged 65-69 were participating in the labor force. By 1990, this figure had fallen to 53 percent, though still high by international standards. There are various factors affecting these declines in the labor market participation, of which improvements in the SS benefits is a significant factor . In this section, we provide some background on the labor market behavior of older persons.

Historical Trends

Figures 1 and 2 show the historical trends of the labor force participation rates of men and women from 1960 to 1995 respectively. For men, there is a decline in the labor force participation rates in those aged 60-64 and aged 65 and above, while those for age 45-59 was virtually flat. For women, the pattern is quite different: For age groups younger than 60, labor force participation increased, while for age groups over 60, the trend towards earlier retirement dominates, although the changes are much less pronounced than in the case of men.

This decline in the labor force participation of older persons in Japan, however, partly reflects the rapidly changing structure in industry and employment. The share

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[1] What "retirement" means in Japan is usually the retirement from the primary firm in which one used to work for long time, and not necessarily that from the labor market. Many Japanese older persons continue to work after the mandatory retirement from the primary firm, moving to the smaller firms with no mandatory retirement but less favorable working conditions.

of workers in agriculture (most of whom are self-employed) over workers in all industries, has fallen from 33 to 7 percent from 1960 to 1995. As a result, the share of the self-employed and family workers in total employment halved to slightly over 20 percent in the same period, although they still accounted for over 50 percent at age 60 and older. The falling ratio of the self-employed sector, where the average labor market participation is higher than that of employees, is one of the major factors behind the falling average LFP ratios.

This decline in the labor force participation is associated with trends in the sizes of pension benefits. Enrollment into a public pension plan is compulsory to everyone in the workforce including the self-employed. The payments of public pensions on the self-employed has little effect on their labor force participation, because eligibility for benefits is not linked with their leaving the workforce, but is granted automatically at age 65. The average benefit level is approximately one quarter of that for employees. On the other hand, the pension benefits to the employees are more significant and are subject to earnings test. The share of employees, who are more affected by public pension policies, in total workers has risen over time from 72 percent in 1960 to 86 percent in 1995, though still low by international standards (Figure 3). This indicates that public pensions become more important for the retirement decisions of the older Japanese workers.

Reversal of the trend towards earlier retirement

An interesting feature of the labor force participation of older persons in Japan is not only its high level but the fact that the long-run pattern of decline has reversed since 1988 and in 1993 it resumed the level attained in the early 1980s. This is particularly prominent in the male age group 60-64, but a similar pattern is observed for the group 65 and over, too. Although many attribute the older people's high levels of labor market participation in Japan to supply side factors such as insufficient SS benefits, these are not plausible factors for explaining the reversal of the trend, as Japan's SS benefits have increased over time.

If we compare the LFP and the unemployment rate of men aged 60-64, the period of the increase of the LFP was affected by the falling unemployment rate of older workers, reflected by the strong demand for labor (Figure 4). While this booming demand for employment was mainly due to cyclical factors, this may well be repeated in the near future. This is because the size of the working age population (ages between 15-64) has already started to shrink from 1995 and this declining trend is projected to continue through the 21st Century: with a constant LFP at each age group, Japan's

labor force will decline by 7.6 percent in 2020 from the 1993 level. This overall decline in the labor force may stimulate the LFP of older persons by providing them with good job opportunities.

Figure 5 indicates the Social Security (SS) replacement rates over time. While the replacement rate has increased steadily over time, there was a sudden jump in 1974 when the public pension scheme was reformed to double the benefit level. In addition, the gradual maturing process of the public pension scheme i.e., an increase in the share of those who have contributed to the pension scheme for the longer time, will also work to increase the average benefit and the replacement ratio in near future.

Recent Labor Market Behavior

For more detailed understanding of the time pattern of labor force participation in recent times, we use the National Census data in 1990. This National Census asks all individuals in the country about their labor force participation at the point of the survey. Also, this is the only survey which publishes the age-by-age labor force participation data.

The age pattern of participation for men and women is shown in Figure 6. At age 45, the participation rate of men is close to full capacity, while 70 percent of women worked in 1990. There is then a gradual decline for men until age 55, at which the pace steepens. There is a sharp drop in participation at age 60, which is the typical mandatory retirement age for major firms. But even after the retirement age, their labor market attachment is relatively strong, and 32% of males still works at age 75. A care need to be taken that there are significant portion of self-employed among the elderly males, who are voluntary part-time workers; they account for 34% and 47% of total employment for age 60-64 and age 65-69 respectively. This implies that the actual unused capacity of human resources at older ages in Japan may well be underestimated. For women, participation falls more rapidly than for men in their 50s, though the pace is almost unchanged up to the age 80s, so that the participation gap between the gender closes beyond age 60. As most older women in the labor market are self-employed, the mandatory retirement system affects the participation of women much less than the case of men.

Figure 6 shows in more detail the allocation of time among men as they age, dividing their activity status into employment, unemployment, and retirement[2]. It is

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[2] Unlike in the United States, we do not have data distinguishing one's retirement and not working.

difficult to take those who are not in the workforce and finding whether they are retired or simply not working in the statistics. Thus, retired persons are defined as those who are not in the labor force, and do not either engage in household works, go to school and seeking for jobs. This same exercise is repeated for women in Figure 7. A particular characteristic of Japanese women at age 40-50 is the high ratio of homemakers; they account for a substantial portion even at age 60s and beyond.

Income Sources of Older Persons

In Figure 8, we examine the public retirement incomes for older persons, which is based on the Basic Survey on People's Life. Figure 90 shows the rate at which public pension and other public assistance is received, mainly from the income maintenance program. Beginning at age 60, the rate of collection of public assistance increases sharply, driven by the collection of SS, until it is over 90 percent for those over the age of 65. Private pensions are not popular in Japan, partly because there are few tax incentives to encourage enrolling in them, and there are many savings and life insurance plans that can substitute for pensions. On the contrary, the large lump-sum severance payments at the time of retirement, which is a substitute for the firm pensions in the United States, play an important role for the savings for retirement (for details, see the section on country-specific practices). While the official data are not available, an ad hoc survey based on a small sample by the Ministry of Post and Telecommunication indicates that the demand for private pension has been rising for the last few years, although the level still remains relatively low (Figure 9).

Finally, Figure 10 shows the distribution of income sources for the family, by the age of the head of the family. We consider the distribution of income across three sources: earnings, capital incomes, public pensions. Wage is the dominant source of family income until age 60, accounting for about 80 percent of total household incomes. Beginning at age 60, earnings and capital income decline, and public pensions grow as a major source of family income. However, figure 13 understates the important role of SS benefits for supporting the living of the elderly. As about two-thirds of elderly persons live with their adult children, and most of them are not heads of the household, they are economically dependent on their children. If we look at the income sources for the older persons individually, instead of the family units, the fraction of public pension is much larger beyond age 60 (Figure 11).

Part II: Key Features of the Social Security System

History of the Social Security System in Japan

The current public pension for private sector employees originated from the Rodosha Nenkin Hokenhou (Pension Insurance for Workers) Act in 1942, following the establishment of the National Health Insurance Act of 1938. Although the major purpose of the Social Security Insurance was to secure the workers' standard of living, such extensive social security reform was only possible in wartime when the government needed all the manpower in exchange for assuring their minimum living standards.

Japan's social security program, consisting of public pension and health insurance schemes, and covering all the people including the self-employed, was established in 1961. Since then, the size of the Social Security expenditures increased at a much faster pace than that of the economy, and grew from 4.9 percent of National Income in 1960 to 9.4 percent in 1975. A major reform of Social Security came in 1973. The pension reform included the introduction of automatic annual increases in benefits with increases in the Consumer Price Index (CPI), maintaining the level of the average pension benefits at 60 percent of monthly wages when the funding scheme is fully matured [3]. Also, there is the scheme providing special benefits for the elderly who had not contributed long enough to receive pension benefits. On the other hand, the health insurance scheme was also reformed mainly to improve benefits. Medical insurance has increased from 50 percent to 70-90 percent of total expenses; also, expensive medical care and care for the elderly (age 70 and above) are covered 100% by the insurance.

However, 1973 was coincidentally hit by the Oil Price Hike and economic growth has decelerated, putting an end to the High Growth Period of 10 percent average economic growth since the early 1950s. Moreover, the total fertility ratio started to decline in 1975 from about 2.1 to 1.4 in 1995, while the male and female life expectancy at age 65 has increased substantially from 13.7 and 16.6 years to 16.7 and 21.0 year respectively. Both economic and demographic factors have worked unfavorably for the Social Security program, putting strong pressure in the form of widening fiscal deficits.

The most recent public pension reform in 1994 intended to mitigate the demographic pressure on the Social Security program. First, pension premiums are to

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[3] Age specific disability data are not available. Also, in Japan, disability is clearly defined as those arising from either injury or disease, and not from mere declining working ability.

be raised to a level slightly lower than 30% of monthly wages in the Year 2025 . Second, pension benefits are linked to wages net of taxes and social security premiums i.e., the higher the taxes and SS premiums imposed on the working generation, the lower the pension benefits of the retired, thus balancing the inter- generational equality. Third, the eligibility age for the flat pension component of the employees' pension is scheduled to be raised from the current age 60 to age 65, starting 2001 for one age in every three years.

1.2 Major features of the public pension scheme

Japan's public pension scheme consists basically of two pillars: one is the Basic Pension for the self-employed and unpaid family workers; the other is for employees who are both in the public and private sectors. The pension benefits for employees consist of two parts: one is the Basic Pension which they have in common with the self-employed, and the Earnings-related Pension.

The Basic Pension is mainly for non-employees, the self-employed and unpaid family workers. It is a simple scheme, and has little effect on retirement decisions, because the benefits are relatively small (the average benefit was 43 000 yen per month in 1995), and are subject to no earnings criteria. It is based on a flat tax and flat benefit structure, and is organized on an individual unit basis, i.e., both husband and wife pay premiums and receive benefits individually, thus there are neither benefits for dependent spouses nor survivors.

On the other hand, the pension schemes for employees are organized on a family unit basis, and dependent spouses are basically covered by the pension of the former employees. In addition, dependent spouses are provided as an individual the Basic Pension from age 65 and the survivors' pension benefits, which is equivalent of two-thirds of the full pension. The earnings-related pension is designed to extend a similar standard of living of an individual during his work life after his working life is over, and payments are proportional to the contributions related to wages in the past, subject to a ceiling. The average amount of the benefits was 168 000 yen per month in 1995. Contrary to the pension scheme for the self-employed, the employee-pension can greatly affect the retirement decision of an individual. Thus, in the following sections, our discussions will center around the pension schemes for employees.

Pension schemes for employees

There are eight public pension schemes covering various types of employees, and the Kosei Nenkin Hoken (KNH, Employees Pension Insurance), dominates as the

largest public pension scheme for private sector employees, covering 85 percent of the total employees. Thus, we focus on the KNH to represent the earning-related pension for employees. The public pension for employees is financed by premiums which are paid by employees and employers in equal proportions, and the total premium paid was 16.5 percent of monthly wages[4] in 1995 (i.e. both employee and employer pay 8.25 percent each).

An additional contribution of 8 percent of monthly wages is devoted to Health Insurance for private sector employees. The Social Security Fund, consisting mostly of pension funds, which amounted to 3.5 percent of GDP in 1995, receives interest from the Fiscal Investment and Loan Program (FILP) [5]. In addition, there are government transfers financed by general taxes equivalent to one-third of the total benefits of the Basic Pension and administrative expenses. Though the public pension fund is subsidized by the central government, it is on a completely separate budget from the general budget account, and the surplus cannot be used to reduce the government deficit.

The eligibility of public pension is based on age. All individuals between 20 and 59 years of age are obliged to participate in their respective public pension programs. Most of the contributions (and income taxes) are automatically deducted from their wages by the company, excluding those who work in small firm. However, those aged above 65 are not automatically qualified to enroll in any public pension scheme, even though they may continue to work [6]. The individual pension assets are transferable to other schemes when one changes his job, as in principle, an individual is eligible to receive only one pension.

