

Changes in Japanese Wage Structure
and the
Effect on Wage Growth
since 1990

Preliminary Draft Report
July 30, 2004

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Since 1990, wage growth has been slowing in nearly all of the world's industrialized economies.¹ Much has been written about the underlying causes of slow wage growth, with various authors attributing the slow rate of growth to changes in the composition of the workforce, the weakened state of unions, an increase in temporary and non-standard workers, low inflation rates, and a host of other reasons. In Japan, too, wage growth has been modest since 1990, and virtually nil since the mid-1990s. The factors that are suppressing wage growth in Japan are generally presumed to be somewhat different than those in other countries, with slow economic growth and the weakening of traditional pillars of the Japanese employment system typically mentioned. Before these factors can be analyzed, however, it is important to determine what changes in Japanese wages have occurred since 1990, and how trends in the structure of wages have affected wage growth.

This report analyzes changes in the structure of Japanese wages between 1990 and 2002/2003 primarily using data from the Basic Survey on Wage Structure (the Wage Structure Survey) published annually by the Japanese Ministry of Labour, with an emphasis on how those changes might affect overall wage growth. The Wage Structure Survey contains a wealth of data on Japanese wages broken down by sex, educational attainment, age, tenure, firm size, industry, and other variables. Using these data, we can determine what some of the underlying drivers of Japanese wage trends have been over the past 13 years.

The report focuses on four issue areas which are particularly relevant to Japanese wage structure and that have had an impact on the growth of wages in Japan since 1990: first, we look at changes in the structure of tenure and age, then look at changes in the ratio of bonuses to monthly wages. Next, we will examine changes in wage structure by educational attainment, before looking briefly at some of the effects of the aging of the workforce.

¹ International Labour Office, Laborsta Database.

Wage Trends in Japan since 1990

Over the entire period 1990-2003, hourly wages² in Japan increased at a rate of 1.2 percent, but all of the wage growth occurred during the first five years of that time period; from 1995 to 2003, wages actually declined slightly.³ Wages rose slightly faster in manufacturing, 1.6 percent per year over the 1990-2003 period and 0.3 percent per year from 1995 to 2003, but compared to the increases in wages in other countries over the same time, these changes were quite small.

Tenure and Age Structure

The Japanese employment system has traditionally been characterized by a strong relationship between the age of a worker and higher wages, as well as a strong relationship between a worker's tenure (the number of years that the worker has worked at a firm) and higher wages. Numerous researchers have found that the tenure and age wage curves in Japan are steeper than in other countries. (Tachibanaki 1978, Hashimoto and Raisian 1985, Abe 2000) Steeper means that for each additional year of tenure or of age that a worker has, his wages increase proportionally more in Japan than in other countries. Japan has also been somewhat unique in that the steep tenure and age wage curves also apply to blue collar workers in addition to white collar workers (Ono and Rebick 2002). These relationships are exemplified by the traditional course that a Japanese worker would follow within the employment system. The worker would typically join a company directly upon graduation from high school or university and work continuously for the company until retirement. Although the worker would generally start with a low starting salary, as he got older and gained tenure at the company, his wages would increase accordingly.

There has recently been much discussion in the popular press about the "dismantling" of the Japanese employment system, with a corresponding

² Throughout the rest of this report, monthly and annual wages are used for analysis of wage structure. Data are not calculated on an hourly basis in most cases because the hours data in the Basic Survey on Wage Structure are not collected with enough precision to typically make the differences in hours among groups of workers meaningful in the context of the analysis that is performed. In these cases, the exclusion of hours from the calculations makes very little difference in the results.

³ Monthly Labor Survey, increase in total wages for workers in firms with 5 or more employees.

weakening of the relationship between tenure, age, and wages. Reports of workers being downsized, increases in non-standard workers, and movements to pay systems based more on performance and ability are widely circulated. Certainly the Japanese employment system is undergoing some changes, but are these changes affecting the average amount of tenure of employees? Are wage curves based on age and on tenure becoming flatter?

