Changes in the Japanese Employment System
in the Two Lost Decades

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Abstract

Despite changes in the economic and social environment following the burst of the bubble economy in the early 1990s, studies on the Japanese employment system so far have detected few major changes in seniority-based wage or lifetime employment patterns. Using recent microdata from the *Basic Survey on Wage Structure*, this paper takes another look at developments in these two key elements of the Japanese employment system. In contrast with previous studies, we do find evidence that the two practices are eroding and that, hence, the traditional employment system overall has begun to unravel. Specifically, with regard to seniority wages, we found, for example, that the age-wage profile has become flatter in recent years, especially for employees in the middle and final phase of their career. And as for lifetime employment, we found a clear downward trend in the share of lifetime employees among younger, university-educated workers from the early 2000s. Taken together, the findings suggest that a growing share of educated younger workers choose to leave indefinite-contract jobs due to the poor prospects for seniority-based wage progression, while older workers choose to stay in their present job despite stagnating or falling wages, since it is more difficult for them to find alternative employment.

JEL Classification: J21, J31, J01

Key words: Seniority-based wages; Lifetime employment; Japan

1. Introduction

The Japanese employment system has been widely regarded as one important driver of economic growth during the country's high-speed growth era and subsequent decades. It greatly contributed to the productivity and competitiveness of Japanese firms by fostering an environment for long-term investments and by enhancing workers' incentives (see, e.g., Kato and Morishima, 2002; Rebick, 2005; Moriguchi and Ono, 2004). However, the prolonged period of slow growth and repeated recessions following the burst of the bubble economy – what has now become the so-called "Two Lost Decades" – may have transformed the economic structures that were complementary to Japanese labor practices and underpinned their success. That is to say, employers may have been forced to adjust labor practices in order to cope with the "Two Lost Decades," which may have resulted in an erosion of the system.

However, to date researchers have discovered little evidence of major changes in the Japanese employment system, or at least the key features of the system, i.e., seniority wages and lifetime employment. In fact, although such practices may be gradually changing in response to changes in the economic and social environment, such as the economic slowdown, the aging of the population, and labor law reforms, many have claimed that "core" employees are still covered by these traditional practices. Regarding the seniority wage, Hattori and Maeda (2000), for instance, showed that the slope of the age-wage profile did not change substantially during the period between 1992 and 1997. Along similar lines, Rebick (2001) found that the wage differential between junior and senior workers remained largely unchanged during the 1990s (until 1996). As for lifetime employment practices, numerous studies have been conducted using a variety of measures, including (i) the proportion of workers who remain with the same employer after school graduation (Chuma, 1998), (ii) the job retention rate (Chuma, 1998; Kato, 2001; Kambayashi and Kato, 2009), and (iii) the average years of tenure (Chuma, 1998; Shimizutani and Yokoyama, 2009). They all indicate that,

even after the mid-1990s, there again was little change in such practices, especially for middle-aged and older male employees.

While the absence of clear signs of change may suggest that the Japanese employment system has been immune to changes in the broader environment surrounding it, another possibility is that previous studies overlooked possible changes, because the period they focused on represents only the beginning of a dynamic long-term transformation. That is to say, most of these studies focused on the 1990s and early 2000s, while structural changes in the employment system may take years to manifest themselves. Yet, it is only since the late 1990s that pressures have been such that employers started downsizing workforces and laying off employees, as is reflected in the higher unemployment rate in the 2000s.

Against this background, the purpose of the present study is to examine if and how traditional Japanese employment practices, especially seniority wages and lifetime employment, have changed in recent years, especially in the period since the early 2000s. We examine these questions using annual microdata from the *Basic Survey on Wage Structure* (hereafter, *BSWS*) covering the period from 1989 to 2008 compiled by the Ministry of Health, Labour and Welfare. We focus on male regular indefinite-contract workers, since they are the group that the labor practices of the Japanese employment system are typically applied to.[1]

Our analysis on the current state of the Japanese employment system is of relevance both to scholars and to policy makers. First, although theoretical studies on the Japanese employment system frequently highlight the mutual complementarity of its various elements, especially that of seniority wages and lifetime employment (e.g., Itoh, 1994; Aoki et al., 1996), most empirical studies actually focus only on a single aspect of the system, i.e., seniority wages or lifetime employment. Our study is the first attempt to examine developments in both of these practices at the same time,

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[1] "Indefinite-contract workers" are workers hired under a contract of employment without a definite term. See Section 3.1 below for details of the *BSWS* classification of definite-contract and indefinite-contract workers.

thus taking their complementarity into account.

Second, development in the employment system has potentially significant implications for the prospects of the Japanese economy. As mentioned, the employment system has been widely regarded as an important pillar of Japan's rise to prosperity. However, if it is indeed the case that the employment system was a key factor underpinning the productivity and competitiveness of Japanese firms, as researchers suggest, then its erosion would indicate that this may no longer be the case in the present economic and social circumstances. Apart from the implications for the management of Japanese firms, the breakdown of the employment system would also have a significant impact on people's lives – an aspect that has received little attention so far. That is to say, without lifetime employment and seniority wages, individual households can no longer base their life plans (as is presumed by the Life-cycle/Permanent Income Hypothesis) on the expectation of a secure job and future salary increases for the head of household.

In order to examine if there have been changes in Japanese employment practices, we construct a variety of indicators for the two key elements. As for seniority wages, we calculate two indicators: (i) the age-wage profile of male lifetime employees, which are defined as workers that entered a firm immediately after graduation and continued to work in the same firm until the survey date; and (ii) the kernel density wage distribution of lifetime employees by age group. With regard to the first indicator, we find that the wage profile has become flatter in recent years, especially for the middle and final phases of workers' careers. More specifically, the wage slope gradually started to flatten in the 1990s and eventually developed a "kink" around age 40, which is most pronounced for university-educated workers in the non-manufacturing sector in 2007-2008. The kernel density wage distribution by age group also behaves in a manner consistent with the flattening wage profile. While until the 1990s, the wage distribution shifted more to the right (higher wages) the older the age group, reflecting pay rises with age and seniority, this rightward shift with age group can no longer be

observed in recent years for age groups above the mid-40s.

As for lifetime employment, we examined two indicators: (i) the share of lifetime employees; and (ii) the five-year job retention rate, both of which are calculated separately for several age groups for two education groups. Although we did not detect any obvious trend in the first indicator for the middle-aged and older groups, we found a clear downward trend in this share in the group of young university graduates from the late 1990s onward. The five-year job retention rate of lifetime employees – defined as the probability that a lifetime employee will continue working with the same employer for an additional five years – also declined noticeably in the 2000s for young university graduates.

Taken together, the results for the different indicators suggest that these two aspects of Japanese employment practices seem to have eroded in recent years. The wage that a young worker can expect during the course of his future career has declined considerably, especially in non-manufacturing sectors. This, in turn, may have discouraged many educated younger workers from staying in the same firm and they instead depart from a job with an indefinite employment contract. On the other hand, older workers have tended to stay in their present job, despite stagnating or falling wages, since it is more difficult for them to find an alternative job, which further adds to the downward pressure on wages for middle -aged and older workers.

The remainder of the paper is organized as follows. Section 2 briefly reviews the key elements of the Japanese employment system and provides further details on the focus of our analysis. Section 3 describes our data sources and the four measures of Japanese employment practices examined in this study. Section 4 reports our empirical findings and discusses their implications. Finally, Section 5 summarizes the findings and concludes the paper.

2. The Japanese Employment System and the Focus of Our Analysis

Although there are some variations in the definition of the Japanese employment system, most studies regard the following three components as key elements: (1) seniority wages, (2) lifetime employment, and (3) enterprise labor unions. Of these three elements, the relevance of labor unions was already in decline during the 1990s, as indicated by the fall in the union participation ratio and their power in wage bargaining (Tsuru, 2002). Consequently, our analysis focuses on developments regarding seniority wages and lifetime employment, the elements which until relatively recently appear to have remained intact.

Theoretical studies on labor practices not only in Japan but also elsewhere often emphasize the complementarity among a variety of labor practices (see, e.g., Milgrom and Roberts, 1992). Particularly in Japanese firms, seniority wages and lifetime employment go hand-in-hand, as shown by Itoh (1994) and Aoki et al. (1996). The rationale, as put forward in the literature, can be summarized as follows. Under the seniority wage system, wages increase with length of service (or chronological age). Employees receive wages below their marginal product when they are young, but can expect wages above their marginal product in later years because of the implicit guarantee embodied in the lifetime employment system. As long as employees feel that this arrangement is to their advantage – through the long-term employment stability and steady wage increases it provides – they remain with the same employer until retirement. Employers, on the other hand, benefit from this arrangement because of the formation of firm-specific skills, which in turn raise productivity. It is due to this institutional complementarity that the Japanese employment system has been stable for such a long period. However, because of this complementarity, if either of these elements starts to erode, this may usher in the breakdown of the entire system and the transition to other labor market structures and practices.

