Chapter 2

Cohort experiences of labor force behavior and its implications for sustainability of the public pension system in Japan

Yukiko Abe*, Hokkaido University

Abstract

This article uses the repeated cross sectional data from two sources to study the cohort experience of labor force behavior and the cohort earnings growth in Japan. From the late 1980s to the early 2000s, men’s participation in the labor market fell for all age groups, while women’s participation rose. Part-time work has become increasingly common for young men, older men (over age 60) and women of all ages. Men and women with more education are more likely to engage in regular, full-time employment. From the late 1990s to the early 2000s, the educational disparities in the proportion of regular full-time employees to population have widened. The earnings of married working men fell in the late 1990s, while earnings of married women rose. Household earnings grew more rapidly in households where the wife worked full-time. The article discusses the implications of these labor market changes on sustainability of the public pension system.

Key words: Cohort, Part-time Employment, Education, Public Pension System, Japan.
JEL classification: J21, J26, H55

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1. Introduction

Significant changes that occurred in the Japanese labor market from the 1990s to the present include (1) the increased participation by women in the labor market and some decline in participation by men, (2) an increase in non-regular workers in the workforce (including part-time workers or workers hired by temporary staffing agencies) and (3) a decline in male earnings from the latter half of the 1990s to the early 2000s and an increase in female earnings. In this article, I document these changes, paying particular attention to cohort experience of labor force behavior and earnings. These changes have several implications for the possible pension reform. The three implications I consider in this paper are (1) labor supply responses to reduced levels of Social Security Wealth, (2) enrollment in public pension, and (3) changes in cohort lifetime earnings for retirement saving.

In order to understand the implications of labor supply on the pension system, it is useful to look at cohort experiences since the pension benefit levels and Social Security Wealth differ significantly depending on birth year. This fact could generate large cohort effects in dimensions of labor supply and earnings if Social Security Wealth has any impact on labor supply. For example, cohorts with smaller Social Security Wealth may increase labor supply at many points in the lifecycle, as the lifecycle hypothesis suggests. The focus of this paper is the labor force experiences by cohorts, defined by gender, birth year and education (whenever possible). For that purpose, I use repeated cross sectional data from two sources: the published version of the Employment Status Survey and the microdata of National Survey of Family Income and Expenditure. While many previous studies have examined labor force behavior for various age groups using cross sectional data, few have examined cohort experiences in detail. Cohort analysis reveals many patterns that have not been understood well in the previous literature.

This paper is organized as follows. In Section 2, labor force experiences of cohorts are examined, separately for men and women. Attention is paid to differences resulting from level of education. Recent trends in retirement behavior are also examined. In Section 3, trends in labor earnings by the cohorts of household are examined. Section 4 discusses the implications of cohort differences in participation and earnings for sustainability of the pension system. Section 5 concludes.
2. Labor supply behavior of cohorts

In this section, I follow the labor force experiences of cohorts. The pattern of labor force participation by age group in a cross section does not necessarily represent the actual labor force experiences of various cohorts. In order to understand the lifetime experiences in work behavior, it is useful to follow the cohort experiences (Goldin, 1989, Chapter 2). I first look at the pattern of cohort experiences for ages 20 to 59 and then take a closer look at the labor force status of elderly men and women, respectively.

2.1 Data and definitions

In the following, I report the results obtained from repeated cross sectional data of the published versions of the Employment Status Survey (ESS) for years 1987, 1992, 1997 and 2002. Three measures are used for gauging participation in the labor market: the employment ratio, full-time employment ratio and part-time employment ratio. In Japan, employment as a regular full-time employee and employment as a non-regular employee (typically, a part-time worker) are quite different in terms of wages, hours, fringe benefits, and working conditions. Therefore, the regular (full-time) employment ratio and the part-time employment ratio are examined separately. The measures are defined as follows:

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\text{Employment Ratio} = \frac{\text{Number of Working Population}}{\text{Population}},
\]

(1)

\[
\text{Regular Employment Ratio} = \frac{\text{Number of Regular Employees}}{\text{Population}},
\]

(2)

\[
\text{Part-time Employment Ratio} = \frac{\text{Number of Part-time Employees}}{\text{Population}}.
\]

(3)

These are calculated for each cohort-education-age group pair, using the ESS data. The ESS is a cross sectional survey conducted every five years by the Ministry of Public Management, Home Affairs, Posts and Telecommunications of Japan. In 2002, the survey was conducted for adults in 440,000 households; the size of the original sample was 1.05 million persons aged 15 and over. The published tables of the aggregated data provide detailed information on labor force status by sex, age group, and education.

In the ESS, respondents are asked to indicate their level of completed education by choosing one of the following four categories: junior high school graduate (9 years of compulsory schooling), senior high school graduate (12 years of schooling), junior college graduate (usually 14 years of schooling, including some vocational and technical schools), and university graduate (16 years or more of schooling, including graduate education).

