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Abstract

Despite the prolonged recession and sizable environmental changes after the burst of the Japanese economic bubble, a drastic degeneration has not been seen, either in seniority-based wages or in Japan's practice of lifetime employment, in the previous studies analyzing the negative impact of "the Lost Decade" (1992 to 2002). This result might indicate that the Japanese labor systems have a structural steadiness. This paper analyzes recent 20-year microdata from the *Basic Survey on Wage Structure* in an effort to examine recent developments in those two practices for male, full-time employees. First, regarding seniority-based wages, we investigate the development of the age-wage profile for lifetime employees, who are defined as those hired by a firm immediately after graduation and continued to work in the same firm until the survey date. We find that the wage slope gradually flattened in the 1990s; thereafter it eventually "kinked" around age 40 in 2007-2008. This change is most clearly observed for university graduates in the non-manufacturing industry. Second, regarding lifetime employment, we examine developments in the share of lifetime employees and five-year job retention rate. While we cannot detect any clear signs of changes for middle to older-aged workers, we find an evident downward trend of the share of lifetime workers for young university graduates after the late 1990s. The job retention rate also declined noticeably in the 2000s for highly educated young workers. Those results indicate that the two employment practices have been deteriorating simultaneously in recent years. Owing to the slow down of wage increases later in their careers, a higher portion of educated young workers may chose to depart from the tenure-track position. On the other hand, many older workers probably have to stay in their present jobs, in exchange for wage growth, since it is more difficult for them to find alternative jobs.

JEL Classification: J21, J31, J01

Key words: Seniority-based wage; Lifetime employment; Japan.

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1. Introduction

During the high-growth period and subsequent decades, a number of researchers regarded the Japanese employment system as an important part of economic growth. It greatly improved the productivity and competitiveness of Japanese firms by keeping up the long-term investment environments for entrepreneurs and positively working on worker incentives (Kato and Morishima, 2002; Rebick, 2005; Moriguchi and Ono, 2004). However, the slowdown of economic growth and the prolonged recession after the burst of the bubble might have transformed the economic structure that preconditioned the effect of Japanese labor practices. At a minimum, employers had to absorb the negative shocks of the prolonged recession by some sort of labor adjustments, which would have resulted in a deterioration of the system (Dore, 1996; Chuma, 2002).

Contrary to this prediction, that branch of literature has thus far discovered no major changes in seniority wages and lifetime employment—key features of the Japanese employment system—in the 1990s. In fact, many researchers claimed that “core” employees had still been covered under those traditional practices. For instance, Hattori and Maeda (2000) and Rebick (2001) presented evidence on the persistence of seniority wages in the mid-1990s. Kato (2001) as well as Kambayashi and Kato (2009) pointed to a resilience of lifetime employment for middle and older-aged male employees by analyzing the transition of the job retention rate. Genda and Rebick (2000) also noted that the outstanding features of the Japanese employment system, including low employment mobility and seniority-based wages, had experienced nothing like a radical change in the 1990s.

While this lack of evidence of any remarkable change may indicate that the Japanese employment system has institutional rigidity against changes in the economic environment, another possibility is that previous studies have examined just the beginning of the dynamic changes. While most of the earlier studies of the early 2000s analyzed the negative impact of “the Lost decade” (1992 to 2002) on the Japanese employment system, structural changes in the system may take years

beyond the most difficult period. Japanese employers appear to have been under continued pressure to downsize a redundant workforce since the late 1990s, resulting in the relatively high unemployment rate in the 2000s. Moreover, other socioeconomic factors, including demographic aging and revisions of labor legislation, may have driven structural shifts in the Japanese labor market even after the early 2000s. Therefore, we may be able to detect significant changes in Japanese employment practices by examining more recent data, even though their institutional rigidity may have matured over the same period.

This paper tries to reveal how traditional Japanese employment practices have changed (or not changed) in recent years, particularly in the period after the late 1990s. To track the developments over decades, we use recent 20-year microdata from the *Basic Survey on Wage Structure* (hereafter, BSWS), compiled annually by the Ministry of Health, Labor and Welfare. The BSWS comprehensively covers workers and retains an extremely large sample of more than a million observations per year. We focus on male indefinite-contract employees (with ordinary status) because they have been the main target of the Japanese employment system.

Our analysis has at least two features. The first one is overall consideration of the developments in the Japanese employment system. Because most previous studies focused only on a single side of the Japanese employment system—either seniority wages or lifetime employment—they could not evaluate the observed developments within the context of institutional complementarity, a key feature emphasized in the previous theoretical studies on the Japanese system. To examine the mutual dependency of the practices, we examine the recent developments of both practices.

One more feature is our interest in the Japanese employment system from view points of employees (or consumers in households). Most of the previous studies on the Japanese system analyzed its corporate benefits from productivity improvements (Hashimoto, 1990; Jones and Kato, 1995; Kato and Morishima, 2002; Tsuru, et al., 2005). However, the employees in the system also

could have benefited from enjoying long-term employment stability and constant wage increases under the traditional scheme. Therefore, the transformation in the labor practices probably has substantial impacts on the life plan of employees. This paper evaluates the vitality of the Japanese employment system from the perspective of employees.

We think we can provide clear-cut indication of degeneration in the two employment practices based on a combination of a few descriptive analyses. As for seniority wages, we construct the age-earnings profile of a median worker who remained with the same employer, and examine the time-series variation of its slope between 1989 and 2008. We found that the wage profile became much flatter in recent years, especially at the mid- to final-phase of worker's career. More specifically, the flattening of the wage slope gradually developed in the 1990s, and thereafter the slope eventually had "kinked" around age 40 in the most recent observations. This change is most clearly observed for university-educated workers in non-manufacturing in 2007-2008. Next, as for the developments in lifetime employment, we construct two indicators: the share of the lifetime worker and the five-year job retention rate. The first index is defined as the share of those hired by a firm immediately after his/her graduation and continued to work in the same firm until the survey date to total indefinite-contract employees in the same category of age and year. We plot the calculated share separately for the 10-age interval groups. While we could not detect an obvious trend of the share for middle to older-aged male indefinite-contract employees, we found a clear downward trend in the share of young university graduates after the late 1990s. We also calculated the five-year job retention rate of the lifetime workers—defined as the probability that a lifetime worker will continue working with the same employer for an additional five years—as our second measure. The second measure also declined noticeably in the 2000s for highly educated younger workers.

Judging from the long-term trend of the above indices, the two employment practices appear to

have deteriorated simultaneously in recent years. The wage a young worker can expect in his/her future career stage has largely declined, particularly in non-manufacturing. As a result of this change, a higher portion of educated young workers was discouraged from remaining in the same firm (by the less attractive seniority wage curve) and chose to depart from their tenure-track status. On the other hand, older workers probably had to stay in their present jobs, in exchange for their wage growth, since they cannot easily find an alternative job, further facilitating the disproportionate wage drop in the middle to older-aged workers. Overall, the Japanese employment system appears to have begun to show deterioration.

This paper proceeds as follows. Section 2 briefly goes over the concept of the Japanese employment system. Section 3 reviews the empirical findings presented by the previous studies. Section 4 describes our data sources and the three measures of the Japanese employment system used in this study. Section 5 reports our empirical findings and discusses their implications. Section 6 summarizes the findings and concludes the paper.

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

Although the definition of the Japanese employment system varies delicately among the prior studies,¹ most studies regarded the following three components as key elements: (1) seniority-wage, (2) lifetime employment, and (3) enterprise labor unions (Aoki, 1984; Koike, 1984; Hashimoto, 1990). The OECD (1972), which reviewed the Japanese employment system in detail, called them as “Three Sacred Treasures.” Of those three practices, the relevance of labor unions has already weakened in recent years, since the union participation ratio has largely declined and its power in

¹ Rebeck (2005) listed the following as features of the Japanese employment system: (1) long-term employment, (2) enterprise-based unions, (3) pay rises with age and seniority, (4) high rates of employee participation and involvement in decision-making, (5) large gender-based differentials and gender-based segregation in the labour market, (6) differentiation by firm size, (7) internal training within companies, (8) age-based discrimination, (9) status differences, (10) widespread use of mandatory systems, (11) a well-organized entry market for new graduates to obtain jobs, and (12) internal mobility.

wage bargaining has largely been corrupted (Tsuru, 2002). Therefore, we focus on recent developments regarding seniority wages and lifetime employment in the following analyses.

Theoretical papers on labor practices often emphasize the mutual complementarity between the seniority-wages and lifetime employment (Milgrom and Roberts, 1992). This concept especially applies to Japanese firms (Itoh, 1994; Aoki, et al., 1996). In the seniority-wage system, wages increase with the number of service years or chronological age in the firm. Although young employees get lower wages than their marginal products, they can expect to enjoy higher payments in later years, as the employer implicitly guarantees the employees the opportunity of harvesting this high wage payment in their later careers within the lifetime employment system. As long as the employees appreciate the merits of this commitment—that is, long-term employment stability and constant wage increases—they remain with the same employer until retirement. From the viewpoint of employers, they benefit from the productivity improvement of the firms probably through the formation of a firm-specific skill.² Owing to this institutional complementarity, the Japanese labor system is said to have equilibrium stability. If either practice starts to degenerate, it may be regarded as a signal for the future breakdown of the entire system.

This paper focuses on male indefinite-contract workers, since the Japanese employment system is typically applied to the main support for a patriarchal family. Since firms are trying to replace the full-time or permanent workers with other types of workers, with the flexibility to cut down fixed labor costs under the recent low-growth economy, the percentage of core workers who are protected by the Japanese employment system is gradually decreasing. Although the decrease in the share of the indefinite-contract workers itself could be regarded as a form of degeneration of the Japanese employment system, we do not consider other flexible employment in the following analyses.

While its coverage varies slightly among scholars (see Ohkuchi, 1972; Aoki, et al. 1996, for

² Ohkusa and Ohta (1994) and Akahane and Nakamura (2008) estimated the reverse causality from the productivity to the degree of steepness in the wage profile, and concluded that the steep wage profile was greatly indebted to the high productivity. Therefore, productivity may be an endogenous factor in a precise sense.

example), the earlier studies generally characterized lifetime employment by the following two conditions. First, lifetime employees are hired immediately after graduation. This condition is referred to as “infancy.” Second, they remain in the same firm until the mandatory retirement age. In this paper, we moderately relax the second condition to avoid a spurious discovery. Specifically, the lifetime employee referred to in this paper is someone who was hired by a firm immediately after graduation and continued to work in the same firm until the survey date, not until mandatory retirement age. In Japan, early retirement and transfer to other firms in the same corporate group frequently occur among older workers several years before the mandatory retirement age (60) even if they almost satisfy the above two conditions.³ Unfortunately, our data cannot follow such subtle labor practices. Moreover, the mean wage, and even the median wage, largely fluctuates in a worker’s late 50s, owing to a considerable variation between those who have been promoted and those who have not. This disrupts the stable estimation of wage profile and the proportion of lifetime workers in their later careers. To avoid possible confusion, which is caused by labor practices several year before retirement, we omit the pattern of wage profile and lifetime employment for workers in their late 50s (i.e., 55 to 59) from our empirical analysis.