It is important to note, though, that what is labeled the "Japanese employment system"

actually covers only a minority of employees, who are typically male (reflecting Japan's patriarchal society), have a university degree, and work for a large firm (since only large firms tend to be sufficiently stable to credibly promise lifetime employment). Since many firms are trying to replace regular full-time employees on indefinite contracts with other types of workers to provide greater flexibility to cut fixed labor costs in the face of slow economic growth, the percentage of core workers who are actually covered by the practices making up the Japanese employment system is gradually decreasing. This decrease in the share of indefinite-contract workers itself could already be regarded as an erosion of the Japanese employment system. The purpose here, however, is to examine employment practices *among* this core group of indefinite-contract workers traditionally covered by the Japanese employment system.

At this point, it is useful to briefly consider what is meant by lifetime employment. Although definitions provided by scholars differ slightly (see, e.g., Ohkochi, 1972, and Aoki et al., 1996), lifetime employment is generally characterized by the following two conditions:

i)   lifetime employees are hired immediately after graduation; and

ii)   lifetime employees remain in the same firm until the retirement age.

While we adopt the first condition, which we refer to as the "infancy" condition, for our own definition, we moderately relax the second condition (referred to as "loyalty" below) to make our analysis empirically feasible. If we took the second condition literally, given the nature of our repeated cross-sectional dataset, we would not be able to use the observations for young employees, since it is not sure whether they will remain in the same firm until their retirement. Therefore, as mentioned above, we define lifetime employees as workers who were hired by a firm immediately after graduation and continued to work in the same firm until the survey date, not until the mandatory retirement age.

Utilizing our definition of lifetime employees, we examine wage profiles and lifetime

employment patterns for workers until their early 50s. The reason for focusing on workers until their early 50s only is the prevalence of early retirement and/or transfers to other (subsidiary firms) several years before the mandatory retirement age (60 years) among employees in Japan, especially those with a university degree and working for a large firm.[2] These practices mean that it is difficult to properly assess the age-wage relationship and employment continuity of workers close to their retirement. Moreover, the time variation in lifetime employment measures, such as the share of lifetime employees and the job retention rate, for male workers in their late 50s is likely to be directly affected by the extension of the mandatory retirement age by revisions of the "Elderly Employment Stabilization Law," because the retirement age of Japanese workers depends greatly on the mandatory retirement age stipulated by the law. To avoid any spurious variation in these measures close to workers' retirement, we drop observations for workers in their late 50s (i.e., 55 to 59) from our analyses.

3. Data Description

3.1 Data Sources

This study uses micro-level data from the *BSWS* for the period between 1989 and 2008. The survey provides information both on establishments and on individuals. Information on establishments includes their 3-digit industrial classification number, the total number of indefinite-contract employees in the firm to which the establishment belongs, and the location. Information on individuals includes not only their wages and bonus payments, but also their age, sex, educational attainment, type of employment, regular/part-time status, length of service in the firm, and actual number of days/hours worked per month. We merged the information on establishments and individuals using the establishment identification number. As mentioned, among the different types

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[2] On this point, see, e.g., Ono and Rebick (2003), who observe that "[t]here is long-standing agreement between management and labor in Japan that allows management to move workers around in the company (or even to loan workers to other companies) in return for a guarantee of employment until mandatory retirement age."

of workers, our analysis will focus on male regular indefinite-contract workers.[3]

The *BSWS* covers all areas of Japan and all major industries. Industries were originally classified into approximately 400 very detailed categories. These categories can be reclassified into the 14 major industries of the 2002 Japan Standard Industry Classification. The 14 industries are (1) mining; (2) construction; (3) manufacturing; (4) electricity, gas, heat supply, and water; (5) information and communication; (6) transport; (7) wholesale and retail trade; (8) finance and insurance; (9) real estate; (10) eating and drinking places, accommodations; (11) medical, health care and welfare; (12) education, learning support; (13) compound services; and (14) services, n.e.c. The establishments are either (a) establishments with 10 indefinite-contract employees or more, either in the private or public sector, or (b) private establishments with 5-9 indefinite-contract employees. The total number of establishments falling under the *BSWS* criteria was about 1.1 to 1.5 million during the observation period, while the total number of persons employed by these establishments was around 30 to 38 million. The Ministry of Health, Labour, and Welfare, the ministry implementing the *BSWS*, selects establishments in the first stage of a two-stage stratified sampling scheme. In the second stage, each establishment is then asked to randomly choose employees from its payroll records. The number of establishments and of employees sampled per year was about 70,000–80,000 and 1.4 to 1.6 million, respectively.

The way the *BSWS* is compiled was revised in 2005, meriting two comments. First, the way that employees are classified was revised. Until 2004, employees were divided into only two categories, namely indefinite-period contract employees and definite-period contract employees. Since 2005, however, employees have been divided into five categories: (1) regular employees with an indefinite-period contract; (2) regular employees with a definite-period contract; (3) non-regular employees with an indefinite-period contract; (4) non-regular employees with a definite-period

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[3] Sample statistics of the data used in this paper are reported in Appendix Table 1.

contract; and (5) temporary employees. Categories (1) and (3) after 2005 correspond to indefinite-period contract employees before 2004. Thus, we can smoothly connect the data before and after the revision without any significant discrepancy in the definition.

Second, 22 occupations were newly included in the *BSWS*. Of these, 12 occupations were transferred from the *Wage Survey of Outdoor Workers by Occupation* owing to its integration with the *BSWS*. The other 10 occupations were newly added to cover professional jobs, such as dentists, veterinarians, lawyers, certified public accountants, certified social insurance labor consultants, university lecturers, and so on. In the construction of our sample, we exclude workers in these added occupations to avoid spurious time variations in wage structures and employment.

The *BSWS* has some distinctive advantages for examining changes in Japan's employment practices. First, even after controlling for a variety of employee attributes, such as educational attainment or the size of the firm they work for, the sample size is still sufficiently large. Second, in contrast with other surveys such as the *Employment Status Survey*, which is conducted only every five years but has often been used in previous studies, the *BSWS* is compiled annually. This high frequency allows us to closely follow developments in labor market practices and to identify the timing of potential changes.

That being said, even the *BSWS*, and hence our data set based on it, has some shortcomings. Since establishments sampled in the *BSWS* are randomly selected from the establishments in the *Survey of Firms and Establishments* (*SFE*), which is revised every three to five years, the *BSWS* suffers from large discontinuities between before and after revisions of the *SFE*. In our sample period, such revisions occurred in 1991, 1994, 1996, 1999, 2001, and 2004. To avoid any discontinuities in variables due to the *SFE* revisions, we adjust the original data obtained from the *BSWS* using sampling ratios of individual workers, available from the survey, to obtain the population median-based wage profile. We also compute the population-based kernel density wage

distribution, the ratio of lifetime employees, and the retention rate in the same way.

3.2 Calculated Measures

To examine recent developments in Japanese employment practices, we compute the following four measures for each year: (1) the age-wage profile; (2) the kernel density wage distribution; (3) the share of lifetime employees; and (4) the job retention rate.[4] As already explained in the previous section, we exclude the age group of 55-59 year-olds in order to avoid any potential distortions of wages and employment resulting from early retirement, transfer to subsidiary firms, and the extension of the compulsory retirement age.

3.2.1 Age-wage Profile

To construct the age-wage profile, which is the most commonly used measure of seniority wages in the literature, we use the median of monthly wages for lifetime employees. Monthly wages here are total monthly contractual cash earnings plus one-twelfth of annual special cash earnings in the previous year. Many previous studies used hourly wages (rather than monthly wages) for the calculation of age-wage profiles because they focus on productivity effects of the Japanese employment system. The reason for using monthly wages here is that this should result in more stable age-wage profiles since monthly wages are unlikely to be significantly affected by fluctuations in hours worked.[5] Further, using monthly wages means that the increase in hourly wages caused by the 1988 and 1994 revisions of the Japanese Labor Standards Law successively reducing the maximum weekly working hours from 48 to 40 does not affect our age-wage profiles.

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[4] Another potential measure of employment practices, which has been used in numerous other studies, is the average years of tenure. However, this measure does not take into account the "infancy" and "loyalty to single-firm" conditions used for our definition of lifetime employment and is therefore not considered here.

[5] Contracts for indefinite-period workers typically state the monthly wage rather than an hourly wage. Therefore, monthly wages vary little except for some minor fluctuations due to overtime payments. Converting monthly wages to hourly wages (i.e., dividing monthly wage by the hours worked per month) would introduce considerable variation due to fluctuations in the hours worked each month.

Specifically, we use contractual cash earnings before taxes in the month of June, including overtime payments. This amount is then deflated by the consumer price index for all of Japan (general, excluding imputed rent). Finally, we plot the wage profile using the median values of the monthly wage from 18 (for high school graduates) or 22 (for university graduates) to 54 years of age. The initial wage at 18 or 22 is normalized to 1 to make the variation in the wage slope more visible.