The working population in the numerator of equation (1) includes all types of working individuals, including the self-employed and those who work at family businesses. It does not include the unemployed, so it differs from the population in the labor force. The reason for not including the unemployed is that...
age group is defined in 5-year intervals in the published versions of the ESS, so age and birth year here are grouped by 5-year intervals. Note that the three measures above are calculated as shares of the population of each cohort-education-age pair.

2.2 Participation in the labor market by men

2.2.1 Young and middle aged men

In Figure 1, the employment ratios of men are plotted against age, separately by the cohorts defined by education and birth year. The legends of the Figure 1 to Figure 10 show the birth year of each cohort, along with the starting age of Employees Pension benefit for each cohort. The following observations are derived from Figure 1. First, the employment ratio fell for all education groups in 1997 and 2002 when the Japanese economy experienced severe recession. The decline was especially large for junior high school graduates, for whom the employment ratio between the ages of 35 and 44 declined by 10 percent between 1987 and 2002. The decline from 1997 to 2002 occurred for other educational groups as well, although the magnitude was the largest for junior high school graduates.4

Second, there are significant cohort differences in the employment ratio of junior high school graduates. The later cohorts of junior high school graduates were much less likely to work than the junior high school graduates of earlier cohorts. For those with senior high school education or more, there is no clear sign of downward shifts in cohort profiles except for the cohorts born after 1973.

Third, the employment rates for ages 20-29 are much lower for those born after 1973 than the same rates for earlier cohorts, for all education groups. Those born after 1973 lost employment from the early stages of recession in the mid-1990s. It has been pointed out that during the recession in the late 1990s, the young workers lost regular employment while the employment of the middle-aged or the old workers were more or less protected (Genda, 2003). This is clearly observed in the figure. There is a sign that, in the early 2000s, job loss seems to have occurred for older males as well. In particular, disparities across the data cannot be obtained for the 4 years of the ESS data. Part-time workers in equation (3) include both part-timers and arbeit workers in the ESS. Part-time worker in the ESS correspond to those workers who are called part-timers in the workplace. Therefore, part-time workers include non-regular employees whose working hours are relatively long.

4 Juhn et al. (2002) report that the nonemployment rate of less educated men in the United States continued to increase from 1967 to 2000, and even during the booming period of the late 1990s, the nonparticipation rate continued to increase.
educational groups widened in the early 2000s, not only for the young. For men aged 40-44, for example, the regular employment ratio of college graduates stayed at about 80 percent from 1992 to 2002, while the regular employment ratio of junior high school graduates of the same age fell from 64 percent in 1992 to 52 percent in 2002. The disparities in the regular employment ratio existed before widened quickly during the recession.

The full-time employment ratio in Figure 2 shows even more significant differences across educational groups, especially for the decline in full-time employment in 2002. For junior high school graduate men, the cohort differences are apparent: later cohorts were uniformly less likely to work full-time. However, although not uniform, the full-time employment ratio fell for other education groups in 2002. For example, the full-time employment ratio fell for senior high school graduates of all ages from 1997 to 2002, keeping the age constant.

It is possible to argue that the proportion of junior high school graduates has fallen dramatically in the past, so the cohort differences observed in Figures 1 and 2 reflect the change in the average “quality” of junior high school graduates. This is true to a certain extent: indeed, the proportion of junior high school graduates fell from 21 percent for the cohort born in 1948-1952 to less than 10 percent for the cohort born in 1958-1977. However, this cannot be the whole story because, as shown in Figure 2, the fall in the employment ratio and full-time employment ratio for junior high school graduate men occurred significantly from year 1997 to year 2002 (the right-ends of each profile) and not before. The explanations based on the cohort differences in “quality” cannot account for the sudden fall in 2002 for almost all age groups of junior high school graduate men. The fall in year 2002 is also striking because regular employment is thought to have strong persistence over time and is protected by the dismissal regulation in Japan. Such factors do not usually anticipate the regular employment ratio of prime-age men to fall. In addition, men’s regular employment profiles are downward sloping from around age 40 for senior high school, junior college and university graduates.

Figure 3 shows the cohort profiles of the part-time employment ratio. The fall in full-time employment of men was accompanied by a rise in part-time employment, especially for less-educated men and young men of all education groups. There was a slight rise in part-time participation by middle-aged senior high school graduates as well.
2.2.2 Elderly men: Age 50-69

Next, I take a closer look at the labor force experiences of older men. Figure 4 plots the employment ratio for the ages 50-69, by education categories and birth year. Several patterns are apparent from the figure. First, for junior high school graduates and senior high school graduates, there is no obvious cohort effect in the employment ratio in that the cohort profiles are located at similar levels. Second, significant cohort effects are observed for college graduates. College graduate cohorts born later are less likely to work. Less significant cohort differences exist for junior college graduates, but for males, the population of junior college graduates is low; for the cohorts in Figure 4, it is less than 5 percent of the population. Third, the decline in the employment ratio in 2002 indicates that labor supply of elderly men declined during the recession period.