3. Evidence Reported in Previous Studies

The change in Japanese employment practices has recently attracted much attention among labor economists. In the light of history, the practices have experienced many significant events, including oil shocks, the collapse of the bubble economy, Japan’s aging population, and legislative revisions. Each time they adjusted gradually in response to those environmental changes (Moriguchi and Ono, 2004). Specifically, the age-wage profile is said to have flattened substantially since the 1960s and, especially, before 1975 (Genda and Rebeck, 2000). Rebeck (2001) examined the earnings differential

³ Ono and Rebeck (2003) stated that “There 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.”

between men aged 20-24 and 50-54 who have worked for the same company since immediately after school graduation. The earnings differential sharply declined from roughly 4.8 times to 4 times between 1967 and the mid-1970s for university graduates in large-sized firms. It declined gently afterward as the retirement age increased and as the population began to age. Similar findings were also reported in other studies (Clark and Ogawa, 1992a, 1992b; Ariga, et al., 2000; Hattori and Maeda, 2000; Mitani, 2003). However, the flattening of the profile appeared to have slowed down by the mid-1990s, and some researchers observed a stability of the age-wage profile in recent years. Hattori and Maeda (2000), for instance, showed an invariant slope of age-wage profile during the period between 1992 and 1997. Rebick (2001) also described a stable wage differential between junior and senior workers in the 1990s (until 1996).

The lifetime employment scheme also interacted with historical events, but empirical studies have generally found no major changes after the bubble burst. Moriguchi and Ono (2004) noted that firms were under pressure to reduce excess employment after the bubble burst, but their decision was to continue the traditional practice without dismissal. Employment security of core workers was maintained by reducing overtime work, by freezing new graduate recruitment, and by transferring employees to subsidiaries (Chuma, 1994, 2002; Genda and Rebick, 2000; Rebick, 2001; and Kato, 2001).⁴ The agreement of low-wage growth with labor unions also contributed to job security and the low rate of the employment mobility throughout the 1990s (Genda and Rebick, 2000; Rebick, 2001). As a result, the lifetime employment system survived through the prolonged stagnation. This fact has been confirmed by the time-series variation of a variety of measures: (i) the proportion of lifetime workers (Chuma, 1997, 1998), (ii) the job retention rate (Chuma, 1997, 1998; Kato 2001; Kambayashi and Kato, 2009) and (iii) the average years of tenure (Chuma 1997, 1998; Shimizutani

⁴ Strictly speaking, the ratio of firms that leaned toward encouragement of voluntary retirement or dismissal increased as the recession became more severe in the late 1990s (Chuma, 2002).

and Yokoyama, 2009).⁵

Ono (2009) comprehensively surveyed prior studies on the Japanese lifetime employment practice, and concluded from various measurements that the findings are still mixed. More concretely, the decreasing ratio of full-time employment in large-sized firms appears to suggest a declining trend in the lifetime employment. However, the probability of surviving job separations at specified durations of employment indicated no significant change in recent years. Those results imply that companies have reduced the inflow into a core workforce but the workers who have entered the core have been protected.

In sum, the Japanese labor practices developed dynamically in response to external shocks. However, a drastic degeneration has not been reported in the seniority-based wage or in the lifetime employment practice after the bubble burst.

4. Data Description

4.1 Data Sources

This paper uses micro-level data from the BSWS during the period between 1989 and 2008. The BSWS has been widely used for the analysis of Japanese wage structure and employment practice (e.g., Clark and Ogawa, 1992a, 1992b; Chuma 1997, 1998; Ariga, et al., 2000; Hattori and Maeda, 2000; Ono, 2009; Shimizutani and Yokoyama, 2009). The survey consists of the establishment and individual files. The former file asks each establishment about its basic attributes, including a 3-digit industrial classification number, the total number of indefinite-contract employees in the enterprise to which the establishment belongs (i.e., firm size), and location.⁶ The latter contains queries not

⁵ Chuma (1997, 1998) showed a constant or an increasing trend of the lifetime employment share for middle and older-aged male workers during the period from 1980 to 1994. Chuma also reported that a 15-year job retention rate fluctuated or increased between the mid 1970s and the early 1990s. Kato (2001) as well as Kambayashi and Kato (2009) revealed that 10-year retention rates did not fall much in male employees even in the late 1990s.

Chuma (1997, 1998) and Shimizutani and Yokoyama (2009) reported a growing number of average years of tenure, particularly for elderly workers.

⁶ To be precise, since 2005, the firm size has been determined not by the number of indefinite-contract employees

only about wages and bonus payments, but also about worker's age, sex, school career, type of employment, ordinary/part-time status, length of service years and actual number of days/hours worked. Those two files are merged by the establishment identification number. Among the several types of workers, we will focus on male indefinite-contract workers with ordinary status in the following analyses.⁷

The BSWS covers the all areas of Japan and all major industries. The industry is originally classified by approximately 400 very detailed industries. We recategorized them into 14 major industries of the 2004 Japan Standard Industry Classification. This includes: (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 service, and (14) services, n.e.c. The establishments are either (1) establishments with 10 indefinite-contract employees or more in both private and public sectors, or (2) private establishments with 5-9 indefinite-contract employees.⁸ The population number of establishments to which employees belong was approximately 1.1 to 1.5 million. The annual number of the population employees was roughly 30 to 38 million during our sample period. The sample employees are randomly chosen from each establishment which is selected in the first stage of the two-stage stratified sampling scheme. The numbers of the establishments and the employees finally sampled per year were about 70,000 to 80,000 and 1.4 to 1.6 million, respectively.

We have to mention some issues of the BSWS revision in 2005. The first point of this revision is a change in the way to classify sample employees. Until 2004, the employees were divided into (1)

but by the total number of employees, including definite- and indefinite-contract employees, except for the temporary ones that are hired for less than 17 days per month.

⁷ Sample statistics of the data used in this paper are reported in Appendix Table 1.

⁸ After 2005, the selection criterion of the establishments is based on the total number of employees, including definite- and indefinite-contract employees, except for the temporary ones that are hired for less than 17 days per month.

indefinite-period contract employees, and (2) definite-period contract employees. Since 2005, the employees have been divided into the following five groups: (1) regular employees for an indefinite period contract, (2) regular employees for a definite period contract, (3) non-regular employees for an indefinite period contract, (4) non-regular employees for a definite period contract, and (5) temporary employees.⁹ Among those five categories after 2005, (1) and (3) correspond to the indefinite-period contract employees before 2004. In addition, the name “part-time status” was changed to “short-time status” (*tanjikan rodosha* in Japanese) without any change of its definition. Shinozaki (2008) pointed out that a portion of part-time workers might have been included in ordinary workers after 2005 because establishments, which filled in the individual files of the BSWS, were misled by the new wording, even though the classification of the ordinary and part-time statuses was substantially invariant between before and after the revision. This phenomenon may become a problem, especially when analyzing the behavior of female workers. The results in this paper, however, would not be affected considerably because we confine our focus to male workers. Next, 22 occupations were newly included in the BSWS coverage. Of those, 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 supplemented to cover professional jobs, such as dentists, veterinarians, lawyers, certified public accountants, certified social insurance labor consultants, university lecturers, and so on. This paper excludes those new occupations so that we do not capture some spurious time variations of wage structure and employment owing to the added occupations.

The BSWS has some distinctive advantages in describing the transition of Japan’s employment practices. First, it contains an adequate sample size in individual ages, even after conditioning on

⁹ The groups of (1) to (4) satisfies any of the following three conditions: (i) a worker with indefinite-period contract, (ii) a worker with definite-period contract of more than one month, and (iii) a worker hired for more than 18 days per month with daily employment or with definite-period contract prior to one month. The group (5) corresponds to the employees that do not satisfy any conditions of (i) to (iii).

some worker's attributes (e.g., school career and firm size). Second, the BSWS has been conducted every year, though the *Employment Status Survey*, which was often used in some earlier studies, has been conducted only every five years. This high frequency allows us to closely follow the development of the labor market practices and to identify the juncture of their change.

Of course, there is something to be desired even for our BSWS-based data set. Since the establishments in the BSWS are randomly selected in accordance with the frame of the *Survey of Firms and Establishments (SFE)*,¹⁰ which is revised every three to five years, the BSWS suffers from the large discontinuities that take place before and after the SFE revisions. In our data set, those revisions occurred in 1986, 1991, 1994, 1996, 1999, 2001, and 2004.¹¹ To avoid the spurious time variation of variables due to this effect, we calculate the population median of wages using a sampling ratio, which is available for each establishment in the BSWS, in drawing out the wage profile. We compute the population-based ratio of lifetime workers and the retention rate in the same way.

It should be noted that the small firms with less than four indefinite-contract employees are dropped from the sample. In this sense, the BSWS cannot describe the wage and employment structure of the whole population in Japan. According to the *Labour Force Survey*, the proportion of employed persons in the small firms (non-agricultural sector) was approximately 7 percent on an average in the past 20 years (1989 to 2008). However, since this proportion has been fairly stable, ranging from 6.6 to 7.6 percent, the sample restriction should not have significantly affected the BSWS sample population throughout our sample period. Therefore, we believe that our primary conclusion would hardly be influenced by the coverage limitation. In addition, as the Japanese

¹⁰ The SFE was conducted every three years during the period from 1948 to 1981; thereafter, it was conducted every five years.

¹¹ The surveys in 1986, 1991, 1996, and 2001 were regular surveys over five-year intervals. Meanwhile, the survey in 1994 was the Establishment Directory Maintenance Survey, which was settled to supplement and maintain the establishment directory. After the 1996 census, this supplemental survey was carried out as a "Simplified Census" in 1999 and 2004.

employment system has been applied mainly to the workers in the large-sized firms, omission of the small firms from the following analyses would not affect the conclusion.

4.2 Calculated Measures

To reveal recent developments in Japanese employment practices, this paper calculates the following three measures: (1) age-wage profile, (2) share of lifetime workers, and (3) job retention rate.¹²

4.2.1 Age-wage Profile

We use the median of monthly wages for lifetime employees by age to construct the age-wage profile, which is our basic measure to examine the seniority-wage system. Our monthly wage is the total amount of monthly contractual cash earnings and the twelfth part of annual special cash earnings of the previous year. The earlier studies mostly used hourly wages (instead of monthly wages) in their age-wage profile because their focus is on productivity effects of the Japanese employment system. However, here, we use the wage on monthly basis, on purpose, since our interest is mainly on the impact of the changes in the system on the life of employees.¹³ Further, we can also avoid the fluctuation of the hourly wage caused by a legislative change by using the monthly wage. Japanese labor standards law was revised in 1988 to lower the upper limit of working hours from 48 to 40. The contractual cash earnings are defined as a before-tax amount of cash wages paid for the surveyed month of June, including overtime allowance. This is deflated by the consumer price index for Japan (general, excluding imputed rent). We use the median values of the monthly wage from 18 (for high school graduates) or 22 (for university graduates) to 54 years of age. The

¹² This paper does not use the average years of tenure in analyzing the persistency of the lifetime employment because it cannot consider the “infancy” and devotion to single-firm conditions.