Figure 1. Wages of Employees by Age, 1990 and 2002

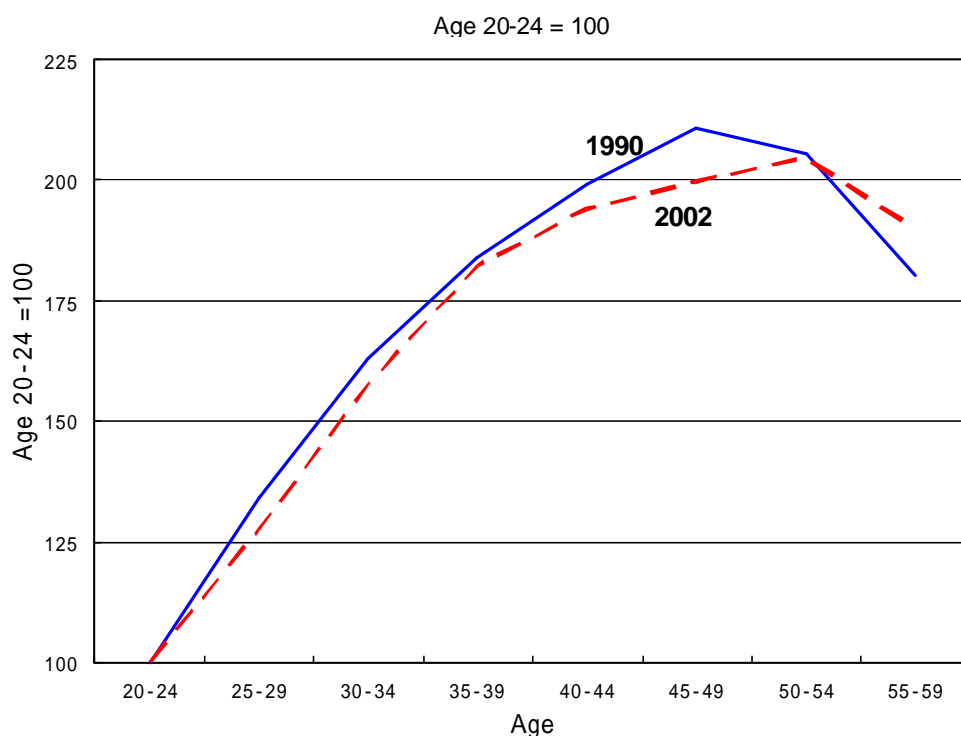


Figure 1 shows wage curves for 1990 and for 2002 for employees by age group, with the wage⁴ level for the 20-24 year old group set to 100. This curve is less steep in 2002 than in 1990, which means that at each age level except the 55-59 age group, the average employee made less relative to the 20-24 age group in 2002⁵ than he did in 1990. The flattening is particularly noticeable for employees between the ages of 40 and 54.

⁴ Wages are adjusted for bonuses.

⁵ The year 2002 is used so that data on bonuses from the 2003 Wage Structure Survey can be used.

Curves similar to those in figure 1 are often used to show that wage structure by age is becoming flatter and that there is a weakening of the age and tenure systems. However, much of this flattening has to do more with changes in the structure of the 20-24 age group than it does to changes in overall wage curves by age. If we examine the same wage curves compared to the 25-29 age group (a more stable grouping) as a base, a very different picture emerges (figure 2).

Figure 2. Wages of Employees by Age, 1990 and 2002

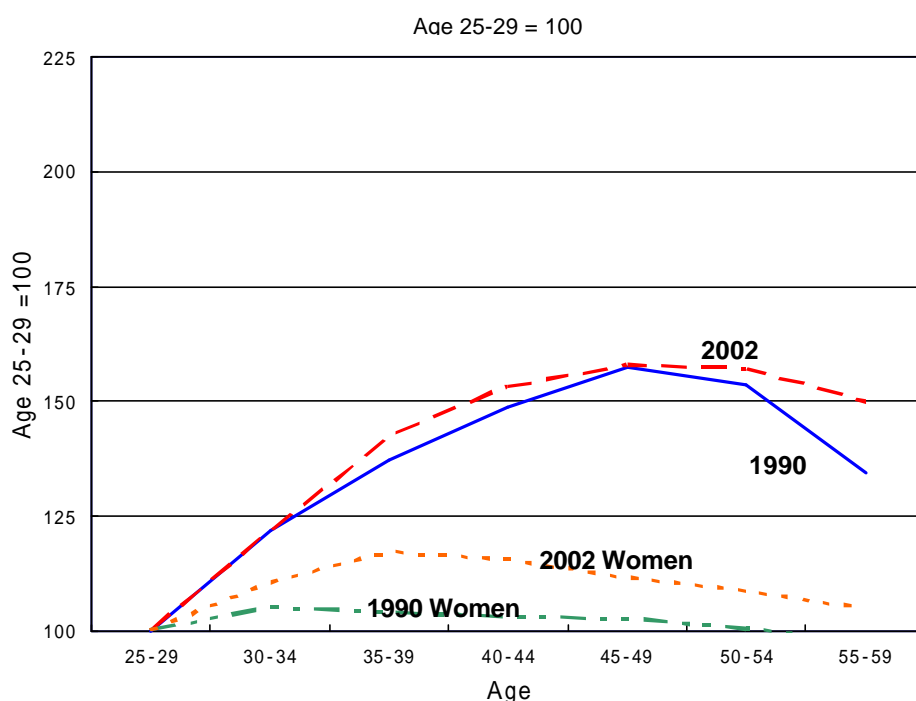


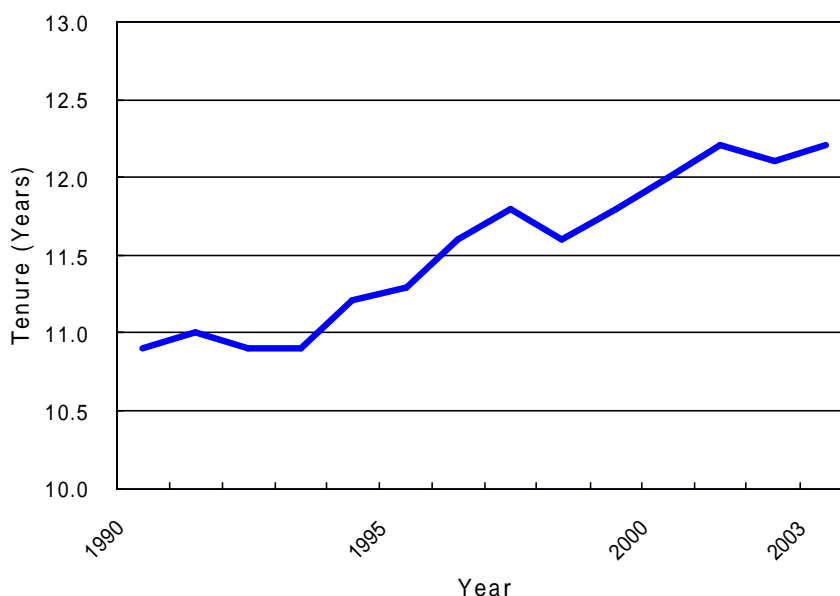
Figure 2 shows that the wage curve is actually steeper in 2002 than in 1990. As workers get older, their wage advantage relative to their younger co-workers in the 25-29 age group is greater now than it was in 1990. The steeper wage curve in 2002 is also present for the most part in the manufacturing industry, although in some industries this is not the case. The steeper curve is particularly evident in the smaller and medium size firms, while in the larger firms the curve has not changed much since 1990.