Figure 5 and Figure 6 show similar cohort profiles of the full-time employment ratio and the part-time employment ratio, respectively. Cohort profiles for full-time employment are relatively stable, except that the full-time employment ratios at age 60-64 for the latest cohort is lower than those for previous cohorts, for all education categories. That is, full-time employment has become less prevalent among men aged 60-64. The part-time employment ratio is less than 10 percent for all education categories, but it has been increasing steadily. In particular, the increase between ages 55-59 and ages 60-64 for the cohort born from 1938 to 1942 is large. A less significant increase is observed between ages 50-54 and ages 55-59 (Figure 3). The evidence of part-time profile shows that net entry into part-time work for men at old age has become increasingly common. The high labor force participation by Japanese older men is, in part, accompanied by a rise in part-time employment at old age. While their overall participation has fallen, the part-time employment has risen.

Retirement from full-time work occurs mainly around age 60. Table 1 shows the changes in the employment ratio, the full-time employment ratio, and the part-time

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5 The published versions of the ESS in 1987 and 1992 do not report the number of regular employees and part-time employees in 5-year age intervals for ages over 65. Figures 5 and 6 plot the regular employment ratios and the part-time employment ratios only for the cases where the ratios can be calculated for the corresponding 5-year intervals. For junior college graduates and university graduates, the regular employment ratio at age 60-64 for the cohort born 1923-1927 is almost at the same level as other cohorts, so the corresponding point is almost invisible from Figure 5. The ratios for age 55-59 for the cohort born 1943-1947 are also invisible for the same reason.
employment ratio from age 55-59 to age 60-64, for selected cohorts at this age during the period of the data. For men, the full-time employment ratio declined by 40 percent at this age (for cohorts born 1938-1942), although the decline is smaller in size for the older cohorts.\(^6\) The full-time employment profile seems to have become steeper for cohorts who turned to this age recently in that the full-time employment ratio at age 55-59 increased, while the same ratio between ages 60-64 fell.

2.3 Participation in the labor market by women

Next, I examine the labor force participation pattern of women. It is well known that the female labor force participation profile in Japan is M-shaped in a cross section. It is also a common understanding that the dip in the middle is deeper in Japan than in other developed countries (see Nakamura and Ueda (1999), for example). Here, the pattern of cohort profiles of women is examined in detail.

2.3.1 Young and middle aged women

Figure 7 shows the employment ratio of women by cohort. While the cohort profiles reasonably show the M-shaped pattern, nontrivial differences across cohorts are also visible. The cohort differences are more apparent when full-time employment and part-time employment are examined separately, as shown below. The cohort profiles of the employment ratio of recent cohorts are located above, or at similar levels of, those of previous cohorts, for the senior high school graduates, junior college graduates, and college graduates. These patterns are in a sharp contrast with the patterns for men, for whom a decline is observed for the recession periods of 1997 and 2002. The participation of those with senior high school education or more is particularly different from participation by junior high school graduate men, for whom the employment ratios are consistently lower for the cohorts born later than cohorts born earlier. For junior high school graduate women, however, the employment rate is lower for recent cohorts, a similar pattern observed for junior high school graduate men.

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\(^6\) Since calculation here is done from cross sectional data, some men start to work as regular employees while others quit from regular employment, so the changes in overall proportion does not correspond to retirement in the usual sense. The other possibility is that those who quit regular employment may move to part-time work, instead of retiring from the labor market altogether. These movements are difficult to follow at the point of this writing since no panel data set that follows the elderly in Japan is available for public use.
In Figure 8, regular employment ratios for women are plotted against age, for four education groups. The following implications are derived from the figures. First, comparing the later cohorts with the earlier cohorts, regular full-time employment increased little for senior high school graduates and junior college graduates. For university graduate women born between 1963 and 1972, the regular employment ratio at age 25-29 is about 10 percent higher than that of the university graduate cohort born between 1958 and 1962. So clearly, young, educated women are now much more likely to work in regular full-time employment than before.

However, even for university-educated women, the regular employment ratio after age 40 has not increased much for cohorts born later. The Equal Employment Opportunity Law for men and women (EEOL) was enacted in 1986 and has helped advance women’s employment in the Japanese labor market. However, the EEOL has not necessarily increased the proportion of regular employment among highly educated middle aged or older women.\(^7\)

Second, reentry into regular employment at middle age is generally limited. The cohort profiles of regular employment after age 40 are virtually flat or declining. So net reentry into the labor market after interruptions (due to childbirth or child rearing) does not take place as regular employment.

Third, the regular employment ratio is much higher for university graduates than senior high school graduates, implying that education is an important determinant for women’s employment status. In 2002, the regular employment ratio was 33 percent for 40- to 44-year-old university graduates, while it was 22 percent for senior high school graduates of the same age group. Although education does not significantly increase the labor force participation rate of women in middle age, more education helps women to gain a “better type of paid employment.”

