Promoting Employment of Older Workers and Adjustment of their Working Conditions at Japanese Firms

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In Japan, the Act on Stabilization of Employment of Elderly Persons has made progress in securing employment opportunities for and improving the work environment of older persons, including continued employment after mandatory retirement. However, there is a strong possibility that firms are making some form of adjustment (e.g., wage, employment status) in exchange for securing employment for older workers. I summarize previous research findings, focusing on the wages and job descriptions of older workers and on the possibility of substituting older workers for younger workers as part of the adjustments made by firms to secure employment for older workers. Then, using microdata from a survey of Japanese firms, I examine the extent of these adjustments. I find that although the wages of those in their early 60s decrease compared to pre-mandatory retirement age wages, wages are adjusted according to changes in job content and workload in continuous employment. I also find that the higher the ratio of employees above 60, the more firms cite their "inability to hire younger workers" as an obstacle to securing employment for those in their early 60s. This suggests that firms are aware of the substitutions between older and younger workers. Moreover, I observe that even when the nature of the work differs from that of the pre-mandatory retirement period, firms have retained older workers to pass on their skills or fill labor shortages in the workplace, considering their physical condition. Meanwhile, it is noted that having workers continue the same work as before mandatory retirement while adjusting the workload could help secure employment opportunities until age 70.

I. Introduction

Declining fertility rates and aging populations have been observed not only in Japan but also in many other countries around the world. The average number of live births per woman in 2019, as reported by the United Nations (2019), was 1.7 in Europe and North America, 1.8 in East and Southeast Asia, 1.8 in Australia and New Zealand, and 2.0 in Latin America, an across-the-board decrease from 1990. Meanwhile, people aged 65 and older as a percentage of the total population are projected to reach 26.1% in Europe and North America, 23.7% in East and Southeast Asia, 22.9% in Australia and New Zealand, and 19% in Latin America by 2050 (United Nations 2019).

When the percentage of the population accounted for by young people stagnates and the percentage of older people increases, the relative size of the working-age population will inevitably shrink. If the working-age population's share of a country's production activities shrinks and the number of people who are economically dependent on the working-age population increases, per capita GDP is expected to decline and growth to slow, leading to a financial deterioration of the social safety net. To prepare for this situation, many countries are encouraging older people in their 60s to keep working longer by raising the starting age for public pension payments. According to the Organisation for Economic Co-operation and Development, OECD (2019), the standard starting age for pension payments under the current system has been raised by an average of 3.5 years in 20 of the 36 OECD countries. Many previous studies in Europe, the United States, and Japan show that raising the age of eligibility for pension payments has a positive effect on the labor supply of older workers (Ishii and Kurosawa 2009; Blundell, French and Tetlow 2016; Coile 2015; Kondo and Shigeoka 2017; Oshio, Shimizutani and Oishi 2020; Oshio, Usui and Shimizutani 2020).

To raise the age of eligibility for pension payments without lowering the living standards of older people, firms must actively employ older workers. In Europe and the United States, laws prohibiting age discrimination have been enacted, but they have not necessarily led to an increase in elderly employment (Lahey 2010; Sakuraba 2014). Meanwhile, most firms in Japan have a mandatory retirement age. According to the 2019 "Survey on Employment of Elderly People," a nationwide survey of private-sector companies with 50 or more employees (excluding industries of "agriculture and forestry, and fisheries," "mining," and "compound service") conducted by the Japan Institute for Labour Policy and Training (JILPT) (hereafter, "JILPT survey"), 94.7% of responding firms have a mandatory retirement age (JILPT 2020). On the other hand, the Act on Stabilization of Employment of Elderly Persons (ASEEP), (first enacted in 1971 as the Act for Promoting Employment of Middle-aged and Older Persons, Etc., later changed its name to the current one in 1986), has been ensuring employment opportunities and improving the environment for older people such as continued employment after mandatory retirement. Having been amended several times, the act currently obliges firms, i.e., the labor demand side, to secure employment through measures such as continued employment up to age 65 and to make efforts to secure employment opportunities for workers in their late 60s.

Thus, it can be said that the labor market for older people in Japan is characterized by the fact that their employment is promoted through raising the pension eligibility age (supply-side intervention) and the ASEEP revision (demand-side intervention). Kondo (2014) examines the impact of the 2006 ASEEP revision, which made it mandatory to secure employment until age 65, on employment in their early 60s, using survey data from the *Labor Force Survey* (conducted by the Ministry of Internal Affairs and Communications). She shows that the requirement to secure employment for older people increased both the labor force participation rate and the employment rate, that the change in the employment rate was larger than that in the labor force participation rate, and that most of the increase in the employment rate was due to the increase in the number of people continuously employed by the same firms. Furthermore, the number of workers who changed jobs did not differ significantly before and after the ASEEP revision, suggesting that the revision may not have strongly squeezed workers in their sixties who changed jobs out of the labor market. These results can be interpreted as an increase in the labor supply induced by an increase in the employment rate due to the expansion of employment opportunities.

However, even before the 2006 ASEEP revision, employment of persons aged 60 or older was not prohibited. As Kondo (2014) notes, if the employment that increased as a result of the ASEEP revision was accounted for by people whom the firms would have preferred not to employ if not required by the revision, it is highly possible that the firms made some form of adjustment in place of promoting the employment of older people. For example, possible channels of adjustment include changes in wages and terms of employment for older people, substitutions between older workers and other age groups, and complementarity between older people and capital. To what extent do each of these adjustments take place in firms? And to what degree do these adjustments contribute to the promotion of employment among the elderly?

Among adjustments at Japanese firms to secure employment for older people, I focus on changes in the wage and terms of employment of older people and employment substitutions between older people and other age groups. Then, while outlining relationships between these adjustments and the employment of older people based on previous studies, I discuss the extent to which the above adjustments have been made, using microdata from the 2015 survey of the above-mentioned JILPT survey. The current ASEEP, enacted in April 2021, requires firms to make efforts to secure employment opportunities up to age 70. I examine the possibility of securing employment opportunities up to 70 through firms' adjustments of working conditions as described above.

In the following Part II, I consider the rationality of the post-retirement continued employment systems adopted by many Japanese companies from an economic perspective. Part III summarizes the findings of previous studies on firms' adjustments to secure older employment, including wages and terms of employment, and the possibility of substituting older workers for those of other age groups, especially younger workers. In Part IV, I examine adjustments of working conditions at Japanese companies using microdata. Part V discusses the feasibility of securing employment opportunities for workers up to age 70 and concludes.

II. Growth of labor demand for older workers

The current ASEEP mandates an "obligation to make an effort to take measures to secure employment opportunities up to age 70," in addition to the existing "prohibition of mandatory retirement ages under 60" and "obligation to take measures to ensure employment up to age 65." The measures to ensure employment up to age 65 are: i) raising the mandatory retirement age to 65, ii) abolishing the mandatory retirement age, or iii) introducing a continuous employment system up to age 65, such as a rehiring system or a system for extending working periods without retirement. Companies are required to take one of these steps. Most firms cope by iii) introducing a continuous employment system after mandatory retirement. According to the report on the employment conditions of elderly persons in 2020 (Ministry of Health, Labour and Welfare, MHLW 2020), 2.7% of firms with 31 or more employees have abolished the mandatory retirement age, and 20.9% have raised it, while 76.4% introduced a continuous employment system.

With regard to reasons why measures i) and ii) above are difficult to introduce in an economic context, the delayed-compensation contract advanced by Lazear (1979), who examined the question "Why is there mandatory retirement?" can be useful. This model assumes that a worker's optimal retirement age (T^*) is the point in time when the worker's productivity (value of marginal product, VMP) is equal to their reservation wage. In addition, it assumes that the firms cannot constantly monitor the workers but can only make random observations of the workers' performance and dismiss the workers based on this information. The model then shows that with these assumptions, paying workers less than their VMP with fewer years on the job and more than their VMP in later years can give workers incentives to stay longer. However, because the discrepancy between wages and productivity increases with years on the job, workers do not voluntarily retire at retirement age (T^*). Therefore, the employment contract must be terminated when workers reach this age. This is the reason for setting a mandatory retirement age.