3.2.2 Kernel Density Wage Distribution

While the age-wage profile only allows us to examine trends in the median wage, examining the entire wage distribution may allow us to identify changes in higher statistical moments such as the dispersion, skewness, and kurtosis. As our second measure to examine seniority wages we here use the kernel density distribution of monthly wages by age group. Specifically, we plot the kernel density distributions for the following five age groups against each other: (1) 30-34 year olds; (2) 35-39 year olds; (3) 40-44 year olds; (4) 45-49 year olds; and (5) 50-54 year olds. If the seniority wage system is still intact, we would expect the wage distribution to lie further to the right the older the age group, as wages rise with age and seniority. On the other hand, if the system no longer operates, we would not expect such a clear-cut pattern. In the latter case, even if the seniority wage system is no longer intact, wages may still increase with age to some extent, but the increments between age groups and the distributional pattern are likely to differ from those in the situation where the seniority wage system is intact, reflecting pay schemes in which seniority plays a smaller role and other aspects, such ability or performance, are more important.

3.2.3 Share of Lifetime Employees

As mentioned earlier, lifetime employees here are defined as those who were hired immediately upon graduating from school or university and have continued to work for the same firm until the

survey date. This definition satisfies two necessary conditions for lifetime employment: "infancy" and "loyalty" to a single firm. Whether these conditions are satisfied can be determined by examining the difference between workers' age and their length of service in their firm. University graduates are regarded as a lifetime employees if the difference is 22 or 23. For high school graduates, a difference of 18 indicates that these conditions are satisfied.

The share of lifetime employees in a particular age group i at time t is calculated by dividing the number of lifetime employees by the total number of workers in the same age group. For presentational reasons, we divide our sample into the following three age groups: (1) 25-34 year olds; (2) 35-44 year olds; and (3) 45-54 year olds.

3.2.4 Job Retention Rate

Our second indicator for the prevalence of lifetime employment is the job retention rate. This is the probability that a worker retains the same job for a certain length of time. This measure has been used in a number of previous studies (e.g., Hall, 1982; Hashimoto and Raisian, 1985; Chuma, 1998; Kato, 2001; and Kambayashi and Kato, 2009), which, however, focused on the degree of labor mobility rather than on the prevalence of lifetime employment, since they examined workers with a relatively short length of service, typically 0-4 or 5-10 years.

As our primary interest is in lifetime employment, we apply the concept of the job retention rate to lifetime employees. The job retention rate for lifetime employees is calculated as the ratio of the lifetime employment share in an age category of one survey divided by that in the corresponding higher age category of a later survey. In this paper, we calculate the five-year job retention rates for lifetime employees in seven five year age groups, that is, 20-24 year olds, 25-29 year olds, 30-34 year olds, 35-39 year olds, 40-44 year olds, 45-49 year olds, and 50-54 year olds, for the four time periods of 1990 to 1995, 1995 to 2000, 2000 to 2005, and 2003 to 2008. We first

calculate the share of lifetime employees in each five year age group for the base years of 1990, 1995, 2000, and 2003. Next, we do the same for each age group in the *BSWS* five years later (1995, 2000, 2005, and 2008). Finally, we divide the share obtained in the first step for one age group by the corresponding value obtained in the second step by the next older age group. For example, the share of lifetime employees in the 20-24 year-old age group in 1990 is divided by that in the 25-29 year-old age group in 1995. The ratio thus obtained is the five-year job retention rate of lifetime employees. Our brief-interval retention rate may help to better identify changes in lifetime employment.

4. Empirical Findings

This section examines the time-series variation in the above-mentioned four measures to examine what happened to the Japanese employment system following the burst of the bubble in the early 1990s, but especially in the period from the late 1990s up to the present.

4.1 Changes in the Wage Profile

We first examine recent developments in the age-wage profile. We divide the sample into the manufacturing sector and the non-manufacturing sector,[6] as the competitive environment in these two sectors has been quite different. The manufacturing sector has long been subject to fierce international competition, whereas the non-manufacturing sector has been sheltered from competition by regulatory barriers.

We construct separate wage profiles for the two sectors for four different subgroups: (1) university graduates in large firms (defined as firms with more than 1,000 indefinite-contract

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[6] The non-manufacturing sector consists of (1) mining; (2) construction; (3) electricity, gas, heat supply, and water; (4) information and communication; (5) transport; (6) wholesale and retail trade; (7) finance and insurance; (8) real estate; (9) eating and drinking places, accommodations; (10) medical, health care and welfare; (11) education, learning support; (12) compound services; and (13) services, n.e.c.

employees); (2) university graduates in small to medium-sized firms (firms with fewer than 1,000 indefinite-contract employees); (3) high school graduates in large firms; and (4) high school graduates in small to medium-sized firms. The results are presented in Figures 1(a) to 1(d) for the manufacturing sector and 2(a) to 2(d) for the non-manufacturing sector, which depict the age-median wage profiles for three selected two-year intervals, 1989-1990, 1998-1999, and 2007-2008. Looking first at the profiles for the first period, 1989-1990, we find that wages increased substantially with age in both sectors, although the slope was steeper in the non-manufacturing than in the manufacturing sector. However, by 1998-1999, the slope had started to flatten somewhat, except for high school graduates in large firms. The relative wage decline was particularly pronounced for middle-aged to older workers, as indicated by the growing divergence between the wage profiles for 1989-1990 and 1998-1999 from the age of around 40 for most subgroups.

Insert Figures 1 and 2

By 2007-2008, the flattening of wage profiles becomes even more pronounced. Moreover, differences between the manufacturing and non-manufacturing sector widened. The wage slope for workers in manufacturing firms slightly declined between 1998-1999 and 2007-2008, regardless of firm size and educational attainment. On the other hand, for 2007-2008, the wage profile in the non-manufacturing sector substantially flattens around the age of 40. Especially for university graduates, the wage barely increases after the mid-40s, regardless of firm size. And although the wage of high school graduates in the non-manufacturing sector continues to gradually increase with age, the increase in 2007-2008 is fairly small when compared with 1989-1990 and 1998-1999.

It should be noted that the age-wage relationship in the above profiles may also be influenced by cohort factors as well as the age effect. If the cohort factors dominate the relationship,

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the flattening age-wage profile may be only a temporal phenomenon which is specific to certain cohorts. In order to determine the significance of the cohort effect, we plot in Figures 3(a) to 3(d) the cohort-specific age-wage profiles for the non-manufacturing sector. The initial wage for those profiles is not normalized to 1, because the initial wage is not necessarily available for all cohorts. As can be clearly seen in Figures 3(a) and 3(b), the cohort-specific profiles also gradually flatten for more recent cohorts from around the age of 40. Thus, the flattening of wage profiles does not appear to be due to cohort factors but mainly due to the age effect.

Insert Figure 3

4.2 Changes in the Kernel Density Wage Distribution

While our finding of nearly non-increasing wages in the latter half of workers' career appears to suggest that the seniority-wage system is breaking down, we must be careful to consider the possibility that the median wage may be affected by certain changes in the distribution of worker quality through labor hoarding and/or employment adjustments following the burst of the bubble. To examine this possibility, Figures 4 and 5 depict the age-group specific kernel density distributions of monthly wages for male university graduates in the non-manufacturing sector, for large firms and for small to medium-sized firms, respectively. As panels (a) and (b) in Figures 4 and 5 illustrate, in 1989-1990 and 1998-1999, the wage distribution used to shift to the right with age, reflecting pay rises with age and seniority. However, panel (c) for 2007-2008 shows that for the 45-49 and 50-54 age groups, the distribution hardly shifts at all. This minuscule shift, as well as the small difference in the shape of the distributions for the 45-49 and 50-54 age groups suggest that the recent decline of the median wage for middle-aged and older workers results not from changes in the distribution of worker quality but from the small increase in wages for the typical employee from middle age

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onward.

4.3 Changes in the Share of Lifetime Employees

Next, we examine changes in the share of lifetime employees over the past two decades. Figures 6(a) to (d) depict this share for the aforementioned four subgroups in all industries.[7] Among these groups, a clear decline in the lifetime employment rate can be observed for the youngest age group (those aged 25-34) of university graduates working in large firms (see Figure 6(a)). The lifetime employment rate for this group shows a sharp decline of nearly 20 percentage points between the mid-1990s and 2008. On the other hand, Figure 6(b) indicates that the decline in lifetime employment among the youngest group of university graduates has been more moderate in small to medium-sized firms. Figures 6(a) and 6(b) also suggest that the share of lifetime employees in the older age groups has remained largely unchanged during our observation period, with the exception of the oldest (45-54) university graduates group working in large firms (Figure 6(a)), which shows a slightly decreasing trend.