¹³ To see the sensitivity of our findings to the choice of wage variables, we also construct the profile using the hourly wage; however, our conclusion changes little (see Appendix Figures A)

initial wage at 18 or 22 is normalized to 1 to make the variation of the wage slope more visible.¹⁴

While Rebeck (2001) calculated the older-younger wage differential (instead of the age-wage profile), he could only identify changes in the slope of linearly-approximated age-wage profile. In contrast, our measure allows us to see the change in the slope of the profile and to identify the period and age in which the change has occurred during the past two decades.

4.2.2 Share of Lifetime Workers

“Lifetime worker” in this paper is defined as someone hired immediately upon graduating from school and continues to work in the same firm until the survey date. This definition satisfies two necessary conditions for the lifetime employment scheme: “infancy,” and devotion to a single firm. Whether those conditions are satisfied could be confirmed by examining the difference between the worker’s age and the length of his service years. University graduates are regarded as a lifetime workers if the difference is 22 or 23. For high school graduates, a difference of 18 indicates the satisfaction of the conditions. This criterion is the same as the condition of “standard employees” in the BSWs.¹⁵

The share of the lifetime worker in age group i at time t is estimated by dividing the number of lifetime workers by the total number of workers in the same category (age group i and time t). In our empirical analysis, we classify the sample into the following three age categories: (1) 25-34, (2) 35-44, and (3) 45-54. We do not examine the 55-59 age group, because the share for this group would be highly sensitive to the extension of the compulsory retirement age.

¹⁴ Let us briefly summarize the time-series variation of non-normalized wages. For university graduates, the wage levels in their 20s increased throughout our sample period, whereas it declined in their late 40s to early 50s. A similar pattern can also be observed for high school graduates, except for the young workers in small- to medium-sized firms in non-manufacturing. In this exceptional group, the wage level of the younger workers increased only in the first half (until 1999) of our sample period. Their wages largely declined in the second half (after 1999).

¹⁵ By this criterion, we exclude the people who failed their school entrance exam (beyond the standard in Japan) from lifetime workers even if they continue working immediately after the graduation. However, this problem rarely matter to high school graduates because the failure of the exam is rare among them. The exclusion problem is also not a serious for the university graduates because the multiple failures are not so common in the university entrance exam.

This “share of lifetime worker” measure has some advantages. One is its visual suggestiveness. Because it can be calculated annually for each age group, its time-series plot clearly reveals the long-term transition of lifetime employment.

4.2.3 Job Retention Rate

The job retention rate is the probability that a worker retains the same job for a certain length of time. We can calculate this measure by “comparing the number of workers in an age-tenure category in one survey with the number in a later survey in correspondingly higher age and tenure categories” (Hall, 1982, p.718). This measure has thus far been used by a number of previous works (Hall, 1982, Hashimoto and Raisian, 1985, Chuma, 1997, 1998; Kato, 2001, and Kambayashi and Kato, 2009). They focused on the workers in the base year with relatively short tenure, typically 0-4 or 5-10 years. In those cases, the retention rate assesses the degree of labor mobility instead the steadiness of the lifetime employment, especially when those measures are applied to older workers. Of course, the similar measure can be applied to the workers with longer tenure, say more than 5, 15-20, or 20-25 years. However, those tenure categories cannot account for the “infancy” condition.

This paper therefore bases our retention rate on the lifetime workers satisfying the conditions of “infancy” and devotion to a single firm. We calculate the five-year job retention rates of them in seven age groups; 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, and 50-54, for the four time periods, 1990 to 1995, 1995 to 2000, 2000 to 2005, and 2003 to 2008. We first calculate the share of lifetime workers in each age group for the base years of 1990, 1995, 2000, and 2003. Next, we apply the same formula to the five-year older age groups, corresponding to each age group of the first step, in the BSWS five years later (1995, 2000, 2005, and 2008). Finally, we divide the share obtained in the first step by the corresponding value of the second step. For example, the share of the 20-24 group in 1990 is divided by that of the 25-29 group in 1995. The ratio eventually obtained is the five-year job

retention rate of the lifetime employees. Our brief-interval retention rate may help us to identify changes in the lifetime employment.

5. Empirical Findings

This section looks carefully at the time-series variation of the above-mentioned three variables. Our focus is to show what happened to the Japanese employment system after the bubble burst, especially in the period from the late 1990s up to the present.

5.1 Changes in the Wage Profile

We first examine recent developments in the age-wage profile. We divide the sample into the manufacturing and non-manufacturing industries, as those two industries probably have been exposed to different competitive environments.¹⁶ The manufacturers, like the steel, auto, electrical equipment, machinery and electronic equipment industries, have long faced harsh international competition, whereas some non-manufacturing industries have been maintained in a less competitive environment by regulatory barriers. The profiles for the two industries are depicted for the following four subgroups: (1) university graduates in large-sized firms (more than 1,000 indefinite-contract employees), (2) university graduates in small to medium-sized firms (fewer than 1,000 indefinite-contract employees), (3) high school graduates in large-sized firms, and (4) high school graduates in small to medium-sized firms.¹⁷

Figures 1a-1d and 2a-2d show the age-median wage profiles of the three selected periods (1989-1990, 1998-1999, and 2007-2008) for manufacturers and non-manufacturers, respectively. Originally, wages increased substantially with age in both sectors, but its pace was faster in the

¹⁶ The non-manufacturing industry contains 13 major industries in the 2004 Japan Standard Industry Classification excluding the manufacturing industry.

¹⁷ This paper does not treat the junior high school and junior college graduates because the sample size of those groups is relatively small.

non-manufacturers. The seniority-wage slope becomes slightly gradual over the period between 1989-1990 and 1998-1999 in almost every category except for high school graduates in large firms. The relative wage decline hit middle to older-aged workers especially hard. Differences between the two industries (manufacturers vs. non-manufacturers) noticeably widened in the second period (from 1998-1999 to 2007-2008). While the wage slope for workers in small to medium-sized manufacturing firms slightly declined between in this period, the slope remains steep regardless of school career in the large firms. On the other hand, the slope of the non-manufacturing industry substantially flattens around 40 years of age in 2007-2008. In particular, the wage of the university graduates barely increases after their mid-40s, regardless of firm size. While the wages of high school graduates in non-manufacturing gradually increase even in later in their careers, the growth rate is fairly small in 2007-2008 compared with those in 1989-1990 and 1998-1999.

While some of the prior studies reported that the slope of the wage curve became more gradual as the retirement age rose, they did not reveal the nearly nonincreasing wages in the latter half of career life (which we are calling the “kinked” wage profile), which is clearly revealed in our graphs.

5.2 Changes in the Share of Lifetime Workers

This subsection discusses the change in the share of lifetime workers over the past two decades. Figures 3a to 3d depict this share for the aforementioned four subgroups of all industries.¹⁸ Among those groups, the downward trend of the lifetime employment rate is clearly observed for the youngest group of university graduates in large-sized firms (see Figure 3a). This group presents a sharp decline, by nearly 20 percent point between the mid-1990s and 2008. Figure 3b reveals a more moderate decreasing trend of the lifetime employment ratio in the youngest university graduate

¹⁸ Appendix A explains the reason why we have to divide the employees into subgroups. Appendix Figures B-1 to B-3 describe the time-series variation of the share of the lifetime employees for all male indefinite-contract employees, male university-graduated workers with indefinite contracts, and male high school-graduated workers with indefinite contracts, respectively.

groups in the small to medium-sized firms. Figures 3a and 3b also suggest that the share of lifetime workers in the older age groups is largely invariant throughout our sample period, except for the oldest group in Figure 3a, which shows a slightly decreasing trend.

Figures 3c and 3d, which report the results for high school graduates, do not demonstrate any clear trend of the lifetime employment share, except for the oldest group, age 45-54. One reason for the increase of the share in this oldest age group may be the extension of the mandatory retirement age. The “law for the stabilization of the elderly employment” has been revised twice since the 1990s. The initial amendment, which was approved in 1994 and enforced in 1998, made the compulsory retirement age of 60 years old obligatory for firms. In the second revision, the retirement age was in turn raised to 65 years of age in 2004. Thus, it is not surprising for us to find that the share of lifetime workers has increased for employees who are close to retirement over the years. No increasing trend of the lifetime employment share for the older educated workers (Figure 3a) may suggest that they had been more likely to be covered by the compulsory retirement system with high retirement age right from the start.

The contrast between the university graduates and high school graduates, as well as that between the large-sized firms and the small to medium-sized firms, probably indicates that Japanese labor practices have been applied mainly to highly educated workers, particularly to those in large firms. Our findings appear to suggest that this practice is recently deteriorating, even for such a selected group of workers. The decline of the lifetime employment share of university graduates in large firms seems to mean that even the employees that had been protected by the Japanese employment system are no longer entitled to a special status in recent years. On the other hand, many high school graduates have probably been excluded from the narrowly defined lifetime employment to begin with. A relatively small share of the lifetime workers in the high school group, especially in small to medium-sized firms, seems to support this inference. Because the trend of the lifetime employment

ratio differs little between manufacturers and non-manufacturers, we did not report the detailed pattern here (see Appendix Figures C-1-1 to C-1-4 and C-2-1 to C-2-4).

Before closing this subsection, we would like to note the distinct contrast between earlier studies and our findings. As explained in Section 3, Chuma (1997, 1998) discovered a non-decreasing trend of the lifetime employment share in the early 1990s. In fact, if we focus on the first half of our sample period, it is difficult to identify a clear trend of the share. However, a decreasing trend is clearly revealed in the second half.

5.3 Changes in the Job Retention Rate

This subsection examines the change in the lifetime employment practice utilizing our second measure, the job retention rate. Table 1 reports the five-year job retention rate of university-educated workers in large-sized firms (1a) and small to medium-sized firms (1b). For example, in 1990, 91.5% of male indefinite-contract employees aged 20-24 satisfied the two conditions necessary for the lifetime employee. Five years later, in 1995, 65.8% of the male indefinite-contract employees in ages 25-29 were considered lifetime employees. The five-year job retention rate for the period 1990 to 1995 is eventually calculated to be $65.8/91.5=71.9\%$.¹⁹ The right three columns report the change of the retention rate between two neighboring periods.

First, we can point out that the retention rate of the youngest category started to decline significantly in the early 1990s. Although this trend does not depend on the firm size, its magnitude is considerably larger in the large-sized firms than in the smaller ones.²⁰ Further, in the second and third youngest categories, the retention rate also decreased after the late 1990s and the early 2000s,

¹⁹ In Table 1, some of the calculated retention rate slightly exceed 100%, owing probably to sampling errors. Although this is always a problem in the pseudo-cohort analysis, we do not have an appropriate way of remedying it.

²⁰ The 'reduction' of the job retention rate for the youngest category (in absolute value) declines throughout our sample period. For example, it declines from -9.7% to -4.9%, and then finally to -3.3% for university graduates. A similar declining trend is also found in high school graduates, though the magnitude of the reduction is small compared to that of university graduates. This trend may be attributed at least partially to cutting the surplus workers that were employed during the bubble economy.

respectively. Those results indicate that today's young university graduates are likely to leave the tenure-track position earlier than they did in the past.²¹ On the other hand, while the retention rate of the middle to older-aged university graduates in the large-sized firm temporarily declined between the late 1990s to early 2000s, the trend did not hold in the more recent period.