Ohashi (1990) extends the assumptions of the Lazear model by formulating a modification to discuss the function of the retirement system and the determination of retirement age within the firms' internal labor market

framework established on the premise of a long-term employment relationship. Specifically, He considers a profit maximization problem in which firms determine retirement age and age-earning profile in a model that incorporates an internal promotion system. In this model, firms have two categories of jobs (productive and managerial). Wages for productive jobs are fixed, while wages for managerial jobs are effort-based pay. This model assumes that the level of effort in productive jobs affects the timing of promotion to managerial jobs, which is the internal promotion component. This model as well shows that wages after promotion must exceed the value of productivity for a mandatory retirement age to exist. It also points out that raising the retirement age may delay workers' promotion. Meanwhile, Chuma and Higuchi (1995) use a two-term model based on human capital theory to analyze changes in the age-earning profiles of regular employees and non-regular employees and their ratios when hired at a firm. The model assumes that the human capital level that firms require for their regular employees varies depending on the economic environment and has an impact on their age-earning profiles. The model also shows that wages may exceed the value of productivity during workers' prime time of their careers due to changes in the economic environment and other factors.

Previous studies examining associations between the value of productivity and age-earning profiles have shown that wages are lower relative to the value of productivity during the initial years and higher in the later years (Kodama and Kotaki 2010). For example, Kawaguchi et al. (2007), using a dataset linking the Census of Manufacture (conducted by the Ministry of Economy, Trade and Industry, METI) and the Basic Survey on Wage Structure (BSWS) (conducted by the MHLW) from 1993 to 2003, compares worker productivity and wages at manufacturing industries in Japan. They show that younger workers earn wages below their value of productivity and that middle-aged and older workers earn wages above their value of productivity. These findings support the rationale for the existence of a mandatory retirement system.

Eliminating or raising the mandatory retirement age would cause losses to firms under an upward-sloping age-earning profile in which the wages of workers with more years on the job exceed their value of productivity. To avoid "overpayment," firms need to revise their entire upward-sloping age-earning profile. Some studies using Japanese microdata confirm that raising the retirement age moderates the slope of the age-earning profile and that wages tend to decline at firms that have raised the retirement age, even when years on the job are the same (among recent studies, Kimura, Kurachi and Sugo 2019). However, the revision of age-earning profiles is expected to involve significant adjustment costs involving negotiations between labor and management. On the other hand, a continuous employment system is a completely different measure from abolishing or raising the retirement age. Raising the retirement age means continuing employment in the same form as before, whereas continuous employment means once having workers retire at the retirement age and then re-contracting them. In the latter case, if firms re-contract with lower pay at a level commensurate with the value of productivity, adjustment of the entire age-earning profile can be avoided. If so, wages after the re-contract would also be lower under the upward-sloping age-earning profile.

In terms of the utilization of workers' human capital, it may be efficient for older people to continue working at the same firms through a rehiring system. For example, suppose human capital accumulated up to retirement age is specific to firms. In that case, the human capital will be utilized more fully with continuous employment compared to employment at other firms after mandatory retirement. Yashiro (2009) points out that when firms continue to employ people who have reached mandatory retirement age, assigning them to the same jobs they had before retirement makes sense. In addition, when firms newly hire older people, the elderly workers have to acquire a large stock of human capital to do the new job, and thus the fixed costs of hiring and training are high (Hutchens 1986). Many of those who have reached mandatory retirement age wish to remain employed at the same firms. According to MHLW (2020), 85.5% of those who reached the mandatory retirement age at firms with mandatory retirement at age 60 were continuously employed. This suggests that continuing to work at the same firms may provide workers with better compensation than moving to other firms after retirement.[1]

Nonetheless, suppose a firm seeks to lower wages after mandatory retirement while having employees do the same work as they did before retirement. In that case, it will result in a situation where "work remains the same

but wages decline," violating the principle of "equal pay for equal work." There have been cases where significant wage reductions have arisen under continuous employment systems due to the conclusion of re-contracts, even though the nature of the work after mandatory retirement hardly changed from before mandatory retirement. Such cases may be regarded as unreasonable differences in working conditions and considered a violation of Article 8 of the Part-Time and Fixed-Term Employment Act.[2] However, the ASEEP does not contain clear provisions regarding wages and working hours for continuous employment, and in principle, the determination of working conditions offered by firms is left to their reasonable discretion.[3]

III. Adjustments by firms to secure older workers' employment

Being required to secure employment for older workers, what levels of wages do firms set for them? And, do the content and amount of work change after mandatory retirement? Regarding the former question, Kondo (2016) examined the effect of the 2006 ASEEP revision, which mandated continued employment until age 65, on wages (annual earnings excluding bonuses) of older people. Using microdata from the BSWS, she showed that the wages of older people who reached age 60 after the revision declined significantly. However, she also points out that this wage decreases after age 60 includes changes due to an increase in the number of older people who continue to work after mandatory retirement, in addition to changes due to an actual wage decrease for nearly equally productive workers. Before the revision, older people who continued to work after retirement were considered relatively productive workers who met the selection criteria set by firms. According to JILPT (2020), the average wage at age 61, when the wage just before age 60 (the lower limit of mandatory retirement age) is 100, was 89.6 for those with the highest level wages, 78.7 for those with the average level wages, and 70.8 for those with the lowest level wages. While it should be noted that the calculation of these averages does not take into account the inclusion of firms with mandatory retirement ages of 61 or older, or firm characteristics such as firm size or industry, it is evident that wages decline after age 60.[4]

Are there any changes in job content and workload after age 60 compared to just before age 60? Kajitani (2011) calculated the percentage of male workers aged 60 to 64 whose current occupation is the same as their occupation at age 55, using data from the "Survey on Employment Conditions of Elderly Persons" conducted by the MHLW in 2004. As shown in Table 1, for example, the percentage of those who held managerial jobs at age 55 and still held managerial jobs at the time of the survey was relatively low at 54.7% (Panel A), while on the other hand, among those who currently held managerial jobs, the percentage of those who also held managerial jobs at age 55 was high at 84.9% (Panel B). These results suggest that in the case of managerial jobs, only a limited number of people can remain in the same jobs after age 60. On the other hand, a high percentage (74.2%) of those who were working in security at age 55 are still working in security (Panel A), while a relatively low percentage (20.8%) of those currently working in security were also working in security at age 55 (Panel B). This

Table 1. Percentage of men aged 60–64 who held the same jobs as at age 55

A: Based on the occupation at age 55 (unit: %)

Occupation at age 55	Professional and technical occupation	Managerial job	Clerical	Sales	Services	Security	Transport and communications	Manufacturing
	71.4	54.7	59.6	65.1	73.6	74.2	74.6	79.5

B: Based on the current occupation

Current occupation	Professional and technical occupation	Managerial job	Clerical	Sales	Services	Security	Transport and communications	Manufacturing
	77.0	84.9	42.3	77.0	47.6	20.8	84.5	78.7

Source: Prepared on the basis of individual questionnaire (Table 18) of the "Survey on Employment of Elderly People" (MHLW).
Note: Excerpted from Kajitani (2011) with partial modification.

implies that many of those currently working in security were previously engaged in other occupations. However, the results also include cases where people were reemployed at other firms after mandatory retirement, so it is not possible to identify whether they are in a continuous employment system.