Finally, the cohorts who finished schooling in the late 1990s experienced a severe decline in regular full-time employment, as men of the same cohort experienced. For example, the regular employment ratio of senior high school graduates aged 20-24 fell from 0.665 in 1992 to 0.380 in 2002.

\(^7\) However, this assessment may not be quite accurate, considering that the employment of men has worsened during the same period (Section 2.2.1). If one takes men as the control group, women’s full-time employment has in fact advanced, even though it has not improved much from that of the previous cohorts of women.
The part-time employment ratio profiles are shown in Figure 9 by four education levels. The part-time employment ratio goes up for women of all ages. The most notable fact from these figures is the large cohort effects in part-time profiles. Later cohorts are much more likely to engage in part-time work, compared with previous cohorts, for all education groups. The increase in part-time work occurs in middle age, so it is a typical form of reentry into the labor market for middle-aged women.

Participation in part-time employment is also significantly related to education. University graduate women are much less likely to work as part-timers than senior high school graduates are, which is in line with the previous literature (Nagase, 1997). It is also notable that the proportion of part-time employment in the population stays almost constant for women aged 45 to 59. Therefore, at least in the aggregate, retirement from part-time work does not take place until age 60, which is the typical mandatory retirement age for regular full-time workers. Since cohort differences are large in part-time profiles, the cross sectional differences in part-time participation across age groups do not correspond to the actual experiences of each cohort. While older women are less likely to work part-time in a cross section, it is not a result of older women retiring from part-time work; rather, older cohorts are much less likely to engage in part-time work than younger cohorts are.

It has also been a common understanding that college-educated women have two distinct patterns of labor force participation: a persistent participation in paid employment or a complete exit from the labor market after marriage or childbirth (Higuchi, 1991, 1998; Wakisaka and Tomita, 2001). Nonetheless, part-time work has become increasingly prevalent among highly educated women of later cohorts: Figure 9 shows that the cohort profiles of part-time work moved up for later cohorts of university graduates and junior college graduates.

2.3.2 Elderly women: aged 50-69

Figure 10 shows the employment ratio of women aged 50-69. The employment ratio at ages 55-59 rose for senior high school graduates and junior college graduates. Again this is in sharp contrast with males, where a decline is observed. The rise in female participation is accompanied by the increase in part-time employment.

Looking at the full-time and part-time profiles for women (Figures 8 and 9), it is quite clear that the rise in labor force participation at age 55-59 is driven by the rise in
part-time employment. It is also apparent that the increase in part-time work occurs for senior high school graduates and junior college graduates.

The regular employment ratio drops by 13-20 percent from the 55- to 59-year-old age group to the 60- to 64-year-old age group, likely due to mandatory retirement age of 60 (Table 1). Before that age, no significant retirement seems to take place; cohort profiles are flat and are not declining with age. There is also an interesting difference in retirement patterns from regular employment and part-time employment. While retirement from regular employment occurs sharply around age 60, retirement from part-time employment around age 60 is more gradual. As shown in Table 1, net retirement from part-time work is less than 6 percent for all cohorts analyzed here and almost zero for women with junior college or university education.

2.4 Comparison with previous studies

The fall in employment rate is related to studies that analyze “non-workers” or “NEET (Not in Employment, Education nor Training).” The NEET issue has been mainly seen as an issue for the young. However, Genda (2006) shows that the number of “non-workers” (those who are not married, not working) has been increasing for ages 35-49, and non-workers in this definition are concentrated in junior high school graduates and senior high school graduates. This observation is related to the falling employment ratio of less education men. However, the analysis here differs from Genda’s in the following respects. First, this paper is explicitly concerned with cohort experiences. The cohort-based analysis reveals how the employment ratio has changed over the lifecycle of cohorts. Cohort differences in employment ratios turn out to be significant, especially for men with less education. Second, male-female differences and differences by education are made explicit here by looking at the proportion of workers in the population of cohorts. Third, the figures here do not distinguish marital status.8

Seike and Yamada (2006) look at the labor force pattern of the elderly by using micro data of the ESS. They estimate a series of cross sectional regressions of labor force status, to assess the impact of pension benefits, education, and other factors. Kawaguchi and Naito (2006) examine the issue of gender wage convergence from 1987 to 2002 using micro data of the ESS. They tabulate the full-time employment ratio and estimate cross sectional

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8 Distinguishing marital status cannot be done without using microdata of the ESS.
regressions predicting full-time employment for men and women. The cohort analysis in this paper differs from these studies in the following respects. First, these two papers do not focus on cohort experiences, where cohort is defined by gender, education and birth year. The cohort-based analysis allows me to clarify the larger decline in the regular employment ratio and the increase in the part-time employment ratio for the cohorts of men who turned age 60 around 2002, for example. The cohort analysis also reveals differential experiences by educational attainment, such as a decline in the employment ratio of university graduate older men. Second, these papers do not necessarily examine the differing patterns of full-time employment and part-time employment explicitly.9

2.5 Comparison with other countries

One of the notable patterns of Japan’s labor force participation, compared with other countries, is late retirement (Seike and Yamada, 2004). The participation rate at old age is high for both men and women. Figure 11 plots the cross-sectional profiles of the labor force participation rate for 8 countries (Sweden, Netherlands, France, Germany, Italy, the United States, Korea, and Japan), separately for men and women.10 Among these 8 countries, the male participation rate in Japan is the highest for all ages. In particular, high participation rates at old ages are noteworthy. Although the evidence reported above shows that men’s employment has been falling in Japan recently, it is still high compared with other countries.