Turning to the lifetime employment ratio for high school graduates, shown in Figures 6(c) and (d), we find no clear trend, except again for the oldest group, i.e., those aged 45-54. The lifetime employment ratio for this oldest group has actually increased. A possible reason for this is the extension of the mandatory retirement age through revisions of the "Elderly Employment

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[7] Because the trend in the lifetime employment ratio differs little between the manufacturing sector and the non-manufacturing sector, we do not report the detailed pattern here. Separate figures for these two sectors are available from the author upon request.

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Stabilization Law" since the early 1990s. The initial amendment, which was approved in 1994 and enforced in 1998, obliged firms to adopt a mandatory retirement age of 60. In the second revision, the retirement age was raised to 65 in 2004. While the impact of these revisions on the lifetime employment ratio for university graduates was limited since they, as mentioned above, traditionally leave their firm before the mandatory retirement age due to early retirement or temporary transfers, the revisions had a more visible impact on the lifetime employment ratio for high school graduates because they typically work up to the mandatory retirement age.

The contrast between university and high school graduates, as well as that between large firms and small to medium-sized firms, partially reflects the fact that the Japanese employment system is applied mainly to highly educated male workers in large firms. However, the findings of our analysis suggest that in recent years even for this privileged group of workers traditional Japanese employment practices no longer apply to the extent as in the past.

4.4 Changes in the Job Retention Rate

We now turn to our second measure of lifetime employment, the job retention rate. Table 1 reports the five-year job retention rate for university-educated lifetime employees in large and small to medium-sized firms. Specifically, it shows that in 1990, 91.5 percent of male indefinite-contract employees aged 20-24 at large firms satisfied the two lifetime employment conditions. However, five years later, in 1995, this was the case for only 65.8 percent of male indefinite-contract employees aged 25-29. Thus, using these figures, the five-year job retention rate for the period 1990 to 1995 is calculated as 65.8/91.5=71.9 percent. The three columns on the right-hand side of the table report the change in the retention rate between two neighboring periods.

Insert Table 1

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Examining these figures in detail, we find the following. First, the retention rate for the youngest age group (those aged 20-24) started to decline significantly in the early 1990s. Although this trend can be observed for both large and small to medium-sized firms, it is considerably more pronounced for large firms. Further, for the second and third youngest categories (those aged 25-29 and 30-34), the retention rate also decreased, from the late 1990s and the early 2000s, respectively. These results indicate that young university graduates today are likely to leave indefinite-contract jobs earlier than young graduates did in the past. On the other hand, while the retention rate of middle-aged to older university graduates in large firms temporarily declined between the late 1990s and the early 2000s, this trend did not continue in the most recent period.

Insert Table 2

Next, let us turn to changes in the job retention rate for high school graduates. Table 2 shows that the retention rate for the youngest age group has declined since the late 1990s. In this group, 6.1 percent of employees at large firms and 2.6 percent of employees at small to medium-sized firms left their first jobs between the 1995-2000 period and the 2000-2005 period. Furthermore, in the most recent period, between 2000-2005 and 2003-2008, among the youngest age group, 16.9 percent of employees at large firms and 8.2 percent of employees at small to medium-sized firms left their first job. In the same period, the retention rate of the second youngest group also started to decline. In contrast, the retention rate for age groups of 30 and above remained largely unchanged, with the exception of the large increase in the 1990s and subsequent decrease in the early 2000s in small to medium-sized firms.

Taken together, the results suggest that there has been an erosion of lifetime employment

among young workers, both university and high school graduates, although no such trend is found for older workers.

4.5 Discussion

Summarizing the findings above, clear changes in Japan's employment system can be observed. First, older workers, particularly those in the non-manufacturing sector, no longer enjoy the same wage increases as in the past. And second, there is a clear erosion of lifetime employment especially among highly educated young workers. According to theoretical studies of the Japanese employment system, which stress the role of institutional complementarity, the seniority-wage system and the lifetime employment system should both disintegrate if either one begins to unravel. Our findings for the non-manufacturing sector may be consistent with this hypothesis.

Let us consider our results – and especially the different findings for younger and older employees – in detail, taking the role of institutional complementarity into account. Starting with the erosion of lifetime employment, it is not surprising that this began with younger workers, since these are more likely to leave their job if they cannot expect satisfactory wage increases in return for their loyalty to the same company. As they can find another job more easily than middle-aged or older workers, they are likely to be more sensitive to a decline in their future wage. In contrast, older workers often have little choice but to stick with their job because it is difficult for them to find an alternative job without taking a significant pay cut. In other words, the labor mobility of older workers is relatively low.

A number of reasons can be given for the wage decline of older employees in the 1990s. First, firms held on to excess workers during the period of slow growth following the burst of the bubble. Had the economy recovered quickly, firms could have simply absorbed the cost of having excess workers. Since this was not the case, however, firms were forced to reduce costs, and older

workers were more likely to accept wage reductions in return for employment guarantees. A second

possible reason is the changing age structure of the workforce. In particular, wage costs (=average

wage × number of workers) for middle-aged and older workers would have increased

disproportionately from the late 1990s as the baby boomer generation (those born between 1947 and

1949, called *dankai* in Japanese) swelled the ranks of the oldest age groups with the highest wages.

Considering the erosion of lifetime employment among younger workers, a number of

other reasons apart from the decline in the predicted seniority wage can be given. One reason is the

high (or excess) intake of new graduates during the bubble period and the subsequent cutback on the

hiring of new graduates in the post-bubble period. The bubble cohort, which likely makes up a bulge

in the age pyramid of large firms, hinders the promotion of the workers in the post-bubble cohort,

because, under the seniority-based promotion system that is prevalent among Japanese firms, the

bubble cohort workers must be promoted before post-bubble cohort workers (see, e.g., Moriguchi

and Ono, 2004). The bubble cohort may also have deprived subsequent cohorts of

on-the-job-training opportunities within the firm because the latter had to stay in lower or less

important positions for longer. As a result, young workers are likely to have been discouraged from

working for the same company throughout their career. This age structure problem may partly

explain our finding that the lifetime employment ratio and the job retention rate started to decline

even before wages began to flatten.

Yet another possible reason for the erosion of lifetime employment among younger

employees is the rapid transformation of Japan's industrial structure. An important element of

lifetime employment and seniority wages is, of course, the development of firm-specific skills.

However, if young employees expect their firm-specific skills to become obsolete as a result of

structural change, then such skills carry less of a premium, lowering the incentive to stay in the same

firm. An additional potential reason for the higher job turnover among younger workers is legislative

changes. Japan's Labor Standards Laws were modified in 1998 to permit fixed-period contracts of three years or less for particular types of jobs. The law was further amended in 2004, extending it to all types of jobs. Until then, the law had obliged firms to choose either indefinite period contracts or definite period contracts of up to one year. The introduction of multi-year definite contracts may have increased the options for firms as well as workers, resulting in greater inter-firm mobility, particularly among younger workers.

Finally, let us consider the differences in wage profile patterns between the manufacturing and the non-manufacturing sector. Specifically, we found that whereas wages for university graduates in the non-manufacturing sector more or less stagnate once workers reach their mid-40s, wages in the manufacturing sector continue to increase even in later stages of workers' career. One possibility is that the slow growth and the distorted age structure in the non-manufacturing sector are responsible for this. The average growth rate for the period 1989-2007 for the manufacturing sector was 2.1 percent, while that for the non-manufacturing sector was 1.2 percent.[8] This growth differential may partly explain the difference in the developments in wage profiles, but it seems too small to completely explain the large differences in wage developments between the two sectors. Similarly, the changing age structure due to population aging cannot really explain the difference between the manufacturing and the non-manufacturing sector, since it is common to both.

Another possible explanation is increased product market competition in the non-manufacturing sector. At least until the late 1990s, the slope of the wage profile in the non-manufacturing sector – which had enjoyed stronger protection – looked steeper than that in the manufacturing sector, leaving some room for wage cuts for middle-aged and older workers. Deregulation in recent years, especially in the non-manufacturing sector, may have led to greater competition among firms in areas such as finance and insurance, information and communications,

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[8] The average growth rates are based on the annual rate of GDP growth classified by economic activity in the National Accounts.

and wholesale and retail. With the increase in competition, firms in the non-manufacturing sector were forced to adapt and to improve their managerial efficiency. Again, though, this seems only a partial explanation at best: the changes observed for university graduates in the non-manufacturing sector look a bit too extreme to be the result of competition-induced adjustments only. Hence, further research is required to solve this remaining "puzzle."

5. Conclusion

The purpose of this paper was to examine developments in two key components of the Japanese employment system – seniority-based wages and lifetime employment – over the past 20 years using data from the *Basic Survey on Wage Structure*. The findings can be summarized as follows. First, with regard to seniority-based wages, we examined developments in the age-wage profile for lifetime employees and found a gradual flattening of the wage slope in the 1990s, followed by a kink in 2007-2008. Examining, moreover, developments in the wage distribution over time, we found that the shift to the right (higher wages) for older age groups observed in earlier periods had almost disappeared in 2007-2008. Second, in order to examine developments in lifetime employment patterns, we calculated the share of lifetime employees and the five-year job retention rate. While we did not detect a clear trend in the share of lifetime employees among middle-aged and older male indefinite-contract employees, we did find a discernable downward trend in the share for university-educated younger workers from the early 2000s. The job retention rate also declined noticeably in the 2000s for university-educated younger workers.