One change of particular note has been the increase in women's relative wages at each age level (figure 2). In 1990, the wage curve was practically flat for

women; in 2002, women in each of the older age groups earned significantly higher wages than their late 20s counterparts. This change in the women's wage curve is an important factor in explaining why the overall wage curve has not flattened since 1990.

Another factor that plays an important role determining wages in the Japanese system is tenure of workers. If the average amount of tenure is falling due to changes in the labor market, we would expect that average wages would also drop to reflect these changes, unless the role of tenure in determining wages is becoming significantly less prevalent in Japanese companies. We can examine this issue by looking at changes in average tenure by age groups and by examining wage increases by tenure and age blocks.

Figure 3. Average Tenure of Employees, 1990-2003



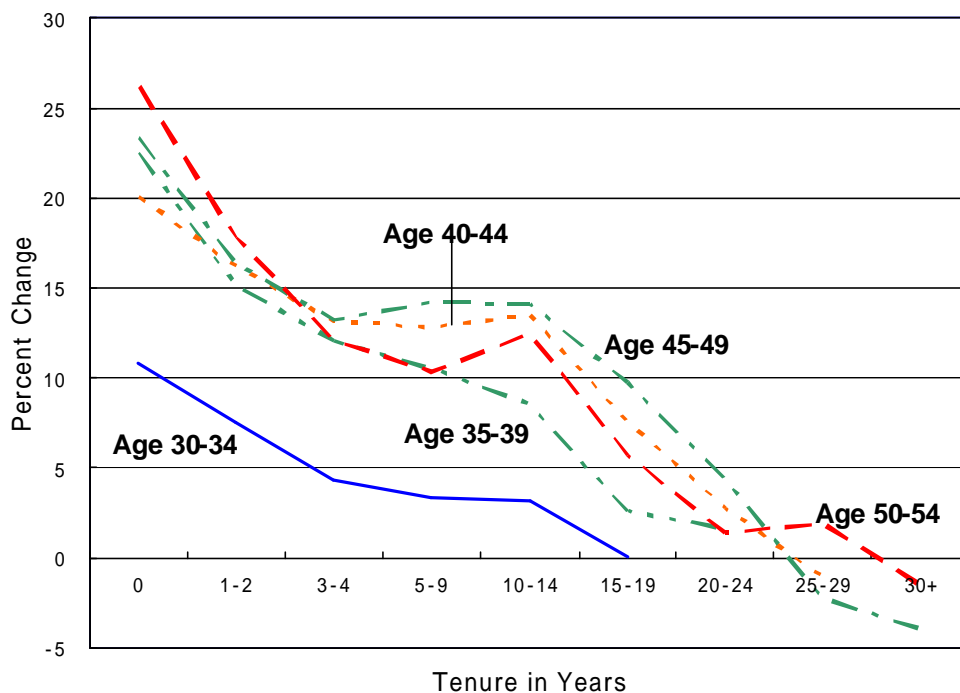
There is no question that tenure is still high in Japan, both by international standards (ILO 2003) and by recent Japanese standards. Average tenure in Japan has risen steadily since 1990, and is now at the highest levels ever (figure 3). While some of this increase in tenure can be attributed to the aging of the workforce, data on average tenure by age group show that aging is not solely responsible for the increase. Among workers in the 50-54 age group, average

tenure increased from 18.5 years in 1990 to 19.8 years in 2003, while tenure increased in the 55-59 age group by nearly four years. These older workers now have more experience at one company than they did in the past.

One would expect to see reductions in tenure in the younger age groups if job-hopping and temporary positions were becoming more common among younger workers, but average tenure in each of the age groups from the 25-29 group to the 45-50 age group stayed the same throughout the 13 years included in this study.

There has been no evidence yet from tenure rates that we are seeing the erosion of long-term employment. The trend in tenure average will bear watching in the future, however. Tenure rates peaked in 1996 for workers in the 50-54 age group and dipped slightly in 2002 and 2003, and the trend recently for university graduates in this age group has been toward lower tenure. With university graduates comprising an increasing part of this age group, we may begin to see average tenure drop in the next few years.

Figure 4. Percentage Change in Wages by Age and Tenure, 1990-2002



Although average tenure has not been eroding in Japan, there is some evidence that pay for tenure has been declining since 1990. Figure 4 shows the percent change in average wages for workers in each tenure group by age.

The downward sloping line for each age group shows that the increase in wages since 1990 has been less for workers with more tenure, and that these changes apply to workers in each age group⁶. For example, among workers in the 50-54 age group, wages for workers with 1-2 years of tenure increased about 18 percent between 1990 and 2003, while 50-54 year olds with 5-9 years of tenure saw their wages increase only about 10 percent over the same period, and workers with 20 or more years of tenure saw very little increase in their wages at all.⁷ In all age groups the same trend is evident; wages have been growing least in the groups with the most tenure. This could be seen as evidence that pay for tenure is weakening somewhat.

Bonus Ratios

Compared to other industrialized countries, bonus payments comprise an unusually large percentage of wages in Japan. (Hori and Shimizutani 2002) While in most countries bonuses are less than 10 percent of wages, bonuses in Japan have typically been 20 percent or more of a worker's total wages. Because of the importance of the bonus in the Japanese system, it is essential when analyzing Japanese wage trends to take into account changes in bonuses as well as changes in scheduled monthly payments.