Kume et al. (2021) analyzed the actual status of the continuous employment system using a sample of those aged 61 to 65 who retired from large firms with 300 employees or more and are currently employed, derived from the "2017 Survey on Relocation, Transfer, and Retirement" conducted by the Research Institute of Economy, Trade and Industry. Comparing those who were continuously employed with those who were not, Kume et al. (2021) point out that high percentages of those who "hold the same job as before mandatory retirement" and those who "hold the same job but scope of duties or workload have been reduced" are continuously employed. They also show that a much smaller percentage of those who "hold a job unrelated to their job before mandatory retirement" are continuously employed. These indicate that in the case of continuous employment, it is highly likely that adjustments such as a reduced workload have been made by firms, albeit with assigning people to the same job as before mandatory retirement.

Policies that boost employment opportunities for older people are desirable insofar as they are responsive to demographic changes but not desirable if they reduce employment opportunities for other age groups more than necessary (Mitani 2001). For example, as Ohta (2012) notes, there are several possible pathways for the effect of expanded older employment on the recruitment of younger people. One is that of similarity between the jobs of older and younger workers. Suppose that the job of older workers substitutes for that of younger workers. In that case, for profit-maximizing firms, mandating continued employment for the elderly decreases recruitment of young people. Conversely, if the two jobs are complementary, the same mandate will increase the recruitment of young people. Also, there could be a pathway that arises from employing elderly workers longer due to mandated continued employment. If there are more existing workers, then the number of new positions available will be smaller, i.e., the continuous employment requirement will cause firms to refrain from hiring younger workers. This occurs irrespective of job-to-job substitution. Does the policy-enforced increase in employment for the elderly reduce employment opportunities for other age groups, especially the young?

According to Böheim and Nice (2019), who primarily surveyed European studies, a positive association is observed between the employment rates of older people and young people, and there is limited evidence that expanding employment of older people reduces the employment of young workers. However, when analyzing the potential for substitution between older and younger workers, there are difficulties related to endogeneity, such as omitted variables and simultaneity. Ohta (2012) and Kondo (2016) focus on the mandate for continued employment up to age 65 under the 2006 ASEEP revision so as to analyze the impact of elderly employment on younger employment in firms while considering the endogeneity. Of these, Ohta (2012), using data by industry from the MHLW's Survey on Employment Trends (SET) from 2004 to 2008, examined whether the percentage of workers aged 60 over those aged 55 or older (the aging index) has an impact on the ratio of new hires to young workers (the youth employment rate) focusing on the 2006 ASEEP revision. He then showed that most coefficients of the aging index were statistically insignificant before 2005, whereas the impact of the aging index on the percentage of female part-time workers hired after 2006 was significantly negative. This result suggests that the mandate for continued employment may have discouraged the new hiring of younger workers. On the other hand, Kondo (2016) constructed panel data for large establishments using microdata from the SET and examined the impact of the increase in older employment due to the 2006 ASEEP revision on new hiring of other age groups. While indicating that the obligation of continued employment may have discouraged the part-time employment of middle-aged and older females, Kondo (2016) also reveals an increase in the full-time employment of younger workers. She points out that there is no clear substitution between elderly employment and hiring younger workers.[5]

Older people who have worked until the mandatory retirement age have acquired wide-ranging knowledge and experience, both general and firm-specific. If this knowledge and experience are shared with other workers within firms so as to train them, it can be interpreted as a complementary relationship between older workers and

others. Göbel and Zwick (2013) used German establishment data for the 1997–2005 period to explore the relationship between human resource policies for older workers, such as shorter working hours and vocational training, and the productivity of older workers. They showed that at firms that employ work teams with a mix of different age groups, the productivity of both older and younger workers is relatively high. This suggests a positive spillover effect between the productivity of different age cohorts working together in groups. Meanwhile, Kawata and Owan (2022) used personnel records from Japanese manufacturers to examine whether there is a potential peer effect of older workers on the job satisfaction of their colleagues. If older workers are able to share their extensive knowledge and experience with other workers, then older people can be seen as having a substantial positive peer effect. However, given the possibility that older people's skills are obsolete, older workers may also exhibit negative peer effects. Knowing which of these effects is larger can provide hints for improving workplace productivity by efficiently placing older people within firms. The results of the analysis show that peer effects on the job satisfaction of coworkers differ depending on the ability of older workers and the age of the coworkers, such as higher job satisfaction of coworkers when they work with more competent older people, and higher job satisfaction of coworkers in their 50s when they work with older people (who are close to their own age). Also, Kawata and Owan (2022) analyzed the potential peer effects of older workers on the frequency of coworkers' skill development (training). They found that working with older people led to more training for colleagues in the 30–40 age group. These findings suggest that firms can effectively facilitate sharing of older people's knowledge and experience in the workplace to cultivate younger workers.

IV. Adjustments by firms based on microdata

The previous section outlined findings from previous studies on changes in wages and job duties of older workers. It was observed or suggested that in the Japanese labor market for older workers, wages decrease at age 60, which is the minimum mandatory retirement age; adjustments are made before and after mandatory retirement, such as changes in occupation or reduction of workload while holding the same job as before mandatory retirement; there is no clear substitution between employment of older people and that of younger people; and firms tend to facilitate the passing down of older workers' knowledge and experience within the workplace. In this section, these points are verified using microdata.

The microdata used in this section is from the 2015 JILPT survey conducted in July 2015 (JILPT 2016). The survey was administered to 20,000 randomly selected private companies with 50 or more employees (excluding industries of "agriculture and forestry, and fisheries," "mining," and "compound service") nationwide, of which 6,187 responded. The breakdown of responding companies by industry sector shows that 28.4% were in manufacturing, 9.9% in transport, 18.4% in wholesale and retail trade, 24.5% in services, and 15.7% in other industries. By firm size, 6.9% of companies had 1–49 employees, 39.2% had 50–99 employees, 35.7% had 100–299 employees, 11.2% had 300–999 employees, and 3.6% had more than 1,000 employees.[6]

The following analysis focuses on firms with a mandatory retirement system to focus on continuous employment after mandatory retirement. The JILPT survey asked firms about the working conditions of workers in continuous employment (i.e., having retired and then been rehired or extending their working period without a retirement) in their early 60s, wages and evaluation systems for workers in their early 60s, and the employment status of people aged 65 and above. Specifically, firms were asked about the following issues: wage levels of workers in their early 60s, wage levels at age 61 compared to just before age 60, the job content of those in continuous employment, points that the firms consider when determining wages for continuously employed workers in their early 60s, considerations when assigning older people to workplaces, issues in securing employment for those in their early 60s, and status of securing employment from age 65 onward. Using these responses, I examine changes in the wage level, work content, and workload of older workers. Restricting the sample to firms for which all information is available for all these items results in a sample size of 2,442.[7] The definitions and descriptive statistics of the variables are summarized in Appended Table 1.

1. Changes in wages and job contents of older workers

I first examine changes in wages and job descriptions of older workers. Figure 1 shows the distribution of wages at age 61 by job type in continuous employment, where the wage just before age 60 is set to 100. Looking at the cases with the highest level of wages at age 61 (Panel A), in the largest number of cases, wages for those doing "exactly the same job" are the same as wages just before age 60. By contrast, regarding wages for those doing "the same job but with different responsibilities" or "partially different job," approximately 20 percentage points down from the wage level just before age 60 was most often observed. The wage levels for those doing "completely different jobs" were even lower. These trends are the same when wages at age 61 are at the average level (Panel B) or at the lowest level (Panel C), but for both, the shape of the wage distribution is more downwardly skewed than in the case of the highest wage level (Panel A). In particular, for those doing "exactly the same job," the shape of the wage distribution is bimodal, with a large split between cases where wages are the same level as those just before age 60 and cases where wages decrease.