Pension Benefits

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[4] Care should be taken that the monthly standard wages exclude semi-annual bonuses, accounting for a quarter of annual earnings. The replacement rate of pension benefits to annual earnings is slightly below 50%, which is on a comparable basis to those other OECD countries.

[5] FILP is the Government financing program directed mainly to public infrastructures which are supported by the funds mainly from the public pension funds and postal savings. FILP has played an important role for providing funds for social capital, particularly during the High Growth Period.

[6] Even after 65, an individual can voluntarily contribute to the Earnings-related pension unless he already receives the pension benefits.

An individual's benefit amount is determined by the following steps: A worker's monthly wages (excluding semi-annual bonuses) are converted into Hyoujun Houshuu Getsugaku (HHG), the standard average monthly earnings), indexed by a national wage index. HHG is divided into thirty brackets that range from 92 000 yen to 590 000 yen. This real wage history is averaged over the employee's entire period of coverage up to age 64. A particular characteristic of the Japanese system is that the total length of the contributing periods for the earning-related portion of KNH is not fixed (regardless of how many years one has worked), and only the age limitation (age 65) exists [7].

In this sense, the additional years' work plays an important role in increasing the benefits in the earning-related component of the employee's pension. For example, a worker who left his firm at age 60 and continues to work in another firm with much lower wages can still increase his pension benefits, as the positive effect on the pension benefits from an additional year of work will more than offset the negative effect arising from the lowering average contribution rate.

Workers can claim KNH benefits before the Normal Retirement Age, which is currently at 60, but is legislated to increase gradually to 65 starting from 2001. Between 60 and 64, the payment of pension benefits is subject to an earnings-test (see below). Beyond 65, the recipient has the option of delaying the receipt of the full pension benefits. For workers reaching age 65 in 1996, an additional 12 percent of pension benefits are paid for each year that the collection of benefits is delayed. This amount will steadily increase until the additional rates reach 88 percent starting at age 70.

Zaishoku (early retirement) Pension

While one can claim the Zaishoku pension benefits as early as from age 60, receipts of SS benefits is conditional on getting a certain score on the "earnings test" on wages (but not other incomes nor assets) until the worker reaches age 65. This scheme corresponds to the early retirement systems in many other OECD countries. That is, if one earns more than a certain floor level, SS benefits (PENWt) are reduced for each additional dollar of earnings (Wt), until at high earnings one may not qualify at all. For example, if an individual earns even a small amount, the benefits are automatically reduced by 20 percent. Benefits are reduced for any earnings above 220

[7] There is the maximum years of contribution (30 years) in the flat pension for the self-employed.

000 yen per month by 50 percent of the full pension benefits (PENF60) for each additional increment of earnings. Benefits are reduced by 100 percent for anyone who earns more than 340 000 yen [8]. The formula is shown as the following:

PENWt = PENF60 for Wt = 0
= 0.8 * PENF60 for 0 < Wt < 22-0.8 * PENF60
= 11-Wt/2 + 0.4*PENF60 for 22-0.8*PENF60 < Wt < 34
= 28-Wt 0.4*PENF60 for 34 < Wt < 28+0.4 PENF60
= 0 for 28 + 0.4 PENF60 < Wt

These thresholds on the earnings test increase every five year with average earnings in the economy.

Full Pension

The full pension of KNH for which one is eligible at age 65 is quite generous by international standards. First, the pension benefits are not subject to any earning tests. Second, no contributions are imposed on earnings if one reaches the age 65, as he is not considered as a contributor even though he may be working full time. Third, there favorable income tax measures on pension benefits compared with the those on earnings, and most of the recipients are exempt from paying income taxes. Thus, the full pension benefits from age 65 do not exert a lot of influence in retirement decisions .

Benefits to dependent spouses

There are additional pension benefit provisions to those who have dependent families. Dependent spouses of SS beneficiaries receive additional benefits, which are Kakyu (supplementary) pension, dependent spouses' own Basic pension, and survivors' benefits [9]. First, Kakyu pension benefits for the dependent spouse is 226 000 yen per year, and the same amount is provided to the first two dependent children under the age of 18, and 75 300 yen is paid for the third and any younger children [10] . Second,

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[8] This rate of reduction of the pension benefits with higher wages have lowered substantially to prevent the disincentive mechanism for the old workers since 1995, but de facto 50 percent effective income tax still remains.

[9] The definition of dependent spouses is who earn less than 1.1 million yen annually, and are not obliged to pay premiums.

[10] Frikae (replacement) pension benefit is replaced by Kakyu pension when dependent spouses reach age 65. This is a temporary provision for older persons with certain reduction rates based on the year born multiplied to Kakyu pension. The

dependent spouses are entitled to have their own Basic Pension from age 65 with no additional contributions compared to singles or economically independent spouses with the same income levels. This is for the protection of dependent spouses who are divorced at older ages but have no individual pension. Third, surviving spouses receive three quarters of the full pension benefits, beginning at age 60. Not only economically dependent spouses, but dependent children, parents, grandchildren, and grand-parents are also eligible for these benefits.

The pension benefits for dependent spouses are somewhat complicated when they have their own earnings because they would have their own pensions. Economically independent spouses are obliged to choose either the survival benefits or their own pension benefits. Since 1995, they have the option of receiving half of each, although the fact that independent spouses cannot receive both survival benefits and their own pension benefits remains [11]. This raises equality issues about the significant differences in the lifetime pension benefits collected between workers with the same level of earnings but may or may not have dependent spouses. In addition , the system may well discourage dependent spouses from working full- time. Indeed, several studies indicate that dependent spouses deliberately restrain their annual earnings in order to maintain their status.

Disability pension

The disability pension is the income that workers physically unable to participate in the labor market will receive to sustain their standard of living. Those who are qualified for the disability pension are eligible for the benefits regardless of their age after 20. The benefits are calculated in a similar way to retirement pensions, and additional benefits of 25 percent are provided to those who are considered to have a "first class" disability. Or, one can collect a disability basic pension amounting to 785 500 yen per year regardless of the length of contributing periods. One can choose either of the two disability pensions.

There were 285 000 recipients of the disability pension (3 percent of the old age

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more recent years spouses are born, the less they receive, and none for those who were born beyond 1965.

[11] A rationale for this adjustment is that both survivors' benefits and own pension benefits are subsidized by the government. The earnings-related pension did not originally consider the case that households in which both husbands and wives work have become so prevalent.

pension) and the average benefit was 102 000 yen per month (60 percent of the old age pension benefits.) in 1994. The eligibility conditions for the disability pension are rather strict. Most of the disabilities must originate from injuries, and physical disabilities that occur with age are not sufficient for eligibility for the disability pension; thus, it is hardly the case that disability pensions are used as a source for financing earlier retirement in Japan.

Wage subsidies

Another social insurance benefit which potentially interacts with public pension program is the wage subsidies program to working older persons, which was established in 1994 as a part of the public employment insurance scheme. These subsidies of 25 percent of the current wage (Wt) are provided to those who are aged 60-64 years and receive a wage which is at least 15 percent lower than they had at the time of normal retirement age of 60 (W0), subject to a certain wage ceiling [12].

Wage subsidies (Sub) to these older workers are set based on the following formulas:

$$\begin{aligned} Sub &= 0.25\ Wt && \text{for } Wt < 0.64*W0 \\ &= (13.6W0-16Wt)/21 && \text{for } 0.64*W0 < Wt < 0.85*W0 \\ &= 0 && \text{for } 0.85*W0 < Wt \end{aligned}$$

The first formula is the one that applies to most older persons, as their wages after mandatory retirement fall by about half on average.

This wage subsidy program is an entirely different scheme from the public pension, but its economic implications are similar to that of the Zaishoku pensions for age 60-64. Both are available to the same age group, and are subject to certain earning criteria, thus affecting retirement decisions. We treat this wage subsidy in the same way as the pension premiums; both affect SS wealth negatively. As the wage subsidies of 25 percent well exceed the employees' share of pension premiums (8.25 percent), the combined effects would increase the net public pension assets of an individual.

Hazard rate

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[12] This wage subsidies program was introduced in order to encourage the older persons who receive unemployment compensations to work. While the maximum periods of the unemployment compensation is 300 days, this wage subsidies are provided for 5 years starting at age 60.

An effective indicator of the effects of the country-specific Social Security system on labor force participation trends is the "hazard rate" out of the labor force for men and women. This is measured as the increase in the labor force leaving from the previous age, relative to the stock of workers participating at the previous age. However, this indicator is susceptible to age-by-age population changes, and is not appropriate to examine the exit pattern of older persons in Japan.

Thus, we instead show for reference the hazard rate of the labor force participation rates -- the percentage point changes in the participation rates from the previous year -- for men and women (Figure 12). We see a large dip in this ratio at age 60 for men. This is obviously the result of the general practice of mandatory retirement. However, it also suggests that SS has a role in explaining the retirement behavior of men, as age 60 is the age of eligibility for SS benefit, just as in the United States. In addition, there is another large dip at age 65, which corresponds to the eligibility age for full pension benefit without the earnings test criteria. On the other hand, the dip at age 60 is less pronounced for women, since retirement for women rises consistently through age 50s, because many women in their 50s are part-time workers, and the SS benefits do not work as retirement incentives for older women.

Part III Survey of Previous Studies

There have not been many empirical studies conducted in Japan concerning the interaction between SS benefits and retirement. This discussion draws on Takayama (1992), Seike (1993), and Tachibanaki and Shimono (1994). First, Takayama (1990) used the micro data set from the National Survey on Family Income and Expenditure (1984), and estimated the pension wealth and analyzed the re-distributional effects of public pension. Takayama (1992) also examined the probability of retirement for dependent employees with various classes of pension benefits in the 60-64 age group, and found a significant negative relationship. Moreover, the marginal effect of an increase in benefits on retirement is large for individuals on the low end of the benefit range. Similar results have been shown by Tachibanaki-Shimono (1980).

Second, Seike (1993), following previous work by Ward (1984), estimated the pension wealth of an average employee having a dependent spouse and its annual changes. He found that the changes in pension wealth as a proportion of annual earnings before retirement turned to negative at age 60 when pension benefits are provided. This is consistent with a large fall in the labor force participation.

However, the concept of Seike's Social Security Wealth is of a gross nature i.e., premiums are not subtracted. Also, the expected value of the survivors' pension is not accounted for, as his pension wealth is more individual-based than ours. While there is room for argument as to what extent the concept of SSW should be widened, we take a wider view accounting for various factors affecting the retirement decision of an individual including wage subsidies specific to the age 60-64 group (see below).

Part IV: Retirement Incentives

In this section, we use a representative household to assess the incentives of SS benefits on retirement through accrual rate effects, and the variations with alternative assumptions. There was a major reform in the Japanese public pension scheme in 1994, but the following analysis is based on the pre-1994 reform which was consistently able to explain the labor market behavior in the previous section. The effect of the 1994 pension reform will be discussed in the final section of this paper on country-specific analysis.

4.1 Modeling Social security Benefits

In Japan, the Social Security Administration's official data that record the individual history of wage earnings and SS tax payments are not available to us. Thus, we use instead data in published sources. The basis for our analysis is the Basic Wage Survey by the Ministry of Labor. This survey is published annually, and each firm submits a report with data indicating the average worker's wage with these characteristics: age, years of work experience at a particular firm, education, firm size, occupation, and industry. We apply the average monthly wage of a worker in the following way.

We present a typical Japanese household, headed by a man aged 65 years in 1995 (born on April 1st in 1930, as the Social Security data is on a fiscal year basis in Japan), whose wife was born in 1933 and has no work experience. He is a high school graduate (as are about 50 percent of the male dependent employees in 1995) and had worked in the same firm from the age of 20 until the normal retirement age of 60. At age 60 he left the firm and started to work in another firm. We assume that he worked full-time in both firms. Their children are already grown, and are now economically independent. He works for a typical Japanese company, and is covered by Kosei Nenkin Hoken (KNH) plan, the largest public pension scheme covering 32.7 million private dependent employees and 5.9 million beneficiaries. There are other public

pensions for employees in the public sector and specific groups of the private sector with different pension contributions and benefits, but these are not considered here. He is eligible for three components of KNH: the basic component, the earnings-related component and the additional component for a dependent wife (Firm pensions and private pensions are not considered here).