Bonuses have long been considered a vehicle through which companies can

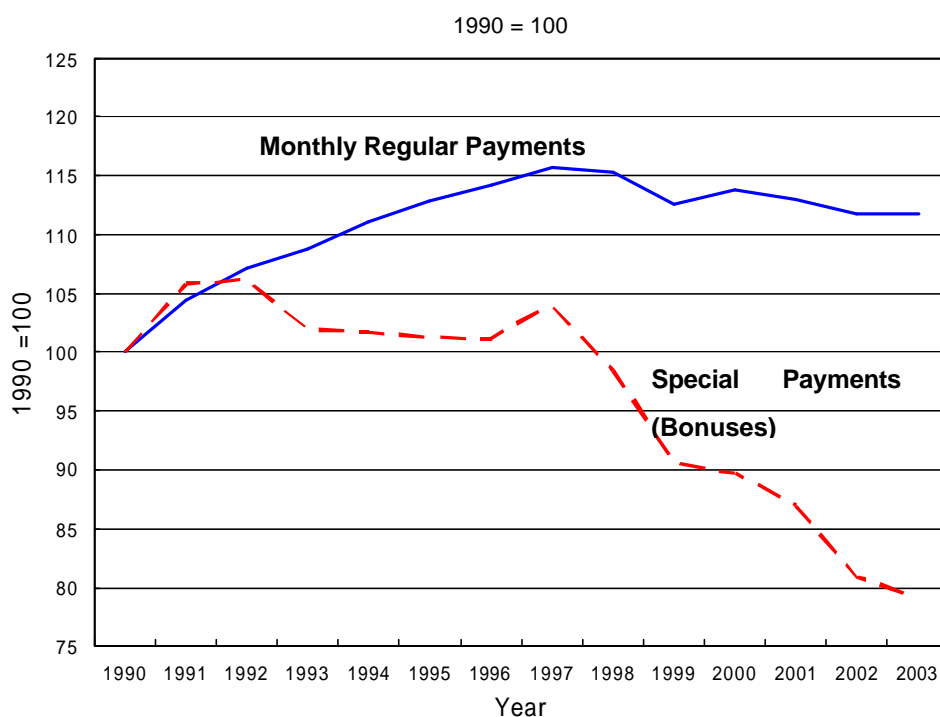
⁶ The 20-24, 25-29 and 55-59 age groups have not been included here because of space limitations and a lack of data points for the younger groups. These groups follow similar patterns to the groups in figure 4.

⁷ The percent increases for workers with zero tenure are likely somewhat overstated because bonus payment data for workers with zero tenure are not collected. The Wage Structure Survey only collects data from firms on annual bonus payments for the year previous to the survey year. Because workers with zero tenure were not at the same firm in the year prior to the survey, bonus data are not available for these workers. As discussed below, bonuses have been growing at a slower rate than monthly wages since 1990, so it is likely that the inclusion of the bonuses for zero tenure workers would lower the percent increases in wages for these workers by a small amount.

maintain an element of pay flexibility during difficult times, particularly given other elements of the Japanese employment system, such as relatively steep tenure and age wage curves. Bonuses could also prove an effective way to reduce wages in the low inflation or deflationary environment that Japan has experienced over the last decade. Kuroda and Yamamoto (2003) found evidence that nominal wages in Japan are downwardly rigid at zero; decreasing the ratio of bonuses to monthly wages is one way in which employers can avoid cutting the monthly pay of workers while still reducing wage costs.

Given the importance that bonuses play in Japan, it is instructive to see what role changes in the ratio of bonuses have played in suppressing wage growth. Average bonus payments have been declining since 1992, and by 2003 they had fallen to about four-fifths the level they were in 1990 (figure 5).

Figure 5. Monthly Wages and Bonuses



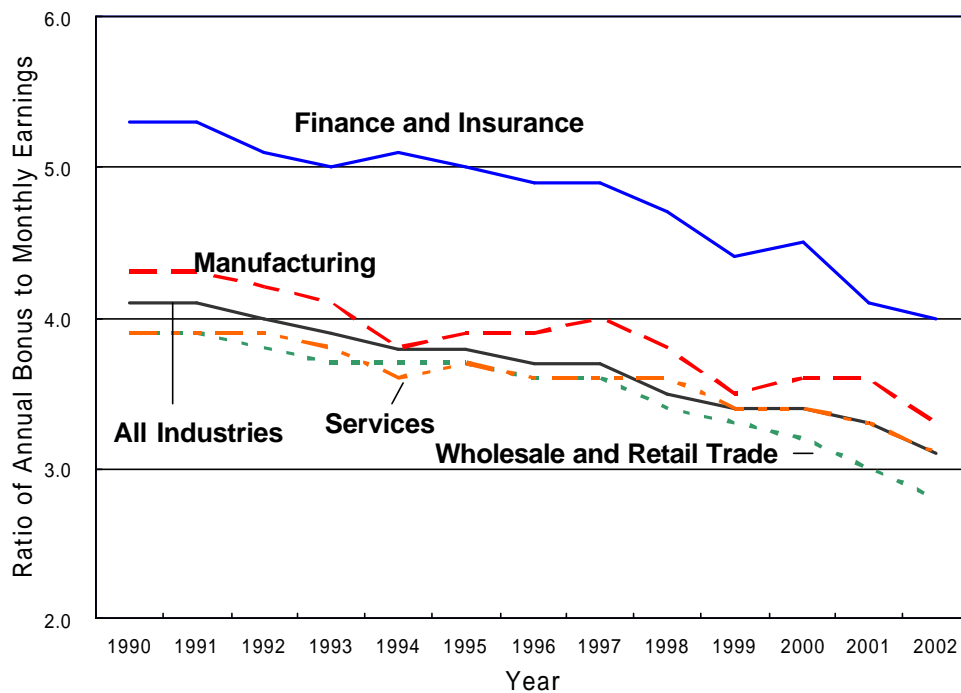
Source: Monthly Labour Survey, firms with 5 or more employees.

Bonuses have been falling in all parts of the economy and for nearly all groups of workers in the last decade, but the declines have not been uniform. Differences in percentage of wages received as bonuses among different worker groups have played an important role in changing Japanese wage structure over the

past 13 years.