However, wages of those in continuous employment can vary depending on the industry, the firm size, and wage determination criteria within the firm, as well as on changes in job content after retirement. Table 2 summarizes the associations between wages in continuous employment and differences in job content before and after mandatory retirement after controlling for these factors. I regress several indicators of wages in continuous employment on a job description, wage determination criteria, and firm characteristics. Columns (1) and (2) of the table show the estimation results with "the average annual income (wage) in their early 60s" as the dependent
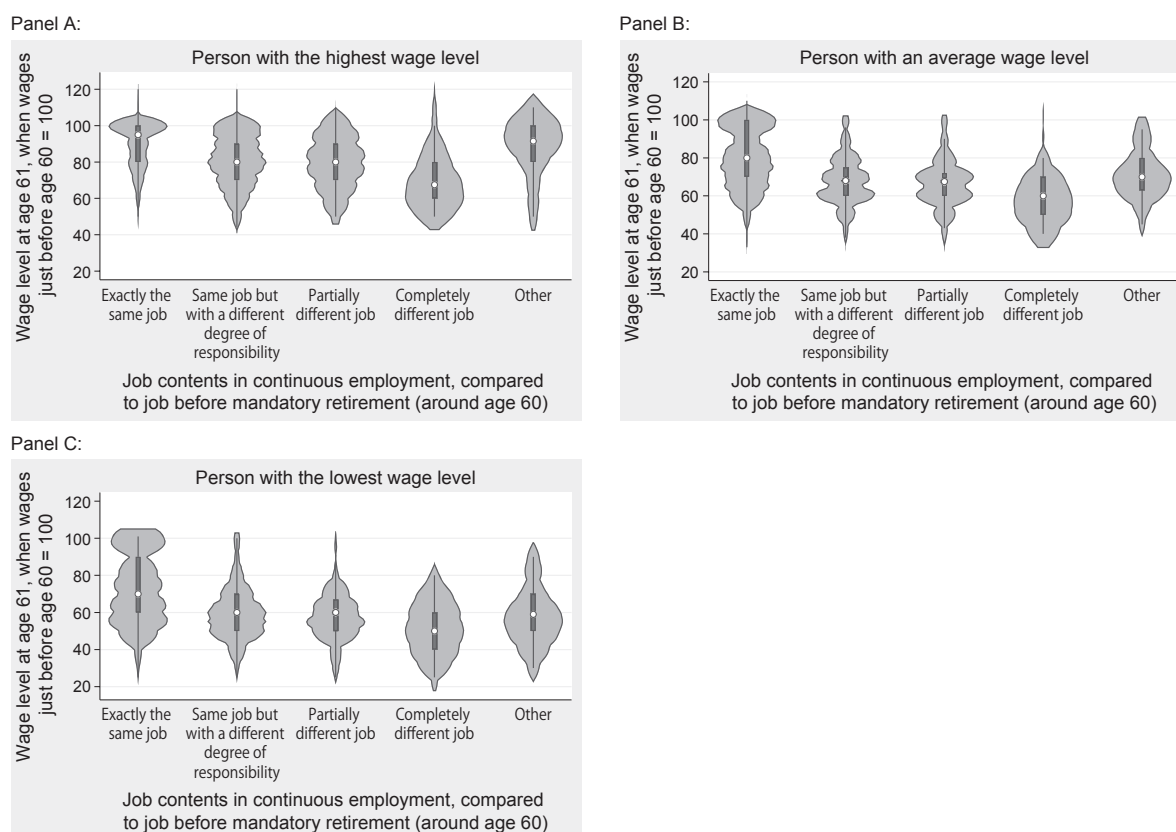
Source: Prepared by the author on the basis of the "Survey on Employment of Elderly People" (JILPT).
Notes: The figure above consists of box plots and the distribution of estimated kernel densities, where the circles and boxes indicate the median and quartile ranges, respectively, of the wage level at age 61.

Figure 1. Distribution of wage level at age 61 by job type in continuous employment

variable. The difference between the dependent variables in columns (1) and (2) is whether or not annual income includes corporate pension and public benefits. Column (1) uses the average annual income of those in their early 60s *including* corporate pensions and public benefits, while column (2) uses the average annual income *excluding* corporate pensions and benefits. Some studies point out that the determination of wages for workers in their early 60s is affected by the Old-age Pension for Active Employees (OPAE) and the Employment Continuation Benefits for Older People (ECBOP) (e.g., Kondo 2017). Comparing the results in columns (1) and

Table 2. Associations between wage level and job contents in continuous employment (OLS)

	(1)	(2)	(3)	(4)	(5)
	Average annual income of workers in their early 60s	Average wages of workers in their early 60s	(when wages just before age 60 = 100)		
			Wages at age 61 (highest level)	Wages at age 61 (average level)	Wages at age 61 (lowest level)
Job content in continuous employment					
Same job as before mandatory retirement but with a different degree of responsibility	-8.025*	-20.194***	-7.166***	-5.458***	-7.642***
	(4.824)	(4.978)	(0.603)	(0.590)	(0.716)
Partially different job	-12.616	-26.459***	-8.739***	-6.925***	-10.206***
	(7.839)	(7.890)	(0.960)	(0.985)	(1.127)
Completely different job	-41.360**	-47.811**	-13.438***	-12.719***	-14.196***
	(18.831)	(19.720)	(3.621)	(3.983)	(3.379)
Other	21.583	25.535	-3.199	1.382	-8.252**
	(33.094)	(35.120)	(3.025)	(4.029)	(3.885)
Considerations when determining wages for workers in their early 60s in continuous employment					
Status of other companies in the industry	-8.054	-12.973**	-2.736***	-2.261***	-3.486***
	(5.470)	(5.320)	(0.724)	(0.747)	(0.850)
Market wages and standards	6.846	9.560*	2.443***	3.072***	2.259***
	(5.656)	(5.603)	(0.687)	(0.666)	(0.810)
Wage level at age 60	18.672***	19.783***	0.395	0.606	0.125
	(4.293)	(4.332)	(0.544)	(0.545)	(0.644)
Starting wage level	-18.479**	-16.956**	-1.425	-1.142	-1.491
	(8.046)	(8.566)	(1.140)	(1.117)	(1.365)
Minimum wage	-43.337***	-42.274***	-0.633	-0.328	-1.209
	(5.725)	(5.686)	(0.786)	(0.827)	(0.941)
Knowledge, skill, and expertise	12.163***	12.722***	1.751***	3.944***	0.435
	(4.227)	(4.289)	(0.529)	(0.546)	(0.624)
Retirement allowances entitlement status	15.265	18.509*	0.193	0.945	-1.568
	(10.537)	(10.022)	(1.335)	(1.440)	(1.736)
Receipt of the OPAE	8.250	-14.594**	-0.668	0.029	-1.492*
	(6.214)	(6.353)	(0.772)	(0.834)	(0.879)
Receipt of the ECBOP	-10.560*	-26.938***	-4.212***	-2.703***	-3.801***
	(5.392)	(5.380)	(0.674)	(0.756)	(0.753)
Sample size	2,442	2,442	2,442	2,442	2,442
Adjusted R^2	0.10	0.14	0.32	0.22	0.29
F-test H_0: Coefficients of all variables except the constant are zero	10.58***	15.91***	49.88***	32.45***	37.63***

Notes: 1. Standard errors in parentheses are adjusted for heterogeneity.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.
3. Coefficients and constant terms for variables related to firm characteristics in the estimated model are omitted.

(2), I find that the average annual income *excluding* corporate pensions and public benefits is significantly lower for firms that take into account whether employees are receiving these pensions and benefits when determining wages for continuing employees in their early 60s. As for "the average wage in their early 60s" (column (2)), the coefficients of "receipt of the OPAE" and "receipt of the ECBOP" are significantly negative. By contrast, regarding "the average annual income in their early 60s" (column (1)), the coefficient of "receipt of the OPAE" is insignificant, and the magnitude of the coefficient of "receipt of the ECBOP" is smaller than that in column (2). This is consistent with the point that wage levels of workers in their early 60s are determined by taking into account the OPAE and the ECBOP.