The following steps are necessary based on the assumptions above, to compute the Social Security Wealth (SSW), which is the expected net present value of SS benefits through the individual's lifetime:

First, we derive the wage profile of a typical worker whose characteristics are given above. Since panel data are not available, we simply assume that the historical wage profile of an individual traces the same wage profile pattern in a given year adjusted by inflation, which is the same method taken by Seike (1991).

Second, the wage data in the Basic Wage Survey are adjusted to the scales of the standard wages on which the pension premium and benefits are based. The monthly SS benefits are the sum of the following components; (1) fixed component which is a certain unit price multiplied by the number of years worked, which is set at maximum 444 months, (2) years of contribution (which do not account for years of unemployment), (3) base wage rate, and (4) adjustment for dependent spouse.

Third, the pension premium is imposed on the "base wage" which are monthly wages including overtime payments but excluding bonuses. Thus, the wage data in the Basic Wage Survey are adjusted to a pension premium basis. In addition, the adjusted wage profiles are deflated by the historical wage series in the Ministry of Labor's Maitsuki Kinrotokei Chousa (Survey on Monthly Wages). We add both the employee and employer's share of the pension premiums, under the assumption that the employer's share is fully borne by the worker in the form of lower wages.

Based on the procedures above, we derive the concepts of Social Security Wealth (SSW), Social Security Accrual (SSA), and tax/subsidies, which explain the worker's retirement incentives. The average life expectancy is based on the Japan Life Tables from the Population Research Institute, Ministry of Health and Welfare, adjusting for the sex/age specific mortality rate. Note that we use the unconditional mortality risk beyond age 55, which is tantamount to disregarding the probability of death at each year after the 55th birthday[13]. We use this unconditional mortality assumption because at the time of the computation of SSW, it is reasonable to base this

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[13] An alternative assumption is the conditional mortality risk varying based on the year of retirement.

on the perspective of the forward looking individual who, at age 54, is considering retirement incentives at all future ages1. In the base case, we use a real discount rate of 3 percent.

4.2 Social Security Wealth

The concept of the Social Security wealth (SSW) is the net discounted sum of lifetime pensions and other benefits at age 55. We subtract the pension premiums that the individual would make during any continued work, and compute an expected net present value of SSW. SSW is the sum of the partial pension (Zaishoku pension, see below), the full pension after age 65 including the addition to dependent spouses, survivor's benefits, and the individual basic pension for dependent spouses aged 65 and over. The last benefit needs some additional explanation; a dependent spouse is eligible for the basic pension individually and this does not belong to the household head. Nevertheless, we include the pension benefit of the dependent spouse to the SS wealth of the household head, as we did with survivors' benefits. In addition, wage subsidies are added to SSW after the 1994 reform (see below).

Comparing the discounted values of the SS wealth at different ages, however, is not enough to predict one's retirement decision. The accrual rate for work in a given year, which is the change in the worker's future SS benefits relative to what he would earn over the coming year, is necessary for the individual to decide whether to work another year or not. Thus, the SS Accrual (SSA) is defined as the difference in SSW in two periods as the following:

$SSA_t = SSW_t - SSW_{t-1}$

The SS Accrual is also presented as a ratio, i.e., the percent change in SSW. Also, the change in SSW (i.e. SSA) relative to projected earnings over that year is defined as a tax/subsidy rate. If the change in SSW associated with an additional year of working is negative, this is like a tax on work. If the change is positive, it is like a subsidy to work.

4. 3 Specific characteristics of the retirement incentives in Japan

The following two points about labor market conditions need to be mentioned about the retirement incentives of older persons in Japan. First, after retirement at age 60, the wages of older persons tend to fall substantially -- by 40 percent on average -- of the pre-retirement level. This is mainly because the wages in the primary firm are seniority-based in the "internal labor market", while that in the second market is close to flat in the "external market". Thus, unlike the case in the United States, the

pre-retirement wage is not a realistic reference for the opportunity costs of one's retirement. We assume that this diminishing wage profile reflects the actual labor market situation in the baseline case simulation.

Second, older persons between the ages 60 and 64 can claim Zaishoku pension, and these benefits are dependent on his wages. When his wages are sufficiently low, he could receive both wages and pension benefits subject to an earnings test. Thus, when deciding to work at that age, he compares a full-time wage on one hand, and a part-time wage and pension benefits on the other. Also, at age 65 and beyond, he is eligible for full pension without any earnings criteria, i.e., he receives full pension benefits unconditionally.

4.4 Base Case Scenario

The results of the base case simulation are summarized in Table 1. Each row represents the age of the worker in the last year he works. For example, 54 means the effect of working up to age 54 and retiring on his 55th birthday.

The first column shows the replacement rate, which is conventionally defined as the ratio of pension benefits to pre-retirement wage earnings. This concept is irrelevant until the worker can actually claim pension benefits, which occurs when his last year of work is 59 and so he retires at his 60th birthday. When he becomes eligible to claim pension, the retirement rate is about 55%. This rate jumps at his 60th year to 80%, because the pre-retirement wage -- the denominator of the replacement rate -- drops substantially after the mandatory retirement age of 60.

The large drop in the replacement rate at age 64 is due to the fact that after the 65th birthday, pension benefits are not conditional to any earnings test and he does not need to pay any pension premiums. He will see a small jump in the rate on his 67th year, when his wife who is three years his junior becomes eligible for her pension benefit.

The next three columns show the evolution of SSW over time. If he retires on his 60th birthday, the net present value of his SSW would be 35.7 million yen. SSW increases up to his 60th birthday, because he cannot claim any benefits until then. If he works another year, however, SSW falls by 1.8%. Thus, for this individual, the public pension system is "actuarially unfair," as it penalizes work beyond 60 by reducing his future SS benefits. SSW is unchanged beyond 65, because as mentioned above, there are no more contributions nor opportunity costs for postponing retirement.

SS Accrual is the change in the SSW from the previous period. Between 55 and 59, the SSA is positive -- an additional year of work gradually raises the SSW with

longer contribution periods, and this exceeds the negative effects of additional pension premiums. However, as the worker is eligible for pension benefits from age 60, additional work until 64 incurs the opportunity costs of a delay in claiming the benefits. In addition, the higher the earnings he receives, the more the on-the-job pension benefits will be reduced. For the base case worker, half of his benefits are reduced due to the pension formula. As a result, the SS Accrual rate is negative; there is roughly a 2% decline in SSW each year due to continued work. SS Accrual becomes zero beyond age 65, reflecting no change in SSW.

The final column shows the tax/subsidy rate. The tax/subsidy rate is the ratio of change in SSW to projected earnings over that year. The negative sign here indicates a subsidy, implying that a worker receives more than an actuarial adjustment for delaying his claims for the benefit and paying additional pension premiums. The worker keeps getting subsidies to work through his 60th birthday, but beyond then he is forced to pay taxes on work through 64. This is because SS benefits are not taxed for most individuals, while wages are taxed. For the decision to work during the period, the forgone SSW amounts to nearly one-third of what he would earn during that year. This significant shift from subsidy to tax on the 60th birthday is a major cause for the dip in the labor force participation, while there is no tax disincentive effect beyond age 65.

4.5 Other cases

Table 2 shows these results for a single worker. Comparing married and single workers, the negative effect from delaying retirement is larger for a single worker. This is mainly because he has no survivors and receives no other benefits for a dependent spouse (even though the premiums paid are equal). SSW of a single worker at age 59 is 21.9 million yen, which is much smaller than that of the married worker by 39%. Nevertheless, the difference in SS Accrual between the married and single individual is not very significant. This is mainly due to the following: while the SSW of the married worker at age 60 is much larger than that of a single worker, the change in SS benefits by working another year is almost parallel between the married and single individual since the additional benefit for a spouse is largely fixed. The larger tax on the single worker, however, indicates that he will benefit less from his decision to continue work than his married counterpart.

The incentive mechanism varies by wage levels. Tables 3 and 4 show the effects of considering different earning histories for a married worker: We compare a worker at the 90th percentile of the earnings distribution (Table 3) with a worker at the

10th percentile (Table 4).[14] According to Tables 3 and 4, the replacement rate is higher for the low earnings worker. Also, the tax rate on the low wage earner is twice that of the high earner. This implies the re-distributional mechanism in the Basic Pension (the fixed component), through which the low wage earner loses more relative to his wage earnings by postponing retirement than in the case of the high wage earner.

Table 5 considers a different permutation to the earnings history for a worker who has an incomplete earnings history. Compared with the base case where the worker has contributed for 40 years at age 60, the worker in this case is assumed to have started to work five years later and he needs to work an additional five years to be eligible for full pension benefits, which, in principle, requires him to work 40 years. According to this table, the tax for working an additional year at age 60-64 is less for the worker with an incomplete earnings history.

Figure 14 shows the time series pattern of taxes on/subsidies to continued work for the base case, and these two permutations of the different earnings histories. The subsidy is larger for the low wage earner at ages before 60. During ages 60 and 64, there is a substantial tax on an additional year of work on the small base of earnings at the 10th percentile. Also, table 6 summarizes various incentive calculations.

5. Country-specific issues

5.1 Effects of the 1994 Pension Reform

In Japan, there was a major revision in the public pension scheme in 1994, as mentioned in a previous section. At the same time, the unemployment insurance system was reformed, with wage subsidies specific to the group aged 60-64 newly introduced.

These two reforms are expected to have a desirable impact on working incentives for the elderly. First, the reform in the Zaishoku (on-the-job) pension has lowered the "tax effect" on work for those aged 60-64. Roughly speaking, after the 1994 reform the worker with an additional two dollars earnings will lose one dollar pension benefit, instead of the two dollars before the reform. Second, the wage subsidy equivalent to 25% of wage earnings is given to the same age group up to a certain ceiling of earnings. These two reforms in the social insurance scheme should reduce the disincentive effect of the public pensions and stimulate working incentives. As a result, the tax rate for an individual working an additional year at age 60 is estimated

[14] Wages for these workers are obtained from the age/earnings profile in 1994.

to have been lowered to approximately one-third of the pre-reform level (see Table 7 and Figure 14). The wage subsidies are scheduled to be revised in 1998: for those who receive both wage subsidies and pension benefits at the same time, an amount equivalent to 10% of wages are to be deducted from the pension benefits. This revision is already accounted for in our calculations.

5.3 Lump-sum severance payments.

In Japan, one can get a substantial amount in severance payments when leaving a company. For example, a typical college graduate working at the same firm for 35 years receives a lump-sum payment equivalent to 48 months of wages in 1994, which is partly substitutable with the firm's pension. Usually, the amount increases with more years of service up to a certain number of years. However, the increase of the lump-sum payments becomes marginal when the worker is in his 50s, so that the net gain from it declines over time. Many Japanese firms encourage earlier retirement by increasing lump-sum payments with a rate of the increase that declines with age. Also, they give higher payments for those employees who voluntarily leave the firm before the normal retirement age.

Conclusion

This study shows the incentive mechanism of the public pension on the retirement decisions made in the Japanese labor market. The labor market participation of Japanese older persons is quite high by international standards. This is partly due to the fact that there is a significant number of self-employed persons in their age 60s in the labor market. Nevertheless, a principle incentive mechanism of the public pension system in Japan affecting the retirement behavior has many things in common with those in the United States and other OECD countries. The pension benefits are designed "actuarially unfair," and the decision to work beyond age 60 is penalized. However, a major difference lies after age 65 when there are no more contributions required nor any earnings tests to determine eligibility of benefits. This partly explains why the labor market participation of the Japanese older persons is high. As the population ages quite rapidly, it is wasteful to maintain the disincentive mechanism arising from the actuarially unfair pension scheme for older persons. This study indicates the need for reform of the public pension schemes to restore an actuarially fair principle.