Data on “annual special cash earnings” are collected in the Wage Structure Survey. The vast majority of annual special cash earnings is comprised of bonuses; other items included in annual special cash earnings are retroactive payments paid due to a new labor agreement and some monthly allowances that are paid less frequently than every three months. These other items comprise a very small amount of the annual special cash earnings and can safely be ignored in the analysis. We can thus refer to annual special cash earnings from the Wage Structure Survey as “bonuses” and the ratio of these bonuses to monthly earnings multiplied by 12 as the “bonus ratio”.⁸

Figure 6. Ratio of Annual Bonus to Monthly Earnings, 1990-2002, Selected Industries

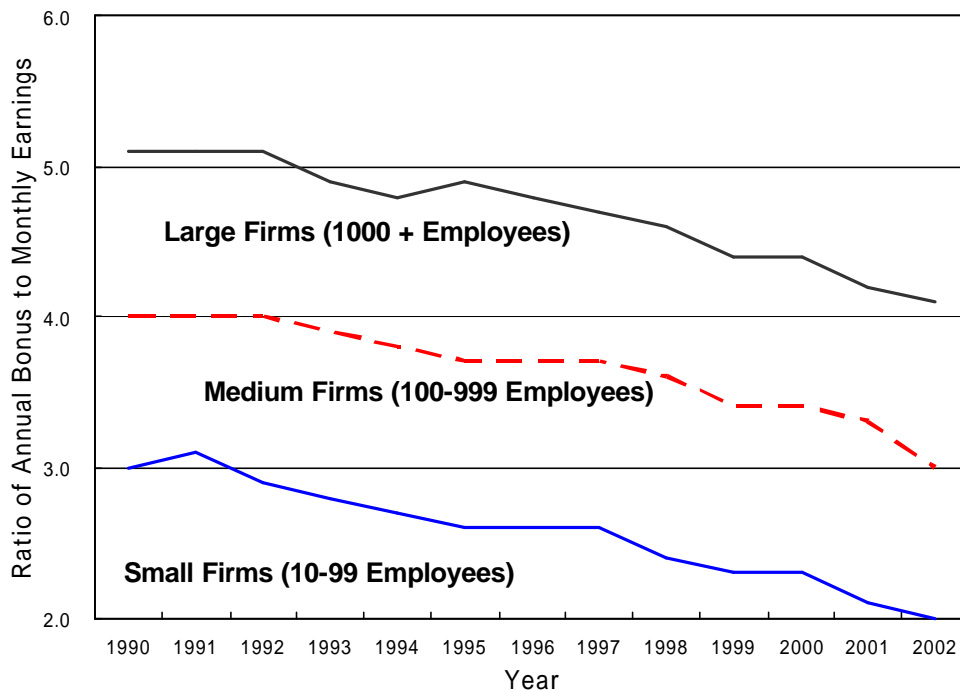


The bonus ratio has been consistently falling since 1990 (figure 6). The drop has been somewhat sharper in the Finance and Insurance and the Wholesale

⁸In the Wage Structure Survey, data on annual special cash earnings are collected for the year prior to the reference period (for example, in the 2003 survey data on monthly earnings relate to 2003, while data collected for bonuses relate to 2002). For analysis purposes, bonus data from a survey are combined with the monthly data from the previous year’s survey.

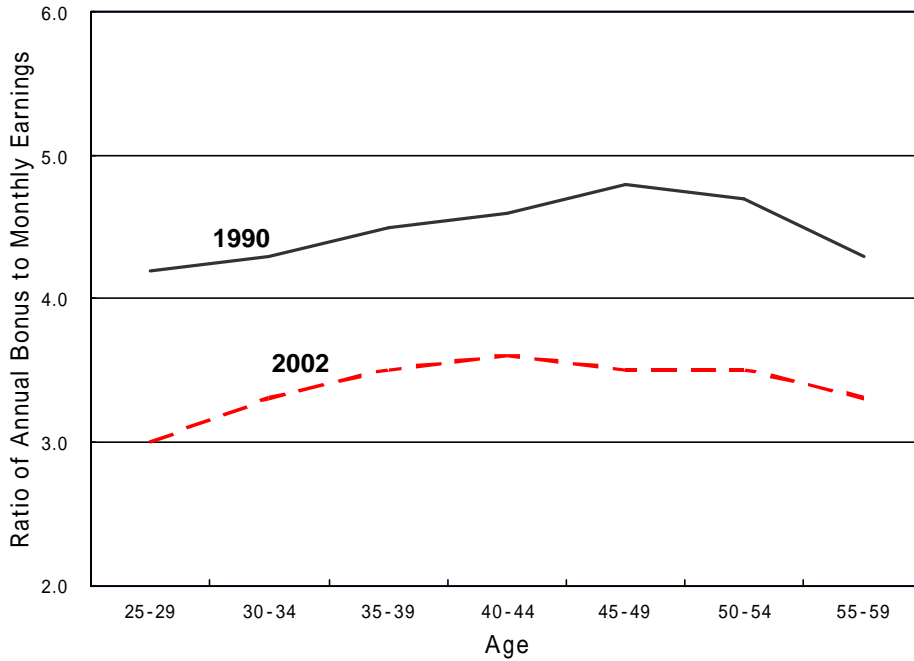
and Retail Trade Industries, but the same trend has been evident across all industries. Bonus ratios also fell for all levels of education, for both men and women, and for blue and white collar workers. In addition, even though there is a wide disparity in the ratio of bonuses by firm size, the ratio fell in all size firms in approximately the same manner (figure 7).