After controlling for these wage determination criteria within firms, I turn our attention to the results in column (2). The coefficients for "the same job but with different responsibilities," "partially different job," and "completely different job" are all negative and statistically significant. Suppose that the magnitude of change in job contents is in the order of "the same job but with different responsibilities," "partially different job," and "completely different job" with "the same job as before mandatory retirement" as the baseline. In this case, I can see that the larger the magnitude of the change in job content, the lower the wages in continuous employment. These results are similar to those when I use "the change in wages before and after mandatory retirement" as the dependent variable. Columns (3) through (5) show the results when the wage at age 61 is used as the dependent variable, with the wage just before age 60 set at 100. The estimation results are statistically significant for the highest, average, and lowest wages at age 61, indicating that the larger the change in job content, the lower the wage at age 61. These findings imply that wages are adjusted in response to changes in the work content and workload of those in continuous employment.

2. Possibility of substitution of employment of older people for that of young people

The JILPT survey asked about several challenges in securing the employment of those in their early 60s. One of the challenges is that 25% of the responding companies "cannot recruit younger workers, resulting in an

Table 3. Potential for substitution of older workers for younger workers

(probit)

	(1) Unable to hire younger workers due to the need to secure employment of workers in their early 60s
	Marginal effect
Percentage of employees aged 60 or older	0.141*
	(0.080)
Job contents in continuous employment	
Same job as before mandatory retirement but with a different degree of responsibility	0.077***
	(0.020)
Partially different job	0.049
	(0.035)
Completely different job	-0.102
	(0.091)
Other	0.084
	(0.129)
Sample size	2,442
Adjusted McFadden's index	0.01
Wald test H$_0$: Coefficients of all variables except the constant are zero	55.07***

Notes: 1. Standard errors in parentheses are adjusted for heterogeneity.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.
3. The marginal effect of a dummy variable indicates the amount of change when the variable goes from 0 to 1.
4. Coefficients and constant terms for variables related to firm characteristics in the estimated model are omitted.

uneven age structure." Based on this question, I examine the possibility that continued employment may result in fewer young people being hired at firms with many older workers. If the firms cite "inability to hire younger workers" as a challenge accompanying the rise in the number of workers in their early 60s who are eligible for continuous employment, I can interpret this as a signal that employment substitution is occurring. Therefore, I have regressed the dummy variable for whether the respondent answered that they are "unable to hire younger workers" on the percentage of employees aged 60 or older, the job descriptions of those in continuous employment, and firm characteristics. Note that in previous studies on the potential for substitution of older people for young people, it has been common to use the number (percentage) of young workers and the number (percentage) of young hires as dependent variables, which differs from those used in this study. However, the fact that firms cite "inability to hire younger workers" as a challenge related to securing employment of those in their early 60s reflects that the firms are aware of the potential for the substitution of older workers for younger ones.

As shown in Table 3, the fact that a higher ratio of employees aged 60 or older is significantly associated with a higher probability of responding "inability to hire younger workers" can be confirmed. In addition, in terms of the job content of those in continuous employment, the probability of responding "inability to hire younger workers" significantly increases when the job is "the same job but with different degree of responsibility" compared to when the job is "the same job as before mandatory retirement." This may reflect the fact that the jobs of older workers with reduced responsibilities are similar to those of younger workers.

3. Considerations when assigning older workers

If there are changes in job content and workload compared to before mandatory retirement, one point of interest is how firms consider when assigning workers in continuous employment. For example, as described in the previous section, firms may adjust the working style of people in continuous employment, taking into account the transfer of their knowledge and experience in the workplace. The JILPT survey asked companies what they take into consideration when assigning rehired older employees. The responses were: "consideration for individual's wishes" (61%), "continuation of work to which the individual is accustomed" (83%), "work that is less physically demanding" (24%), and "smooth transfer of skills and know-how" (36%) (see Appended Table 1). What is the association between the presence or absence of these considerations and changes in the work content and workload of those in continuous employment?

Table 4 summarizes the associations between the job descriptions of those in continuous employment and the considerations in assigning older workers. I regress dummy variables representing the presence or absence of consideration of each item in columns (1) through (8) on the job description and firm characteristics. Since the presence or absence of consideration is a binary variable, the table shows the estimated results of a linear probability model. In column (9), I use a dummy variable with a value of 1 when the respondent answered "no particular consideration," and a value of 0 otherwise as the dependent variable. Among the results shown in the table, the results in columns (2), (3), (5), (6), and (9) are of particular interest. In column (2), I can observe that the probability of "continued placement in a job to which the worker is accustomed" significantly increases when the job is "the same job but with different degree of responsibility," as compared to "the same job as before mandatory retirement," while the probability of "continued placement in a job to which the worker is accustomed" is significantly lower when the job is "partially different" or "completely different." These results may reflect that older people are more accustomed to the same jobs as before mandatory retirement than to different jobs from before mandatory retirement.

On the other hand, column (3) shows that the probability of "assignment to jobs that impose less physical strain" increases as the variables move from "the same job but with different degree of responsibility," to "partially different job," to "completely different job," in that order, with "the same job as before mandatory retirement" as the baseline. Column (5) similarly shows that the probability of "placement in a department with a shortage of labor" increases in the same order. In column (6), the probability of "assignment that ensures smooth transfer of skills and expertise" significantly increases in the case of "the same job but with different

Table 4. Associations between the job contents in continuous employment and the considerations in assigning jobs (linear probability model)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Consideration of individual's wishes	Continuation of work to which the individual is accustomed	Work that is less physically demanding	Improvement of equipment and work environment	Assignment to departments with labor shortages	Passing on skills and expertise	Assignment of employees so that they feel comfortable with each other	Raising awareness of workers with management experience	No consideration
Job contents in continuous employment									
Same job as before mandatory retirement but with a different degree of responsibility	0.068***	0.053***	0.131***	0.013**	0.017*	0.160***	0.068***	0.036***	-0.045***
	(0.022)	(0.016)	(0.018)	(0.006)	(0.010)	(0.022)	(0.013)	(0.010)	(0.009)
Partially different job	0.049	-0.073**	0.242***	0.019	0.086***	0.192***	0.057***	0.012	-0.043***
	(0.037)	(0.032)	(0.034)	(0.012)	(0.023)	(0.036)	(0.022)	(0.014)	(0.012)
Completely different job	0.081	-0.478***	0.425***	-0.005	0.160*	-0.109	0.242**	0.034	-0.058***
	(0.114)	(0.113)	(0.118)	(0.007)	(0.095)	(0.083)	(0.106)	(0.054)	(0.011)
Other	0.035	-0.044	0.165	0.060	-0.047***	-0.029	0.088	-0.021***	-0.053***
	(0.124)	(0.112)	(0.135)	(0.069)	(0.016)	(0.103)	(0.094)	(0.007)	(0.009)
Sample size	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442	2,442
Adjusted R^2	0.02	0.05	0.06	0.02	0.03	0.07	0.01	0.01	0.04
F-test H_0: Coefficients of all variables except the constant are zero	4.40***	5.62***	9.53***	2.08***	3.91***	12.90***	2.52***	3.76***	4.23***

Notes: 1. Standard errors in parentheses are adjusted for heterogeneity.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.
3. Coefficients and constant terms for variables related to firm characteristics in the estimated model are omitted.

degree of responsibility" and "partially different job," compared to "the same job as before mandatory retirement." Conversely, the results in column (9) show that the probability of "no consideration" significantly decreases in all cases of "the same job but with different degree of responsibility," "partially different job," and "completely different job," compared to the case of "the same job as before mandatory retirement." Regarding the placement of older workers in continuous employment, these findings suggest that at firms with weaker restrictions to the effect that work be the same as before mandatory retirement, the firms efficiently used the older workforce by passing on skills and responding to human resource shortages while considering the decline in their physical ability.[8]

V. Conclusion: Challenges in securing employment opportunities until age 70

This study summarized the findings of previous studies on adjustments by firms in securing employment for older people, focusing on their wages and job descriptions and the potential for substitution of their employment for that of younger people. Then, using microdata from a questionnaire survey conducted on companies, I examined the extent to which these adjustments were made. The results showed that wages in the early 60s age group decreased compared to pre-retirement age workers but that wages were adjusted in response to changes in the work content and the degree of the burden imposed by continuous employment. On average, wage levels are relatively high for older people engaged in the same job as before mandatory retirement, and wages drop when the degree of responsibility or workload changes within the same job. If the job is completely different from before mandatory retirement, wages decrease further. If doing the same work as before mandatory retirement, older people can use the skills they have accumulated up to retirement as before, and firms can offer wages

commensurate with those skills. On the other hand, if not all of the accumulated skills are utilized due to changes in the work content and workload, then firms will not offer wages commensurate with those skills. In this way, the wage adjustment mechanism shown in the estimation results can be interpreted as the result of rational behavior by the firms.