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Figure 1:

Histrical Trends of Labor Force Participation Rates(Male)

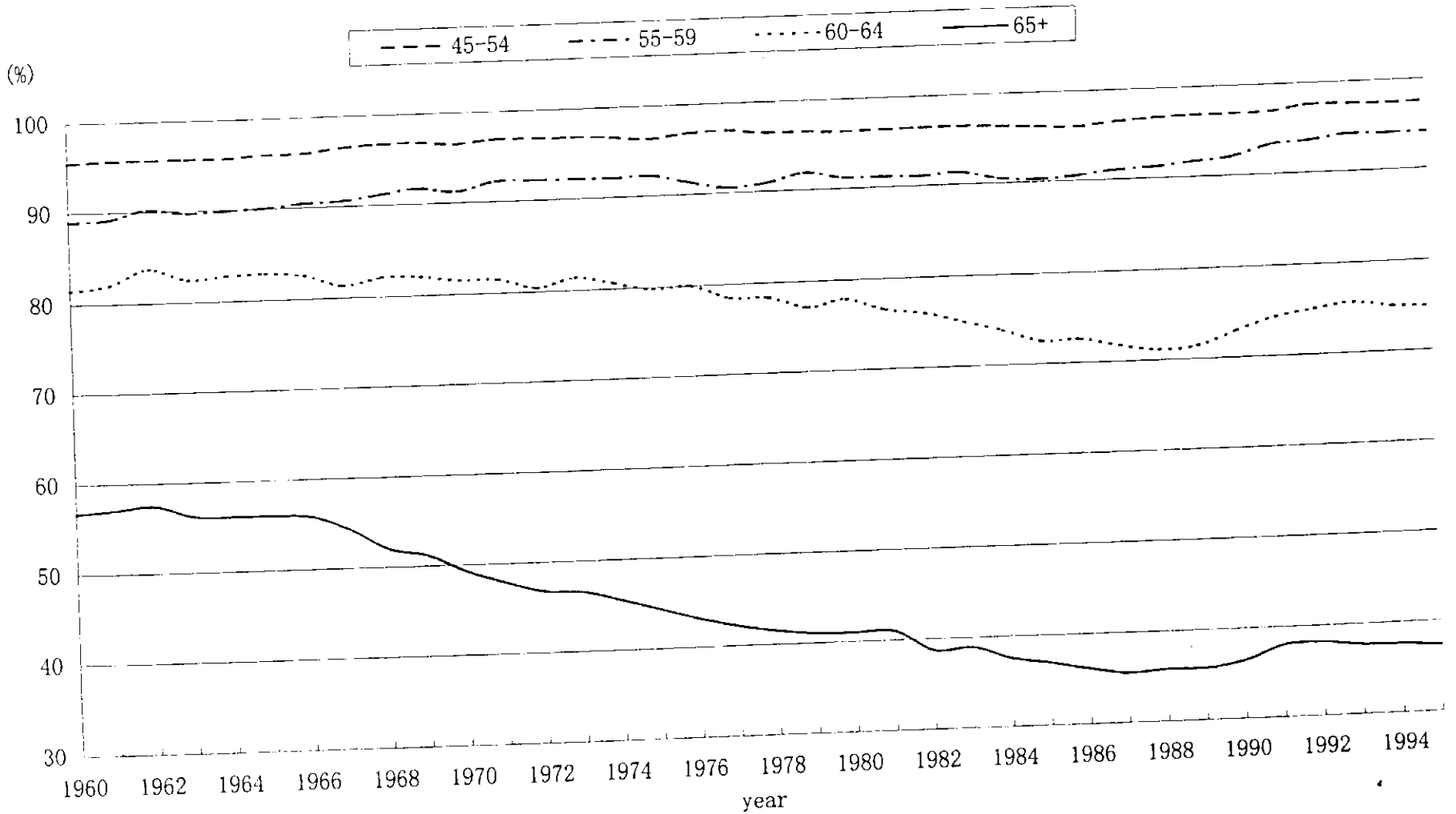


Figure 2:

Histrical Trends of Labor Force Participation Rates(Female)