Next, let us turn to the change in the job retention rate of high school graduates. Table 2 reports that the retention rate of the young age groups has declined since the late 1990s. Among young workers, about 8 to 17 percent of the people in their 20s left their first jobs relatively quickly in recent years. In contrast, the retention rate of middle to older-aged workers remains unchanged, except for the up-and-down movement in the small to medium-sized firms during the period from the 1990s to early 2000s. Overall, the recent deterioration of lifetime employment in the young workers is a common finding for university and high school graduates, whereas such a trend is not found in the older workers.

Contrary to our findings, Kato (2001) as well as Kambayashi and Kato (2009) concluded—based on their ten-year job retention rate without the “infancy” condition—that they found little evidence of serious deterioration of lifetime employment for male workers, even in the post-bubble period. Although they reported a drop of the job retention rate for young male workers in the late 1990s, they underemphasized the change and pointed to the resilience of the Japanese employment system. They instead highlighted a substantial reduction in job security of female workers throughout the 1990s, saying that the burden of restructuring fell disproportionately in female indefinite-contract employees.

In our analysis, with extended sample period up to 2008, we think that we could demonstrate a drop in the retention rate after the late 1990s more vividly than the prior studies did.

²¹ A possible explanation for the declining retention rate of the recent young workers is a reduction of the job-match quality in the labor market for new graduates after the bubble burst. Genda and Kurosawa (2001) revealed that an increase in the unemployment rate at the time of labor market entry increased the future probability of workers of leaving firms by lowering the quality of job matches.

5.4 Discussion

Summarizing the above findings, recent changes in the Japanese employment system are characterized by the suspension of wage increases for older workers, particularly in the nonmanufacturing industries, and of lifetime employment for highly educated young workers. Based on the theory of complementary institutions, both the seniority-wage and the lifetime employment systems would fall apart if either one starts to deteriorate. Our findings for the non-manufacturers appear to be consistent with this thesis.

On the basis of institutional complementarity, it is possible to give a more detailed explanation for our results, namely, the asymmetry between young and older employees. It is not surprising that the deterioration of lifetime employment began with the young workers, since they are more likely to leave their jobs if they cannot expect a satisfactory wage increase for their long service in the same company. Because they can find another job more easily than the middle/older-aged workers can, they are probably more sensitive to future wage declines. In contrast, older workers have to stick to their jobs because it is hard for them to find an alternative job without taking a significant pay cut. In other words, the labor mobility of older-aged workers is relatively low.

This explanation is supported by the results of the *Survey on Career Formation of Working People* in 2000, conducted by the Research Institute for Advancement of Living Standards. It finds that roughly 70 percent of male workers who had changed jobs experienced their job switch before they turned 29. Furthermore, their first and second major reasons for the job switch were “uncertainty about the future of one’s firm” and “low wage payment,” respectively.²² The percentage of choosing the second reason declines with the age of the job switch. Those findings are consistent with our interpretation. The survey also shows that the younger workers were more likely

²² 30.8 (30.1) percent of the displaced workers chose the first (second) reason in the question where multiple answers were allowed.

to report “having found a better job” as a reason for leaving the former job than the elderly ones did.

This is also consistent with the above explanation.

A number of reasons can be given for the wage decline of the older employees in the 1990s. First, firms tried to maintain excess employment under the prolonged low growth economy after the bubble burst, as previously stated. Under this circumstance, older workers were more likely to accept a wage reduction in return for guarantees of their employment. If the Japanese economy had rapidly recovered, the firms could have absorbed the burden of the temporal excess employment without wage reduction. The second possible reason is the changing age structure of the workforce. In particular, wage costs (=average wage × number of workers) for the middle to older-aged workers would have disproportionately increased after the late 1990s due to the entry of the baby boom generation (born from 1947 to 1949, called *Dankai* in Japanese) into the older-aged category.

For a recent breakdown of lifetime employment among younger workers, there are at least a few reasons other than the decline of the predicted seniority wage. One explanation is the high (or excess) intake of the new graduates during the bubble period, and the subsequent cutbacks on hiring of new graduates in the post-bubble period. The distorted age structure has hindered the promotion of young workers in the post-bubble cohort because a large fraction of the bubble cohort must be promoted before them (Moriguchi and Ono, 2004). At the same time, the bubble cohort also deprived their subsequent cohorts of the opportunity of job training within firms. As a result, the young workers were discouraged from continuously working in the same company. This age structure problem may partly justify our findings that the lifetime employment ratio and job retention rate started to decline even before wages began to flatten. Another possibility is the rapid transformation of Japan’s industrial structure. If young employees expect the obsolescence of their firm-specific skill owing to changes in the industrial structure, they may think that it is not in their best interests to develop such a skill over time in the same company.

Additionally, we must point to the legislative changes as a reason for the higher turnover of the younger workers. Japan's labor standards laws were modified in 1998 to permit fixed-period contracts of three years or less for particular types of workers.²³ The scope was extended to all types of job in 2004.²⁴ Until then, the law had forced firms to choose either indefinite period contracts or definite ones of up to one year. The introduction of the multiple-year definite contract could have increased the options of firms as well as workers, resulting in a great inter-firm mobility, particularly for younger workers.

Before concluding, we need to consider the background of the different pattern of wage profiles between industries. Whereas wages for university graduate workers in non-manufacturing remains roughly constant after workers reach their mid-40s, wages in the manufacturing continue to increase even later in one's career. Our tentative hypotheses were lower growth, and a distorted age structure in non-manufacturing. First, the average growth rate (1989-2007) of manufacturing and non-manufacturing was 2.1% and 1.2%, respectively.²⁵ This different growth rate may be partly responsible for the difference in the change of wage profiles, although this small difference is not sufficient to explain the remarkable difference completely. Nor can the second factor, the changing age structure due to Japan's aging population, explain the difference between industries, since it is common to both manufacturing and non-manufacturing.

Another conceivable possibility is the increased competition in the product market of the non-manufacturing sector. At least until the late 1990s, the slope of the wage profile in non-manufacturing—which had enjoyed stronger protection—looked steeper than that in the manufacturing, leaving some room for adjustments for the non-manufacture firms. Market entry deregulation in recent days, especially those in the non-manufacturing industry, could have

²³ Workers who possess advanced and specialized knowledge and older workers aged 60 years and older.

²⁴ At the same time, the contract term for older or specialized workers grew to five years.

²⁵ The average growth rates base on the annual rate of the GDP growth classified by economic activities in the National Accounts.

facilitated market competition among firms in finance and insurance, information and communications, and wholesale and retail. As the intensity of competition increased, firms in non-manufacturing were forced to adapt to the environmental changes and to improve their managerial efficiency. However, the changes observed for university graduates in the non-manufacturing sector look somewhat excessive for only a competition-induced adjustment between the two industries. Hence, further research is required to solve this remaining “puzzle.”

6. Conclusion

By comprehensively analyzing the recent 20-year observations of the BSWS, this paper adduced new evidence for Japan’s degenerating employment system. First, as for seniority-based wages, we examined the developments of the age-wage profile for lifetime employees and found a much flatter wage slope after age 40 in recent years. More specifically, the flattening of the wage slope gradually developed in the 1990s, and thereafter the profile appeared to have eventually kinked, in 2007-2008. This change is most clearly observed for the university graduate workers in the non-manufacturing industry. Second, in order to examine the developments of the lifetime employment, we calculated the share of the lifetime workers and five-year job retention rate. While we could not identify a clear trend in the share of the lifetime workers for middle to older-aged male indefinite-contract employees, we found an evident downward trend in the share for the university-graduated young workers after the late 1990s. The job retention rate also declined noticeably in the 2000s for highly educated younger workers.

The long-term pattern of our three measures suggests that the two key practices of the Japanese employment system have recently deteriorated simultaneously. Owing to the wage flattening later in the career stage, a higher portion of educated young workers may have incentives to depart from their current tenure-track positions. On the other hand, older workers probably decided to stay in

their present jobs in exchange for wage growth, since they cannot easily find alternative jobs. Their lower job mobility facilitates the disproportionate wage reduction in the middle to older-aged workers. Thus, the logical consideration of the structure of the institutional complementarity suggests that Japanese employment system probably has already started to deteriorate in recent years.

Finally, we have to note that some of the previous studies, such as Kambayashi and Kato (2009), emphasized resilience of the Japanese employment system, although they discovered a few signs of the degeneration of lifetime employment for young male workers. In fact, the middle to older-aged workers, who were considered to be the core of the system, appear to be still protected by the practice. However, their wages have barely increased in more recent years, thereby discouraging the young workers from entering into the traditional system. Again, from the viewpoint of the institutional complementarity, the widely-observed dropout of the young workers from the lifetime employment system probably suggests that the Japanese employment system has started to degenerate, and is not sustainable in the long run.