At firms with higher percentages of employees aged 60 or older, and in cases of continuous employment where the work contents remain the same as before mandatory retirement but the degree of responsibility changes, "inability to recruit younger workers" was cited as a challenge related to securing employment for those in their early 60s. This suggests that firms are aware of the potential for the substitution of older workers for younger ones. On the other hand, even in cases where the job duties of those in continuous employment differ from those prior to mandatory retirement, older workers are assigned to positions to pass on the skills and expertise they possess and to compensate for staff shortages in the workplace, while taking their physical condition into account.

In April 2021, the ASEEP introduced measures that firms are obliged to make an effort to implement, to secure employment opportunities until age 70. These measures include "raising the retirement age to 70," "abolishing the mandatory retirement age," "introducing a system of continuous employment until age 70," and "measures to support business startups, etc.," such as programs to maintain outsourcing contracts until age 70 continuously. Finally, among the several adjustments made by firms to cope with mandatory employment until age 65, I conclude by examining whether the changes in the work content and workload of those in continuous employment have also achieved the securing of employment opportunities until age 70.

The JILPT survey inquired about the possibility of working after age 65. According to the survey, 28.8% of responding companies said that people "cannot work after age 65," 61.7% that they "can work after age 65 if they wish to do so and meet certain criteria," and 9.5% that "all who wish can work after age 65." These indicate that continued employment after age 65 with certain criteria is the currently prevailing model. Therefore, I examine the association between changes in the work content and workload of those in continuous employment and the possibility of employment after age 65. As shown in Appended Table 2, the probability of "cannot work after age 65" increases as the variables shift from "the same job" to "the same job but with different degree of responsibility," "partially different job," and "completely different job," in that order, with "the same job as before mandatory retirement" as the baseline. Conversely, the probability that all applicants can work after age 65 declines when they are assigned "the same job but with different degree of responsibility" or "partially different job," compared to when they are assigned "the same job as before mandatory retirement." These results indicate that the stronger the "same job" constraint on the placement of older workers in continuous employment, the higher the probability of their working in their late 60s. Of course, to secure employment for older people, it is necessary to take the diminishing physical capabilities of workers as they age into account. In this sense, it can be said that allowing workers to continue to do the same work as before mandatory retirement as much as possible with adjusting workload leads to securing employment opportunities up to age 70.

Appended Table 1. Definition of variables and descriptive statistics

Variable	Definition	Mean	Standard deviation	Minimum	Maximum
Wage level of workers in their early 60s					
Average annual income of workers in their early 60s (in 10 thousand yen)	For Q8 (1) [Average annual income], values exceeding the "mean ± 2 × standard deviation" are considered outliers and excluded from the sample.	362.46	107.78	73	770
Average wage of workers in their early 60s (in 10 thousand yen)	[Wages and bonuses] of [average annual income of workers in their early 60s] (Q8(2), (i)).	322.77	112.33	50	750

		Mean	SD	Min	Max
Wage level compared to just before age 60					
Wages at age 61 (highest level)	For Q8 (3) [Wages at age 61 (highest level) when the value just before age 60 is 100], values exceeding the "mean ± 2 × standard deviation" are considered outliers and excluded from the sample.	84.16	14.60	44	120
Wages at age 61 (average level)	For Q8 (3) [Wages at age 61 (average level) when the wage just before age 60 is 100], values exceeding the "mean ± 2 × standard deviation" are considered outliers and excluded from the sample.	72.57	15.45	33	110
Wages at age 61 (lowest level)	For Q8 (3) [Wages at age 61 (lowest level) when the value just before age 60 is 100], values exceeding the "mean ± 2 × standard deviation" are considered outliers and excluded from the sample.	64.91	17.87	25	101
Job contents in continuous employment					
Same job as before mandatory retirement but with a different degree of responsibility	For Q6 (1) [Job content in continuous employment], the value is 1 if "Same job as before mandatory retirement (around age 60) but different degree of responsibility," and 0 otherwise.	0.49	0.50	0	1
Partially different job	For Q6 (1) [Job content in continuous employment], the value is 1 if "Partially different job from before mandatory retirement (around age 60)," and 0 otherwise.	0.09	0.29	0	1
Completely different job	For Q6 (1) [Job content in continuous employment], the value is 1 if "Completely different job from before mandatory retirement (around age 60)," and 0 otherwise.	0.01	0.09	0	1
Other	For Q6 (1) [Job content in continuous employment], the value is 1 for "Other," and 0 otherwise.	0.01	0.08	0	1
Employment security challenges for workers in their early 60s					
Unable to hire younger workers	For Q7 [Employment security challenges for workers in their early 60s], the value is 1 for "Cannot recruit younger workers, resulting in an uneven age structure," and 0 otherwise.	0.25	0.43	0	1
Considerations when assigning older workers					
Consideration for individual's wishes	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Consideration for individual's wishes," and 0 otherwise.	0.61	0.49	0	1
Continuation of work to which the individual is accustomed	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Continuation of work to which the individual is accustomed," and 0 otherwise.	0.83	0.38	0	1
Work that is less physically demanding	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Work that is less physically demanding," and 0 otherwise.	0.24	0.43	0	1
Improvement of equipment and work environment	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Improvement of equipment and work environment," and 0 otherwise.	0.02	0.14	0	1
Assignment to departments with labor shortages	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Assignment to departments with labor shortages," and 0 otherwise.	0.06	0.25	0	1
Passing on skills and expertise	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Passing on skills and expertise," and 0 otherwise.	0.36	0.48	0	1
Assignment of employees so that they feel comfortable with each other	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Assignment of employees so that they feel comfortable with each other," and 0 otherwise.	0.09	0.29	0	1
Raising awareness of workers with management experience	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "Raising awareness of workers with management experience," and 0 otherwise.	0.04	0.20	0	1
No consideration	For Q6 (2) [Considerations when assigning workers in continuous employment], the value is 1 for "No consideration," and 0 otherwise.	0.04	0.20	0	1
Securing employment for workers aged 65 and over	For Q15 [Securing employment for workers aged 65 and over], the value is 1 for "cannot work after age 65," 2 for "can work after age 65 if they wish to do so and meet certain criteria," and 3 for "all who wish can work after age 65."	1.81	0.59	1	3