Figure 7. Ratio of Annual Bonus to Monthly Earnings,
1990-2002, by Firm Size



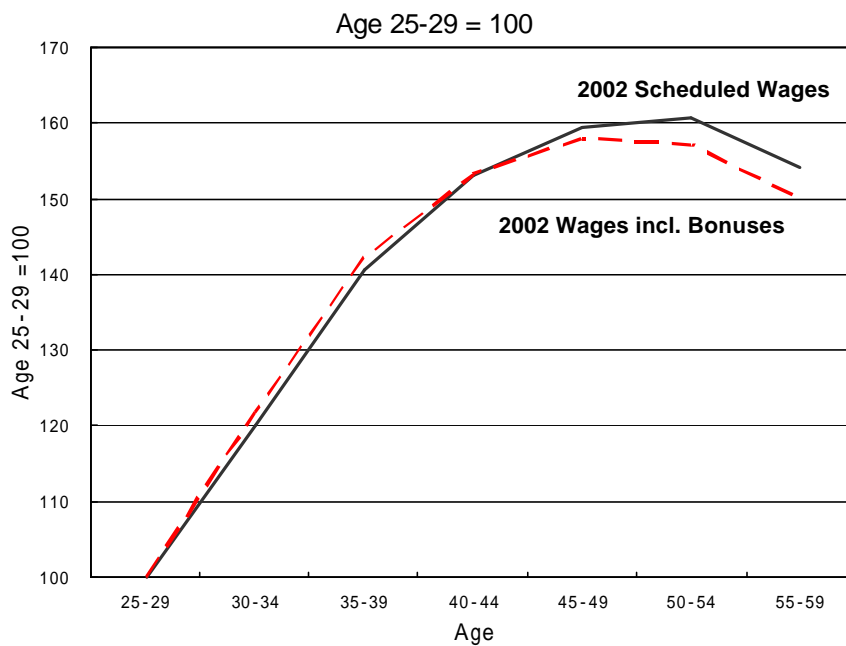
Bonus ratios have not fallen uniformly across all age groups, however, and this is one of the main reasons for the flattening of the wage curve by age. In the past, the bonus ratio used to get larger the older the worker; that trend no longer applies to workers over the age of 40. Figure 8 shows the bonus ratio by age group for 1990 and 2002. In 1990, the ratio of bonuses rose with age, eventually reaching the highest levels between the ages of 45 and 55. By 2002, the curve had flattened after the age of 40.

Figure 8. Ratio of Annual Bonus to Monthly Earnings,
1990-2002, by Age



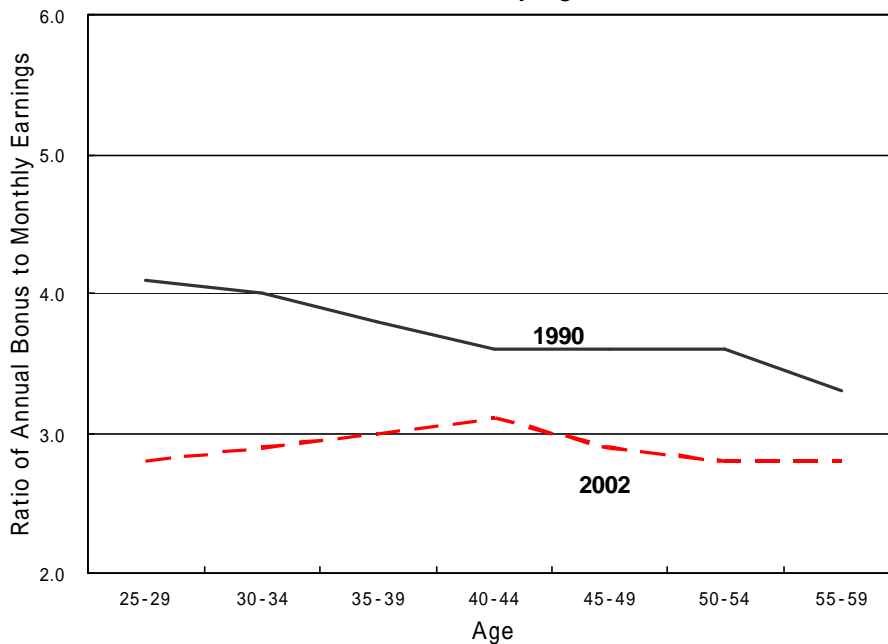
The flattening of the bonus ratio had the effect of flattening the wage curve for older workers as well. Figure 9 shows scheduled monthly wages as well as wages including bonuses. Up until the 40-44 age group, inclusion of bonuses in wages makes the curve steeper; from that point, the curve including bonuses is flatter than the curve of scheduled wages only, indicating that at the older ages the inclusion of bonuses in wages causes the wage curve by age to be flatter. This drop in the bonus ratio has contributed more to the decline in wages of older workers than of younger workers.

Figure 9. Wages of Employees by Age, 2002



The shape of bonus ratio curves are fairly uniform across industries now, which is a change from 1990, when the ratio curves of men in the large manufacturing and finance and insurance industries spiked up rather steeply at the older ages. In general, bonus ratio curves of men flattened overall, but the bonus trends were different for women. It was noted earlier in figure 2 that women at older ages now have wage levels that are appreciably higher than their age 25-29 counterparts. This is partly attributable to the change in the bonus ratio curve. In 1990, the bonus ratio curve for women was negatively sloped (figure 10). In 2002, the ratio of bonuses was very similar for women across all age groups. Although ratios for all age groups of women declined between 1990 and 2003, the ratios fell relatively less for older women than for younger women.