Appendix A. Reason for Focusing on Small Subgroups

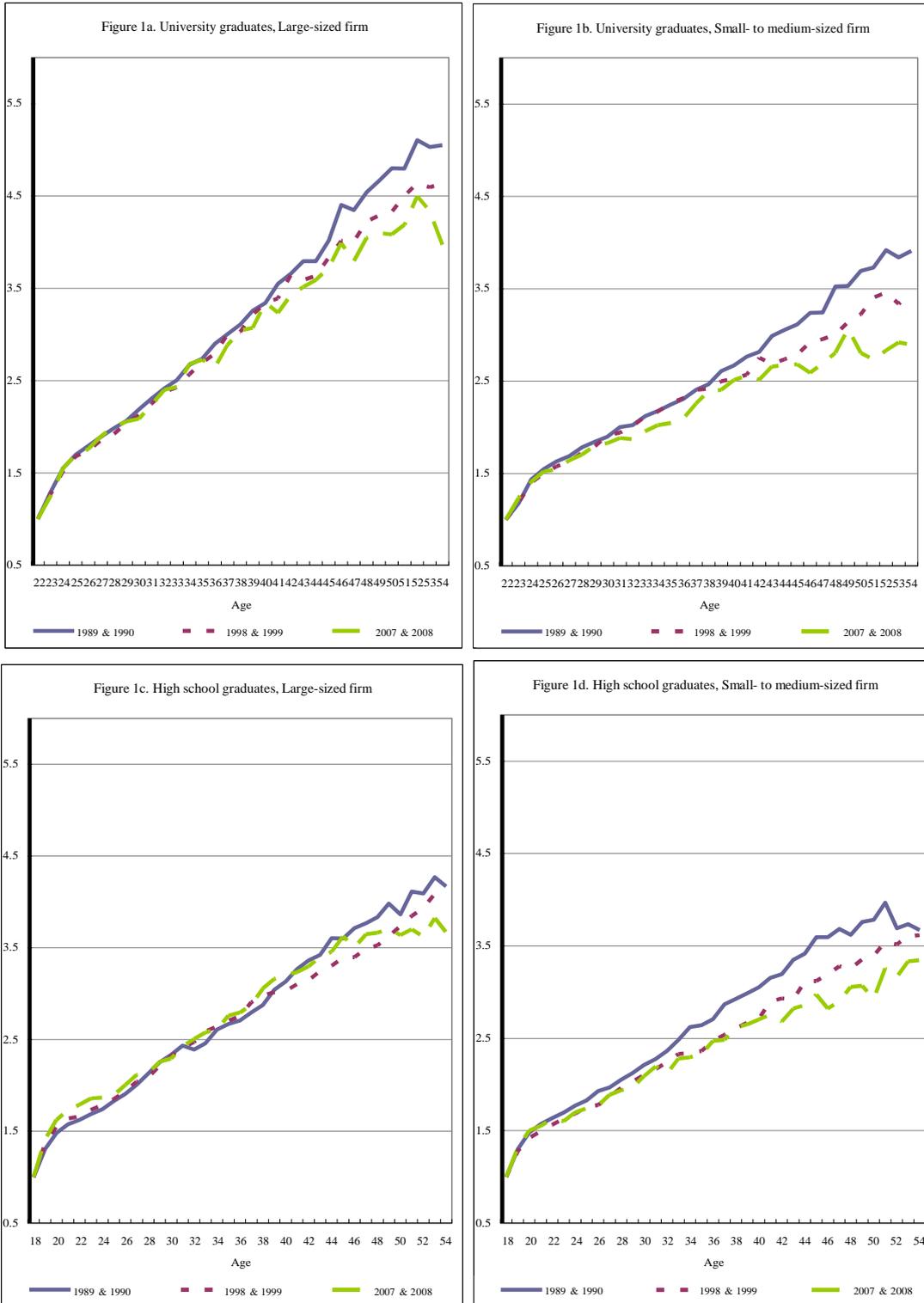
This Appendix explains the reason for dividing the employees into the four subgroups. Appendix Figure B-1 shows the lifetime employment share for all-male indefinite-contract employees for the three age groups. The share in the youngest age group (25-34) gradually decreased in the 2000s, while the share in the oldest age group (45-54) consistently increased. If we take those trends at face value, we can point to the deterioration of the practice of lifetime employment practice for young workers and its evolution for the older ones. However, this time-series variation of the share would reflect some spurious trends that are irrelevant to the changes in the employment system. One likely explanation for those trends is an increase of the university graduates rate in the data, due primarily

to an increase in the university entrance ratio in the 1990s.²⁶

To discern the real change of the lifetime employment from that owing to other socioeconomic trends, we further divide male indefinite-contract employees according to school career (high school graduates and university graduates). Appendix Figures B-2 and B-3 demonstrate the lifetime employment share of university and high school graduate employees, respectively. Of the university graduates, the share for the youngest age group started to decline in the mid-1990s, whereas that of other age groups underwent little change. On the other hand, as for the high school graduates, the lifetime employment share in the youngest age group appeared to have merely fluctuated within a small range. In addition, the share of lifetime employees in the oldest age group has gradually increased. Overall, recent developments in the lifetime employment seem to differ according to school career. Similarly, observations of the small and large-sized firms also show the different changes between the firm sizes. We therefore further divide the observations in each school career by firm size.

²⁶ In fact, the lifetime employment share of those aged 20-24 shows a gradual increase throughout our sample period, which reflects this composition effect. We therefore dropped this group from our figures to avoid ambiguity.

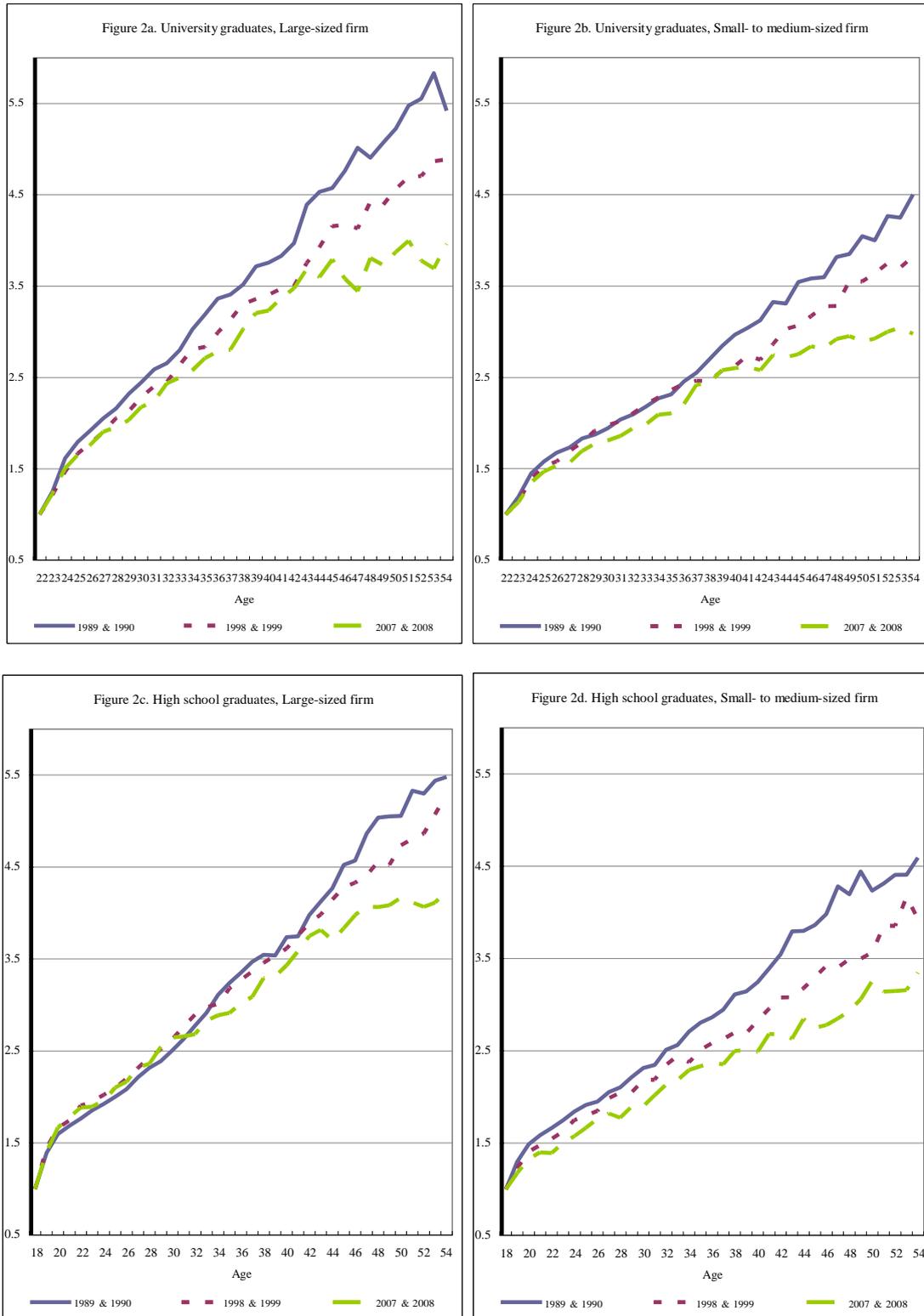
Figure 1. The median monthly wage profile of the manufacturing industry



Source: *Basic Survey on the Wage Structure* (various issues)

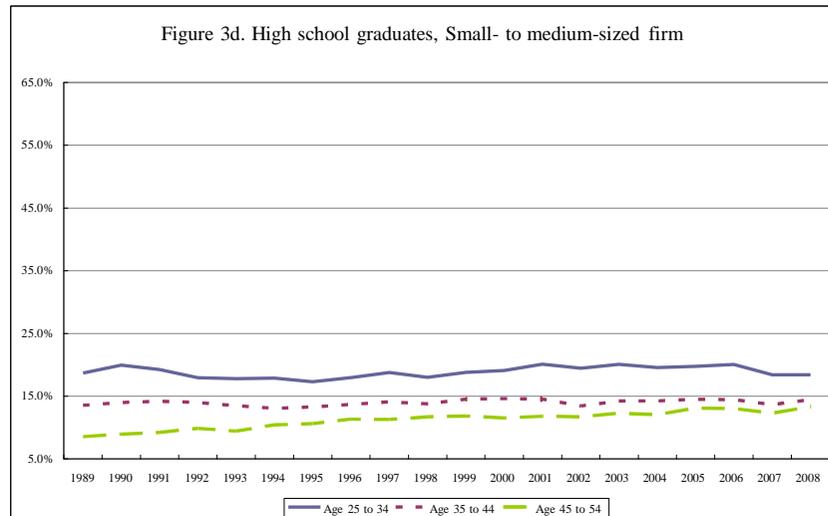
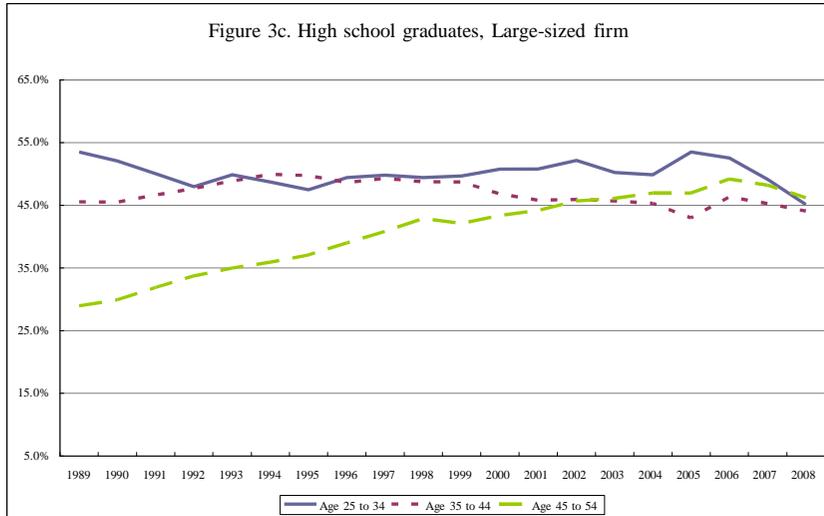
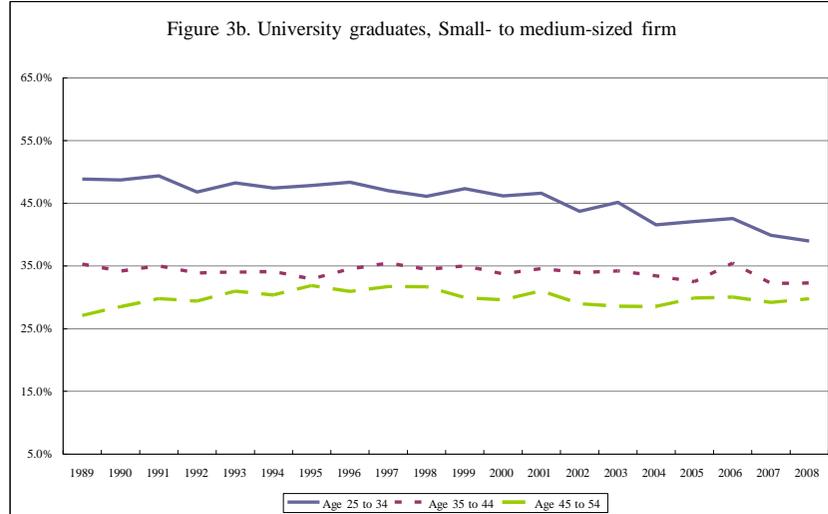
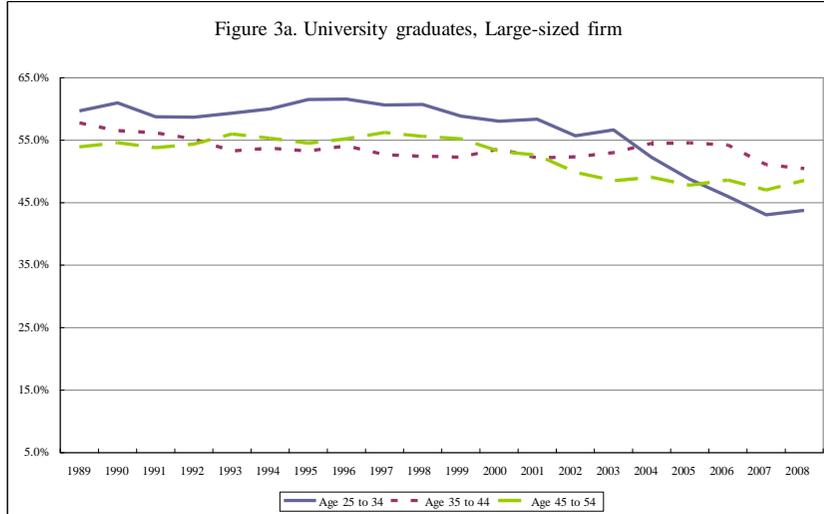
Note: The median monthly wage is calculated based on the total amount of monthly contractual cash earnings and the twelfth part of annual special cash earnings of previous year. This is deflated by the consumer price index for Japan (general, excluding imputed rent). "Large-sized firm" has more than 1000 indefinite-contract employees. "Small- to medium-sized firm" has less than 1000 indefinite-contract employees.