Considerations when determining wages for workers in their early 60s in continuous employment					
Status of other companies in the industry	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Status of other companies in the industry," and 0 otherwise.	0.19	0.39	0	1
Market wages and standards	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Market wages and standards for job duties," and 0 otherwise.	0.21	0.40	0	1
Wage level at age 60	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Wage level at age 60," and 0 otherwise.	0.59	0.49	0	1
Starting wage level	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Firms' own starting wage level," and 0 otherwise.	0.06	0.23	0	1
Minimum wage	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Minimum wage in region where company is located," and 0 otherwise.	0.13	0.34	0	1
Knowledge, skill, and expertise	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Employee's knowledge, skill, and expertise," and 0 otherwise.	0.57	0.50	0	1
Retirement allowances entitlement status	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Retirement allowances entitlement status," and 0 otherwise.	0.04	0.19	0	1
Receipt of the OPAE	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Receipt of the Old-age Pension for Active Employees," and 0 otherwise.	0.17	0.38	0	1
Receipt of the ECBOP	For Q10 [Considerations when determining wages for workers in their early 60s in continuous employment], the value is 1 for "Receipt of the Employment Continuation Benefits for Older People," and 0 otherwise.	0.23	0.42	0	1
Firm characteristics					
Mandatory retirement age	For Q1 [Status of mandatory retirement], this is the retirement age of firms that responded "There is a mandatory retirement age."	60.62	1.64	60	70
Percentage of workers aged 60 and above	Value of F4 (3) [Number of employees (regular + non-regular) by age] divided by F4 (1) [Number of employees].	0.14	0.13	0	0.96
Percentage of workers in continuous employment who are regular employees	Q5 [Regular employees as a percentage of all workers in their early 60s in continuous employment].	0.27	0.41	0	1
Manufacturing industry	The value is 1 if F1 [Industry] is "Manufacturing," and 0 otherwise.	0.33	0.47	0	1
Transport industry	The value is 1 if F1 [Industry] is "Transport," and 0 otherwise.	0.10	0.31	0	1
Wholesale and retail trade industry	The value is 1 if F1 [Industry] is "Wholesale and retail trade," and 0 otherwise.	0.19	0.40	0	1
Service industry	The value is 1 if F1 [Industry] is "Services," and 0 otherwise.	0.22	0.42	0	1
1950 or before	For F2 [Year of establishment], the value is 1 for "1950 or before," and 0 otherwise.	0.23	0.42	0	1
1951–1970	For F2 [Year of establishment], the value is 1 for "1951–1970," and 0 otherwise.	0.36	0.48	0	1
1971–1990	For F2 [Year of establishment], the value is 1 for "1971–1990," and 0 otherwise.	0.27	0.44	0	1
1991–2000	For F2 [Year of establishment], the value is 1 for "1991–2000," and 0 otherwise.	0.07	0.26	0	1
50–99 employees	For F4 [Number of employees], the value is 1 for "50–99," and 0 otherwise.	0.39	0.49	0	1
100–299 employees	For F4 [Number of employees], the value is 1 for "100–299," and 0 otherwise.	0.39	0.49	0	1
300–999 employees	For F4 [Number of employees], the value is 1 for "300–999," and 0 otherwise.	0.12	0.33	0	1
1000 and more employees	For F4 [Number of employees], the value is 1 for "1000 or more," and 0 otherwise.	0.04	0.19	0	1

Sample size = 2,442

Appended Table 2. Associations between job contents in continuous employment and employment security after age 65 (multinomial probit)

	(1)	(2a)	(2b)	(3a)	(3b)
	Cannot work after age 65 (base)	Can work after age 65 if they wish to do so and meet certain criteria		All who wish can work after age 65	
	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect
Job contents in continuous employment					
Same job as before mandatory retirement but with a different degree of responsibility	0.082***	-0.295***	-0.039*	-0.594***	-0.043***
	[0.021]	(0.092)	[0.022]	(0.125)	[0.012]
Partially different job	0.102***	-0.350**	-0.056	-0.779***	-0.046***
	[0.036]	(0.140)	[0.037]	(0.216)	[0.012]
Completely different job	0.303**	-1.108**	-0.272**	-0.969	-0.031
	[0.124]	(0.456)	[0.125]	(0.642)	[0.043]
Other	-0.005	0.141	0.083	-9.989***	-0.078***
	[0.109]	(0.486)	[0.109]	(0.310)	[0.006]
Sample size			2,442		
Sample size for each response	704	1,507		231	
AdjustedCountR^2			0.08		
Wald test H$_0$: Coefficients of all variables except the constant are zero			9924.64***		

Notes: 1. Figures in parentheses ( ) are standard errors adjusted for heterogeneity, and figures in [ ] are standard errors calculated using the Delta method.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.
3. The marginal effect of a dummy variable indicates the amount of change when the variable goes from 0 to 1.
4. Coefficients and constant terms for variables related to firm characteristics in the estimated model are omitted.

Notes

1.   For example, Yamada (2000), who analyzed the decline in wage rates of those who have reached mandatory retirement age, shows that wages decline by about 19% in the case of reemployment with a change of employer (i.e., without continuous employment) compared to those in continuous employment after mandatory retirement. Even if an older worker wishes to be reemployed with a different employer, the cost of their reemployment may be high due to asymmetric information and discrimination, and it may be difficult for the older person to find a reemployment opportunity that matches their skills. Many studies have been conducted in Europe and the US on the existence of discrimination against older people. Recent studies suggest that the effect of discrimination against older people is larger for women than for men (Neumark, Burn and Button 2019; Carlsson and Eriksson 2019).

2.   In a recent case, the merits of reducing the basic salary for the reemployed person at post-mandatory retirement were disputed in the lawsuit (The *Nagoya Automotive School (rehiring)* Case). A court ruling in the lawsuit made a guideline that it would be unreasonable if the basic salary of a rehired employee was reduced below 60% of the pre-retirement salary when the re-employees' job contents and degree of responsibility were the same as those of regular employees (Nagoya District Court, October 28, 2020 judgment, *Rodo Hanrei* 1233: 5–25, Sanro Research Institute).

3.   The act of presenting working conditions that are unreasonable and unacceptable to workers when rehiring may constitute an illegal action that infringes on the legally protected benefit of stable employment until age 65, as an indirect effect of the obligation on the part of the firms to take measures to ensure employment (Fukuoka High Court, September 7, 2017 judgment (The *Kyushu Sozai* Case), *Rodo Hanrei* 1167: 49–63, Sanro Research Institute).

4.   As discussed in Part IV, there is also the fact that wages over 60 are set lower due to institutional factors such as the Old-age Pension for Active Employees (OPAE) and the Employment Continuation Benefits for Older People (ECBOP). As for the OPAE, the pension

payment of elderly workers is reduced depending on their labor income after age 60. As for the ECBOP, workers reemployed after age 60 can receive subsidies when the wage after age 60 is less than 75% of the wage at age 60.

5. With regard to the possibility that the increase in employment of older people has hampered the recruitment of female part-time workers, Teruyama, Goto and Lechevalier (2018) used the "Basic Survey of Japanese Business Structure and Activities" conducted by the METI from 2000 to 2014. Using microdata from this survey, they estimated labor demand functions for part-time labor and dispatched labor, respectively, assuming that changes in the labor force participation rate of workers aged 60 and above are labor supply-side factors. They then showed that the increase in the labor force participation rate of workers aged 60 and above has a negative impact on both the ratio of part-time workers and the ratio of dispatched workers within firms.

6. There was no answer with regard to industry and firm size from 3.1% and 3.4% of the respondents, respectively. Note that the microdata used in this study is archived data with confidentiality processing, so some items differ from the values reported by the JILPT (2016).

7. As shown in Appended Table 1, even when the sample is restricted to firms for which all information used for analysis is available, the percentages of industries and firm size are not significantly different from before the sample was restricted.

8. Correlations between the error terms in each of the estimation equations in columns (1) through (9) were also estimated using the SUR model, but the results were not significantly different.

References

Böheim, René and Thomas Nice. 2019. "The Effect of Early Retirement Schemes on Youth Employment." *IZA World of Labor* 70v2.

Blundell, Richard, Eric French and Gemma Tetlow. 2016. "Retirement Incentives and Labor Supply." *Handbook of the Economics of Population Aging* 1, North-Holland: 457–566.

Carlsson, Magnus, and Stefan Eriksson. 2019. "Age Discrimination in Hiring Decisions: Evidence from a Field Experiment in the Labor Market." *Labour Economics* 59: 173–183.

Chuma, Hiroyuki, and Yoshio Higuchi. 1995. "Keizai kankyo no henka to choki koyo shisutemu" [The changing economic environment and the long-term employment system]. *Nihon no Koyo Shisutemu to Rodo Shijo* [Japan's employment system and labor market], edited by Inoki Takenori, and Yoshio Higuchi. Tokyo: Nikkei Inc.