Figure 10. Ratio of Annual Bonus to Monthly Earnings Women, 1990-2002, by Age



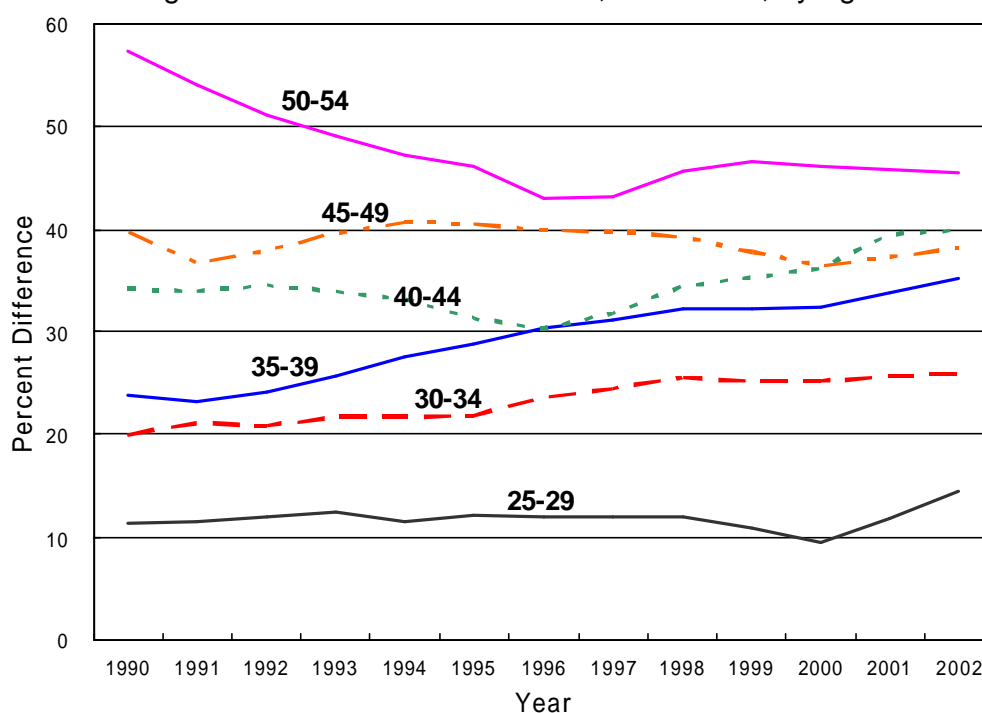
Changes in Educational Attainment

For many years there has been an influx of higher percentages of highly educated workers into the Japanese workforce, and the increase of university graduates as a percentage of all workers has climbed at each age level since 1990. In 1990, 19 percent of the workforce had a university degree; by 2003 that number had reached 28 percent, with one-third or more workers between the ages of 25 and 40 holding a university degree. The percentage of men in the age 50-54 group who were university graduates nearly doubled, from 11 percent in 1990 to 20 percent in 2003. This large-scale entry of university graduates into the workforce has interesting implications for wage structure.

University graduates have traditionally earned higher wages than high-school graduates, and the disparity between the two has increased in recent years, with male university graduates in 2003 making 33 percent more than high school graduates; in 1990 the difference between the two was only 28 percent. This growing disparity is not reflected in all age groups, however. As figure 11 shows, growth in the disparity between university and high school graduates is

most strongly reflected in the middle age groups (the 30-34, 35-39, and 40-44 age groups), but there was a decline in the disparity of the groups where previously the disparity was largest (the 45-49 and 50-54 age groups). These trends, coupled with the fact that the percentage of university graduates has doubled in the 50-54 age group, have interesting implications for wage curves comparing older workers to younger ones.

Figure 11. Disparity between Male University Graduates and High School Graduates in Percent, 1990-2002, by Age



Why is the disparity in wages between university graduates and high school graduates declining for older men? One possible explanation is that university graduates in the 50-54 age group in 1990 were graduates from the 1950s, when it was much less common to attend university. Graduates from that era were relatively rare and may have been able to command more of a premium than university graduates in the same age group today, who would have graduated in the early 1970s, when university graduates were more plentiful. These earlier graduates may also have had more advancement opportunities than the later graduates.

Data on the managerial position level attained can shed some light on this theory. The Wage Structure Survey collects data on four different types of managerial position: “bucho”, who typically supervises 20 or more peoples, “kacho”, who supervises 10 or more people, “kakaricho”, who supervises fewer than 10 people, and non-manager⁹. In 1990, 41 percent of university graduates fell into the “bucho” category, while in 2003 only 24 percent did. Meanwhile, the percentage of university graduates classified as non-managers increased from 31 percent to 43 percent.

This scenario is what we would expect to see if the advantage associated with a university degree were lessening, although there are also other factors that could impact the managerial structure as well. For example, the number of bucho in the 55-59 age group increased a great deal over the time period studied, and this may have resulted in fewer bucho positions at the 50-54 age group, but the large number of workers in the non-manager group would not likely be affected much by this.

Among each of these four managerial types in the 50-54 age group, the ratio of wages to the non-managers who comprise the 20-24 age group remained stable over the 1990-2003 time period. This implies that if there had then been no changes in the numbers of each managerial type over that time period, we would not have seen a drop in the relative wages of university graduates in the 50-54 age group. Because the percentage of the higher wage-earners (bucho) declined and the percentage of lowest wage-earners (non-managers) increased, the ratio of the wages of university graduates in the 50-54 age group to those in the 20-24 age group declined as well. This effect may account for some of the flattening of the wage curve relative to the 20-24 age group.

There are also changes in educational composition at the younger end of the age spectrum. The percentage of male new graduate hires who are university graduates has been increasing dramatically in recent years. In 1990, 39 percent of new male graduates who were hired were university graduates, but by 2003 that percentage was up to 59 percent. Even in manufacturing, the sector which hires the largest number of new high school graduates, university

⁹ These definitions are simplistic and do not fully define these concepts, but are sufficiently accurate for the manner in which they are used here.

graduates comprised 43 percent of new graduate hires, up from 28 percent in 1990.