Figure 2. The median monthly wage profile of the non-manufacturing industry



Source and Note: The same as Figure 1.

Figure 3. The share of the lifetime employee in all industries



Source: The same as Figure 1.

Note: The lifetime employee is defined as those who are hired immediately upon graduating from school and continue working in the same firm until survey date. The share of the lifetime employee 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-sized firm" has more than 1000 indefinite-contract employees. "Small- to medium-sized firm" has less than 1000 indefinite-contract employees.

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

| 1990 | | 1995 | | Five-year job retention rate (A) (i) 1990-1995 | | 1995 | | 2000 | | Five-year job retention rate (B) (ii) 1995-2000 | | 2000 | | 2005 | | Five-year job retention rate (C) (iii) 2000-2005 | | 2003 | | 2008 | | Five-year job retention rate (D) (iv) 2003-2008 | | (B)-(A) | (C)-(B) | (D)-(C) |
|---------------------------------|-------------------------|-------------------------|-------------------------|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--|-------------------------|----------|------------|------------|
| Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | Lifetime employee share | (i)→(ii) | (ii)→(iii) | (iii)→(iv) |
| 1a. Large-sized firm | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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% | | | | |
| 1b. Small- to medium-sized firm | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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: The same as Figure 1.

Note: The five-year job retention rate is calculated by dividing the lifetime employee share in age group i at year t by that in age group $i+1$ at year $t+5$. "Large-sized firm" has more than 1000 regular employees. "Small- to medium-sized firm" has less than 1000 regular employees. The right three columns report the change of the retention rate between two neighboring periods. "Large-sized firm" has more than 1000 indefinite-contract employees. "Small- to medium-sized firm" has less than 1000 indefinite-contract employees.

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

| 1990 | | 1995 | | Five-year job retention rate (A) | | 1995 | | 2000 | | Five-year job retention rate (B) | | 2000 | | 2005 | | Five-year job retention rate (C) | | 2003 | | 2008 | | Five-year job retention rate (D) | | (B)-(A) | (C)-(B) | (D)-(C) |
|---------------------------------|-------|-------------------------|-------|----------------------------------|--|-------------------------|-------|-------------------------|-------|----------------------------------|--|-------------------------|-------|-------------------------|-------|----------------------------------|--|-------------------------|-------|-------------------------|-------|----------------------------------|--|----------|------------|------------|
| Lifetime employee share | | Lifetime employee share | | (i) 1990-1995 | | Lifetime employee share | | Lifetime employee share | | (ii) 1995-2000 | | Lifetime employee share | | Lifetime employee share | | (iii) 2000-2005 | | Lifetime employee share | | Lifetime employee share | | (iv) 2003-2008 | | (i)→(ii) | (ii)→(iii) | (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: The same as Figure 1.

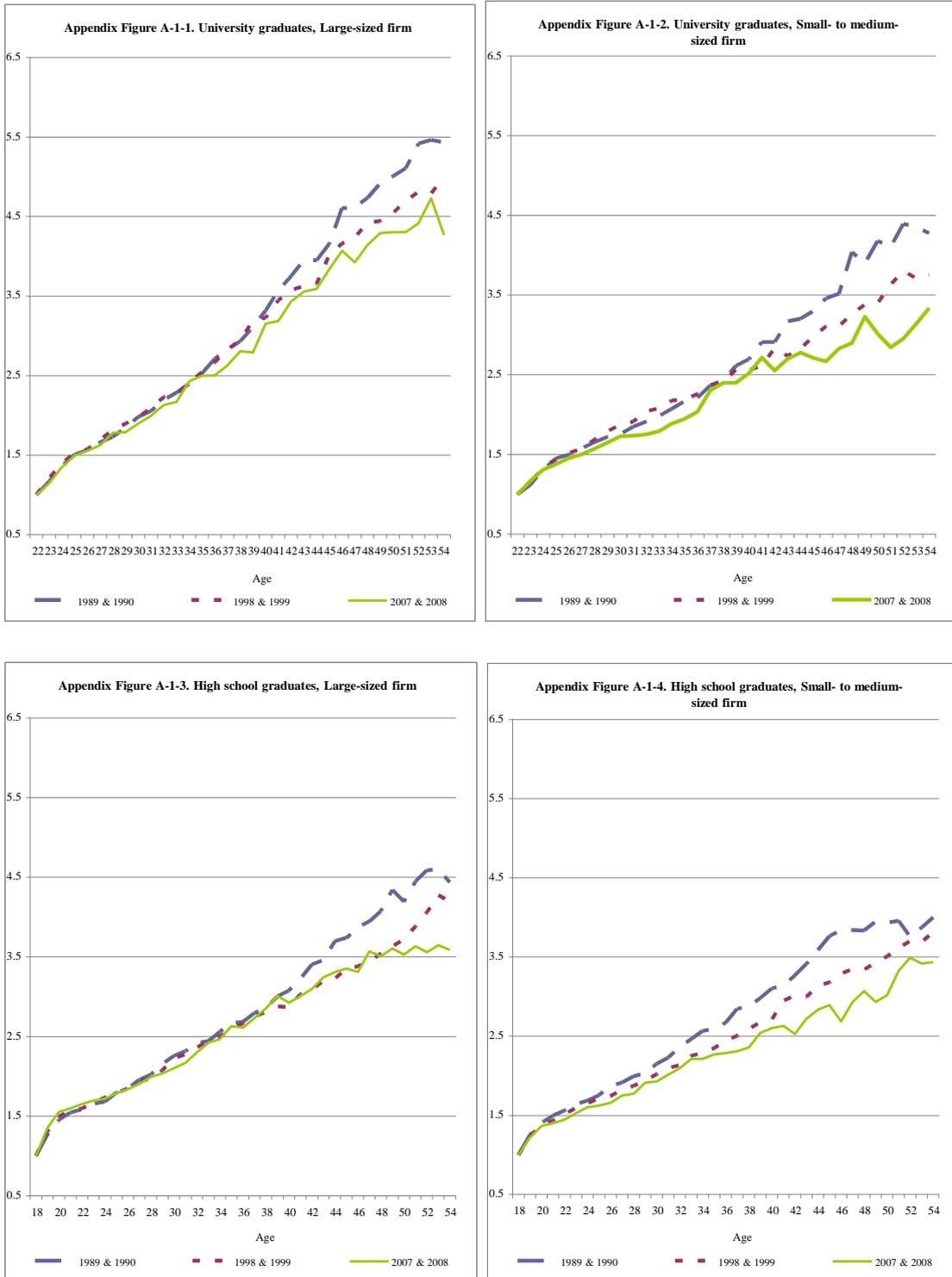
Note: The same as Table 1.

Appendix Table 1. Sample statistics for the male indefinite-contract employees (excluding part-time workers)

| Year | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|--|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Monthly wage/CPI (100 yen) | 4152.0 (2035.5) | 4253.9 (2076.8) | 4314.6 (2082.9) | 4385.2 (2102.7) | 4561.0 (2230.1) | 4614.3 (2232.3) | 4660.5 (2233.9) | 4619.4 (2166.8) | 4614.5 (2148.0) | 4570.8 (2154.6) |
| Age | 39.48 (11.58) | 39.77 (11.75) | 40.01 (11.93) | 40.16 (12.03) | 39.50 (12.05) | 39.56 (12.00) | 39.77 (11.99) | 40.03 (12.05) | 40.27 (12.07) | 40.31 (12.09) |
| School career | | | | | | | | | | |
| 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 (# of indefinite-contract employees) | | | | | | | | | | |
| 1000≤ | 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 | 762126 | 758632 | 758516 | 759437 | 796410 | 760491 | 800212 | 814247 | 822308 | 803000 |
| Year | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
| Monthly wage/CPI (100 yen) | 4553.1 (2151.7) | 4583.7 (2145.0) | 4639.0 (2182.7) | 4605.3 (2203.5) | 4567.7 (2190.0) | 4513.0 (2156.5) | 4564.4 (2287.2) | 4593.3 (2302.1) | 4590.8 (2337.1) | 4495.0 (2281.4) |
| Age | 40.51 (12.01) | 40.67 (11.9) | 40.88 (11.82) | 40.83 (11.79) | 41.04 (11.70) | 41.16 (11.65) | 41.12 (11.54) | 41.12 (11.62) | 41.08 (11.64) | 41.06 (11.62) |
| School career | | | | | | | | | | |
| 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 (# of indefinite-contract employees) | | | | | | | | | | |
| 1000≤ | 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 | 792656 | 756490 | 739097 | 722613 | 713736 | 715765 | 567072 | 596717 | 548022 | 554980 |

Note: The rows of "Monthly wage/CPI" and "Age" report their mean values. The monthly wage is the total amount of monthly contractual cash earnings and the twelfth part of annual special cash earnings of previous year. The numbers in parentheses of monthly wage/CPI and Age are their standard deviations. Since 2005, the firm size has been determined by the total number of employees, including definite- and indefinite-contract employees, except for the temporary ones that are hired for less than 17 days per month.