The participation rate of middle-aged women in Japan is lower than that of women in other countries. Among the countries here, the participation rate of Japan at ages 30-34 is the second lowest, just above Korea. However, the ranking changes as age progresses. For ages 50-64, the women’s participation rate in Japan is the 4th highest among the 8 countries (although the set of countries that have higher participation rates than Japan’s changes depending on 5-year age intervals). For women in Japan, late retirement is accompanied with a low participation in the middle age. Looking over the lifecycle, the pattern of women is also thought of as “intertemporal substitution toward working at old age.”11 The female

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9 Abe (1999) analyzes the cohort experience of young women’s labor supply using the micro data of the ESS from 1982 to 1997, but he does not distinguish full-time employment and part-time employment.
10 The data for all countries but France are those of year 2005; the French data are for year 2004.
11 However, it is important to note that an international comparison of cross-sectional data here may not necessarily capture the lifecycle pattern in participation. For example, if sizable cohort effects in participation exist for some countries but not for others, a cross-sectional comparison does not correspond to differences in lifecycle labor supply behavior.
participation pattern in Korea has the similar feature.

3. Cohort movement of wage-salary earnings

3.1 Cohort wage-salary earnings of husbands and wives

As documented in Section 2, in the 1990s, participation in the labor market declined for less-educated men and women. Participation of educated men fell slightly as well. On the other hand, for women with senior high school education or more, participation increased. The decline in participation of junior high school graduate men and women and the increase in participation by educated women seem to be permanent in that the cohort profiles shifted for a certain range of age.

The participation measure does not show how the earnings of the working population have changed. However, it is natural to expect that such significant changes in participation are accompanied by changes in the earnings of working men and women. This section reports how the mean earnings of cohorts evolved in the 1990s and how they differ across cohorts. To do so, I utilize the microdata from the National Survey of Family Income and Expenditure (NSFIE, assembled by Statistics Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications of Japan). The NSFIE is a cross-sectional survey of households that contains detailed information on earnings, consumption, and employment status of family members. The survey asks wage-salary earners whether their employment is full-time or part-time. Unfortunately, the NSFIE does not contain information on the educational attainment of family members. Therefore, the differences across educational groups cannot be assessed. In the following analysis, the earnings figures are deflated into 2000 prices by using the Consumer Price Index.

From the microdata of NSFIE, I extract the sample of households that are headed by men aged less than 54 years old, who are married and working as a full-time salary earner (a regular employee). The sample size is around 20,000 for each year of 1989, 1994, and 1999. From this sample, the mean wage-salary earnings of the husband (household head) and the wife (the wife of the head) are calculated. Since the NSFIE is conducted every 5 years, I group the husband’s age by 5-year intervals.

In this sample, the mean real earnings of the husband rose about 6.4 percent from

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12 Since the main focus here is the wife’s full-time employment and part-time employment on family earnings, the word “earnings” in this section is restricted to wage-salary earnings.
1989 to 1994, and those of the wife rose by 29 percent (for calculating the wife’s mean earnings, non-working wives are included). The couple’s real earnings rose, on average, by 8.7 percent from 1989 to 1994. In contrast, the husband’s real earnings fell, and the wife’s real earnings rose from 1994 to 1999. The mean earnings of the couple fell by 2.4 percent because the fall of the husband’s earnings is large relative to the rise in the wife’s earnings. In the late 1990s to early 2000s, married working men, on average, started to earn less than what the previous cohorts of similar men earned. Although the effects of educational composition cannot be assessed directly, the fall is unlikely to be attributed to the changing educational composition of men, since it improved for cohorts born later.

A more detailed movement of earnings by cohorts is shown in Figures 12, 13, and 14. Figure 12 plots the cohort profiles of the husband’s mean earnings (cohort defined by the husband’s birth year). The cohort profiles have a clear pattern: the earnings profiles of the later cohort “cross” the profiles of earlier cohorts from the upper-left to the lower-right, at the right ends. That is, keeping the age of household head constant, the mean earnings in year 1994, the year at the middle of the three data points, are higher for the later cohort. On the other hand, the mean earnings in year 1999, the last year of the data that correspond to the right-ends, are lower for the later cohorts. Until 1994, male earnings had grown in such a way that later cohorts earn more than previous cohorts. However, such a pattern disappeared in 1999, for the sample of married, working male household heads.