Overall, the long-term trends of our four measures suggest that the two key elements of the Japanese employment system have recently started to erode simultaneously. It appears that as a result of the flattening of the wage curve in later career stages, younger educated workers have a greater incentive to leave indefinite-contract jobs, and a growing proportion are beginning to do so.

On the other hand, older workers probably decided to stay in their present job, accepting a stagnation or cut in their wages, since they cannot easily find an alternative job. As a result, the lower job mobility of middle-aged to older workers is likely to have contributed to the disproportionate wage reductions they have had to endure. Thus, given the complementarity of seniority-based wages and lifetime employment, the observed trends overall suggest that the Japanese employment system has started to unravel in recent years.

The erosion of the traditional employment system is bound to have a significant impact both on people's lives and on corporate management practices. Although this is an issue that has received little attention in the literature so far, the impact on people's everyday lives is at least as significant as that in the corporate sectors. That is, without seniority-based wages and lifetime employment, individual households can no longer plan their lives based on the expectation of a secure job and future salary increases for the head of household. Therefore, considering how the erosion of the Japanese employment system affects the behavior of households (or consumers) is an important topic worthy of further careful study, and we hope to address this in our future work.

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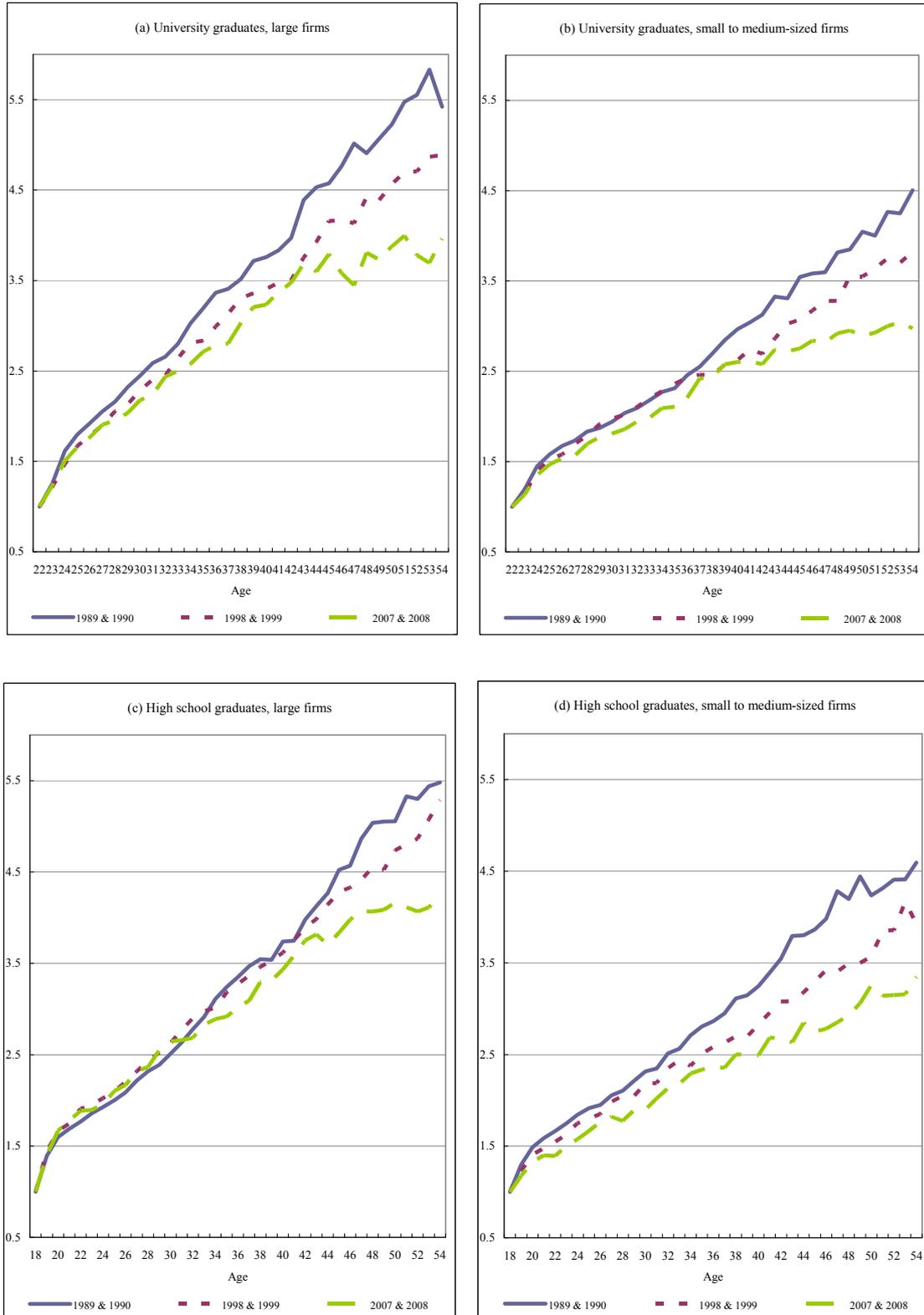
Figure 1. Median monthly wage profile, manufacturing sector
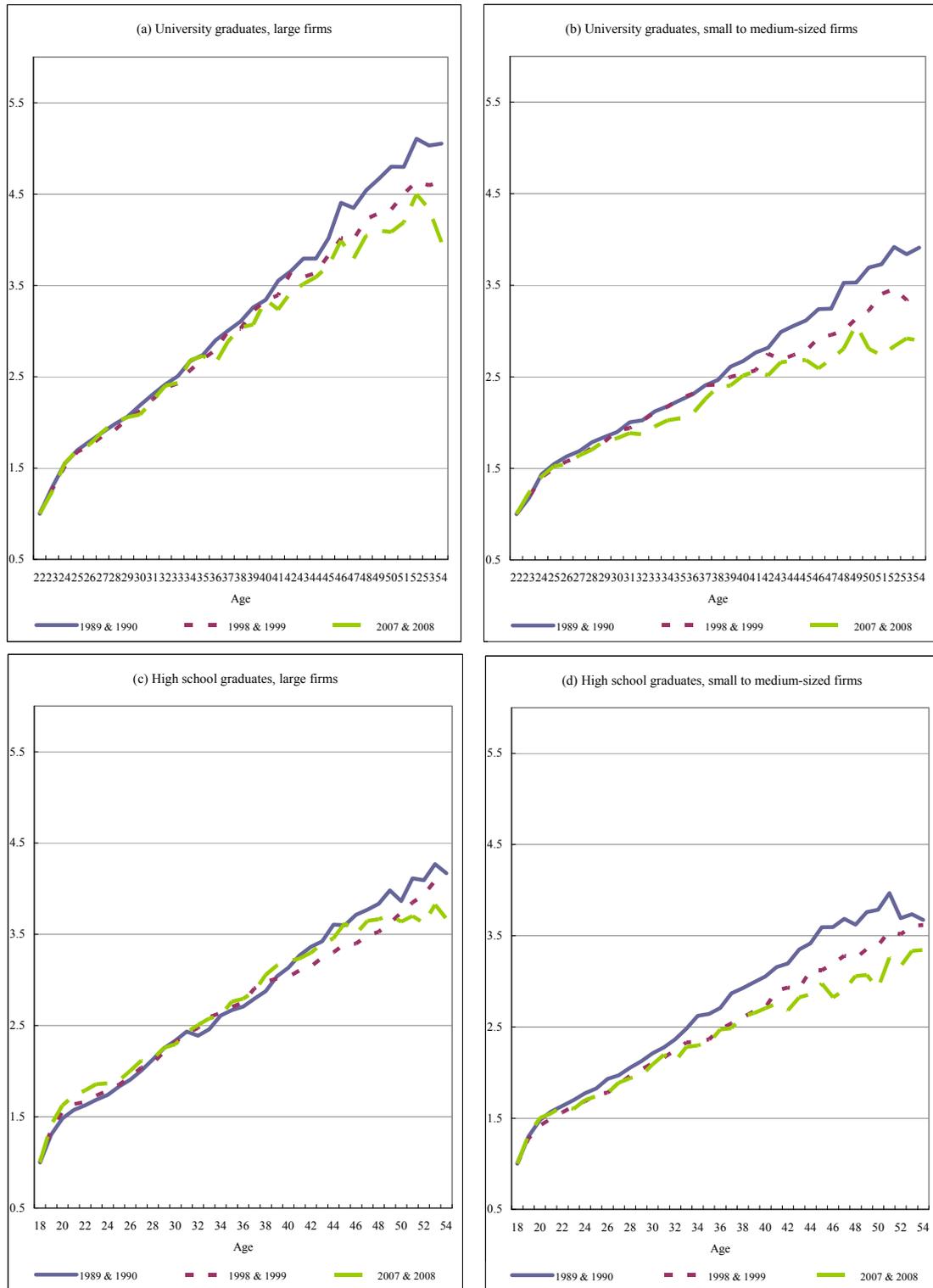
Source: *Basic Survey on Wage Structure* (various issues, 1989-2008).
Notes: The median monthly wage is calculated based on the total amount of monthly contractual cash earnings and one-twelfth of the annual special cash earnings of the previous year. Large firms are firms with 1,000 or more indefinite-contract employees. Small to medium-sized firms are firms with fewer than 1,000 indefinite-contract employees. The median monthly wage is deflated by the consumer price index for Japan (general, excluding imputed rent).