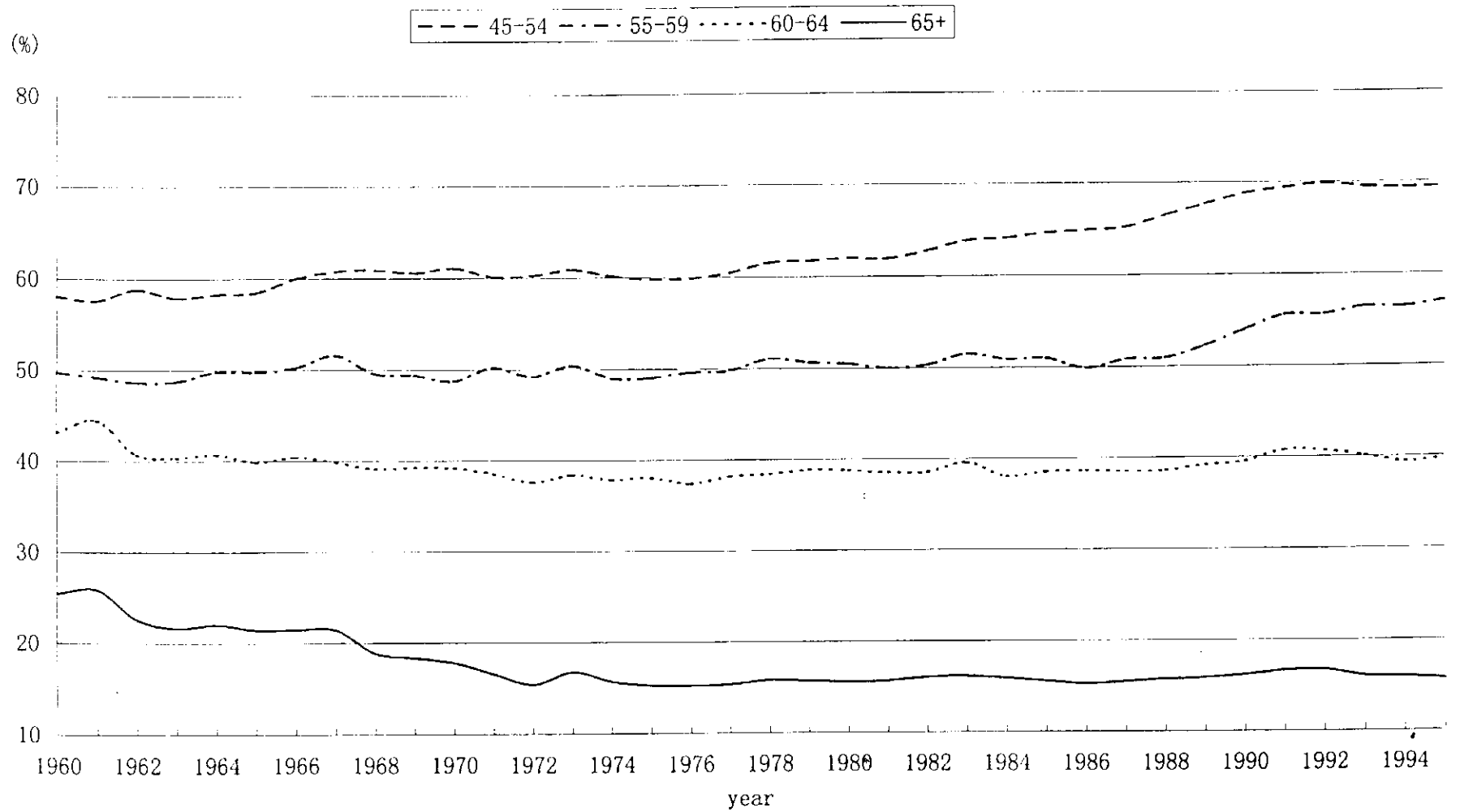


Figure 3: Share of Dependent Employees in total Employees

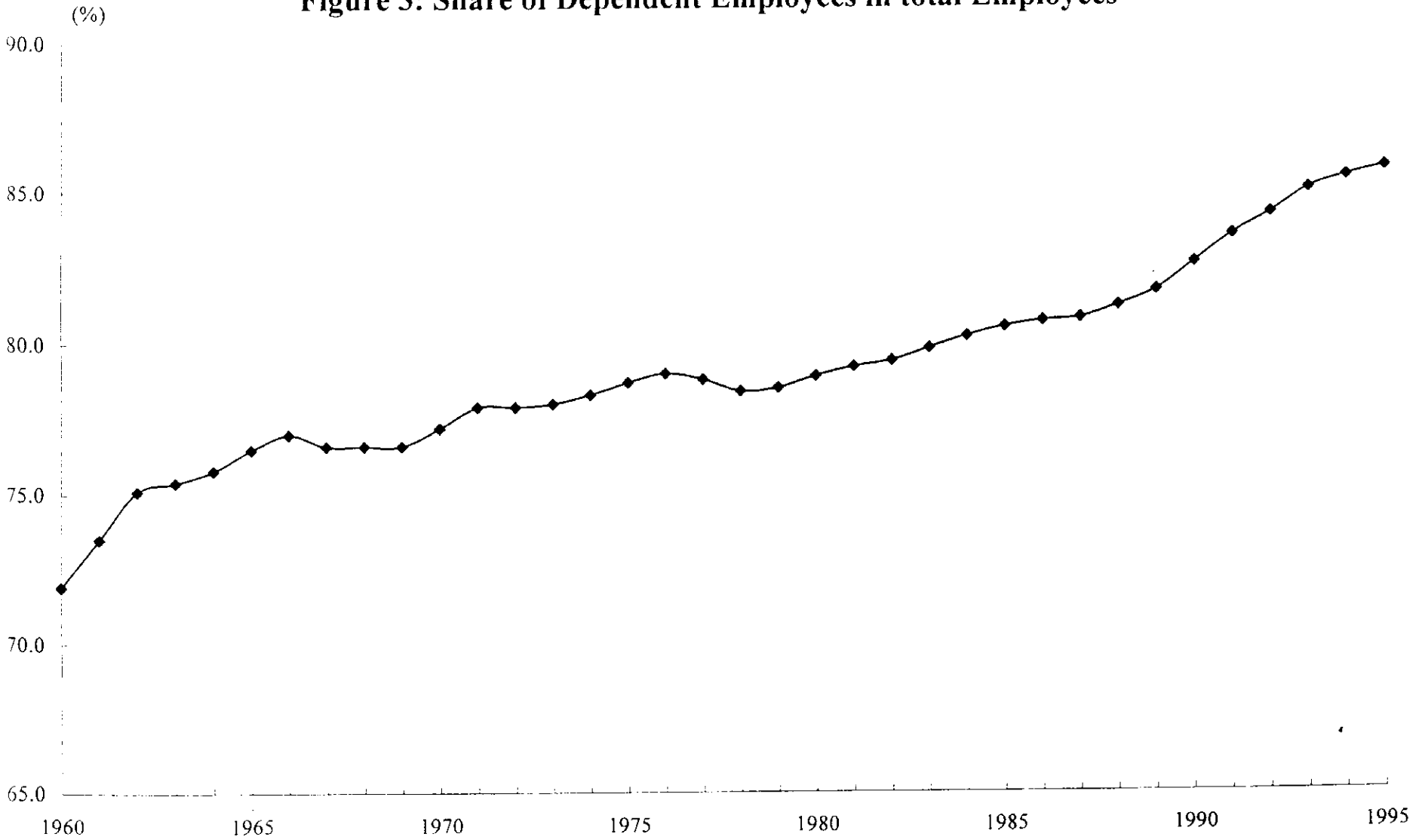


Figure 4: Labor force participation rate of men 60-64

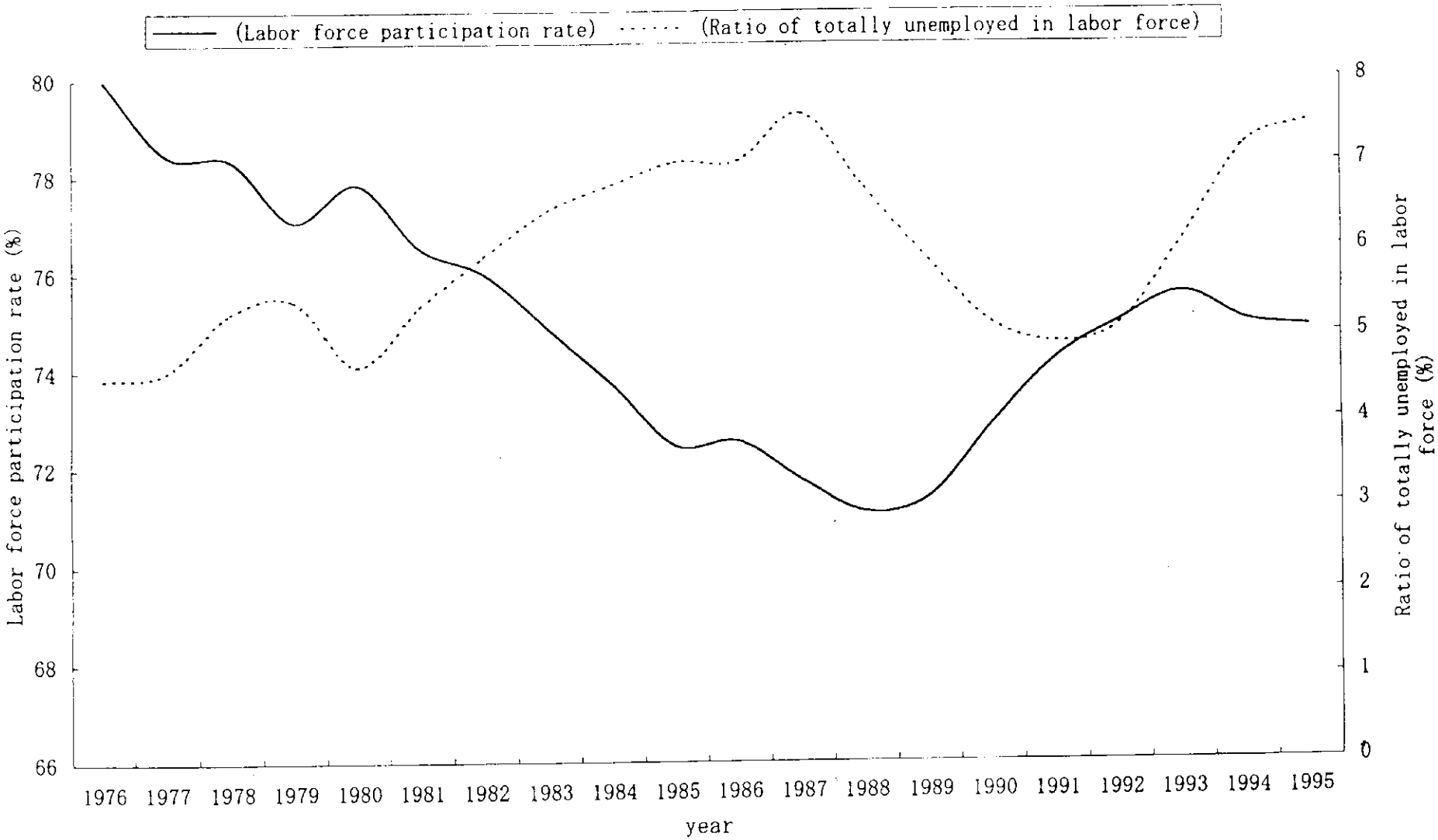


Figure 5:SS Replacement Rates Over Time
(Monthly earnings including bonus)

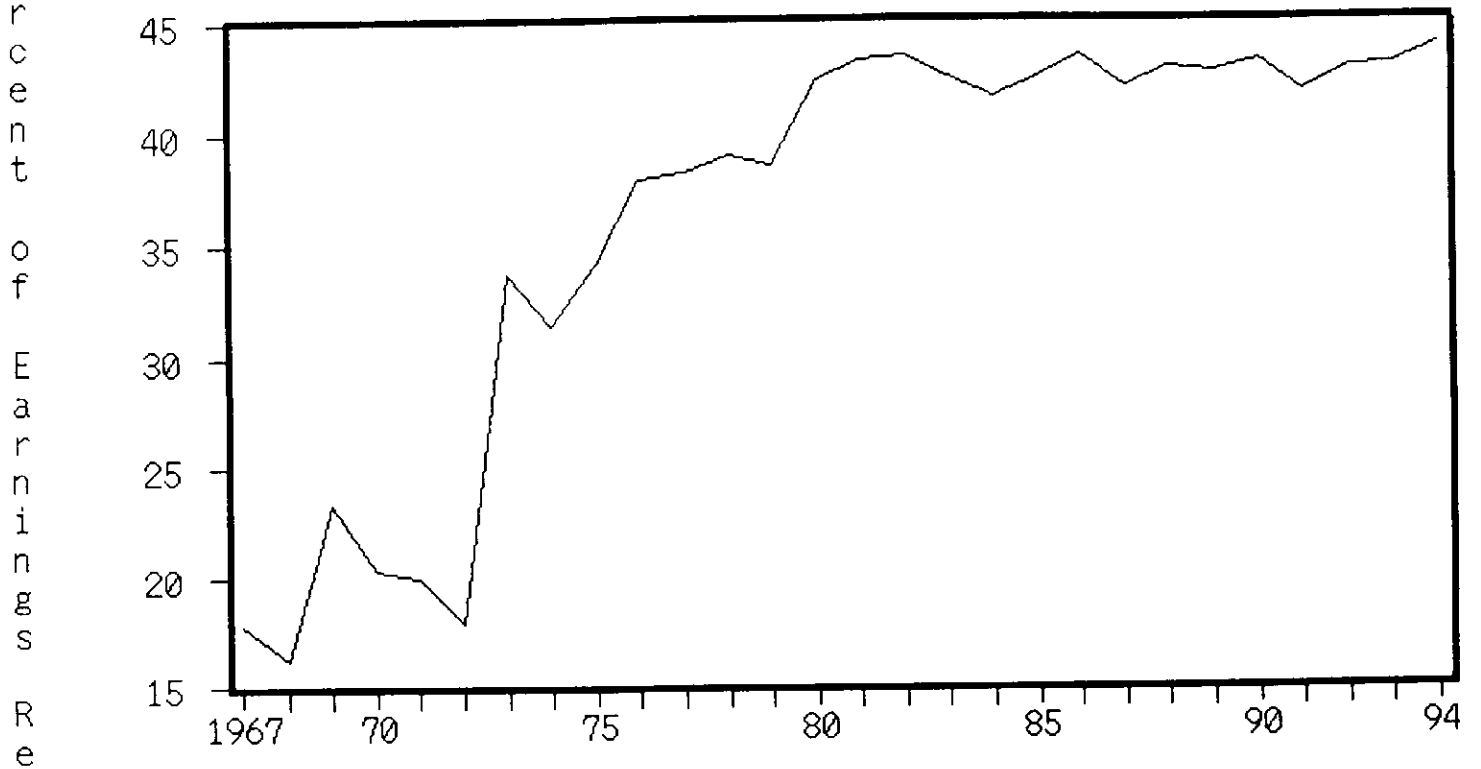


FIGURE 6: Participation Rates
by Age and Sex (Percent)

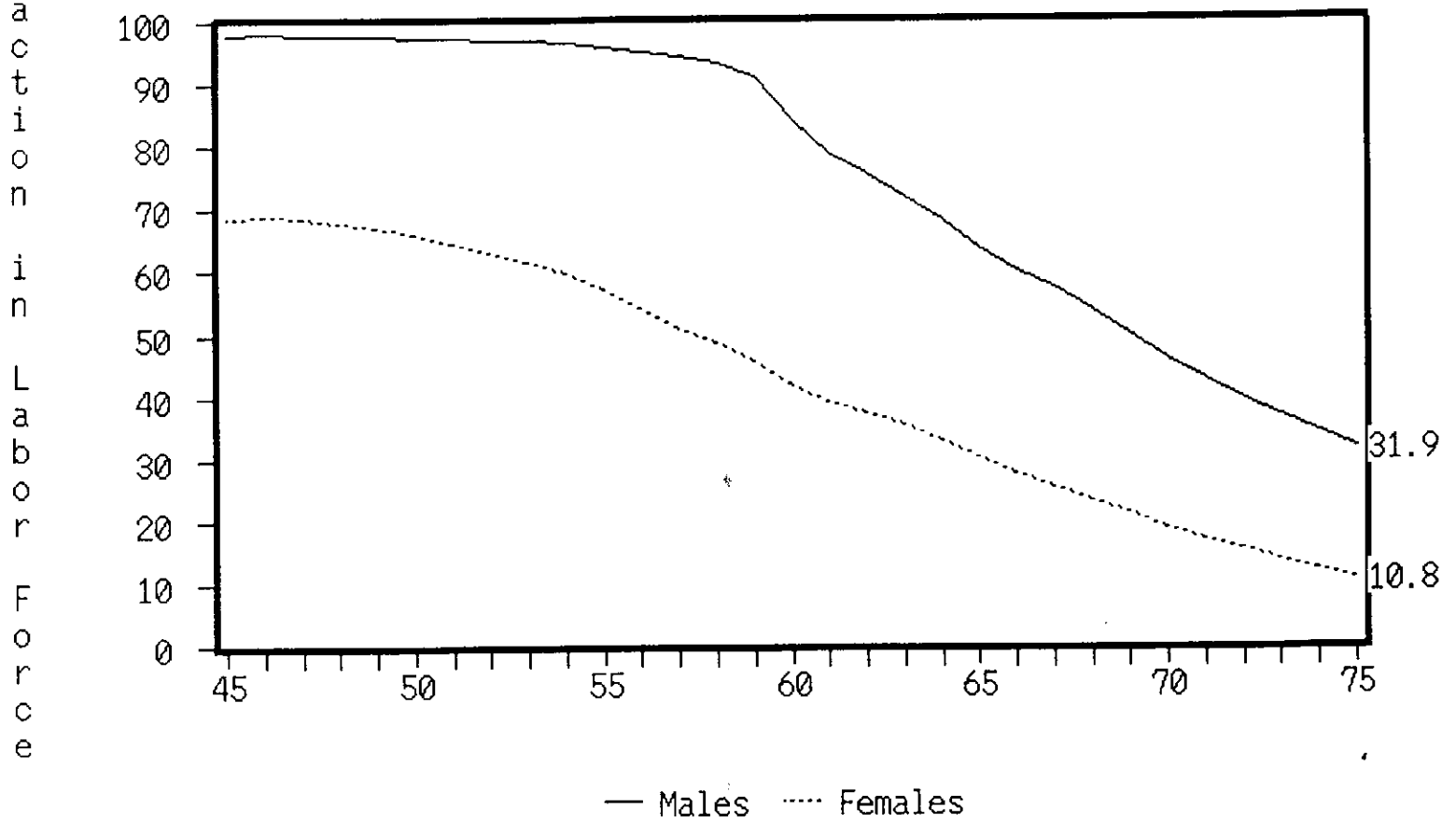
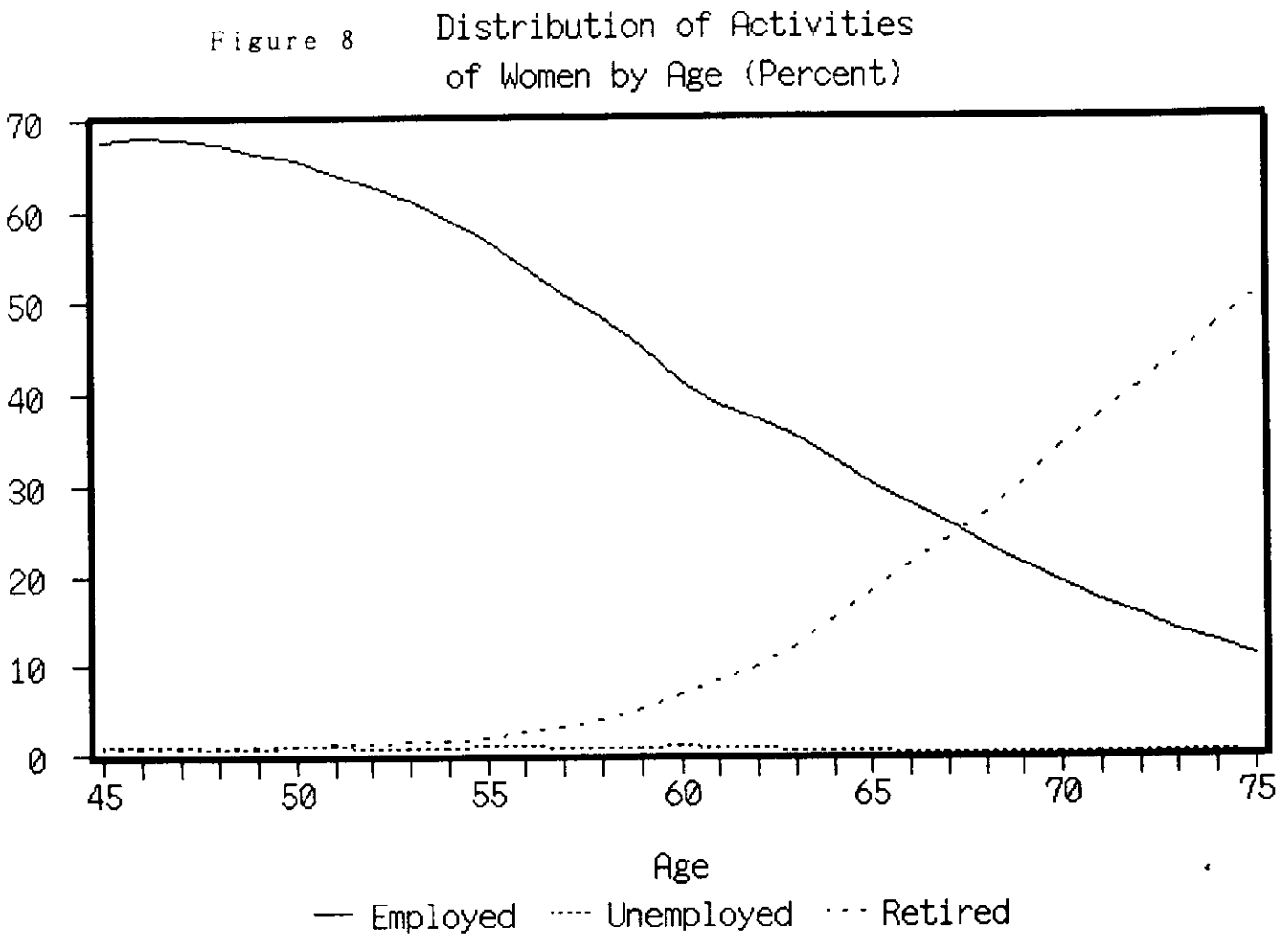