For the wives, the mean earnings have increased both for those working full-time and those working part-time. Figure 13 plots the mean earnings of full-time working wives against the husband’s age, separately by the birth year of the husband. Figure 14 plots the similar earnings profiles for part-time working wives. The earnings of full-time working wives increased continuously from 1989 to 1999 in such a way that later cohorts of wives earned uniformly more than the previous cohorts of full-time working wives. The mean earnings of part-time working wives grew as well. These patterns are in contrast with the results for the husbands, for whom the fall in earnings is observed in 1999. Note that these are mean figures for working wives, and the set of working wives expand as cohorts age, by

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13 Shinozaki (2006) uses the repeated cross sectional data of the Basic Survey of Wage Structure from 1964 to 2004 to derive the cohort earnings profile of male regular employees by education. Oishi (2006) uses the data from the Survey on the Redistribution of Income and plots the husband’s mean earnings by cohort. Cohort profiles derived in these papers show a pattern of falling earnings by men in a similar way explained here.
the wife’s reentry into the labor market. The earnings growth of continuously working wives is probably higher.\textsuperscript{14}

3.2 Family earnings by cohort

Next, the earnings of couples, the sum of earnings of the husband and the wife, are examined by the wife’s employment status.\textsuperscript{15} The mean earnings of couples where the wife works full-time and those of the couples where the wife works part-time are compared.

Wives in regular (full-time) employment earn much more than wives in part-time employment. For example, when the husband is 40-44 years of age, the average earnings of wives who are full-time employees are 3.2 million yen, while that of part-time employees is 890 thousand yen (figures from the NSFIE of 1999).

The mean family earnings are plotted against the husband’s age in Figure 15. The cohort profiles of family earnings show that, for households where the wife works full-time, the family earnings are high and growing, although the growth from 1994 to 1999 is lower than that from 1989 to 1994. On the other hand, for the households where the wife works part-time, there is no clear pattern of cohort growth from 1994 to 1999. It is important to keep in mind that women’s reentry into full-time work is limited after middle age, while reentry into part-time work is common (Figures 8 and 9). The cohort earnings profiles for part-time working wives in Figure 14 reflect this kind of compositional change.

4. Implications on sustainability of the pension system

As documented in Section 2, participation by women has risen and participation by men has fallen. As shown in Section 3, wage-salary earnings of men fell, while that of women rose. While the reduced participation and reduced earnings of men are likely to result in lower lifetime earnings for men, the increased participation by women of later cohorts generates income.\textsuperscript{16} What are the implications of the increased incomes of lifetime earnings of women on the pension system? In the following, I discuss three issues related to

\textsuperscript{14} If the increased participation is accompanied by the entry of women with low earnings in the set of working wives, the mean earnings of working wives could fall. The fact that the mean earnings rose in spite of significant entry into part-time work (Figure 9) suggests that wives’ earnings growth would have been large.

\textsuperscript{15} In the following, the term “family earnings” is used to indicate the sum of wage-salary earnings of the husband and the wife.

\textsuperscript{16} It is also possible to understand the increased participation by women as the response to the decline in male earnings (added worker effect).
these changes in the labor market: (1) labor supply responses to reduced Social Security Wealth, (2) enrollment in public pension, and (3) changes in participation and earnings on retirement saving.

4.1 Labor supply responses to reduced levels of Social Security Wealth

As Suzuki (2006) shows, the levels of Social Security Wealth of Japanese men and women differ significantly depending on the birth year. One of the possible behavioral responses to a low level of Social Security Wealth is to increase labor supply over the lifecycle. Can the changes in participation observed above be understood as responses to lower Social Security Wealth? Here, I present a brief discussion of the relationship between the Social Security Wealth, starting age of Employee’s Pension benefits, and labor supply.

The legends of Figure 1 to Figure 10 show the starting age of Employees’ Pension (EP) benefits alongside the birth years for each cohort analyzed here. Because the cohort here is defined by 5-year intervals of birth year while the starting age of EP benefits is raised mostly by 2-year differences in birth dates, the cohorts in Figures 1 to 10 contain individuals with differing starting ages for EP benefits.

Clearly, the declining participation by cohorts of men born later does not square with the reduced Social Security Wealth for those cohorts. For them, compared to earlier cohorts of similar characteristics, pension benefits are reduced, but real lifetime earnings may fall (due to lower participation and possibly lower real earnings from the 2000s), which could result in even more severe generational inequality in terms of retirement consumption.

For women, since the reduced benefits are related to higher participation, it could be argued that reduced Social Security Wealth induces them to work more over their lifecycle. Although other factors, such as the enactment of the Equal Employment Opportunity Law or expansion of part-time job opportunities, have played roles in increasing women’s participation and earnings, the fact that reduced Social Security Wealth coincides with increased participation and work effort nonetheless means that women’s earnings may contribute to raise retirement saving.