Coile, Courtney C. 2015. "Economics Determinants of Workers' Retirement Decisions." *Journal of Economic Surveys* 29 (4): 830–853.

Göbel, Christian, and Thomas Zwick. 2013. "Are Personnel Measures Effective in Increasing Productivity of Old Workers?" *Labour Economics* 22: 80–93.

Hutchens, Robert. 1986. "Delayed Payment Contracts and a Firm's Propensity to Hire Older Workers." *Journal of Labor Economics* 4 (4): 439–457.

Ishii, Kayoko, and Masako Kurosawa. 2009. "Nenkin seido ga dansei koreisha no rodo kyokyu kodo ni ataeru eikyo no bunseki" [Analysis of the impact of pension system amendments on labor supply lines of older male workers]. *Japanese Journal of Labour Studies* 589: 43–64.

JILPT (Japan Institute for Labour Policy and Training). 2016. "Koreisha no koyo ni kansuru chosa (kigyo chosa)" [Survey on employment of elderly people (enterprise survey)]. JILPT Research Series 156.

———. 2020. "Koreisha no koyo ni kansuru chosa" [Survey on employment of elderly people (enterprise survey)]. JILPT Research Series 198.

Kajitani, Shinya. 2011. "Zaishoku rorei nenkin to teinen taishokusha no saishushoku kodo: Teinen taishoku zengo no shokushu henka ni chumoku shite" [Old-age pension for active employees and reemployment behavior of retirees: Focus on occupational changes before and after retirement]. *JCER Economic Journal* 64: 56–76.

Kawaguchi, Daiji, Ryo Kanbayashi, Kim Young-gak, Kwon Hyeog-ug, Satoshi Shimizutani, Kyoji Fukao, Tatsuji Makino, and Izumi Yokoyama. 2007. "Nenko chingin wa seisansei to kairi shite iruka: Kogyo tokei chosa chingin kozo kihon chosa kohyo deta ni yoru jissho bunseki" [Do seniority-based wages deviate from value of productivity? An empirical analysis based on data from the Census of Manufacture and the Basic Survey on Wage Structure]. *Economic Review* 58 (1): 61–90.

Kawata, Yuji, and Hideo Owan. 2022. "Peer Effects on Job Satisfaction from Exposure to Elderly Workers." *Journal of the Japanese and International Economies* 63: 101183.

Kimura, Taro, Yoshiyuki Kurachi, and Tomohiro Sugo. 2019. "Decreasing Wage Returns to Human Capital: Analysis of Wage and Job Experience Using Micro Data of Workers." *Bank of Japan Working Paper Series* 19–E–12.

Kodama, Naomi, and Kazuhiko Odaki. 2010. "Chingin kabu to seisansei" [Wage curves and productivity]. *Japanese Journal of Labour Studies* 597: 18–21.

Kondo, Ayako. 2014. "Konenreisha koyo anteiho no eikyo bunseki" [Analysis of the impact of the act on stabilization of employment of older persons]. *Gendai keizaigaku no choryu 2014* [Current trends in economics 2014], ch. 5, edited by Iwamoto, Yasushi, Michihiro Kandori, Etsuro Shioji, and Hiroshi Teruyama. Tokyo: Toyo Keizai Inc.

———. 2016. "Effects of Increased Elderly Employment on Other Workers' Employment and Elderly's Earnings in Japan," *IZA Journal Labor Policy* 5 (2).

———. 2017. "Koreisha koyo no genjo to seisaku kadai" [Current status and policy challenges of older employment]. *Nihon no rodo shijo: Keizaigakusha no shiten* [Japan's labor market: An economist's perspective], ch. 5, edited by Kawaguchi, Daiji. Tokyo: Yuhikaku.

Kondo, Ayako, and Hitoshi Shigeoka. 2017. "The Effectiveness of Demand-side Government Intervention to Promote Elderly Employment: Evidence from Japan." *ILR Review* 70 (4): 1008–1036.

Kume, Koichi, Kotaro Tsuru, Shinpei Sano, and Kengo Yasui. 2021. "Teinengo no keizoku koyosha no hatarakikata no jittai to sono hyoka" [Actual status and evaluation of the working conditions of post-retirement workers in continuous employment]. *JCER Economic Journal* 79: 1–23.

Lahey, Joanna N. 2010. "International Comparison of Age Discrimination Laws." *Research on Aging* 32 (6): 679–697.

Lazear, Edward P. 1979 "Why is There Mandatory Retirement?" *Journal of Political Economy* 87 (6): 1261–1284.

METI (Ministry of Economy, Trade and Industry). "Kogyo Tokei Chosa" [Census of Manufacture]. https://www.meti.go.jp/english/statistics/tyo/kougyo/index.html.

MHLW (Ministry of Health, Labour and Welfare). 2020. "Konenreisha no Koyo Jokyo" [Survey on the employment conditions of elderly persons]. 2020 aggregation result. https://www.mhlw.go.jp/content/11703000/000715711.pdf.

——— (Ministry of Health, Labour and Welfare). "Koyo Doko Chosa" [Survey on employment trends]. https://www.mhlw.go.jp/toukei/list/9-23-1c.html.

Mitani, Naoki. 2001. "Koreisha koyo sesaku to rodo jyuyo" [Employment policies for the older and labor demand]. *Koyo seisaku no keizai bunseki*, edited by Inoki, Takenori, and Fumio Otake. Tokyo: University of Tokyo Press.

Neumark, David, Ian Burn, and Patrick Button. 2019. "Is It Harder for Older Workers to Find Jobs? New and Improved Evidence from a Field Experiment." *Journal of Political Economy* 127 (2): 922–970.

OECD (Organisation for Economic Co-operation and Development). 2019. "Future Retirement Ages." *Pensions at a Glance 2019: OECD and G20 Indicators*. Paris: OECD Publishing.

Ohashi, Isao. 1990. *Rodo Shijo no Riron* [Labor market theory]. Tokyo: Toyo Keizai Inc.

Ohta, Souich. 2012. "Koyo no ba ni okeru jyakunensha to koreisha: Kyogo kankei no saikento" [Young and old in the labor market: Are they competing for jobs?]. *Japanese Journal of Labour Studies* 626: 60–74.

Oshio, Takashi, Satoshi Shimizutani, and Akiko S. Oishi. 2020. "Examining How Elderly Employment is Associated with Institutional Disincentives in Japan." *Journal of the Japanese and International Economies* 56: 101078.

Oshio, Takashi, Emiko Usui, and Satoshi Shimizutani. 2020. "Labor Force Participation of the Elderly in Japan." *Social Security Programs and Retirement around the World*, edited by Courtney C. Coile, Kevin Milligan, and David A. Wise: 163–178. Chicago: University of Chicago Press.

Sakuraba, Ryoko. 2014. "Nenrei sabetsu kinshi to teinensei: EU ho no tenkai o tegakari ni" [Age discrimination law and contractual mandatory retirement age]. *Japanese Journal of Labour Studies* 643: 31–40.

Teruyama, Hiroshi, Yasuo Goto, and Sebastien Lechevalier. 2018. "Firm-level Labor Demand for and Macroeconomic Increases in Non-regular Workers in Japan." *Japan and the World Economy* 48: 90–105.

United Nations. 2019. *World Population Prospects 2019: Highlights* (ST/ESA/SER.A/423).

Yamada, Atsuhiro. 2000. "Intai katei ni okeru chingin teika to shotoku hoten" [Wage decline and income compensation in the retirement process]. *Quarterly of Social Security Research* 35 (4): 377–394.

Yashiro, Atsushi. 2009. "Teinen encho to keizoku koyo seido: 60 sai iko no koyo encho to jinteki shigen kanri" [Human resources management for elderly employees over 60 years old: Extending the mandatory retirement age or an alternative way?]. *Japanese Journal of Labour Studies* 589: 20–29.

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