Figure 2. Median monthly wage profile, non-manufacturing sector

(a) University graduates, large firms

(b) University graduates, small to medium-sized firms

(c) High school graduates, large firms

(d) High school graduates, small to medium-sized firms

Source and notes: See Figure 1.

Figure 3. Cohort-specific median monthly wage profile for the non-manufacturing sector
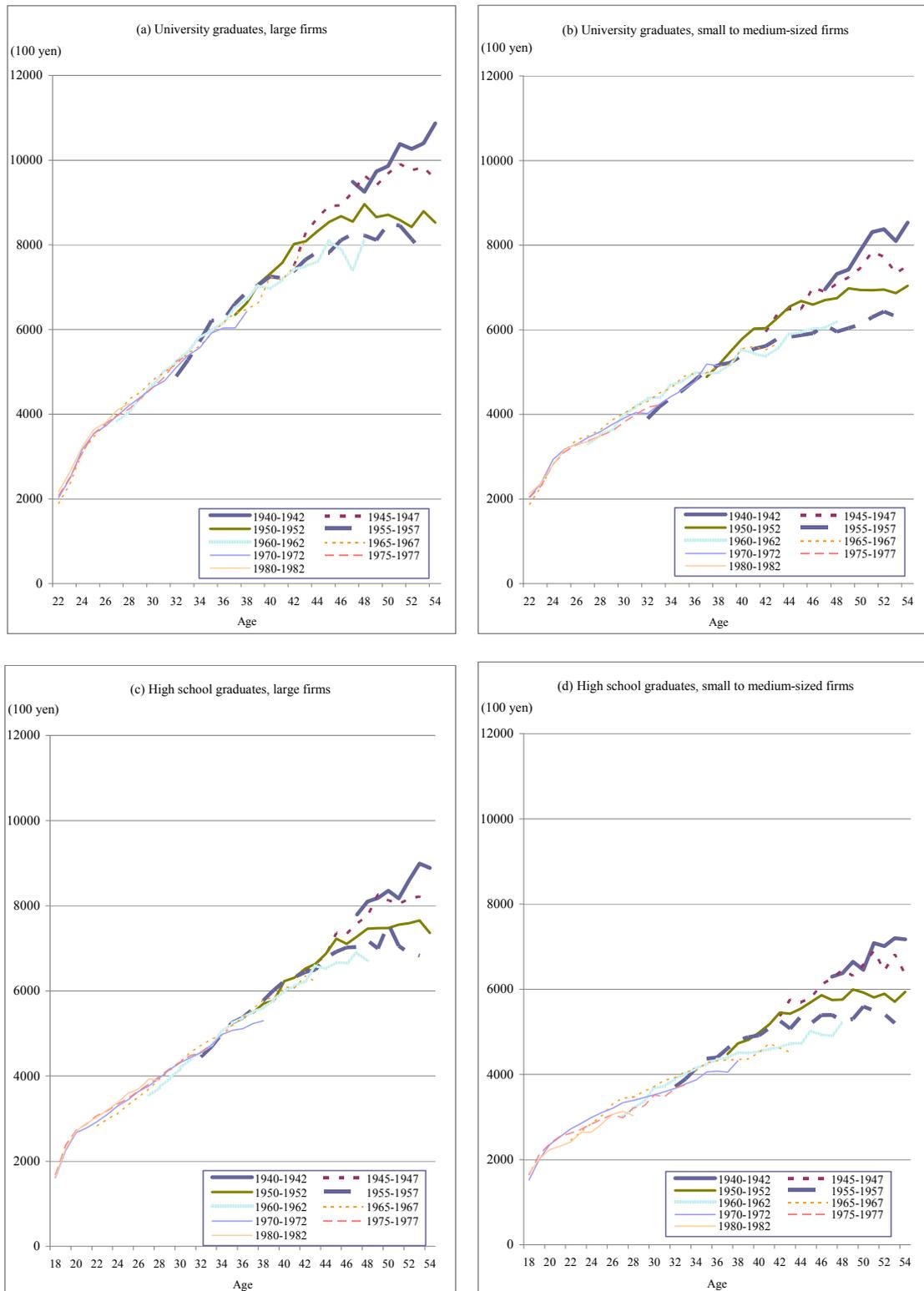
Source: See Figure 1.
Notes: The cohort-specific wage profile of monthly wages is constructed based on the monthly contractual cash earnings plus one-twelfth of the annual special cash earnings of the previous year, deflated by the CPI. Large firms are firms with 1,000 or more indefinite-contract employees. Small to medium-sized firms are firms with fewer than 1,000 indefinite-contract employees.

Figure 4. Kernel density distribution of monthly wages for *large firms* by age group
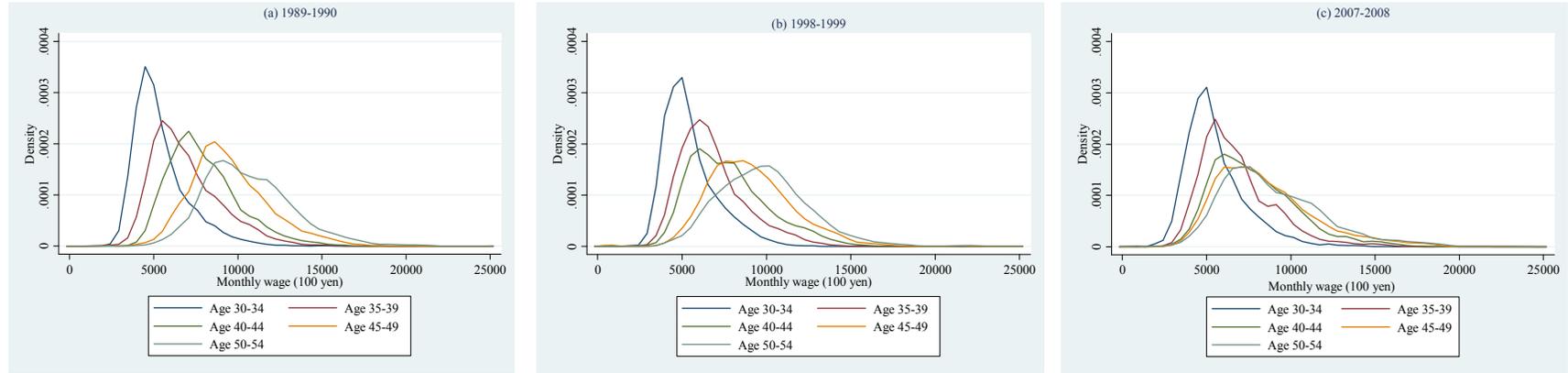(male university graduates, non-manufacturing sector)

Figure 5. Kernel density distribution of monthly wages for *small to medium-sized firms* by age group
(male university graduates, non-manufacturing sector)
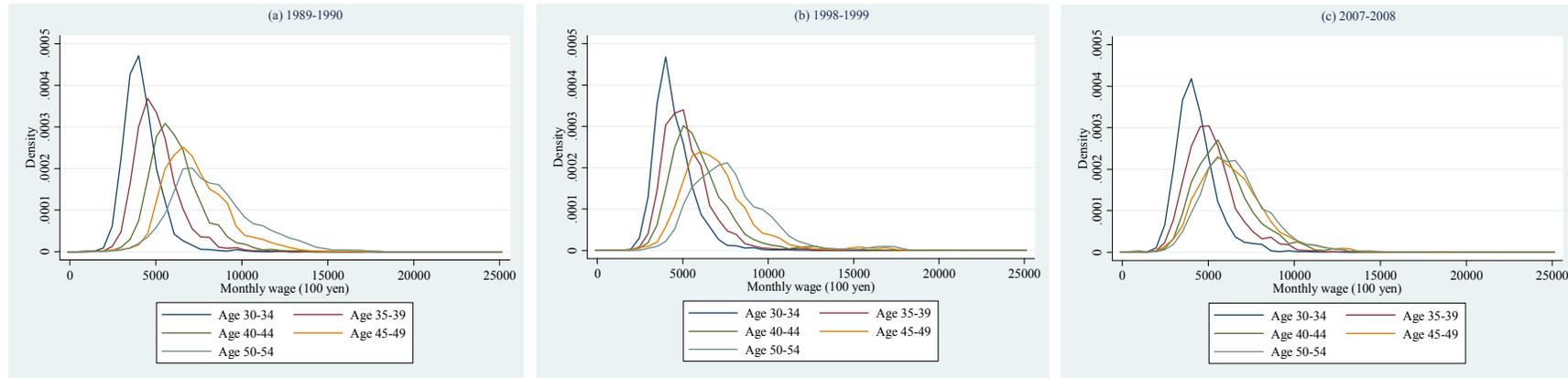
Source: See Figure 1.