4.2 Enrollment in Public Pension

In Japan, enrollment in one of the public pension program is compulsory for those aged 20-60. In reality, enrollment is closely related to employment. Full-time salary
earners participate in Employees’ Pension (EP) program through employers. The rule is that workers with weekly hours of 30 hours or more have to enroll in EP through employers. Due to this rule, many part-time workers are not covered through their employers (Abe, 2003). Wage earners who are not covered in the workplace (because of short working hours or possible non-compliance), the self-employed, and non-workers are required to enroll in the National Pension System. In reality, enrollment in EP by full-time salary earners is much more likely to be enforced than enrollment for other types of workers and non-workers in the National Pension System; it is widely reported that the non-enrollment rate in the National Pension System is more than 30 percent.

Given the reality that enrollment in public pension is closely linked to full-time employment, decline in full-time work is a potential concern for lower enrollment and lower benefits in the future. Currently, reform aimed at reducing the threshold hours for enrollment in the EP to 20 hours per week (instead of the current level of 30 hours per week), is under consideration.17

4.3 Implications of changes in participation and earnings on retirement saving

Increased participation and earnings of women may result in higher pension benefits for older women, if they enroll in employer-based pensions and make contributions during the period they work. However, a significant portion of the increased participation by women takes the form of part-time employment. Men’s employment is also shifting to part-time work. Since part-time employees are much less likely to be covered by the employer-based public pension system in Japan (EP), pension benefits may not go up because of increased work effort, for those who work as part-time employees at middle or old ages. Nonetheless, the increase in part-time work still generates income that contributes to the increase in lifetime earnings and retirement saving. On the other hand, since men’s employment and earnings have been falling, men’s future benefits may also fall.

5. Conclusion

In this paper, I document the cohort experiences of labor market participation, separately for regular employment and part-time employment by paying attention to differences in educational attainment. Then, I document the cohort movement of earnings in

17 Nakata and Kaneko (2007) discuss the possible impacts of such a reform.
the 1990s to early 2000s.

The major changes in participation behavior are summarized as follows. First, by looking separately by the levels of educational attainment, the employment ratio of men fell for all ages from 1997 to 2002, especially for less educated men. On the other hand, women’s employment does not generally indicate such decline, except that the cohorts born after 1973 and women with junior high school education experienced a decline in regular employment. Second, for both men and women born after 1973, the cohort profiles of regular employment are located below the profiles of earlier cohorts for all education groups. Third, men’s regular employment ratio starts to decline from age 40-59, while women’s employment rises at a similar age and women’s regular employment rate is almost constant at those ages. Finally, retirement from full-time work around age 60 is large for both men and women, and it has become larger for recent cohorts. There is a net entry into part-time employment for men around age 60. For women, net entry into part-time work around age 60 is not observed, but retirement from part-time work is more gradual than retirement from full-time work.

The growth pattern of mean earnings of married couples is examined, using microdata of the NSFIE. The husband’s earnings fell from 1994 to 1999, while the wife’s earnings rose. The mean real earnings of married full-time working men are less than the mean real earnings of the previous cohorts of men of the same age. The sum of the earnings of the husband and the wife fell slightly from 1994 to 1999. However, the growth pattern of family earnings (the sum of the earnings of the husband and the wife) differs according to the wife’s employment status. For the household in which the wife works full-time, the family earnings grew from 1989 to 1999. On the other hand, for the household in which the wife works part-time, the family earnings growth was stagnant. The women’s earnings seem to be a growing component, and households with that source of earnings enjoyed the most earnings growth.

This paper also discusses the impact of changing patterns of employment and earnings on the pension reform. Men’s participation has been falling for cohorts that are expected to experience decline in Social Security Wealth. Women’s participation has been rising for cohorts with less Social Security Wealth. Decline in full-time employment is a concern for sustaining a high enrollment in public pension.
References