Companies seem to be targeting more highly educated workers for new hires, and this is particularly prevalent among the large firms with 1000 or more employees. (In large firms, 3 out of every 4 new male graduates who are hired come from universities.) As a result the number of high school graduates in the 20-24 age group is only two-thirds the number of high school graduates in the 25-29 age group, and has been falling. We can expect these trends to continue and the 20-24 age group to continue to attain a higher mix of university graduates.

Whether this increase in education will lead to higher wages in the lower age groups remains to be seen. On the one hand, salaries are higher for university graduates, so a change in mix toward more university graduates could increase average wages in the age group. On the other hand, the growing number of university graduates gives companies a larger supply of potential workers from which to choose, which should in turn keep wages in check. There is currently a large glut of university graduates available; the percentage of new graduates with “shuushoku,” or getting a career-type job has declined to 55 percent (it was over 80 percent in 1990). The supply of potential hires may work to keep wages in check.

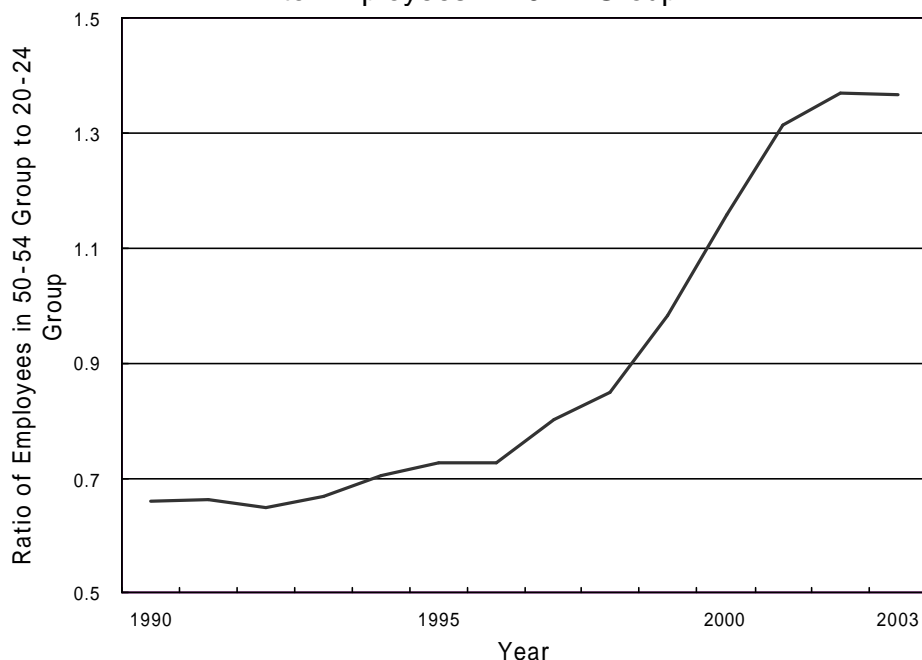
Taken together, trends related to educational attainment in both the younger and older groups may explain to some extent why we see a flattening of the wage curve by age.

The Aging of the Labor Force and the Effect on Wages

One major change in Japanese wage structure since 1990 has been the aging of the labor force. Using data from the Wage Structure Survey, the average age of a Japanese worker has increased about 0.2 years annually, rising from 38.3 years in 1990 to 40.3 years in 2003. The number of workers age 50 and over has now reached half the number of all workers under 40. The changes have been especially dramatic in the 20-24 and 50-54 age groups. Since 1990, the ratio of workers aged 50-54 relative to workers aged 20-24 has increased from

0.66 to 1.37 (figure 12).

Figure 12. Ratio of Employees in 50-54 Age Group to Employees in 20-24 Group



This large increase in the number of older workers and simultaneous decline in the number of young workers can have a depressive effect on year-to-year percent changes in wages if the average wages of older workers are rising at a slower rate than the younger workers, even though the older workers have higher levels of earnings.

Consider an example using representative data for the two age groups mentioned above. As a worker moves up in age one year in the 20-24 age group, he can expect an increase of approximately 4 percent.¹⁰ A worker in the 50-54 age group could expect an increase of only about 1.8 percent. Assuming that workers in the 50-54 age group earn slightly more than twice as much as workers in the 20-24 age group (using data from figure 1), we can calculate how much the average wage increase for the two groups combined would be using

¹⁰ These are estimates using data on wages for standard workers by age. They are meant to be representative of changes by workers in these age groups, not exact estimates.

employment weights from both 1990 and 2003. If the employment structure is like 1990, with a ratio of .66 workers aged 50-54 for every one worker aged 20-24, this example would yield a weighted average wage increase of 2.7 percent. If the employment structure for 2003 is used, where the ratio of age 50-54 workers to age 20-24 workers is 1.37, the weighted average wage increase would only be 2.4 percent.

In this case the weighted average wage increase is lowered because many workers are moving out of the faster growing group and into the slower growing group. Of course, there are many other factors which affect the rate of increase of wages from year to year, but changes in the weights of employment toward older workers could slow wage growth in Japan.

The labor force in Japan will continue to age in coming years as the population age groups that will be coming into the labor force are much smaller than the youngest age groups that are currently in the labor force. For example, there are currently 40 percent more people between the ages of 20 and 34 than between the ages of 5 and 19. When the younger population enters the labor force, there may be more competition for young labor and an increase in relative wages for younger workers, which could lead to less steep wage curves based on age and tenure.

Summary

This report has examined some important aspects of wage structure in Japan and the effect those changes have had on wage growth, for the most part suppressing it. These are by no means the only issues that could be examined; in particular, changes in non-standard and part-time workers are of interest. Nevertheless, the issues covered in the report provide a good starting point for the future analysis of Japanese wage structure.

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