Notes: The kernel density distribution of monthly wages (monthly contractual cash earnings plus one-twelfth of the annual special cash earnings of the previous year, deflated by the CPI) is based on the Epanechikov kernel and adjusted by the sampling ratio. Large firms are firms with 1,000 or more indefinite-contract employees. Small to medium-sized firms are firms with fewer than 1,000 indefinite-contract employees.

Figure 6. The share of lifetime employees in all industries

(a) University graduates, large firms

(b) University graduates, small to medium-sized firms

(c) High school graduates, large firms

(d) High school graduates, small to medium-sized firms
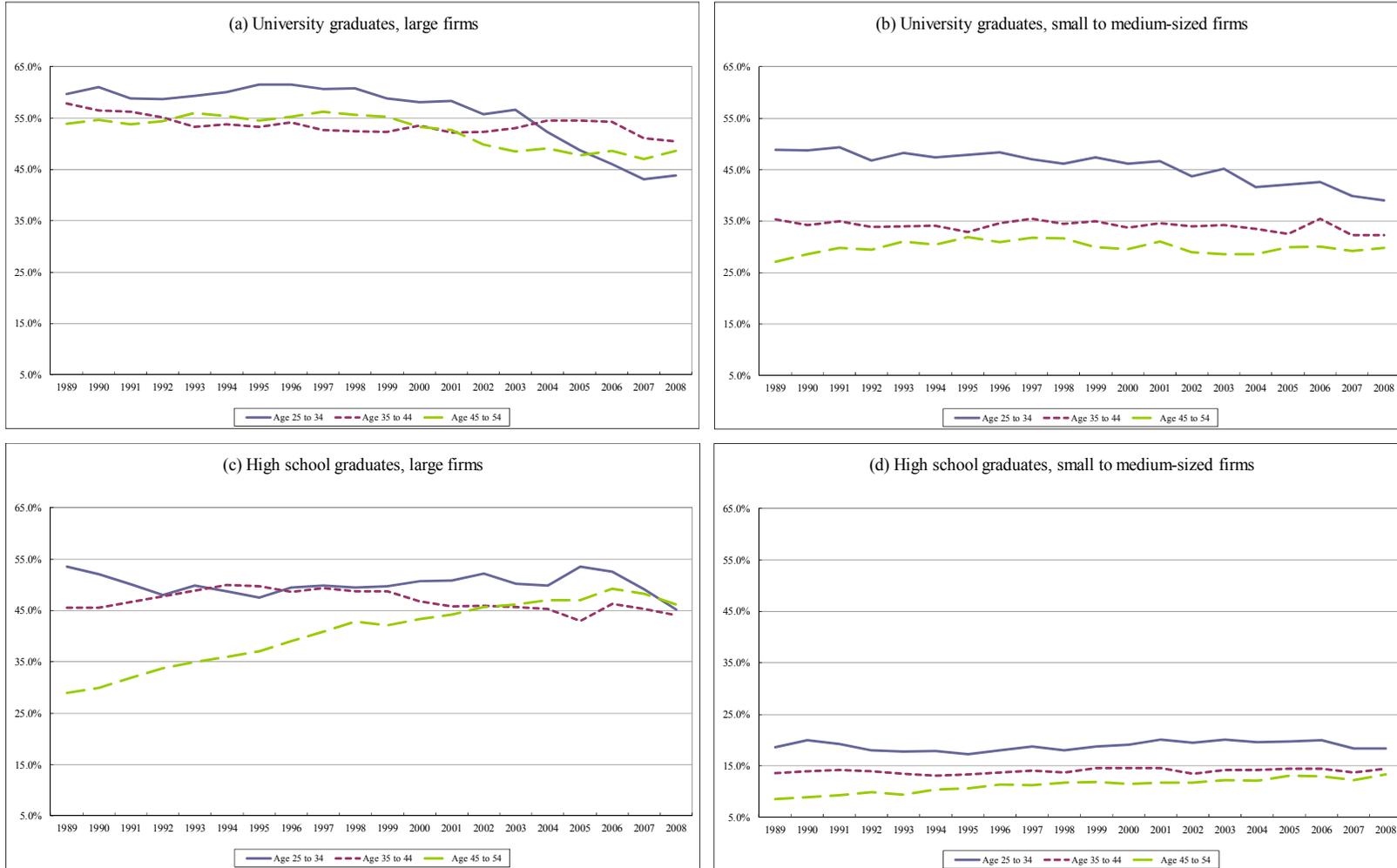
Source: See Figure 1.

Notes: Lifetime employees are defined as employees that were hired immediately upon graduation from school or university and continued to work in the same firm until the survey date. The share of lifetime employees in age group i at time t is calculated by dividing the number of lifetime employees by the total number of employees in the same category (age group i and time t). Large firms are firms with 1,000 or more indefinite-contract employees. Small to medium-sized firms are firms with fewer than 1,000 indefinite-contract employees.

Table 1. Five-year job retention rate for university graduates

1990 Lifetime employee share	1995 Lifetime employee share	Five-year job retention rate (A) (i) 1990-1995	1995 Lifetime employee share	2000 Lifetime employee share	Five-year job retention rate (B) (ii) 1995-2000	2000 Lifetime employee share	2005 Lifetime employee share	Five-year job retention rate (C) (iii) 2000-2005	2003 Lifetime employee share	2008 Lifetime employee share	Five-year job retention rate (D) (iv) 2003-2008	(B)-(A) (i)→(ii)	(C)-(B) (ii)→(iii)	(D)-(C) (iii)→(iv)
Large firms														
20-24 91.5%	25-29 65.8%	71.9%	20-24 89.9%	25-29 55.9%	62.2%	20-24 88.7%	25-29 50.8%	57.3%	20-24 87.8%	25-29 47.5%	54.0%	-9.7%	-4.9%	-3.3%
25-29 63.3%	30-34 56.2%	88.8%	25-29 65.8%	30-34 59.7%	90.7%	25-29 55.9%	30-34 47.1%	84.2%	25-29 54.2%	30-34 40.3%	74.3%	1.9%	-6.5%	-10.0%
30-34 58.1%	35-39 52.7%	90.7%	30-34 56.2%	35-39 53.3%	94.9%	30-34 59.7%	35-39 57.9%	97.0%	30-34 58.6%	35-39 49.9%	85.2%	4.3%	2.1%	-11.8%
35-39 54.7%	40-44 54.0%	98.7%	35-39 52.7%	40-44 53.9%	102.4%	35-39 53.3%	40-44 50.7%	95.1%	35-39 52.8%	40-44 51.0%	96.6%	3.6%	-7.2%	1.5%
40-44 58.3%	45-49 55.9%	95.8%	40-44 54.0%	45-49 50.7%	93.9%	40-44 53.9%	45-49 48.4%	89.7%	40-44 53.3%	45-49 52.5%	98.4%	-1.9%	-4.2%	8.7%
45-49 57.5%	50-54 52.3%	91.0%	45-49 55.9%	50-54 55.9%	100.0%	45-49 50.7%	50-54 47.0%	92.7%	45-49 47.1%	50-54 43.1%	91.4%	9.1%	-7.3%	-1.4%
Small to medium-sized firms														
20-24 90.5%	25-29 55.6%	61.4%	20-24 89.7%	25-29 51.2%	57.0%	20-24 89.0%	25-29 48.4%	54.4%	20-24 89.1%	25-29 46.2%	51.9%	-4.4%	-2.6%	-2.5%
25-29 55.7%	30-34 40.7%	73.0%	25-29 55.6%	30-34 39.8%	71.7%	25-29 51.2%	30-34 36.8%	72.0%	25-29 51.7%	30-34 32.6%	63.2%	-1.3%	0.3%	-8.8%
30-34 41.7%	35-39 35.6%	85.4%	30-34 40.7%	35-39 35.4%	87.1%	30-34 39.8%	35-39 34.6%	86.8%	30-34 38.8%	35-39 32.6%	84.1%	1.7%	-0.3%	-2.7%
35-39 34.1%	40-44 29.9%	87.6%	35-39 35.6%	40-44 32.0%	90.0%	35-39 35.4%	40-44 30.4%	85.9%	35-39 35.9%	40-44 31.9%	88.8%	2.4%	-4.1%	3.0%
40-44 34.4%	45-49 32.3%	93.9%	40-44 29.9%	45-49 29.1%	97.6%	40-44 32.0%	45-49 31.6%	98.6%	40-44 32.5%	45-49 32.0%	98.4%	3.6%	1.1%	-0.2%
45-49 31.1%	50-54 31.3%	100.5%	45-49 32.3%	50-54 30.2%	93.7%	45-49 29.1%	50-54 27.8%	95.3%	45-49 29.8%	50-54 27.4%	92.0%	-6.9%	1.6%	-3.4%

Source: See Figure 1.