Table 1: Retirement Pattern of Men and Women by Education and Birth Year

<table>
<thead>
<tr>
<th>Education</th>
<th>Birth Year</th>
<th>Starting age of EP Benefits</th>
<th>Retire from work</th>
<th>Retire from Full-time work</th>
<th>Retire/Entry to Part-time work</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Junior High</td>
<td>1928-1932</td>
<td>60</td>
<td>-0.146</td>
<td>-0.194</td>
<td>0.047</td>
</tr>
<tr>
<td>(9 years)</td>
<td>1933-1937</td>
<td>60</td>
<td>-0.222</td>
<td>-0.276</td>
<td>0.045</td>
</tr>
<tr>
<td></td>
<td>1938-1942</td>
<td>60-61</td>
<td>-0.250</td>
<td>-0.370</td>
<td>0.066</td>
</tr>
<tr>
<td>Senior High</td>
<td>1928-1932</td>
<td>60</td>
<td>-0.166</td>
<td>-0.240</td>
<td>0.031</td>
</tr>
<tr>
<td>(12 years)</td>
<td>1933-1937</td>
<td>60</td>
<td>-0.244</td>
<td>-0.345</td>
<td>0.043</td>
</tr>
<tr>
<td></td>
<td>1938-1942</td>
<td>60-61</td>
<td>-0.288</td>
<td>-0.447</td>
<td>0.061</td>
</tr>
<tr>
<td>Junior College</td>
<td>1928-1932</td>
<td>60</td>
<td>-0.212</td>
<td>-0.364</td>
<td>0.042</td>
</tr>
<tr>
<td>(14 years)</td>
<td>1933-1937</td>
<td>60</td>
<td>-0.272</td>
<td>-0.427</td>
<td>0.032</td>
</tr>
<tr>
<td></td>
<td>1938-1942</td>
<td>60-61</td>
<td>-0.273</td>
<td>-0.423</td>
<td>0.055</td>
</tr>
<tr>
<td>Univ</td>
<td>1928-1932</td>
<td>60</td>
<td>-0.157</td>
<td>-0.290</td>
<td>0.016</td>
</tr>
<tr>
<td>(16 years</td>
<td>1933-1937</td>
<td>60</td>
<td>-0.245</td>
<td>-0.343</td>
<td>0.022</td>
</tr>
<tr>
<td>or over)</td>
<td>1938-1942</td>
<td>60-61</td>
<td>-0.285</td>
<td>-0.428</td>
<td>0.029</td>
</tr>
</tbody>
</table>

| **Women**         |                |                             |                  |                            |                               |
| Education         | Birth Year     | Starting age of EP Benefits | Retire from work | Retire from Full-time work | Retire/Entry to Part-time work |
|                   |                |                             |                  |                            |                               |
| Junior High       | 1928-1932      | 55-56                       | -0.095           | -0.055                     | 0.002                         |
| (9 years)         | 1933-1937      | 56-58                       | -0.163           | -0.103                     | -0.035                        |
|                   | 1938-1942      | 58-60                       | -0.209           | -0.133                     | -0.039                        |
| Senior High       | 1928-1932      | 55-56                       | -0.094           | -0.069                     | -0.008                        |
| (12 years)        | 1933-1937      | 56-58                       | -0.161           | -0.100                     | -0.026                        |
|                   | 1938-1942      | 58-60                       | -0.206           | -0.130                     | -0.059                        |
| Junior College    | 1928-1932      | 55-56                       | -0.126           | -0.145                     | 0.004                         |
| (14 years)        | 1933-1937      | 56-58                       | -0.108           | -0.099                     | 0.000                         |
|                   | 1938-1942      | 58-60                       | -0.181           | -0.153                     | -0.006                        |
| Univ              | 1928-1932      | 55-56                       | -0.114           | 0.037                      | 0.033                         |
| (16 years         | 1933-1937      | 56-58                       | -0.176           | -0.169                     | -0.012                        |
| or over)          | 1938-1942      | 58-60                       | -0.172           | -0.192                     | -0.007                        |

Figure 1  Male employment rates by birth year and education: Age 20-59

Figure 2  Male regular employment rates by birth year and education: Age 20-59
Figure 3  Male part-time employment rates by birth year and education: Age 20-59

Figure 4  Male employment rates by birth year and education: Age 50-69
Figure 5  Male regular employment rates by birth year and education: Age 55-69

Figure 6  Male part-time employment rates by birth year and education: Age 55-69
Figure 7  Female employment rates by birth year and education: Age 20-59


Figure 8  Female regular employment rates by birth year and education: Age 20-59

Figure 9  Female part-time employment rates by birth year and education: Age 20-59

![Graph showing female part-time employment rates by birth year and education for ages 20-59. The graph compares employment rates for different birth years and education levels, with each line representing a specific birth year range. The x-axis represents age, and the y-axis represents employment rates.](image)


Figure 10  Female employment rates by birth year and education: Age 50-79

![Graph showing female employment rates by birth year and education for ages 50-79. The graph compares employment rates for different birth years and education levels, with each line representing a specific birth year range. The x-axis represents age, and the y-axis represents employment rates.](image)

Figure 11  Labor Force Participation of Selected Countries

Source: Author's calculation from LABORSTA Labour Statistics Database, INTERNATIONAL LABOUR ORGANIZATION, Geneva
Figure 12  The mean earnings of full-time working husbands

The Mean Earnings of Working Husbands

Source: Author's calculation from micro data of the National Survey of Family Income and Expenditure

Figure 13  The mean earnings of full-time working wives

The Mean Earnings of Full-time Working Wives

Source: Author's calculation from micro data of the National Survey of Family Income and Expenditure
Figure 14   The mean earnings of part-time working wives

Source: Author's calculation from micro data of the National Survey of Family Income and Expenditure
Figure 15  Real Family Earnings by the Wife’s Employment Status

Wife Full-time employment

Wife Part-time employment

Source: Author’s calculation from micro data of the National Survey of Family Income and Expenditure