Figure 7 Distribution of Activities of Men by Age (Percent)

Figure 8


Distribution of Activities
of Women by Age (Percent)
70
60
50
40
30
20
10
0
45
50
55
60
65
70
75
Age
Employed
Unemployed
Retired

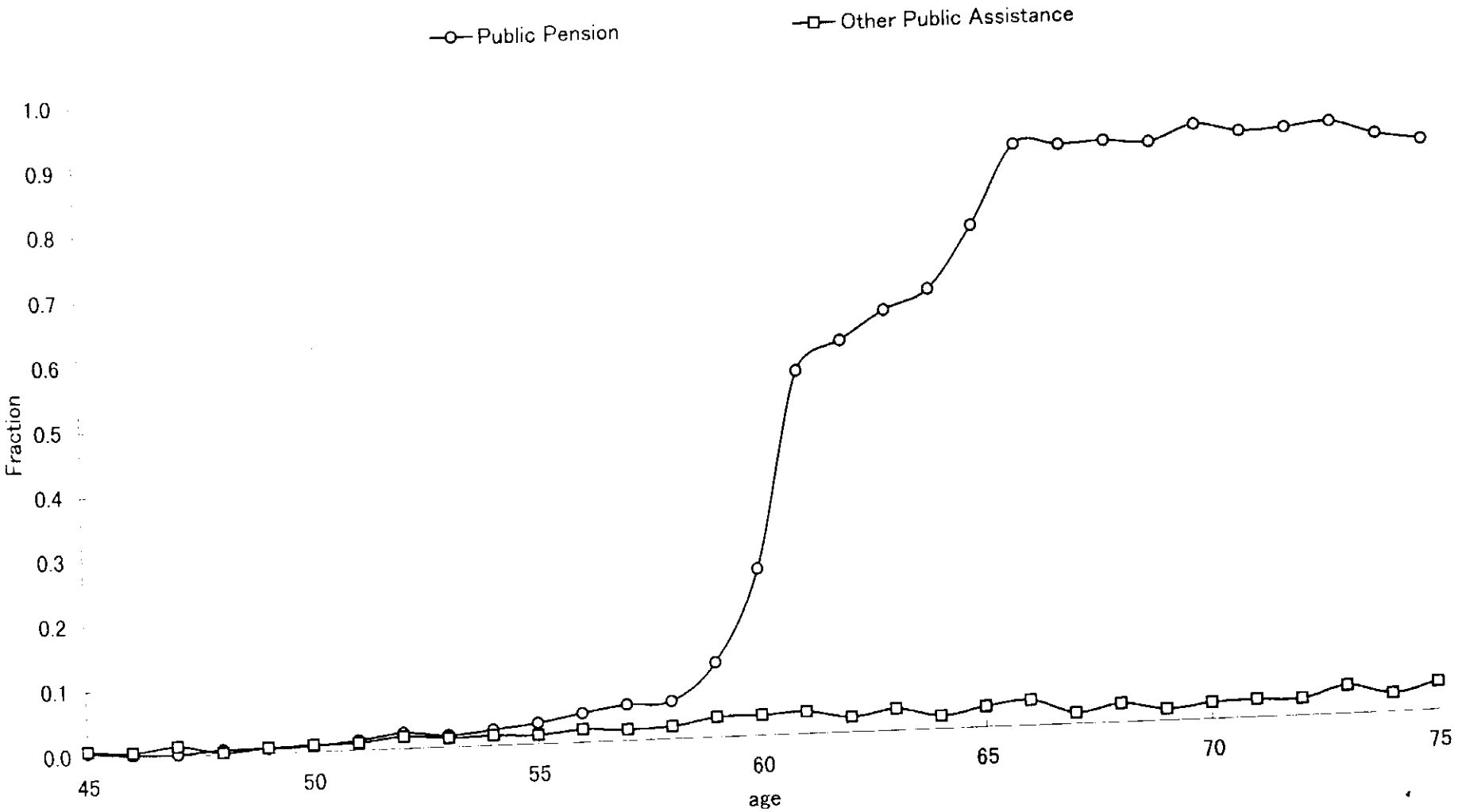


Figure 9 .: Public Income Recipiency for Men

Figure 10: Participation ratio of
Families to Private Pensions

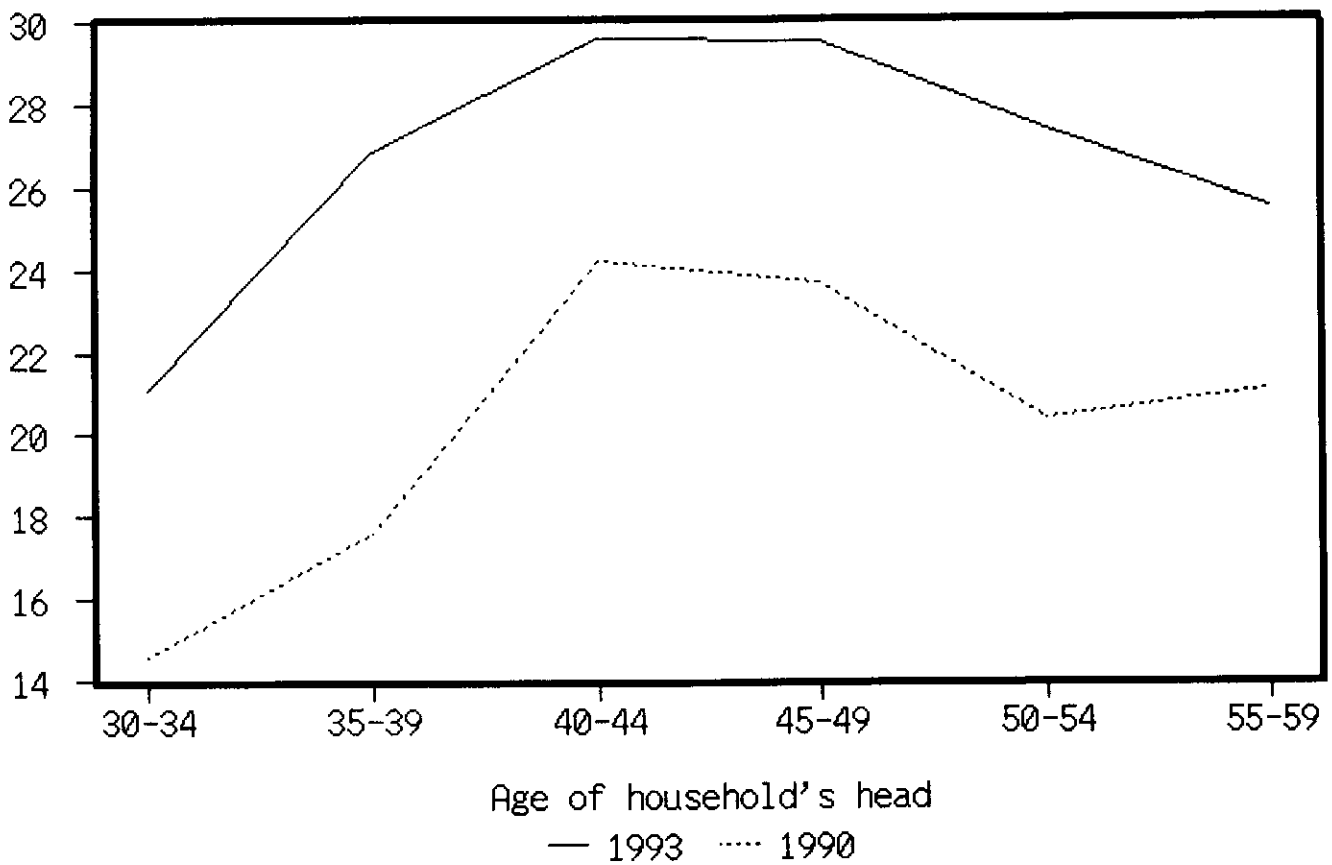
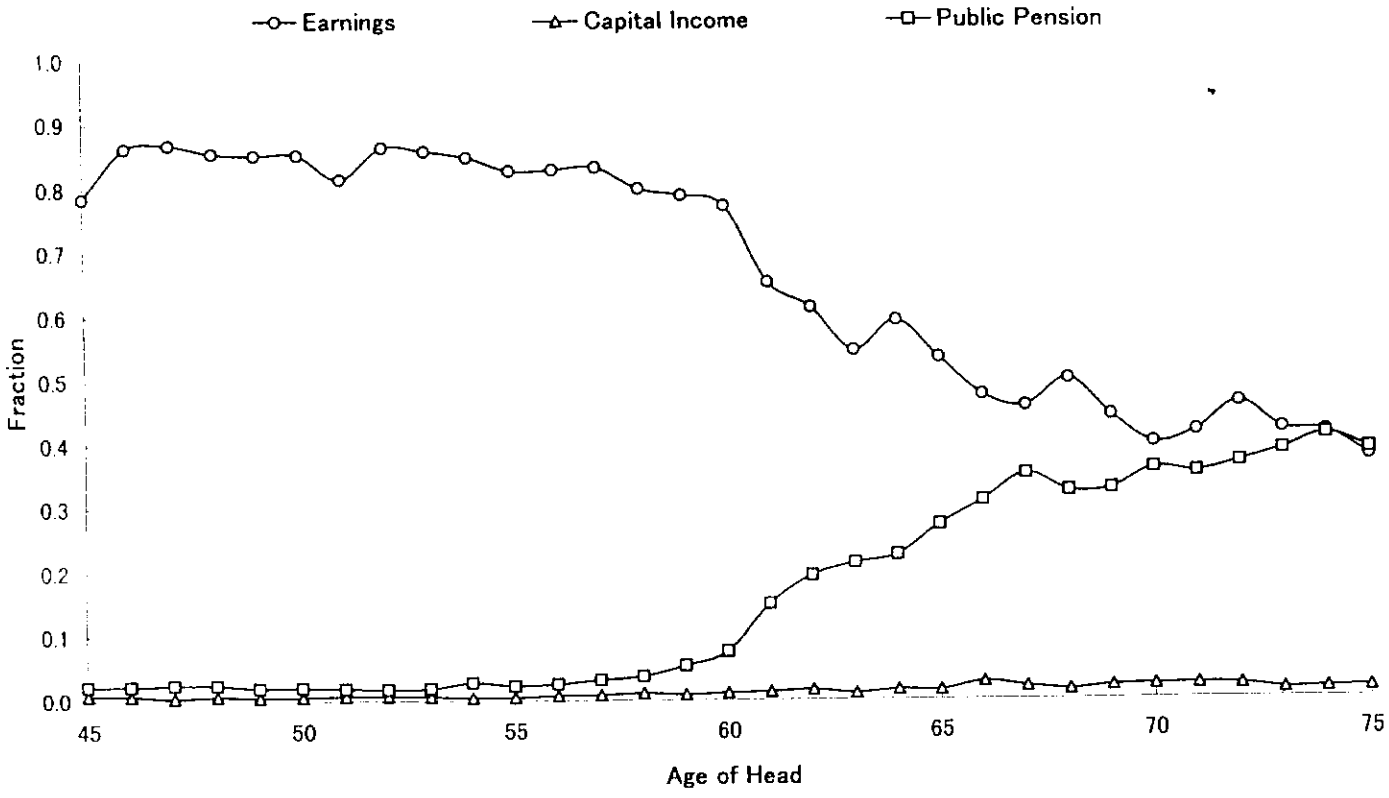