Notes: The five-year job retention rate is calculated by dividing the lifetime employee share in age group i in year t by that in age group $i+1$ in year $t+5$. Large firms are firms with 1,000 or more indefinite-contract employees. Small to medium-sized firms are firms with fewer than 1,000 indefinite-contract employees. The three rightmost columns report the change in the retention rate between two neighboring periods.

Table 2. Five-year job retention rate for high school graduates

1990 Lifetime employee share	1995 Lifetime employee share	Five-year job retention rate (A) (i) 1990-1995	1995 Lifetime employee share	2000 Lifetime employee share	Five-year job retention rate (B) (ii) 1995-2000	2000 Lifetime employee share	2005 Lifetime employee share	Five-year job retention rate (C) (iii) 2000-2005	2003 Lifetime employee share	2008 Lifetime employee share	Five-year job retention rate (D) (iv) 2003-2008	(B)-(A) (i)→(ii)	(C)-(B) (ii)→(iii)	(D)-(C) (iii)→(iv)
					2a. Large-sized firm									
20-24 60.4%	25-29 47.4%	78.5%	20-24 62.4%	25-29 56.1%	90.1%	20-24 60.7%	25-29 50.9%	84.0%	20-24 63.1%	25-29 42.3%	67.1%	11.5%	-6.1%	-16.9%
25-29 52.4%	30-34 47.6%	90.8%	25-29 47.4%	30-34 44.5%	93.8%	25-29 56.1%	30-34 55.0%	98.0%	25-29 55.0%	30-34 47.0%	85.6%	3.1%	4.1%	-12.4%
30-34 51.7%	35-39 49.7%	96.1%	30-34 47.6%	35-39 45.7%	96.1%	30-34 44.5%	35-39 41.6%	93.4%	30-34 46.7%	35-39 43.9%	94.1%	0.0%	-2.7%	0.7%
35-39 51.7%	40-44 49.8%	96.4%	35-39 49.7%	40-44 48.0%	96.6%	35-39 45.7%	40-44 44.3%	97.0%	35-39 47.5%	40-44 44.2%	93.1%	0.2%	0.4%	-3.9%
40-44 39.7%	45-49 39.5%	99.6%	40-44 49.8%	45-49 50.0%	100.3%	40-44 48.0%	45-49 47.8%	99.5%	40-44 43.9%	45-49 44.5%	101.4%	0.7%	-0.8%	1.8%
45-49 35.0%	50-54 34.1%	97.6%	45-49 39.5%	50-54 37.0%	93.7%	45-49 50.0%	50-54 46.3%	92.7%	45-49 49.3%	50-54 47.9%	97.3%	-3.9%	-1.0%	4.6%
					2b. Small- to medium-sized firm									
20-24 35.1%	25-29 19.3%	54.9%	20-24 34.6%	25-29 21.6%	62.5%	20-24 36.1%	25-29 21.6%	59.9%	20-24 37.1%	25-29 19.2%	51.7%	7.6%	-2.6%	-8.2%
25-29 22.0%	30-34 15.1%	68.9%	25-29 19.3%	30-34 16.5%	85.4%	25-29 21.6%	30-34 18.4%	85.1%	25-29 23.6%	30-34 17.8%	75.7%	16.6%	-0.4%	-9.3%
30-34 17.7%	35-39 13.8%	78.1%	30-34 15.1%	35-39 15.4%	101.6%	30-34 16.5%	35-39 14.8%	89.6%	30-34 17.0%	35-39 15.4%	90.7%	23.5%	-12.0%	1.1%
35-39 15.6%	40-44 12.8%	82.1%	35-39 13.8%	40-44 13.8%	99.5%	35-39 15.4%	40-44 14.2%	92.3%	35-39 14.8%	40-44 13.4%	91.1%	17.4%	-7.1%	-1.2%
40-44 12.6%	45-49 11.3%	90.2%	40-44 12.8%	45-49 12.8%	99.9%	40-44 13.8%	45-49 13.1%	95.1%	40-44 13.6%	45-49 13.4%	98.6%	9.8%	-4.8%	3.5%
45-49 10.8%	50-54 9.7%	89.5%	45-49 11.3%	50-54 10.4%	91.7%	45-49 12.8%	50-54 13.1%	102.6%	45-49 13.5%	50-54 13.2%	98.2%	2.2%	10.8%	-4.3%

Source: See Figure 1.
Notes: See Table 1.

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Appendix Table 1. Sample statistics for the male indefinite-contract employees

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Monthly wage/CPI (100 yen)	4,152.0	4,253.9	4,314.6	4,385.2	4,561.0	4,614.3	4,660.5	4,619.4	4,614.5	4,570.8
	(2,035.5)	(2,076.8)	(2,082.9)	(2,102.7)	(2,230.1)	(2,232.3)	(2,233.9)	(2,166.8)	(2148.0)	(2,154.6)
Age	39.48	39.77	40.01	40.16	39.50	39.56	39.77	40.03	40.27	40.31
	(11.58)	(11.75)	(11.93)	(12.03)	(12.05)	(12.00)	(11.99)	(12.05)	(12.07)	(12.09)
Educational attainment										
Junior high school	0.239	0.229	0.221	0.206	0.161	0.149	0.143	0.142	0.134	0.127
High school	0.520	0.524	0.529	0.533	0.519	0.519	0.518	0.530	0.531	0.526
Junior college	0.037	0.040	0.041	0.044	0.051	0.054	0.058	0.062	0.065	0.070
University	0.204	0.207	0.209	0.216	0.268	0.277	0.281	0.265	0.270	0.277
Firm size (no. of indefinite-contract employees)										
1,000≤	0.315	0.317	0.317	0.329	0.379	0.383	0.370	0.325	0.321	0.324
300≤ & ≤999	0.136	0.139	0.141	0.142	0.163	0.164	0.164	0.165	0.169	0.164
30≤ & ≤299	0.350	0.349	0.346	0.343	0.312	0.306	0.314	0.356	0.358	0.357
5≤ & ≤29	0.200	0.195	0.196	0.186	0.146	0.147	0.151	0.154	0.152	0.155
Observations	762,126	758,632	758,516	759,437	796,410	760,491	800,212	814,247	822,308	803,000

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Monthly wage/CPI (100 yen)	4,553.1	4,583.7	4,639.0	4,605.3	4,567.7	4,513.0	4,564.4	4,593.3	4,590.8	4,495.0
	(2,151.7)	(2145.0)	(2,182.7)	(2,203.5)	(2190.0)	(2,156.5)	(2,287.2)	(2,302.1)	(2,337.1)	(2,281.4)
Age	40.51	40.67	40.88	40.83	41.04	41.16	41.12	41.12	41.08	41.06
	(12.01)	(11.9)	(11.82)	(11.79)	(11.70)	(11.65)	(11.54)	(11.62)	(11.64)	(11.62)
Educational attainment										
Junior high school	0.118	0.111	0.103	0.093	0.085	0.073	0.068	0.063	0.059	0.054
High school	0.523	0.522	0.520	0.517	0.515	0.510	0.486	0.489	0.489	0.502
Junior college	0.072	0.075	0.079	0.083	0.085	0.089	0.087	0.085	0.087	0.088
University	0.287	0.292	0.298	0.307	0.314	0.328	0.360	0.362	0.365	0.356
Firm size (no. of indefinite-contract employees)										
1,000≤	0.319	0.322	0.325	0.320	0.315	0.285	0.278	0.286	0.303	0.316
300≤ & ≤999	0.163	0.163	0.167	0.166	0.167	0.175	0.165	0.163	0.159	0.157
30≤ & ≤299	0.360	0.356	0.351	0.352	0.355	0.405	0.388	0.370	0.368	0.358
5≤ & ≤29	0.157	0.159	0.157	0.162	0.164	0.135	0.169	0.181	0.170	0.169
Observations	792,656	756,490	739,097	722,613	713,736	715,765	567,072	596,717	548,022	554,980

Source: See Figure 1.

Notes: The rows "Monthly wage/CPI" and "Age" report mean values. The monthly wage is the sum of monthly contractual cash earnings plus one-twelfth of the annual special cash earnings of the previous year. The figures in parentheses are standard deviations. The rows "Educational attainment" and "Firm size" report the share for each sub-category.