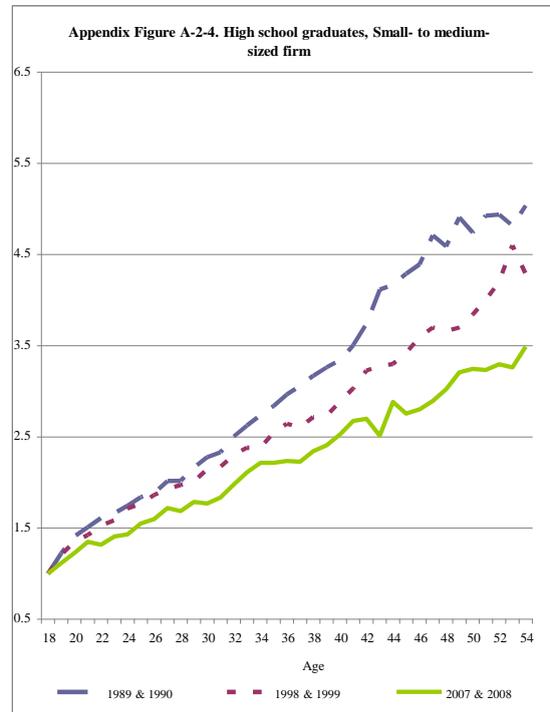
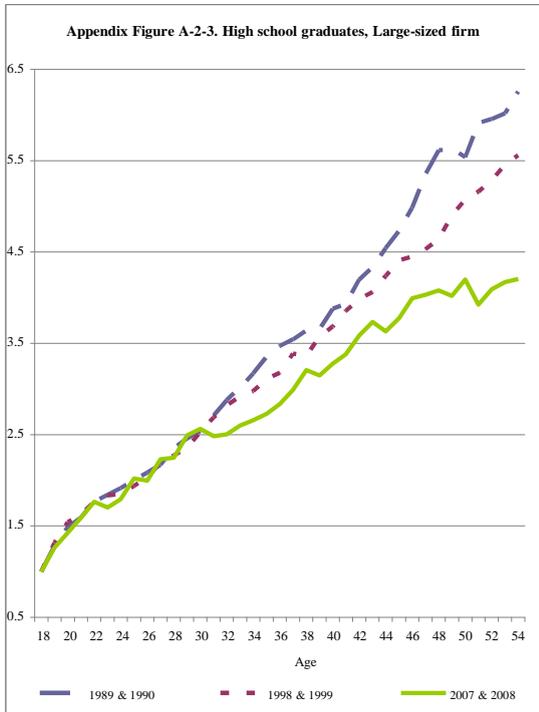
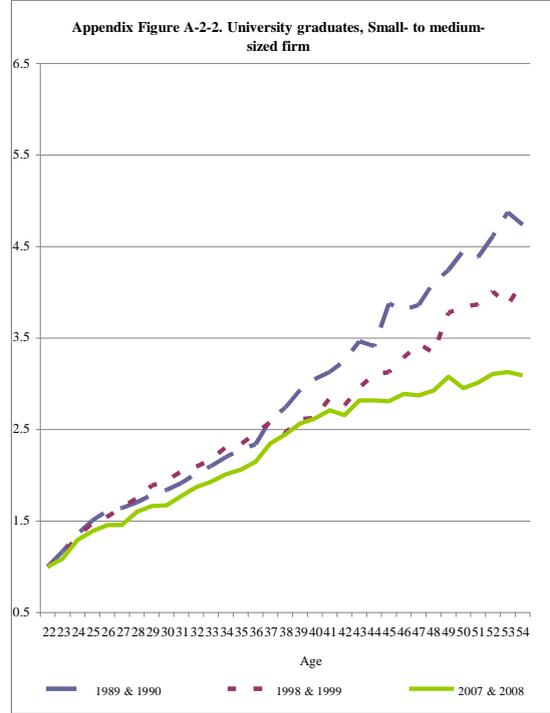
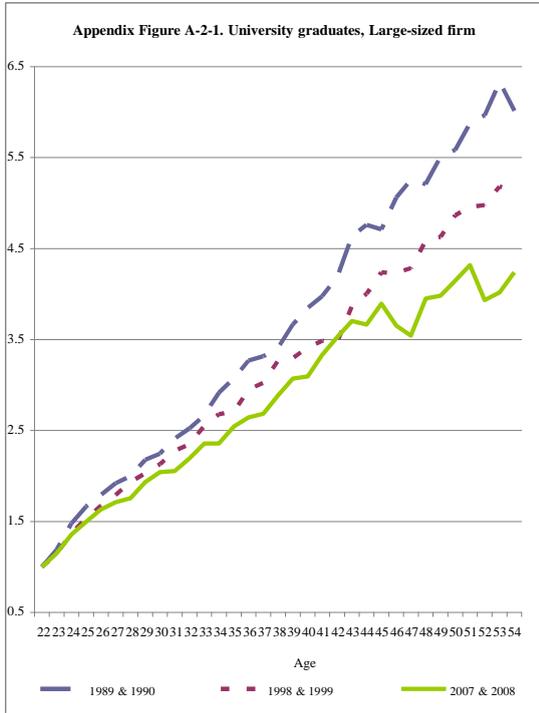
Appendix Figure A-1. The median hourly wage profile of the manufacturing industry



Source: The same as Figure 1.

Note: The hourly wage is calculated by dividing the total amount of monthly contractual cash earnings and the twelfth part of annual special cash earnings of previous year by the total number of scheduled hours and overtime worked. This is deflated by the consumer price index for Japan (general, excluding imputed rent). "Large-sized firm" has more than 1000 indefinite-contract employees. "Small- to medium-sized firm" has less than 1000 indefinite-contract employees.

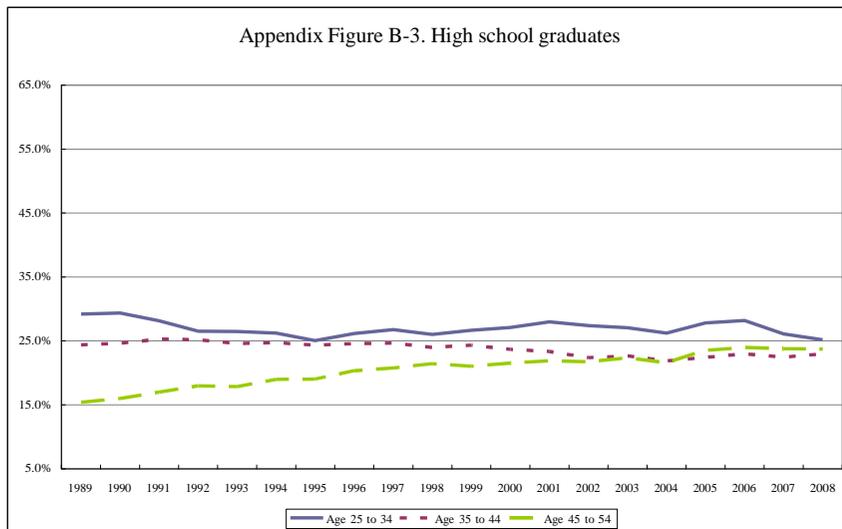
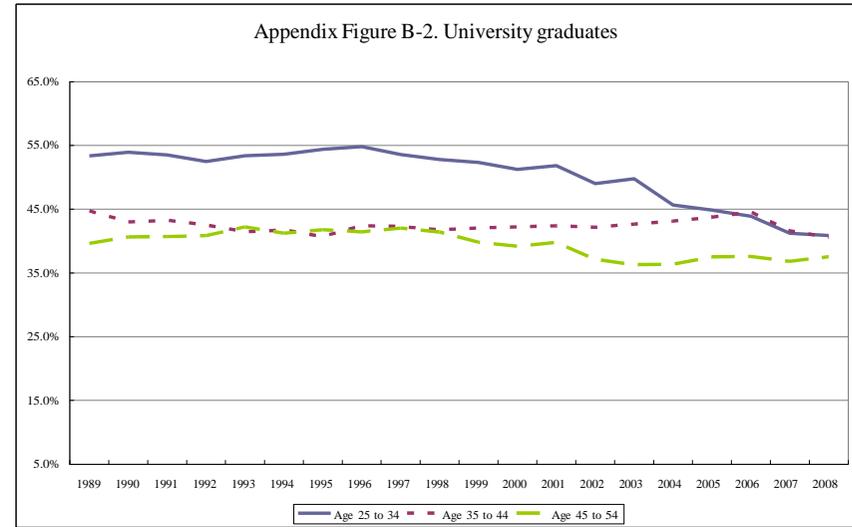
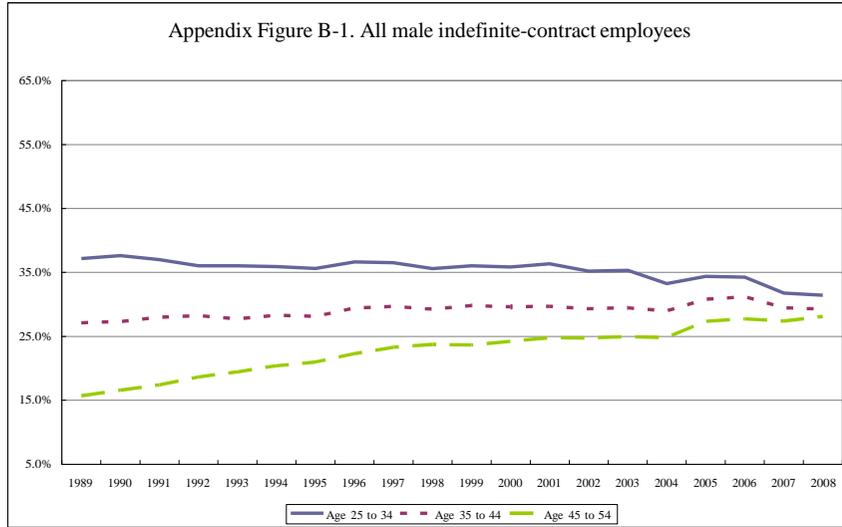
Appendix Figure A-2. The median hourly wage profile of the non-manufacturing industry



Source: The same as Figure 1.