Figure 11 Distribution of Family Income by Source

A. Household Basis



B. Individual Basis

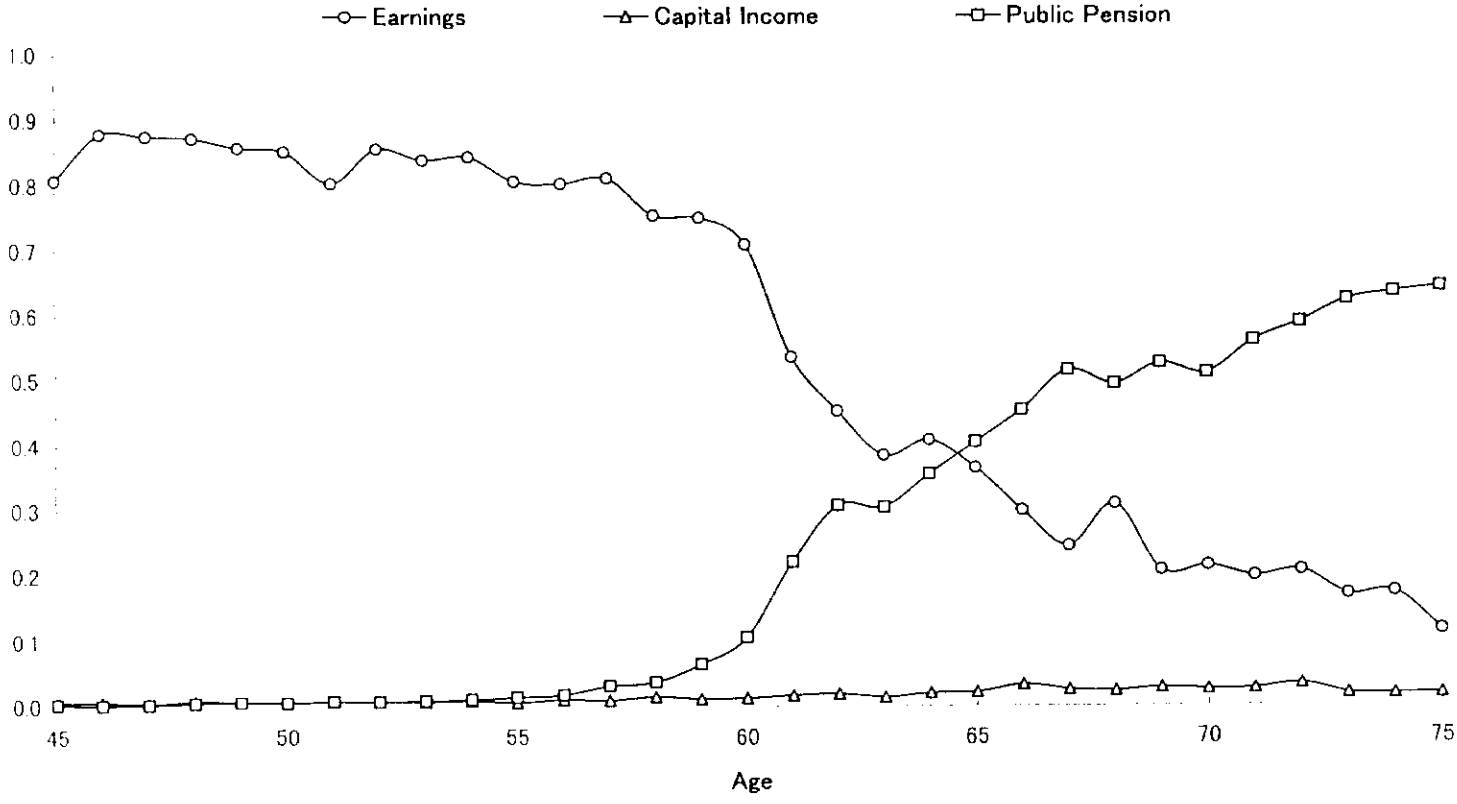


Figure 12 Hazard Rate out of the Labor Force
(Differeces in RFP ratio)

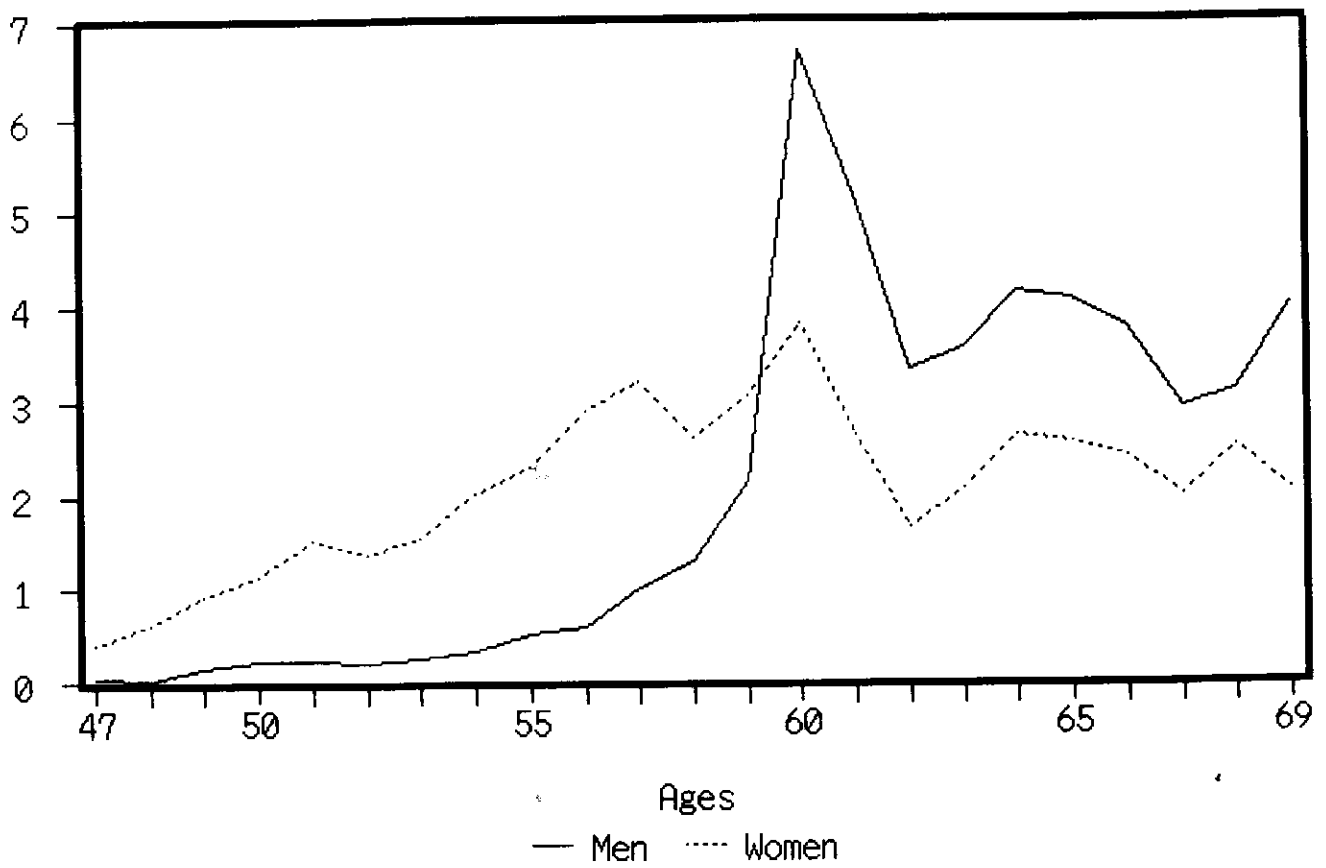


Figure 13: Tax/Subsidy Rates Across Earnings Profiles

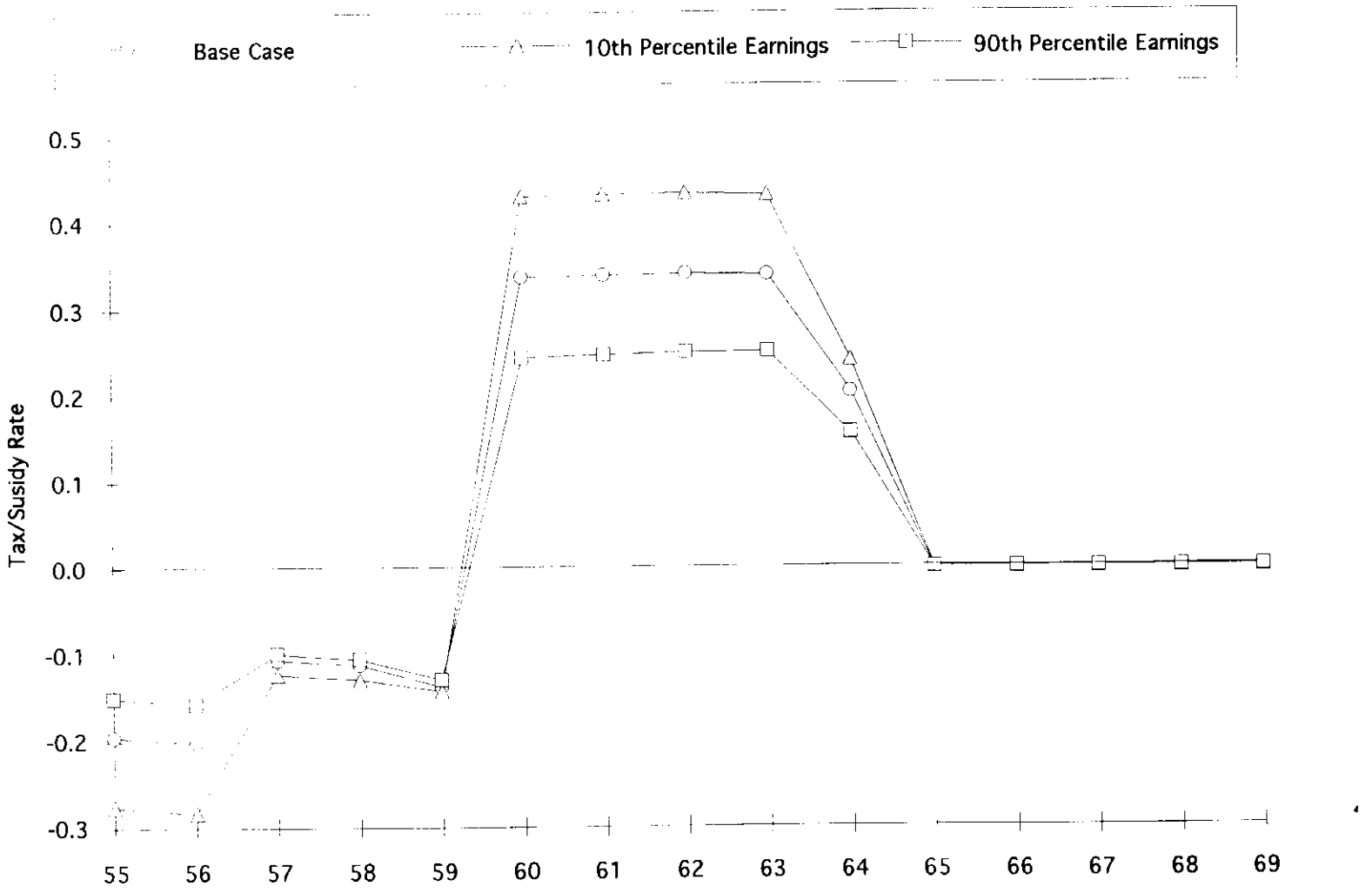


Figure 14: Tax/Subsidy Rates before and after the 1994 Reform

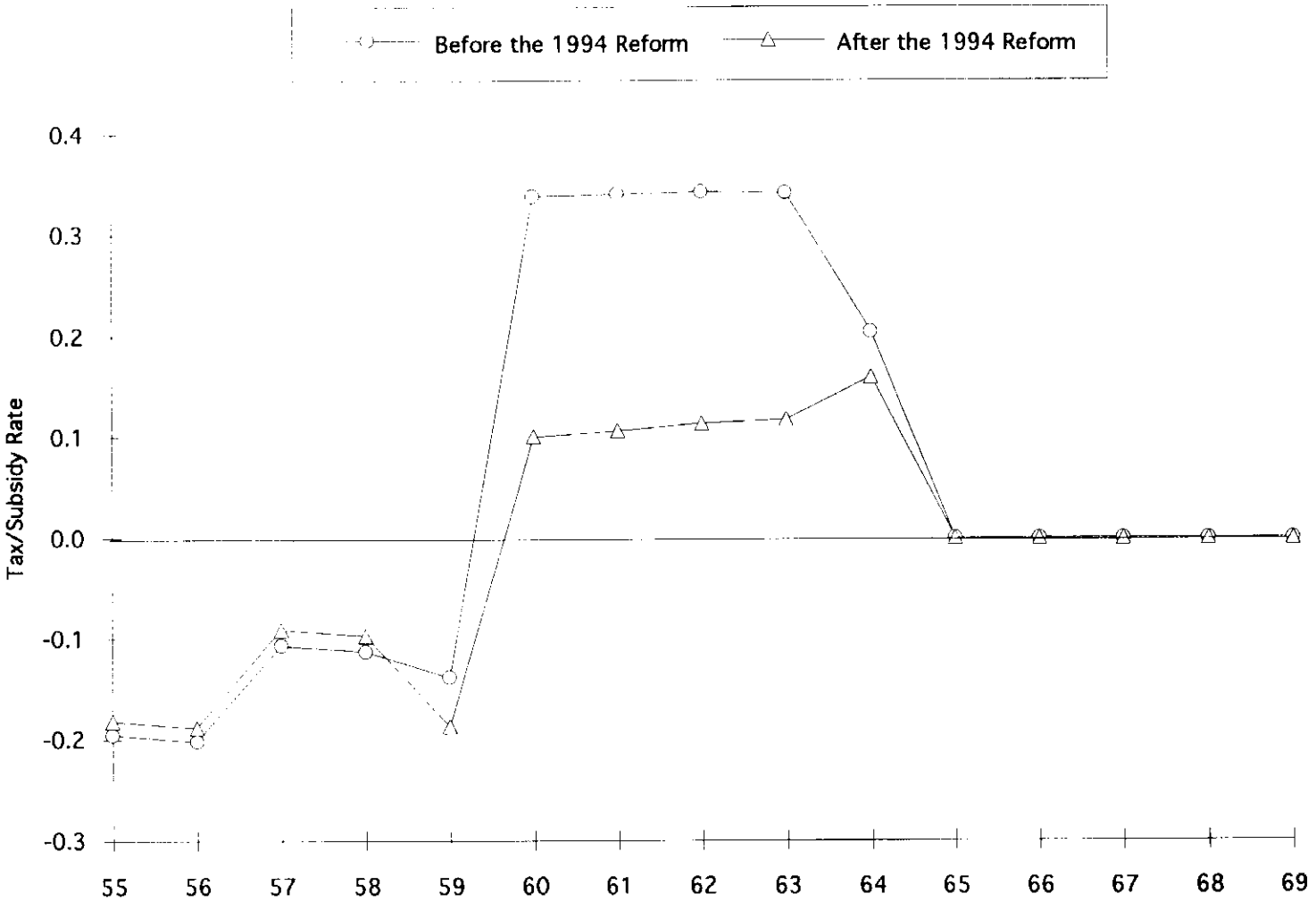


Table 1: Base Case Incentive Calculations

Last Year of Work	Replacement Rate	SSW (thousand yen)	Accrual (thousand yen)	Accrual Rate	Tax/ Subsidy
54	-	33,490	-	-	-
55	-	34,106	616	0.018	-0.195
56	-	34,734	628	0.018	-0.202
57	-	35,058	324	0.009	-0.106
58	-	35,390	333	0.009	-0.112
59	0.552	35,662	272	0.008	-0.138
60	0.800	35,018	-644	-0.018	0.338
61	0.799	34,396	-622	-0.018	0.340
62	0.802	33,792	-603	-0.018	0.342
63	0.801	33,208	-584	-0.017	0.340
64	0.438	32,719	-489	-0.015	0.204
65	0.549	32,719	0	0	0
66	0.547	32,719	0	0	0
67	0.716	32,719	0	0	0
68	0.608	32,719	0	0	0
69	0.607	32,719	0	0	0

Table 2: Incentive Calculations - Single Worker

Last Year of Work	Replacement Rate	SSW (thousand yen)	Accrual (thousand yen)	Accrual Rate	Tax/ Subsidy
54	-	20,350	-	-	-
55	-	20,840	490	0.024	-0.158
56	-	21,338	498	0.024	-0.163
57	-	21,529	191	0.009	-0.064
58	-	21,727	198	0.009	-0.069
59	0.516	21,864	137	0.006	-0.071
60	0.751	21,164	-700	-0.032	0.376
61	0.751	20,483	-681	-0.032	0.381
62	0.754	19,821	-662	-0.032	0.384
63	0.753	19,178	-643	-0.032	0.383
64	0.425	18,630	-548	-0.029	0.244
65	0.541	18,630	0	0	0
66	0.538	18,630	0	0	0
67	0.536	18,630	0	0	0
68	0.534	18,630	0	0	0
69	0.532	18,630	0	0	0

Table 3: Incentive Calculations - 90 Percentile Earnings

Last Year of Work	Replacement Rate	SSW (thousand yen)	Accrual (thousand yen)	Accrual Rate	Tax/ Subsidy
54	-	39,031	-	-	-
55	-	39,777	746	0.019	-0.150
56	-	40,545	768	0.019	-0.157
57	-	41,018	472	0.012	-0.099
58	-	41,507	489	0.012	-0.105
59	0.425	41,907	400	0.010	-0.129
60	0.618	41,178	-729	-0.017	0.244
61	0.620	40,469	-709	-0.017	0.247
62	0.624	39,777	-692	-0.017	0.250
63	0.625	39,104	-673	-0.017	0.251
64	0.391	38,575	-529	-0.014	0.156
65	0.478	38,575	0	0	0
66	0.476	38,575	0	0	0
67	0.595	38,575	0	0	0
68	0.527	38,575	0	0	0
69	0.526	38,575	0	0	0

Table 4: Incentive Calculations - 10 Percentile Earnings

Last Year of Work	Replacement Rate	SSW (thousand yen)	Accrual (thousand yen)	Accrual Rate	Tax/ Subsidy
54	-	29,547	-	-	-
55	-	30,082	535	0.018	-0.276
56	-	30,622	540	0.018	-0.283
57	-	30,853	230	0.008	-0.123
58	-	31,087	235	0.008	-0.129
59	0.772	31,283	196	0.006	-0.143
60	**0.982**	**30,713**	**-571**	**-0.018**	**0.430**
61	0.981	30,163	-549	-0.018	0.432
62	0.985	29,633	-531	-0.018	0.434
63	0.982	29,121	-512	-0.017	0.432
64	0.474	28,676	-444	-0.015	0.241
65	0.606	28,676	0	0	0
66	0.604	28,676	0	0	0
67	0.825	28,676	0	0	0
68	0.669	28,676	0	0	0
69	0.669	28,676	0	0	0

Table 5: Incentive Calculations - Incomplete Earings History

Last Year of Work	Replacement Rate	SSW (thousand yen)	Accrual (thousand yen)	Accrual Rate	Tax/ Subsidy
54	-	22,218	-	-	-
55	-	22,689	471	0.021	-0.197
56	-	23,175	486	0.021	-0.189
57	-	23,682	506	0.022	-0.201
58	-	24,194	512	0.022	-0.209
59	0.409	24,664	470	0.019	-0.276
60	0.581	24,533	-131	-0.005	0.079
61	0.591	24,385	-148	-0.006	0.093
62	0.603	24,219	-166	-0.007	0.107
63	0.612	24,122	-96	-0.004	0.063
64	0.387	24,084	-39	-0.002	0.020
65	0.460	24,084	0	0	0
66	0.458	24,084	0	0	0
67	0.665	24,084	0	0	0
68	0.546	24,084	0	0	0
69	0.545	24,084	0	0	0

Table 6: Incentive Calculations - Summary of Other Cases for Last Year of Work is Age 60

Case	Replacement Rate	SSW (thousand yen)	Accrual (thousand yen)	Accrual Rate	Tax/ Subsidy
Base Case	0.800	35,018	-644	-0.018	0.338
Single worker	0.751	21,164	-700	-0.032	0.376
90th pctile	0.618	41,178	-729	-0.017	0.244
10th pctile	0.735	30,169	-1,257	-0.040	0.671
Incomplete History	0.581	24,533	-131	-0.005	0.079

Table 7: Base Case Incentive Calculations (after 1994 reform)

Last Year of Work	Replacement Rate	SSW (thousand yen)	Accrual (thousand yen)	Accrual Rate	Tax/ Subsidy
54	-	33,490	-	-	-
55	-	34,053	563	0.017	-0.182
56	-	34,629	575	0.017	-0.188
57	-	34,901	272	0.008	-0.091
58	-	35,184	283	0.008	-0.097
59	0.562	35,655	472	0.013	-0.187
60	**0.624**	**35,412**	**-244**	**-0.007**	**0.100**
61	0.627	35,164	-248	-0.007	0.106
62	0.628	34,911	-253	-0.007	0.113
63	0.633	34,649	-263	-0.008	0.117
64	0.409	34,267	-381	-0.011	0.159
65	0.549	34,267	0	0	0
66	0.547	34,267	0	0	0
67	0.716	34,267	0	0	0
68	0.608	34,267	0	0	0
69	0.607	34,267	0	0	0