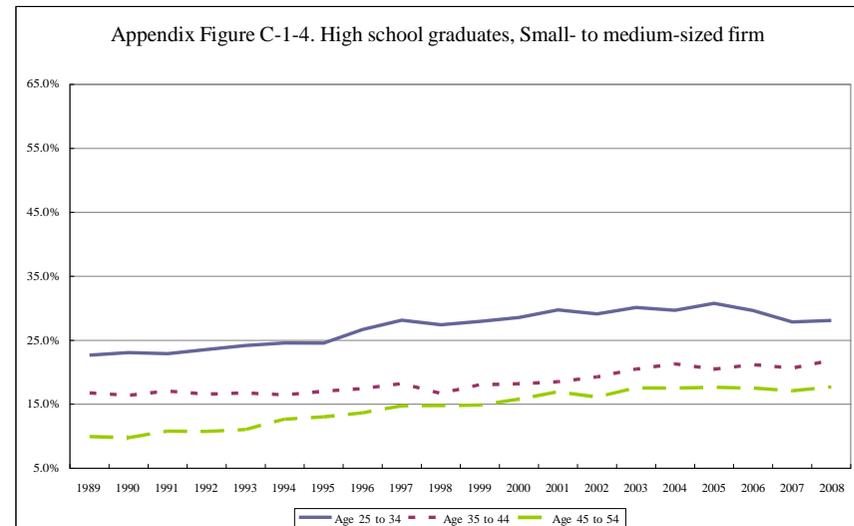
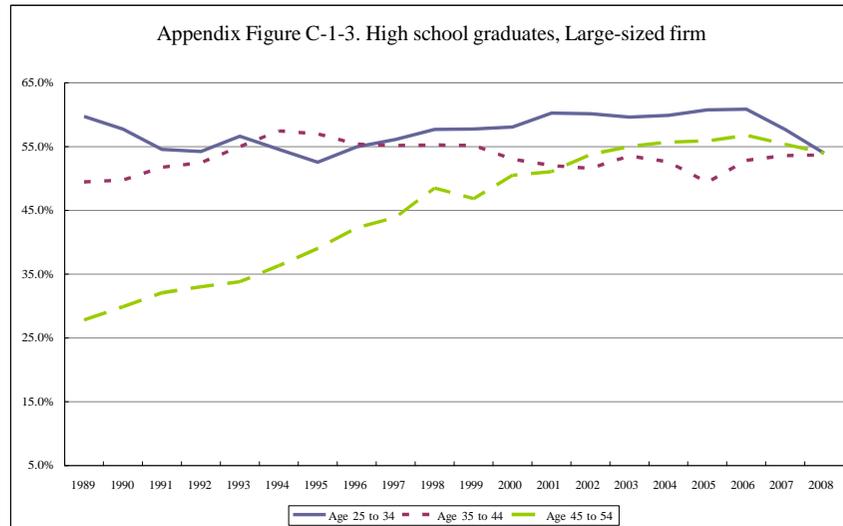
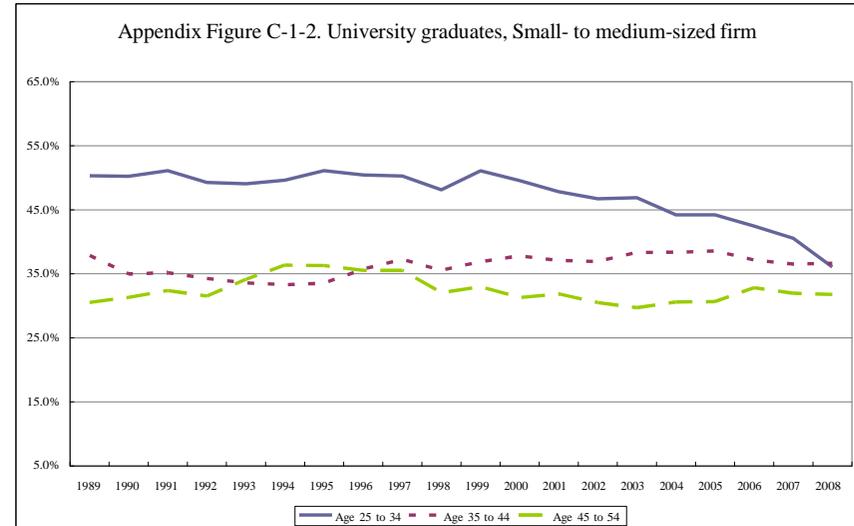
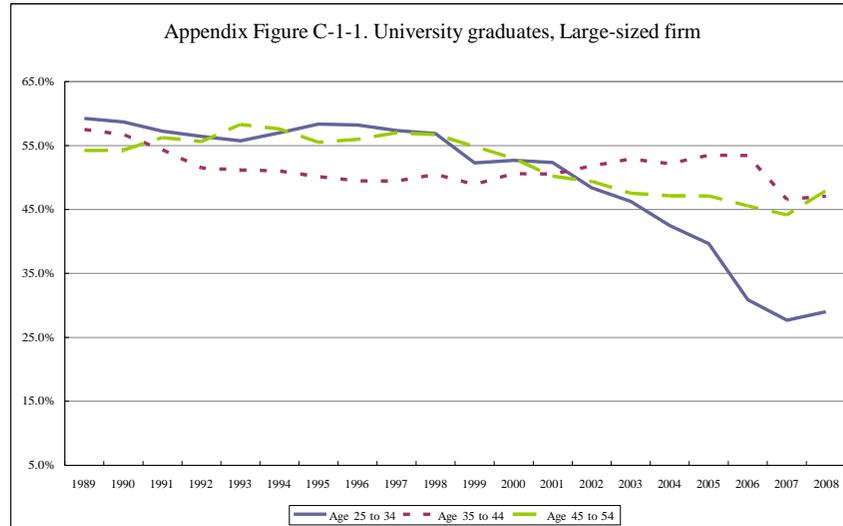
Note: The same as Appendix Figure A-1.

Appendix Figure B. The share of the lifetime employee in some broad groups



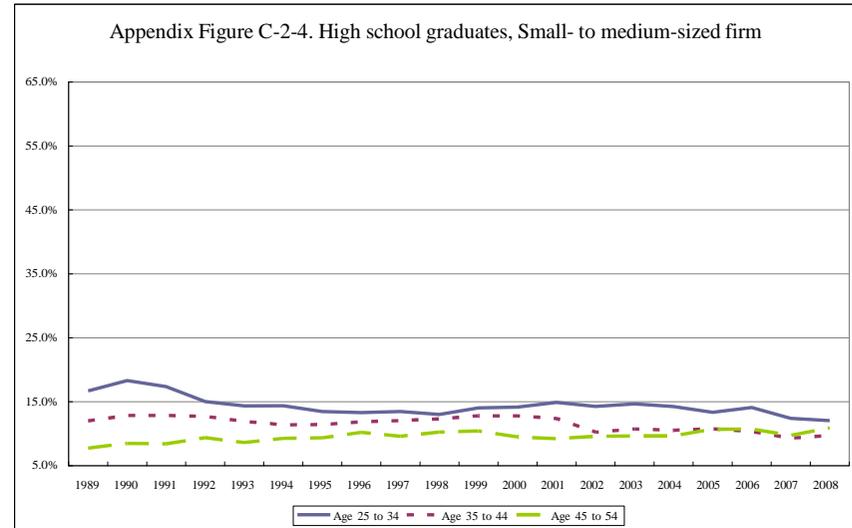
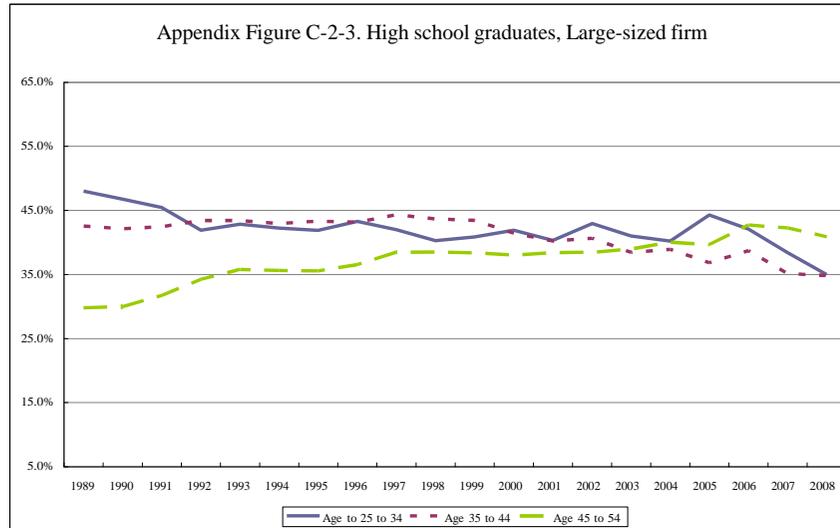
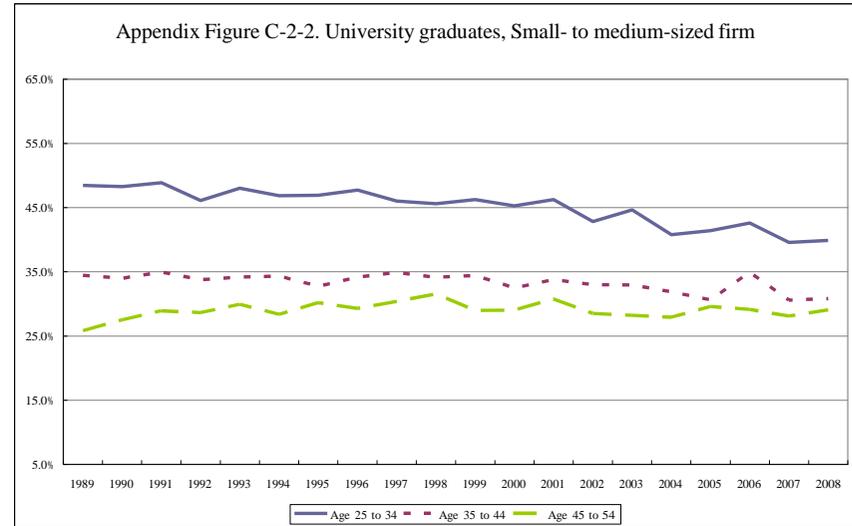
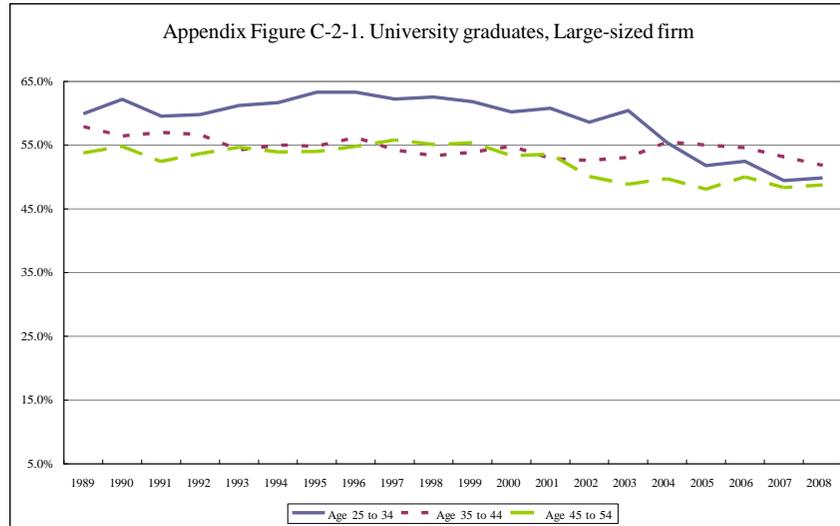
Source and Note: The same as Figure 3.

Appendix Figure C-1. The share of the lifetime employee in the manufacturing industry



Source and Note: The same as Figure 3.

Appendix Figure C-2. The share of the lifetime employee in the non-manufacturing industry



Source and Note: The same as Figure 3.

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